

# **SPILL CONTINGENCY PLAN**

## **Northern Ellesmere Ice Shelves, Epishelf Lakes and Climate Impacts**

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*This plan has been prepared for the Nunavut Water Board in accordance with the NWT Environmental Protection Act, Spill Contingency Planning and Reporting Regulations, July 22, 1998 and A Guide to the Spill Contingency Planning and Reporting Regulations, June 2002*

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## **1. Introduction**

This Spill Contingency Plan outlines a plan of action to be taken in the relatively unlikely event of a hazardous materials spill at the Purple Valley camp location or surrounding fieldwork locations on and near the ice shelves of northern Ellesmere Island. This field site is operated by Dr. Luke Copland of the University of Ottawa, Dr. Derek Mueller of Carleton University, and their graduate students and research partners. The Plan outlines the procedures for responding to a spill that will minimize potential health and safety hazards, environmental damage and remediation activities.

The objectives of this document are to:

- a) Identify the types of hazardous materials present at the site.
- b) Identify specific individuals and their responsibilities with respect to responding to a spill.
- c) Define procedures for the safe and effective containment and cleanup/disposal of a material spill.
- d) Define the reporting procedures and communication network to be used in the management of a material spill.

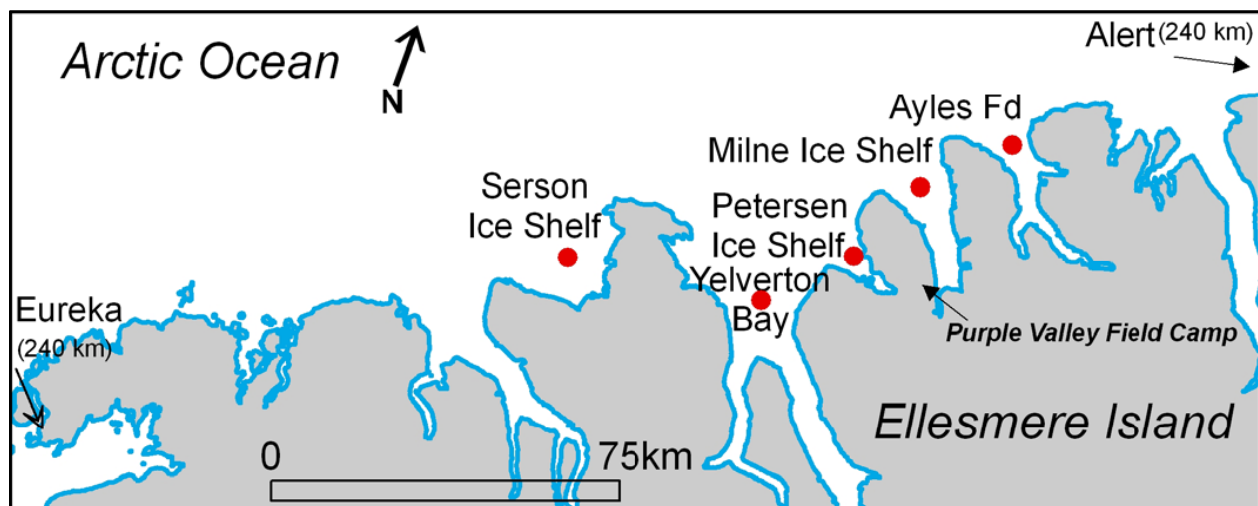
The secondary objective of this Plan is to make all field personnel aware of the seriousness and the ramifications of a hazardous material spill, which should promote mindfulness whenever handling such materials. Prevention of any type of spill is the ultimate goal.

## 2. Site Description

The area of operations for this research program is Purple Valley and the nearby ice shelves, glaciers and sea ice features along the coastline of northern Ellesmere Island. This includes Petersen Ice Shelf, Milne Ice Shelf, Serson Ice Shelf, Milne Glacier, Ayles Fiord and Yelverton Bay (Figure 1). Operations are usually conducted from a base camp at Purple Valley, with most field locations lying within a radius of ~50 km from this location. This field site was first visited briefly by Copland and Mueller in April 2008, and a camp was run there in May 2010 and 2012. In the spring, when most research operations are being conducted, the camp typically consists of 4 personal sleeping tents, a cooking/living tent, an equipment storage tent, two snowmobiles, sleds, and a fuel supply for the snowmobiles. Occasionally this camp site may also be used as a base for summer fieldwork, in which case most transportation would occur by helicopter. Spring visits typically last for 2-3 weeks and involve 4 people, while summer visits would typically last for up to 2 weeks and involve 2 people.

Upon completion of research activities on each trip, all scientific equipment, tools, food and camp supplies are flown out when personnel leave the site. Remaining on-site is a small cache of equipment consisting of komatiq sleds, plywood sheets to use under the cooking/living tent, and surplus fuel and oil.

### 2.1 Site Map



**Figure 1:** Map showing Purple Valley camp location and surrounding fieldwork locations on northern Ellesmere Island

## **2.2 Hazardous Materials Storage**

The fuel cache is located on a flat bedrock bench adjacent to the field camp location in Purple Valley, ~0.5 km from the southern end of a permanently ice-covered inlet from Milne Fiord. The site lies ~30 m above sea level and is not near any streams. The site is well drained and on a small hill, so there is never any running or ponded water on the surface. Most activities take place in May of each year, when temperatures are always below freezing and snow is on the ground. Typical snow depths at the cache location are ~0.3 m during fieldwork in May. All snow melts away in the summer.

Fuel stored on site will be separated by fuel type (as specified in Section 3) into individual caches. At the fuel caches, fuel will be stored in 205 litre (45 gallon) drums which stand on flat and stable ground. The ground consists primarily of bedrock in this location, so in our experience the drums never tip over. This keeps the risk of significant spills to a minimum.

At the close of field operations after each visit, the following must be done prior to leaving the site:

1. Empty barrels are to be removed by aircraft, and returned to Eureka or Resolute for proper disposal (typically by PCSP).
2. Pumps are to be removed from barrels.
3. All barrels that have been opened but not emptied must be checked to ensure that bungs and screw-caps are tightly sealed with an appropriately fitting bung-wrench.
4. Each fuel cache is organized: barrels are arranged in a group, and gloves, funnels, wrenches, and all other fuel transfer supplies are stored in a sealed wooden box.
5. GPS locations of the fuel cache are recorded to enable simple discovery on future trips by ourselves or others.

## **2.3 Spill Prevention Measures**

Fuel transfer takes place in two ways:

1. Transfer from 205 litre drum to 5-20 litre jerry can using a barrel pump.
2. Pouring from 5-20 litre jerry cans into the gas tank of snowmobiles, gas generators, or small gas powered drills.

During transfer drip pans will always be used to contain any spills, and the trapped fuel will be transferred directly back to the source drum or jerry can. When pouring fuel from a jerry can into small gas drills or generators, an appropriately sized funnel will be used to minimize risk of spillage, in addition to a drip pan.

Refueling will not take place below the high water mark of any water body, and will be undertaken in a way to prevent the leakage of fuel into any water body that contains fish.

When drums are in use, the barrel pump is left in the drum all the time and the open end of the transfer hose is stored facing upwards to prevent any release of fuel from the hose. There is a small risk of a spill when a barrel pump is removed, but this will be contained by using a drip tray or absorbent pad. Once empty, drums are immediately re-sealed to ensure there is no risk of spillage of residual fuel. The same is true of empty jerry cans. Empty drums are removed from the field site on the first available aircraft and returned to Eureka or Resolute Bay. Empty jerry cans are returned at the end of each field season. Leaky or damaged pumps, hoses, jerry can pour spouts or funnels must be repaired, if possible, or removed and no longer used.

