ConocoPhillips

SAFETY DATA SHEET

SECTION 1 : IDENTIFICATION

Product Name:	**Bakken Crude Oil, Sweet**
SDS Manufacturer Number:	825378
Synonyms:	Crude Oils, Desalted, Sweet, Field Crude, Petroleum Crude, Petroleum Oil, Rock Oil, Separator Crude, Sweet Crude, Crude Oils
Product Use/Restriction:	Refinery Feed
Manufacturer Name:	ConocoPhillips
Address:	600 N. Dairy Ashford Houston, Texas 77079-1175
General Phone Number:	855-244-0762
Health Issues Information:	SDS@conocophillips.com
Emergency Phone Number:	Chemtrec: 800-424-9300 (24 Hours)
Website:	www.conocophillips.com
SDS Creation Date:	May 19, 2014
SDS Revision Date:	May 19, 2014

NFPA

HMIS

Health Hazard	2*
Fire Hazard	3
Reactivity	1
Personal Protection	X

* Chronic Health Effects

SECTION 2 : HAZARD(S) IDENTIFICATION

GHS Pictograms:

Signal Word: Danger.

GHS Class:

Extremely flammable liquid and vapor Category 1.
Aspiration Hazard, Category 1.
Eye Irritant, Category 2.
Specific Target Organ Toxicity, Single Exposure, Category 3.
Specific Target Organ Toxicity, Repeated Exposure, Category 2.
Carcinogen, Category 1B.
Hazardous to the aquatic environment, long-term, chronic, Category 2.

Hazard Statements:

H224 - Extremely flammable liquid and vapor
H304 - May be fatal if swallowed and enters airways.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
cH373 - May cause damage to organs through prolonged or repeated exposure.
H351 - Suspected of causing cancer.
H411 - Toxic to aquatic life with long lasting effects.

<u>Hazards not Otherwise Classified</u>
May contain or release poisonous hydrogen sulfide gas

Precautionary Statements:

Keep away from heat/sparks/open flames/hotsurfaces. — No smoking.
Ground/Bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
In case of fire: Use dry chemical, carbon dioxide to extinguish small fires. Use water for large fires.
Do not breathe dust/fume/gas/mist/vapours/spray.
Wash hands thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep container tightly closed. Store in a well-ventilated place. Keep cool.
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 ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
Contaminated work clothing should not be allowed out of the workplace.
IF SWALLOWED: Immediately call a POISON CENTER/doctor/... Do not induce vomiting.
Get medical advice/attention if you feel unwell.
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.
Collect spillage.
Avoid release to the environment.
Dispose of contents/container in accordance with Local, State, Federal and Provincial regulations.

Emergency Overview:

DANGER! Extremely Flammable. Pulmonary aspiration hazard if swallowed.
Eye and Skin irritant

Route of Exposure: Eyes. Skin. Inhalation. Ingestion.

Potential Health Effects:

Eye: Causes serious eye irritation

Ex. 5522-000010-CRK

Skin:	Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking
Inhalation:	May cause drowsiness and dizziness.
Ingestion:	May be fatal if swallowed and enters airways.
Physical Health Hazard:	This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers. This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.
Signs/Symptoms:	Effects of overexposure may include irritation of the digestive tract, irritation of the respiratory tract, nausea, vomiting, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).
Target Organs:	May cause damage to organs through prolonged or repeated exposure. Laboratory animal studies of crude oil by the dermal and inhalation exposure routes have demonstrated toxicity to the liver, blood, spleen and thymus
Aggravation of Pre-Existing Conditions:	Not expected to be a sensitizer

SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Ingredient Percent	EC Num.
Crude Oil (Petroleum)	8002-05-9	100 by weight	
N-Hexane	110-54-3	<5 by Volume	
Ethyl Benzene	100-41-4	<3 by weight	
Xylenes	1330-20-7	<1 by weight	
Benzene	71-43-2	<1 by weight	
Hydrogen Sulfide	7783-06-4	<0.2 by Volume	
Naphthalene	91-20-3	0 - 0.9 by weight	

Total Sulfur: < 0.5 wt%

Crude oil, natural gas and natural gas condensate can contain minor amounts of sulfur, nitrogen and oxygen containing organic compounds as well as trace amounts of heavy metals like mercury, arsenic, nickel, and vanadium. Composition can vary depending on the source of crude.

