MATERIAL SAFETY DATA SHEET

PROPANE HD-5

MSDS NO. APPC 719
REV. DATE: 09/17/91

NORTHWEST PROPANE SALES, INC.
PO BOX 652
LYNDEN, WA 98264

354-4471

IMPORTANT:
READ THIS MSDS BEFORE HANDLING AND DISPOSING OF THIS PRODUCT AND PASS THIS INFORMATION ON TO EMPLOYEES, CUSTOMERS, AND USERS OF THIS PRODUCT.

THIS PRODUCT IS CONSIDERED A HAZARDOUS SUBSTANCE UNDER THE OSHA HAZARD COMMUNICATION RULE

------I. GENERAL ------

TRADE NAME: PROPANE HD-5

OTHER NAMES: LIQUEFIED, LOW SULFUR, PROPANE,
LIQUEFIED PETROLEUM GAS OR LP-GAS OR L.P.G.
DIMETHYLMETHANE

GENERIC NAME: ALKANE HYDROCARBON

CHEMICAL FAMILY: PARAFFIN HYDROCARBONS

CAS NUMBER: 00000074-98-6

COMPANY ID NUMBER: 3677236772

DOT PROPER SHIPPING NAME: PROPANE

UN/NA NUMBER: UN 1978

DOT HAZARD CLASS: 2.1

------II. SUMMARY OF HAZARDS ------

DANGER:

EXTREMELY FLAMMABLE!
OSHA/NFPA CLASS-IA FLAMMABLE GAS.
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.

VAPOR REDUCES OXYGEN AVAILABLE FOR BREATHING!
USE ONLY WITH ADEQUATE VENTILATION. ODOR IS AN INADEQUATE WARNING OF POTENTIALLY HAZARDOUS AIR CONCENTRATIONS.

CHEMICAL BURNS MAY RESULT FROM CONTACT WITH LIQUID. A SIMPLE ASPHYXIANT AND A CENTRAL NERVOUS SYSTEM DEPRESSANT.

MAY SENSITIZE THE HEART TO SYMPATHOMIMETICS LIKE EPINEPHRINE RESULTING IN IRREGULAR HEART BEATS.

------III. FIRE AND EXPLOSION ------

FLASH POINT METHOD = (EST.) AP -160 DEG. F; SEE FIRE AND EXPLOSION HAZARDS.

AUTOIGNITION TEMP. METHOD = (EST.) AP 840 DEG. F BASED UPON "PROPANE"

FLAMMABLE LIMITS (% VOLUME IN AIR):

AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE LOWER: AP 2.1
UPPER: AP 9.5
BASED ON "PROPANE"

FIRE AND EXPLOSION HAZARDS:
THIS GAS RELEASES FLAMMABLE VAPORS AT WELL BELOW AMBIENT TEMPERATURES AND READILY FORMS FLAMMABLE MIXTURES WITH AIR. EXPOSED TO AN IGNITION SOURCE, IT WILL BURN IN THE OPEN OR BE EXPLOSIVE IN CONFINED SPACES. ITS VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL LONG DISTANCES TO A POINT OF IGNITION, AND THEN FLASH BACK. ALKANE/CHLORINE GAS MIXTURES HAVE PRODUCED EXPLOSIONS.

EXTINGUISHING MEDIA:
DRY CHEMICAL, CO2, HALOGENATED EXTINGUISHING AGENT

SPECIAL FIREFIGHTING PROCEDURES:
GAS FIRES SHOULD NOT BE EXTINGUISHED UNLESS THE GAS FLOW CAN BE STOPPED IMMEDIATELY. SHUT OFF GAS SOURCE AND ALLOW THE FIRE TO BURN ITSELF OUT. IF THE SOURCE CANNOT BE SHUT OFF IMMEDIATELY, ALL EQUIPMENT AND SURFACES EXPOSED TO THE FIRE SHOULD BE COOLED WITH WATER TO PREVENT OVER-HEATING. FLASH-BACKS, OR EXPLOSIONS. CONTROL FIRE UNTIL GAS SUPPLY CAN BE SHUT OFF. FIREMEN MUST USE PROPER PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY APPARATUS TO PROTECT AGAINST HAZARDOUS COMBUSTION PRODUCTS/OXYGEN DEFICIENCIES.

