

# MATERIAL SAFETY DATA SHEET

## Section 1. Chemical Product and Company Identification

**Product Name:** ChemTreat P817E  
**Product Use:** Water Clarification/Solids Conditioning Agent  
**Supplier's Name:** ChemTreat, Inc.  
**Emergency Telephone Number:** (800) 424-9300  
**Address (Corporate Headquarters):** 4461 Cox Road  
Glen Allen, VA 23060  
**Telephone Number for Information:** (800) 648-4579  
**Date of MSDS:** September 30, 2009

## Section 2. Hazard(s) Identification



**Signal Word:** WARNING!

**Hazard Statement(s):** May be harmful in contact with skin.  
May be harmful if inhaled.  
May be harmful if swallowed.

**Precautionary Statement(s):** No significant health risks are expected from exposures under normal conditions of use.

## Section 3. Composition/Hazardous Ingredients

Component	CAS Registry #	Wt. %
There are no hazardous ingredients in this product as defined in 29 CFR 1910.1200.	Proprietary	N/A

## Section 4. First Aid Measures

**Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.

**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.

**Skin:** Wash with plenty of soap and water. Call a poison center or doctor/physician if you feel unwell.

**Ingestion:** DO NOT INDUCE VOMITING. Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.

**Notes to Physician:** N/A

**Additional First Aid Remarks:** N/A

## ***Section 5. Fire Fighting Measures***

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**Flammability of the Product:** Not flammable.

**Suitable Extinguishing Media:** Use extinguishing media suitable to surrounding fire.

**Specific Hazards Arising from the Chemical:** None known.

**Protective Equipment:** If product is involved in a fire, wear full protective clothing including a positive-pressure, NIOSH approved, self-contained breathing apparatus.

## ***Section 6. Accidental Release Measures***

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**Personal Precautions:** Use appropriate Personal Protective Equipment (PPE).

**Environmental Precautions:** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.

**Methods for Cleaning up:** Contain and recover liquid when possible. Flush spill area with water spray.

**Other Statements:** None.

## ***Section 7. Handling and Storage***

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**Handling:** Wear appropriate Personal Protection Equipment (PPE) when handling this product. Do not get in eyes, or on skin and clothing. Wash thoroughly after handling. Do not ingest. Avoid breathing vapors, mist or dust. Material is very slippery if spilled.

**Storage:** Store away from incompatible materials (see Section 10). Store at ambient temperatures. Keep container securely closed when not in use. Label precautions also apply to empty container. Recondition or dispose of empty containers in accordance with government regulations. For Industrial use only. Keep from freezing. Do not store below 41°F. Do not store above 86°F.

## Section 8. Exposure Controls/Personal Protection

### Exposure Limits

Component	Source	Exposure Limits
There are no hazardous ingredients in this product as defined in 29 CFR 1910.1200.		N/E

### Carcinogenicity Category

Component	Source	Code	Brief Description
There are no hazardous ingredients in this product as defined in 29 CFR 1910.1200.			N/E

### Engineering Controls:

Use only with adequate ventilation. The use of local ventilation is recommended to control emission near the source.

### Personal Protection

- Eyes:** Wear chemical splash goggles or safety glasses with full-face shield. Maintain eyewash fountain in work area.
- Skin:** Maintain quick-drench facilities in work area. Wear butyl rubber or neoprene gloves. Wash them after each use and replace as necessary. If conditions warrant, wear protective clothing such as boots, aprons, and coveralls to prevent skin contact.
- Respiratory:** If misting occurs, use NIOSH approved organic vapor/acid gas dual cartridge respirator with a dust/mist prefilter in accordance with 29 CFR 1910.134.

## Section 9. Physical and Chemical Properties

<b>Physical State and Appearance:</b>	Liquid Emulsion, White, Opaque
<b>Specific Gravity:</b>	1.0720
<b>pH:</b>	6.0 – 8.0
<b>Freezing Point:</b>	0°F
<b>Flash Point:</b>	N/D
<b>Odor:</b>	Mild
<b>Melting Point:</b>	N/A
<b>Boiling Point:</b>	N/D
<b>Solubility in Water:</b>	Complete
<b>Evaporation Rate:</b>	N/D
<b>Vapor Density:</b>	N/D
<b>Molecular Weight:</b>	N/D
<b>Viscosity:</b>	N/A
<b>Flammable Limits:</b>	N/A
<b>Autoignition Temperature:</b>	N/A
<b>Density:</b>	8.94 lb/ga

Vapor Pressure:  
% VOC

0.002 mmHg, @ 20C  
10

## Section 10. Stability and Reactivity

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**Chemical Stability:** Stable at normal temperatures and pressures.

**Incompatibility with Various Substances:** Strong oxidizers

**Hazardous Decomposition Products:** Oxides of carbon, Oxides of nitrogen

**Possibility of Hazardous Reactions:** None known.

## Section 11. Toxicological Information

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Chemical Name	Exposure	Type of Effect	Concentration	Species
ChemTreat P817E	Oral	LD50	>5000 mg/kg	Rat

**Comments:** None.

## Section 12. Ecological Information

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Species	Duration	Type of Effect	Test Results
Fathead Minnow	96h	LC50	>1000 mg/l
Algae	72h	EC50	>1000 mg/l
Daphnia magna	48h	LC50	15 mg/l
Mysid Shrimp	48h	LC50	6.8 mg/l
Inland Silverside	96h	LC50	320 mg/l

**Comments:** None.

## Section 13. Disposal Considerations

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Dispose of in accordance with local, state and federal regulations.  
Not a RCRA-regulated hazardous waste when disposed in the original product form.

## Section 14. Transport Information

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### DOT Classification

**DOT Name:** COMPOUND, INDUSTRIAL WATER TREATMENT, LIQUID  
**Technical Name:** N/A  
**Hazard Class:** Not D.O.T. Regulated.  
**UN/NA#:** N/A  
**Packing Group:** N/A

## Section 15. Regulatory Information

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### Inventory Status

**United States (TSCA):** All ingredients listed.  
**Canada (DSL/NDSL):** All ingredients listed.

### Federal Regulations

#### SARA Title III Rules

#### Sections 311/312 Hazard Classes

**Fire Hazard:** No  
**Reactive Hazard:** No  
**Release of Pressure:** No  
**Acute Health Hazard:** Yes  
**Chronic Health Hazard:** No

#### Other Sections

Component	Section 313 Toxic Chemical	Section 302 EHS TPQ	CERCLA RQ
There are no hazardous ingredients in this product as defined in 29 CFR 1910.1200.	N/A	N/A	N/A

### State Regulations

**California Proposition 65:** This product contains chemical(s) known to the State of California to cause cancer and/or to cause birth defects or other reproductive harm: residual acrylamide.

### Special Regulations

Component	States
There are no hazardous ingredients in this product as defined in 29 CFR 1910.1200.	None

### International Regulations

#### Canada

**WHMIS Classification:** N/A

**Controlled Product Regulations (CPR):** N/A

## *Section 16. Other Information*

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### HMIS Hazard Rating

**Health:** 1  
**Flammability:** 1  
**Physical Hazard:** 0  
**PPE:** X

**Notes:** The PPE rating depends on circumstances of use. See Section 8 for recommended PPE.  
The Hazardous Material Information System (HMIS) is a voluntary, subjective alpha-numeric symbolic system for recommending hazard risk and personal protection equipment information. It is a subjective rating system based on the evaluator's understanding of the chemical associated risks. The end-user must determine if the code is appropriate for their use.

**NSF:** N/A

**FDA:** N/A

**KOSHER:** This product is certified by the Orthodox Union as kosher pareve.

**FIFRA:** N/A

**Other:** None

## Abbreviations

Abbreviation	Definition
<	Less Than
>	Greater Than
ACGIH	American Conference of Governmental Industrial Hygienists
EHS	Environmental Health and Safety Dept
N/A	Not Applicable
N/D	Not Determined
N/E	Not Established
OSHA	Occupational Health and Safety Dept
PEL	Personal Exposure Limit
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weight Average
UNK	Unknown

Prepared by: Regulatory Affairs Department

## *Disclaimer*

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Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, ChemTreat, Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ChemTreat, Inc. be responsible for damages of any nature whatsoever resulting from the use or reliance upon information. No representation or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature are made hereunder with respect to information or the product to which information refers.

# MATERIAL SAFETY DATA SHEET

## Section 1. Chemical Product and Company Identification

**Product Name:** ChemTreat P891L  
**Product Use:** Water Clarification Agent  
**Manufacturer's Name:** ChemTreat, Inc.  
**Emergency Telephone Number:** (800) 424-9300  
**Address (Corporate Headquarters):** 4461 Cox Road  
Glen Allen, VA 23060  
**Telephone Number for Information:** (800) 648-4579  
**Date of MSDS:** February 2, 2009

## Section 2. Hazard(s) Identification



**Signal Word:** WARNING!

**Hazard Statement(s):** May be harmful in contact with skin.  
May be harmful if inhaled.  
May be harmful if swallowed.

