APPENDIX "E"

MSDS SHEETS

Shell Canada Limited

Material Safety Data Sheet

Effective Date: 19980901

Class B3 Combustible Liquid

Class D2B Other Toxic Effects - Skin Irritant

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT:	REGULAR SULPHUR DIESEL FUEL
SYNONYMS:	Diesel Automotive Gas Oil
PRODUCT USE:	Fuel Solvent
MSDS Number:	322-110

MANUFACTURER	TELEPHONE NUMBERS	
Shell Canada Limited	Shell Emergency Number	1-800-661-7378
P.O. Box 100, Station M	CANUTEC 24 HOUR EMERGENCY NUMBER	613-996-6666
400-4th Ave. S.W.		
Calgary, AB Canada	For general information:	1-800-661-1600
T2P 2H5	For MSDS information:	403-691-3982
	(From 7:30 to 4:30 Mountain Time)	403-691-2220

This MSDS was prepared by the Toxicology and Material Safety Section of Shell Canada Limited.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled	CBI Claim No. CBI Date
REGULAR SULPHUR DIESEL FUEL	68476-34-6	100	Yes	

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Lightly Coloured Hydrocarbon Odour

Routes of Exposure:	Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.
Hazards:	Combustible Liquid. Irritating to skin. Vapours are moderately irritating to the eyes. Vapours are moderately irritating to the respiratory passages. The liquid when accidently aspirated into the lungs can cause a severe inflammation of the lung.
Handling:	Eliminate all ignition sources. Avoid prolonged exposure to vapours. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes	Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.
Skin	Flush affected skin with gently flowing lukewarm water for at least 20 minutes and remove contaminated clothing while rinsing. Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.
Ingestion	DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.
Inhalation	Remove victim from further exposure and restore breathing, if required. Obtain medical attention.
Notes to Physician	The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media	Dry Chemical Carbon Dioxide Foam Water Fog

Firefighting Instructions	Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Do not use water except as a fog. Product will float and can be reignited on surface of water. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Caution - Combustible. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.
Hazardous Combustion Products	A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Combustible". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Try to work upwind of spill. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling:	Combustible. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Never siphon by mouth. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.
Storage:	Use explosion-proof ventilation to prevent vapour accumulation. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

Occupational Exposure Limits (1998) : North American exposure limits have not been established for the product. Consult local authorities for acceptable provincial values.
Oil mist (mineral): 5 mg/m3 (TLV/TWA) ACGIH
10 mg/m3 (TLV/STEL) ACGIH
Recommend SHELL guideline of 125 mg/m3 for vapours (8 hour shift).

Mechanical Ventilation: Use explosion-proof ventilation as required to control vapour concentrations. Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Impervious gloves (viton, nitrile) should be worn at all times when handling this material. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Lightly Coloured
Odour:	Hydrocarbon Odour
Odour Threshold:	Not available
Freezing/Pour Point:	Not available
Boiling Point:	246 - 388 degrees C
Density:	<876 kg/m3 @ 15 degrees C
Vapour Density (Air = 1):	Not available
Vapour Pressure:	Not available
pH:	Not applicable
Flash Point:	Method Pensky-Martens CC >40 degrees C
Lower Explosion Limit:	1 % (vol.)
Upper Explosion Limit:	6 % (vol.)
Autoignition Temperature:	250 degrees C
Viscosity:	1.3 - 4.1 cSt @ 40 degrees C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (K_{ow}):	Not available
Water Solubility:	Insoluble

Other Solvents:	Hydrocarbon Solvents
Formula:	C10 to C22 Hydrocarbons

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Hazardous Decomposition Products:	Thermal decomposition products are highly dependent on combustion conditions.
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
REGULAR SULPHUR DIESEL FUEL	LD50 Oral Rat >5000 mg/kg LD50 Dermal Rabbit >2000 mg/kg

Routes of Exposure:	Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.
Irritancy:	This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.
Chronic Effects:	Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression. Prolonged or repeated contact may cause various forms of dermatitis including folliculitis and oil acne.
Pre-existing Conditions:	Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.
Carcinogenicity and Mutagenicity:	The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk.