------IV. HEALTH HAZARDS ------

SUMMARY OF ACUTE HAZARDS:
MAY PRODUCE DIZZINESS, DISORIENTATION, CENTRAL NERVOUS SYSTEM (CNS) DEPRESSION OR ASPHYXIATION. LIQUID OR VAPOR MAY CAUSE CHEMICAL BURNS OR IRRITATION.

ROUTE OF EXPOSURE:

INHALATION: - PRIMARY ROUTE.
EXCESSIVE EXPOSURE TO THIS MATERIAL MAY CAUSE RESPIRATORY TRACT IRRITATION, CNS DEPRESSION WITH SYMPTOMS OF HEADACHE, DIZZINESS, NAUSEA, STUPOR, CONVULSIONS, LOSS OF CONSCIOUSNESS, OR DEATH.

EYE CONTACT:
DIRECT CONTACT WITH LIQUID, PRESSURIZED GAS OR FROST PARTICLES MAY PRODUCE SEVERE AND POSSIBLE PERMANENT EYE DAMAGE.

SKIN ABSORPTION:
NO SIGNIFICANT SYSTEMIC EFFECTS ARE EXPECTED UNDER NORMAL USE CONDITIONS. BUT, SOME COMPONENTS OF THIS MIXTURE ARE CAPABLE OF PENETRATING THE SKIN.

SKIN IRRITATION:
CONTACT WITH LIQUID OR LOW TEMPERATURE VAPORS MAY CAUSE FREEZE BURNS OR IRRITATION.

INGESTION:
DRINKING OF THIS MATERIAL WOULD CAUSE SEVERE GASTROINTESTINAL EFFECTS.

SUMMARY OF CHRONIC HAZARDS AND SPECIAL HEALTH EFFECTS:
SEE ACUTE HAZARDS. PERSONNEL WITH PRE-EXISTING CHRONIC RESPIRATORY DISEASES SHOULD AVOID EXPOSURE TO THIS MATERIAL

------V. PROTECTIVE EQUIPMENT/CONTROL MEASURES ------

RESPIRATORY PROTECTION:
AN APPROVED SUPPLIED-AIR RESPIRATOR OR SELF-CONTAINED BREATHING APPARATUS (SCBA) MUST BE USED WHEN VAPOR CONCENTRATIONS EXCEED THE EXPOSURE LIMITS SHOWN IN SECTION VI. RESPIRATOR USE SHOULD COMPLY WITH OSHA STANDARDS.

EYE PROTECTION:
USE CHEMICAL-TYPE GOGGLES AND FACE SHIELD WHEN HANDLING LIQUIFIED GASES. SAFETY GLASSES AND/OR A FACE SHIELD ARE RECOMMENDED WHEN HANDLING HIGH-PRESSURE CYLINDERS AND PIPING SYSTEMS AND WHENEVER VAPORS ARE DISCHARGED.

SKIN PROTECTION:
AVOID ALL SKIN CONTACT, WEAR OIL IMPERVIOUS (EG; NITRILE) CLOTHING AND GLOVES. IF SKIN CONTACT OCCURS, IMMEDIATELY USE WATERLESS HAND CLEANER, DRY WIPE, THEN FLUSH AREA WITH SOAP AND WATER.

ENGINEERING CONTROLS:
LOCAL EXHAUST AND GENERAL ROOM VENTILATION MAY BOTH BE ESSENTIAL IN WORK AREAS TO PREVENT ACCUMULATION OF EXPLOSIVE MIXTURES. IF MECHANICAL VENTILATION IS USED, ELECTRICAL EQUIPMENT MUST MEET N.E.C. REQUIREMENTS.

OTHER HYGIENIC PRACTICES:
EMERGENCY EYE WASH FOUNTAINS AND SAFETY SHOWERS FOR FIRST AID TREATMENT OF POTENTIAL FREEZE BURNS SHOULD BE AVAILABLE IN THE VICINITY OF WHERE THERE MAY BE A POSSIBILITY OF A COMPRESSED GAS RELEASE. (SEE SECTIONS IV, AND VII.)

