



Heavy Crude Oil Sweet MSDS

Material Safety Data Sheet

1. Product and Company Identification

Product Name: Heavy Crude Oil Sweet
Synonym: Heavy Crude Oil
Product use: Refinery feedstock
Manufacturer: Pembina NGL Corporation
Address: 3800, 525 – 8th Avenue SW
Calgary, AB, T2P 1G1
Emergency Contact: 1-800-360-4706

2. Hazards Identification

EMERGENCY OVERVIEW

This product is **highly flammable!** Contains benzene, a proven human carcinogen. Vapors are heavier than air and may travel considerable distances to a source of ignition and flash back. Vapors may spread along the ground and may enter sewers, basements and other confined spaces. Refer to North American Emergency Response Guide (NAERG) 128.

POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE

Eye: This product is a moderate eye irritant and chronic exposure may cause reddening of the eye.

Skin: This product is a moderate irritant of the skin and repeated or prolonged contact may defat the skin

Ingestion: If ingested, abdominal cramping, vomiting and diarrhea may occur. Aspiration of liquid into the lungs may cause chemical pneumonia, severe lung damage and respiratory failure.

Inhalation: Potential effects target the Central Nervous System, liver and kidneys. The benzene component is a known human carcinogen that may result in aplastic anemia and leukemia (cancer of the bone marrow).

3. Composition/Information on Ingredients

Ingredient Name	%	CAS No.
Heavy Crude Oil	100	8002-05-9
iso-Butane	1-3	75-28-5
n-Butane	1-3	106-97-8
iso-Pentane	1-4	78-78-4
n-Pentane	1-3	109-66-0
Methylcyclopentane	1-3	96-37-7
n-Hexane	3-8	110-54-3
Cyclohexane	1-3	110-82-7
Methylcyclohexane	1-3	108-87-2
Heptane	5-10	142-82-5
Octane	5-10	111-65-9
Benzene	0.1-2	71-43-2
Toluene	1-3	108-88-3



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Ethylbenzene	0.1-1.5	100-41-4
Xylene	0-3	1330-20-7

Heavy Crude Oil is a commingled stream from multiple petroleum facilities and is a complex mixture consistent with the definition within WHMIS regulation CPR section 2. The listed components are provided as guidance based on the available knowledge of the commingled stream.

4. First Aid Measures

Eyes:	In case of contact with eyes, immediately flush with clean, low-pressure water for at least 20 minutes. Hold eyelids open to ensure adequate flushing. Seek medical attention.
Skin:	Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water (waterless hand cleanser may be used if water is not readily available). Obtain medical attention if irritation or redness develops.
Ingestion:	Do not induce vomiting because of the danger of aspiration of fluid into the lungs. Obtain immediate medical attention.
Inhalation:	Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an area free of inhalation hazards. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES

Flammable Liquid

HAZARDOUS COMBUSTION PRODUCTS

Irritating gases of incomplete combustion such as carbon monoxide and carbon dioxide may be produced.

FIRE AND EXPLOSION HAZARDS

Product vapors are heavier than air and may travel considerable distances to sources of ignition and flash back. Vapors may spread along the ground and may enter sewers, basements and other confined spaces. Will be easily ignited by heat, sparks or flames.

EXTINGUISHING MEDIA

Small Fires: Dry chemical, CO₂, water spray or regular foam.

Large Fires: Water spray, fog or regular foam. Use water spray or fog; do not use straight streams. Move containers from fire area if possible without risk.

FIRE FIGHTING INSTRUCTIONS:

Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Cool containers with large quantities of water until well after the fire has been put out. Do not direct the water stream at the source of the leak. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. Fight fires from maximum distance and for massive fires, use unmanned hose holders or monitor nozzles. If this is not possible, withdraw from the



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area and let the fire burn. Approved self-contained breathing apparatus (SCBA) with full-face piece and full protective firefighting clothing should be worn.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

UNUSUAL FIRE & EXPLOSION HAZARDS

Product floats on water and is capable of creating a fire hazard along path of runoff.

6. Accidental Release Measures

ACTIVATE SITE SPECIFIC EMERGENCY RESPONSE PLAN, IF AVAILABLE.

Small Spills: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Remove all ignition sources. Ventilate the area and attempt to stop the leak if possible without risk. Do not attempt to extinguish a fire unless the leak can be stopped.