**Precautionary Statement(s):** No significant health risks are expected from exposures under normal conditions of use.

## Section 3. Composition/Hazardous Ingredients

Component	CAS Registry #	Wt. %
Aluminum chlorohydrate	12042-91-0	30-60

## Section 4. First Aid Measures

**Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.

**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.

**Skin:** Wash with plenty of soap and water. Call a poison center or doctor/physician if you feel unwell.

**Ingestion:** DO NOT INDUCE VOMITING. Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.

**Notes to Physician:** N/A

**Additional First Aid Remarks:** N/A

## ***Section 5. Fire Fighting Measures***

---

**Flammability of the Product:** Not flammable.

**Suitable Extinguishing Media:** Use extinguishing media suitable to surrounding fire.

**Specific Hazards Arising from the Chemical:** None known.

**Protective Equipment:** If product is involved in a fire, wear full protective clothing including a positive-pressure, NIOSH approved, self-contained breathing apparatus.

## ***Section 6. Accidental Release Measures***

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**Personal Precautions:** Use appropriate Personal Protective Equipment (PPE).

**Environmental Precautions:** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.

**Methods for Cleaning up:** Contain and recover liquid when possible. Flush spill area with water spray.

**Other Statements:** None.

## ***Section 7. Handling and Storage***

---

**Handling:** Wear appropriate Personal Protection Equipment (PPE) when handling this product. Do not get in eyes, or on skin and clothing. Wash thoroughly after handling. Do not ingest. Avoid breathing vapors, mist or dust.

**Storage:** Store away from incompatible materials (see Section 10). Store at ambient temperatures. Keep container securely closed when not in use. Label precautions also apply to empty container. Recondition or dispose of empty containers in accordance with government regulations. For Industrial use only. Protect from heat and sources of ignition. Store in corrosive resistant container with a resistant liner.

## Section 8. Exposure Controls/Personal Protection

### Exposure Limits

Component	Source	Exposure Limits
Aluminum chlorohydrate		N/E

### Carcinogenicity Category

Component	Source	Code	Brief Description
Aluminum chlorohydrate			N/E

### Engineering Controls:

Use only with adequate ventilation. The use of local ventilation is recommended to control emission near the source.

### Personal Protection

**Eyes:** Wear chemical splash goggles or safety glasses with full-face shield. Maintain eyewash fountain in work area.

**Skin:** Maintain quick-drench facilities in work area. Wear butyl rubber or neoprene gloves. Wash them after each use and replace as necessary. If conditions warrant, wear protective clothing such as boots, aprons, and coveralls to prevent skin contact.

**Respiratory:** If misting occurs, use NIOSH approved organic vapor/acid gas dual cartridge respirator with a dust/mist prefilter in accordance with 29 CFR 1910.134.

## Section 9. Physical and Chemical Properties

<b>Physical State and Appearance:</b>	Liquid, Colorless, Clear
<b>Specific Gravity:</b>	1.3350
<b>pH:</b>	3.7
<b>Freezing Point:</b>	27°F
<b>Flash Point:</b>	N/D
<b>Odor:</b>	Mild
<b>Melting Point:</b>	N/A
<b>Boiling Point:</b>	212°F
<b>Solubility in Water:</b>	Complete
<b>Evaporation Rate:</b>	N/D
<b>Vapor Density:</b>	N/D
<b>Molecular Weight:</b>	N/D
<b>Viscosity:</b>	N/A
<b>Flammable Limits:</b>	N/A
<b>Autoignition Temperature:</b>	N/A
<b>Density:</b>	11.13 lb/ga
<b>Vapor Pressure:</b>	N/D
<b>% VOC</b>	0

## ***Section 10. Stability and Reactivity***

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**Chemical Stability:** Stable at normal temperatures and pressures.

**Incompatibility with Various Substances:** Strong oxidizers, Strong bases

**Hazardous Decomposition Products:** Hydrochloric acid

**Possibility of Hazardous Reactions:** None known.

## ***Section 11. Toxicological Information***

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Chemical Name	Exposure	Type of Effect	Concentration	Species
N/D				

**Comments:** None.

## ***Section 12. Ecological Information***

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Species	Duration	Type of Effect	Test Results
Ceriodaphnia dubia	48h	LC50	>2000 mg/l
Daphnia pulex	48h	LC50	7071 mg/l
Fathead Minnow	96h	LC50	>1000 mg/l
	48h	LC50	3675 mg/l

**Comments:** None.

## ***Section 13. Disposal Considerations***

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Dispose of in accordance with local, state and federal regulations.

## Section 14. Transport Information

---

### DOT Classification

**DOT Name:** COMPOUND, INDUSTRIAL WATER TREATMENT, LIQUID  
**Technical Name:** N/A  
**Hazard Class:** Not D.O.T. Regulated.  
**UN/NA#:** N/A  
**Packing Group:** N/A

## Section 15. Regulatory Information

---

### Inventory Status

**United States (TSCA):** All ingredients listed.  
**Canada (DSL/NDSL):** All ingredients listed.

### Federal Regulations

#### SARA Title III Rules

#### Sections 311/312 Hazard Classes

**Fire Hazard:** No  
**Reactive Hazard:** No  
**Release of Pressure:** No  
**Acute Health Hazard:** Yes  
**Chronic Health Hazard:** No

#### Other Sections

Component	Section 313 Toxic Chemical	Section 302 EHS TPQ	CERCLA RQ
Aluminum chlorohydrate	N/A	N/A	N/A

### State Regulations

**California Proposition 65:** None known.

### Special Regulations

Component	States
Aluminum chlorohydrate	None

## International Regulations

### Canada

**WHMIS Classification:** N/A

**Controlled Product Regulations (CPR):** N/A

## ***Section 16. Other Information***

---

### HMIS Hazard Rating

**Health:** 1  
**Flammability:** 0  
**Physical Hazard:** 0  
**PPE:** X

**Notes:** The PPE rating depends on circumstances of use. See Section 8 for recommended PPE.  
The Hazardous Material Information System (HMIS) is a voluntary, subjective alpha-numeric symbolic system for recommending hazard risk and personal protection equipment information. It is a subjective rating system based on the evaluator's understanding of the chemical associated risks. The end-user must determine if the code is appropriate for their use.

**NSF:** Certified to NSF/ANSI Standard 60  
Maximum use rate for potable water – 250 mg/L  
This product ships as NSF from:  
Ashland, VA  
Eldridge, IA  
Nederland, TX  
Orangeburg, SC  
Canada  
Baltimore, MD  
Bastrop, LA

**FDA:** GRAS – Using the Eligibility for Classification outlined in 21 CFR 170.30, ChemTreat has determined that this product is considered Generally Recognized as Safe (GRAS) and complies with 21 CFR 182.90, "Substance migrating to food from paper and paperboard products."

**KOSHER:** This product has not been evaluated for Kosher approval.

**FIFRA:** N/A

**Other:** None

## Abbreviations

Abbreviation	Definition
<	Less Than
>	Greater Than
ACGIH	American Conference of Governmental Industrial Hygienists
EHS	Environmental Health and Safety Dept
N/A	Not Applicable
N/D	Not Determined
N/E	Not Established
OSHA	Occupational Health and Safety Dept
PEL	Personal Exposure Limit
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weight Average
UNK	Unknown

Prepared by: Regulatory Affairs Department

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## 1. Identification

<b>GHS product identifier:</b> Natural gas condensate	<b>Version #:</b> 01
<b>Synonyms:</b> Drip gasoline	<b>Issue date:</b> 07/31/2013
	<b>Revision date:</b> 07/31/2016
	<b>Supersedes date:</b> Previous to 07/31/2013
<b>CAS #:</b> Mixture	
<b>Recommended use:</b> Hydrocarbon liquids condensed at Encana well sites during production.	
<b>Recommended restrictions:</b> Use in accordance with this SDS.	
<b>Manufacturer:</b> Encana Oil & Gas (USA) Inc. 370 17 <sup>th</sup> Street, Suite 1700 Denver, CO 80202	
<b>Emergency phone #:</b> 866-244-0062 911	<b>Email:</b> SDS@encana.com

## 2. Hazard identification

### GHS classification & label elements

<b>Signal word:</b> <b>Danger</b>			
	Type of Hazard	Category	Hazard Symbol
Physical Hazards	Flammable liquids	2	
Health Hazards	Skin corrosion/irritation	2	
	Acute toxicity, dermal	5	
	Germ cell mutagenicity	1B	
	Carcinogenicity	1B	
	Reproductive toxicity	2	
	Specific target organ toxicity—single exposure, narcotic effects	3	
Aspiration hazard	1		
Environmental Hazards	Hazardous to the aquatic environment, long-term hazard	2	

#### Hazard statement

- Highly flammable liquid and vapor.
- May be fatal if swallowed and enters airways.
- May be harmful in contact with skin.
- Causes skin irritation.

**Precautionary statement**

- May cause drowsiness or dizziness.
- May cause cancer.
- May cause genetic defects.

Prevention:

- Keep away from heat, sparks, open flames, hot surfaces—no smoking.
- Keep container tightly closed.
- Wash hands thoroughly after handling.
- Use personal protective equipment to prevent contact as determined by assessing hazards and likely routes of exposure.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Avoid breathing gas, mist, vapors, or spray.
- Use only outdoors or in a well-ventilated area.

Response:

- If skin irritation occurs, get medical advice/attention.
- Take off contaminated clothing and wash before reuse.
- If exposed or concerned, get medical advice/attention.
- Call a poison center/doctor if you feel unwell.
- If swallowed, immediately call a poison center/doctor.
- Do not induce vomiting.

