



Safety Data Sheet

MSDS ID NO: 012

Revision date: April 2014

Section 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: Produced Water Solution
Synonyms: Formation Water; Crude Oil Separated Water; Salt Water Brine; Separated Water; Sweet Water
Chemical family: Water
Formula: A mixture of water, salts, and hydrocarbons, with variable amounts of impurities.
Producer: EnLink Midstream, L.P.
2501 Cedar Springs Road
Suite 100
Dallas, TX 75201
www.EnLink.com

Emergency Line	866-394-9839	Available 24 hours
CHEMTREC	800-424-9300	
EnLink	214-953-9500	Available during normal business hours

****Ask for Compliance Dept****

Section 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Produced water is potentially toxic based on impurities, including salts. This product may be contaminated with crude oil or hydrocarbon condensate. Liquid contact may cause irritation of the eyes and skin. Ingestion may cause gastrointestinal irritation, nausea, and vomiting. Inhalation of liquid mist may cause mild mucous membrane irritation.

OSHA-GHS Hazard Statement:

DANGER — May Cause Cancer (*category 1*)

WARNING — Causes Eye Irritation (*category 2B*)

Inhalation: No inhalation hazard under normal conditions. Vapor spaces of storage and transport compartments may contain hydrogen sulfide and/or hydrocarbon vapor. If misting occurs, may cause mild mucous membrane irritation of the nose, throat and upper respiratory tract. This product contains benzene which may cause cancer, or be toxic to blood-forming organs.

Ingestion: May cause gastrointestinal irritation, leading to nausea, vomiting, and diarrhea.

Skin contact: May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through skin in toxic amounts if large areas of skin are exposed repeatedly.

Eye contact: May cause moderate irritation.

Carcinogenic Repeated and prolonged exposures may be harmful and may cause cancer.

Name	IARC carcinogens:	NTP carcinogens:	ACGIH — carcinogens	OSHA — select carcinogens
Benzene 71-43-2	Supplement 7 (1987) Monograph 29 (1982)	Known human carcinogen	A1 — Confirmed human carcinogen	Present

Section 3. COMPOSITION / INFORMATION ON INGREDIENTS

The composition of produced water can vary significantly depending on its source, and may contain a variety of dissolved mineral salts, including sodium chloride, calcium chloride, and potassium chloride. It may also contain small amounts of condensate or crude oil as a contaminant.

Material information:

Name	CAS No.	Weight %
Sodium chloride	7647-14-5	5-20
N-hexane	110-54-3	0.1-1
Benzene	71-43-2	0.1-1
Hydrogen sulfide	7783-06-4	Trace <0.1

Note: The above weight percentages are represented in ranges as estimates. Due to variations in source locations, components of produced water will vary.

Section 4, FIRST AID MEASURES

Inhalation: Ensure your own safety and use the appropriate respiratory protection to immediately remove the affected person to fresh air. If the affected person is not breathing or breathing is irregular, provide artificial respiration, CPR and/or oxygen by trained personnel and seek emergency medical attention.

Skin contact: Remove contaminated clothing; wash affected area with soap and water; launder contaminated clothing before reuse. If irritation persists, seek medical attention.

Ingestion: Aspiration hazard if swallowed. DO NOT induce vomiting; if vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs and monitor for breathing difficulties. Seek immediate medical attention. Vomiting may be induced only under the supervision of a physician.

Eye contact: Check for and remove contact lenses. Flush eyes with clear, tepid running water for 15 minutes while holding eyelids open. If symptoms or irritation persist, seek medical attention.

Section 5. FIREFIGHTING MEASURES

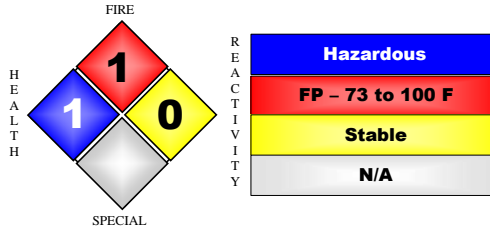
Suitable extinguishing media: Small fires — Class B fire-extinguishing media such as CO₂, dry chemical, foam (AFFF/ATC) or water spray can be used. Large fires — use extinguishing agent suitable for the surrounding fire.

Specific hazards: This product is not flammable; however, sufficient hydrocarbon vapors may accumulate from oil or natural gas condensate floating on the surface of the produced water to cause a flash fire. The fire should burn out rapidly depending on the amount of oil and natural gas condensate floating on the surface of the produced water.

Special protective equipment for firefighters:

For fires beyond the initial stage when the potential chemical hazard is unknown or in enclosed or confined spaces, emergency responders in the immediate hazard area should wear self-contained breathing apparatus (SCBA) and protective clothing. Use approved gas detectors for confined spaces.