### 3. Hazardous Material Inventory

The following is a list of the hazardous materials temporarily kept onsite at the Purple Valley base camp. All materials fall under the class of Fuels and Lubricants, and are used as transport fuel or cooking and heating fuel.

Volumes stored on-site vary; fuel supplies are typically delivered by Twin Otter aircraft at the beginning of each research season. The amount delivered is intended to correspond to the amount that will be used during one season's research activities, with allowances made for an "emergency" supply. Surplus fuels are stored on-site over winter in properly sealed drums. Empty fuel containers are removed whenever aircraft are available to return them to Eureka or Resolute. There is no intention to keep permanent stockpiles of fuel at this site. All fuel supplies will be removed upon completion of the research program.

For each of the substances listed below, detailed information on specific health hazards or disposal procedures can be found in the MSDS sheets (Appendix B of this document).

- **Gasoline (Mogas)** is used in snowmobiles, generators and ice coring drills. It is stored in 205 litre metal drums (and/or 5 to 20 litre plastic jerry cans during fieldwork). Typical supply on-site is 2 to 4 drums.
- **Jet-B / JP-4** is used in helicopters or fixed-wing aircraft. It is stored in 205 litre metal drums. It is used rarely at Purple Valley, but supply on-site could amount up to 6 drums if a helicopter is likely to be working in the area.
- **Propane** is used as primary cooking fuel. It is stored and transported in 11 kg (25 lb.) metal tanks. Typical supply on-site is 6 tanks.
- **2-cycle engine oil** is used in snowmobiles. It is stored in sealed plastic 1-litre containers. Typical supply on-site is 10 litres. The 1 litre containers are stored in sealed wooden boxes lined with absorbent pads.

#### **4. Spill Resource Inventory**

Spill kits are provided upon deployment to all field teams by the Polar Continental Shelf Project. Spill kits are composed of: absorbent pads, heavy-duty Nitrile gloves, safety goggles, and disposable bags. A minimum of two spill kits will be kept on-site.

In addition to spill kits, the camp is supplied with the following items that can be used to assist with a potential spill clean-up:

- 4 snow shovels
- 100 heavy plastic garbage bags
- Duct tape (4 x 100' rolls)
- Plastic tarps
- 6 sealable plastic totes (60L each), which combined will hold more than the contents of the largest fuel container on site (240L)

The above materials will be located in the base camp equipment storage tent at Purple Valley.



## **5. Response Organization**

### **5.1 Instructions and Training**

Prior to deployment to the field site, all personnel will be provided with a copy of the Spill Contingency Plan and will be instructed on its activation, should a spill occur in the field. Upon arrival at the field camp, personnel will be familiarized with the identification and location of all hazardous materials listed in the inventory, and will be instructed on how to properly store, transport and handle these materials. The location of spill kits will also be provided.

### **5.2 Duties of the Spill Response Team**

Due to the small number of personnel (max. 4) occupying the Purple Valley field site at any one time, the Spill Response Team necessarily includes all members of the field team. The only person with specific responsibilities is therefore the Field Supervisor (Project Manager or Camp Manager).

Spill Response Team Responsibilities:

- Perform daily inspections of the camp fuel storage areas
- Report any spill to the Field Supervisor.
- Containment of any spill and site remediation.

Field Supervisor Responsibilities:

- Assume complete authority over any spill scene and coordinate all personnel involved.
- Evaluate spill situation and develop overall plan of action.
- Activate the spill contingency plan
- Immediately report any spills to the NWT 24-Hour Spill Report Line and regulatory agencies (for spill greater than 1 litre)
- Fill out the Spill Report Form (for spill greater than 1 litre)
- Report the spill to the Project Manager (for spill greater than 1 litre)
- If required, obtain additional manpower, equipment, and material if not available on site for spill response by contacting the PCSP Base Manager in Resolute Bay.

## **6. Spill Response Plan**

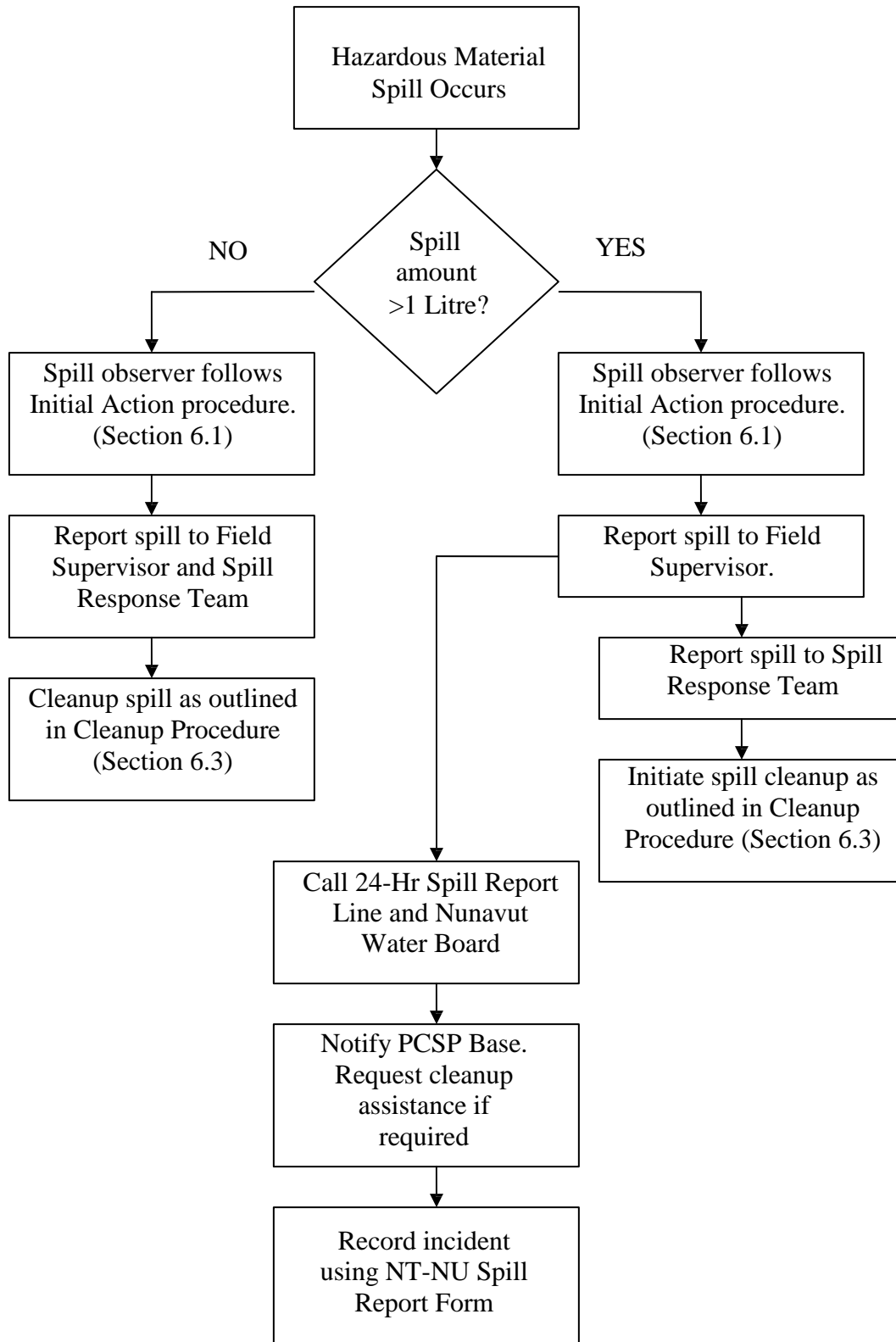
### **6.1 Initial Action**

These instructions are to be followed by the first person on a spill scene:

1. Always be alert and consider your safety first.
2. Wear personal protective equipment.
3. Do not smoke and eliminate all sources of ignition (e.g., snowmobile)
4. Assess the hazard to people in the vicinity of the spill. If possible control danger to human life.
5. Do not touch, smell, taste or get close to an unknown substance.
6. If substance has been identified and if possible and safe to do so, try to stop the flow of material:
  - a. If filling is in progress, stop at once
  - b. If seeping through a small hole, patch the hole if practical to do so.
  - c. If necessary and practical, pump the fuel from the leaking container into a refuge container.
7. Immediately report the spill to the Field Supervisor and Spill Response Team by radio, satellite phone or in person.
8. Resume any effective action to contain, mitigate, or terminate the flow of the spilled material.
9. If in doubt about cleaning procedures or for a very large spill, consult MSDS sheets for information or regulatory agencies for help.