OTHER WORK PRACTICES:
PERSONNEL SHOULD NOT ENTER AREAS WHERE THE ATMOSPHERE IS BELOW 19.5 VOL. % OXYGEN WITHOUT SPECIAL PROCEDURES/EQUIPMENT. RESPIRATOR USE SHOULD COMPLY WITH OSHA 29 CFR 1910.134 OR EQUIVALENT. (SEE SECTION XI. -GENERAL COMMENTS)

------VI. OCCUPATIONAL EXPOSURE LIMITS ------

SUBSTANCE	SOURCE	DATE	TYPE	VALUE/UNITS	TIME
PROPANE	OSHA	1989	PEL	1000PPM	8 HRS
LIQUIFIED PETROLEUM GAS (L.P.G.)	ACGIH	1990	TWA	1000PPM	8 HRS
	OSHA	1989	PEL	1000PPM	8 HRS
BUTANE	ACGIH	1989	TWA	1000PPM	8 HRS
	OSHA	1990	PEL	800PPM	8 HRS

------VII. EMERGENCY AND FIRST AID ------

INHALATION:
IMMEDIATELY MOVE PERSONNEL TO AREA OF FRESH AIR. FOR RESPIRATORY DISTRESS, GIVE AIR, OXYGEN OR ADMINISTER CPR (CARDIOPULMONARY RESUSCITATION), IF NECESSARY. OBTAIN MEDICAL ATTENTION IF BREATHING DIFFICULTIES CONTINUE.

EYE CONTACT:
RINSE EYE WITH WATER. REMOVE CONTACT LENSES. IRRIGATE GENTLY WITH TEPID WATER FOR 10-15 MINUTES. SEEK MEDICAL ATTENTION.

SKIN CONTACT:
FROZEN TISSUES SHOULD BE FLOODED OR SOAKED WITH WARM WATER (105 - 115 F.).

DO NOT USE HOT WATER!

CRYOGENIC BURNS WHICH RESULT IN BLISTERING OR DEEPER TISSUE FREEZING SHOULD BE

PROMPTLY SEEN BY A PHYSICIAN.

INGESTION:
DO NOT INDUCE VOMITING. DRINK WATER/MILK ONLY IF CONSCIOUS. SEEK MEDICAL ATTENTION.

EMERGENCY MEDICAL TREATMENT PROCEDURES:
SEE ABOVE PROCEDURES.

------VIII. SPILL AND DISPOSAL ------

PRECAUTIONS IF MATERIAL IS SPILLED OR RELEASED:
ELIMINATE ALL POTENTIAL SOURCES OF IGNITION. EVACUATE ALL NON-ESSENTIAL PERSONNEL TO AN AREA UPWIND. (AT LEAST 1/2 MILE IN ALL DIRECTIONS IF TANKS OR TANK CARS ARE INVOLVED IN FIRE.) STOP SOURCE OF RELEASE WITH NON-SPARKING TOOLS BEFORE PUTTING OUT ANY FIRE. VENTILATE ENCLOSED AREAS TO PREVENT FORMATION OF FLAMMABLE OR OXYGEN-DEFICIENT ATMOSPHERES. WATER SPRAY MAY BE USED TO REDUCE VAPORS. CLOSED SYSTEMS FORM WHITE FROST AT THE POINT OF LEAK. LIQUID SPILLS WILL VAPORIZE FORMING COLD, DENSE VAPOR CLOUDS THAT DO NOT READILY DISPERSE. AVOID VAPOR CLOUD, EVEN WITH PROPER RESPIRATORY EQUIPMENT.

