

# **Spill Contingency Plan for the Hamlet of Tuktoyaktuk**

**Water Licence #N5L3-0714**

**Created September 15, 2015**

**Revised September 2018**

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## Preface

Under the *Waters Act (WA)* and Section 5 (2) (g) of the *Waters Regulations (WR)* all applicants where the undertaking involves the handling or storage of petroleum products or hazardous materials, must prepare (i) a plan for the safe handling, storage and disposal thereof, and (ii) a contingency plan for their containment and for the clean-up thereof in the event of a spill.

## Revision History

Date	Revised By:	Revision Description
Sept 15, 2015	AECOM	
Jan 28, 2016	AECOM	
Feb 2, 2016	AECOM	
Sept 2018	AECOM	Updates to Water Licence (cover, 1.11.4), contacts (1.1, 1.3, 2.1, 2.2) and landfill (1.12.2)

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# 1. Introduction and Project Details

## 1.1. General

This Spill Contingency Plan provides for the prompt and coordinated response of the Hamlet of Tuktoyaktuk located at 69° 27' N and 133° 02' W.

Contact information:

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Attention: Duncan Walker, SAO

## 1.2. Effective Date

The effective date of this Spill Contingency plan is September 15, 2015.

## 1.3. Distribution List

This plan and the most recent revisions have been distributed to:

### Distribution List

Organization	Title	Date distributed
Environment Canada- Environmental Protection	Michael Bell/Regional Director, Prairie and Northern Region Phone: (780) 951-8887	
Fisheries and Ocean Canada	Ellen Lea/Fisheries Management Biologist Phone: (867) 777-7503	
Government of NWT- MACA	David Reid/Regional Superintendent Phone: (867) 777-7120	
Hamlet of Tuktoyaktuk	Duncan Walker/SAO Phone: (867)777-2286	
Government of the NWT – Lands Division - Inuvik	Conrad Baetz/Regional Superintendent Phone: (867) 777-8901	
Government of the NWT – ENR - Water Resources	Philippe Thibert-Leduc/Water Resource Officer Phone: (867) 678-6676	
Inuvialuit Water Board (IWB)	Mardy Semmler/Executive Director Phone: (867) 678-8609	

## 1.4. Purpose and Scope

The purpose of this plan is to outline response actions for potential spills. The plan identifies key response personnel and their roles and responsibilities in the event of a spill, as well as the

equipment and other resources available to respond to a spill. It details spill response procedures that will minimize potential health and safety hazards, environmental damage, and clean-up requirements. The plan has been prepared to ensure quick access to all the information required in responding to a spill. The Spill Contingency Plan shall be reviewed annually.

## **1.5. Environmental Policy**

Not available.

## **1.6. Sites Descriptions**

The Hamlet of Tuktoyaktuk (or Tuktuujaartuq, “looks like a caribou”) is located on Kugmallit Bay near the Mackenzie River Delta. Tuktoyaktuk is accessible by plane, or seasonally by ice-road. The 137 kilometre (km) all season Inuvik-Tuktoyaktuk Highway (ITH) is currently under construction and is scheduled for completion in 2017-2018.

Tuktoyaktuk is the most northern community on Canada’s mainland. Prior to 1900, the area was home to many Inuit whalers, but this original population was badly hit by years of influenza epidemics brought by American whalers. Eventually Alaskan Dene people and inhabitants of Herschel Island settled in the area. A Hudson’s Bay trading post was built in 1928, and in the 1950s Tuktoyaktuk became a supply base for the Cold War DEW Line. Today, many community residents work in oil and gas, and transportation (i.e., Inuvik-Tuk Highway), support local tourism and Arctic research, or practice traditional economic activities such as hunting and trapping.

Table 1 below presents a brief profile of the community including size, terrain, climate and socio-economic characteristics.

**Table 1: Profile of Tuktoyaktuk**

Category	Description
Location:	69° 27' N and 133° 02' W
Population:	962 (2014 NWT Bureau of Statistics)
Residences:	265 (2014 NWT Bureau of Statistics)
Proximity:	137 km north of Inuvik, 1130 km northwest of Yellowknife
Weather:	Annual Daily Average = -10.2°C July Daily Average = 11.0°C and January Daily Average = -26.6°C (Canadian Climate Normals 1981-2010)
Precipitation:	7.49 cm of rainfall and 10.31 cm of snowfall annually
Vegetation:	Surrounding vegetation consists of moss, peat, grasses, lichens, and small bushes of willow and Labrador Tea. Small flowering plants are common in summer (GNWT, 1982).
Transportation:	Accessible by air year-round, or by ice road from Inuvik or Aklavik in winter. All season road from Inuvik to Tuktoyaktuk is expected to be completed in 2017/18 winter season.
Economy:	Major industries include transportation, petroleum exploration, tourism and traditional trapping and hunting
Services:	Public School, Health Centre, RCMP Station, etc.
Geology/Terrain:	Terrain around Tuk is flat, barren tundra dotted with shallow lakes and pingos. Permafrost is continuous, with an active layer generally less than 0.5 m. The peninsula under the community is coarse sand, silt, clay and gravel with interbedded ice lenses, formed from erosion material.

## 1.7. Identification of Special Areas that can Potentially be Impacted

Sensitive Locations

Hamlet Water Supply – 69° 26' 15" N, 133° 1' 40" W

Landfill - 69° 25' 15" N, 133° 1' 29" W

Wastewater Discharge location - 69° 24' 0" N, 133° 2' 55" W

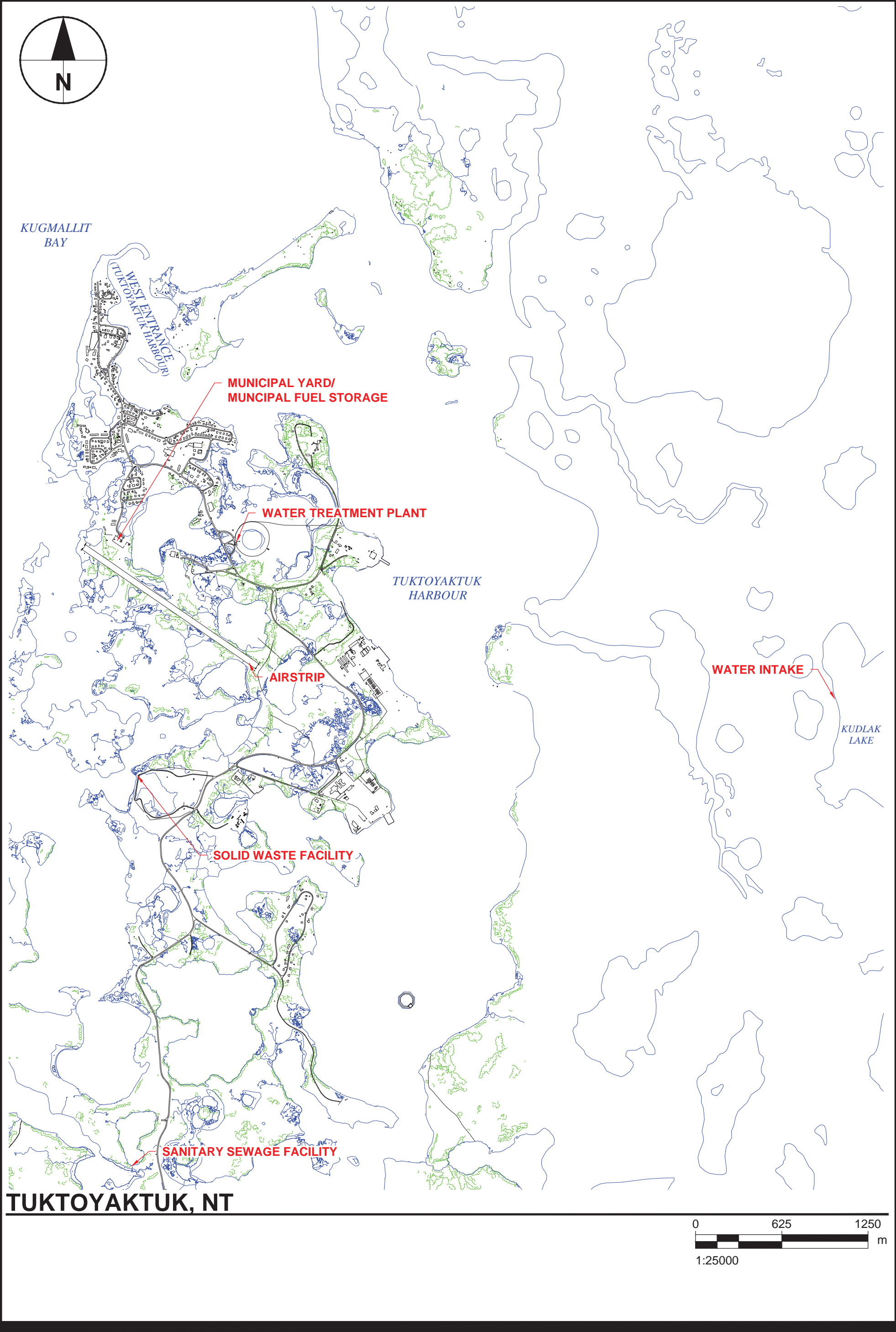
## 1.8. Hazardous Materials Stored on Site

**Table 2: On Site Hazardous Materials, Container Type, Normal/Maximum Quantities, Location**

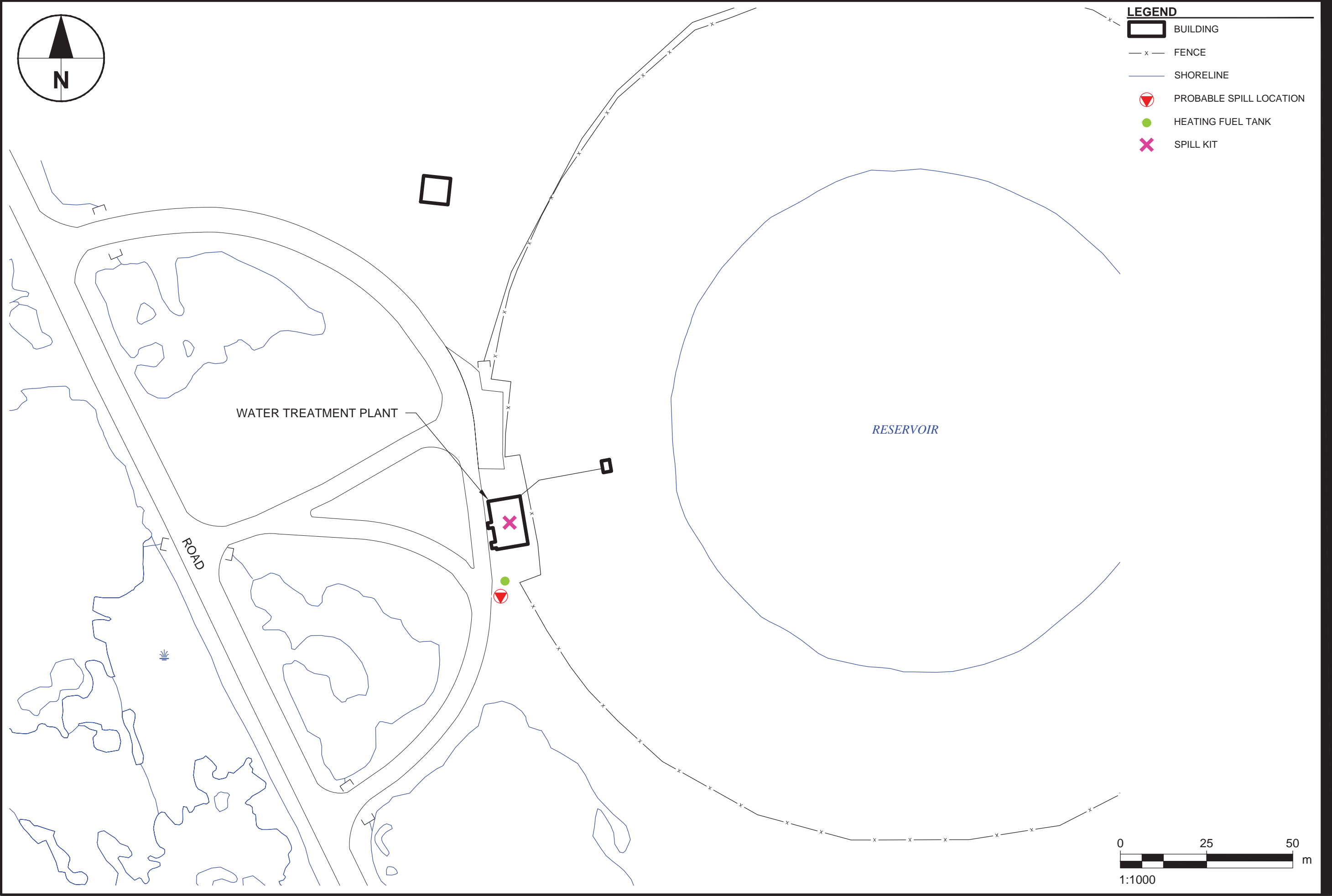
Material	Storage container	Average on-site	Maximum on-site	Storage location and uses
Automotive Batteries	On pallets in cold storage warehouse	15	30	Municipal yard – store and transfer
Used Oil	1000 liter containers	1	1	Municipal yard – burned in waste oil furnace
Mercury-containing Products	In clearly labelled waste containers	20	40	Municipal yard – store and transfer
Propane	2 X 3000 L and 4 X 1500 L tanks	6	6	Kudlak lake access road – used to power the water pump system
Chlorine	32 X 20 L pails	20	50	Inside Water Treatment Plant – treating water
Heating Fuel	1 X double-walled 1500 L tank	1	1	Water Treatment Plant – heating the building