Storage:

- Store in a well-ventilated place.
- Keep cool.
- Store locked up.

Disposal:

- Dispose of contents/container in accordance with local, regional, national, and international regulations.

Special hazards

- Breathing high vapor concentrations may cause dizziness, light-headedness, headache, nausea, and loss of coordination.
- Continued inhalation may result in unconsciousness.
- Prolonged or repeated contact with skin may cause redness, itching, irritation, eczema/chapping, and oil acne.
- Prolonged and repeated contact with the product may cause skin cancer.
- May cause damage to the liver.
- Components of the product may be absorbed into the body through the skin.
- Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
- Material will float and can be re-ignited on surface of water.

Hazards not otherwise classified:

- None.

### 3. Composition / information on ingredients

Components	Common Synonyms	CAS #	Percent
Decane		124-18-5	<60W
Octane		111-65-9	<50W
n-Hexane		110-54-3	<30W
Heptane		142-82-5	<25W
Nonane		111-84-2	<25W
Pentane		109-66-0	<10W
2-Methylbutane	Isopentane	78-78-4	<10W
Benzene		71-43-2	<2.5W
Toluene		108-88-3	<2W
Isobutane		75-28-5	<1.5W
Xylene		95-47-6	<1.5W
2,2,4-Trimethylpentane	Iso-octane	540-84-1	<1W

**Notes:** V=volume, W=weight. (1) All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are listed as percent by volume.

### 4. First aid measures

#### First aid procedures

#### Inhalation:

- Move to fresh air.
- If breathing is difficult, give oxygen.
- Get medical attention if discomfort develops or persists.

#### Skin contact:

- Immediately remove contaminated clothing.
- Wash with soap and water.
- Continue to rinse for up to 15 minutes.
- For rashes, wounds, or other skin disorders, seek medical attention and bring along this SDS.

#### Eye contact:

- Remove any contact lenses and open eyelids wide apart.
- Immediately flush with plenty of water for up to 15 minutes.
- Get medical attention if irritation develops or persists.

#### Ingestion:

- Immediately rinse mouth and drink plenty of water or milk.
- Keep person under observation.
- Do not induce vomiting.
- If vomiting occurs, keep head low.
- Transport immediately to hospital and take T.

- Never give anything by mouth to an unconscious person.
- Most important symptoms/effects (acute & delayed)**
- Irritation of eyes and mucus membranes.
  - Skin irritation.
  - Dermatitis.
  - Ingestion may cause irritation and malaise.
  - Droplets of the product aspirated into the lungs through ingestion or vomiting may cause serious chemical pneumonia.
- Notes to physician**
- Treat symptomatically.
  - The effects might be delayed.

**General advice** Get medical attention if any discomfort develops.

## 5. Fire-fighting measures

### Flammable properties

- The product is highly flammable.
- Explosive vapor/air mixtures may be formed even at normal room temperatures.
- Material will float and can be re-ignited on surface of water.
- See Sections 9 and 10 for physical/chemical and stability/reactive properties.
- NFPA: Health: 2, Flammability: 3, Instability: 0.

### Extinguishing media

Suitable	Do not use
<ul style="list-style-type: none"> <li>▪ Dry chemical</li> <li>▪ Carbon dioxide (CO<sub>2</sub>)</li> <li>▪ Sand</li> <li>▪ Earth</li> <li>▪ Water spray <i>or</i></li> <li>▪ Regular foam</li> </ul>	<ul style="list-style-type: none"> <li>▪ Water jet, which will spread the fire.</li> <li>▪ Simultaneous use of foam and water on the same surface, as water destroys the foam.</li> </ul>

### Protection of fire-fighters

Specific hazards arising from the chemical	Protective equipment and precautions
<ul style="list-style-type: none"> <li>▪ Thermal decomposition may produce smoke, oxides of carbon, and lower molecular weight organic compounds whose composition have not been characterized.</li> <li>▪ Sulfur oxides (SO<sub>x</sub>).</li> <li>▪ Nitrogen oxides (NO<sub>x</sub>).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fire-fighters must wear full protective clothing and a self-contained breathing apparatus (SCBA) when fighting fire in an enclosed or inadequately ventilated area.</li> </ul>

## Fire-fighting equipment / instructions

- Move containers of the product from the fire area if they are possible to move and 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.

## 6. Accidental release measures

### Personal precautions

- Stay upwind.
- Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area).
- Avoid contact with skin.
- Wear suitable protective clothing, gloves, and eye/face protection.
- For personal protection, see section 8 of this SDS.

### Environmental precautions

- Prevent spreading over a wide area (e.g., by containment or oil barriers).
- Do not contaminate water.
- Contact local authorities in case of spillage to drain / aquatic environment.

### Methods of containment

- Stop the flow of material, if this is without risk.
- Dike the spilled material, where this is possible.
- Absorb with inert absorbent, such as dry clay, sand, or diatomaceous earth; commercial sorbents; or recover using pumps.

### Methods for cleaning up

- Remove sources of ignition.
- Beware of the explosion danger.
- For small spills, absorb spillage with non-combustible, absorbent material.
- For large spills, remove with vacuum trucks or pump to storage/salvage vessels.
- Use a non-combustible material such as vermiculite, sand, or earth, to soak up the product and place into a container for later disposal.
- Wash area with soap and water.
- Ensure that waste and contaminated materials are collected and removed from the work area as soon as possible in a suitably labeled container.

## 7. Handling and storage

### Handling

- Access to work area should be restricted to people handling the product only.
- Should be handled in closed systems, if possible.
- Avoid contact with eyes, skin, and clothing.
- Avoid inhalation of vapors.
- Wear appropriate personal protective equipment.
- Ground container and transfer equipment to eliminate static electric sparks.

- Vapors are heavier than air and may travel along the floor and in the bottom of containers.
- Immediately change contaminated clothes.
- Do not eat, drink, or smoke when using the product.
- Observe good hygiene practices.
- The product is highly flammable. Explosive vapor/air mixtures may form even at normal room temperatures.
- HMIS®: Health: 2, Flammability: 3, Physical hazards: 0.

**Storage and incompatibilities**

- May form explosive mixtures in presence of oxidizing substances (gas, dust, etc.).
- Follow rules for flammable liquids.
- Keep away from heat, sparks, and open flame.
- Keep in a cool, well-ventilated place.
- Keep away from food, drink, and animal feeding stuffs.

## 8. Exposure controls / personal protection

### Occupational exposure limits

Components	Limit Type	OSHA PEL	ACGIH TLV	NIOSH REL
2,2,4-Trimethylpentane (CAS 540-84-1)	TWA	2350 mg/m3	300 ppm	None
Benzene (CAS 71-43-2)*	STEL	1 ppm	2.5 ppm	1 ppm
	TWA	5 ppm	0.5 ppm	0.1 ppm
Heptane (CAS 142-82-5)	STEL	None	500 ppm	440 ppm(C)
	TWA	500 ppm	400 ppm	85 ppm
Isobutane (CAS 75-28-5)	TWA	None	1000 ppm	800 ppm
2-Methylbutane (CAS 78-78-4)	TWA	None	600 ppm	None
n-Hexane (CAS 110-54-3)	STEL	None	375 ppm	None
	TWA	500 ppm	50 ppm	50 ppm
Nonane (CAS 111-84-2)	TWA	None	200 ppm	200 ppm
Octane (CAS 111-65-9)	TWA	500 ppm	300 ppm	75 ppm
Pentane (CAS 109-66-0)	TWA	1000 ppm	600 ppm	120 ppm
Toluene (CAS 108-88-3)*	STEL	300 ppm	None	150 ppm
	TWA	200 ppm	20 ppm	100 ppm
Xylene (CAS 95-47-6)	STEL	None	150 ppm	150 ppm
	TWA	100 ppm	100 ppm	100 ppm

**Notes:** C=ceiling; PEL=permissible exposure limit; ppm=parts per million; REL=recommended exposure limit; TVL=threshold limit value; TWA=time-weighted average.

\* Limits contained in 29 CFR 1910.1000 Z-2 may apply. All values are based on 2012 standards.

- Recommended monitoring** Follow standard monitoring procedures per established OSHA or NIOSH methods.
- Engineering controls**
- In the absence of occupational exposure limits for this product, it is recommended that the above-mentioned limits are followed.
  - Provide adequate ventilation to minimize the risk of inhalation of vapors and oil mist.
  - Provide easy access to water supply and eye wash facilities. Use explosion-proof equipment.
- Personal protective equipment**
- Eye/face protection:
- Wear goggles / face shield.
- Skin protection:
- Risk of contact: anti-static and flame-resistant protective clothing is recommended.
  - Wear protective gloves, such as nitrile or butyl rubber. Frequent glove change is advised.
  - Suitable gloves can be recommended by the glove supplier.
- Respiratory protection:
- An approved respirator must be worn 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).
  - Respirators do not protect against a potentially flammable environment; appropriate precautions must be taken in potentially explosive environments.
  - Industrial hygienists should monitor personal exposure to determine the need for a respirator.
- General hygiene**
- When using, do not eat, drink, or smoke.
  - Wash hands after handling.
  - Launder contaminated clothing before reuse.
  - Private clothes and working clothes should be kept separate.
  - Handle in accordance with good hygiene and safety practice.
  - Observe any medical surveillance requirements.