## 6.2 Spill Response Plan

The following flow chart outlines the decisions to be made and the sequence of events to take place in the event of a hazardous material spill at the Purple Valley camp location or surrounding area:



### **6.3 Cleanup Procedure**

Spill Response Team members tasked with cleaning up a Hazardous Material Spill must address the following points before proceeding with a cleanup:

1. Always be alert and consider your safety first.
2. Wear personal protective equipment.
3. Do not smoke and eliminate all source of ignition.
4. Do not touch, smell, taste or get close to unknown substances.

#### **For Spills <1 Litre**

Any small spill (< 1L) in the spring will quickly soak into the surface snow or soil. Snow is a very effective absorber of isothermal petroleum products; the petroleum will fill the void spaces between snow grains, and the snow will thus contain the spilled liquid until the petroleum begins to evaporate, or a temperature rise causes the snow to melt<sup>1</sup>. Therefore, absorbent powders, booms, or pads will not be effective at containing or extracting petroleum products already spilled on snow. However, these powders and pads will be used for fuel spilled on soil. The most effective way to remediate the spill site is to remove all contaminated snow or soil to a facility equipped with a holding tank, where the snow/soil/petroleum mixture can be melted and the petroleum burnt or evaporated off. Contaminated snow will be slightly discolored – pale yellow in color. Contaminated soil will appear darker than the surrounding area. All contaminated snow and soil, in a 5 cm buffer surrounding the contaminated area, shall be shoveled into a tub or bucket lined with a plastic garbage bag. Once filled, bags should be securely tied shut, and the tub or bucket fitted with a lid. Containers of contaminated snow/soil shall be stored out of direct sunlight until they can be removed to Resolute Bay at the earliest opportunity. Containers should be labeled to properly identify the contents to the cargo handlers at PCSP.

#### **For Spills >1 Litre**

Experience revealed from numerous case studies of accidental and field or laboratory experimental petroleum spills suggest that spills > 1L would simply percolate deeper into the snow pack until all liquid is absorbed by snow, or until it encounters the soil<sup>1,2,3</sup>. At the site where fuel is stored at Purple Valley, the surface snow pack is <1 m deep. Below this is frozen soil, which would act as a barrier to further downward migration of any spilled liquid. Since it is relatively easy to excavate the surface snow down to this depth, removal of all contaminated snow and soil is still the best way to deal with a spill (see above for the removal and transportation from the site). If fuel spills on the ground, absorbent pads and powders will be used to soak up the spill. Contaminated soil will be dug up and removed from the site. If there is too much contaminated soil to feasibly remove from the site it will be dumped onto a tarpaulin where it will be aerated for several years and returned to the site after the hydrocarbons evaporate.

<sup>1</sup> Martel, C. James and Nadeau, Beth M. 1994. 'Snow as an expedient sorbent for hazardous materials', *Journal of Environmental Science and Health, Part A*, 29: 1, 237 — 247

<sup>2</sup> MacKay, D, P. J. Lweinovev, J. C. K. Overall and B. R. Wood. 1975. The behavior of crude oil spilled on snow. *Arctic*, 28:9-10.

<sup>3</sup> Barber, F.G. 1970. Oil spills on ice: some clean-up options. *Arctic*, 23(4): 285-8.

## **6.4 Material Specific Response Actions**

Consult MSDS sheets (found in Appendix B) for specific information on hazards, handling precautions, or cleanup for each of the fuels or chemicals listed in Section 3.

## 7. Contacts

People and organizations to be contacted in the event of a hazardous material spill:

<b>Title</b>	<b>Name</b>	<b>Contact</b>
Project Manager	Luke Copland	Tel: 613-562-5800 x2826 (work) Tel: 613-265-1817 (cell, 24hr)
Camp Manager	Derek Mueller	Tel: 613-520-2600 x1984
Department of Geography, University of Ottawa	Chantale Arcand or Jean Bjornson	Tel: 613-562-5725 Fax: 613-562-5145
PCSP Base Manager, Resolute Bay (March-September)	Michael Kristjanson	Tel: 867-252-3872
PCSP Base Manager, Ottawa (October-February)	Michael Kristjanson	Tel: 613-947-1650
NT-NU Spill Report Line (24 hr)		Tel: 867-920-8130 Fax: 867-873-6924

**Note:** The Project Manager and/or the Camp Manager will, in most cases, be at the work site for the duration of all field research activities. The only way to contact personnel in the field is via satellite phone or HF radio communications. Satellite phone numbers are not known prior to their issue by PCSP to the field personnel. If field personnel must be contacted during fieldwork, contact the PCSP Base Manager, who will relay or coordinate communications.

### **Organizations whom can be contacted for additional information:**

<b>Agency</b>	<b>Contact</b>
Department of Indian and Northern Affairs Canada, Manager of Field Operations	Peter Kusugak Tel: 867-975-4295, Fax: 867-975-6445
Environment Canada (Yellowknife)	Tel: 867-669-4744
Department of Fisheries and Oceans	Tel: 519-383-1813 or 1-866-290-3731
Government of Nunavut, Department of Environment, Environmental Assessment	Froeydis Reinhart Tel: 867-975-7735, Fax: 867-975-7739
Kitikmeot Inuit Association	Tel: 867-982-3310

## **8. Reporting**

If a hazardous materials spill occurs, the Project Manager shall:

1. Employ the Spill Contingency Plan; and
2. For each spill occurrence, submit to the Nunavut Water Board Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site. The NT-NU Spill Report Form (available at [http://www.enr.gov.nt.ca/\\_live/documents/content/NT-NU\\_Interactive\\_Spill\\_Form.pdf](http://www.enr.gov.nt.ca/_live/documents/content/NT-NU_Interactive_Spill_Form.pdf) and found in Appendix A of this document) shall be used for reporting.

## **Appendix A: Spill Report Form**

Following is a copy of the NT-NU Spill Report Form. An electronic version (fillable .PDF form) is to be kept on all field laptops.

## **Appendix B: MSDS for Hazardous Materials Inventory**

Copies of MSDS Sheets for all fuels and chemicals used or stored on-site at Purple Valley (listed in Section 3) shall be maintained with this document.