## **1.9. Preventive Measures**

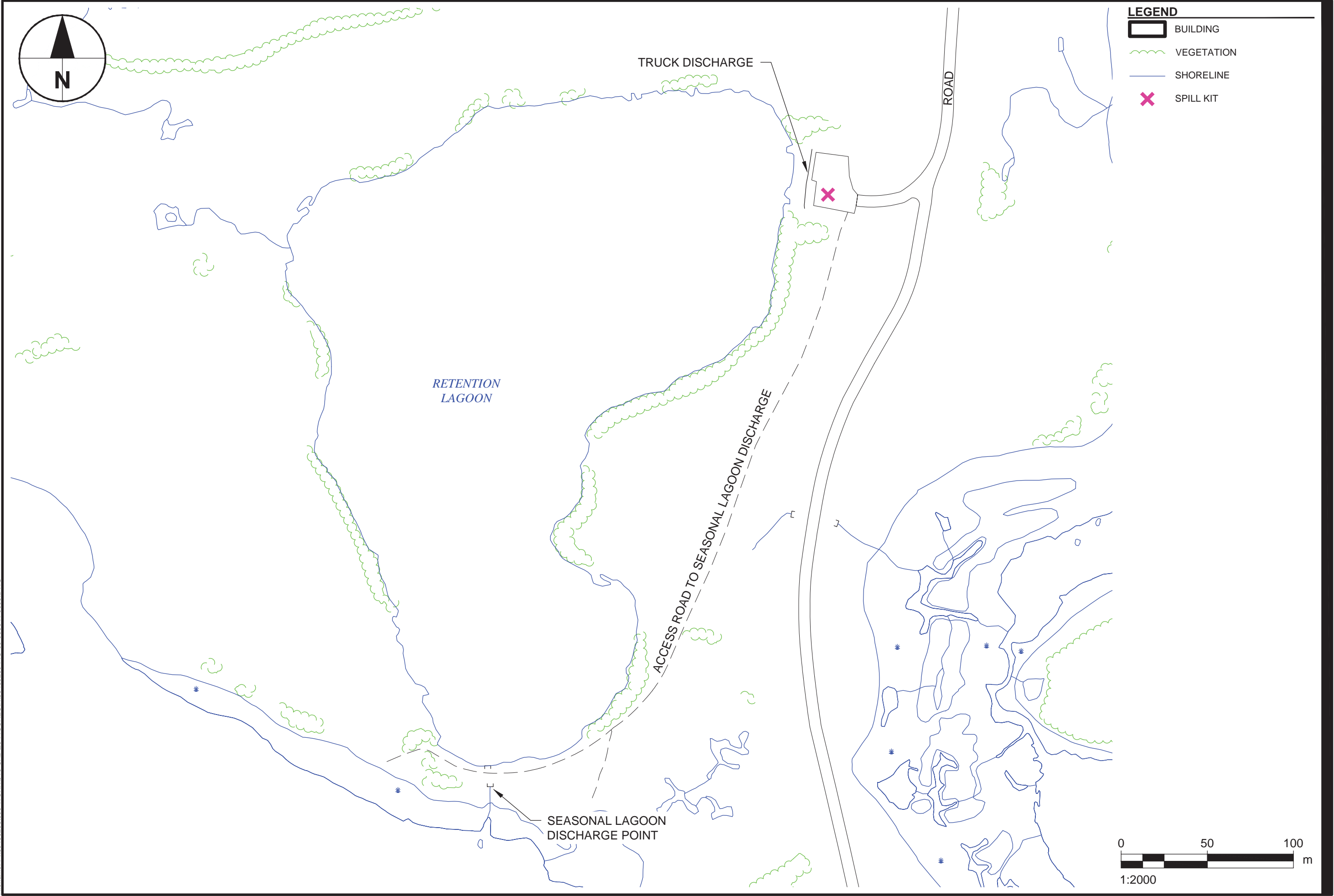
This section provides an overview of Tuktoyaktuk's water supply and waste disposal systems and their built in preventative measures. **Figure 1.9.1** shows the locations of the water and waste management infrastructure described below. **Figures 1.9.2 through 1.9.5** show details of each facility, including hazardous and spill kit locations.

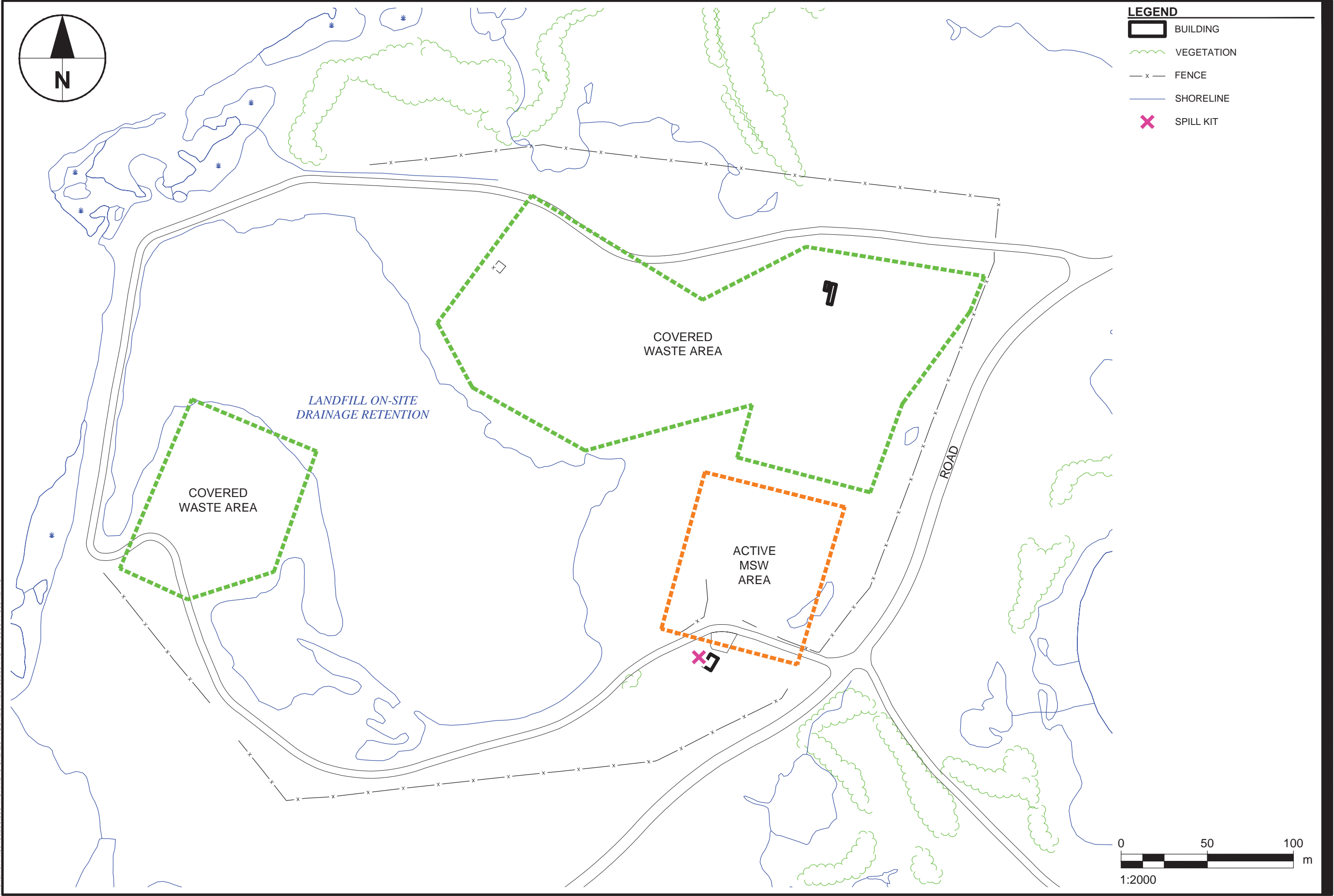












## 1.10. Water Supply

The Hamlet's potable water supply system consists of the following elements:

- Seasonal raw water supply from Kudlak Lake
- Raw water storage reservoir
- Water treatment facility and truckfill station
- Trucked water delivery

### 1.10.1. Seasonal Raw Water Supply

Tuktoyaktuk's raw water comes from Kudlak Lake, a shallow lake located approximately 5.5 km east of the community centre and 4.5 km east of the raw water reservoir. Tuktoyaktuk's raw supply water is of good chemical quality for domestic use. The water is clear, moderately hard, well buffered, slightly alkaline, and has a moderate amount of dissolved solids.

In winter, the lake freezes deep enough that obtaining water from the lake is difficult and water quality is poor. The Hamlet uses a raw water storage reservoir to hold water for use during winter months.

The community obtains water from the lake via a high-density polyethylene pipeline. This intake line is partially submerged under Tuktoyaktuk Harbour and runs along the ground surface for the overland distance to the raw water reservoir. The intake line was replaced in October 2006 with a new 200 millimetre (mm; 8") diameter pipe after the old 100 mm diameter pipeline broke in the summer of 2006.

The water pump house at Kudlak Lake was relocated south of the previous location in April 2007.

### 1.10.2. Water Storage Reservoir

The water reservoir, built in 1984, is an earth structure with a capacity of approximately 90,300 cubic metres (m<sup>3</sup>). The reservoir characteristics are presented in **Table 3** below.

**Table 3: Tuktoyaktuk Water Reservoir Characteristics**

Characteristic	Description
Maximum Reservoir Capacity	94,300 m <sup>3</sup>
Usable Volume Under Ice	53,100 m <sup>3</sup>
Maximum Water Depth	7.0 m
Design Ice Thickness	2.1 m
Dead Storage Depth	0.5 m
Freeboard	1.3 m
Full Reservoir Water Surface Dimension	102 m in diameter
Inside Slope	4:1
Liner	0.8 mm CPE with sand cover

The design capacity of the water reservoir is equivalent to consumption by 1,900 community residents and 250 camp residents.

The raw water storage reservoir is filled to capacity in the late summer of each year. This filling procedure usually takes about a week of continuous pumping of water from Kudlak Lake.

### 1.10.3. Water Treatment and Truckfill Station

Prior to 2009, water was treated by chlorinating with calcium hypochlorite (powdered form of chlorine) during truckfill.

A new water treatment plant and truckfill station was constructed in 2009 by Corix Water Systems. The new water treatment process includes 50 micron cartridge filters, a pressure filter, UV reactors applying a 40 mJ/cm<sup>2</sup> dose, and a chlorine contact chamber.

#### 1.10.4. Distribution

Water is distributed throughout the community using water trucks operated by a private contractor. Two trucks operate seven days per week, filling individual building water tanks. Most of the existing houses have small tanks that are filled daily. Each truck has a capacity of 15,890 litres (L.) Water deliveries are metered at the truck.

### **1.11. Sanitary Sewage Facility**

Tuktoyaktuk's sewage is collected using trucked pumpout services. The sewage is discharged in a sewage lagoon, which is located approximately 5 km south of the Community.

#### 1.11.1. Trucked Sewage Pumpout

Sewage is collected by a local contractor using two 14,320 L vacuum trucks. Two trucks operate seven days per week. The sewage is transferred from holding tanks in each building to a retention lagoon located approximately 5 km south of the community via an all-weather gravel road.

#### 1.11.2. Lagoon Access Road and Sewage Truck Discharge Area

The access road to the sewage lagoon is an all-weather gravel road which exits the Reindeer Point subdivision access road. The access road leads to the truck discharge area at the north end of the lagoon. A seasonal access road extends to the south end of the lagoon.

The truck discharge area consists of a gravel area with two gravel ramps leading to a steel chute and pipe system for the discharge from the vacuum trucks. The vacuum trucks discharge by elevating the tank at the front end of the truck, and opening a valve at the back of the truck.

The dispersion structures at the sewage lagoon consist of a timber retaining wall and a metal ramp from the base of the retaining wall into the lagoon. The metal ramp provides a means of effluent dispersion into the lagoon and provides erosion protection to the retaining wall.

#### 1.11.3. Sewage Lagoon

The Hamlet's sewage lagoon is located approximately 5.8 km due south from the Hamlet Office, or 3.9 km south of the Airport Terminal Building, and 1.5 km southwest of the Reindeer Point subdivision.

The sewage lagoon provides 365-day retention of the sanitary sewage generated by the community. The facility is a 5.9 hectare natural lake that has been modified with a perimeter berm at the south edge to provide the necessary retention capacity. The lagoon has sufficient capacity for a population of 1,900 community residents and 250 camp residents, assuming only domestic use.

#### 1.11.4. Lagoon Effluent Discharge

The sewage lagoon is discharged in the early fall of each year to a saltwater inlet. Fall discharge ensures that the sewage receives the maximum possible natural aerobic treatment within the lagoon provided by sunlight, warm temperatures, and wind in the summer.

The seasonal discharge point is located on the constructed berm at the south edge of the lagoon, 3.0 km directly southeast from the open ocean of Kugmallit Bay and approximately 6.5 km from the ocean by way of the inlet channels. Discharge is accomplished by pumping effluent over the berm.

The Hamlet collects samples from the sewage lagoon (SNP 0714-2) and the run-off lagoon at the landfill (SNP 0714-3) during summer and fall months. Some historical data is available from Taiga labs for the number of samples shown in **Table 4**. More recent data has not been included in this Plan.

**Table 4: Lagoon Effluent Sampling Summary**

SNP Sampling Location	Number of Samples with Available Data			
	2005	2006	2007	2008
0714-2 (Sewage Lagoon)	6	2	4	1
0714-3 (Runoff Lagoon at Landfill)	1	3	1	0

The following tables show the average sample results for the sewage lagoon and solid waste lagoon, along with the operating parameter requirements of the Hamlet's Water Licence.

**Table 5: Results of Sewage Lagoon Effluent Sampling**

Parameter	Units	Licence Requirement	Average Sample Result
BOD <sub>5</sub>	mg/L	120 (MAC)	28
TSS	mg/L	180 (MAC)	92
pH		6 to 9	7.93
Oil & Grease	mg/L	5 and no visible sheen	None visible
Fecal Coliforms	CFU/100mL	1 x 10 <sup>4</sup> (10,000)	11000

**Table 6: Results of Solid Waste Run-off Lagoon Effluent Sampling**

Parameter	Units	Licence Requirement	Sample Result (2012)
BOD <sub>5</sub>	mg/L	120 (MAC)	10
TSS	mg/L	180 (MAC)	6
Polychlorinated Biphenyls (PCBs)	µg/L	25 (MAC)	<0.1
Oil & Grease	mg/L	5 (MAC)	-
pH			8.36
Fecal Coliforms	CFU/100mL		55
Cadmium	µg/L		<0.05
Cobalt	µg/L		<0.01
Chromium	µg/L		0.8
Copper	µg/L		<0.02
Iron	µg/L		391
Mercury	µg/L		<0.01
Manganese	µg/L		7.4
Nickel	µg/L		2.2
Lead	µg/L		<0.01
Zinc	µg/L		6.6

## 1.12. Solid Waste Facility

Tuktoyaktuk's solid waste is collected by truck and transported to the solid waste landfill, approximately 3 km south of the Hamlet. The landfill site consists of the following components:

- Perimeter fence and access roads to landfill areas

- Active municipal waste disposal area (east area)
- Bulky waste disposal area (south area)
- Remediated disposal areas
- On-site drainage retention system

#### 1.12.1. Solid Waste Collection and Site Access

Solid waste collection is done by truck under contract to the Hamlet. Collection currently involves two trucks operating seven days per week. The Solid Waste Disposal site is accessed from a gate along the all-weather road to Reindeer Point. This entrance provides access to the bulky waste area and storage shed for the Hamlet's caterpillar tractor. The gate is normally closed to provide security for the caterpillar tractor.