## 9. Physical and chemical properties

<b>Appearance</b>	Clear liquid
<b>Physical state</b>	Liquid
<b>Form</b>	Liquid
<b>Color</b>	Colorless to dark brown
<b>Odor</b>	Hydrocarbon
<b>Odor threshold</b>	Not available
<b>pH</b>	Not available

<b>Melting point / freezing point</b>	-200 to -75°F (-128.9 to -59.4°C)
<b>Initial boiling point</b>	>95°F (>35°C)
<b>Boiling range</b>	Not available
<b>Flash point</b>	<140 °F (<60.6 °C)
<b>Evaporation rate</b>	Not available
<b>Flammability (solid, gas)</b>	Not available
<b>Flammability limits in air, lower to upper (% by volume)</b>	0.6–8%
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available
<b>Relative density</b>	Not available
<b>Solubility(ies)</b>	Not available
<b>Partition coefficient (n-octanol/water)</b>	Not available
<b>Auto-ignition temperature</b>	Not available
<b>Pour point</b>	Not available
<b>Viscosity</b>	Not available
<b>Oxidizing properties</b>	Not available
<b>Explosive properties</b>	Not available

## 10. Stability and reactivity

<b>Reactivity</b>	The product is non-reactive under normal conditions of use, storage, and transport.
<b>Chemical stability</b>	Stable at normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	<ul style="list-style-type: none"> <li>▪ Heat, sparks, flames, and elevated temperatures</li> <li>▪ Strong acids.</li> <li>▪ Strong oxidizing agents.</li> </ul>
<b>Incompatible materials</b>	Not available.
<b>Hazardous decomposition products</b>	<ul style="list-style-type: none"> <li>▪ Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.</li> </ul>

## 11. Toxicological information

### Toxicological data

Component	Species	Test Results
<b>2,2,4-Trimethylpentane (CAS 540-84-1)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	118 mg/L, 4 Hours
<b>Benzene (CAS 71-43-2)</b>		
Acute <i>Oral</i>		
LD50	Rat	930 mg/kg
<b>Decane (CAS 124-18-5)</b>		
Acute <i>Inhalation</i>		
LC50	Mouse	72.3 mg/L, 2 Hours
<b>Heptane (CAS 142-82-5)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	103 mg/L, 4 Hours
<b>iso-Pentane (CAS 78-78-4)</b>		
Acute <i>Inhalation</i>		
LC50	Mouse	450 mg/L, 2 Hours
<b>Nonane (CAS 111-84-2)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	3,200 mg/L, 4 Hours
<b>Octane (CAS 111-65-9)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	118 mg/L, 4 Hours
<b>Pentane (CAS 109-66-0)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	364 mg/L, 4 Hours
<b>Toluene (CAS 108-88-3)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	8,000 mg/L, 4 Hours
<i>Oral</i>		
LC50	Rat	636 mg/kg
<b>Xylenes (CAS 95-47-6)</b>		
Acute <i>Dermal</i>		

Component	Species	Test Results
LD50	Rabbit	>43 g/kg 14.1 mg/kg
<i>Inhalation</i>		
LC50	Mouse	4,600 mg/L, 6 hours
	Rat	6,350 mg/L, 4 hours
LCL0	Rat	8,000 mg/L, 4 Hours
<i>Oral</i>		
LD50	Mouse	1,590 mg/kg
	Rat	4,300 mg/kg

**Notes:** **g/kg**=gram per kilogram; **LC50**=half maximal lethal concentration; **LD50**=Half maximal lethal dose; **LCL0**=lowest concentration reported to be lethal to an animal; **mg/kg**=milligrams/kilogram; **mg/L**-milligrams per liter.

**Routes of exposure**

- Absorption
- Eye contact
- Inhalation of vapor

**Toxicological effects**

Occupational exposure to the substance or mixture may cause adverse effects.

Acute toxicity:

- Human evidence indicates that this product has very low acute oral, dermal, or inhalation toxicity.
- There may be profound central nervous system depression following prolonged exposure to high levels of vapor.
- Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea, and loss of coordination.
- Continued inhalation may result in unconsciousness.
- Irritant effect on skin; may irritate and cause stomach pain, vomiting, diarrhea, and nausea.

Chronic effects:

- Prolonged or repeated contact with skin may cause redness, itching, irritation, eczema/chapping, and oil acne.
- May cause damage to the liver, kidney, and central nervous system.
- Contains n-hexane, which causes prolonged damage to the peripheral nervous system (e.g., fingers, feet, and arms).

**Skin corrosion/irritation**

Causes skin irritation. Pre-existing skin conditions, including dermatitis, might be aggravated by exposure to this product.

**Serious eye damage / eye irritation**

May cause eye irritation on direct contact.

**Sensitization**

- May cause eczema-like skin disorders (dermatitis).
- May cause photosensitization, evidenced by repeated occurrence of dermatitis or a rash on exposure to sunlight.

**Local effects**

Irritating to eyes and the skin.

**Mutagenicity**

May cause genetic defects.

**Carcinogenicity** May cause cancer.

**Benzene**

Agency	Classification
ACGIH	A1 Confirmed human carcinogen.
IARC	1 Carcinogenic to humans.
US NTP Report on Carcinogens	Known To Be Human Carcinogen.
US OSHA Specifically Regulated Substances (29 CFR 1910.101-1050)	Cancer hazard.

**Toluene and xylenes**

ACGIH	A4 Not classifiable as a human carcinogen.
IARC	3 Not classifiable as to carcinogenicity to humans.

**Reproductive toxicity** Suspected of damaging fertility or the fetus.

- Symptoms**
- Skin irritation.
  - Dermatitis.
  - Irritation of eyes and mucus membranes.
  - Irritation of nose and throat.

**Epidemiology** Pre-existing conditions, including dermatitis, might be aggravated by exposure to this product.

**Absorption hazard** Components of the product may be absorbed into the body through the skin.

## 12. Ecological information

### Ecological data

Components	Dose	Species	Test Results
<b>Benzene (CAS 71-43-2)</b>			
Crustacea	EC50	Water flea ( <i>Daphnia magna</i> )	8.76–15.6 mg/L, 48h
Fish	LC50	Rainbow trout, donaldson trout ( <i>Oncorhynchus mykiss</i> )	5 mg/L, 96h
<b>Decane (CAS 124-18-5)</b>			
Fish	LC50	Sheepshead minnow ( <i>Cyprinodon variegatus</i> )	>500 mg/L, 96h
<b>Heptane (CAS 142-82-5)</b>			
Fish	LC50	Mozambique tilapia ( <i>Tilapia mossambica</i> )	375 mg/L, 96h

**Safety Data Sheet: Natural gas condensate**

Components	Dose	Species	Test Results
<b>n-Hexane (CAS 110-54-3)</b>			
Fish	LC50	Fathead minnow (Pimephales promelas)	2.101–2.981 mg/L, 96h
<b>Pentane (CAS 109-66-0)</b>			
Crustacea	EC50	Daphnia	2.3 mg/L, 48h
Fish	LC50	Fish	3.1 mg/L, 96h
<b>Toluene (CAS 108-88-3)</b>			
Crustacea	EC50	Water flea ( <i>Daphnia magna</i> )	5.46–9.83 mg/L, 48h
Fish	LC50	Coho salmon, silver salmon ( <i>Oncorhynchus kisutch</i> )	5.5 mg/L, 96h
<b>Xylenes (CAS 95-47-6)</b>			
Crustacea	EC50	Water flea ( <i>Daphnia magna</i> )	0.78–2.51 mg/L, 48h
Fish	LC50	Rainbow trout, donaldson trout ( <i>Oncorhynchus mykiss</i> )	5.59–11.6 mg/L, 96h

**Ecotoxicity** Oil spills are generally hazardous to the environment.

**Environmental effects** The product contains volatile organic compounds, which a potential to create photochemical ozone.

**Aquatic toxicity** Toxic to aquatic organisms: may cause long-term adverse effects in the aquatic environment.

**Persistence and degradability** Expected to be inherently biodegradable.

**Bioaccumulative potential** Has the potential to bioaccumulate.

**Partition coefficient (n/octanol/water [ $\log K_{ow}$ ])**

Benzene	2.13
iso-Pentane	2.3
Toluene	2.73
Isobutane	2.76
Xylene	3.12
Pentane	3.39
n-Hexane	3.9
Heptane	4.66
Decane	5.01
2,2,4-Trimethylpentane	5.18
Octane	5.18
Nonane	5.46

**Mobility in soil** This product is a hydrocarbon liquid with volatile compounds and mostly alkane natural gas components. If spilled, this product would mostly volatilize before adsorbing to soil.

The individual components of natural gas condensate have varying degrees of mobility:

- The components that make up the majority of the product have low mobility or are immobile in soil (i.e., decane, octane, and heptane).
- The compounds above the bold line have a low K<sub>oc</sub> value and are considered to have moderate to high mobility in soil.
- The compounds below the bold line have a high K<sub>oc</sub> value and are considered to have low mobility in soil or are immobile.