Canada

# NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

**REPORT LINE USE ONLY**

<b>A</b>	REPORT DATE: MONTH – DAY – YEAR		REPORT TIME		<input type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	<b>REPORT NUMBER</b> _____
	<b>B</b> OCCURRENCE DATE: MONTH – DAY – YEAR		OCCURRENCE TIME			
<b>C</b>	LAND USE PERMIT NUMBER (IF APPLICABLE)			WATER LICENCE NUMBER (IF APPLICABLE)		
<b>D</b>	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION				REGION	
					<input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
<b>E</b>	LATITUDE			LONGITUDE		
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES	SECONDS
<b>F</b>	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION			
<b>G</b>	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION			
<b>H</b>	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	
<b>I</b>	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES	
<b>J</b>	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	
<b>K</b>	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS					
<b>L</b>	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE	
<b>M</b>	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE	

**REPORT LINE USE ONLY**

<b>N</b>	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER
		STATION OPERATOR		YELLOWKNIFE, NT	(867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					



# Echo Power Blend Two-Cycle Engine Oil

## Material Safety Data Sheet

CITGO Petroleum Corporation  
P.O. Box 4689  
Houston, TX 77210

MSDS No. 625478416  
Revision Date 3/22/2006

**IMPORTANT:** Prepared in accordance with 29 CFR 1910.1200. Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

### Emergency Overview

**Physical State** Liquid.

**Color** Blue-green. **Odor** Petroleum.

#### **WARNING:**

**Contains Petroleum Distillates.**

**Harmful if swallowed - Can enter lungs and cause damage.**

**If swallowed, DO NOT induce vomiting. Call a physician immediately.**

**Combustible Liquid.**

**Heated material can release vapor that can cause flash fire or ignite with explosive force.**

**Vapor or mists can cause mucous membrane and respiratory tract irritation.**

**Spills may create a slipping hazard.**

### Hazard Rankings

	HMIS	NFPA
Health Hazard	* 1	1
Fire Hazard	2	2
Reactivity	0	0

\* = Chronic Health Hazard

### Protective Equipment

Minimum Recommended  
See Section 8 for Details



## SECTION 1. PRODUCT IDENTIFICATION

<b>Trade Name</b>	Echo Power Blend Two-Cycle Engine Oil	<b>Technical Contact</b>	(800) 248-4684
<b>Product Number</b>	625478416	<b>Medical Emergency</b>	(832) 486-4700
<b>CAS Number</b>	Mixture.	<b>CHEMTREC Emergency (United States Only)</b>	(800) 424-9300
<b>Product Family</b>	Two cycle engine oil		
<b>Synonyms</b>	Two cycle engine oil; CITGO® Material Code No.: 625478416		

## SECTION 2. COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
Distillates, petroleum, solvent-refined heavy paraffinic	64741-88-4	40 - 60
Polybutene	9003-29-6	20 - 40
Petroleum hydrocarbon distillates	8052-41-3	10 - 30
Proprietary Ingredients	Proprietary Mixture	<10
Distillates, petroleum, hydrotreated heavy paraffinic	64742-54-7	<10

## Echo Power Blend Two-Cycle Engine Oil

### SECTION 3. HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

**Major Route(s) of Entry** Skin contact. Eye contact.

#### Signs and Symptoms of Acute Exposure

<b>Inhalation</b>	At elevated temperatures or in enclosed spaces, product mist or vapors may irritate the mucous membranes of the nose, the throat, bronchi, and lungs.
<b>Eye Contact</b>	This material can cause eye irritation with tearing, redness, or a stinging or burning feeling. Further, it can cause swelling of the eyes with blurred vision. Effects may become more serious with repeated or prolonged contact.
<b>Skin Contact</b>	This product can cause mild, transient skin irritation with short-term exposure. The severity of irritation will depend on the amount of material that is applied to the skin and the speed and thoroughness that it is removed. Symptoms include redness, itching, and burning of the skin. Repeated or prolonged skin contact can produce moderate irritation (dermatitis).
<b>Ingestion</b>	If swallowed, large volumes of material can cause generalized depression, headache, drowsiness, nausea, vomiting and diarrhea. Smaller doses can cause a laxative effect. If aspirated into the lungs, liquid can cause lung damage.

**Chronic Health Effects Summary** Prolonged and/or repeated skin contact may cause irritation and inflammation. Symptoms include defatting, redness, dryness, blistering eczema-like lesions, scaly dermatitis, and/or more serious skin disorders. Chronic effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction.

**Conditions Aggravated by Exposure** Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin, Respiratory System, Liver, Kidneys, Central Nervous System (CNS)

**Target Organs** May cause damage to the following organs: upper respiratory tract, skin, eye, lens or cornea

**Carcinogenic Potential** This product is not known to contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification			
Irritant	<input type="checkbox"/>	Sensitizer	<input type="checkbox"/>	Combustible	<input checked="" type="checkbox"/>	Explosive	<input type="checkbox"/>
Toxic	<input type="checkbox"/>	Highly Toxic	<input type="checkbox"/>	Flammable	<input type="checkbox"/>	Oxidizer	<input type="checkbox"/>
Corrosive	<input type="checkbox"/>	Carcinogenic	<input type="checkbox"/>	Compressed Gas	<input type="checkbox"/>	Organic Peroxide	<input type="checkbox"/>
						Pyrophoric	<input type="checkbox"/>
						Water-reactive	<input type="checkbox"/>
						Unstable	<input type="checkbox"/>

### SECTION 4. FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

**Inhalation** Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.

## Echo Power Blend Two-Cycle Engine Oil

<b>Eye Contact</b>	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
<b>Skin Contact</b>	If burned by hot material, cool skin by quenching with large amounts of cool water. For contact with product at ambient temperatures, remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately.
<b>Ingestion</b>	Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. If significant amounts are swallowed or irritation or discomfort occurs, seek medical attention immediately.
<b>Notes to Physician</b>	INGESTION: The viscosity range of the product(s) represented by this MSDS is greater than 100 SUS at 100°F. There is a low risk of aspiration upon ingestion. Careful gastric lavage or emesis may be considered to evacuate large quantities of material.

## SECTION 5. FIRE FIGHTING MEASURES

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<b>NFPA Flammability Classification</b>	NFPA Class-IIIA combustible liquid.		
<b>Flash Point</b>	Closed cup: 68°C (154°F). (Pensky-Martens (ASTM D-93)) Open cup: 84°C (183°F) (Cleveland.).		
<b>Lower Flammable Limit</b>	No data.	<b>Upper Flammable Limit</b>	No data.
<b>Autoignition Temperature</b>	Not available.		
<b>Hazardous Combustion Products</b>	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur and/or nitrogen.		
<b>Special Properties</b>	This material will release vapors when heated above the flash point temperature that can ignite when exposed to a source of ignition. In enclosed spaces, vapors can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point.		
<b>Extinguishing Media</b>	SMALL FIRE: Use dry chemicals, carbon dioxide, foam, or inert gas (nitrogen). Carbon dioxide and inert gas can displace oxygen. Use caution when applying carbon dioxide or inert gas in confined spaces. LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.		
<b>Protection of Fire Fighters</b>	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines.		

## Echo Power Blend Two-Cycle Engine Oil

### SECTION 6. ACCIDENTAL RELEASE MEASURES

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Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

### SECTION 7. HANDLING AND STORAGE

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<b>Handling</b>	Avoid contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.
<b>Storage</b>	Keep container closed. Store in a cool, dry, well-ventilated area. Do not store with oxidizing agents. Do not store at elevated temperatures or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

### SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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<b>Engineering Controls</b>	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station.
<b>Personal Protective Equipment</b>	Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



<b>Eye Protection</b>	Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Wear goggles if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available.
<b>Hand Protection</b>	Avoid skin contact. Use heavy duty gloves constructed of chemical resistant materials such as Viton® or heavy nitrile rubber. Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.

## Echo Power Blend Two-Cycle Engine Oil

<b>Body Protection</b>	Use clean protective clothing if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated clothing before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.
<b>Respiratory Protection</b>	The need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).
<b>General Comments</b>	Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.

### Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels
Oil Mist, Mineral	<b>ACGIH (United States).</b> TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>
	<b>OSHA (United States).</b> TWA: 5 mg/m <sup>3</sup>
	<b>ACGIH (United States).</b> TWA: 100 ppm
Petroleum hydrocarbon distillates	<b>OSHA (United States).</b> TWA: 500 ppm

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

<b>Physical State</b>	Liquid.	<b>Color</b>	Blue-green.	<b>Odor</b>	Petroleum.
<b>Specific Gravity</b>	0.87 (Water = 1)	<b>pH</b>	Not Applicable.	<b>Vapor Density</b>	>1 (Air = 1)
<b>Boiling Range</b>	Not available.			<b>Melting/Freezing Point</b>	Not available.
<b>Vapor Pressure</b>	<0.1 kPa (<1 mm Hg) (at 20°C)			<b>Volatility</b>	135 g/l VOC (w/v)
<b>Solubility in Water</b>	Negligible solubility in cold water.			<b>Viscosity (cSt @ 40°C)</b>	77
<b>Flash Point</b>	Closed cup: 68°C (154°F). (Pensky-Martens (ASTM D-93)) Open cup: 84°C (183°F) (Cleveland.).				
<b>Additional Properties</b>	Gravity, °API (ASTM D287) = 31.3 @ 60° F Density = 7.24 Lbs/gal. Viscosity (ASTM D2161) = 400 SUS @ 100° F				

## Echo Power Blend Two-Cycle Engine Oil

### SECTION 10. STABILITY AND REACTIVITY

<b>Chemical Stability</b>	Stable.	<b>Hazardous Polymerization</b>	Not expected to occur.
<b>Conditions to Avoid</b>	Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions.		
<b>Materials Incompatibility</b>	Strong oxidizers.		
<b>Hazardous Decomposition Products</b>	No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.		

### SECTION 11. TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

<b>Toxicity Data</b>	<b>Distillates, petroleum, solvent-refined heavy paraffinic :</b>
	ORAL (LD50): Acute: >5000 mg/kg [Rat].
	DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested. Analyses conducted by method IP 346 indicate that the concentration of DMSO extractables in this mineral oil is below 3.0 weight percent.

#### **Petroleum hydrocarbon distillates:**

Dermal, Acute LD<sub>50</sub> (rabbit): >3000 mg/kg  
Inhalation, Acute LC<sub>50</sub> (rat): >5.5 mg/l (8 hours)

Studies on laboratory animals have associated similar materials with eye and respiratory tract irritation. Studies on laboratory animals have shown similar materials to cause skin irritation after repeated or prolonged contact. Repeated direct application of Stoddard Solvent to the skin can produce defatting dermatitis and kidney damage in laboratory animals. Rats developed kidney damage and elevated blood urea nitrogen levels when exposed to a concentration of 1.9 mg/L for 65 days. The kidney damage occurred only in male rats and appeared to involve both the tubules and glomeruli. The significance of these animal study results to human health is unclear.

#### **Distillates, petroleum, hydrotreated heavy paraffinic:**

ORAL (LD50): Acute: >5000 mg/kg [Rat].  
DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

## Echo Power Blend Two-Cycle Engine Oil

### SECTION 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.
<b>Environmental Fate</b>	An environmental fate analysis is not available for this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum products. Petroleum-based (mineral) lubricating oils normally will float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway may be sufficient to cause a fish kill or create an anaerobic environment.

### SECTION 13. DISPOSAL CONSIDERATIONS

**Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.**

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

### SECTION 14. TRANSPORT INFORMATION

**The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.**

<b>US DOT Status</b>	A U.S. Department of Transportation regulated material.		
<b>Proper Shipping Name</b>	Combustible liquid, n.o.s. (contains Petroleum Distillates) [This product has a flash point temperature between 60.5° to 93°C (141° and 200°F). For bulk shipments, it is classified as a US DOT "Combustible Liquid." According to 49 CFR 173.150 (f)(2), certain transportation-related requirements, such as labeling, may not apply to this product when shipped in non-bulk packaging (e.g., less than 119 gallons capacity). However, pursuant to 49 CFR 173.150 (b) limited-quantities offered for or transported via aircraft may be subject to US DOT regulation.]		
<b>Hazard Class</b>	Combustible liquid.	<b>Packing Group(s)</b>	III
		<b>UN/NA Number</b>	NA 1993
<b>Reportable Quantity</b>	A Reportable Quantity (RQ) has not been established for this material.		



## Echo Power Blend Two-Cycle Engine Oil

Placard(s)



Emergency Response  
Guide No.

128

MARPOL III Status

Not a DOT "Marine  
Pollutant" per 49 CFR  
171.8.

## SECTION 15. REGULATORY INFORMATION

<b>TSCA Inventory</b>	This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.
<b>SARA 302/304 Emergency Planning and Notification</b>	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
<b>SARA 311/312 Hazard Identification</b>	<p>The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories:</p> <p>fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard</p>
<b>SARA 313 Toxic Chemical Notification and Release Reporting</b>	This product contains the following components in concentrations above <i>de minimis</i> levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.
<b>CERCLA</b>	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. This product or refinery stream is not known to contain chemical substances subject to this statute. However, it is recommended that you contact state and local authorities to determine if there are any other reporting requirements in the event of a spill.
<b>Clean Water Act (CWA)</b>	This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
<b>California Proposition 65</b>	<p>This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health &amp; Safety Code Section 25249.5):</p> <p>Ethylbenzene: &lt;0.005% Toluene: &lt;0.001%</p>
<b>New Jersey Right-to-Know Label</b>	Petroleum Oil (Two Cycle Engine Oil)
<b>Additional Remarks</b>	No additional regulatory remarks.

## Echo Power Blend Two-Cycle Engine Oil

### SECTION 16. OTHER INFORMATION

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Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

#### REVISION INFORMATION

**Version Number** 3.0  
**Revision Date** 3/22/2006  
**Print Date** Printed on 3/22/2006.

#### ABBREVIATIONS

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AP: Approximately	EQ: Equal	>: Greater Than	<: Less Than	NA: Not Applicable	ND: No Data	NE: Not Established
ACGIH: American Conference of Governmental Industrial Hygienists				AIHA: American Industrial Hygiene Association		
IARC: International Agency for Research on Cancer				NTP: National Toxicology Program		
NIOSH: National Institute of Occupational Safety and Health				OSHA: Occupational Safety and Health Administration		
NPCA: National Paint and Coating Manufacturers Association				HMIS: Hazardous Materials Information System		
NFPA: National Fire Protection Association				EPA: US Environmental Protection Agency		

#### DISCLAIMER OF LIABILITY

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THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS CORRECTNESS. SOME INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE SUBSTANCE ITSELF. THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION MAY NOT BE APPLICABLE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION OR PRODUCTS FOR THEIR PARTICULAR PURPOSE.

THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE, AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

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\*\*\*\*\* END OF MSDS \*\*\*\*\*



## MATERIAL SAFETY DATA SHEET

Propane

MSDS No. 6182

### EMERGENCY OVERVIEW

**DANGER!**  
**EXTREMELY FLAMMABLE GAS - MAY CAUSE FLASH FIRE OR**  
**EXPLOSION! -**  
**COMPRESSED GAS**



NFPA 704 (Section 16)

High concentrations may exclude oxygen and cause dizziness and suffocation. Contact with liquid or cold vapor may cause frostbite or freeze burn.

### 1. CHEMICAL PRODUCT and COMPANY INFORMATION )

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

**EMERGENCY TELEPHONE NUMBER (24 hrs):**  
**COMPANY CONTACT (business hours):**  
**MSDS (Environment, Health, Safety) Internet Website**

**CHEMTREC (800)424-9300**  
Corporate Safety (732)750-6000  
www.hess.com

**SYNONYMS:** Dimethylmethane; Liquefied Petroleum Gas (LPG); Sales Propane  
See Section 16 for abbreviations and acronyms.