NFPA rating:
Health: 1
Flammability: 1
Instability/reactivity: 0
Other: N/A



Section 6. ACCIDENTAL RELEASE MEASURES

Personal precautions: STEPS TO BE TAKEN IN THE EVENT MATERIAL IS RELEASED OR SPILLED: Immediately contact emergency personnel. This material may burn, but it will not ignite readily. Keep all sources of ignition and hot metal surfaces away from the spill/release if it is safe to do so. Prevent further leakage or spillage if safe to do so. Do not allow material to enter drains, sewers or waterways. Recover by pumping (using an explosion-proof motor or hand pump), or use sand or other oil-absorbing materials. Carefully shovel, scoop, or sweep into a waste container for reclamation or disposal. See Section 8 for minimum personal protective equipment (PPE). For spills in excess of allowable quantities (RQ), notify the National Response Center at (800) 424-8802. Refer to CERCLA 40 CFR and SARA Title III, Section 313 40 CFR 372 for detailed instructions concerning reporting requirements.

Section 7. HANDLING AND STORAGE

Handling: Handle as a flammable liquid. Tank headspaces should always be regarded as potentially flammable. Bond and ground containers during product transfer and avoid static electrical discharge and all ignition sources during filling, discharging, and sampling from storage tanks. Electrical equipment should be approved for classified areas. Do not pressurize, cut, heat, weld, grind, or exposure containers to sources of ignition. Refer to OSHA regulations, ANSI Z49.1 and other standards pertaining to cleaning, repairing, welding or similar operations.

Storage: Keep containers in well-ventilated areas away from flame, sparks, and excessive temperatures. Keep containers closed and clearly labeled. Empty product containers may contain flammable or explosive vapors. Special precautions should be taken when entering or handling tanks, containers, or equipment containing produced water due to hazards associated with hydrocarbon vapor, including benzene, hydrogen sulfide, and possible radioactive contamination from naturally-occurring radioactive materials (NORM). All equipment should be checked for radioactivity or opened to the atmosphere and have forced ventilation applied at least 4 hours prior to confined space entry or handling. Avoid skin contact with any surface. Exercise good personal hygiene, including removal and laundering or disposal of soiled clothing and prompt washing with soap and water.

Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits:

Name	CAS No.	Weight %	OSHA — PEL (ppm)	ACGIH® TLV® (ppm)	NIOSH REL (ppm)
Sodium chloride	7647-14-5	5-20	Not Established	Not Established	Not Established
N-hexane	110-54-3	1-5	500	50	50
Benzene	71-43-2	0-1	1 5 — STEL Ref: 29 CFR 1910.1028	0.5 2.5 — STEL Skin — potential absorption	0.1 1 — STEL
Hydrogen sulfide	7783-06-4	<0.1	20 — Ceiling	1 5 — STEL	10 — STEL (10 minutes)

All exposure limits listed are 8-hour time weighted average (TWA) — except where noted otherwise.

TWA — Time Weighted Average is an average value of exposure over the course of an 8-hour work shift.

STEL — Short-Term Exposure Limit, a TWA exposure that occurs over a 15-minute time period

PEL — Permissible Exposure Limit is the maximum amount or concentration of a chemical that a worker may be exposed to under OSHA regulations.

Ceiling — This limit may not be exceeded at any time.

Engineering measures: The use of local exhaust ventilation is recommended to control emissions near the source. Provide mechanical ventilation of confined spaces. Use explosion-proof ventilation equipment.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection: None required while threshold limits are kept below maximum allowable concentrations; if TWA exceeds limits, NIOSH-approved respirators must be worn. Refer to 29 CFR 1910.134 for complete regulations.

Skin and body protection: Neoprene, butyl or nitrile rubber gloves

Eye protection: Chemical splash goggles. Refer to 29 CFR 1910.133.

Hygiene measures: Minimize body contact with this, as well as all chemicals in general. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove contaminated clothing and launder before reuse.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, amber, or brown liquid
Physical state (solid/liquid/gas):	Liquid
Substance type (pure/mixture):	Mixture
Color:	Varies from clear to dark brown
Odor:	Faint hydrocarbon odor
Molecular weight:	Varies
pH:	4.9 – 8.5
Boiling point/range (5-95%):	>212° F (100°C)
Melting point/range:	<32° F (0°C)
Decomposition temperature:	Not available

Specific gravity:	1.0 – 1.1 @ 68° F
Density:	8.34-9.18 pounds/gallon
Vapor density:	<3 (air=1)
Vapor pressure:	13 – 20 mm Hg @ 68°F
Evaporation rate:	No data available
Flash point:	Variable organic and dissolved gases are flammable
Auto-ignition temperature:	No data available
Flammable limits in air — (lower):	No data available
Flammable limits in air — (upper):	No data available