**Soil Organic Carbon-Water Partitioning Coefficient (K<sub>oc</sub>)**

2,2,4-Trimethylpentane	3.43
Isobutane	35
Benzene	79
Pentane	80
n-Hexane	130
Toluene	37–178
Xylene	39–365
2-Methylbutane (CAS 78-78-4)	520
Heptane	8,200
Octane	16,000
Nonane	28,000
Decane	22,200–42,700

**Water solubility** The product is insoluble in water. It will spread on the water surface while some of the components will eventually dissolve in water.

**Other adverse effects** Toxic to aquatic life with long lasting effects. The product contains volatile organic compounds, which have a potential to create photochemical ozone.

## 13. Disposal considerations

**Disposal methods** This material and its container must be disposed of as hazardous waste.

**Local disposal regulations** Dispose in accordance with all applicable regulations.

**Hazardous waste code** US RCRA Hazardous Waste U List: Reference

- Benzene (CAS 71-43-2): U019
- Toluene (CAS 108-88-3): U220
- Xylene (CAS 95-47-6): U239

**Contaminated packaging** Since emptied cylinders may retain product residue, follow label warnings even after cylinder is emptied.

## 14. Transport information

### DOT

UN number	UN1267
UN proper shipping name	Petroleum crude oil
Transport hazard class(es)	3
Packing group	III
Environmental hazards: Marine pollutant	Yes
Labels required	3
Special provisions	144, 357, IB2, T4, TP1, TP8
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.

### IATA

UN number	UN1267
UN proper shipping name	Petroleum crude oil
Transport hazard class(es)	3
Packaging group	III
Environmental hazards	Yes
Labels required	3
ERG Code	3L
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.

### IMDG

UN number	UN1267
UN proper shipping name	Petroleum Crude Oil
Transport hazard class(es)	3
Packaging group	III
Environmental hazards: Marine pollutant	Yes
Labels required	3
EmS	F-E, S-E

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable. However, this product is a liquid and, if transported in bulk, is covered under MARPOL73/78, Annex I.
General information	This product is covered under the scope of MARPOL Annex I.

## 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. OSHA Specifically Regulated Substances (29 CFR 1910.1001–1050)

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

### CERCLA (Superfund) reportable quantity

Benzene (CAS 71-43-2)	10 lbs
Decane (CAS 124-18-5)	not listed
Heptane (CAS 142-82-5)	not listed
n-Hexane (CAS 110-54-3)	5,000 lbs
Nonane (CAS 111-84-2)	not listed
Octane (CAS 111-65-9)	not listed
Pentane (CAS 109-66-0)	not listed
Toluene (CAS 108-88-3)	1,000 lbs
Xylenes (CAS 95-47-6)	1,000 lbs
2-Methylbutane	not listed
Isobutane	not listed
2,2,4-Trimethylpentane	1,000 lbs

### 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
- SARA 302 Extremely hazardous substance: No
- SARA 311/312 hazardous chemicals: No

## International Inventories

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

Country(s) or region	Inventory name	On inventory (Yes/No)*
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
US & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

**Notes:** \*A Yes indicates this product complies with the inventory requirements administered by the governing country(s).

## 16. Other information, including date of preparation or last version

**Issue date** 07/31/2013

**Revision date:** 07/31/2016

**Version #** 01

**Disclaimer** This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.



# Safety Data Sheet

Natural gas, sweet

## 1. Identification

<b>GHS product identifier:</b> Natural gas, sweet	<b>Version #:</b> 01
<b>Synonyms:</b> Compressed natural gas CNG	<b>Issue date:</b> 07/31/2013
	<b>Revision date:</b> 07/31/2016
	<b>Supersedes date:</b> Previous to 07/31/2013
<b>CAS #:</b> Mixture	
<b>Recommended use:</b> Product produced at Encana well sites or processing facilities for processing or sale.	
<b>Recommended restrictions:</b> Use in accordance with this SDS.	
<b>Manufacturer:</b> Encana Oil & Gas (USA) Inc. 370 17th Street, Suite 1700 Denver, CO 80202	
<b>Emergency phone #:</b> 866-244-0062 911	<b>Email:</b> SDS@encana.com

## 2. Hazard identification

### GHS classification & label elements

<b>Signal word:</b> <b>Danger</b>			
Type of Hazard		Category	Hazard Symbol
Physical Hazards	Flammable gasses Compressed gas	1 NA	
Health Hazards	None	None	None
Environmental Hazards	None	None	None

#### Hazard statement

- Extremely flammable gas.
- Contains gas under pressure; may explode if heated.

**Precautionary statement**

Prevention:

- Keep away from heat, sparks, open flames, and hot surfaces.
- No smoking.

Response:

- Leaking gas fire: do not extinguish unless leak can be stopped safely.
- Eliminate all ignition sources if safe to do so.

Storage:

- Protect from sunlight.
- Storage in a well-ventilated place.

Disposal:

- Dispose of waste and residues in accordance with local authority requirements.

Hazards not otherwise classified:

None.

### 3. Composition / information on ingredients

Components	Common Synonyms	CAS #	Percent (by volume)
Methane		74-82-8	55-95
Ethane		74-84-0	<20
Propane		74-98-6	<10
Butane		106-97-8	<3.5
Isobutane		75-28-5	<2
2-Methylbutane	Isopentane	78-78-4	<1.5
Ethyl mercaptan	Ethanethiol	75-08-1	<0.01

**Notes:** Ethyl mercaptan may be present in the product as an odorant.

### 4. First aid measures

**First aid procedures**

Inhalation:

- Remove victim to fresh air.
- If not breathing, clear airway and start mouth-to-mouth artificial respiration or use a bag-mask respirator.
- Get immediate medical attention.
- If the victim is having trouble breathing, transport to medical care and, if available, give supplemental oxygen.

Skin contact:

- Frostbite: do not remove clothes, but flush with copious amounts of lukewarm water.
- Call an ambulance and continue to flush during transportation to hospital.

Eye contact:

- Frostbite: immediately and briefly flush with lukewarm, gently flowing water.
- Cover both eyes with a sterile dressing.
- Immediately obtain medical attention.

Ingestion:

- This material is a gas at normal atmospheric conditions; ingestion is unlikely.

**Most important symptoms/effects (acute & delayed)**

- Narcosis
- Behavioral changes
- Decrease in motor functions

**Indication of immediate medical attention and special treatment**

- Inhalation overexposure can produce toxic effects.
- Monitor for respiratory distress.
- If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis.
- Administer supplemental oxygen with assisted ventilation, as required.

**Notes to physician**

- This material (or a component) may sensitize the myocardium to the effects of sympathomimetic amines.
- Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material.
- Administration of sympathomimetic drugs should be avoided.

**General information**

Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

## 5. Fire-fighting measures

### Flammable properties

- Extremely flammable gas.
- Contains gas under pressure; may explode if heated or under fire.
- See Sections 9 and 10 for physical/chemical and stability/reactive properties.
- NFPA: Health: 1, Flammability: 4, Instability: 0.

### Extinguishing media

Suitable	Do not use
<ul style="list-style-type: none"> <li>▪ Carbon dioxide</li> </ul>	<ul style="list-style-type: none"> <li>▪ None</li> </ul>

Suitable	Do not use
<ul style="list-style-type: none"> <li>▪ Dry powder <i>or</i></li> <li>▪ Water fog</li> </ul>	

### Protection of fire-fighters

Specific hazards arising from the chemical	Protective equipment and precautions
<ul style="list-style-type: none"> <li>▪ During fire, gases hazardous to health may be formed.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fire-fighters should wear appropriate protective equipment and a self-contained breathing apparatus (SCBA) with full face-piece operated in positive pressure mode if fighting fire in poorly ventilated area.</li> <li>▪ Use approved gas detectors in confined spaces.</li> <li>▪ Gas cylinders and pressure vessels can burst violently when heated, due to excess pressure build-up.</li> </ul>

### Fire-fighting equipment / instructions

- In the event of fire or explosion, do not breathe fumes, evacuate area, and check oxygen content before entering area.
- Remove pressurized gas cylinders from the immediate vicinity.
- Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.
- Stop leak if you can do so without risk.
- Fight fire from a safe distance.
- Water spray should be used to cool gas cylinders and pressure vessels.

## 6. Accidental release measures

#### Personal precautions

- Stay upwind.
- Ventilate closed spaces before entering.
- Eliminate all ignition sources (smoking, flares, sparks, or flames) in area.
- Wear suitable protective clothing, gloves, and eye/face protection (See Section 8 of this SDS).
- Vaporization upon release—rapid expansion possible.

#### Environmental precautions

- Stop leak if possible without any risk.
- Basements and cellars must be evacuated.
- Contact local authorities in case of spillage to drain / aquatic environment.

#### Methods of containment

- Stop leak if possible without risk.
- Prevent entry of natural gas into waterway, sewers, or confined areas.

Methods for cleaning up

- Ventilate well, stop flow of gas if possible.
- Remove ignition sources.
- Do not enter confined spaces, such as sewers, due to explosion risk.

## 7. Handling and storage

Handling

- Avoid contact with eyes, skin, and clothing.
- Avoid breathing gas.
- This material is an asphyxiant and can displace oxygen necessary for breathing.
- Wear appropriate personal protective equipment.
- The product is extremely flammable.
- HMIS®: Health: 1, Flammability: 4, Physical hazards: 0.