The landfill site is surrounded by a 1200 metre (m) perimeter fence on the inland side of the site. The ocean-facing side of the landfill, to the west, is not fenced.

#### 1.12.2. Solid Waste Disposal Facility

The Tuktoyaktuk Solid Waste Disposal site is a large fenced-in facility, approximately 3 km south of the Hamlet. It has been in operation since the early 1970s as a replacement to the dump formerly located at the end of the community airstrip. The facility covers an area of approximately 20 hectares, but not all of the area is currently in use.

The municipal waste area occupies an area approximately 70 m wide and 50 m long. There are designated areas for separation of municipal solid waste, metal, white goods, tires. Hazardous waste is stored at the municipal yard. The municipal waste area is used by both the community and the local industries with no direct fee charged. Access to the site is not controlled and the site is not manned.

The Hamlet was operating a bulky metal waste area approximately 100 m wide by 100 m long. This area was remediated with complete cover in 2004.

Several old landfill areas were remediated in the north, southwest and east portions of the landfill site. These areas have been covered, and have limited vegetative cover in the north and southwest areas and substantial vegetative cover in the east area.

The existing landfill is scheduled to cease operation and is a listed priority site of the Government of Northwest Territories (GNWT) and Aboriginal and Northern Development Canada (AANDC) for closure. A new landfill site located approximately 17 km southwest of the community has been designed and approved and construction was initiated in 2015. As of this writing, Phase 1, including a landfill cell and access road to the site, has been completed. Phase 2, including fencing, gate, and buildings, is not complete. Final operations will be contingent upon receipt of final permission for direct access to the new ITH.

#### 1.12.3. Solid Waste Disposal Facility On-site Drainage Retention and Control Berm

Most of the surface area of the Solid Waste Disposal facility is covered by a lagoon containing surface runoff from the landfill. The surface runoff lagoon is retained by a 250 m long gravel and clay berm on the eastern edge of the landfill site.

The berm does not have any discharge control structure, so water that accumulates from spring melt and rain is pumped over the berm into the ocean periodically. The perimeter berm also prevents the ingress of the ocean.

#### 1.12.4. Water Pollution

The pollution factors associated with the landfill include surface water pollution, and subsurface water pollution. Surface water pollution is a concern which is managed with the on-site runoff collection within the landfill area.

## 2. Response Organization

### 2.1. Primary List of Contacts for Spill Response

Table 7: Primary List of Contacts for Spill Response

Organization	Contact	Phone Number
Northwest Territories 24 Hour Spill Report Line		867-920-8130
Inuvialuit Water Board	Mardy Semmler	867-678-2942
GNWT ENR Water Resource Officer (Inspector)	Philippe Thibert-Leduc	867-678-6676
GNWT Environment & Natural Resources (ENR), Inuvik	Stephen Charlie	867-678-6690
Inuvialuit Land Administration (Env. Mgmt.)	Shawna Wilson	867-977-7100

### 2.2. Spill Reporting Procedures

The Hamlet of Tuktoyaktuk has established procedures in the event of a spill. All spills regardless of quantity will be reported to the Hamlet Management, GNWT ENR Water Resource Officer (Inspector) and the NWT/NU Spill Line where the release:

- Is near or into a water body
- Is near or into a designated sensitive environment or sensitive wildlife habitat
- Poses an imminent threat to human health or safety; or
- Poses an imminent threat to a listed species at risk or its critical habitat

If applicable a detailed report including GPS location must be submitted to the GNWT ENR Inspector no later than 30 days after the initial report for any occurrence.

The NT/NU Spill Report Form is provided in Schedule A, **Appendix A** and will be kept with a copy of the Spill Response Plan at all areas where potentially harmful substances or fuel are stored or transferred and extra copies will be available with the Hamlet Management.

### 2.3. Initial Spill Response Actions

- Ensure safety of all personnel.
- Assess spill hazards and risks.
- Remove all sources of ignition.
- Stop the spill if safely possible (e.g. shut off pump, replace cap, tip drum upwards, patch leaking hole). Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so.
- No matter what the volume is, notify Hamlet Management.
- Contain the spill - use contents of spill kits to place sorbent materials on the spill, or use shovel to dig to contain spill. Methods may vary depending on the nature of the spill.
- Relay information to internal company contacts, government agencies and, if required, the designated Communications representative.
- If needed workers will be evacuated or diverted from the spill area.
- If the spill involves petroleum products, all sources of ignition will be eliminated from spill area, and the area will be evaluated for risk of fire or explosion.
- Personal Protective Equipment (PPE) will be used until concentrations are determined to be within acceptable levels.
- If the area is deemed hazardous, it will be marked, flagged and ribbon off.
- Ground and Weather conditions will be evaluated to assess the risk to environment. (Rain, gravel, sand, water body, muskeg, etc.)

- Leak location will be identified, the type of leak, the duration and the volume release, and reported to the Hamlet Management who will advise the authority having jurisdiction.
- Monitor the air at the perimeter of the flagged off area as necessary.
- In the event of a large spill, or a spill in a watercourse, the spill will be evaluated for: possibility of migrating, anticipated direction of migration, how far can it go, what lands or water bodies may be affected. This information will be collected and provided to the Hamlet Management and authorities having jurisdiction.
- The spill will initially be contain and then cleaned up using appropriate methods.
- For large spill or in a watercourse, the access to the spill and the recovery points will be established as well as the equipment required to perform the cleanup operation.
- Minimize vehicular traffic as much as possible at the spill site.
- The spill site may be cordoned off to prevent wildlife from entering.

Spills of hazardous materials in the NWT present a potential threat to the public interest and environment. Agencies responsible for conducting spill investigations and monitoring clean-up of spills have signed an agreement to promote a well-coordinated state of preparedness for these activities.

#### **2.4. Designation of Lead Investigating Agency for Spill on Land in the NWT:**

- The GNWT, Department of Environment and Natural Resources (ENR) is the lead agency in dealing with spills on lands and facilities in the Northwest Territories
- The National Energy Board (NEB) is responsible for spills at oil and gas exploration and production facilities
- The Inuvialuit Land Administration (ILA) is responsible for spills on land in the NWT set aside under the Inuvialuit Land Claim Agreement

#### **2.5. Designation of Lead Agency for Spills on Water in NWT:**

- The Government of the Northwest Territories, Department of Environment and Natural Resources (ENR) is the lead agency responsible for spills on water in the NWT.
- Transport Canada is the Lead Investigating Agency for all ship source spills
- The Canadian Coast Guard is the Lead Response Agency ensuring spills from ships and barges (including Oil Handling Facility re-supply) and unreported spills on water are addressed.
- The National Energy Board is responsible for spills on water at oil and gas exploration and production facilities.

#### **2.6. Response Team Organization**

The flow chart depicted in **Figure 2.1** identifies the response organization and when applicable their alternates, as well as the chain of command for responding to a spill or release. The duties of various response personnel are summarized, contact information is provided including 24-Hour phone numbers for responsible people and the location of communications equipment on site is discussed.

An immediately reportable spill is defined as a release of a substance that is likely to be an imminent human health or environmental hazard or meets or exceeds the volumes outlined in Schedule B in **Appendix A**. It will be reported to the NWT 24-Hour Spill Report Line at 867-920-8130. Any spills less than these quantities will not be reported immediately to the spill reporting line. Rather, these minor spills will be tracked and documented by the Hamlet of Tuktoyaktuk and submitted to the appropriate authority either immediately upon request or at a pre-determined

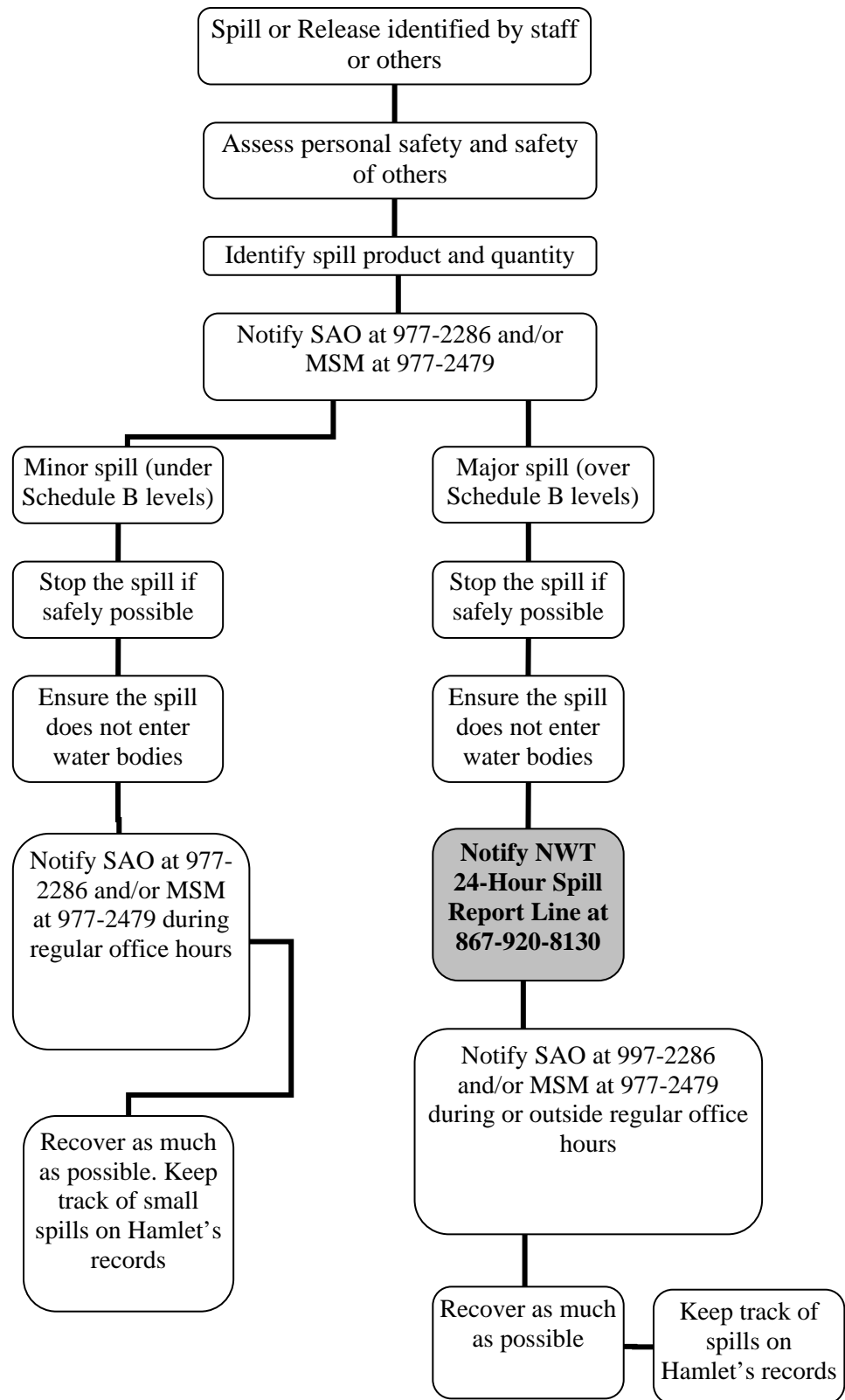


reporting interval. If there is any doubt that the quantity spilled exceeds reportable levels, the spill will be reported to the NWT 24-Hour Spill Report Line.

Modes of communication during spills include telephones, personal cell phones and vehicle 2-way radios. In the event of a spill involving danger to human life these phones or CB radios will be used to contact emergency response personnel.

The person that discovers the spill will inform the SAO or the Municipal Services Manager and, they will report the spill to the NWT 24-Hour Spill Report Line as necessary. The person that discovers the spill will also inform the SAO or the Municipal Services Manager of minor spills that are under the thresholds identified on Schedule B in **Appendix A** for tracking on the Hamlet's records.

**Figure 2.1: Flow Chart of Response**



### **3. 3.0 Action Plan**

#### **3.1. Potential Spill Sizes and Sources**

In this section the potential spill event and spill volume are presented for the primary hazardous materials stored in Hamlet's facilities. The most likely spill discharge volume is indicated and the spill cleanup procedures will focus on spills of this quantity. A worst case scenario is also presented.

##### **3.1.1. Sewage spills from trucks**

Sewage spill could originate from valves or hoses and connections during transfer. Spills could also occur from failed holding tanks due to accidents or long term corrosion. Routine inspections consist of looking for sewage coming out of the tanks from crack or failure of the tank wall. Owners should visually inspect their tanks several times a year. Failure of a Sewage Truck or any equipment used while pumping sewage into the truck from a tank or out of the truck to the sewage disposal facility can also be prevented by routine inspections by the owner of all valves, hoses and connections. The North Coast Supply Company; Shawn Lundrigan at 867-977-2624 is responsible of cleaning in the event of a spill. The North Coast Supply Company; Shawn Lundrigan will be using two sewage truck(s) of 14,320 L each, which mean that in the event of a spill, the spill is likely to be under 14,320 L.

##### **3.1.2. Sewage spills from Sewage Disposal Facilities**

The truck turn-around pad and sewage discharge chute associated with sewage disposal facility structures, and drainage courses are inspected on a weekly basis by the MSM. In addition, during the summer months the integrity of the structures is visually checked by the MSM. In the event of a spill, the spill is likely to be under 100,000,000 L.

##### **3.1.3. Spills from fuel storage**

Many buildings have fuel storage for heating. There could be minor leaking or large puncture from drum or tank in/outside fuel storage areas. In the event of a spill at a privately owned structure, owners are responsible for the cleaning of the spill, unless the spill threatens a special area like the school. Should this happen, the SAO and/or MSM response will be called to protect that special area. The discharge of the spill is likely to be under 1364 L and in the worst case scenario the spill will be from a fuel oil storage tank for a building the size of the water treatment plant. If contents seeped into surrounding soil and water bodies, this could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

##### **3.1.4. Spills from Water Supply Facilities**

At the water treatment plant, chlorine is contained in 20 L pails, which are stored inside the water treatment plant. The number of pails stored on site is normally less than 32. Heating fuel for the building is stored in a double-walled 1500 L tank located outside the building. The fuel tank is protected from vehicular impact by steel bollards.