Large Spills: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Isolate spill or leak area immediately for at least 300 meters (1000 feet) in all directions. Keep unauthorized personnel away and stay upwind. Many vapors are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep out of low areas. Do not discharge solid water stream pattern into the liquid resulting in splashing. Do not flush down sewer or drainage systems. Protect bodies of water by diking, if possible. Place suitable absorbent materials into closed containers for approved disposal. For large spills, recover liquid and remove contaminated earth.

Evacuation: Fire: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

Caution: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Consideration should be given to environmental clean-up and waste material generation when deciding if the use of large volumes of water is appropriate for non-fire emergency situations. Clean-up crews must be properly trained and must utilize proper protective equipment.

7. Handling and Storage

HANDLING PRECAUTIONS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Handle as a flammable liquid. Keep away from all sources of heat, sparks, open flame or any sources of ignition as well as flammable materials or oxidizers. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Use only with adequate ventilation and avoid breathing vapors. Ground and bond all lines and equipment. Electrical equipment must be approved for classified areas. DO NOT siphon by mouth.

STORAGE PRECAUTIONS

Store in a cool, dry and well ventilated area out of sunlight and away from all sources of ignition. Avoid storage in low, confined locations or near incompatible materials such as

other flammable materials, oxidizers or materials that support combustion. Reference applicable standards for storage of petroleum products.

WORK/HYGIENIC PRACTICES

An emergency eye wash station should be available in the vicinity of any potential splash exposure. Use good personal hygiene practices. Avoid skin exposure and wash hands before eating, drinking, smoking, or using toilet facilities. Do not eat, drink or smoke in areas of use or storage. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer.

8. Exposure Controls / Personal Protection



ENGINEERING CONTROLS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Ensure adequate ventilation to keep vapor and gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Electrical equipment including ventilation systems should be approved for classified areas. Showers and/or eyewash fountains should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids.



PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: Wear chemical goggles or a full-face shield when handling this product.

Skin Protection: Avoid skin contact. Wear appropriate fire retardant and chemical resistant gloves when handling this product.

Respiratory Protection: Ensure your own safety and use the appropriate respiratory protection. An approved organic vapour respirator with face-piece appropriate for concentrations the concentration exceeds the OEL (Occupational Exposure Limit). When assessing the proper type of respiratory protection consider the occupational exposure limits applicable to individual ingredients. Refer to CSA Standard "Selection, Use and Care of Respirators" (Z94.4-11) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.

Exposure Limits

Ingredient Name	CAS No.	Occupational Exposure Limits
Heavy Crude Oil	8002-05-9	Not applicable
n-Butane	75-28-5	ACGIH TLV-TWA =1000ppm
iso-Pentane	78-78-4	ACGIH TLV-TWA =600ppm
n-Pentane	109-66-0	ACGIH TLV-TWA =600ppm
n-Hexane	110-54-3	ACGIH TLV-TWA =50ppm (skin)



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Cyclohexane	110-82-7	ACGIH TLV-TWA =100ppm
Methylcyclohexane	108-87-2	ACGIH TLV-TWA =400ppm
Heptane	142-82-5	ACGIH TLV-TWA =400ppm ACGIH TLV-STEL =500ppm
Octane	111-65-9	ACGIH TLV-TWA =300ppm
Benzene	71-43-2	ACGIH TLV-TWA =0.5ppm (skin) ACGIH TLV-STEL =2.5ppm
Toluene	108-88-3	ACGIH TLV-TWA =20ppm
Ethylbenzene	100-41-4	ACGIH TLV-TWA =20ppm
Xylene	1330-20-7	ACGIH TLV-TWA =100ppm ACGIH TLV-STEL = 150ppm

ACGIH – American Conference of Governmental Industrial Hygienists

TLV – Threshold Limit Value

TWA – Time Weighted Average

STEL – Short Term Exposure Limits

9. Physical and Chemical Properties

Appearance and state:	Black or green liquid
Odour:	Hydrocarbon
Odour Threshold:	Not available
Flash Point:	<-25-26°C (Closed Cup)
Auto Ignition:	260°C (n-Pentane)
Lower Explosive Limit (%):	1.5 (n-Pentane)
Upper Explosive Limit (%):	7.8 (n-Pentane)
Boiling Point:	Not available
Melting Point:	Not available
Vapor Pressure:	2767 kPa @ 37.8°C
Vapor Density (Air = 1):	>1
Viscosity:	Not available
Specific Gravity:	0.92 to 1.0
Solubility (H ₂ O):	Slight
Percent Volatiles:	100%
Evaporation Rate:	Not available

10. Stability and Reactivity

STABILITY

Stable

CONDITIONS TO AVOID (STABILITY)

Material is stable under normal conditions but can rapidly become volatile. Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers, ignition sources and heat.