WASTE DISPOSAL METHODS:
RELEASES ARE EXPECTED TO CAUSE ONLY LOCALIZED NON-PERSISTENT ENVIRONMENTAL DAMAGE. WASTE MIXTURES CONTAINING THESE GASES SHOULD NOT BE ALLOWED TO ENTER DRAINS OR SEWERS WHERE THERE IS DANGER OF THEIR VAPORS BELONGING IGNITED. WHEN IT BECOMES NECESSARY TO DISPOSE OF THESE GASES, IT IS PREFERABLE TO DO SO AS A VAPOR. UNUSED PRODUCT MAY BE USED AS AN AUXILIARY FUEL OR DISPOSED OF BY BURNING IN A PROPERLY DESIGNED FLARE OR INCINERATOR. VENTING OF GAS TO THE ATMOSPHERE SHOULD BE AVOIDED. DEFECTIVE, EMPTY, OR PARTIALLY USED PORTABLE CONTAINERS SHOULD BE RETURNED TO THE SUPPLIER WITH APPROPRIATE TAGS.

------IX. COMPONENTS ------

(THIS MAY NOT BE A COMPLETE LIST OF COMPONENTS)

COMPONENT NAME	CAS NUMBER	CARCINOGEN(1)	%COMPOSITION BY VOLUME(2)
PROPANE	74-98-6	N/AP	GT 92
PROPYLENE	115-07-1	N/AP	LT 5
ISO-BUTANE	75-28-5	N/AP	LT 2.5

(1)=LISTED BY: 1 = NTP
2 = IARC
3 = OSHA
4 = OTHER

(2)=SEE QUALIFICATION BELOW. COMPOSITIONS GIVEN ARE TYPICAL VALUES, NOT SPECIFICATIONS.

------X. PHYSICAL AND CHEMICAL DATA ------

BOILING POINT: AP -45 DEG. F

PH: N/AP

FREEZING POINT: AP -305 DEG. F

DRY POINT: N/AP

SPECIFIC GRAVITY (H2O=1 AT 39.2 DEG. F): AP .52

VOLATILE CHARACTERISTICS: COMPLETE

VISCOSITY UNITS, TEMP. (METHOD): N/AP

SOLUBILITY IN WATER: MODERATE

VAPOR PRESSURE: AP 190.0 TO 205.0 (PSIA AT 100 F)

STABILITY: STABLE

VAPOR SP. GR. (AIR = 1 AT 60 DEG. - 90 DEG. F): AP 1.5

HAZARDOUS POLYMERIZATION: NOT EXPECTED TO OCCUR

OTHER CHEMICAL REACTIVITY: N/P

OTHER PHYSICAL AND CHEMICAL PROPERTIES:
GROSS HEAT OF COMBUSTION @ 60 F. = 21,650 BTU/LB OR 2,550 BTU/FT3.

APPEARANCE AND ODOR:
COLORLESS LIQUID/INVISIBLE VAPOR; DISTINCTIVE ODOR DUE TO ADDED ETHYL MERCAPTAN.

CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES

MATERIALS TO AVOID:
STRONG ACIDS, ALKALIES, AND OXIDIZERS SUCH AS CHLORINE (GAS OR LIQUID) AND OXYGEN.

HAZARDOUS DECOMPOSITION PRODUCTS:
BURNING OR EXCESSIVE HEATING MAY PRODUCE CARBON MONOXIDE AND OTHER HARMFUL GASES/VAPORS INCLUDING OXIDES AND/OR OTHER COMPOUNDS OF SULFUR.

