

Safety Data Sheet

1. Identification



Product Identifier: Produced Water (Non-Sour, Flammable)
Other Means of Identification: Formation water, Produced Brine
Product use: For disposal
Restrictions on use: Do not use for purposes other than those listed above

Manufacturer: Keyera and Affiliates
Address: Suite 200, The Ampersand, West Tower
 144 – 4th Avenue SW
 Calgary, AB, T2P 3N4

Main Phone Number : (403) 205-8300 / 1 (888) 699-4853 (Mon. - Fri. 8 AM - 5 PM)
Transportation Emergencies Only : CANUTEC (CAN) Ph:1-888-CAN-UTEC(226-8832) Cell*666 (24 hr)
 CHEMTREC (US) Ph: 1-800-424-9300 (24 hr)

2. Hazards Identification

GHS Hazards

Pictogram	Classification	Hazard Statements
	Flammable Liquids – Category 2	Highly flammable liquid and vapor
	Reproductive Toxicity - Category 1A	May damage fertility or the unborn child.

Signal Word: Danger

Precautionary Statements:

Prevention

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources – No smoking.
- Keep container tightly closed.
- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.
- Wear protective gloves/ protective clothing/ eye protection/ face protection.
Gloves: neoprene, nitrile.
Clothing: fire-retardant Nomex, Proban.
Eye: Safety glasses with side shields or goggles.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.

Response

- In case of fire: use dry chemical, CO₂, or fire-fighting foam to extinguish.
- In case of leakage, eliminate all ignition sources.
- If on skin (or hair): take off immediately all contaminated clothing. Rinse skin with water/shower.
- If exposed or concerned: Call a doctor/physician.

Storage

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

Disposal

- Dispose of contents/container in accordance with applicable local, provincial/state, and federal regulations.

3. Composition/Information on Ingredients

Chemical Name: Produced Water

Common Name/Synonyms: Formation Water, Produced Brine

Ingredient Name	Weight %	CAS No.
Water	95 - 98	7732-18-5
Minerals salts Cations: sodium, potassium, calcium Anions: chlorides, carbonate, sulphate	2 - 5	Not applicable
Crude oil and hydrocarbons	0 - Trace	8002-05-9
Benzene	0.001 – 0.07	71-43-2
Toluene	0.001– 0.2	108-88-3
Xylene (all isomers)	0.001 – 0.1	1330-20-7
Ethylbenzene	0.001 – 0.01	100-41-4

4. First Aid Measures

Immediate Medical Attention and Special Treatment:

Treat symptomatically and supportively. Refer also to Table below.

First Aid:	
Inhalation:	Remove person to fresh air and keep comfortable for breathing. If exposed or concerned: Call a doctor/physician.
Skin:	If on skin (or hair): take off immediately all contaminated clothing. Rinse skin with water/shower.
Eyes:	Rinse cautiously with water for several minutes. If eye irritation persists: get medical advice/attention.
Ingestion:	Not expected to be a route of exposure.

Most Important Effects and Symptoms, Acute or Delayed:		
Exposure Route	Health Effects	Symptoms of Exposure
Inhalation:	may cause mild respiratory irritation.	Mild shortness of breath to slight dizziness.
Skin:	Prolonged exposure to skin may cause mild irritation.	Redness, dry skin.
Eyes:	May cause irritation.	Redness, tearing, irritation.
Ingestion:	Ingestion in large quantity may cause thirst.	Feeling thirsty.