Storage and incompatibilities

- May form explosive mixtures in presence of oxidizing substances (e.g., gas and dust).
- Keep in cool, well-ventilated area.
- Avoid heat, sparks, open flames, and other ignition sources.
- Ground container and transfer equipment to eliminate static electric sparks.
- Store away from incompatible materials: oxidizing agents (Section 10).
- Store cylinders of product in accordance with regulatory requirements and recognized best practices.

## 8. Exposure controls / personal protection

### Occupational exposure limits

Components	Limit Type	OSHA PEL	ACGIH TLV	NIOSH REL
Methane (CAS 74-82-8)	TWA	None	1,000 ppm	None
Ethane (CAS 74-84-0)	TWA	None	1,000 ppm	None
Propane (CAS 74-98-6)	TWA	1,000 ppm	1,000 ppm	1,000 ppm
Butane (CAS 106-97-8)	TWA	None	1,000 ppm	800 ppm
Isobutane (CAS 75-28-5)	TWA	None	1000 ppm	800 ppm
2-Methylbutane (CAS 78-78-4)	TWA	None	600 ppm	None
Ethyl mercaptan (CAS 75-08-1)	Ceiling	10 ppm	None	0.5 ppm
	TWA	None	0.5 ppm	None

Notes: PEL=permissible exposure limit; ppm=parts per million; REL=recommended exposure limit; TVL=threshold limit value; TWA=time-weighted average. All values are based on 2012 standards.

**Engineering controls**

- Explosion proof exhaust ventilation should be used.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended occupational exposure limits.
- Provide adequate ventilation and minimize the risk of inhalation of gas.

**Personal protective equipment**

Eye/face protection:

- Risk of contact: wear goggles/face shield.

Skin protection:

- Risk of contact: wear cold insulating gloves.
- Suitable gloves can be recommended by the glove supplier.
- Anti-static and flame-retardant protective clothing is recommended.

Respiratory protection:

- Use appropriate respiratory protection if ventilation is inadequate.
- Industrial hygienists should monitor personal exposure to determine the need for a respirator.

**General hygiene**

- Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, or smoking.
- Routinely wash work clothing and protective equipment to remove contaminants.
- Observe any medical surveillance requirements.

## 9. Physical and chemical properties

Physical state	Gas
Form	Not available
Color	Clear, colorless
Odor	Odorless in raw, unprocessed form. Sales gas may be odorized with ethyl mercaptan to aid in leak detection. Gas with added ethyl mercaptan has the odor of rotten eggs.
Odor threshold	Not available
pH	Not available
Melting point / freezing point	-296.7°F (-182.6 °C)
Initial boiling point	Not available
Boiling range	Not available
Flash point	<238°F (<114.4 °C)
Evaporation rate	Not available
Flammability (solid, gas)	Not applicable
Lower explosive limit (by volume)	2%
Upper explosive limit by volume	15%

Vapor pressure	300–600 psi in pipeline
Vapor density	0.5–0.94
Relative density	Not available
Solubility(ies)	Not available
Partition coefficient (n-octanol/water)	1.09
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Dynamic viscosity temperature	930.2°F (499°C)

## 10. Stability and reactivity

<b>Reactivity</b>	The product is non-reactive under normal conditions of use, storage, and transport.
<b>Chemical stability</b>	Stable under normal temperature conditions. Heat may cause the containers to explode.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Heat, sparks, and flames
<b>Incompatible materials</b>	Strong oxidizing agents
<b>Hazardous decomposition products</b>	<ul style="list-style-type: none"> <li>▪ Carbon dioxide (CO<sub>2</sub>)</li> <li>▪ Carbon monoxide</li> </ul>

## 11. Toxicological information

### Toxicological data

Components	Limit Type	Test Results
<b>Methane (CAS 74-82-8)</b>		
Acute Inhalation LC50	Mouse	326 mg/m <sup>3</sup> , 2 hours
<b>Propane (CAS 74-98-6)</b>		
Acute Inhalation LC50	Rat	>1,442.847 mg/L, 15 minutes

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**Butane (CAS 106-97-8)**

Acute  
*Inhalation*  
LC50

Rat	658 mg/L, 4 hours
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**2-Methylbutane (CAS 78-78-4)**

Acute  
*Inhalation*  
LC50

Mouse	450 mg/L, 2 hours
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**Notes:** LC50=half maximal lethal concentration; mg/L=milligrams per liter;  
mg/m<sup>3</sup>=milligrams per cubic meter.

<b>Routes of exposure</b>	Ingestion:	<ul style="list-style-type: none"><li>This material is a gas under normal atmospheric conditions and ingestion is unlikely.</li></ul>
	Inhalation:	<ul style="list-style-type: none"><li>Suffocation (asphyxiant) hazard—if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.</li></ul>
	Skin contact:	<ul style="list-style-type: none"><li>Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.</li></ul>
	Eye contact:	<ul style="list-style-type: none"><li>Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.</li><li>Permanent eye damage or blindness could result.</li></ul>
	<b>Toxicological effects</b>	<ul style="list-style-type: none"><li>Narcosis.</li><li>Behavioral changes.</li><li>Decrease in motor or central nervous system functions.</li></ul>
	Acute toxicity:	<ul style="list-style-type: none"><li>Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.</li><li>Asphyxiants displace oxygen in the air and can cause symptoms of oxygen deprivation (asphyxiation).</li></ul>
	Chronic effects:	<ul style="list-style-type: none"><li>Prolonged or repeated exposure to high concentrations may affect the central nervous system.</li></ul>
<b>Skin corrosion/irritation</b>		Contact with liquefied gas may cause frostbite and tissue damage.
<b>Serious eye damage / eye irritation</b>		Not classified.
<b>Respiratory sensitization</b>		Not classified.
<b>Skin sensitization</b>		Not a skin sensitizer.

<b>Mutagenicity</b>	Not classified.
<b>Carcinogenicity</b>	Not classified.
<b>Reproductive toxicity</b>	Not classified.
<b>Specific target organ toxicity—single exposure</b>	Not classified.
<b>Specific target organ toxicity—repeated exposure</b>	Not classified.
<b>Aspiration hazard</b>	Suffocation (asphyxiant) hazard if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.
<b>Other effects</b>	<p>Effects to components of natural gas:</p> <ul style="list-style-type: none"><li>▪ <b>Propane.</b> Studies in laboratory animals indicate exposure to extremely high levels of propane (1–10 vol-% in air) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.</li><li>▪ <b>Butanes.</b> Studies in laboratory animals indicate exposure to extremely high levels of butanes (1–10 or higher vol-% in air) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.</li><li>▪ <b>Pentanes.</b> Studies of pentanes isomers in laboratory animals indicate exposure to extremely high levels (roughly 10 vol%) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.</li></ul> <p>Exposure to this material may cause adverse effects or damage to the following organ systems:</p> <ul style="list-style-type: none"><li>▪ Central nervous system</li><li>▪ Heart</li><li>▪ Eyes</li><li>▪ Skin</li></ul>

## 12. Ecological information

<b>Ecotoxicity</b>	Not expected to be harmful to aquatic organisms.
<b>Environmental effects</b>	Not available.
<b>Persistence and degradability</b>	The product is readily biodegradable.
<b>Bioaccumulative potential</b>	The product is not expected to bioaccumulate.

**Partition coefficient (n/octanol/water [log K<sub>ow</sub>])**

Encana Natural Gas	1.09
2-Methylbutane (CAS 78-78-4)	2.3
Butane (CAS 106-97-8)	2.89
Ethane (CAS 74-84-0)	1.81
Isobutane (CAS 75-28-5)	2.76
Methane (CAS 74-82-8)	1.09
Propane (CAS 74-98-6)	2.36

**Mobility in soil**

This product is a gas, which, if spilled, preferentially volatilizes into air instead of adsorbing to soil. However, gases can dissolve in water at the spill site and move through soil.

Most of the components of natural gas have a low mobility in soil. Isobutane and methane have a high mobility in soil. Methane, as a gas, is also mobile in soil.

**Soil Organic Carbon-Water Partitioning Coefficient (K<sub>oc</sub>)**

Isobutane (CAS 75-28-5)	35
Methane (CAS 74-82-8)	90
Ethane (CAS 74-84-0)	230
Propane (CAS 74-98-6)	460
2-Methylbutane (CAS 78-78-4)	520
Butane (CAS 106-97-8)	900
Encana Natural Gas	NV

**Water solubility**

This product is a gas, which, if spilled, preferentially volatilizes into air instead of dissolving in water; however, the components of the product are water soluble.

**Other adverse effects**

This product contains volatile organic compounds, which have the potential to create photochemical ozone.

## 13. Disposal considerations

**Disposal methods**

In its present state, this product is not a hazardous waste when discarded or disposed of according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

**Local disposal regulations**

Dispose in accordance with all applicable regulations.

**Waste from residues/unused products**

Dispose of in accordance with regulations.

**Hazardous waste code**

D001: Waste Flammable material with a flash point <140 °F

Contaminated packaging

Since emptied cylinders may retain product residue, follow label warnings even after cylinder is emptied.

## 14. Transport information

### DOT

UN number	UN1971
UN proper shipping name	Natural gas, compressed with high methane content
Transport hazard class(es)	2.1
Packing group	Not available
Subsidiary class(es)	Not available
Labels required	2.1
Packaging exceptions	306
Packaging non bulk	302
Packaging bulk	302
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.