Potential spills at the water plant could include chlorine or heating fuel. Chlorine spills could occur during receiving. In the event of half the pails spilling that would result in a spill of approximately 300 L. If the heating fuel were to spill, it could result in a release of up to 1500 L.

##### **3.1.5. Fuel spill from motorized equipment**

Fuel spills can occur when overfilling motorized equipment, spills can also come from drum or hose while filling the motorized equipment from drums, whether in or outside the storage area. Fuel spills from accidents involving personal vehicles and fuel carriers will be addressed as they pertain to special areas. Clean up will be the responsibility of the SAO and/or MSM or designated employees. Regular maintenance and oil checks of all motorized equipment are also undertaken to avoid preventable leaks. The discharge of the spill is likely to be less than 200 L.

#### 3.1.6. Propane spill

Propane is extremely volatile and is the most flammable material stored on site, thus the Fire Department should be the first responder in all cases. All non-responders must be kept well away from the area.

Propane spill can occur when the cylinder has a leak in or outside fuel storages area, when propane lines not properly connected to equipment (i.e. kitchen stove, dryer). The complete volume of the cylinder will be released if a leak develops; therefore safety during emergency response to a propane spill is of the utmost concern.

In the event of a spill occurring from one of the large tanks at Kudlak Lake, it could result in a release of up to 2000 L.

#### 3.1.7. Waste Oil or Lubricating Oil spill

Runoff into water bodies must be avoided.

Oils spill could come from a variety of sources including new supplies but mainly from waste oils stored in drums that are leaking. The discharge of the spill is likely to be under 1000L. If a storage drum was punctured or opened and contents seeped into surrounding soil and water bodies, this could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

### **3.2. Procedures for Initial Action**

1. Be alert and consider your personal safety first;
2. Assess the hazard to persons in the vicinity of the spill and where possible take action to control danger to human life (ensure safety of everyone);
3. Assess the situation and make arrangements for first aid and removal of injured personnel. Take the necessary action where possible to secure the site to protect human safety;
4. Assess spill hazards and risks;
5. Identify the material or products involved in the spill;
6. If applicable and only if it is safe to do so, remove or shut off all ignition sources;
7. If safe try to take the appropriate action to stop the spill (e.g. shut off pump, replace cap, tip drum upward, patch leaking hole, create a ditch to stop flow etc). Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so;
8. Take all necessary action to contain or prevent the spread of the spilled (e.g. use contents of spill kits to place sorbent material on the spill, or use shovel to dig dike to contain spill. Methods will vary depending on the nature of the spill);
9. Gather information on the status of the situation;
10. No matter what the volume is, contact the SAO and/or MSM to report the spill;
11. As soon as possible and if required, contact the NWT 24 Hour Spill Report Line at 1-867-920-8130;
12. If required, complete a spill report form (see Schedule A in **Appendix A**).

### **3.3. Procedures for Containing and Cleaning up the Spill**

First, initiate spill containment by first determining what will be affected by the spill. Second, assess speed and direction of spill and cause of movement (water, wind and slope). Third, determine best location for containing spill, avoiding any water bodies. Have a contingency plan ready in case spill worsens beyond control or if the weather or topography impedes containment.

#### **3.3.1. Sewage infrastructure**

1. Any person who sees a liquid flowing or seeping from a sewage holding tank, a sewage truck or a connection from the truck to a hose or the lagoon should report this to the SAO and or MSM.
2. The SAO and/or MSM should, upon notification, determine the extent and size of the spill. Therefore, the SAO and/or MSM is responsible to take the appropriate action and use the reporting procedures to notify the proper authorities. Since spills of sewage involve an infectious substance that may cause health problems, the local nursing station and Environmental Health Officer should be notified of the spill.
3. If the area in which the spill occurred is accessible to the public or domestic pets, the contaminated area must be clearly marked or cordoned off to restrict access. Keep children and interested bystanders away from cleanup activities.
4. If the spilled material can't be recovered using hand tools, a commercial vacuum / pump truck should be called to remove all visible liquid and solid material. Any spill resulting from the failure of a sewage truck or its connections would necessitate the procurement of vacuum trucks to contain the sewage while any soil or ground material contaminated by the spill is recovered and properly disposed of according to an Environmental Health Officer.
5. Protective clothing (at a minimum, rubber or latex gloves and rubber boots) should be worn when cleaning up a sewage spill. (Dispose of gloves and wash rubber boots when leaving spill site).
6. When the area is visibly clean, lime will be spread on the ground where the spill took place under the instructions of an Environmental Health Officer. Lime can be obtained from a variety of hardware stores. Please note that hydrated lime is a caustic material and can be dangerous to handle and apply. Lime should only be used or applied by people experienced in using this material.
7. If no lime is available, a chlorine/water solution (bleach) should be applied to the spill area to disinfect. To make a 5% chlorine solution, add 3/4 cup (180 ml) Clorox bleach to one (1) gallon of water. Only use bleach that has "sanitizes" or "kills germs" on the label. Do not mix cleaning/disinfecting products or chemicals. Cleaning products can react with one another to produce toxic vapor or liquid substances.
8. Notify the SAO and/or MSM when the clean up is done.
9. When the spill area has been cleaned (24 hours after the chlorine solution or hydrate lime has been spread), the barriers can be removed and access to the area restored.
10. Any repairs or replacement of the failed tank should take place under acceptable engineering standards.

#### **3.3.2. Lagoon dam structure**

The lagoon is designated as an impervious structure..

1. Any person who sees a liquid flowing from a breach (a hole) in the lagoon dam structures should report this to the SAO and/or MSM.
2. The SAO and/or MSM should, upon notification, determine the extent and size of the problem. Therefore, the SAO and/or MSM is responsible to take the appropriate action and use the reporting procedures to notify the proper authorities.
3. Any spill resulting from the failure of a lagoon dam structure would likely necessitate the construction of a berm to contain the sewage while either temporary or permanent repairs are carried out on the failed structure. A qualified Engineer and contractor would be engaged to undertake the work.

4. Rebuilding the dam or establishing a cofferdam with course materials, clay and sandy materials would contain the spill. Any sewage should be contained with berms or impoundment basins and pumped back into the lagoon. Any repairs to the failed structure would take place to acceptable engineering standards.

#### 3.3.3. Containment of Spill on open water

Spills on water such as rivers, streams or lakes are the most serious types of spills as they can negatively impact water quality and aquatic life. All measures need to be undertaken to contain spills on open water.

For spills in open water, containment procedures will vary depending on whether the material floats or sinks, and whether the water is flowing or standing.

1. In the event of a spill, any person who found it should report this to the SAO and/or MSM.
2. The SAO and/or MSM should, upon notification, determine the source, the extent and size of the spill. Therefore, the SAO and/or MSM is responsible to take the appropriate action and use the reporting procedures to notify the proper authorities.
3. If the area in which the spill occurred is accessible to the public or domestic pets, the contaminated area must be clearly marked or cordoned off to restrict access. Keep children and interested bystanders away from cleanup activities.
4. Protective clothing (at a minimum, rubber or latex gloves and rubber boots) should be worn when cleaning up a spill. (Dispose of gloves and wash rubber boots when leaving spill site).
5. Assess speed and direction of spill.
6. Determine best location for containing spill.
7. For floating materials, a surface boom shall be deployed. Booms are commonly used to recover fuel floating on the surface of a lake or slow moving streams. They are released from the shore of a water body to create a circle around the spill. If the spill is away from the shoreline a boat will need to be used to reach the spill and the boom can be set out. More than one boom may be used at once. Booms may also be used in streams and should be set out at an angle to the current. Booms are designed to float and some have sorbent materials built into them to absorb fuels at the edge of the boom. Fuel contained within the circle of the boom will need to be recovered using sorbent materials or pumps and placed into barrels for disposal. If a boom can't be installed, weirs may be constructed, especially in shallow areas.
8. Weirs can be used to contain spills in streams and to prevent further migration downstream. Plywood or other materials found on site can be placed into and across the width of the stream, such that water can still flow under the weir. Spilled fuel will float on the water surface and be contained at the foot of the weir. It can then be removed using sorbents, booms or pumps and placed into barrels.
9. The On-Scene Coordinator will have to judge whether the impact of the spill will be most reduced by carrying out a containment procedure or by immediately attempting to remove any containers from the water. This will depend on the equipment available and how long it will take for additional equipment to arrive. Removed containers should be placed on an impermeable contained surface (example poly liner in a depression) or an overpack drum to prevent further seepage.

#### 3.3.4. Containment of Spills on Ice

Spills on ice are generally the easiest spills to contain due to the predominantly impermeable nature of the ice.

For spills on Ice, containment procedures will vary depending on whether the material stays on the ice or sinks into it.

1. In the event of a spill, any person who found it should report this to the SAO and/or MSM. The SAO and/or MSM should, upon notification, determine the source, the extent and size of the spill. The SAO and/or MSM is responsible to take the appropriate action and alert the necessary people.
2. Use the reporting procedures to notify the proper authorities.
3. If the area in which the spill occurred is accessible to the public or domestic pets, the contaminated area must be clearly marked or cordoned off to restrict access. Keep children and interested bystanders away from cleanup activities.
4. Protective clothing (at a minimum, rubber or latex gloves and rubber boots) should be worn when cleaning up a spill. (Dispose of gloves and wash rubber boots when leaving spill site).
5. Assess speed and direction of spill.
6. Determine best location for containing spill.
7. Spills on ice can be affected by the strength of the ice and the floating or sinking characteristics of the materials. The safe bearing capacity of ice has to be carefully assessed. For good ice the following thickness table can be used to estimate the load capacity:

**Table 8: Ice Capacity**

Thickness		Load	
Mm	Inches	Kg	Tons
80	3	181	.2
150	6	907	1.0
230	9	5443	6.0
500	20	9071	10
760	30	18143	20
1010	40	36287	40

8. If the spill does not penetrate the ice, and the ice is safe to work on, sorbent materials are used to soak up spilled fuel. Remaining contaminated ice/slush can be scraped and shovelled into a barrel. However, all possible attempts should be made to prevent spills from entering ice covered waters as no easy method exists for containment and recovery of spills if they seep under ice.
9. If the spill penetrates the ice, dykes can be used to contain fuel spills on ice. By collecting surrounding snow, compacting it, mounding it and watering it down to form a dyke down slope of the spill, a barrier is created thus helping to contain the spill. The collected fuel can then be pumped into barrels or collected with sorbent materials.
10. For significant spills on ice, trenches can be cut into the ice surrounding and/or down slope of the spill such that fuel is allowed to pool in the trench. It can then be removed via pump into barrels, collected with sorbent materials, or mixed with snow and shovelled into barrels.

### 3.3.5. Containment of Spills on Snow

Snow is a natural sorbent, thus as with spills on soil, spilled can be more easily recovered. Therefore, snow should be used as much as possible when it is available.

1. In the event of a spill, any person who found it should report this to the SAO and/or MSM. The SAO and/or MSM should, upon notification, determine the source, the extent and size of the spill. The SAO and/or MSM is responsible to take the appropriate action and alert the necessary people.
2. Use the reporting procedures to notify the proper authorities.

3. If the area in which the spill occurred is accessible to the public or domestic pets, the contaminated area must be clearly marked or cordoned off to restrict access. Keep children and interested bystanders away from cleanup activities.
4. Protective clothing (at a minimum, rubber or latex gloves and rubber boots) should be worn when cleaning up a spill. (Dispose of gloves and wash rubber boots when leaving spill site).
5. Assess speed and direction of spill.
6. Determine best location for containing spill.
7. Small spills on snow can be easily cleaned up by raking and shovelling the contaminated snow into empty barrels, and storing these at an approved location.
8. Dykes can also be used to contain fuel spills on snow. By compacting snow down slope from the spill, mounding it to form a dyke and watering it down, a barrier is created thus helping to contain the spill. The collected fuel/snow mixture can then be shovelled into barrels, or collected with sorbent materials.

### 3.3.6. Containment of Spills on Land

Spills on land include spills on rock, gravel, soil and/or vegetation. It is important to note that soil is a natural sorbent, thus spills on soil are generally less serious than spills on water as contaminated soil can be more easily recovered. Generally spills on land occur during the late spring, summer or fall when snow cover is at a minimum. It is important that all measures be undertaken to avoid spills reaching open water bodies.

1. In the event of a spill, any person who found it should report this to the SAO and/or MSM. The SAO and/or MSM should, upon notification, determine the source, the extent and size of the spill. The SAO and/or MSM is responsible to take the appropriate action and alert the necessary people.
2. Use the reporting procedures to notify the proper authorities.
3. If the area in which the spill occurred is accessible to the public or domestic pets, the contaminated area must be clearly marked or cordoned off to restrict access. Keep children and interested bystanders away from cleanup activities.
4. Protective clothing (at a minimum, rubber or latex gloves and rubber boots) should be worn when cleaning up a spill. (Dispose of gloves and wash rubber boots when leaving spill site).
5. Assess speed and direction of spill.
6. Determine best location for containing spill.
7. In all cases of liquid spills, the initial containment step is to prevent further dispersion. This is done with cut-off ditches and dyking with soil as needed around the spill utilizing mobile heavy equipment. If necessary, absorbents (example Zorbal, Hazorb Pillows, peat moss, sawdust) or gelling agents (example - Chemgel) should be spread to prevent further spread or seepage.
8. Dykes can be created using soil surrounding a spill on land. These dykes are constructed around the perimeter or down slope of the spilled fuel. A dyke needs to be built up to a size that will ensure containment of the maximum quantity of fuel that may reach it. Fuel that pool up can be removed with sorbent materials or by pump into barrels. If the spill is migrating very slowly a dyke may not be necessary and sorbents can be used to soak up fuels before they migrate away from the source of the spill.
9. If you can't build a dyke, trenches can be dug out to contain spills as long as the top layer of soil is thawed. Shovels pick axes or a loader can be used depending on the size of trench required. It is recommended that the trench be dug to the bedrock or permafrost, which will then provide containment layer for the spilled fuel. Fuel can then be recovered using a pump or sorbent materials. Once the soil has been removed it should be replaced with clean soil to avoid slumping.



### 3.3.7. Fire or Explosion

1. In all cases the first step is to clear people from the surrounding area. Particular care must be taken to prevent inhalation of vapours that are products of combustion.
2. When fire is associated with a spill of hazardous material, the local fire department must be the first responder to fire and explosion occurrence in all cases.
3. The fire department will take all the necessary measures to extinguish the fire.
4. If necessary, the fire department will construct dykes down slope from liquid spills, to minimize spreading of fire and contain unburned fluid. Foam, CO<sub>2</sub> or water will then be used as appropriate for the fire.