5. Fire Fighting Measures

<p>Flammability: Yes. Residual hydrocarbon on top of the produced water may be highly flammable.</p>	<p>Hazardous Combustion Products: Carbon monoxide (CO), carbon dioxide (CO₂), acrid smoke and sulphur dioxide (SO₂).</p>
<p>Explosion: Sensitive to impact: No.</p>	<p>Sensitive to static discharge: No</p>
<p>Extinguishing Media: Small Fire: dry chemical, CO₂. Water spray or alcohol-resistant foam. Large Fire: water spray or fog. Do not use straight streams.</p>	
<p>Unsuitable Extinguishing Media:</p> <ul style="list-style-type: none"> • Foam, high pressure water streams. 	
<p>Special Protective Equipment for Firefighters:</p> <ul style="list-style-type: none"> • Wear protective gloves/ protective clothing/ eye protection/ face protection. 	
<p>Precautions for Firefighters:</p> <ul style="list-style-type: none"> • If tank, rail car or tank truck is involved in a fire, ISOLATE and consider initial evacuation <u>in all directions</u> for 800 meters (0.5 mile). • Move container from fire area if you can do it without risk. • Apply cooling water to sides of containers exposed to flames until well after fire is out. • Cool fire-exposed containers with flooding quantities of water applied from as far a distance as possible. • A vapour-suppressing foam may be used to reduce vapours. • Stay away from ends of tanks. • Containers exposed to fire may explode or vent through pressure-relief devices. • Refer to Guide 127 of the Emergency Response Guidebook (Transport Canada/US Dept. of Transportation). 	
<p>Unusual Fire and Explosion Hazards:</p> <ul style="list-style-type: none"> • Vapors may form explosive mixtures with air. • Vapors may travel to source of ignition and flash back. 	

6. Accidental Release Measures

Protective Equipment:

Gloves: Recommended: neoprene and nitrile.
 Not recommended: polyvinyl chloride PVC.

Clothing: Flame-retardant coverall e.g. Nomex, Proban.

Respirator: NIOSH Approved Supplied-Air Respirator or SCBA where an oxygen-deficient atmosphere may exist.

Eye: Safety glasses with side shields, safety goggles or face shields.

Large spills: wear full protective clothing and NIOSH-approved SCBA with full face-piece.

Precautions:

- Do not breathe gas/vapors (hydrocarbons).
- May have very low flash point: water spray reduce vapour but may not prevent ignition.

Emergency Procedures:

- Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Shut off leak/release source, if it can be done safely. Ventilate area of leak or spill.
- Evacuate area of all unnecessary personnel.
 Small spill: absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
 Large spill: dike far ahead of liquid spill for containment and cleanup. Water spray may reduce vapour but may not prevent ignition.
- Consider initial downwind evacuation of at least 300 m 1000 ft). If tank, rail car or tank truck is involved in a fire, ISOLATE & consider initial evacuation all directions for 800 m (½ mile).
- Emergency personnel must wear appropriate personal protective equipment.

Containment and Clean-up:

- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.
- Dike far ahead of liquid spill for containment and cleanup. Collect spillage with inert material (vermiculite, dry sand, earth), and place in coated metal container which can be grounded. Do not use combustible materials, such as sawdust, as absorbent.
- If a leak or spill has not ignited, use water spray to disperse the vapors or divert vapor cloud draft. Do not direct water at spill or source of leak.
- Prevent entry into waterways, sewers, basements or confined areas.
- Dispose of contents/container in accordance with applicable local, provincial/state, and federal regulations.
- Refer to Guide 127 of the Emergency Response Guidebook (Transport Canada/US Dept. of Transportation).

7. Handling and Storage

Handling Precautions:

- Do not breathe gas or vapour. Use only outdoors or in a well-ventilated area.
- Keep away from heat, hot surfaces, sparks, open flames & other ignition sources. No smoking.
- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment. Use non-sparking tools.
- Take action to prevent static discharges.
- Wear protective gloves/ protective clothing/ eye protection/ face protection.
Gloves: neoprene, nitrile. Clothing: fire-retardant Nomex, Proban.
- Eye: Safety glasses with side shields or goggles.

Storage Precautions:

Locations

- Store in a well-ventilated place. Keep container tightly closed. Keep cool.
- Storage and use areas should be No Smoking areas. Store locked-up.

Containers

- Keep container tightly closed.
- Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition.