12. ECOLOGICAL INFORMATION

Environmental Effects	Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May cause physical fouling of aquatic organisms.
Biodegradability	Not readily biodegradable. Potential for bioaccumulation.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN/NA Number	UN1202
Proper Shipping Name	FUEL OIL
Hazard Class	Class 3 Flammable Liquid
Packing Group	PG III
Shipping Description	FUEL OIL Class 3 UN1202 PG III

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B3 Combustible Liquid Class D2B Other Toxic Effects - Skin Irritant
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act.
Other Regulatory Status:	No Canadian federal standards.

16. ADDITIONAL INFORMATION

LABEL STATEMENTS

Hazard Statement :	Combustible Liquid. Irritating to skin.
Handling Statement:	Eliminate all ignition sources. Avoid prolonged exposure to vapours. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.

Revisions: This MSDS has been reissued in the ANSI Z400.1 standard format.

ICG PROPANE

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name **PROPANE**

Synonym Propane HD-5, Propane commercial, Dimethylmethane, Propyl hydride, Liquefied Petroleum Gas (LPG), Alkane, C_3H_8

Supplier
ICG PROPANE
Suite 200, 19433 96th Avenue
Surrey, BC V4N 4C4

In case of emergency
ICG Propane Inc.
1-800-424-8807

Material Uses Propane is used as a fuel gas, refrigerant and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks and cylinders.

Section 2. Composition and Information on Ingredients

Name	CAS #	% (V/V)	Exposure Limits (ACGIH) TLV-TWA (8 h)	STEL	CEILING
Propane	74-98-6	>80	4508 mg / m3. (2500 PPM - 1996 Occupational Exposure Limit)	Not applicable	Not applicable
Propylene */**	115-07-1	<5	Simple asphyxiant	Not applicable	Not applicable
Butane	106-97-8	<3	800 ppm	Not applicable	Not applicable
Ethane	74-84-0	0-5	Simple asphyxiant	Not applicable	Not applicable
Ethyl mercaptan	75-08-1	<50 ppm	0.5ppm	Not applicable	Not applicable

*Propane commercial contains more propylene
**Propylene may not be present

Supplier Recommendation: Recommends a maximum exposure level of 2500 ppm (4508 mg/m3) for 8 hours time weighted average when handling propane based on 1996 ACGIH notice of intended change for propane. Consult local authorities for acceptable exposure limits.

Other Exposure Limits: Consult local, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification

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

Section 4. First Aid Measures

Eye Contact: If the eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with running water for at least 15 minutes, keeping eyelids open. If irritation, pain, swelling, or crying has occurred, get medical attention.

Skin Contact: Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burns). If frostbite has occurred, do not rub the affected areas or flush them with water, but thaw frosted parts by soaking in water in order to prevent further tissue damage, do not attempt to remove frozen clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water.

Inhalation: Evacuate the victim to fresh air at once. If the victim is not breathing, perform mouth-to-mouth resuscitation. Administer oxygen if available. Keep the victim warm and at rest. Seek medical attention as soon as possible.

Ingestion: Since the product is a gas and that it is mostly probable that it will be inhaled more than ingested, please consider to look first at the preventive measures in case of inhalation.

Note to Physician: Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Monitor blood gases to assure adequate ventilation. If vital signs become abnormal or symptoms develop obtain a chest x-ray.