### IATA

UN number	UN1971
UN proper shipping name	Natural gas, compressed with high methane content
Transport hazard class(es)	2.1
Subsidiary class(es)	Not available
Packaging group	Not available
Labels required	Not available
ERG Code	10L
Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.

### IMDG

UN number	UN1971
UN proper shipping name	Natural gas, compressed with high methane content
Transport hazard class(es)	2.1
Subsidiary class(es)	Not available
Packaging group	Not available
Labels required	2.1
EmS	F-D, S-U

Special precautions for user	Read safety instructions, SDS, and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available

## 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.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)** None

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001–1050)** None

**CERCLA (Superfund) reportable quantities** Not listed

**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
- SARA 302 Extremely hazardous substance: No
- SARA 311/312 hazardous chemicals: No

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List** Not regulated

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

- 2-Methylbutane (CAS 78-78-4)
- Butane (CAS 106-97-8)
- Ethane (CAS 74-84-0)
- Isobutane (CAS 75-28-5)
- Methane (CAS 74-82-8)
- Propane (CAS 74-98-6)

**Safe Drinking Water Act (SDWA)** Not regulated.

**Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and** Not regulated.

1310.04(f)(2) and Chemical Code Number

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c)) Not regulated

DEA Exempt Chemical Mixtures Code Number Not regulated

Food and Drug Administration Not regulated

International Inventories

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)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
US & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

Notes: \*A Yes indicates this product complies with the inventory requirements administered by the governing country(s).

16. Other information, including date of preparation or last version

Issue date 07/31/2013

Revision date: 07/31/2016

Version # 01

References ACGIH  
EPA: Acquire database  
NLM: Hazardous Substances Data Base

US. IARC Monographs on Occupational Exposures to Chemical Agents

**Disclaimer**

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.



# Safety Data Sheet

Produced water, sweet

## 1. Identification

<b>GHS product identifier:</b> Produced water, sweet	<b>Version #:</b> 01
<b>Synonyms:</b>	<b>Issue date:</b> 07/31/2013
	<b>Revision date:</b> 07/31/2016
	<b>Supersedes date:</b> Previous to 07/31/2013
<b>CAS #:</b> Mixture	
<b>Recommended use:</b> Product produced at Encana well sites. Includes liquids, except for natural gas condensates generated from a producing well.	
<b>Recommended restrictions:</b> Use in accordance with this SDS.	
<b>Manufacturer:</b> Encana Oil & Gas (USA) Inc. 370 17 <sup>th</sup> Street, Suite 1700 Denver, CO 80202	
<b>Emergency phone #:</b> 866-244-0062 911	<b>Email:</b> SDS@encana.com

## 2. Hazard identification

### GHS classification & label elements

<b>Signal word:</b> <b>Danger</b>			
Type of Hazard		Category	Hazard Symbol
Physical Hazards	Flammable liquids	3	
Health Hazards	Skin corrosion/irritation Reproductive toxicity	3 2	
Environmental Hazards	Hazardous to the aquatic environment, long-term hazard	2	

- Hazard statement**
- Causes mild skin irritation.
  - Suspected of damaging fertility.
  - Toxic to aquatic life with long-lasting effects.

- Precautionary statement**
- Prevention:
- Do not handle until all safety precautions have been read and understood.
  - Obtain special instructions before use.
  - Keep away from flames and hot surfaces— no smoking.
  - Use personal protective equipment to prevent contact, as determined by assessing hazards and likely routes of exposure.
  - Wear protective gloves, eye protection, and face protection.
  - Avoid release to the environment.
- Response:
- In case of fire, use alcohol-resistant foam, carbon dioxide, dry powder, or water fog for extinction.
  - If exposed or concerned, get medical advice/attention.
  - Collect spillage if safe to do so.
- Storage:
- Store in a well-ventilated place.
  - Keep cool.
  - Store locked up.
- Disposal:
- Dispose of contents in accordance with local, regional, national, and international regulations.
- Special hazards
- Direct contact with eyes may cause temporary irritation.
  - Prolonged contact may cause dryness of the skin.
- Hazards not otherwise classified:
- None.

### 3. Composition / information on ingredients

Components	Common Synonyms	CAS #	Percent (by weight)
Octane		111-65-9	1-<10%
Decane		124-18-5	1-<5%
Heptane		142-82-5	1-<5%
n-Hexane		110-54-3	0.1-<2.5%

## 4. First aid measures

**First aid procedures**

Inhalation:

- Move to fresh air.
- Get medical attention if discomfort develops or persists.

Skin contact:

- Remove contaminated clothing.
- Wash with soap and water.
- For rashes, wounds, or other skin disorders, seek medical attention and bring along this SDS.

Eye contact:

- Remove any contact lenses and open eyelids wide apart.
- Immediately flush with plenty of water for up to 15 minutes.
- Get medical attention if irritation or symptoms persists

Ingestion:

- Rinse mouth.
- Never give anything by mouth to an unconscious person.
- Do not induce vomiting unless told to do so by a poison control center or doctor.

**Most important symptoms/effects (acute & delayed)**

- May cause redness and pain.
- May cause eye irritation on direct contact.

**Notes to physician**

- Treat symptomatically.
- The effects might be delayed.

**General advice**

Get medical attention if any discomfort develops.

## 5. Fire-fighting measures

### Flammable properties

- The product is flammable.
- Heating may generate vapors which may form explosive vapor/air mixtures.
- See Sections 9 and 10 for physical/chemical and stability/reactive properties
- NFPA: Health: 1, Flammability: 2, Instability: 0.

### Extinguishing media

Suitable	Do not use
<ul style="list-style-type: none"> <li>▪ Water spray</li> <li>▪ Fog</li> </ul>	<ul style="list-style-type: none"> <li>▪ Water jet, which will spread the fire.</li> <li>▪ Simultaneous use of foam and water on the same surface, as water destroys the foam.</li> </ul>

Suitable	Do not use
<ul style="list-style-type: none"> <li>▪ Carbon dioxide (CO<sub>2</sub>)</li> <li>▪ Dry chemical <i>or</i></li> <li>▪ Alcohol-resistant foam</li> </ul>	

### Protection of fire-fighters

Specific hazards arising from the chemical	Protective equipment and precautions
<ul style="list-style-type: none"> <li>▪ Heating may generate vapors, which may form explosive vapor/air mixtures.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fire-fighters must wear full protective clothing &amp; a self-contained breathing apparatus (SCBA) when in poorly ventilated area.</li> </ul>

### Fire-fighting equipment / instructions

- Use standard firefighting procedures and consider the hazards of other involved materials.
- Move containers of product, if possible, 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.

## 6. Accidental release measures

- |                                  |   |
|----------------------------------|---|
| <b>Personal precautions</b>      | <ul style="list-style-type: none"> <li>▪ Avoid prolonged and repeated contact.</li> <li>▪ Wear suitable protective clothing; for personal protection, see Section 8 of this SDS.</li> </ul>   |
| <b>Environmental precautions</b> | <ul style="list-style-type: none"> <li>▪ Avoid discharge into drains, water courses, or onto the ground.</li> </ul>   |
| <b>Methods of containment</b>    | <ul style="list-style-type: none"> <li>▪ Do not allow to enter drains, sewers, or watercourses.</li> </ul>  |
| <b>Methods for cleaning up</b>   | <ul style="list-style-type: none"> <li>▪ Small spills: absorb spillage with suitable absorbent material.</li> <li>▪ Large spills: use a non-combustible material like vermiculite, sand, or earth to soak up the product and place into a container for later disposal.</li> <li>▪ For waste disposal, see Section 13 of this SDS.</li> </ul> |

## 7. Handling and storage

- |                 |   |
|-----------------|---|
| <b>Handling</b> | <ul style="list-style-type: none"> <li>▪ Avoid contact with eyes and prolonged or repeated contact with skin.</li> <li>▪ Pregnant women should not work with the product, if there is any risk of exposure.</li> <li>▪ Keep away from heat, spark, open flames, and other sources of ignition.</li> <li>▪ Wash hands after handling and before eating.</li> </ul> |
|-----------------|---|

- Observe good hygiene practices.
- HMIS®: Health: 1, Flammability: 2, Physical hazards: 0.

**Storage and incompatibilities**

- Follow rules for flammable liquids.
- Keep away from heat, sparks, and open flame.
- Keep in a cool, well-ventilated place.
- Keep away from food, drink, and animal feeding materials.
- Keep away from incompatible materials: water reactive materials and strong oxidizing agents (Section 10).
- Store locked up.

## 8. Exposure controls / personal protection

### Occupational exposure limits

Components	Limit Type	OSHA PEL	ACGIH TLV	NIOSH REL
Heptane (CAS 142-82-5)	STEL	None	500 ppm	440 ppm
	TWA	500 ppm	400 ppm	85 ppm
n-Hexane (CAS 110-54-3)	TWA	500 ppm	50 ppm	50 ppm
Octane (CAS 111-65-9)	STEL	375 ppm	None	385 ppm (Ceiling)
	TWA	500 ppm	300 ppm	75 ppm

**Notes:** PEL=permissible exposure limit; ppm=parts per million; REL=recommended exposure limit; TVL=threshold limit value; TWA=time-weighted average. \* Limits contained in 29 CFR 1910.1000 Z-2 may apply. All values are based on 2012 standards.

