

**Section 1: IDENTIFICATION**

**Product Name:** Produced Water, Sour  
**Synonyms:** Not available.  
**Product Use:** Waste stream.  
**Restrictions on Use:** Not available.  
**Manufacturer/Supplier:** Encana Corporation  
500 Centre Street SE  
Calgary, AB T2P 2S5  
**Phone Number:** (403) 645-2000  
**Emergency Phone:** Canutec: (613) 996-6666 or Cellular \*666  
**Date of Preparation of SDS:** October 3, 2017

**Section 2: HAZARD(S) IDENTIFICATION****GHS INFORMATION**

**Classification:** Acute Toxicity - Inhalation, Category 2

**LABEL ELEMENTS**

**Hazard**

**Pictogram(s):**



**Signal Word:** Danger

**Hazard Statements:** Fatal if inhaled.

**Precautionary Statements**

**Prevention:** Do not breathe mist, vapors, or spray.  
Use only outdoors or in a well-ventilated area.  
Wear respiratory protection.

**Response:** If inhaled: Remove person to fresh air and keep comfortable for breathing.  
Immediately call a poison center or doctor.

**Storage:** Store in a well-ventilated place. Keep container tightly closed.  
Store locked up.

**Disposal:** Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients with Unknown Toxicity:** None.

This material is considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200). This material is considered hazardous by the Hazardous Products Regulations.

**Section 3: COMPOSITION / INFORMATION ON INGREDIENTS**

Hazardous Ingredient(s)	Common name / Synonyms	CAS No.	% wt./wt.
Hydrogen sulfide (H <sub>2</sub> S)	Not available.	7783-06-4	< 0.5
Petroleum	Not available.	8002-05-9	< 0.01

**Section 4: FIRST-AID MEASURES**

<b>Inhalation:</b>	<p>IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR) respectively. Get medical attention immediately.</p> <p><b>Acute and delayed symptoms and effects:</b> Fatal if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. Excessive inhalation may cause headache, dizziness, confusion, loss of appetite and/or loss of consciousness. This product contains Hydrogen sulphide which may accumulate in confined spaces. Inhalation of Hydrogen sulphide may cause loss of sense of smell, major irritation of the respiratory tract, headache, nausea, vomiting, dizziness, and fluid buildup in the lungs (pulmonary edema), which can be fatal. At 300 ppm unconsciousness may occur after 20 minutes. From 300 to 500 ppm, death can occur within 1 to 4 hours of continuous exposure. At 500 ppm the respiratory system is paralyzed, the victim collapses almost instantaneously, and death can occur after exposure of only 30 to 60 minutes. Above 500 ppm Hydrogen sulphide may cause immediate loss of consciousness; death is rapid, and possibly immediate.</p>
<b>Eye Contact:</b>	<p>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor if you feel unwell.</p> <p><b>Acute and delayed symptoms and effects:</b> May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision. Hydrogen sulphide may cause eye irritation at 1-20 ppm and acute conjunctivitis at higher concentrations. Above 50 ppm H<sub>2</sub>S, eye irritation may include symptoms of redness, severe swelling, tearing, sensitivity to light and the appearance of 'Halos' around lights.</p>
<b>Skin Contact:</b>	<p>IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Call a POISON CENTER or doctor if you feel unwell. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.</p> <p><b>Acute and delayed symptoms and effects:</b> Causes skin irritation. Signs/symptoms may include localized redness, swelling, and itching.</p>
<b>Ingestion:</b>	<p>IF SWALLOWED: Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an</p>

unconscious person. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR) respectively. Get medical attention immediately.

**Acute and delayed symptoms and effects:** May be fatal if swallowed and enters airways. May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea. Swallowed liquids can vapourize in the trachea. Aspiration into the lungs is an asphyxiation hazard.

**General Advice:** In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

**Note to Physicians:** Symptoms may not appear immediately. For inhalation of Hydrogen Sulphide, consider oxygen.

### Section 5: FIRE-FIGHTING MEASURES

#### FLAMMABILITY AND EXPLOSION INFORMATION

Not flammable or combustible by OSHA/WHMIS criteria. When heated, this material may evolve toxic and flammable Hydrogen sulphide.

**Sensitivity to Mechanical Impact:** This material is not sensitive to mechanical impact.

**Sensitivity to Static Discharge:** This material is not sensitive to static discharge.

#### MEANS OF EXTINCTION

**Suitable Extinguishing Media:** Small Fire: Dry chemical, CO<sub>2</sub>, water spray or regular foam.

Large Fire: Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.

**Unsuitable Extinguishing Media:** Not available.

**Products of Combustion:** Oxides of sulphur.

**Protection of Firefighters:** Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. Hydrogen sulphide is heavier than air and may collect in low lying areas and confined spaces. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

### Section 6: ACCIDENTAL RELEASE MEASURES

**Emergency Procedures:** Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

**Personal Precautions:** Do not touch or walk through spilled material. Use personal protection recommended in Section 8. Don full-face, positive pressure, self-contained breathing apparatus.

