Photo by NASA

FACT SHEET:

Environmental and Health Concerns About Oil and Gas Spills After Hurricane Harvey

Texas' oil and gas regulator, the Railroad Commission of Texas, has received reports of spilled oil, gas, and other fluids from at least 20 locations, involving thousands of barrels of oil and produced water.

We may never know the full impacts of these spills, but here's what we know now:

Pollution Concerns with Oil and Gas Wells

An oil or gas well operating in normal conditions produces water in addition to oil and/or gas. The water comes from naturally occurring formations deep underground, and may be mixed with the targeted fossil fuel. As oil or gas is pumped from the ground, water also comes to the surface. That water is known as "produced water" and is too dirty to be released to surface waterways. This wastewater is typically stored at the well site in large tanks or open pits and is periodically trucked away, usually to be injected into deep underground disposal wells.

During extreme weather events, like we saw with Hurricane Harvey, wastewater storage tanks can be damaged or even float away, while open pits can flood, mixing wastewater into the floodwater.

Produced water can contain salt (which is why the produced water sometimes is called brine), naturally occurring radiation, and other naturally occurring contaminants like heavy metals.[1] If the well has been fracked, the water that comes to the surface will also contain fracking chemicals (with the highest concentration of those chemicals in the first few weeks of the well's operation).

Environmental Impacts of Spills

Wastewater spills can cause environmental damage. Produced water is known to contain 83 different toxic chemicals.[2] If produced water spills into the public water supply, these contaminants could threaten human health. Additionally, the high level of salinity has been found to harm soil health.[3]

- In normal circumstances, the salt levels in produced water can kill all vegetation and prevent its regrowth,[4] while spills into waterways can kill fish.[5] For example, a 2012 spill of 3,000 gallons of oil wastewater north of Dallas killed trees in a wildlife refuge.[6]
- We also know that oil and produced water will travel far and wide. In one post-Harvey spill, the Railroad Commission reported: "Oil stains are visible in trees 10-feet above ground level at a site about one-half mile from the location pad."[7]

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Health Concerns from Oil, Gas and Wastewater Spills

While it is unknown exactly how much oil and produced water can be found in the floodwaters of Houston, there are health concerns for anyone who was exposed to the flooding or who is involved in the cleanup process. Currently, the Houston Chronicle and other outlets are reporting that residents in Houston are experiencing skin infections, itchiness, and coughing problems after exposure to floodwaters. Skin irritation and respiratory problems are common symptoms following exposure to oil and wastewater spills.[8]

Exposure to spilled oil is associated with health effects, such as headaches and dizziness.[9] The chemicals in oil can affect the central nervous system, skin, eyes, and respiratory system. Researchers studying people living in the vicinity of past oil spills have found consistent evidence of acute toxic effects. These effects include neurological damage, eye irritation and damage, and respiratory or breathing problems among exposed residents.[10]

Poor Reporting Means Gaps in Knowledge

Unfortunately, we cannot know the extent of produced water spills since Texas does not require well operators to disclose them.[11] In the aftermath of Harvey, most produced water spills have been reported in conjunction with oil spill reporting, which is mandatory, and we likely don't know about all of the wastewater spills that have happened.

The following is a list of spills from the Railroad Commission, as of September 6, 2017. We will continue to update the list as we gain more information.

	Site	Barrels (or MCF for gas)	Material	Date RRC Added
1	Port Arthur, Jefferson County	25	Crude oil and produced water	9/6/17
2	Gunn Unit A - Sandie Creek, DeWitt County*	461	Crude oil and produced water	9/6/17
3	Montgomery County – Lillie K. Butler (17315) Lease	Unknown	Crude oil	9/6/17
4	West Hastings - Friendswood, Brazoria County	200	Crude oil	9/6/17
5	Mag. Beach - Matagorda Bay, Calhoun County	500 MCF	gas	9/6/17
6	State Tract 686 - Nueces Bay, Nueces County	Unknown	Condensate and produced water	9/6/17
7	Montgomery County – Hutcheson (23684) Lease	Unknown	Crude oil	9/6/17
8	State Tract 13 - Mesquite Bay, Aransas County	Unknown	Condensate and produced water	9/6/17
9	Liberty County – Joseph Mitchell Estate (02676) Lease	25	Crude oil	9/6/17
10	Fayette County – McCullum Hood (21482) Lease, Well No. 1	106	Crude oil and produced water	9/5/17
11	Fayette County – Karisch Pietsh (21772) Lease, Well No. 1	269	Crude oil and produced water	9/5/17
12	Fayette County - Morgan Kovar (21502) Lease, Well No. 1	220	Crude oil and produced water	9/5/17
13	Fayette County – Morgan Morgan (21656) Lease, Well No. 1	220	Crude oil and produced water	9/5/17
14	Fayette County – Red Hot Unit (22616) Lease, Well No. 1	85	Produced water	9/5/17
15	Fayette County – Scanlin (21989) Lease, Well No. 1	40	Produced water	9/5/17
16	Fayette County – Elizabeth-Taylor Unit (20177) Lease, Well No. 1	104	Crude oil and produced water	9/5/17
17	Fayette County - Vaclavik Unit (22772) Lease, Well No. 1	73	Crude oil and produced water	9/5/17
18	State Tract 118 - Aransas Bay, Aransas County	Unknown	Condensate and produced water	9/5/17
19	Sour Lake Olefins Facility - Pine Island Bayou, Hardin County	Unknown	Brine	9/5/17
20	Mount Belvieu Salt Cavern - Cedar Bayou, Chambers County	Unknown	Brine	9/5/17
21	Mercy Gas Unit - San Jacinto County	Unknown	Condensate	9/7/17
22	Boise - Orange County	5	Crude oil	9/7/17
23	Low-Burgher - Waller County	Unknown	Crude oil	9/5/17

Preventing Future Impacts: Policy Recommendations

The only way to truly prevent future spills of oil, gas and drilling-related wastewater would be to transition away from fossil fuels toward a clean energy future. In the meantime, there are steps Texas can take to prevent future spills and limit damage.

Colorado faced similar threats in September 2013, when heavy rain and flooding caused 43,478 gallons of produced water and 48,250 gallons of oil and fracking condensate to spill.[12] After the flooding subsided, the Colorado Oil and Gas Conservation Commission inspected the damage and identified best practices for the future. The Commission eventually passed new regulations, including requirements that:

- All new wells in floodplains can be shut-off remotely, and
- All wells be retrofitted with containment berms on steel rings that can contain spills.[13]

Another way to minimize damage is to keep wells out of floodplains, and to mandate a substantial buffer between oil and gas drilling sites and bodies of water, as well as homes and development. Banning the use of open-air pits for wastewater storage would also improve safety.

In order to address ongoing safety concerns associated with floodwater cleanup, the state and federal government must fund monitoring activities so that residents and first responders know what chemicals and risks that they are being exposed to during this process.

Furthermore, the state should improve reporting requirements so the public knows which chemicals are being used in drilling operations and knows when wastewater spills occur.

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