**Recommended monitoring** Follow standard monitoring procedures per established OSHA or NIOSH methods.

- Engineering controls**
- Provide adequate ventilation and minimize the risk of inhalation of vapors.
  - Provide easy access to water supply and eye wash facilities.
  - Use explosion-proof equipment.

**Personal protective equipment**

Eye/face protection:

- Risk of contact: wear safety glasses with side shields (or goggles).

Skin protection:

- Risk of contact: wear appropriate chemical resistant clothing to prevent any possibility of skin contact.

Respiratory protection:

- An approved respirator must be worn 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).
- Respirators do not protect against a potentially flammable environment; appropriate precautions must be taken in potentially explosive environments.

- Industrial hygienists should monitor personal exposure to determine the need for a respirator.

**General hygiene**

- When using, do not eat, drink, or smoke.
- Wash hands after handling.
- Launder contaminated clothing before reuse.
- Private clothes and working clothes should be kept separate.
- Handle in accordance with good hygiene and safety practice.
- Observe any medical surveillance requirements.

## 9. Physical and chemical properties

Physical state	Liquid
Form	Liquid
Color	Colorless to brown
Odor	Hydrocarbon
Odor threshold	Not available
pH	4.3–6.8
Melting point / freezing point	-15–32°F (-26.1–0°C)
Initial boiling point	212°F (100°C)
Boiling range	Not available
Flash point	84–210°F (28.9–98.9°C)
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Flammability limits in air, lower to upper (% by volume)	Not available
Vapor pressure	0.1–1.8 psi (Reid Vapor Pressure at 100°F).
Vapor density	Not available
Relative density	1.01–1.08
Solubility(water)	Soluble
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not applicable
Pour point	Not available
Viscosity	Not available
Oxidizing properties	Not available
Explosive properties	Not available
Decomposition temperature	Not applicable

## 10. Stability and reactivity

<b>Reactivity</b>	Not available.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	<ul style="list-style-type: none"> <li>▪ Excessive heat.</li> <li>▪ Contact with incompatible materials.</li> </ul>
<b>Incompatible materials</b>	<ul style="list-style-type: none"> <li>▪ Water reactive materials.</li> <li>▪ Strong oxidizing agents.</li> </ul>
<b>Hazardous decomposition products</b>	<ul style="list-style-type: none"> <li>▪ None known.</li> </ul>

## 11. Toxicological information

### Toxicological data

Component	Species	Test Results
<b>Decane (CAS 124-18-5)</b>		
Acute <i>Inhalation</i>		
LC50	Mouse	72.3 mg/L, 2 hours
<b>Heptane (CAS 142-82-5)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	103 mg/L, 4 hours
<b>Octane (CAS 111-65-9)</b>		
Acute <i>Inhalation</i>		
LC50	Rat	118 mg/L, 4 Hours

**Notes:** LC50=half maximal lethal concentration; mg/L-milligrams per liter.

<b>Routes of exposure</b>	<ul style="list-style-type: none"> <li>▪ Absorption</li> <li>▪ Eye contact</li> <li>▪ Inhalation of vapor</li> </ul>
---------------------------	--

<b>Toxicological effects</b>	Occupational exposure to the substance or mixture may cause adverse effects. Acute toxicity: <ul style="list-style-type: none"> <li>▪ Skin irritation.</li> <li>▪ Ingestion may cause irritation and malaise.</li> </ul> Chronic effects: <ul style="list-style-type: none"> <li>▪ Can cause kidney, liver, and central nervous system damage.</li> <li>▪ Prolonged or repeated contact with skin may cause redness, itching, irritation, eczema/chapping, and oil acne.</li> <li>▪ Contains n-hexane, prolonged or repeated exposures to which may cause damage to the peripheral nervous system (e.g., fingers, feet, and arms).</li> </ul>
<b>Skin corrosion/irritation</b>	Irritating to skin.
<b>Serious eye damage / eye irritation</b>	Not classified.
<b>Sensitization</b>	Not a skin sensitizer.
<b>Local effects</b>	<ul style="list-style-type: none"> <li>▪ May cause eye irritation.</li> <li>▪ May produce skin irritation or contact dermatitis.</li> </ul>
<b>Mutagenicity</b>	Not classified.
<b>Carcinogenicity</b>	Not classified.
<b>Reproductive toxicity</b>	Suspected of damaging fertility.
<b>Symptoms</b>	<ul style="list-style-type: none"> <li>▪ May cause redness and pain.</li> <li>▪ May cause eye irritation on direct contact.</li> </ul>
<b>Epidemiology</b>	No data available.
<b>Absorption hazard</b>	Not classified.

## 12. Ecological information

### Ecological data

Components	Dose	Species	Test Results
Decane (CAS 124-18-5)			
Fish	LC50	Sheepshead minnow ( <i>Cyprinodon variegatus</i> )	>500 mg/L, 96h

## Safety Data Sheet: Produced water, sweet

Components	Dose	Species	Test Results
<b>Heptane (CAS 142-82-5)</b>			
Fish	LC50	Mozambique tilapia ( <i>Tilapia mossambica</i> )	375 mg/L, 96h
<b>n-Hexane (CAS 110-54-3)</b>			
Fish	LC50	Fathead minnow ( <i>Pimephales promelas</i> )	2.101–2.981 mg/L, 96h

**Notes:** LC50=half maximal lethal concentration; mg/L-milligrams per liter.

**Ecotoxicity** Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

**Environmental effects** Toxic to aquatic life with long lasting effects.

**Persistence and degradability** Expected to be inherently biodegradable.

**Bioaccumulative potential** Has the potential to bioaccumulate.

#### Partition coefficient (n/octanol/water [ $\log K_{ow}$ ])

n-Hexane (CAS 110-54-3)	3.9
Heptane (CAS 142-82-5)	4.66
Decane (CAS 124-18-5)	5.01
Octane (CAS 111-65-9)	5.18

**Mobility in soil** This product mostly contains water, which has a high mobility in soil. The organic components, however, have varying degrees of mobility:

- Decane, octane, and heptane have high koc values and are immobile or have low mobility in soil.
- n-Hexane has a low koc value and is considered to have high mobility in soil.

#### Soil organic carbon-water partition coefficient (koc)

n-Hexane (CAS 110-54-3)	130
Heptane (CAS 142-82-5)	8,200
Octane (CAS 111-65-9)	16,000
Decane (CAS 124-18-5)	22,200–42,700

**Water solubility** The product is water soluble; however, the alkane components are considered hydrophobic and have a very low water solubility.

**Other adverse effects** None known.

### 13. Disposal considerations

<b>Disposal methods</b>	Dispose of in accordance with all applicable regulations.
<b>Local disposal regulations</b>	Dispose of in accordance with all applicable regulations.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations.
<b>Contaminated packaging</b>	Empty containers should be sent to an approved handling site for recycling, recovery, or disposal.

### 14. Transport information

#### DOT

<b>UN number</b>	UN1267
<b>UN proper shipping name</b>	Petroleum crude oil, Marine pollutant
<b>Transport hazard class(es)</b>	3
<b>Packing group</b>	III
<b>Environmental hazards: Marine pollutant</b>	Yes
<b>Labels required</b>	3
<b>Special provisions</b>	144, 357, B1, IB3, T2, TP1
<b>Packaging exceptions</b>	150
<b>Packaging non bulk</b>	203
<b>Packaging bulk</b>	242
<b>Special precautions for user</b>	Read safety instructions, SDS, and emergency procedures before handling.

#### IATA

<b>UN number</b>	UN1267
<b>UN proper shipping name</b>	Petroleum crude oil
<b>Transport hazard class(es)</b>	3
<b>Packaging group</b>	III
<b>Environmental hazards</b>	Not available.
<b>Labels required</b>	Not available
<b>ERG Code</b>	Not available
<b>Special precautions for user</b>	Not available

## IMDG

UN number	UN1267
UN proper shipping name	Petroleum Crude Oil
Transport hazard class(es)	3
Packaging group	III
Environmental hazards: Marine pollutant	Yes
Labels required	3
EmS	F-E, S-E
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable
General information	Not applicable

## 15. Regulatory information

**US federal regulations** This product is not a hazardous chemical.

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001–1050)** None.

**CERCLA (Superfund) reportable quantity**

n-Hexane (CAS 110-54-3)	5,000 lbs
Heptane (CAS 142-82-5)	Not listed
Octane (CAS 111-65-9)	Not listed
Decane (CAS 124-18-5)	Not listed

**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
- SARA 302 Extremely hazardous substance: No
- SARA 311/312 hazardous chemicals: No

## International Inventories

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	Yes

Country(s) or region	Inventory name	On inventory (Yes/No)*
	(EINECS)	
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
US & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

**Notes:** \*A Yes indicates this product complies with the inventory requirements administered by the governing country(s).

## 16. Other information, including date of preparation or last version

**Issue date** 07/31/2013

**Revision date:** 07/31/2016

**Version #** 01

**References** IARC Monographs. Overall Evaluation of Carcinogenicity (Volumes 1–102)  
IUCLID. Hazardous Substances Data Bank.

**Disclaimer** This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.