## **3.4. Procedures for Transferring, Storing and Managing Spill-Related Hazardous Waste**

Spill related hazardous waste should be scooped up (using equipment appropriate to the spill size) and transferred into containers. Any soil beneath the spill, which may have been contaminated, should also be removed where possible, and disposed of with the recovered material.

In most cases, spill cleanups are initiated at the far end of the spill and contained moving toward the source of the spill. Sorbent socks and pads are generally used for small spill clean up. A pump with attached fuel transfer hose can suction spills from leaking containers or large accumulations on land or ice, and direct these larger quantities into empty drums. Hand tools such as cans, shovels, and rakes are also very effective for small spills or hard to reach areas. Heavy equipment can be used if deemed necessary, and given space and time constraints.

Used sorbent materials are to be placed in barrels for future disposal. All materials mentioned in this section are available in the spill kits located at the Water Supply Facility, Hazardous Waste Temporary Storage Area, Solid Waste Facility, and Sanitary Sewage Facility as indicated on Figures 1.4.1 through 1.4.5 as well as at the Kudlak Lake Propane Storage Area.. Following clean up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible.

For most of the containment procedures outlined in Section 3.3, spilled petroleum products and materials used for containment will need to be placed into containers such as empty waste oil/fuel containers and sealed for proper disposal at an approved disposal facility.

## **3.5. Procedures for Restoring Affected Areas, Providing Inspectors with Status Updates and Cleanup Completion**

Once a spill of reportable size has been contained, the SAO and/or MSM will consult with the regulatory authorities to determine the level of cleanup required. The Regulator may require a site specific study to ensure appropriate clean up levels are met. Criteria that may be considered include natural biodegradation of oil, replacement of soil and re vegetation. Also, the soil will be remediated to meet Government of Northwest Territories (GNWT) soil criteria and water will be addressed so that it meets the Canadian Council of Ministers of the Environment (CCME) requirements for the protection of aquatic life.

## 4. Resource Inventory

### 4.1. On-Site Resources

Spill kits locations are indicated on **Figures 1.4.1 through 1.4.5**, and at the Kudlak Lake Propane Storage Area. The contents are described below. In addition, earth moving and other equipment is also listed below.

If required additional copies of the Spill Contingency Plan can be obtained through the Hamlet Management.

#### 4.1.1. Contents of Spill Kits

A spill kit is available in the event of a chemical spill. The kit includes:

- Heavy-duty gloves
- Safety glasses
- Mop/wringer/spill squeegee
- Shovel/ broom/dustpan
- Chemical spill container with sealable lid
- Sand/kitty litter (absorbent, non-flammable material).

Alternatively, a 50 Gallon Universal Sorbent Spill Kit can be provided, which includes:

- (10)–3" x 48" socks
- (4)–3" x 10' socks
- (50)–15" x 17" pads
- (4)–pillows
- (50)–wipers
- (5)–disposal bags and ties
- (5)–tamperproof seals
- (2)–pair nitrile gloves
- (1)–emergency response guidebook

#### 4.1.2. Earth moving and other equipment

A dozer, a loader and 2 gravel trucks are available for spill clean-up.

## 4.2. Off-Site Resources

Table 9: Contact List

Organization	Location/Contact	Number
Environment Canada	Prairie and Northern Region Edmonton Office	780-951-8600
Department of Fisheries and Oceans	Inuvik Office	867-777-7500
GNWT Environment and Natural Resources	Inuvik Region Paulatuk Office	867-580-3021
NWT Emergency Measures Office	Emergency Number	867-920-2303*
Inuvialuit Land Administration	Tuktoyaktuk, NT	867-977-7100
NT 24-Hour Spill Report Line		867-920-8130*
NWT Emergency Services Division-MACA	24 h – Emergency line	867-873-7554*
RCMP		867-977-1111
Environmental Health	Inuvik	867-777-4840/4841
Tele-Care NWT Health Line		888-255-1010
NWT Fire Marshal Office	Emergency Number	867-920-2303*

\* 24-hour phone line

\*\*24 Hour phone line

## **5. Training Program**

The Hamlet is committed to ensure all personnel involved in a spill response fully understand their roles and the roles of others whom they may interact with during an incident. To meet this commitment and to ensure personnel respond effectively, training activities will include the following.

### **5.1. Orientation**

- Provide employees and contractor personnel with an orientation to the Spill Contingency Plan and its applicable elements
- Discuss and clarify bridging between contractors' emergency response procedures and this Spill Contingency Plan where applicable
- Utilize summary wall charts outlining key responsibilities and lines of communication for quick reference purposes
- Devote a portion of scheduled safety and/or staff meetings to discussion of spill response issues on an on-going basis

### **5.2. Specialized Spill Response Training**

- Make available (through the Hamlet Management) all required training
- Ensure employees and contractor personnel comply with the Hamlet's safety training requirements (e.g. First Aid/CPR, Workplace Hazardous Materials Information System (WHMIS), Transportation of Dangerous Goods, Firefighting, etc.)

### **5.3. Spill Drills**

Employees and contractors should conduct drills on an on-going basis to ensure readiness.

### **5.4. External Orientation**

As appropriate, brief and familiarize all external groups or agencies having a role in this Spill Contingency Plan with the overall plan and their specific responsibilities under the plan.

## 6. References

Water Resources Division Indian and Northern Affairs Canada. (2007). Guideline for Spill Contingency Planning.

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

GNWT. "Consolidation of Regulation R-068-93 Spill Contingency Planning and Reporting Regulations", 1993

**Appendix A: NT-Nu Spill Report Form and Instruction , Immediately Reportable Spill Quantities**





## Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and e-mailed as an attachment to [spills@gov.nt.ca](mailto:spills@gov.nt.ca). Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call to the spill line. Forms can also be printed and faxed to the spill line at 867-873-6924. Spills can still be phoned in by calling collect at 867-920-8130.

<b>A. Report Date/Time</b>	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. <b>Please do not fill in the Report Number:</b> the spill line will assign a number after the spill is reported.
<b>B. Occurrence Date/Time</b>	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
<b>C. Land Use Permit Number / Water Licence Number</b>	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
<b>D. Geographic Place Name</b>	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. <b>You must include the geographic coordinates</b> (Refer to Section E).
<b>E. Geographic Coordinates</b>	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
<b>F. Responsible Party Or Vessel Name</b>	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. <b>Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.</b>
<b>G. Contractor involved?</b>	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
<b>H. Product Spilled</b>	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Wherever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B)
<b>I. Spill Source</b>	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overfill, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m <sup>2</sup> )
<b>J. Factors Affecting Spill</b>	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or environment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
<b>K. Additional Information</b>	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. <b>Please number the pages to ensure that recipients can be certain that they received all pertinent documents.</b> If only the spill report form was filled out, number the form as "Page 1 of 1".
<b>L. Reported to Spill Line by</b>	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
<b>M. Alternate Contact</b>	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
<b>N. Report Line Use Only</b>	<b>Leave Blank.</b> This box is for the <b>Spill Line's use only.</b>



## Schedule B: Immediately Reportable Spill Quantities

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive Unknown substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas (i.e. contains H <sub>2</sub> S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or sensitive wildlife habitat, poses imminent threat to human health or safety, poses imminent threat to a listed species at risk or its critical habitat, or is uncontrollable.

## **Appendix B: SDS**

# Safety Data Sheet



## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

**Product Name:** CHLORINE

**Other name(s):** Liquefied chlorine, Liquid chlorine, Diatomic chlorine, Chlorine cylinder (used)

**Recommended use of the chemical and restrictions on use:** Disinfection, water treatment, bleaching, metal recovery, neutralising agent, oxidant.

**Supplier:** Ixom Operations Pty Ltd  
**ABN:** 51 600 546 512  
**Street Address:** Level 8, 1 Nicholson Street  
Melbourne 3000  
Australia

**Telephone Number:** +61 3 9665 7111  
**Facsimile:** +61 3 9665 7937  
**Emergency Telephone:** 1 800 033 111 (ALL HOURS)

Please ensure you refer to the limitations of this Safety Data Sheet as set out in the "Other Information" section at the end of this Data Sheet.

## 2. HAZARDS IDENTIFICATION

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

This material is hazardous according to Safe Work Australia; HAZARDOUS SUBSTANCE.

**Classification of the substance or mixture:**

Oxidising Gases - Category 1  
Gases under pressure - Liquefied Gas  
Skin Irritation - Category 2  
Eye Irritation - Category 2A  
Acute Inhalation Toxicity - Category 3  
Specific target organ toxicity (single exposure) - Category 3

The following health/environmental hazard categories fall outside the scope of the Workplace Health and Safety Regulations:  
Acute Aquatic Toxicity - Category 1

**SIGNAL WORD:** DANGER



**Hazard Statement(s):**

H270 May cause or intensify fire; oxidizer.  
H280 Contains gas under pressure; may explode if heated.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H331 Toxic if inhaled.  
H335 May cause respiratory irritation.  
H400 Very toxic to aquatic life.

# Safety Data Sheet



## Precautionary Statement(s):

### Prevention:

P220 Keep / Store away from clothing / incompatible materials / combustible materials.  
P244 Keep valves and fittings free from oil and grease.  
P261 Avoid breathing dust / fume / gas / mist / vapours / spray.  
P271 Use only outdoors or in a well-ventilated area.  
P264 Wash hands thoroughly after handling.  
P280 Wear protective gloves / protective clothing / eye protection / face protection.  
P273 Avoid release to the environment.

### Response:

P302+P352 IF ON SKIN: Wash with plenty of soap and water.  
P332+P313 If skin irritation occurs: Get medical advice/attention.  
P362 Take off contaminated clothing and wash before reuse.  
P321 Specific treatment (see First Aid Measures on Safety Data Sheet).  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P311 Call a POISON CENTER or doctor/physician.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P337+P313 If eye irritation persists: Get medical advice/attention.  
P312 Call a POISON CENTER or doctor/physician if you feel unwell.  
P370+P378 In case of fire: Use extinguishing media as outlined in Section 5 of this Safety Data Sheet to extinguish.  
P391 Collect spillage.

### Storage:

P403+P233 Store in a well-ventilated place. Keep container tightly closed.  
P405 Store locked up.

### Disposal:

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**Poisons Schedule (SUSMP):** S7 Dangerous Poison.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Hazard Codes
Chlorine	7782-50-5	>=99.8%	H331 H319 H335 H315 H400

## 4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor at once.

### Inhalation:

Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

### Skin Contact:

If skin or hair contact occurs, immediately remove any contaminated clothing and wash skin and hair thoroughly with running water. If swelling, redness, blistering or irritation occurs seek medical assistance. For skin burns, cover with a clean, dry dressing until medical help is available. Launder contaminated clothing before reuse.

Product Name: CHLORINE  
Substance No: 000031098201

Issued: 26/08/2013  
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# Safety Data Sheet

**Eye Contact:**

If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.

**Ingestion:**

Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

**Indication of immediate medical attention and special treatment needed:**

Treat symptomatically. Effects may be delayed. Delayed pulmonary oedema may result.

## 5. FIRE FIGHTING MEASURES

**Suitable Extinguishing Media:**

Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

**Hazchem or Emergency Action Code:** 2XE**Specific hazards arising from the substance or mixture:**

Non combustible, but will support combustion of other materials. Oxidizing substance.

**Special protective equipment and precautions for fire-fighters:**

Not combustible, however will support the combustion of other materials. Keep containers cool with water spray. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire. Only move cool cylinders. Do not approach cylinders suspected to be hot. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure. If unable to keep cylinders cool, evacuate area.

## 6. ACCIDENTAL RELEASE MEASURES

**Emergency procedures/Environmental precautions:**

Clear area of all unprotected personnel. Evacuate personnel from downwind areas. Wear protective equipment to prevent skin and eye contact and inhalation of vapours/dusts. Avoid breathing in vapours. Work up wind or increase ventilation. Wear self contained breathing apparatus. Shut off leak if possible without risk. Work up wind. Use water spray to disperse vapour. DO NOT spray water directly on the leak, liquid chlorine or chlorine container. If safe to do so, rotate container so that gas and not liquid escapes. SMALL SPILLS: Allow liquid to evaporate.

Seek specialist advice. For large spills notify the Emergency Services.

Chlorine gas only becomes visible at high concentrations.

**Personal precautions/Protective equipment/Methods and materials for containment and cleaning up:**

Clear area of all unprotected personnel. Wear protective equipment to prevent skin and eye contact and breathing in vapours. Avoid breathing in vapours. Work up wind or increase ventilation. Air-supplied masks are recommended to avoid inhalation of toxic material. For gas leak, DO NOT spray water directly on the leak or chlorine container. Use fire hoses equipped with fog nozzles to disperse gas downwind. For liquid: Contain - prevent run off into drains and waterways. Use fog nozzles as before. Do NOT allow any water to fall onto a pool of liquid chlorine as this will increase gas cloud. If safe to do so, cover with large plastic sheet. Where possible vapour knock down water should be contained.

## 7. HANDLING AND STORAGE

# Safety Data Sheet



This material is a Scheduled Poison S7 and must be stored, maintained and used in accordance with the relevant regulations.

## Precautions for safe handling:

Avoid skin and eye contact and breathing in vapour. Avoid all contact.

## Conditions for safe storage, including any incompatibilities:

Store in a well ventilated area. Store away from foodstuffs. Store away from combustible materials. Store away from incompatible materials described in Section 10. Keep dry - reacts with water. Cylinders should be securely restrained so that they are kept upright at all times. Drums should be stored horizontally. Keep containers closed when not in use - check regularly for leaks.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chlorine: Peak Limitation = 3 mg/m<sup>3</sup> (1 ppm)

As published by Safe Work Australia Workplace Exposure Standards for Airborne Contaminants.

Peak Limitation - a maximum or peak airborne concentration of a particular substance determined over the shortest analytically practicable period of time which does not exceed 15 minutes.

These Workplace Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These workplace exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

## Appropriate engineering controls:

Ensure ventilation is adequate to maintain air concentrations below Workplace Exposure Standards. If inhalation risk exists: Use with local exhaust ventilation or while wearing air supplied mask. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected.

## Individual protection measures, such as Personal Protective Equipment (PPE):

The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

OVERALLS, CHEMICAL GOGGLES, SAFETY SHOES, FACE SHIELD OR AIR MASK, GLOVES (Long).

\* Not required if wearing air supplied mask.