SECTION 4 : FIRST AID MEASURES

Eye Contact:	Immediately flush eyes with plenty of water for at least 15 to 20 minutes. Ensure adequate flushing of the eyes by separating the eyelids with fingers. Get immediate medical attention. Remove contacts if present and easy to do.
Skin Contact:	Immediately wash skin with plenty of soap and water for 15 to 20 minutes, while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
Ingestion:	Aspiration hazard. Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.
Note to Physicians:	At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% $NaNO_2$ solution (0.5 gm $NaNO_2$ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias. Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.
Other First Aid:	Before attempting rescue, first responders should be alert to the possible presence of hydrogen sulfide, a poisonous gas with the smell of rotten eggs, and should consider the need for respiratory protection (see Section 8). Remove casualty to fresh air as quickly as possible. Immediately begin artificial respiration if breathing has ceased. Consider whether oxygen administration is needed. Obtain medical advice for further treatment
Most important symptoms and effects	**Acute:** Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue **Delayed:** Dry skin and possible irritation with repeated or prolonged exposure.

SECTION 5 : FIRE FIGHTING MEASURES

Flammable Properties:	Extremely flammable.
Flash Point:	<-20°F (<-29°C)
Flash Point Method:	Manual ASTM D53
Auto Ignition Temperature:	Not determined.
Lower Flammable/Explosive Limit:	Not determined.
Upper Flammable/Explosive Limit:	Not determined.
Fire Fighting Instructions:	Long-duration fires involving crude or residual fuel oil stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11 or API 2021). For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.
Extinguishing Media:	Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.
Protective Equipment:	As in any fire, wear Self-Contained Breathing Apparatus (SCBA), MSHA/NIOSH (approved or equivalent) and full protective gear.
Unusual Fire Hazards:	This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.
Hazardous Combustion Byproducts:	Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Hydrogen sulfide and oxides of nitrogen and sulfur may also be formed. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

NFPA Ratings:

NFPA Health:	2
NFPA Flammability:	3
NFPA Reactivity:	0

SECTION 6 : ACCIDENTAL RELEASE MEASURES

Personnel Precautions:	Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. May contain or release poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H2S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.
Environmental Precautions:	Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).
Methods for containment:	Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. Notify relevant authorities in accordance with all applicable regulations.
Methods for cleanup:	Immediate cleanup of any spill is recommended. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

SECTION 7 : HANDLING and STORAGE

Handling:	Extremely Flammable. May vaporize easily at ambient temperatures. Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. May contain or release dangerous levels of hydrogen sulfide. Do not breathe vapors or mists. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use

good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Storage: This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H2S, and flammability prior to entry. Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.
"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations

Special Handling Procedures: Mercury and other heavy metals may be present in trace quantities in crude oil, raw natural gas, and condensates. Production and processing of these materials can lead to "drop-out" of elemental mercury in enclosed vessels and pipe work, typically at the low point of any process equipment because of its density. Mercury may also occur in other process system deposits such as sludges, sands, scales, waxes, and filter media. Personnel engaged in work with equipment where mercury deposits might occur (confined space entry, sampling, opening drain valves, draining process lines, etc), may be exposed to a mercury hazard (see sections 3 and 8).

Hygiene Practices: Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace.

SECTION 8 : EXPOSURE CONTROLS, PERSONAL PROTECTION - EXPOSURE GUIDELINES

Engineering Controls: Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Good general ventilation should be sufficient to control airborne levels. Where such systems are not effective wear suitable personal protective equipment, which performs satisfactorily and meets OSHA or other recognized standards. Consult with local procedures for selection, training, inspection and maintenance of the personal protective equipment.