8. Exposure Controls / Personal Protection

EXPOSURE LIMITS

	Authority	15 MINS STEL or Ceiling	8-HOURS
Benzene (CAS 71-43-2)	Alberta	2.5 ppm (8 mg/m ³) – skin	0.5 ppm (1.6 mg/m ³) – skin
	Ontario, BC	2.5 ppm – skin	0.5 ppm – skin
Toluene (CAS 108-88-3)	Alberta	-	50 ppm (188 mg/ m ³)
	Ontario, BC	-	20 ppm (75 mg/ m ³)
Xylene (o-,m-,p- isomers) (CAS 1330-20-7)	Alberta	150 ppm (650 mg/ m ³)	100 ppm (434 mg/m ³)
	Ontario, BC	150 ppm	100 ppm
Ethylbenzene (CAS 100-41-4)	Alberta	125 ppm (543 mg/ m ³)	100 ppm (434 mg/ m ³)
	Ontario, BC	-	20 ppm (87 mg/ m ³)

ENGINEERING CONTROLS



- Ventilate area where product is used, stored and/or handled to maintain airborne concentrations below the LEL and OEL, especially in confined spaces.
- Exhaust/ventilate to the outside. Ventilation equipment must be explosion proof.
- Ventilation system should be grounded and separate from other exhaust ventilation systems. Adequate make-up air must be provided.

PERSONAL PROTECTIVE EQUIPMENT



- Gloves: Recommended: neoprene and nitrile;
Not recommended: polyvinyl chloride PVC.
- Clothing: Flame-retardant coverall e.g. Nomex, Proban.
- Respirator: NIOSH Approved Supplied-Air Respirator or SCBA.
- Eye: Safety glasses with side shields, safety goggles or face shields.

9. Physical and Chemical Properties

Chemical Formula: H ₂ O		Molecular Weight: 18.00 g/mole	Physical State: Liquid
Appearance: Slight amber color		N/Av	Odor Threshold: N/Av
pH: ~5-9	Melting/Freezing Point: 0 to -5°C	Boiling Point: 50 to 100°C	Boiling Range: Not available
Flash Point: 0-60°C		Flammability: Yes	Evaporation Rate: Not available
Upper-Lower Explosive Limit: N/Av		Vapor Pressure: Not available	Vapor Density: Not available
Density: ~ 1.00 kg/m ³		Soluble in water (@20°C): ~100%	Percent Volatile: < 1
Partition Coefficient n-octanol/water: Not available		Auto-Ignition Temperature: Not available	Decomposition Temp.: Not available
Viscosity: 1.0 – 2.3 cSt (@15°C)		Henry's Law Constant: Not available	Isobaric Heat Capacity: Not available

10. Stability and Reactivity

Reactivity: Avoid incompatible materials: may react violently with oxidizers.
Chemical Stability: Stable under normal temperatures and pressures.
Possibility of Hazardous Reactions: Polymerization has not been reported to occur under normal temperature and pressure conditions.
Conditions to Avoid: Extreme temperatures and incompatible materials.
Incompatible Materials: <ul style="list-style-type: none"> Strong oxidizing agents.
Hazardous Decomposition Products: <ul style="list-style-type: none"> No known decomposition product of this material. Combustion of hydrocarbon forms carbon monoxide, carbon dioxide, sulphur dioxide, and acrid smoke.

11. Toxicological Information

Exposure Route	Acute Health Effects	Symptoms of Exposure
Inhalation:	May irritate respiratory tract	Mild shortness of breath to slight dizziness
Skin:	In liquid form: skin irritation	Redness, itchy skin
Eye:	May cause eye irritation	Irritation, tearing, visual disturbances
Ingestion:	Not expected to be a route of exposure.	

Chronic Exposure:
Inhalation:

Repeated or prolonged exposure may cause respiratory tract irritation.

Skin:

Not known to be a skin-sensitizer. Repeated and prolonged contact may cause dry, red, cracked skin (dermatitis).

Medical Conditions Aggravated by Exposure:

Possibly asthma.

Sensitization: No	Reproductive Toxicology: Yes	Teratogenicity: No	Mutagenicity: Yes
Carcinogenicity: No	Irritancy: No	Target Organs: Repeated exposure: no data available	

Lethality Tests:

Chemical Name	CAS No.	LD50	LC50
Benzene	71-43-2	Oral Rat 810 mg/kg Dermal Rabbit >8200 mg/kg	Rat 44.66 mg/L 4 h
Toluene	108-88-3	Oral Rat 2600 mg/kg Dermal Rabbit 12000 mg/kg	Rat 12.5 mg/L 4 h
Xylenes	1330-20-7	Oral Rat 3500 mg/kg Dermal Rabbit >4350 mg/kg	Rat 29.08 mg/L 4 h
Ethyl benzene	100-41-4	Oral Rat 3500 mg/kg Dermal Rabbit 15400 mg/kg	Rat 17.4 mg/L 4 h

12. Ecological Information

Persistence & Degradability: No.	Bioaccumulative Potential: No.
Mobility: No data available.	Other Adverse Effects: See below.