HAZARDOUS DECOMPOSITION PRODUCTS

Irritating or toxic substances may be emitted upon thermal decomposition.

Decomposition products include carbon dioxide and carbon monoxide.

**HAZARDOUS POLYMERIZATION**

Will not occur

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Chemical Name	CAS No.	LD50	LC50
Iso-Butane	75-28-5	Not available	Not available
n-Butane	106-97-8	Not available	Rat:658 mg/l/4Hrs
iso-Pentane	78-78-4	Not available	Mouse: 14000 ppm
n-Pentane	109-66-0	Mouse (ivn): 446 mg/kg	Rat: 364 gm/m3 (4Hr)
Cyclopentane	287-92-3	Not available	Not available
Methylcyclopentane	96-37-7	Not available	Not available
n-Hexane	110-54-3	Rat (oral): 43.5 mg/kg BW	Mouse inhalation 48000 ppm/4 hr
Cyclohexane	110-82-7	Rat oral 8.0 mL/kg	Not available
Methylcyclohexane	108-87-2	Not available	Not available
Heptane	142-82-5	Mouse, iv 222 mg/kg	Not available
Octane	111-65-9	Not available	Rat inhalation 118 g/cu m/4 hr
Benzene	71-43-2	Rat (oral): 3306mg/kg	Rat ihl: 10,000 ppm 7hr
Toluene	108-88-3	Rat oral 5000 mg/kg	rats 8000 ppm for 4 hr.
Ethylbenzene	100-41-4	Rat oral 3500 mg/kg	Not available
Xylene	1330-20-7	LD50 Rat oral 4.3 g/kg	Not available
1, 2, 4 Trimethylbenzene	25551-13-7	Rat, oral 8970 mg/kg	Not available

POTENTIAL HEALTH EFFECTS

Acute effects: Low concentrations may irritate eyes, skin, respiratory system, central nervous system, and peripheral nervous system. May cause CNS depression, cardiac sensitization, drowsiness, narcosis and asphyxia.

Chronic effects: Potential chronic effects to this product include peripheral neuropathy and blurred vision. Chronic exposure has resulted in aplastic anemia, acute myoblastic leukemia, bone marrow depression, corneal vacuolization erythroleukemia and even death.

Sensitization: Butane is linked with cardiac sensitization.

Mutagenicity: Benzene is a weak mutagen.

Reproductive effects: Spontaneous abortion is possible for women exposed to Toluene during pregnancy. Benzene exposure has been linked to menstrual changes, spontaneous abortion and stillbirth. Xylene is embryotoxic.



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Carcinogenicity: Benzene carcinogenic listings are as follows: Known Carcinogen NTP, Known Human Carcinogen IARC Group 1 proven and Confirmed Human Carcinogen ACGIH A1. Ethylbenzene is classified as a Possible Carcinogen IARC 2B.

Target organs: Central nervous system (CNS), heart, blood forming systems, liver and kidneys, gastrointestinal tract and respiratory system.

12. Ecological Information

If released into soil, this product will absorb and may biodegrade in anaerobic conditions. In water, it may become volatile. Photo-oxidation products include phenol, nitrophenols, nitrobenzene, formic acid and peroxyacetyl nitrate.

13. Disposal Considerations

Maximize product recovery for reuse or recycling. Contaminated materials may be classified as a hazardous waste due to the low flash point and benzene. Empty containers can have residues that are subject to hazardous waste disposal requirements. Dispose of waste in accordance with all applicable federal, provincial, and/or local regulations.

14. Transport Information

PROPER SHIPPING NAME:	Petroleum distillate, N.O.S.
TDG CLASS:	3
TDG IDENTIFICATION NUMBER:	UN1267
TDG SHIPPING LABEL:	Flammable liquid
PACKING GROUP:	III
NAERG:	Guide 128

15. Regulatory Information

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR.



Class B3 – Flammable Liquid

Class D2A – Materials Causing Serious and Other Toxic Effects

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

All components of this product are listed on the Canadian DSL Inventory.



16. Other Information

Prepared for: Pembina NGL Corporation Health and Safety
Issue Date: April 2, 2012
More Information: (403) 231-7500
Technical Preparation by: Deerfoot Consulting Inc.

Disclaimer of Expressed and Implied Warranties

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