

# Produced Water Hazard Alert

**Emerging Issues Focus Group**

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By

J.D. Danni – Oil and Gas Specialist

OSHA Region VIII

# Produced Water Hazard Alert

- Calling the Hazard Alert: “Working Safely with Produced Water and Related Equipment”
- Tag lines: “Know What’s in Your Tank”  
“Never Assume it’s Just Water”

# Produced Water

- It is referred to as;
  - Brine
  - Salt Water
  - Waste Water
  - Production Water
- Produced water still has small amount of crude oil and gas present in production tanks and transportation tanker/vacuum trucks.
- Just over the last several years, there have been over 9 fatalities of explosions/fires, struck-by, and toxic exposures relating to tankers and production tanks.

# Case Definition

- Fatalities of workers during 2012-2015 that were associated with produced water (also known as brine, salt water, production water, etc.) while conducting activities for oil and gas extraction operations (maintenance shops, yards, and well sites).
- This does not include motor vehicle crash fatalities hauling produced water.

# Summary Points

- During 2012-2015, nine fatalities and 1 hospitalization incident (4 workers) were identified that met the above case definition.
- Of the 9 fatalities-
  - 1 occurred in 2015
  - 3 in 2014
  - 4 in 2013
  - 1 in 2012
- 5 fatalities occurred in Texas, 1 in Colorado, 1 in North Dakota, 1 in West Virginia, 1 in Arkansas, and a hospitalization in Oklahoma.

# Summary Points

- Three fatalities occurred on production sites
- Six fatalities occurred at the maintenance/welding shop or yard of the employer
- Three workers were welding on the tanker/vacuum truck
- Two workers were using a propane torch to thaw frozen valves, hoses, and lines
- In at least one case, the victim climbed into the tanker/vacuum truck and was overcome by toxic atmosphere or lack of oxygen.

# Summary Points

- One worker was using an oxygen and acetylene torch to cut bolts and wing nuts located on the rear hatch of the trailer.
- Equipment not intrinsically safe for the environment.
- One worker was gauging a water tank and overcome with H<sub>2</sub>S and fell 24 feet to ground.
- Four workers were hospitalized with burns and struck-by injuries from using a cutting torch to cut the bolts/nuts on “butterfly valves”.

# Produced Water Hospitalization



Four injured in oil tanker explosion near Stillwater - YouTube[via torchbrowser.com] (3).mp4



# Produced Water Fatalities

- Employee killed from explosion from spot welding a pinhole leak on a sight glass stem on a tanker truck.

## Produced Water Fatalities (cont.)

- The driver was sitting in the cab of tanker truck while the welder attempted to repair cracks in the tank vessel. The vapors of the production water ignited within the vessel causing an explosion to occur which in turn severed the end cap of the tank vessel propelling the end cap into the cab of the tractor.



05/11/2012 12:12





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# Production Water Fatalities (cont.)

- An employee was killed in an explosion while using a propane torch to loosen a frozen ball valve on the back of a tanker truck. The metal hatch blew off the back of the tanker and struck the employee. The tanker was empty and had previously hauled production lease salt water from an oil well site. The tanker truck was in the yard.











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# Produced Water (cont.)

- Major Contributing Causes
  - Not recognizing the hazard
  - Not cleaning or thoroughly cleaning out tank before beginning work
  - No monitoring
  - No Venting
  - No Hotwork permit
  - No JSAs
    - Have Supervisors sign off on permit/audit work procedures

