

1. Product and Company Identification

Material name **Sour Crude Oil**
Version # 02
Revision date 01-22-2009
Product use Fuel
Manufacturer/Supplier Noble Energy, Inc.
 100 Glenborough Dr., Suite 100
 Houston, TX 77067 US
 24-hour Contact Phone Number: 1-760-476-3962 (access code is
 333053)

2. Hazards Identification

Emergency overview **DANGER!**

 Very toxic by inhalation. Causes skin, eye and respiratory tract irritation. Aspiration hazard: Harmful or fatal if swallowed. Can enter lungs and cause damage.

 Flammable. Will be easily ignited by heat, spark or flames.

OSHA regulatory status This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects
 Routes of exposure Inhalation. Ingestion. Skin contact. Eye contact.
 Eyes Causes eye irritation. Eye contact may result in corneal injury. Do not get this material in contact with eyes.
 Skin Causes skin irritation. Do not get this material in contact with skin.
 Inhalation Very toxic by inhalation. Irritating to respiratory system. May cause cancer by inhalation. Do not breathe dust/fume/gas/mist/vapors/spray. Vapors may cause drowsiness and dizziness.
 Ingestion Do not ingest. Harmful or fatal if swallowed. Can enter lungs and cause damage. Components of the product may be absorbed into the body by ingestion.
Target organs Blood. Bone. Central nervous system. Eyes. Respiratory system. Skin.
Chronic effects Cancer hazard. Possible risk of harm to the unborn child. Possible risk of impaired fertility. May cause damage to the liver and kidneys. Prolonged skin contact may defat the skin and produce dermatitis. Conjunctiva. May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion, and blurred vision) and/or damage. Cyanosis. Unconsciousness.

Signs and symptoms Irritation of nose and throat. Irritation of eyes and mucous membranes. Unconsciousness. Corneal damage. Narcosis. Cyanosis. Decrease in motor functions. Behavioral changes. Conjunctivitis. Defatting of the skin. Rash. Irritation.

Potential environmental effects Components of this product are hazardous to aquatic life.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Petroleum Distillate	8002-05-9	>95
Benzene	71-43-2	0.5-2
Hydrogen sulfide	7783-06-4	0-3
Hexane	110-54-3	0.9-1.5
Ethylbenzene	100-41-4	0-1

4. First Aid Measures

First aid procedures
 Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention.

Skin contact	Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention if irritation develops or persists.
Inhalation	Move injured person into fresh air and keep person calm under observation. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	Give one or two glasses of water if patient is alert and able to swallow. Seek immediate medical attention. Do not induce vomiting.
Notes to physician	Oxygen, if needed. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General advice	In case of shortness of breath, give oxygen. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Keep victim under observation. Keep victim warm. If exposed or concerned: get medical attention/advice.

5. Fire Fighting Measures

Flammable properties	Containers may explode when heated. Flammable by OSHA criteria. Runoff to sewer may cause fire or explosion hazard.
Extinguishing media	
Suitable extinguishing media	Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Protection of firefighters	
Specific hazards arising from the chemical	Fire may produce irritating, corrosive and/or toxic gases.
Protective equipment and precautions for firefighters	In case of fire and/or explosion do not breathe fumes. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. 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. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
Specific methods	In the event of fire and/or explosion do not breathe fumes. In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Stay upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Ventilate closed spaces before entering. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for containment	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk. Prevent entry into waterways, sewers, basements or confined areas. Dike the spilled material, where this is possible.
Methods for cleaning up	Wipe up with absorbent material (e.g. cloth, fleece). Should not be released into the environment. Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Small Spills: Clean contaminated surface thoroughly. After removal flush contaminated area thoroughly with water. This material and its container must be disposed of as hazardous waste. Never return spills in original containers for re-use.
Other information	Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling	Avoid exposure - obtain special instructions before use. Do not empty into drains. Keep away from sources of ignition - No smoking. Do not smoke. Wear personal protective equipment. May be ignited by open flame. Vapors may form explosive mixtures with air. Avoid contact with skin. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid release to the environment. Do not get this material in contact with eyes. Use only with adequate ventilation. Avoid prolonged exposure. Do not handle or store near an open flame, heat or other sources of ignition. All equipment used when handling the product must be grounded. Wash thoroughly after handling.
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Storage