Eco Toxicity Tests:

Chemical Name	CAS No.		
Benzene	71-43-2	Fish	LC50 96 h <i>Lepomis macrochirus</i> 22.49 mg/L [static] LC50 96 h <i>Pimephales promelas</i> 22330 - 41160 µg/L [static]
Toluene	108-88-3	Fish	LC50 96 h <i>Pimephales promelas</i> 15.22 - 19.05 mg/L [flow-through] (1 day old); LC50 96 h <i>Pimephales promelas</i> 12.6 mg/L [static]
Xylene	1330-20-7	Fish	LC50 96 h <i>Pimephales promelas</i> 15.22 - 19.05 mg/L [flow-through] (1 day old); LC50 96 h <i>Pimephales promelas</i> 12.6 mg/L [static] LC50 96 h <i>Pimephales promelas</i> 15.22 - 19.05 mg/L [flow-through] (1 day old); LC50 96 h <i>Pimephales promelas</i> 12.6 mg/L [static]
Ethylbenzene	100-41-4	Fish	LC50 96 h <i>Lepomis macrochirus</i> 32 mg/L [static] LC50 96 h <i>Pimephales promelas</i> 7.55 - 11 mg/L [flow-through]

13. Disposal Considerations

Waste Disposal:

- Dispose of waste material at an approved waste treatment/disposal facility in accordance with applicable local, provincial, and federal regulations.
- Do not dispose of waste with normal garbage, or to sewer systems.

14. Transport Information

TDG (CANADA) CLASSIFICATION

PROPER SHIPPING NAME: Flammable Liquid, N.O.S. (Trace hydrocarbons)

CLASS: 3

UN NUMBER: UN1993

PACKING GROUP: II

LABEL/PLACARD:



Special Provision: 16

The technical name of at least one of the most dangerous substances that predominantly contributes to the hazard or hazards posted by the dangerous goods must be shown, in parenthesis, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(ii)(A) of Part 3 (Documentation)

Caution:

- *As produced water is traditionally hauled by trucks that previously transported other products (e.g. crude, condensate) and not steamed or rinsed, the product remaining in these trucks may change the composition of this product (Sour, Flammable Produced Water)*
- *The Consignor must review the content remaining in the incoming truck, by examining “residue-last-contained”, and may need to placard the produced water differently*

15. Regulatory Information

CANADA

	Benzene	Toluene	Xylenes	Ethylbenzene
CAS	71-43-2	108-88-3	1330-20-7	100-41-4
DSL	yes	yes	yes	yes
NPRI	yes	yes	yes	yes
E2	yes	yes	yes	yes

16. Other Information

Prepared for: Keyera Health and Safety
Issue Date/ Revision No: August 17, 2021/ Revision #1

Revisions:	Dates:	Main Changes:
• Original	July 1, 2020 August	-
• 1 st revision	17, 2021	Update address and phone number

Glossary

ACGIH – American Conference of Governmental Industrial Hygiene
DOT – US Department of Transportation
DSL – Domestic Substance List (Canada)
E2 – Environmental Emergencies (Canada)
GHS – Globally Harmonized System
IARC – International Agency for Research on Cancer
IDLH – Immediately Dangerous to Life and Health
NIOSH – National Institute for Occupational Safety & Health
NPRI – National Pollutant Release Inventory (Canada)
NTP – National Toxicology Program
OSHA – Occupational Safety & Health Administration of the US Depart of Labour
PEL – Permissible Exposure Limit
SARA – Superfund Amendments and Reauthorization Act of 1986
STEL – Short Term Exposure Limit
TRI – US Toxic Release Inventory
TSCA – Toxic Substance Control Act
TWA – Time Weighed Average

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~ End of Safety Data Sheet ~