**Environmental Precautions:** Keep out of drains, sewers, ditches, and waterways.

**Methods for Containment:** Stop leak if without risk. Do not flush to sewer or allow to enter waterways.

**Methods for Clean-Up:** Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

**Other Information:** See Section 13 for disposal considerations.

**Section 7: HANDLING AND STORAGE**

**Handling:**

Do not swallow. Do not breathe mist, vapors, or spray. Use only outdoors or in a well-ventilated area. See Section 8 for information on Personal Protective Equipment.

**Storage:**

Limit quantity of material in storage. Restrict access to storage area. Post appropriate warning signs. Keep storage area separate from populated work areas. Consider leak detection and alarm systems, as required. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store away from incompatible materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children. Head spaces in storage containers may contain toxic hydrogen sulphide gas. Structural materials and lighting and ventilation systems should be corrosion resistant.

**Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Exposure Guidelines**

**Component**

Hydrogen sulfide [CAS No. 7783-06-4]

**ACGIH:** 1 ppm (TWA); 5 ppm (STEL); (2009)

**OSHA:** 20 ppm (C); 50 ppm (Peak) (Maximum duration: 10 mins. once only if no other meas. exp. occurs.)  
10 ppm (TWA); 15 ppm (STEL) [Vacated]

Petroleum [CAS No. 8002-05-9]

**ACGIH:** No TLV established.

**OSHA:** 500 ppm (TWA), 2000 mg/m<sup>3</sup> (TWA);  
400 ppm (TWA) [Vacated];

**PEL:** Permissible Exposure Limit

**TLV:** Threshold Limit Value

**TWA:** Time-Weighted Average

**STEL:** Short-Term Exposure Limit

**C:** Ceiling

**Engineering Controls:** Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**



**Eye/Face Protection:** Safety glasses are recommended. Use equipment for eye protection that meets the standards referenced by OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.



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**Hand Protection:** Wear protective gloves. Consult manufacturer specifications for further information.

**Skin and Body Protection:** Wear protective clothing.

**Respiratory Protection:** Wear respiratory protection. If engineering controls and ventilation are not sufficient to control exposure to below regulatory limits then a self-contained breathing apparatus or supplied air breathing apparatus must be used.

**General Hygiene Considerations:** Handle according to established industrial hygiene and safety practices.

**Section 9: PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance:** Clear to dirty liquid.

**Colour:** Colourless to grey.

**Odour:** Rotten eggs. May be odourless (due to high H<sub>2</sub>S concentrations present).

**Odour Threshold:** 0.0047 ppm (Hydrogen sulphide)

**Physical State:** Liquid.

**pH:** 7 to 8

**Melting Point / Freezing Point:** 0 °C (32 °F) (Water)

**Initial Boiling Point:** Not available.

**Boiling Point:** 93 °C (199.4 °F) (Water)

**Flash Point:** > 93 °C (199.4 °F) (Water)

**Evaporation Rate:** Not available.

**Flammability (solid, gas):** Not applicable.

**Lower Flammability Limit:** Not available.

**Upper Flammability Limit:** Not available.

**Vapor Pressure:** Not available.

**Vapor Density:** Not available.

**Relative Density:** Not available.

**Solubilities:** Soluble in water.

**Partition Coefficient: n-Octanol/Water:** Not available.

**Auto-ignition Temperature:** Not available.

**Decomposition Temperature:** Not available.

**Viscosity:** Not available.

**Percent Volatile, wt. %:** Not available.



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VOC content, wt. %: Not available.  
Density: Not available.  
Coefficient of Water/Oil Distribution: Not available.

**Section 10: STABILITY AND REACTIVITY**

Reactivity: Contact with incompatible materials. Sources of ignition. Exposure to heat.  
Chemical Stability: Stable under normal storage conditions.  
Possibility of Hazardous Reactions: None known.  
Conditions to Avoid: Contact with incompatible materials. Sources of ignition. Exposure to heat.  
Incompatible Materials: Bases. Oxidizers.  
Hazardous Decomposition Products: Hazardous sulphur dioxide, and related oxides of sulphur may be generated upon combustion.

**Section 11: TOXICOLOGICAL INFORMATION**

**EFFECTS OF ACUTE EXPOSURE**

**Product Toxicity**

Oral: Not available.  
Dermal: Not available.  
Inhalation: Not available.

**Component Toxicity**

Component	CAS No.	LD <sub>50</sub> oral	LD <sub>50</sub> dermal	LC <sub>50</sub>
Hydrogen sulfide (H <sub>2</sub> S)	7783-06-4	Not available.	Not available.	444 ppm (rat); 4H
Petroleum	8002-05-9	4300 mg/kg (rat)	Not available.	Not available.

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation. Ingestion.

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system. Lungs. Blood. Cardiovascular system. Nervous system.