### 2. COMPOSITION and INFORMATION ON INGREDIENTS \*

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Propane (74-98-6)	70 min.
Propylene (115-07-1)	30 max.
Ethane (74-84-0)	< 2
Mixed hydrocarbons [butane (C4) and higher]	< 2.5

Light gases from distilled and catalytically-cracked petroleum oil consisting of hydrocarbons having carbon numbers in the range of C3 through C4, predominantly propane and propylene. This MSDS describes Propane, C<sub>3</sub>H<sub>8</sub>; other constituents exhibit similar hazards - significant differences are noted as appropriate. Odorized with trace amounts of odorant (typically well below 0.1% ethyl mercaptan).

### 3. HAZARDS IDENTIFICATION

#### EYES

Vapors are not irritating. However, contact with liquid or cold vapor may cause frostbite, freeze burns, and permanent eye damage

#### SKIN

Vapors are not irritating. Direct contact to skin or mucous membranes with liquefied product or cold vapor may cause freeze burns and frostbite. Ingestion is unlikely. Contact to mucous membranes with liquefied product may cause frostbite and freeze burns. Signs of frostbite include a change in the color of the skin to gray or white, possibly followed by blistering. Skin may become inflamed and painful.

#### INGESTION

Ingestion is unlikely. Contact with mucous membranes with liquefied product may cause frostbite and freeze burns.



## MATERIAL SAFETY DATA SHEET

**Propane**

**MSDS No. 6182**

### **INHALATION**

This product is considered to be non-toxic by inhalation. Inhalation of high concentrations may cause central nervous system depression such as dizziness, drowsiness, headache, and similar narcotic symptoms, but no long-term effects. Numbness, a "chilly" feeling, and vomiting have been reported from accidental exposures to high concentrations.

This product is a simple asphyxiant. In high concentrations it will displace oxygen from the breathing atmosphere, particularly in confined spaces. Signs of asphyxiation will be noticed when oxygen is reduced to below 16%, and may occur in several stages. Symptoms may include rapid breathing and pulse rate, headache, dizziness, visual disturbances, mental confusion, incoordination, mood changes, muscular weakness, tremors, cyanosis, narcosis and numbness of the extremities. Unconsciousness leading to central nervous system injury and possibly death will occur when the atmospheric oxygen concentration is reduced to about 6% to 8% or less.

**WARNING:** The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

### **CHRONIC and CARCINOGENICITY**

None expected - see Section 11.

### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Individuals with pre-existing conditions of the heart, lungs, and blood may have increased susceptibility to symptoms of asphxia (lack of oxygen).

## **4. FIRST AID MEASURES**

### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

### **INGESTION**

Risk of ingestion is extremely low. However, in cases of ingestion or oral exposure, seek immediate medical attention.

### **INHALATION**

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## **5. FIRE FIGHTING MEASURES**

### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-156 °F (-104 °C)
AUTOIGNITION POINT:	842 °F (450 °C)
OSHA/NFPA FLAMMABILITY CLASS:	FLAMMABLE GAS
LOWER EXPLOSIVE LIMIT (%):	2.1
UPPER EXPLOSIVE LIMIT (%):	9.5

### **FIRE AND EXPLOSION HAZARDS**

Liquid releases flammable vapors at well below ambient temperatures and readily forms a flammable mixture with air. Dangerous fire and explosion hazard when exposed to heat, sparks or flame. Vapors



## MATERIAL SAFETY DATA SHEET

**Propane**

**MSDS No. 6182**

are heavier than air and may travel long distances to a point of ignition and flash back. Container may explode in heat or fire. Runoff to sewer may cause fire or explosion hazard.

### **EXTINGUISHING MEDIA**

Dry chemical, carbon dioxide, Halon or water. However, fire should not be extinguished unless flow of gas can be immediately stopped.

### **FIRE FIGHTING INSTRUCTIONS**

Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out. If spill or leak has not ignited, determine if water spray may assist in dispersing gas or vapor to protect personnel attempting to stop leak.

Use water to cool equipment, surfaces and containers exposed to fire and excessive heat. For large fire the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure.

Isolate area, particularly around ends of storage vessels. Let vessel, tank car or container burn unless leak can be stopped. Withdraw immediately in the event of a rising sound from a venting safety device. Large fires typically require specially trained personnel and equipment to isolate and extinguish the fire.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

See Section 16 for the NFPA Hazard Rating.

## **6. ACCIDENTAL RELEASE MEASURES**

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and secure all ignition sources. No road flares, smoking or flames in hazard area. Consider wind direction, stay upwind and uphill, if possible. Evaluate the direction of product travel. Vapor cloud may be white, but color will dissipate as cloud disperses - fire and explosion hazard is still present!

Stop the source of the release, if safe to do so. Do not flush down sewer or drainage systems. Do not touch spilled liquid (frostbite/freezing burn hazard!). Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

## **7. HANDLING and STORAGE**

### **HANDLING PRECAUTIONS**

Keep away from flame, sparks and excessive temperatures. Use only in well ventilated areas. See also applicable OSHA regulations for the handling and storage of this product, including, but not limited to, 29 CFR 1910.110 Storage and Handling of Liquefied Petroleum Gases.

### **STORAGE PRECAUTIONS**

Store only in approved containers. Bond and ground containers. Keep away from flame, sparks, excessive temperatures and open flame. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area and in accordance with NFPA 58 "Liquefied Petroleum Gas Code."



## MATERIAL SAFETY DATA SHEET

Propane

MSDS No. 6182

### 8. EXPOSURE CONTROLS and PERSONAL PROTECTION

#### EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	Note
Propane (74-98-6)	OSHA ACGIH	1000 1000	
Propylene (115-07-1)	OSHA ACGIH	None established by OSHA 500 ppm; A4; Simple asphyxiant	
Ethane (74-84-0)	OSHA ACGIH	None established by OSHA or ACGIH Simple asphyxiant	
Mixed hydrocarbons [butane (C4) and higher]	OSHA ACGIH	N/A - Limits above will predominate	

#### ENGINEERING CONTROLS

Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Use explosion-proof equipment and lighting in classified/controlled areas.

#### EYE/FACE PROTECTION

Where there is a possibility of liquid contact, wear splash-proof safety goggles and faceshield.

#### SKIN PROTECTION

Where contact with liquid may occur, wear apron, faceshield, and cold-impervious, insulating gloves.

#### RESPIRATORY PROTECTION

Use a NIOSH/MSHA approved positive-pressure, supplied air respirator with escape bottle or self-contained breathing apparatus (SCBA) for gas concentrations above occupational exposure limits, for potential for uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere.

**CAUTION:** Flammability limits (i.e., explosion hazard) should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection.

Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

### 9. PHYSICAL and CHEMICAL PROPERTIES

#### APPEARANCE

Colorless gas. Cold vapor cloud may be white but the lack of visible gas cloud does not indicate absence of gas. A colorless liquid under pressure.

#### ODOR

Odorless when pure, but may have a "natural gas" type odor when treated with odorizing agent (usually ethyl mercaptan).

#### BASIC PHYSICAL PROPERTIES

BOILING POINT: -43.8 °F (-42.1 °C)  
VAPOR PRESSURE: 109.73 psig @ 70 °F (21.1 °C)  
VAPOR DENSITY (air = 1): 1.56 @ 32 °F (0 °C)  
SPECIFIC GRAVITY (H<sub>2</sub>O = 1): 0.531 @ 32 °F (0 °C)  
SOLUBILITY (H<sub>2</sub>O): slight (62.4 ppm) @ 77 °F (25 °C)



## MATERIAL SAFETY DATA SHEET

Propane

MSDS No. 6182

### 10. STABILITY and REACTIVITY

**STABILITY:** Stable. Hazardous polymerization will not occur.

#### **CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**

Keep away from strong oxidizers, ignition sources and heat. Explosion hazard when exposed to chlorine dioxide. Heating barium peroxide with propane causes violent exothermic reaction. Heated chlorine-propane mixtures are explosive under some conditions.