Wear overalls, chemical goggles, full face shield, elbow-length impervious gloves. Use with adequate ventilation. If determined by a risk assessment an inhalation risk exists, wear an air-supplied mask meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Physical state:

Gas / Liquid

### Colour:

Greenish - Yellow (high concentrations) ; Clear/invisible (low concentrations)

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<b>Odour:</b>	Pungent , Irritating
<b>Odour Threshold:</b>	1 ppm (approx)
<b>Molecular Formula:</b>	Cl <sub>2</sub>
<b>Specific Gravity:</b>	1.468 (liquid); 1.56 (@ -35°C).
<b>Relative Vapour Density (air=1):</b>	2.4
<b>Vapour Pressure (20 °C):</b>	666 kPa
<b>Flash Point (°C):</b>	Not applicable.
<b>% Volatile by Volume:</b>	ca. 100
<b>Solubility in water (g/L):</b>	7300 mg/L
<b>Boiling Point/Range (°C):</b>	-34
<b>Freezing Point/Range (°C):</b>	-101

## 10. STABILITY AND REACTIVITY

<b>Reactivity:</b>	Reacts violently with many organic chemicals (e.g. mineral oils, greases), hydrocarbons, silicones, and finely divided metals. Forms explosive mixtures with alcohols, glycols, ammonia and its compounds, and hydrogen over a wide range of concentrations.
<b>Chemical stability:</b>	Reactive chemical. Corrosive in the presence of moisture.
<b>Possibility of hazardous reactions:</b>	Oxidising agent. Supports combustion of other materials and increases intensity of a fire. Corrosive to some metals in the presence of moisture. (brass, copper, lead, nickel, steel and stainless steel) Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. Can react with acids and some nitrogen or phosphorous compounds. Hazardous polymerisation will not occur.
<b>Conditions to avoid:</b>	Avoid exposure to heat, sources of ignition, and open flame. Avoid contact with combustible substances. Do not allow water to come into contact with liquid chlorine.
<b>Incompatible materials:</b>	Incompatible with combustible materials. Incompatible with heat and hot surfaces. Incompatible with reducing agents.
<b>Hazardous decomposition products:</b>	Oxides of chlorine. Chlorine compounds.

## 11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

<b>Ingestion:</b>	Not a likely route of exposure, however, swallowing liquid will result in freeze burns of the mouth, throat and stomach. Swallowing can result in chemical burns to the mouth, throat and abdomen; perforation of the gastrointestinal tract and vomiting of blood and eroded tissue.
<b>Eye contact:</b>	A severe eye irritant. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury. Liquid splashes or spray may cause freeze burns to the eye.
<b>Skin contact:</b>	Liquid chlorine is corrosive to skin. Contact with skin will result in irritation. Liquid splashes or spray may cause freeze burns.

# Safety Data Sheet



**Inhalation:** Material is irritant to the mucous membranes of the respiratory tract (airways). May cause coughing and shortness of breath. May cause adverse lung effects if high concentrations are inhaled. Inhalation of vapours may cause severe breathing difficulties and lung oedema. Delayed (up to 48 hours) fluid build up in the lungs may occur. Severe exposure may cause lung damage. Overexposure may result in death.

**Acute toxicity:**

Inhalation LC50 (rat): 293 ppm/1hr.

Inhalation LC50 (mice): 137 ppm/1hr.

**Skin corrosion/irritation:** Corrosive (rabbit).

**Serious eye damage/irritation:** Severe irritant (rabbit).

**Chronic effects:** No information available for the product.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity** Avoid contaminating waterways.

**Persistence/degradability:** Does not accumulate in organisms. The material is not expected to bioconcentrate.

**Aquatic toxicity:** Very toxic to aquatic organisms.

96hr LC50 (fish): 0.014 mg/L

**Terrestrial toxicity:** Very ecotoxic in the soil environment.

## 13. DISPOSAL CONSIDERATIONS

**Disposal methods:**

Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Contact supplier for advice. For all Orica labelled chlorine packages, return directly to Orica.

## 14. TRANSPORT INFORMATION

**Road and Rail Transport**

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.



**UN No:**

1017

**Transport Hazard Class:**

2.3 Toxic Gas

**Subrisk 1:**

5.1 Oxidising Agent

**Subrisk 2:**

8 Corrosive

**Proper Shipping Name or**

CHLORINE

**Technical Name:**

**Hazchem or Emergency Action** 2XE

**Code:**



# Safety Data Sheet



## Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

**UN No:** 1017  
**Transport Hazard Class:** 2.3 Toxic Gas  
**Subrisk 1:** 5.1 Oxidising Agent  
**Subrisk 2:** 8 Corrosive  
**Proper Shipping Name or Technical Name:** CHLORINE

**IMDG EMS Fire:** F-C  
**IMDG EMS Spill:** S-U

**Marine Pollutant** Yes

## Air Transport

TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in Passenger and Cargo Aircraft, and Cargo Aircraft Only.

## 15. REGULATORY INFORMATION

### **Classification:**

This material is hazardous according to Safe Work Australia; HAZARDOUS SUBSTANCE.

### **Classification of the substance or mixture:**

Oxidising Gases - Category 1  
Gases under pressure - Liquefied Gas  
Skin Irritation - Category 2  
Eye Irritation - Category 2A  
Acute Inhalation Toxicity - Category 3  
Specific target organ toxicity (single exposure) - Category 3

The following health/environmental hazard categories fall outside the scope of the Workplace Health and Safety Regulations:

Acute Aquatic Toxicity - Category 1

### **Hazard Statement(s):**

H270 May cause or intensify fire; oxidizer.  
H280 Contains gas under pressure; may explode if heated.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H331 Toxic if inhaled.  
H335 May cause respiratory irritation.  
H400 Very toxic to aquatic life.

**Poisons Schedule (SUSMP):** S7 Dangerous Poison.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

## 16. OTHER INFORMATION

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2012.

# Safety Data Sheet



This safety data sheet has been prepared by Ixom Operations Pty Ltd Toxicology & SDS Services.

Maximum use rate for potable water treatment is 30 mg/L (as per NSF certification)

**Reason(s) for Issue:**

Change in Handling & Storage Requirements

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Ixom Operations Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Ixom representative or Ixom Operations Pty Ltd at the contact details on page 1.

Ixom Operations Pty Ltd's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.



# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**  
US GHS

**Synonyms:** Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquids - Category 3  
Skin Corrosion/Irritation – Category 2  
Germ Cell Mutagenicity – Category 2  
Carcinogenicity - Category 2  
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)  
Aspiration Hazard – Category 1  
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Flammable liquid and vapor.  
Causes skin irritation.  
Suspected of causing genetic defects.  
Suspected of causing cancer.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

#### Precautionary Statements

##### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**

Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Avoid breathing fume/mist/vapours/spray.

## Response

In case of fire: Use water spray, fog or foam to extinguish.  
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.  
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.  
IF exposed or concerned: Get medical advice/attention.

## Storage

Store in a well-ventilated place. Keep cool.  
Keep container tightly closed.  
Store locked up.

## Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \*\*\* Section 3 - Composition / Information on Ingredients \*\*\*

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

## \*\*\* Section 4 - First Aid Measures \*\*\*

### First Aid: 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.

### First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

### First Aid: 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. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

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## First Aid: 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.

## \* \* \* Section 5 - Fire Fighting Measures \* \* \*

### General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. 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.

### Hazardous Combustion Products

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

### Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, and other gaseous agents.

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.

### Unsuitable Extinguishing Media

None

### Fire Fighting Equipment/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.

## \* \* \* Section 6 - Accidental Release Measures \* \* \*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

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.

### Emergency Measures

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.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## Environmental Precautions

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.

## Prevention of Secondary Hazards

None

## \*\*\* Section 7 - Handling and Storage \*\*\*

### Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. 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 Procedures

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."

### Incompatibilities

Keep away from strong oxidizers.

## \*\*\* Section 8 - Exposure Controls / Personal Protection \*\*\*

### Component Exposure Limits

#### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)  
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Naphthalene (91-20-3)

ACGIH: 10 ppm TWA  
15 ppm STEL  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
NIOSH: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
15 ppm STEL; 75 mg/m<sup>3</sup> STEL

## Engineering Measures

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

## Personal Protective Equipment: Respiratory

A NIOSH/MSHA-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.

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.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## Personal Protective Equipment: Eyes

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

## Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent 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.

## \* \* \* Section 9 - Physical & Chemical Properties \* \* \*

<b>Appearance:</b>	Clear, straw-yellow.	<b>Odor:</b>	Mild, petroleum distillate odor
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	0.009 psia @ 70 °F (21 °C)	<b>Vapor Density:</b>	>1.0
<b>Boiling Point:</b>	320 to 690 °F (160 to 366 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H<sub>2</sub>O):</b>	Negligible	<b>Specific Gravity:</b>	0.83-0.876 @ 60°F (16°C)
<b>Evaporation Rate:</b>	Slow; varies with conditions	<b>VOC:</b>	ND
<b>Percent Volatile:</b>	100%	<b>Octanol/H<sub>2</sub>O Coeff.:</b>	ND
<b>Flash Point:</b>	>125 °F (>52 °C) minimum	<b>Flash Point Method:</b>	PMCC
<b>Upper Flammability Limit (UFL):</b>	7.5	<b>Lower Flammability Limit (LFL):</b>	0.6
<b>Burning Rate:</b>	ND	<b>Auto Ignition:</b>	494°F (257°C)

## \* \* \* Section 10 - Chemical Stability & Reactivity Information \* \* \*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Conditions to Avoid

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

## Incompatible Products

Keep away from strong oxidizers.

## Hazardous Decomposition Products

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

## \* \* \* Section 11 - Toxicological Information \* \* \*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

#### B: Component Analysis - LD50/LC50

##### Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m<sup>3</sup> 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

### Potential Health Effects: Skin Corrosion Property/Stimulativeness

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 repeatedly exposed.

### Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

### Potential Health Effects: Ingestion

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.

### Potential Health Effects: 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.

### Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

### Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

### Carcinogenicity

#### A: General Product Information

Suspected of causing cancer.



# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**

Studies have shown that similar products produce 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.

## B: Component Carcinogenicity

### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

### Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

## Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

## Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

## Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

## Aspiration Respiratory Organs Hazard

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.

## \*\*\* Section 12 - Ecological Information \*\*\*

## Ecotoxicity

### A: General Product Information

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

### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

#### Fuels, diesel, no. 2 (68476-34-6)

##### Test & Species

96 Hr LC50 Pimephales promelas

35 mg/L [flow-through]

##### Conditions

#### Naphthalene (91-20-3)

##### Test & Species

96 Hr LC50 Pimephales promelas

5.74-6.44 mg/L [flow-through]

##### Conditions

96 Hr LC50 Oncorhynchus mykiss

1.6 mg/L [flow-through]

96 Hr LC50 Oncorhynchus mykiss

0.91-2.82 mg/L [static]

96 Hr LC50 Pimephales promelas

1.99 mg/L [static]

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

## Persistence/Degradability

No information available.

## Bioaccumulation

No information available.

## Mobility in Soil

No information available.

## \*\*\* Section 13 - Disposal Considerations \*\*\*

### Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

### Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \*\*\* Section 14 - Transportation Information \*\*\*

### DOT Information

**Shipping Name:** Diesel Fuel

**NA #:** 1993 **Hazard Class:** 3 **Packing Group:** III

**Placard:**



## \*\*\* Section 15 - Regulatory Information \*\*\*

### Regulatory Information

#### Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

#### Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

#### SARA Section 311/312 – Hazard Classes

Acute Health  
X

Chronic Health  
X

Fire  
X

Sudden Release of Pressure  
--

Reactive  
--

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

## State Regulations

### Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

### Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

### Additional Regulatory Information

### Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

## \*\*\* Section 16 - Other Information \*\*\*

**NFPA® Hazard Rating**

Health	1
Fire	2
Reactivity	0



**HMIS® Hazard Rating**

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal

\*Chronic

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**

## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

## Literature References

None

## Other Information

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.

End of Sheet



# Safety Data Sheet

**Material Name: Fuel Oil No. 2**

**SDS No. 0088**  
EU/CLP GHS

**Synonyms:** #2 Heating Oil; 2 Oil; Off-road Diesel Fuel

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquids - Category 3  
Acute Toxicity, Inhalation - Category 4  
Skin Corrosion/Irritation – Category 2  
Eye Damage/Irritation – Category 2  
Carcinogenicity - Category 2  
Specific Target Organ Toxicity (Single Exposure) – Category 3 (respiratory irritation, narcosis)  
Aspiration Hazard – Category 1  
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Flammable liquid and vapor.  
Harmful if inhaled.  
Causes skin irritation.  
Causes eye irritation.  
Suspected of causing cancer.  
Suspected of causing genetic defects.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

# Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088

## Precautionary Statements

### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.  
Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Avoid breathing fume/mist/vapors/spray.  
Use only outdoors or in a well-ventilated area.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Avoid release to the environment.

### Response

In case of fire: Use water spray, fog or foam.  
If on skin (or hair): Wash with plenty of soap and water. Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs, get medical advice/attention.  
If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center or doctor if you feel unwell.  
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.  
If exposed or concerned: Get medical advice/attention.  
If swallowed: Immediately call a poison center or doctor/physician if you feel unwell. Do NOT induce vomiting.

### Storage

Store in a well ventilated place.  
Keep cool. Keep container tightly closed.  
Store locked up.

### Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \* \* \* Section 3 - Composition / Information on Ingredients \* \* \*

CAS #	Component	Percent
68476-30-2	Fuel oil No. 2	100
91-20-3	Naphthalene	<0.1

A complex combination of hydrocarbons with carbon numbers in the range C9 and higher produced from the distillation of petroleum crude oil.

# Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088

## \*\*\* Section 4 - First Aid Measures \*\*\*

### First Aid: 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.

### First Aid: Skin

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

### First Aid: 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. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### First Aid: 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.

## \*\*\* Section 5 - Fire Fighting Measures \*\*\*

### General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. 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.

### Hazardous Combustion Products

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

### Extinguishing Media

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

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.

### Unsuitable Extinguishing Media

None

### Fire Fighting Equipment/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.

## \*\*\* Section 6 - Accidental Release Measures \*\*\*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

# Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088

## Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal.

## Emergency Measures

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.

## Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## Environmental Precautions

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.

## Prevention of Secondary Hazards

None

<b>*** Section 7 - Handling and Storage ***</b>
---

## Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. 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 this product is loaded into tanks previously containing low flash point products (such as gasoline) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

## Storage Procedures

Keep containers closed and clearly labeled. Use approved vented storage containers. 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."