**Symptoms (including delayed and immediate effects)**

Inhalation: Fatal if inhaled. May cause drowsiness or dizziness. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. Excessive inhalation may cause headache, dizziness, confusion, loss of appetite and/or loss of consciousness. This product contains Hydrogen sulphide which may accumulate in confined spaces. Inhalation of Hydrogen sulphide may cause loss of sense of smell, major irritation of the respiratory tract, headache, nausea, vomiting, dizziness, and fluid buildup in the lungs (pulmonary edema), which can be fatal. At 300 ppm unconsciousness may occur after 20 minutes. From 300 to 500 ppm, death can occur within 1 to 4 hours of continuous exposure. At 500 ppm the respiratory system is paralyzed, the

victim collapses almost instantaneously, and death can occur after exposure of only 30 to 60 minutes. Above 500 ppm Hydrogen sulphide may cause immediate loss of consciousness; death is rapid, and possibly immediate.

**Eye:** May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision. Hydrogen sulphide may cause eye irritation at 1-20 ppm and acute conjunctivitis at higher concentrations. Above 50 ppm H<sub>2</sub>S, eye irritation may include symptoms of redness, severe swelling, tearing, sensitivity to light and the appearance of 'Halos' around lights.

**Skin:** May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

**Ingestion:** May be fatal if swallowed and enters airways. May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea. Swallowed liquids can vapourize in the trachea. Aspiration into the lungs is an asphyxiation hazard.

**Skin Sensitization:** Not available.

**Respiratory Sensitization:** Not available.

**Medical Conditions Aggravated By Exposure:** Not available.

**EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)**

**Target Organs:** Skin. Eyes. Gastrointestinal tract. Respiratory system. Lungs. Blood. Cardiovascular system. Nervous system.

**Chronic Effects:** Prolonged or repeated contact may dry skin and cause irritation. Hydrogen sulphide may reduce lung function; cause neurological effects such as headaches, nausea, depression and personality changes; eye and mucous membrane irritation: damage to cardiovascular system.

**Carcinogenicity:** Product is not classified as a carcinogen. See Component Carcinogenicity table below for information on individual components. Lifetime skin painting studies in animals with whole crude oils and crude oil fractions have produced tumours in animals following prolonged and repeated skin contact.

**Component Carcinogenicity**

Component	ACGIH	IARC	NTP	OSHA	Prop 65
Petroleum	Not listed.	Group 3	Not listed.	OSHA Carcinogen.	Not listed.

**Mutagenicity:** Not available.

**Reproductive Effects:** Not available.

**Developmental Effects**

**Teratogenicity:** Not available.

**Embryotoxicity:** Not available.

**Toxicologically Synergistic Materials:** Not available.

**Section 12: ECOLOGICAL INFORMATION**

**Ecotoxicity:** Not available.  
**Persistence / Degradability:** Not available.  
**Bioaccumulation / Accumulation:** Not available.  
**Mobility in Environment:** Not available.  
**Other Adverse Effects:** Not available.

**Section 13: DISPOSAL CONSIDERATIONS**

**Disposal Instructions:** Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

**Section 14: TRANSPORT INFORMATION**

**U.S. Department of Transportation (DOT)**

**Proper Shipping Name:** UN3494, PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC, 3 (6.1), PG III

**Class:** 3 (6.1)

**UN Number:** UN3494

**Packing Group:** III

**Label Code:**



Danger, Possible Hydrogen Sulfide Inhalation Hazard

**Canada Transportation of Dangerous Goods (TDG)**

**Proper Shipping Name:** UN3494, PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC, 3 (6.1), PG III, Toxic by inhalation

**Class:** 3 (6.1)

**UN Number:** UN3494

**Packing Group:** III

**Label Code:**



Toxic by inhalation

**Section 15: REGULATORY INFORMATION**

**Chemical Inventories**

**US (TSCA)**

The components of this product are in compliance with the chemical notification requirements of TSCA.

**Canada (DSL)**

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.





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**Federal Regulations**

**United States**

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**SARA Title III**

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Hydrogen sulfide	500	100	100	313s	U135	10000

**State Regulations**

**Massachusetts**

US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Component	CAS No.	RTK List
Hydrogen sulfide	7783-06-4	Listed.
Petroleum	8002-05-9	Listed.

**New Jersey**

US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Component	CAS No.	RTK List
Hydrogen sulfide	7783-06-4	SHHS
Petroleum	8002-05-9	SHHS

**Note:** SHHS = Special Health Hazard Substance

**Pennsylvania**

US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Component	CAS No.	RTK List
Hydrogen sulfide	7783-06-4	E
Petroleum	8002-05-9	Listed.

**Note:** E = Environmental Hazard

**California**

**California Prop 65:**



**WARNING** This product can expose you to chemicals including Toluene, Benzene, and Ethylbenzene which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**Section 16: OTHER INFORMATION**

**Disclaimer:** The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his own particular use.

**Date of Preparation of SDS:** October 3, 2017  
**Version:** 1.0  
**GHS SDS Prepared by:** **Deerfoot Consulting Inc.**  
**Phone: (403) 720-3700**