#### **HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

### 11. TOXICOLOGICAL PROPERTIES

#### **ACUTE TOXICITY**

Propane exhibits some degree of anesthetic action and is mildly irritating to the mucous membranes. At high concentrations propane acts as a simple asphyxiant without other significant physiological effects. High concentrations may cause death due to oxygen depletion.

#### **CARCINOGENICITY**

Carcinogenicity: **OSHA:** NO **IARC:** NO **NTP:** NO **ACGIH:** NO

### 12. ECOLOGICAL INFORMATION

Liquid release is only expected to cause localized, non-persistent environmental damage, such as freezing. Biodegradation of this product may occur in soil and water. Volatilization is expected to be the most important removal process in soil and water. This product is expected to exist entirely in the vapor phase in ambient air.

### 13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

### 14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	Propane	
HAZARD CLASS:	2.1	
DOT IDENTIFICATION NUMBER:	UN 1978	
DOT SHIPPING LABEL:	FLAMMABLE GAS	Placard:



PROPER SHIPPING NAME:	Petroleum Gas, Liquefied
HAZARD CLASS:	2.1
DOT IDENTIFICATION NUMBER:	UN 1075
DOT SHIPPING LABEL:	FLAMMABLE GAS

### 15. REGULATORY INFORMATION (rev. Oct-07)

#### **U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION**

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.



## MATERIAL SAFETY DATA SHEET

Propane

MSDS No. 6182

### CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

### CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts natural gas and synthetic gas usable for fuel and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, may still apply.

### SARA SECTION 311/312 - HAZARD CLASSES

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	X	--

### SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

<u>INGREDIENT NAME</u>	<u>CONCENTRATION PERCENT BY VOLUME</u>
Propylene	CAS NUMBER: 115-07-1 30 max.

### CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS

This product does not contain chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

### CANADIAN REGULATORY INFORMATION (WHMIS)

Class A (Compressed Gas)      Class B, Division 1 (Flammable Gas)

## 16. OTHER INFORMATION

<b><u>NFPA® HAZARD RATING</u></b>	HEALTH:	1	Slight
	FIRE:	4	Serious
	REACTIVITY:	0	Minimal

<b><u>HMIS® HAZARD RATING</u></b>	HEALTH:	1	Slight
	FIRE:	4	Serious
	PHYSICAL:	0	Minimal

**SUPERSEDES MSDS DATED:**      07/01/06

### **ABBREVIATIONS:**

AP = Approximately      < = Less than      > = Greater than  
N/A = Not Applicable      N/D = Not Determined      ppm = parts per million





## MATERIAL SAFETY DATA SHEET

**Propane**

**MSDS No. 6182**

### **ACRONYMS:**

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
AIHA	American Industrial Hygiene Association	OPA	Oil Pollution Act of 1990
ANSI	American National Standards Institute (212)642-4900	OSHA	U.S. Occupational Safety & Health Administration
API	American Petroleum Institute (202)682-8000	PEL	Permissible Exposure Limit (OSHA)
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	RCRA	Resource Conservation and Recovery Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]	REL	Recommended Exposure Limit (NIOSH)
EPA	U.S. Environmental Protection Agency	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
HMIS	Hazardous Materials Information System	SCBA	Self-Contained Breathing Apparatus
IARC	International Agency For Research On Cancer	SPCC	Spill Prevention, Control, and Countermeasures
MSHA	Mine Safety and Health Administration	STEL	Short-Term Exposure Limit (generally 15 minutes)
NFPA	National Fire Protection Association (617)770-3000	TLV	Threshold Limit Value (ACGIH)
NIOSH	National Institute of Occupational Safety and Health	TSCA	Toxic Substances Control Act
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	TWA	Time Weighted Average (8 hr.)
		WEEL	Workplace Environmental Exposure Level (AIHA)
		WHMIS	Workplace Hazardous Materials Information System (Canada)

### **DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



## MATERIAL SAFETY DATA SHEET

Jet Fuel JP-4

MSDS No. 9947

### EMERGENCY OVERVIEW

#### DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT  
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF  
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

### 1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

**EMERGENCY TELEPHONE NUMBER (24 hrs):**  
**COMPANY CONTACT (business hours):**  
**MSDS Internet Website**

**CHEMTREC (800)424-9300**  
Corporate EHS (732)750-6000  
www.hess.com

**SYNONYMS:** JP - 4 Jet Fuel See Section 16 for abbreviations and acronyms.

### 2. COMPOSITION and INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Kerosene (8008-20-6)	35 to 65
Light Naphtha (64742-73-0)	<balance>
Benzene (71-43-2)	0.1 to 0.4

A complex combination of hydrocarbons including naphthenes, paraffins, and aromatics.

### 3. HAZARDS IDENTIFICATION

#### EYES

Contact may cause mild irritation.

#### SKIN

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

#### INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.



## MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

### **INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

### **CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

## **4. FIRST AID MEASURES**

### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

### **INGESTION**

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### **INHALATION**

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## **5. FIRE FIGHTING MEASURES**

### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-10 to 30 °F (-23 to -1 °C)
AUTOIGNITION POINT:	464 °F (240 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1B Flammable
LOWER EXPLOSIVE LIMIT (%):	1.3
UPPER EXPLOSIVE LIMIT (%):	8.0

### **FIRE AND EXPLOSION HAZARDS**

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier



## MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### **EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

### **FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

## **6. ACCIDENTAL RELEASE MEASURES**

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## **7. HANDLING and STORAGE**

### **HANDLING PRECAUTIONS**

Handle as a combustible liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.



## MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

### **STORAGE PRECAUTIONS**

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

### **WORK/HYGIENIC PRACTICES**

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

## **8. EXPOSURE CONTROLS and PERSONAL PROTECTION**

### **EXPOSURE LIMITS**

Components (CAS No.)	Source	<u>Exposure Limits</u>		Note
		TWA/STEL		
Kerosene (8008-20-6)	OSHA	5 mg/m <sup>3</sup> as mineral oil mist		
	ACGIH	100 mg/m <sup>3</sup> TWA		A3
Light Naphthalene ((64742-73-0))	OSHA	10 ppm		
	ACGIH	10 ppm TWA/ 15 ppm STEL		A4
Benzene (71-43-2)	OSHA	1 ppm TWA / 5 ppm STEL		
	ACGIH	0.5 ppm TWA/ 2.5 ppm STEL		A1

### **ENGINEERING CONTROLS**

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

### **EYE/FACE PROTECTION**

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

### **SKIN PROTECTION**

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.



## MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

### **RESPIRATORY PROTECTION**

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

### **9. PHYSICAL and CHEMICAL PROPERTIES**

#### **APPEARANCE**

Pale yellow to water-white liquid

#### **ODOR**

Characteristic petroleum distillate odor

#### **BASIC PHYSICAL PROPERTIES**

BOILING RANGE: 135 to 518 °F (57 to 270 °C)  
VAPOR PRESSURE: 2-3 psia @ 100 °F (38 °C)  
VAPOR DENSITY (air = 1): AP 4.5  
SPECIFIC GRAVITY (H<sub>2</sub>O = 1): 0.75 - 0.80  
PERCENT VOLATILES: 100 %  
EVAPORATION RATE: Fast, based on naphtha component  
SOLUBILITY (H<sub>2</sub>O): Negligible

### **10. STABILITY and REACTIVITY**

**STABILITY:** Stable. Hazardous polymerization will not occur.

#### **CONDITIONS TO AVOID**

Material is stable under normal conditions. Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers such as nitric and sulfuric acids.