## Incompatibilities

Keep away from strong oxidizers; Fluorel ®



# Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088

## \*\*\* Section 8 - Exposure Controls / Personal Protection \*\*\*

### Component Exposure Limits

#### Fuel oil No. 2 (270-671-4)

- ACGIH: 100 mg/m<sup>3</sup> TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)  
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)
- Belgium: 100 mg/m<sup>3</sup> TWA (as total hydrocarbon, aerosol and vapor)  
Skin (listed under Gas oil)
- Portugal: 100 mg/m<sup>3</sup> TWA [VLE-MP] (aerosol and vapor, as total Hydrocarbons, listed under Fuel diesel)

#### Naphthalene (202-049-5)

- ACGIH: 15 ppm STEL  
10 ppm TWA  
Skin - potential significant contribution to overall exposure by the cutaneous route
- Austria: 10 ppm TWA [TMW]; 50 mg/m<sup>3</sup> TWA [TMW]  
skin notation
- Belgium: 15 ppm STEL; 80 mg/m<sup>3</sup> STEL  
10 ppm TWA; 53 mg/m<sup>3</sup> TWA  
Skin
- Denmark: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA
- Finland: 2 ppm STEL; 10 mg/m<sup>3</sup> STEL  
1 ppm TWA; 5 mg/m<sup>3</sup> TWA
- France: 10 ppm TWA [VME]; 50 mg/m<sup>3</sup> TWA [VME]
- Germany: 0.1 ppm TWA AGW (The risk of damage to the embryo or fetus can be excluded when MAK and BAT values are observed, inhalable fraction, exposure factor 1); 0.5 mg/m<sup>3</sup> TWA AGW (The risk of damage to the embryo or fetus can be excluded when MAK and BAT values are observed, inhalable fraction, exposure factor 1)
- Greece: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA
- Ireland: 15 ppm STEL; 75 mg/m<sup>3</sup> STEL  
10 ppm TWA; 50 mg/m<sup>3</sup> TWA
- Netherlands: 80 mg/m<sup>3</sup> STEL  
50 mg/m<sup>3</sup> TWA
- Portugal: 10 ppm TWA [VLE-MP]
- Spain: 15 ppm STEL [VLA-EC]; 80 mg/m<sup>3</sup> STEL [VLA-EC]  
10 ppm TWA [VLA-ED]; 53 mg/m<sup>3</sup> TWA [VLA-ED]  
skin - potential for cutaneous exposure
- Sweden: 10 ppm LLV; 50 mg/m<sup>3</sup> LLV  
15 ppm STV; 80 mg/m<sup>3</sup> STV

### Engineering Measures

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

### Personal Protective Equipment: Respiratory

A NIOSH/MSHA-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.

# Safety Data Sheet

**Material Name: Fuel Oil No. 2**

**SDS No. 0088**

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.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## Personal Protective Equipment: Eyes

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

## Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent 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.

## \*\*\* Section 9 - Physical & Chemical Properties \*\*\*

<b>Appearance:</b>	Red or reddish/orange colored (dyed)	<b>Odor:</b>	Mild, petroleum distillate odor
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	0.009 psia @ 70 °F (21 °C)	<b>Vapor Density:</b>	>1.0
<b>Boiling Point:</b>	340 to 700 °F (171 to 371 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H2O):</b>	Negligible	<b>Specific Gravity:</b>	AP 0.823-0871
<b>Evaporation Rate:</b>	Slow; varies with conditions	<b>VOC:</b>	ND
<b>Octanol/H2O Coeff.:</b>	ND	<b>Flash Point:</b>	100 °F (38 °C) minimum
<b>Flash Point Method:</b>	PMCC	<b>Upper Flammability Limit (UFL):</b>	7.5
<b>Lower Flammability Limit (LFL):</b>	0.6	<b>Burning Rate:</b>	ND
<b>Auto Ignition:</b>	494°F (257°C)		

## \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.

### Conditions to Avoid

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

### Incompatible Products

Keep away from strong oxidizers; Fluorel ®

### Hazardous Decomposition Products

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

## \*\*\* Section 11 - Toxicological Information \*\*\*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

# Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088

## B: Component Analysis - LD50/LC50

### Fuel oil No. 2 (68476-30-2)

Oral LD50 Rat 12 g/kg; Dermal LD50 Rabbit 4720 µL/kg; Dermal LD50 Rabbit >2000 mg/kg; Inhalation LC50 Rat 4.6 mg/L 4 h

### Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m<sup>3</sup> 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

### Product Mixture

Oral LD50 Rat 14.5 ml/kg; Dermal LD50 Rabbit >5 mL/kg; Guinea Pig Sensitization: negative; Primary dermal irritation: moderately irritating (Draize mean irritation score - 3.98 rabbits); Draize eye irritation: mildly irritating (Draize score, 48 hours, unwashed - 2.0 rabbits)

## Potential Health Effects: Skin Corrosion Property/Stimulativeness

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 repeatedly exposed.

## Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

## Potential Health Effects: Ingestion

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.

## Potential Health Effects: 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.

## Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

## Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects. Material of similar composition has been positive in a mutagenicity study.

## Carcinogenicity

### A: General Product Information

Suspected of causing cancer.

Dermal carcinogenicity: positive - mice

# Safety Data Sheet

**Material Name: Fuel Oil No. 2**

**SDS No. 0088**

Studies have shown that similar products produce 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.

This product is similar to Diesel Fuel. IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A) and NIOSH regards it as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

## **B: Component Carcinogenicity**

### **Fuel oil No. 2 (68476-30-2)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

### **Naphthalene (91-20-3)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

## **Reproductive Toxicity**

This product is not reported to have any reproductive toxicity effects.

## **Specified Target Organ General Toxicity: Single Exposure**

This product is not reported to have any specific target organ general toxicity single exposure effects.

## **Specified Target Organ General Toxicity: Repeated Exposure**

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

## **Aspiration Respiratory Organs Hazard**

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.

## **\* \* \* Section 12 - Ecological Information \* \* \***

## **Ecotoxicity**

### **A: General Product Information**

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### **B: Component Analysis - Ecotoxicity - Aquatic Toxicity**

#### **Fuel oil No. 2 (68476-30-2)**

##### **Test & Species**

96 Hr LC50 Pimephales promelas

35 mg/L [flow-through]

##### **Conditions**

#### **Naphthalene (91-20-3)**

##### **Test & Species**

96 Hr LC50 Pimephales promelas

5.74-6.44 mg/L [flow-through]

##### **Conditions**

96 Hr LC50 Oncorhynchus mykiss

1.6 mg/L [flow-through]

# Safety Data Sheet

**Material Name: Fuel Oil No. 2**

**SDS No. 0088**

96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]
96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

## Persistence/Degradability

No information available.

## Bioaccumulation

No information available.

## Mobility in Soil

No information available.

## \* \* \* Section 13 - Disposal Considerations \* \* \*

### Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

### Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \* \* \* Section 14 - Transportation Information \* \* \*

### IATA Information

**Shipping Name:** Heating oil, light

**UN #:** 1202 **Hazard Class:** 3 **Packing Group:** III

### ICAO Information

**Shipping Name:** Heating oil, light

**UN #:** 1202 **Hazard Class:** 3 **Packing Group:** III

### IMDG Information

**Shipping Name:** Heating oil, light

**UN #:** 1202 **Hazard Class:** 3 **Packing Group:** III

# Safety Data Sheet

Material Name: Fuel Oil No. 2

SDS No. 0088

## \*\*\* Section 15 - Regulatory Information \*\*\*

### Regulatory Information

#### Component Analysis – Inventory

Component/CAS	EC #	EEC	CAN	TSCA
Fuel oil No. 2 68476-30-2	270-671-4	EINECS	DSL	Yes
Naphthalene 91-20-3	202-049-5	EINECS	DSL	Yes

## \*\*\* Section 16 - Other Information \*\*\*

### Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

### Literature References

None

### Other Information

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.

End of Sheet



# Safety Data Sheet

**Material Name: Gasoline All Grades**

**SDS No. 9950**  
US GHS

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

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquid - Category 2  
Skin Corrosion/Irritation - Category 2  
Germ Cell Mutagenicity - Category 1B  
Carcinogenicity - Category 1B  
Toxic to Reproduction - Category 1A  
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)  
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)  
Aspiration Hazard - Category 1  
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Highly flammable liquid and vapour.  
Causes skin irritation.  
May cause genetic defects.  
May cause cancer.  
May damage fertility or the unborn child.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

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## Precautionary Statements

### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.  
Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Do not breathe mist/vapours/spray.  
Use only outdoors or in well-ventilated area.  
Do not eat, drink or smoke when using this product.  
Avoid release to the environment.

### Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.  
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.  
IF exposed or concerned: Get medical advice/attention.  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.  
Get medical advice/attention if you feel unwell.  
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

### Storage

Store in a well-ventilated place.  
Keep cool. Keep container tightly closed.  
Store locked up.

### Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

## \* \* \* Section 3 - Composition / Information on Ingredients \* \* \*

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9



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110-54-3	Hexane	0.5-4
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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). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

## \* \* \* Section 4 - First Aid Measures \* \* \*

### First Aid: 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.

### First Aid: Skin

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

### First Aid: 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. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### First Aid: 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.

## \* \* \* Section 5 - Fire Fighting Measures \* \* \*

### General Fire Hazards

See Section 9 for Flammability Properties.

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.

### Hazardous Combustion Products

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

### Extinguishing Media

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

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.

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

### Unsuitable Extinguishing Media

None

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## Fire Fighting Equipment/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.

## \*\*\* Section 6 - Accidental Release Measures \*\*\*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

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.

### Emergency Measures

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.

### Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### Environmental Precautions

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.

### Prevention of Secondary Hazards

None

## \*\*\* Section 7 - Handling and Storage \*\*\*

### Handling Procedures

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.

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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 Procedures

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".

## Incompatibilities

Keep away from strong oxidizers.

## \* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \*

### Component Exposure Limits

#### Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA  
500 ppm STEL

#### Toluene (108-88-3)

ACGIH: 20 ppm TWA  
OSHA: 200 ppm TWA; 375 mg/m<sup>3</sup> TWA  
150 ppm STEL; 560 mg/m<sup>3</sup> STEL  
NIOSH: 100 ppm TWA; 375 mg/m<sup>3</sup> TWA  
150 ppm STEL; 560 mg/m<sup>3</sup> STEL

#### Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)  
OSHA: 800 ppm TWA; 1900 mg/m<sup>3</sup> TWA  
NIOSH: 800 ppm TWA; 1900 mg/m<sup>3</sup> TWA

#### Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA  
150 ppm STEL  
OSHA: 100 ppm TWA; 435 mg/m<sup>3</sup> TWA  
150 ppm STEL; 655 mg/m<sup>3</sup> STEL

#### Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m<sup>3</sup> TWA

#### Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL  
OSHA: 1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA  
NIOSH: 1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA

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## **Ethylbenzene (100-41-4)**

ACGIH: 20 ppm TWA  
OSHA: 100 ppm TWA; 435 mg/m<sup>3</sup> TWA  
125 ppm STEL; 545 mg/m<sup>3</sup> STEL  
NIOSH: 100 ppm TWA; 435 mg/m<sup>3</sup> TWA  
125 ppm STEL; 545 mg/m<sup>3</sup> STEL

## **Benzene (71-43-2)**

ACGIH: 0.5 ppm TWA  
2.5 ppm STEL  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA  
NIOSH: 0.1 ppm TWA  
1 ppm STEL

## **Hexane (110-54-3)**

ACGIH: 50 ppm TWA  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 500 ppm TWA; 1800 mg/m<sup>3</sup> TWA  
NIOSH: 50 ppm TWA; 180 mg/m<sup>3</sup> TWA

## **Engineering Measures**

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

## **Personal Protective Equipment: Respiratory**

A NIOSH/MSHA-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.

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.

## **Personal Protective Equipment: Hands**

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## **PERSONAL PROTECTIVE EQUIPMENT**

### **Personal Protective Equipment: Eyes**

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

### **Personal Protective Equipment: Skin and Body**

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent 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.

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## \*\*\* Section 9 - Physical & Chemical Properties \*\*\*

<b>Appearance:</b>	Translucent, straw-colored or light yellow	<b>Odor:</b>	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	<b>Vapor Density:</b>	AP 3-4
<b>Boiling Point:</b>	85-437 °F (39-200 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H2O):</b>	Negligible to Slight	<b>Specific Gravity:</b>	0.70-0.78
<b>Evaporation Rate:</b>	10-11	<b>VOC:</b>	ND
<b>Percent Volatile:</b>	100%	<b>Octanol/H2O Coeff.:</b>	ND
<b>Flash Point:</b>	-45 °F (-43 °C)	<b>Flash Point Method:</b>	PMCC
<b>Upper Flammability Limit (UFL):</b>	7.6%	<b>Lower Flammability Limit (LFL):</b>	1.4%
<b>Burning Rate:</b>	ND	<b>Auto Ignition:</b>	>530°F (>280°C)

## \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.

### Conditions to Avoid

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

### Incompatible Products

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 nitrocresols that can decompose violently.

## \*\*\* Section 11 - Toxicological Information \*\*\*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

#### B: Component Analysis - LD50/LC50

##### Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

##### Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

##### Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

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**Xylenes (o-, m-, p- isomers) (1330-20-7)**

Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

**Benzene, 1,2,4-trimethyl- (95-63-6)**

Inhalation LC50 Rat 18 g/m<sup>3</sup> 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

**Ethyl alcohol (64-17-5)**

Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

**Ethylbenzene (100-41-4)**

Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

**Benzene (71-43-2)**

Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

**Hexane (110-54-3)**

Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

**Potential Health Effects: Skin Corrosion Property/Stimulativeness**

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 repeatedly exposed.

**Potential Health Effects: Eye Critical Damage/ Stimulativeness**

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

**Potential Health Effects: Ingestion**

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.

**Potential Health Effects: 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.

**Respiratory Organs Sensitization/Skin Sensitization**

This product is not reported to have any skin sensitization effects.

**Generative Cell Mutagenicity**

This product may cause genetic defects.

**Carcinogenicity**

**A: General Product Information**

May cause cancer.

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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.

## B: Component Carcinogenicity

### **Gasoline, motor fuel (86290-81-5)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

### **Toluene (108-88-3)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

### **Xylenes (o-, m-, p- isomers) (1330-20-7)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

### **Ethyl alcohol (64-17-5)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

### **Ethylbenzene (100-41-4)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

### **Benzene (71-43-2)**

ACGIH: A1 - Confirmed Human Carcinogen

OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA

NIOSH: potential occupational carcinogen

NTP: Known Human Carcinogen (Select Carcinogen)

IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

## Reproductive Toxicity

This product is suspected of damaging fertility or the unborn child.

