

Questions and answers about oil and gas wastewater spills

John Flesher, Associated Press, 1-21-15

Nearly 3 million gallons of briny water generated by crude oil production has leaked from a North Dakota pipeline and reached two creeks, making it the biggest spill of this type of wastewater since the state's Bakken formation oil boom began in 2006.

Here are some questions and answers about oil and gas saltwater spills:

Q: What does this liquid consist of, and where does it come from?

A: Trapped within underground rock is naturally occurring water that can be more than 10 times saltier than the oceans, depending on the location. It accumulates in porous formations that also contain oil and gas deposits, so it rises to the earth's surface when those hydrocarbons are pumped out. The industry and regulators refer to the wastewater by different terms, including "produced water," "saltwater," "brine" and "formation water."

Q. Does it include the fresh water that is forced underground during hydraulic fracturing, or "fracking?"

A. Much of that water returns to the surface as well. Some states consider it a type of produced water, while others give it a different label, such as "flowback."

Q. How much of this wastewater does the industry generate?

A. More than 800 billion gallons a year nationwide, according to the U.S. Geological Survey. The typical well yields much more water than oil or gas.

Q. Is the wastewater dangerous?

A. Congress has exempted it from classification as hazardous waste. But it can contain benzene, toluene and other organic compounds, along with heavy metals such as arsenic, mercury and lead, plus varying levels of radiation. Fracking fluids also contain chemicals that help break apart rock formations and free trapped oil and gas.

Q. What happens when it comes to the surface?

A. It is separated from the useful hydrocarbons at the wellhead. Some is re-used for fracking or — if it isn't too salty or polluted — for irrigation, power generation or other purposes. Most is injected back underground or stored in pits where the water can evaporate, leaving behind solid residues that can be placed in a landfill.

Q. How do spills happen?

A. Some result from equipment malfunctions, or from ruptures of pipelines that carry the wastewater to injection wells or other disposal sites. In some cases, trucks carrying briny water have overturned and spilled. There have been reports of drivers deliberately releasing the water in isolated spots.

Q. How frequent are spills?

A. State records show that spills of less than 100 gallons are commonplace. In North Dakota alone, 141

pipeline leaks were reported in 2012. A rupture in 2006 spewed 1 million gallons into a creek, aquifer and pond. Another million-gallon spill last July spewed from an underground pipeline on the Fort Berthold Indian Reservation.

Q. How damaging are oil and gas wastewater spills?

A. Even large amounts released into a lake or river can be diluted relatively quickly, unlike oil. But smaller water bodies and land can be contaminated. Salt can sterilize soils, making them unsuitable for plant growth. Ranchers in many states have lost crop and grazing lands to saltwater spills. Polluted plants and water can be toxic to wildlife.