Avoid exposure - obtain special instructions before use. The pressure in sealed containers can increase under the influence of heat. Do not handle or store near an open flame, heat or other sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in cool place. Keep in a well-ventilated place. Keep container tightly closed. Keep in an area equipped with sprinklers. Keep this material away from food, drink and animal feed. Keep out of the reach of children. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Components

Components	Type	Value
Benzene (71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm
Ethylbenzene (100-41-4)	STEL	125 ppm
	TWA	100 ppm
Hexane (110-54-3)	TWA	50 ppm
Hydrogen sulfide (7783-06-4)	STEL	15 ppm
	TWA	10 ppm

U.S. - OSHA

Components

Components	Type	Value
Benzene (71-43-2)	Ceiling	25 ppm
	STEL	5 ppm
	TWA	10 ppm
Ethylbenzene (100-41-4)	PEL	435 mg/m3
		100 ppm
	STEL	545 mg/m3
	TWA	125 ppm
Hexane (110-54-3)		100 ppm
		435 mg/m3
	PEL	500 ppm
	TWA	1800 mg/m3
Hydrogen sulfide (7783-06-4)		50 ppm
		180 mg/m3
	Ceiling	20 ppm
	STEL	15 ppm
		21 mg/m3
	TWA	14 mg/m3
		10 ppm

Engineering controls

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Provide adequate ventilation and minimize the risk of inhalation of vapors and mists.

Personal protective equipment

Eye / face protection

Wear approved safety goggles.

Skin protection

Apron and long sleeves are recommended.

Respiratory protection

Avoid exposure - obtain special instructions before use. Wear positive pressure self-contained breathing apparatus (SCBA). Avoid breathing dust/fume/gas/mist/vapors/spray. If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: High-efficiency particulate respirator. Seek advice from local supervisor.

General hygiene considerations

When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Do not get this material in contact with eyes. Avoid contact with skin. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

9. Physical & Chemical Properties

Appearance

Liquid.

Color	Greenish-brown
Odor	Rotten-egg like.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	Not available.
Melting point	Not available.
Freezing point	Not available.
Boiling point	50 - 1099.4 °F (10 - 593 °C)
Flash point	< 80 °F (< 26.7 °C)
Evaporation rate	Variable (Ether=1)
Flammability	Not available.
Flammability limits in air, upper, % by volume	10
Flammability limits in air, lower, % by volume	1
Vapor pressure	100 - 800 mmHg @ 68°F (20°C)
Vapor density	Not available.
Specific gravity	0.7 - 1.1 (water=1)
Relative density	Not available.
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Carbon monoxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product

Sour Crude Oil

Components

Ethylbenzene (100-41-4)

Hexane (110-54-3)

Benzene (71-43-2)

Hydrogen sulfide (7783-06-4)

Test Results

Acute Other LD50 Mouse: 29574 mg/kg estimated

Test Results

Acute Dermal LD50 Rabbit: 17800 mg/kg

Acute Oral LD50 Rat: 3500 mg/kg

Acute Other LD50 Mouse: 2272 mg/kg

Acute Dermal LD50 Rabbit: > 2 g/kg

Acute Oral LD50 Rat: 24 g/kg

Acute Inhalation LC50 Mouse: 9980 mg/l

Acute Inhalation LC50 Rat: 10000 mg/l 7 Hours

Acute Oral LD50 Mouse: 4700 mg/kg

Acute Oral LD50 Rat: 3306 mg/kg

Acute Other LD50 Rat: 2890 µg/kg

Acute Inhalation LC50 Monkey: 0.7 mg/l 35 Minutes

Acute Inhalation LC50 Mouse: > 0.024 mg/l 960 Minutes

Components

Hydrogen sulfide (7783-06-4)

Test Results

Acute Inhalation LC50 Rat: > 0.38 mg/l 960 Minutes

Sensitization

Not available.