## Specified Target Organ General Toxicity: Single Exposure

This product may cause drowsiness or dizziness.

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## Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

## Aspiration Respiratory Organs Hazard

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.

## \* \* \* Section 12 - Ecological Information \* \* \*

### Ecotoxicity

#### A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

#### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

##### Gasoline, motor fuel (86290-81-5)

###### Test & Species

###### Conditions

96 Hr LC50 <i>Alburnus alburnus</i>	119 mg/L [static]
96 Hr LC50 <i>Cyprinodon variegatus</i>	82 mg/L [static]
72 Hr EC50 <i>Pseudokirchneriella subcapitata</i>	56 mg/L
24 Hr EC50 <i>Daphnia magna</i>	170 mg/L

##### Toluene (108-88-3)

###### Test & Species

###### Conditions

96 Hr LC50 <i>Pimephales promelas</i>	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 <i>Pimephales promelas</i>	12.6 mg/L [static]	
96 Hr LC50 <i>Oncorhynchus mykiss</i>	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 <i>Oncorhynchus mykiss</i>	14.1-17.16 mg/L [static]	
96 Hr LC50 <i>Oncorhynchus mykiss</i>	5.8 mg/L [semi-static]	
96 Hr LC50 <i>Lepomis macrochirus</i>	11.0-15.0 mg/L [static]	
96 Hr LC50 <i>Oryzias latipes</i>	54 mg/L [static]	
96 Hr LC50 <i>Poecilia reticulata</i>	28.2 mg/L [semi-static]	
96 Hr LC50 <i>Poecilia reticulata</i>	50.87-70.34 mg/L [static]	
96 Hr EC50 <i>Pseudokirchneriella subcapitata</i>	>433 mg/L	
72 Hr EC50 <i>Pseudokirchneriella subcapitata</i>	12.5 mg/L [static]	
48 Hr EC50 <i>Daphnia magna</i>	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 <i>Daphnia magna</i>	11.5 mg/L	

##### Xylenes (o-, m-, p- isomers) (1330-20-7)

###### Test & Species

###### Conditions

96 Hr LC50 <i>Pimephales promelas</i>	13.4 mg/L [flow-through]
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96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi- static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

## **Benzene, 1,2,4-trimethyl- (95-63-6)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

## **Ethyl alcohol (64-17-5)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

## **Ethylbenzene (100-41-4)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi- static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow- through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

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96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

## **Benzene (71-43-2)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

## **Hexane (110-54-3)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

## **Persistence/Degradability**

No information available.

## **Bioaccumulation**

No information available.

## **Mobility in Soil**

No information available.

## **\*\*\* Section 13 - Disposal Considerations \*\*\***

### **Waste Disposal Instructions**

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

### **Disposal of Contaminated Containers or Packaging**

Dispose of contents/container in accordance with local/regional/national/international regulations.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## \*\*\* Section 14 - Transportation Information \*\*\*

### Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

### DOT Information

Shipping Name: Gasoline

UN #: 1203 Hazard Class: 3 Packing Group: II

Placard:



## \*\*\* Section 15 - Regulatory Information \*\*\*

### Regulatory Information

#### A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

##### **Toluene (108-88-3)**

SARA 313: 1.0 % de minimis concentration  
CERCLA: 1000 lb final RQ; 454 kg final RQ

##### **Xylenes (o-, m-, p- isomers) (1330-20-7)**

SARA 313: 1.0 % de minimis concentration  
CERCLA: 100 lb final RQ; 45.4 kg final RQ

##### **Benzene, 1,2,4-trimethyl- (95-63-6)**

SARA 313: 1.0 % de minimis concentration

##### **Ethylbenzene (100-41-4)**

SARA 313: 0.1 % de minimis concentration  
CERCLA: 1000 lb final RQ; 454 kg final RQ

##### **Benzene (71-43-2)**

SARA 313: 0.1 % de minimis concentration  
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ; 2270 kg final RQ

## SARA Section 311/312 – Hazard Classes

Acute Health

X

Chronic Health

X

Fire

X

Sudden Release of Pressure

--

Reactive

--

## Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

## State Regulations

## Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

## Additional Regulatory Information

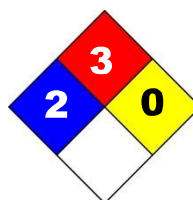
## Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

## \*\*\* Section 16 - Other Information \*\*\*

**NFPA® Hazard Rating**

Health	2
Fire	3
Reactivity	0



**HMIS® Hazard Rating**

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal

\*Chronic

## Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

## Literature References

None

# Safety Data Sheet

**Material Name: Gasoline All Grades**

**SDS No. 9950**

## Other Information

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.

End of Sheet

# SAFETY DATA SHEET

**Airgas**<sup>®</sup>

## Propane

### Section 1. Identification

<b>GHS product identifier</b>	: Propane
<b>Chemical name</b>	: propane
<b>Other means of identification</b>	: Propyl hydride; n-Propane; Dimethyl methane; Bottled gas; propane in gaseous state; propane liquefied, n-Propane; Dimethylmethane; Freon 290; Liquefied petroleum gas; Lpg; Propyl hydride; R 290; C <sub>3</sub> H <sub>8</sub> ; UN 1075; UN 1978; A-108; Hydrocarbon propellant.
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: Propyl hydride; n-Propane; Dimethyl methane; Bottled gas; propane in gaseous state; propane liquefied, n-Propane; Dimethylmethane; Freon 290; Liquefied petroleum gas; Lpg; Propyl hydride; R 290; C <sub>3</sub> H <sub>8</sub> ; UN 1075; UN 1978; A-108; Hydrocarbon propellant.
<b>SDS #</b>	: 001045
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>24-hour telephone</b>	: 1-866-734-3438

### Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas

#### GHS label elements

##### **Hazard pictograms**



##### **Signal word**

: Danger

##### **Hazard statements**

: Extremely flammable gas.  
Contains gas under pressure; may explode if heated.  
May cause frostbite.  
May form explosive mixtures in Air.  
May displace oxygen and cause rapid suffocation.

#### Precautionary statements

##### **General**

: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

##### **Prevention**

: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

##### **Response**

: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

##### **Storage**

: Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

## Section 2. Hazards identification

- Disposal** : Not applicable.
- Hazards not otherwise classified** : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

## Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : propane
- Other means of identification** : Propyl hydride; n-Propane; Dimethyl methane; Bottled gas; propane in gaseous state; propane liquefied, n-Propane; Dimethylmethane; Freon 290; Liquefied petroleum gas; Lpg; Propyl hydride; R 290; C<sub>3</sub>H<sub>8</sub>; UN 1075; UN 1978; A-108; Hydrocarbon propellant.

### CAS number/other identifiers

- CAS number** : 74-98-6
- Product code** : 001045

Ingredient name	%	CAS number
Propane	100	74-98-6

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

**Occupational exposure limits, if available, are listed in Section 8.**

## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : As this product is a gas, refer to the inhalation section.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : As this product is a gas, refer to the inhalation section.

#### Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.



## Section 4. First aid measures

**Ingestion** : No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

**Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

**Small spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

## Section 6. Accidental release measures

- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
Propane	<b>NIOSH REL (United States, 10/2013).</b> TWA: 1800 mg/m <sup>3</sup> 10 hours. TWA: 1000 ppm 10 hours. <b>OSHA PEL (United States, 2/2013).</b> TWA: 1800 mg/m <sup>3</sup> 8 hours. TWA: 1000 ppm 8 hours. <b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 1800 mg/m <sup>3</sup> 8 hours. TWA: 1000 ppm 8 hours.

- Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

## Section 8. Exposure controls/personal protection

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Gas. [Liquefied compressed gas.]
- Color** : Colorless.
- Molecular weight** : 44.11 g/mole
- Molecular formula** : C<sub>3</sub>H<sub>8</sub>
- Boiling/condensation point** : -161.48°C (-258.7°F)
- Melting/freezing point** : -187.6°C (-305.7°F)
- Critical temperature** : 96.55°C (205.8°F)
- Odor** : Odorless.BUT MAY HAVE SKUNK ODOR ADDED.
- Odor threshold** : Not available.
- pH** : Not available.
- Flash point** : Closed cup: -104°C (-155.2°F)  
Open cup: -104°C (-155.2°F)
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and oxidizing materials.
- Lower and upper explosive (flammable) limits** : Lower: 1.8%  
Upper: 8.4%
- Vapor pressure** : 109 (psig)
- Vapor density** : 1.6 (Air = 1)

## Section 9. Physical and chemical properties

Specific Volume (ft <sup>3</sup> /lb)	: 8.6206
Gas Density (lb/ft <sup>3</sup> )	: 0.116 (25°C / 77 to °F)
Relative density	: Not applicable.
Solubility	: Not available.
Solubility in water	: 0.0244 g/l
Partition coefficient: n-octanol/water	: 1.09
Auto-ignition temperature	: 287°C (548.6°F)
Decomposition temperature	: Not available.
SADT	: Not available.
Viscosity	: Not applicable.

## Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatible materials	: Oxidizers
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Not available.

IDLH : 2100 ppm

#### Irritation/Corrosion

Not available.

#### Sensitization

Not available.

#### Mutagenicity

Not available.

#### Carcinogenicity

Not available.

#### Reproductive toxicity

Not available.

#### Teratogenicity

Not available.

## Section 11. Toxicological information

### Specific target organ toxicity (single exposure)

Not available.

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.  
**Inhalation** : No known significant effects or critical hazards.  
**Skin contact** : No known significant effects or critical hazards.  
**Ingestion** : As this product is a gas, refer to the inhalation section.

### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : No specific data.  
**Inhalation** : No specific data.  
**Skin contact** : No specific data.  
**Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.  
**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.  
**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

**General** : No known significant effects or critical hazards.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Not available.

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Propane	1.09	-	low

### Mobility in soil






Soil/water partition coefficient (K<sub>oc</sub>) : Not available.

Other adverse effects : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN1978	UN1978	UN1978	UN1978	UN1978
<b>UN proper shipping name</b>	PROPANE	PROPANE	PROPANE	PROPANE	PROPANE
<b>Transport hazard class(es)</b>	2.1 	2.1 	2.1 	2.1 	2.1 
<b>Packing group</b>	-	-	-	-	-
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<b>Limited quantity</b> Yes.  <b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: Forbidden.  <b>Cargo aircraft</b> Quantity limitation: 150 kg  <b>Special provisions</b> 10, 150	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).  <b>Explosive Limit and Limited Quantity Index</b> 0.125  <b>ERAP Index</b> 2000	-	-	<b>Passenger and Cargo Aircraft</b> Quantity limitation: 0 Forbidden <b>Cargo Aircraft Only</b> Quantity limitation: 150 kg

## Section 14. Transport information

		<u>Passenger Carrying Ship Index</u> 65  <u>Passenger Carrying Road or Rail Index</u> Forbidden  <u>Special provisions</u> 29, 42			
--	--	--	--	--	--

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined  
**United States inventory (TSCA 8b):** This material is listed or exempted.  
**Clean Air Act (CAA) 112 regulated flammable substances:** propane

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Fire hazard  
Sudden release of pressure

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Propane	100	Yes.	Yes.	No.	No.	No.

### State regulations

**Massachusetts** : This material is listed.

**New York** : This material is not listed.

## Section 15. Regulatory information

**New Jersey** : This material is listed.

**Pennsylvania** : This material is listed.

### International regulations

#### International lists

#### National inventory

**Australia** : This material is listed or exempted.

**Canada** : This material is listed or exempted.

**China** : This material is listed or exempted.

**Europe** : This material is listed or exempted.

**Japan** : This material is listed or exempted.

**Malaysia** : This material is listed or exempted.

**New Zealand** : This material is listed or exempted.

**Philippines** : This material is listed or exempted.

**Republic of Korea** : This material is listed or exempted.

**Taiwan** : This material is listed or exempted.

### Canada

**WHMIS (Canada)** : Class A: Compressed gas.  
Class B-1: Flammable gas.  
**CEPA Toxic substances**: This material is not listed.  
**Canadian ARET**: This material is not listed.  
**Canadian NPRI**: This material is listed.  
**Alberta Designated Substances**: This material is not listed.  
**Ontario Designated Substances**: This material is not listed.  
**Quebec Designated Substances**: This material is not listed.

## Section 16. Other information

**Canada Label requirements** : Class A: Compressed gas.  
Class B-1: Flammable gas.

### Hazardous Material Information System (U.S.A.)

Health	*	1
Flammability		4
Physical hazards		2

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)



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## Section 16. Other information

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### Procedure used to derive the classification

Classification	Justification
Flam. Gas 1, H220 Press. Gas Liq. Gas, H280	Expert judgment Expert judgment

### History

**Date of printing** : 10/20/2015

**Date of issue/Date of revision** : 10/20/2015

**Date of previous issue** : No previous validation

**Version** : 0.01

**Key to abbreviations** : ATE = Acute Toxicity Estimate  
BCF = Bioconcentration Factor  
GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
IATA = International Air Transport Association  
IBC = Intermediate Bulk Container  
IMDG = International Maritime Dangerous Goods  
LogPow = logarithm of the octanol/water partition coefficient  
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
UN = United Nations

**References** : Not available.

☑ Indicates information that has changed from previously issued version.

**Other special considerations** : The information below is given to call attention to the issue of "Naturally occurring radioactive materials". Although Radon-222 levels in the product represented by this MSDS do not present any direct Radon exposure hazard, customers should be aware of the potential for Radon daughter build up within their processing systems, whatever the source of their product streams. Radon-222 is a naturally occurring radioactive gas which can be a contaminant in natural gas. During subsequent processing, Radon tends to be concentrated in Liquefied Petroleum Gas streams and in product streams having a similar boiling point range. Industry experience has shown that this product may contain small amounts of Radon-222 and its radioactive decay products, called Radon "daughters". The actual concentration of Radon-222 and radioactive daughters in the delivered product is dependent on the geographical source of the natural gas and storage time prior to delivery. Process equipment (i.e. lines, filters, pumps and reaction units) may accumulate significant levels of radioactive daughters and show a gamma radiation reading during operation. A potential external radiation hazard exists at or near any pipe valve or vessel containing a Radon enriched stream, or containing internal deposits of radioactive material due to the transmission of gamma radiation through its wall. Field studies reported in the literature have not shown any conditions that subject workers to cumulative exposures in excess of general population limits. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha emitting decay products which may be a hazard if inhaled or ingested. Protective equipment such as coveralls, gloves, and respirator (NIOSH/MHSA approved for high efficiency particulates and radionuclides, or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion, or inhalation of any residues containing alpha radiation. Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state.

### Notice to reader

## Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.