------XI. ADDITIONAL PRECAUTIONS ------

HANDLING STORAGE AND DECONTAMINATION PROCEDURES:
REFER TO APPLICABLE OSHA AND D.O.T. REGULATIONS CONCERNING STORAGE, HANDLING AND SHIPMENT OF PETROLEUM GASES. IF UPON INITIAL RECEIPT INSPECTION A CYLINDER IS FOUND TO BE IN POOR OPERATING CONDITION, CONTACT THE SUPPLIER. THE MOST COMMON HAZARD IS LEAKAGE DUE TO FAULTY PRESSURE CONTROL REGULATORS. LARGE PRESSURE BUILD-UP CAN RESULT IN EXPLOSIVE DECOMPRESSION AT THE CYLINDER HEAD, CAUSING THE CYLINDER TO ROCKET LIKE A MISSILE. USE PRESSURE-REDUCING REGULATOR WHEN CONNECTING TO LOWER PRESSURE PIPING SYSTEMS. PREVENT ENTRAPMENT OF LIQUID IN CLOSED SYSTEMS. USE CHECK VALVE TO PREVENT BACK-FLOW INTO STORAGE CONTAINER. ALWAYS CHAIN CYLINDERS SECURELY IN AN UPRIGHT POSITION. STORE AND USE GAS CONTAINERS ONLY IN WELL VENTILATED AREAS. STORAGE AREAS SHOULD NOT EXCEED 100 F. AND BE PROTECTED FROM DAMPNESS, SALT, OR CORROSIVE CHEMICALS. OSHA REQUIRES CYLINDER STORAGE BE SEGREGATED FROM OXIDIZERS AND OTHER COMBUSTIBLE MATERIALS BY A DISTANCE OF AT LEAST 20 FEET. CYLINDERS SHOULD NOT BE STORED IN HEAVY TRAFFIC AREAS IN ORDER TO PREVENT KNOCKING OVER OR DAMAGE FROM FALLING OBJECTS. AVOID DRAGGING, ROLLING, OR SLIDING CYLINDERS. VALVE CAPS SHOULD REMAIN ON CYLINDERS NOT CONNECTED FOR USE. SEPARATE FULL CONTAINERS FROM EMPTY ONES. EMPTY AND PARTIALLY FILLED CONTAINERS SHOULD BE RETURNED TO THE SUPPLIER.

GENERAL COMMENTS:
FOR EXPLANATION OF SEVERAL OCCUPATIONAL EXPOSURE LIMITS SHOWN IN SECTION VI., REFER TO THE DEFINITION OF "SIMPLE ASPHYXIANT" PRESENTED IN THE ACGIH TLV BOOKLET. RELEASES OF THESE GASES MAY CAUSE ATMOSPHERES, SOME OXYGEN DEFICIENT, WHICH CAN HAVE FLAMMABLE/EXPLOSION POTENTIAL. DO NOT ENTER SUCH AREAS/CONFINED SPACES WITHOUT SPECIAL SAFETY PROCEDURES INCLUDING APPROPRIATE MONITORING FOR OXYGEN DEFICIENCY AND FLAMMABILITY. SOME OF THE INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE

MIXTURE ITSELF.

------XII. REGULATORY INFORMATION ------

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA), TITLE III:
SECTION 311/312 HAZARD CATEGORIES:
IMMEDIATE (ACUTE) HEALTH HAZARD
DELAYED (CHRONIC) HEALTH HAZARD
FIRE HAZARD

SECTION 313:
THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 313 AND 40 CFR 372.
PROPYLENE

TOXIC SUBSTANCES CONTROL ACT (TSCA):
ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA):
NO CHEMICALS IN THIS PRODUCT ARE SUBJECT TO THE REPORTING REQUIREMENTS OF CERCLA.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 - PROPOSITION 65:
BASED ON INFORMATION CURRENTLY AVAILABLE, THIS PRODUCT IS NOT KNOWN TO CONTAIN ANY CHEMICALS CURRENTLY LISTED AS CARCINOGENS OR REPRODUCTIVE TOXINS UNDER CALIFORNIA PROPOSITION 65 AT LEVELS WHICH WOULD BE SUBJECT TO THE PROPOSITION. IF YOU REFORMULATE OR FURTHER PROCESS THIS PRODUCT, YOU SHOULD FURTHER EVALUATE THIS PRODUCT BASED UPON SUCH REFORMULATION OR PROCESSING, AS WELL AS UPON ITS FINAL COMPOSITION AND USE.

------XIII. DISCLAIMERS ------

DISCLAIMER OF LIABILITY:
THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS CORRECTNESS.

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

THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION MAY NOT BE APPLICABLE.

QUALIFICATIONS:
EQ = EQUAL
AP = APPROXIMATELY
N/P = NO APPLICABLE INFORMATION FOUND
LT = LESS THAN
UK = UNKNOWN
N/AP = NOT APPLICABLE
GT = GREATER THAN
TR = TRACE
N/DA = NO DATA AVAILABLE