US ACGIH Threshold Limit Values: Skin designation

Benzene (CAS 71-43-2)

Can be absorbed through the skin.

Hexane (CAS 110-54-3)

Can be absorbed through the skin.

Acute effects

Causes skin, eye and respiratory tract irritation.

Chronic effects

Hazardous by OSHA criteria. Repeated absorption may cause disorder of central nervous system, liver, kidneys and blood. Prolonged exposure may cause chronic effects.

Subchronic effects

Blood disorder may occur after ingestion. Blood disorder may occur after prolonged inhalation. Blood disorder may occur after prolonged skin contact.

Carcinogenicity

Hazardous by OSHA criteria. Cancer hazard.

ACGIH Carcinogens

Benzene (CAS 71-43-2)

Group A1 Confirmed human carcinogen.

Ethylbenzene (CAS 100-41-4)

Group A3 Confirmed animal carcinogen with unknown relevance to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Benzene (CAS 71-43-2)

1 Human carcinogen.

Ethylbenzene (CAS 100-41-4)

2B Possible carcinogen.

Petroleum Distillate (CAS 8002-05-9)

3 Classification not possible from current data.

US NTP Report on Carcinogens: Known carcinogen

Benzene (CAS 71-43-2)

Known carcinogen.

US OSHA Specifically Regulated Substances: Cancer hazard

Benzene (CAS 71-43-2)

Cancer hazard.

Epidemiology

Hazardous by OSHA criteria.

Mutagenicity

Not available.

Neurological effects

Hazardous by OSHA criteria.

Reproductive effects

Avoid exposure to women during early pregnancy.

Teratogenicity

Not available.

Further information

Symptoms may be delayed.

12. Ecological Information**Ecotoxicological data****Components****Test Results**

Ethylbenzene (100-41-4)

EC50 Water flea (Daphnia magna): 1.37 - 4.4 mg/l 48 Hours

LC50 Rainbow trout, donaldson trout (Oncorhynchus mykiss): 4.2 mg/l 96 Hours

Hexane (110-54-3)

LC50 Fathead minnow (Pimephales promelas): 2.101 - 2.981 mg/l 96 Hours

Benzene (71-43-2)

EC50 Water flea (Daphnia magna): 8.76 - 15.6 mg/l 48 Hours

LC50 Rainbow trout, donaldson trout (Oncorhynchus mykiss): 5.3 mg/l 96 Hours

Hydrogen sulfide (7783-06-4)

LC50 Lake whitefish (Coregonus clupeaformis): 0.002 mg/l 96 Hours

Petroleum Distillate (8002-05-9)

LC50 Cutthroat trout (Oncorhynchus clarki): 2.1 - 4.3 mg/l 96 Hours

Ecotoxicity

Components of this product are hazardous to aquatic life.

Persistence and degradability

Not available.

Bioaccumulation / Accumulation

No data available.

Mobility in environmental media

No data available.

13. Disposal Considerations

Waste codes D018: Waste Benzene
D001: Waste Flammable material with a flash point <140 F

US RCRA Hazardous Waste U List: Reference

Benzene (CAS 71-43-2) U019
Hydrogen sulfide (CAS 7783-06-4) U135

Disposal instructions Dispose of this material and its container at hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. Do not dispose of waste into sewer. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.

14. Transport Information

DOT

Basic shipping requirements:

UN number UN1267
Proper shipping name Petroleum crude oil
Hazard class 3
Packing group III
Additional information:
Special provisions 144, B1, IB3, T2, TP1
Packaging exceptions 150
Packaging non bulk 203
Packaging bulk 242
ERG number 128

IATA

Basic shipping requirements:

UN number 1267
Proper shipping name Petroleum crude oil
Hazard class 3
Packing group III

IMDG

Basic shipping requirements:

UN number 1267
Proper shipping name PETROLEUM CRUDE OIL
Hazard class 3
Packing group III



DOT



IATA



IMDG

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

Hydrogen sulfide (CAS 7783-06-4) 100 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