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Section 5. Fire-fighting Measures

Flammability	Class I - flammable gas (NFPA).	Flammable Limits	LOWER: 2.4%, UPPER: 9.5%, (B149.2M95).
Flash Points	CLOSED CUP: -104.4°C (-156°F) (NFPA).	Auto-Ignition Temperature	493 - 549°C (920 - 1020°F). (B149.2M95).
Fire Hazards in Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition.	Explosion Hazards in Presence of Various Substances	Can react vigorously with oxidizing materials. Severe explosion hazard when exposed to chlorine dioxide. Vapour explosion hazard indoors, outdoors or in sewers. Do not cut, weld, heat, drill or pressurize empty container.
Products of Combustion	Burns with a luminous, smoky flame. Carbon oxides (CO, CO_2), smoke and irritating fumes as products of incomplete combustion.		
Fire Fighting Media and Instructions	CAUTION This product has a low flash point. Use of water spray when fire may be inefficient. Cool containing vessels with water spray, do not use jet spray, in an effort to prevent pressure build up, auto ignition, or explosion. Small fire use dry chemical, CO_2, water spray or foam. Large fire, use water spray, fog, or foam. If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 Mile) in all directions, also consider initial evacuation for 1600 meters (1 Mile) in all directions. Allow gas to burn if it cannot be shut off safely. If this is impossible, withdraw from area & let fire burn under controlled conditions. Withdraw immediately in case of rising sound from venting safety relief valve. For small outdoor fires, portable fire extinguishers may be used and Self Contained Breathing Apparatus may not be required. For all indoor fires, and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel. Handle damaged cylinders with extreme care.		

Section 6. Accidental Release Measures

Material Release or Spill	NAERG'96, GUIDE 115, Flammable Gas. ELIMINATE ALL IGNITION SOURCES. Ventilate closed spaces. Avoid contact. Stop leak if without risk. By forced ventilation, maintain concentration of gas below the range of explosive mixture. Remove the tank or cylinder to an open area. Leave to bleed off in the atmosphere. Use water spray to reduce vapours. Isolate area until gas has disappeared. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Section 7. Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Empty container may contain flammable/explosive residues or vapours. DO NOT reuse empty containers without commercial cleaning or reconditioning. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Keep away from incompatibles such as oxidizing agents (peroxides, chlorine). Avoid inhalation of vapours and skin or eye contact with liquid. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods SPECIAL PRECAUTIONS: Sludges and tank scale from propane storage tanks, trucks, rail cars, and filters/screens may contain naturally occuring radioactive material ("NORM") in the form of lead, 210. Similarly, equipment used for the transfer of propane such as product pipelines, pumps and compressors, may have detectable levels of radioactive lead 210 on inner surfaces. Workers involved in cleaning, repair or other maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities. Suitable codes of practice should be developed for these activities, detailing appropriate occupational hygiene and disposal practices.
Storage	Transport and store cylinders and tanks secured in an upright position in a ventilated space. Cylinders that are not in use must have the valves in closed position and be equipped with a protective cap or collar. Do not store with oxidizing agents, oxygen or chlorine cylinders. Transport, handle and store according to applicable Federal and Provincial regulations (i.e. CAN/CGA B149.2 Propane Installation Code and TDG regulations.)

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal outdoor application, special ventilation is not necessary. For indoor or confined spaces, provide explosion-proof local exhaust ventilation (as per the CAN/CGA B149.2 Propane Installation Code), adequate oxygen (at least 18% by volume), and flame-proof electrical switches and lighting system. Make-up air should always be supplied to balance air removed by exhaust ventilation.
Personal Protection	
Eyes	Face shield, safety glasses or chemical splash goggles in case of splashing.
Body	Wear appropriate loose clothing with closed neck and long sleeves to prevent the skin from becoming frozen from contact with the liquid or from contact with vessels containing the liquid.
Respiratory	When exposure is likely to exceed recommended exposure limit (see section #2), use NIOSH approved respirator. Respirator should be selected based on the form and concentration of containment in air (refer to NIOSH Pocket Guide for Chemical Hazard for respirator selection). In order to determine the concentration of the containment, air sampling is recommended and should be performed by a health and safety specialist (as per the NIOSH Manual of analytical methods for method of measurement). If air sampling is not practical and concentration is unknown, use SCBA.
Hands	Wear insulated gloves to prevent frostbite.
Feet	Safety boots or shoes.

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