Section 10. STABILITY AND REACTIVITY

Stability:	This material is stable
Polymerization:	Will not occur.
Hazardous decomposition products:	Carbon oxides (CO, CO ₂), sulfur oxides (SO, SO ₂), nitrogen oxides NO, NO ₂), Hydrogen sulfide
Materials to avoid:	Strong oxidizers such as nitrates, chlorates, and peroxides, strong acids
Conditions to avoid:	Sources of heat or ignition

Section 11. TOXICOLOGICAL INFORMATION

Acute toxicity:
Product information (toxicological data does not exist for this mixture):

Name	CAS No.	Inhalation:	Dermal:	Oral:
Sodium chloride	7647-14-5	Rat LC ₅₀ 42,000ppm/4 hrs	Rabbit LD ₅₀ >10,000 mg/kg	Rat LD ₅₀ 3,000 mg/kg
N-hexane	110-54-3	Rat LC ₅₀ 48,000ppm/4 hrs	No data available	Rat LD ₅₀ 25,000 mg/kg
Benzene	71-43-2	Rat LC ₅₀ 10,000ppm/7 hrs	No data available	Human LD _{Lo} 50 mg/kg
Hydrogen sulfide	7783-06-4	Rat LC ₅₀ 700 mg/m ³ /4 hrs	No data available	No data available

Chronic toxicity:
Hexane: reproductive, teratogenic, and tumorigenic health effects have occurred in experimental animals. This product contains benzene at a level of >0.1%. Repeated or prolonged exposure to benzene at concentrations in excess of the TLV may cause serious injury to blood-forming organs. Significant chronic exposure to benzene vapor has been reported to produce various blood disorders ranging from anemia to certain forms of leukemia (cancer) in humans. Benzene produced tumors in rats and mice in lifetime chronic toxicity studies, but the response has not been consistent across species, strain, sex or route of exposure. Animal studies on benzene have demonstrated immune toxicity, chromosomal aberrations, testicular effects and alterations in reproductive cycles and embryo/fetotoxicity, but not teratogenicity.

Carcinogenic and acute health effect information: *refer to Health Hazard Section 2*

Section 12. ECOLOGICAL INFORMATION

Ecotoxicological Data:	Sodium chloride: EC50 Water flea (Daphnia magna): 340 – 469mg/l 48 hours. EC50 American eel (Anguilla rostrata): 100 – 27,260mg/l 96 hours.
Ecotoxicity Effects:	Not expected to be harmful to aquatic organisms.

Section 13. DISPOSAL CONSIDERATIONS

Cleanup considerations: This product as produced is not specifically listed as an EPA RCRA hazardous waste according to federal regulations (40 CFR 261). However, when discarded or disposed of, it may meet the criteria of a "characteristic" hazardous waste. This product could also contain benzene at > 0.5 ppm and could exhibit characteristics of "toxicity" as determined by the toxicity characteristic leaching procedure (TCLP). This material could become hazardous waste or other substance(s). It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations.

Section 14. TRANSPORT INFORMATION

Please refer to 40 CFR 172.101: This product when transported via U.S. commerce is not regulated by the Department of Transportation (DOT).
Transport information:
Proper shipping name:
UN/identification no.:
Hazard class:
Packing group:
DOT reportable quantity (lbs):

Section 15. REGULATORY INFORMATION

U.S. TSCA (Toxic Substance Control Act)

All components of this product are listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory) or are exempted from listing because a Low Volume Exemption has been granted in accordance with 40 CFR 723.50.

SARA Section 302: This product may contain the following component listed on EPA's Extremely Hazardous Substance (EHS) List.

Hydrogen sulfide	100 pounds EPCRA RQ	500 pounds TPQ
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SARA Section 304:

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) has notification requirements for releases or spills to the environment of the Reportable Quantity (RQ) or greater amounts, according to 40 CFR 302.

Name	CERCLA/SARA — Hazardous substances and their reportable quantities (RQ)
Benzene	10 pounds final RQ
N-hexane	5,000 pounds final RQ
Hydrogen sulfide	100 pounds final RQ

SARA TITLE III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE: HEALTH HAZARD
CHRONIC: HEALTH HAZARD
FIRE: NO
REACTIVITY: NO
SUDDEN RELEASE: NO

313 REPORTABLE INGREDIENTS

This product is a toxic chemical subject to annual reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372: Benzene (0.1% de minimis concentration), N-hexane, hydrogen sulfide.

NOTE: *User must consult with applicable state and local agencies for special specifics, determinations or compliance obligations regarding this product.*

Section 16. OTHER INFORMATION

The information and recommendations contained herein are based upon tests, data, and information resources believed to be reliable. However, EnLink Midstream, L.P., and its related operations or divisions (EnLink) do not guarantee the accuracy or completeness, nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of goods, the merchantability of the goods or the fitness of the goods for a particular purpose. Adjustment to conform to actual conditions of usage may be required. EnLink assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of this data. No warranty against infringement of any patent, copyright or trademark is made or implied.