#### **HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

### **11. TOXICOLOGICAL PROPERTIES**

#### **ACUTE TOXICITY**

Acute dermal LD50 (rabbits): > 5 g/kg	Acute oral LD50 (rats): > 25 g/kg
Primary dermal irritation: mildly irritating (rabbits)	Primary eye irritation: mildly irritating (rabbits)
Guinea pig sensitization: negative	

#### **CHRONIC EFFECTS AND CARCINOGENICITY**

Carcinogenicity: **OSHA:** NO **IARC:** NO **NTP:** NO **ACGIH:** 1997 NOIC: A3  
Dermal carcinogenicity: positive (mice)

Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.



## MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

### 12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### 13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

### 14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:	Fuel, Aviation, turbine engine
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1863
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:



### 15. REGULATORY INFORMATION

#### U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

#### CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

#### CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

#### SARA SECTION 311/312 - HAZARD CLASSES

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	--	--

#### SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION PERCENT BY WEIGHT</u>
Benzene (71-43-2)	0.01 to 0.4

#### CANADIAN REGULATORY INFORMATION (WHMIS)





# MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

Class B, Division 2 (Flammable Liquid) Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

## **CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>Date Listed</u>
Benzene	2/27/1987

## **16. OTHER INFORMATION**

<b><u>NFPA® HAZARD RATING</u></b>	HEALTH:	1
	FIRE:	3
	REACTIVITY:	0

Refer to NJPA 704 "Identification of the Fire Hazards of Materials" for further information

<b><u>HMIS® HAZARD RATING</u></b>	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal
			* CHRONIC

**SUPERSEDES MSDS DATED:** 1/18/1999

## **ABBREVIATIONS:**

AP = Approximately < = Less than > = Greater than  
N/A = Not Applicable N/D = Not Determined ppm = parts per million

## **ACRONYMS:**

ACGIH	American Conference of Governmental Industrial Hygienists	NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
AIHA	American Industrial Hygiene Association	NTP	National Toxicology Program
ANSI	American National Standards Institute (212)642-4900	OPA	Oil Pollution Act of 1990
API	American Petroleum Institute (202)682-8000	OSHA	U.S. Occupational Safety & Health Administration
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit (OSHA)
DOT	U.S. Department of Transportation [General Info: (800)467-4922]	RCRA	Resource Conservation and Recovery Act
EPA	U.S. Environmental Protection Agency	REL	Recommended Exposure Limit (NIOSH)
HMIS	Hazardous Materials Information System	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
IARC	International Agency For Research On Cancer	SCBA	Self-Contained Breathing Apparatus
MSHA	Mine Safety and Health Administration	SPCC	Spill Prevention, Control, and Countermeasures
NFPA	National Fire Protection Association (617)770-3000	STEL	Short-Term Exposure Limit (generally 15 minutes)
NIOSH	National Institute of Occupational Safety and Health	TLV	Threshold Limit Value (ACGIH)
		TSCA	Toxic Substances Control Act
		TWA	Time Weighted Average (8 hr.)





## MATERIAL SAFETY DATA SHEET

**Jet Fuel JP-4**

**MSDS No. 9947**

WEEL    Workplace Environmental Exposure  
          Level (AIHA)

WHMIS   Workplace Hazardous Materials  
            Information System (Canada)

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Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

### EMERGENCY OVERVIEW

#### DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT  
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF  
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

### 1. CHEMICAL PRODUCT and COMPANY INFORMATION

**Hess Corporation**  
**1 Hess Plaza**  
**Woodbridge, NJ 07095-0961**

**EMERGENCY TELEPHONE NUMBER (24 hrs):**  
**COMPANY CONTACT (business hours):**  
**MSDS (Environment, Health, Safety) Internet Website**

**CHEMTREC (800)424-9300**  
Corporate Safety (732)750-6000  
[www.hess.com](http://www.hess.com)

**SYNONYMS:** Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

### 2. COMPOSITION and INFORMATION ON INGREDIENTS \*

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

### 3. HAZARDS IDENTIFICATION

#### **EYES**

Moderate irritant. Contact with liquid or vapor may cause irritation.

#### **SKIN**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

#### **INGESTION**

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

#### **INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

#### **CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

#### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

### 4. FIRST AID MEASURES

#### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

#### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

#### **INGESTION**



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DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### **INHALATION**

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## **5. FIRE FIGHTING MEASURES**

### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

### **FIRE AND EXPLOSION HAZARDS**

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### **EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

### **FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.



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### **6. ACCIDENTAL RELEASE MEASURES**

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### **7. HANDLING and STORAGE**

#### **HANDLING PRECAUTIONS**

\*\*\*\*\*USE ONLY AS A MOTOR FUEL\*\*\*\*\*

\*\*\*\*\*DO NOT SIPHON BY MOUTH\*\*\*\*\*

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

#### **STORAGE PRECAUTIONS**

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

#### **WORK/HYGIENIC PRACTICES**

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.



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### 8. EXPOSURE CONTROLS and PERSONAL PROTECTION

#### EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	Skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	20	--	A4	
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

#### ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

#### EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

#### SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

#### RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

### 9. PHYSICAL and CHEMICAL PROPERTIES

#### APPEARANCE

A translucent, straw-colored or light yellow liquid



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### **ODOR**

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

### **ODOR THRESHOLD**

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

### **BASIC PHYSICAL PROPERTIES**

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	0.70 - 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H <sub>2</sub> O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

## **10. STABILITY and REACTIVITY )**

**STABILITY:** Stable. Hazardous polymerization will not occur.

### **CONDITIONS TO AVOID**

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

### **INCOMPATIBLE MATERIALS**

Keep away from strong oxidizers.

### **HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitroresols that can decompose violently.

## **11. TOXICOLOGICAL PROPERTIES**

### **ACUTE TOXICITY**

Acute Dermal LD50 (rabbits): > 5 ml/kg	Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating	Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative	

### **CHRONIC EFFECTS AND CARCINOGENICITY**

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.





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This product may contain methyl tertiary butyl ether (MTBE ): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

### 12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API ([www.api.org](http://www.api.org)) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

### 13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

### 14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Gasoline  
DOT HAZARD CLASS and PACKING GROUP: 3, PG II  
DOT IDENTIFICATION NUMBER: UN 1203  
DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



### 15. REGULATORY INFORMATION

#### U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

#### CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

#### CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

#### SARA SECTION 311/312 - HAZARD CLASSES

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	--	--

#### SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION WT. PERCENT</u>
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3





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n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents ([www.epa.gov/tri](http://www.epa.gov/tri)) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

### **CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>Date Listed</u>
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

### **CANADIAN REGULATORY INFORMATION (WHMIS)**

Class B, Division 2 (Flammable Liquid)

Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

### **16. OTHER INFORMATION**

<b><u>NFPA® HAZARD RATING</u></b>	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
<b><u>HMIS® HAZARD RATING</u></b>	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal
			* CHRONIC

**SUPERSEDES MSDS DATED:** 07/01/06

### **ABBREVIATIONS:**

AP = Approximately      < = Less than      > = Greater than  
N/A = Not Applicable      N/D = Not Determined      ppm = parts per million

### **ACRONYMS:**

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation
ANSI	American National Standards Institute (212)642-4900		[General Info: (800)467-4922]
API	American Petroleum Institute (202)682-8000	EPA	U.S. Environmental Protection Agency
		HMIS	Hazardous Materials Information System



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IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

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