Eye/Face Protection: Wear appropriate protective glasses or splash goggles as described by 29 CFR 1910.133, OSHA eye and face protection regulation, or the European standard EN 166.

Skin Protection Description: Wear appropriate protective gloves and other protective apparel to prevent skin contact. Consult manufacturer's data for permeability data.

Hand Protection Description: Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure to hydrogen sulfide (H2S) above exposure limits, a NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used. Under conditions where hydrogen sulfide (H2S) is NOT detected, a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.
A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).
If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene). Workplace monitoring plans should consider the possibility that heavy metals such as mercury may concentrate in processing vessels and equipment presenting the possibility of exposure during various sampling and maintenance operations. Implement appropriate respiratory protection and the use of other protective equipment as dictated by monitoring results (See Sections 2 and 7).

Other Protective: Facilities storing or utilizing this material should be equipped with an eyewash and a deluge shower safety station.

PPE Pictograms:

EXPOSURE GUIDELINES

Crude Oil (Petroleum) :

Guideline User Defined: ConocoPhillips Guidelines
TWA:100 mg/m3 - 8 hr

N-Hexane :

Guideline ACGIH: Skin: Yes.
TLV-TWA: 50 ppm

Guideline OSHA: PEL-TWA: 500 ppm

Ethyl Benzene :

Guideline ACGIH: TLV-TWA: 20 ppm

Guideline OSHA: PEL-TWA: 100 ppm

Xylenes :

Guideline ACGIH: TLV-STEL: 150 ppm
TLV-TWA: 100 ppm

Benzene :

Guideline ACGIH: Skin: Yes.
TLV-STEL: 2.5 ppm
TLV-TWA: 0.5 ppm

Guideline OSHA: PEL-TWA: 1 ppm
PEL-STEL: 5 ppm

Guideline User Defined: ConocoPhillips Guidelines

	TWA: 0.2 mg/m3 (as total of 17 PNA's measured by NIOSH Method 5506)
Hydrogen Sulfide :	
Guideline ACGIH:	TLV-STEL: 5 ppm TLV-TWA: 1 ppm TLV-TWA: 1 ppm TLV-STEL: 5 ppm
Guideline OSHA:	PEL-Ceiling/Peak: 20 ppm PEL-Ceiling/Peak: 50 ppm Peak
Guideline User Defined:	ConocoPhillips Guidelines TWA: 5 ppm 8hr TWA: 2.5 ppm 12hr STEL: 15 ppm
Naphthalene :	
Guideline ACGIH:	Skin: Yes. TLV-STEL: 15 ppm TLV-TWA: 10 ppm
Guideline OSHA:	PEL-TWA: 10 ppm
Note:	Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals. State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

SECTION 9 : PHYSICAL and CHEMICAL PROPERTIES

Physical State:	Liquid.
Color:	Amber to Black
Odor:	Petroleum. Rotten egg / sulfurous
Odor Threshold:	Not determined.
Boiling Point:	70 to 110 °F (21 to 43 °C)
Melting Point:	Not determined.
Density:	5.83-8.58 lbs/gal Bulk
Specific Gravity:	0.7-1.03 @ 60°F (15.6°C) Reference water = 1
Solubility:	Negligible solubility in water.
Vapor Density:	>1 (air = 1)
Vapor Pressure:	8.5-15 psia (Reid VP) @ 100°F (37.8°C)
Percent Volatile:	Not determined.
Evaporation Rate:	Not determined.
pH:	Not applicable.
Viscosity:	Not determined.
Coefficient of Water/Oil Distribution:	Not determined.
Flash Point:	<-20°F (<-29°C)
Flash Point Method:	Manual ASTM D53
Auto Ignition Temperature:	Not determined.
Note:	Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