# Hazard Alert

Hazard Alert

**Know What's in Your Tank — Never Assume It's Just Water!**

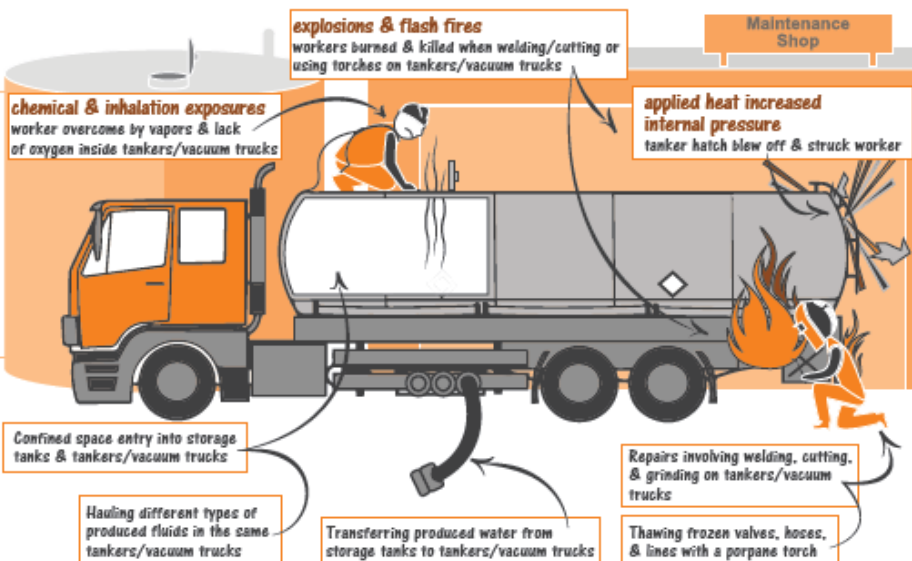
Hazard Alert

## Working Safely with Produced Water and Related Equipment

Using proper safety precautions, people work safely around produced water every day. However, between 2012 and 2015, nine workers have died while performing duties associated with produced water tanks and tanker/vacuum trucks during maintenance shop operations, equipment yard activities, and oil and gas operations. In each incident, the assumption was made that the tank or tanker/vacuum truck contained only "water" and did not present a hazard. Recognizing and understanding the job hazards can prevent potential fires, explosions, and health hazards.

Produced water, also known as brine, salt water, and production water is brought to the surface, along with oil and gas, and separated during production operations. Tanks and tanker/vacuum trucks are used to store or transport produced water and may also contain hydrocarbons and chemical contaminants (i.e.  $H_2S$ , benzene). These contaminants may release toxic and flammable vapors.

## Understand The Hazards



### Employers

#### Must conduct exposure and hazard assessments at the worksite and review with workers:

- Hazards of possible hydrocarbons being present
- Safety Data Sheets (SDSs) on produced water
- Proper use & limitations of PPE (eye, face, skin, FRC, hearing protection) & respiratory protection

#### Must establish safe work practices and procedures for:

- Hot work, confined space, LOTO
- Venting tanks to safe areas before hot work, confined space entry, or during loading operations
- Thoroughly cleaning tanks before beginning work
- Continuously monitoring (i.e. 4-gas meter) for  $H_2S$ , oxygen, and lower explosive limits (LELs)
- Thawing frozen valves, hoses, & lines

#### Must implement and train workers on additional hazard control measures, including:

- Recognizing and eliminating ignition sources
- Equipment approved for hazardous locations (i.e. tools, lights, emergency shutoff for diesel trucks, etc.)
- Air monitoring devices and procedures
- Grounding and bonding requirements
- Hot work permits and other safe work practices (i.e. confined space, LOTO, etc.)
- Emergency Action Plan

#### Must verify sub-contractors are following work practices/procedures

### Workers

Your employer has established safety procedures for your protection, including a Hazard Assessment and Work Practices/Procedures

#### Follow your employer's Hazard Assessment and established Work Practices/Procedures

- Use proper grounding/bonding
- Obtain appropriate safe work permits (i.e. hot work, confined space, etc.) before beginning work
  - Have supervisors sign off on permit/audit work procedures
  - Review hazards with supervisor
- Attend hazard communication training — know the hazards of the fluids in the tanker/vacuum trucks
- Be aware of potential ignition sources (i.e. static, cell phones, open flames, sparks from tools or metal objects, etc.)
- Use air monitoring devices and heed all alarms
- Use required PPE
- Evacuate & report hazards immediately

If you're uncertain about potential risks,  
**STOP THE JOB AND ASK —**  
**IT COULD SAVE YOUR LIFE!**

Through the OSHA/NIOSH National Steps Alliance, the Produced Water Hazard Alert is for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. April, 2016

Under the Occupational Safety and Health Act, employers are responsible for providing a safe and healthy workplace and workers have rights. OSHA can help answer questions or concerns from employers and workers. OSHA's On-site Consultation Program ([www.osha.gov/onconsultation](http://www.osha.gov/onconsultation)) offers free and confidential advice to small and medium-sized businesses, with priority given to high-hazard workplaces. For more information, contact your regional or area OSHA office ([www.osha.gov/OSHAmap.html](http://www.osha.gov/OSHAmap.html)), call 1-800-321-OSHA (6742), or visit [www.osha.gov](http://www.osha.gov).



## REMEMBER: Empty Tanks May Still Contain Flammable and Toxic Vapors

# Thank You

Any Questions

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J.D. Danni

OSHA Region VIII

Safety and Health Specialist (Oil & Gas)

720-264-6581

[danni.jd@dol.gov](mailto:danni.jd@dol.gov)