Hydrogen sulfide (CAS 7783-06-4) 500 LBS

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Benzene (CAS 71-43-2) 0.1 %

Ethylbenzene (CAS 100-41-4)	0.1 %
Hexane (CAS 110-54-3)	1.0 %
Petroleum Distillate (CAS 8002-05-9)	0.1 % N590 Substance is not eligible for the de minimis exemption except for the purposes of supplier notification requirements.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Benzene (CAS 71-43-2)	Listed.
Ethylbenzene (CAS 100-41-4)	Listed.
Hexane (CAS 110-54-3)	Listed.
Petroleum Distillate (CAS 8002-05-9)	N590 Listed.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Reportable threshold

Petroleum Distillate (CAS 8002-05-9)	100 LBS N590
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CERCLA (Superfund) reportable quantity (lbs)

Petroleum Distillate: 100
 Benzene: 10
 Hydrogen sulfide: 100
 Hexane: 5000
 Ethylbenzene: 1000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Benzene (CAS 71-43-2)	Listed.
Ethylbenzene (CAS 100-41-4)	Listed.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Benzene (CAS 71-43-2)	Listed: February 27, 1987 Carcinogenic.
Ethylbenzene (CAS 100-41-4)	Listed: June 11, 2004 Carcinogenic.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Benzene (CAS 71-43-2)	Listed: December 26, 1997 Developmental toxin.
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US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

Benzene (CAS 71-43-2)	Listed: December 26, 1997 Male reproductive toxin.
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US - New Jersey Community RTK (EHS Survey): Reportable threshold

Benzene (CAS 71-43-2)	500 LBS
Ethylbenzene (CAS 100-41-4)	500 LBS
Hexane (CAS 110-54-3)	500 LBS
Hydrogen sulfide (CAS 7783-06-4)	500 LBS

Petroleum Distillate (CAS 8002-05-9) 500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Benzene (CAS 71-43-2) Listed.

Ethylbenzene (CAS 100-41-4) Listed.

Hexane (CAS 110-54-3) Listed.

Hydrogen sulfide (CAS 7783-06-4) Listed.

Petroleum Distillate (CAS 8002-05-9) Listed.

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Benzene (CAS 71-43-2) Special hazard.

16. Other Information

Further information

HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings

Health: 3*
Flammability: 3
Physical hazard: 0

NFPA ratings

Health: 3
Flammability: 3
Instability: 0

Disclaimer

The information provided herein is believed to be accurate as of the date of issue, but is offered without guarantee. The information provided may not be complete, as it is not practicable to provide all scientific information in the format of this document. Further, additional information may be necessary under exceptional conditions of use, or because of applicable laws or regulations. Noble Energy, Inc. does not assume any liability arising out of product use even if safety procedures are followed as outlined herein. The user has the responsibility for evaluating the adequacy of the information under the conditions of use and obtaining additional information where uncertainty exists. No express or implied guarantees are made as to the effects of use, the results to be obtained, or the safety and toxicity of the product in any specific application. The user assumes all risks of use of the product. Noble Energy, Inc. expressly disclaims all warranties of every kind including warranties of merchantability and fitness for any particular purpose. Nothing herein is intended to be construed as permission or recommendation for use of the product in any manner which might infringe existing patents.

Communication with Employees and Purchasers: This Material Safety Data Sheet (MSDS) alerts the reader to potential safety and health hazards. It also contains valuable reference material relating to the safe use and handling of the product. Make sure that this information is shared with all employees and purchasers who use or handle the product. It is an important part of the OSHA hazard communication program.

ABBREVIATIONS: TLV - Threshold Limit Value MSDS - Material Safety Data Sheet STEL - Short-term Exposure Limit PEL - Permissible Exposure Limit DOT - Department of Transportation (USA) CAS - Chemical Abstract Service Number ACGIH - American Conference of Government Industrial Hygienists NFPA - National Fire Protection Association (USA) IARC - International Agency for Research on Cancer OSHA - Occupational Safety and Health Administration TSCA - Toxic Substance Control Act The information in the sheet was written based on the best knowledge and experience currently available.

Issue date

01-22-2009

This data sheet contains changes from the previous version in section(s):

Regulatory Information