SECTION 10 : STABILITY and REACTIVITY

Chemical Stability:	Stable under normal ambient and anticipated conditions of use.
Hazardous Polymerization:	Hazardous Polymerization does not occur.
Conditions to Avoid:	Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.
Incompatible Materials:	Avoid contact with strong oxidizing agents and strong reducing agents.
Special Decomposition Products:	Thermal decomposition or combustion may liberate carbon oxides, aldehydes, and other toxic gases or vapors

SECTION 11 : TOXICOLOGICAL INFORMATION

Crude Oil (Petroleum) :	
Eye:	Administration into the eye - Rabbit Standard Draize test : 100 mg [Mild] (RTECS)
Skin:	Administration onto the skin - Rabbit LD50 - Lethal dose, 50 percent kill : >2000 mg/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)
Ingestion:	Oral - Rat LD50 - Lethal dose, 50 percent kill : >4300 mg/kg [Details of toxic effects not reported other than lethal dose value] Oral - Rat LD50 - Lethal dose, 50 percent kill : >5000 mg/kg [Gastrointestinal - Hypermotility, diarrhea] (RTECS)
Carcinogenicity:	May cause cancer Chronic application of crude oil to mouse skin resulted in an increased incidence of skin tumors. IARC concluded in its Crude Oil Monograph that there is limited evidence of

carcinogenicity in animals, and that crude oil is not classifiable as to its carcinogenicity in humans (Group 3). It has not been listed as a carcinogen by NTP or OSHA.

Mutagenicity: Inadequate information available.

Reproductive Toxicity: Inadequate information available. Dermal exposure to crude oil during pregnancy resulted in limited evidence of developmental toxicity in laboratory animals. Decreased fetal weight and increased resorptions were noted at maternally toxic doses. No significant effects on pup growth or other developmental landmarks were observed postnatally.

Other Toxicological Information:

N-Hexane :

Eye: Administration into the eye - Rabbit Standard Draize test : 10 mg [Mild] (RTECS)

Inhalation: Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 48000 ppm/4H [Details of toxic effects not reported other than lethal dose value]
Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 627000 mg/m3/3M [Details of toxic effects not reported other than lethal dose value] (RTECS)

Ingestion: Oral - Rat LD50 - Lethal dose, 50 percent kill : 15840 mg/kg [Details of toxic effects not reported other than lethal dose value]
Oral - Rat LD50 - Lethal dose, 50 percent kill : 29700 mg/kg [Behavioral - Somnolence (general depressed activity) Gastrointestinal - Changes in structure or function of salivary glands Gastrointestinal - Hypermotility, diarrhea] (RTECS)

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Neurological Effects: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Ethyl Benzene :

Eye: Administration into the eye - Rabbit Standard Draize test : 500 mg [Severe] (RTECS)

Skin: Administration onto the skin - Rabbit LD50 - Lethal dose, 50 percent kill : 17800 uL/kg [Details of toxic effects not reported other than lethal dose value]
Administration onto the skin - Rabbit LD50 - Lethal dose, 50 percent kill : >5000 mg/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)

Inhalation: Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 55000 mg/m3/2H [Details of toxic effects not reported other than lethal dose value] (RTECS)
In rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study there was mild damage to the kidney (tubular hyperplasia), liver (eosinophilic foci, hypertrophy, necrosis), lung (alveolar epithelium metaplasia), thyroid (hyperplasia), thyroid (hyperplasia) and pituitary (hyperplasia). In animal models (particularly rats), ethyl benzene affects the auditory function mainly in the cochlear mid-frequency range and ototoxicity was observed after combined exposure to noise and ethyl benzene. There is no evidence of either ethyl benzene-induced hearing losses or ototoxicity with combined exposure to ethyl benzene and noise in workers.

Ingestion: Oral - Rat LD50 - Lethal dose, 50 percent kill : 3500 mg/kg [Liver - Other changes Kidney/Ureter/Bladder - Other changes]
Oral - Rat LD50 - Lethal dose, 50 percent kill : 3500 mg/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC.

Xylenes :

Eye: Administration into the eye - Rabbit Standard Draize test : 87 mg [Mild]
Administration into the eye - Rabbit Standard Draize test : 5 mg/24H [Severe] (RTECS)

Skin: Administration onto the skin - Rabbit LD50 - Lethal dose, 50 percent kill : >1700 mg/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)

Inhalation: Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 5000 ppm/4H [Details of toxic effects not reported other than lethal dose value] (RTECS)

Ingestion: Oral - Rat LD50 - Lethal dose, 50 percent kill : 4300 mg/kg [Liver - Other changes Kidney/Ureter/Bladder - Other changes] (RTECS)

Reproductive Toxicity: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions, but no evidence of teratogenicity.

Other Toxicological Information: Rats exposed to xylenes at 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

Benzene :

Eye: Administration into the eye - Rabbit Standard Draize test : 88 mg [Moderate]
Administration into the eye - Rabbit Standard Draize test : 2 mg/24H [Severe] (RTECS)

Skin: Administration onto the skin - Rabbit LD50 - Lethal dose, 50 percent kill : >9400 uL/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)

Inhalation: Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 10000 ppm/7H [Details of toxic effects not reported other than lethal dose value] (RTECS)

Ingestion: Oral - Rat LD50 - Lethal dose, 50 percent kill : 930 mg/kg [Behavioral - Tremor Behavioral - Convulsions or effect on seizure threshold]
Oral - Rat LD50 - Lethal dose, 50 percent kill : 1 mL/kg [Details of toxic effects not reported other than lethal dose value]
Oral - Rat LD50 - Lethal dose, 50 percent kill : 1800 mg/kg [Details of toxic effects not reported other than lethal dose value]
Oral - Rat LD50 - Lethal dose, 50 percent kill : 6400 mg/kg [Peripheral Nerve and Sensation - Recording from peripheral motor nerve Blood - Changes in other cell count (unspecified) Blood - Changes in leukocyte (WBC) count] (RTECS)

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Mutagenicity:	Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.
Reproductive Toxicity:	Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.
Other Toxicological Information:	Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Hydrogen Sulfide :

Inhalation:	Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 444 ppm [Lungs, Thorax, or Respiration - Other changes Gastrointestinal - Hypermotility, diarrhea Kidney/Ureter/Bladder - Urine volume increased] Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 820 mg/m3/3H [Details of toxic effects not reported other than lethal dose value] Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 700 mg/m3/4H [Details of toxic effects not reported other than lethal dose value] Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 470 mg/m3/6H [Details of toxic effects not reported other than lethal dose value] Inhalation - Rat LC50 - Lethal concentration, 50 percent kill : 444 ppm/4H [Details of toxic effects not reported other than lethal dose value] (RTECS)

Naphthalene :

Skin:	Administration onto the skin - Rat LD50 - Lethal dose, 50 percent kill : >2500 mg/kg [Details of toxic effects not reported other than lethal dose value] Administration onto the skin - Rabbit LD50 - Lethal dose, 50 percent kill : >20 gm/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)
Ingestion:	Oral - Rat LD50 - Lethal dose, 50 percent kill : 490 mg/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)
Carcinogenicity:	Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

SECTION 12 : ECOLOGICAL INFORMATION

Ecotoxicity:	Experimental studies of acute aquatic toxicity show values for crude oil in the range of 2 to over 100 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. Crude oil should be regarded as harmful to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.
Environmental Fate:	Persistence per IOPC Fund definition: Persistent
Bioaccumulation:	Log Kow values measured for the hydrocarbon components of this material range from less than 2 to greater than 6, and therefore would be regarded as having the potential to bioaccumulate.
Biodegradation:	Most crude oils are not regarded as readily biodegradable. Most of the non-volatile constituents are inherently biodegradable; some of the highest molecular weight components are persistent in water.
Mobility In Environmental Media:	Crude oil spreads as a film on the surface of water, facilitating loss of its lighter components by volatilization. In air, the volatile hydrocarbons undergo photodegradation by reaction with hydroxyl radicals with half-lives varying from 0.5 days for n-dodecane to 6.5 days for benzene. The lower molecular weight aromatic hydrocarbons and some polar compounds have low but significant water solubility. Some higher molecular weight compounds are removed by emulsification and these also slowly biodegrade; others adsorb to sediment and sink. A further removal process from water involving the heavier fraction is agglomeration to form tars, some of which sink.

SECTION 13 : DISPOSAL CONSIDERATIONS

Waste Disposal:	Consult with the US EPA Guidelines listed in 40 CFR Part 261.3 for the classifications of hazardous waste prior to disposal. Furthermore, consult with your state and local waste requirements or guidelines, if applicable, to ensure compliance. Arrange disposal in accordance to the EPA and/or state and local guidelines. The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations. This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste. Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.
RCRA Number:	EPA Waste Number(s) • D001 - Ignitability characteristic • D018 - Toxicity characteristic (Benzene)

SECTION 14 : TRANSPORT INFORMATION

DOT Shipping Name:	Petroleum crude oil
DOT UN Number:	UN1267
DOT Hazard Class:	3
DOT Packing Group:	I
IATA Shipping Name:	Petroleum crude oil

IATA UN Number:	UN1267
IATA Hazard Class:	3
IATA Packing Group:	I
IMDG UN NUmber :	UN1267
IMDG Shipping Name :	Petroleum crude oil
IMDG Hazard Class :	3
IMDG Packing Group :	I
Notes :	U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25. If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.

SECTION 15 : REGULATORY INFORMATION

Section 311/312 Hazard Categories:	Acute Health: Yes Chronic Health: Yes Fire Hazard: Yes Pressure Hazard: No Reactive Hazard: No
California PROP 65:	This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): Various Polycyclic Aromatic Hydrocarbons: Skin Cancer Toluene: Developmental Toxicant, Female Reproductive Toxicant
Canada WHMIS:	**WHMIS Hazard Class:** **B2 - Flammable Liquids** **D2A, D2B**
Crude Oil (Petroleum) :	
TSCA Inventory Status:	Listed
Canada DSL:	Listed
N-Hexane :	
TSCA Inventory Status:	Listed
Section 313:	EPCRA - 40 CFR Part 372 - (SARA Title III) Section 313 Listed Chemical.: 1.0% de minimis
Canada DSL:	Listed
Ethyl Benzene :	
TSCA Inventory Status:	Listed
Section 313:	EPCRA - 40 CFR Part 372 - (SARA Title III) Section 313 Listed Chemical.: 0.1% de minimis
California PROP 65:	Listed: cancer.
Canada DSL:	Listed
Xylenes :	
TSCA Inventory Status:	Listed
Section 313:	EPCRA - 40 CFR Part 372 - (SARA Title III) Section 313 Listed Chemical.: 1.0% de minimis
Canada DSL:	Listed
Benzene :	
TSCA Inventory Status:	Listed
Section 313:	EPCRA - 40 CFR Part 372 - (SARA Title III) Section 313 Listed Chemical.: 0.1% de minimis
California PROP 65:	Listed: developmental.
Canada DSL:	Listed
Hydrogen Sulfide :	
TSCA Inventory Status:	Listed
Section 302 EHS:	TPQ 500 lb
Section 304 RQ:	100 lb
Canada DSL:	Listed
Naphthalene :	
TSCA Inventory Status:	Listed
Section 313:	EPCRA - 40 CFR Part 372 - (SARA Title III) Section 313 Listed Chemical.: 0.1% de minimis
California PROP 65:	Listed: cancer.
Canada DSL:	Listed

SECTION 16 : ADDITIONAL INFORMATION

HMIS Health Hazard:	2*
HMIS Fire Hazard:	3
HMIS Reactivity:	1

HMIS Personal Protection:	X
SDS Creation Date:	May 19, 2014
SDS Revision Date:	May 19, 2014
MSDS Author:	Actio Corporation
Guide to Abbreviations:	ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)
Disclaimer:	The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

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