

Adam Haecker  
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To Commissioners Craddick, Wright and Christian:

My name is Adam Haecker, I am a licensed professional geologist in the State of Texas. I work in oil and gas and am a petrophysicist by training. I strongly urge you to enact more stringent regulations regarding reserve pits. Responsible oil and gas operators can bear the cost of responsibly disposing of drilling fluids. In many cases, operators are already disposing or recycling drilling fluids. I urge you to protect the public health of fellow Texans like me and my children. No parent wants their child to drink water filled with lead, arsenic or carcinogens.

Proposed Minor Rule Changes:

1. Reserve pits and mud circulation pits should be moved from “Schedule A Authorized Pits” to “Schedule B Authorized Pits,” which have more reasonable construction standards protective of groundwater and soil.
2. Operators should be required to close pits using reasonable standards that ensure protection of the environment and groundwater. This should include groundwater monitoring for up to 5 years after pits have been closed.
3. Operators should be required to notify and obtain a landowner’s permission before permanently burying waste on their land.

Opinion of Revised Regulations:

As I read it, the updated rule imposes no construction, operation, or closure requirements on these pits. While the new pit registration requirement may be helpful in identifying pit locations, it will not eliminate the inherent hazards reserve pits pose to groundwater or land. Reasonable construction standards, liner requirements, groundwater monitoring, pre-closure testing of waste, and closure standards are the best ways to protect our groundwater and preserve our land.

Discussion of Data:

After reviewing the proposed regulations and aquifer reports for Texas Water Development Board (TWDB) for areas of heavy oil and gas drilling, the reported contaminants are getting worse in many cases. It is easy to access reports from the 1960s to today on the TWDB website, and the same issues that were reported in the 1960’s continue to plague areas

surrounding oil and gas activity like Commissioner Craddick's hometown, Midland, Texas. I realize that Railroad Commission of Texas (RRC) does not regulate aquifers, but you do regulate the source of the problem, reserve pits!

Here is a summary of the public health risks from contaminants from reserve pits. Contamination from reserve pits has a significant impact on public health, particularly in regions where aquifers are a primary source of drinking water. Reserve pits, often unlined or poorly managed, can leak toxic substances into the groundwater, introducing a range of harmful chemicals and pollutants into nearby aquifers. Here's how specific contaminants from reserve pits affect public health:

### **1. Hydrocarbons (Benzene, Toluene, Xylene)**

- **Health Risks:** Long-term exposure to hydrocarbons, especially benzene, is linked to increased cancer risks, particularly leukemia. These compounds can also cause reproductive issues, damage to the nervous system, and immune system dysfunction.
- **Sources:** Hydrocarbons often leach into aquifers from reserve pits where drilling fluids, oil, and gas wastes are stored. Improperly lined pits allow these chemicals to seep into the soil and groundwater.

### **2. Heavy Metals (Lead, Arsenic, Cadmium)**

- **Health Risks:** Heavy metals like lead and arsenic are known carcinogens and neurotoxins. Lead exposure is especially dangerous for children, leading to developmental delays and cognitive impairments. Arsenic exposure is linked to skin lesions, cardiovascular disease, and certain cancers.
- **Sources:** Reserve pits often contain drilling muds and fluids contaminated with heavy metals. These metals can migrate into aquifers, posing a serious threat to communities that rely on these water sources for drinking.

### **3. Salts and Chlorides**

- **Health Risks:** High concentrations of salts, particularly chlorides, in drinking water can lead to hypertension, kidney damage, and gastrointestinal issues. Saline contamination also makes water unpalatable and unsuitable for irrigation.
- **Sources:** Reserve pits frequently hold brine and produced water (a byproduct of oil and gas extraction), which are high in salts. When pits are not properly sealed or are located near sensitive aquifers, these salts can infiltrate groundwater.

### **4. Volatile Organic Compounds (VOCs)**

- **Health Risks:** VOCs such as benzene and toluene are particularly dangerous due to their volatility and ability to evaporate into the air and dissolve in water. Exposure can lead to respiratory problems, liver and kidney damage, and in severe cases, cancer.
- **Sources:** VOCs are commonly present in drilling byproducts stored in reserve pits. When pits leak, these compounds can migrate into both the air and groundwater, contaminating aquifers and endangering surrounding communities.

## 5. Methane Gas

- **Health Risks:** Methane in groundwater doesn't typically pose a direct health risk when consumed, but it can lead to explosions in confined spaces if it accumulates. Inhalation in high concentrations can lead to asphyxiation.
- **Sources:** Methane can seep from reserve pits or oil and gas wells into groundwater, especially in regions with active drilling operations, like the Permian Basin and Eagle Ford Shale. This can contaminate drinking water wells and cause explosive hazards in homes.

Here is a summary of the different contaminants in the major Aquifers of Texas as described by the Texas Water Development Board (TWDB). I believe you have a duty to the people of Texas to mitigate this important source of ground water pollution. It is in the best interest of all landowners, and anyone who drinks water in this state on a regular basis.

Texas aquifers have been impacted by a variety of contaminants, mainly from oil and gas operations, agriculture, and industrial activities. You will see a recurring theme of contamination from reserve pits. Here's a breakdown of major contaminants found in some of the state's most important aquifers from data sourced from TWDB Texas Aquifers study, 2016:

### 1. Ogallala Aquifer

- **Contaminants:** Nitrates, arsenic, hydrocarbons (from oil production), and salts.
- **Sources:** Agricultural runoff, leaking oil wells, and improper disposal of drilling fluids.
- **Impact:** Elevated nitrate levels have been detected in many parts of the Ogallala, posing risks to drinking water and agriculture. Arsenic levels above safe drinking standards have also been found.

### 2. Edwards Aquifer

- **Contaminants:** Fecal coliform bacteria, pesticides, volatile organic compounds (VOCs), and heavy metals (like lead).
- **Sources:** Urban runoff, agricultural activities, and industrial pollution.
- **Impact:** The Edwards Aquifer, which supplies water to over 2 million people, is vulnerable due to its karst nature, which allows rapid movement of contaminants. Bacterial contamination from septic systems and runoff is a major concern.

### 3. Carrizo-Wilcox Aquifer

- **Contaminants:** Nitrates, pesticides, radionuclides, and hydrocarbons.
- **Sources:** Agricultural runoff, oil and gas extraction, and natural radionuclides.
- **Impact:** Significant nitrate pollution has been detected due to extensive agricultural use. In some areas, hydrocarbons from nearby oil extraction activities have been reported.

### 4. Trinity Aquifer

- **Contaminants:** Chlorides, sulfates, heavy metals, and benzene.
- **Sources:** Oil and gas activities, improper disposal of drilling fluids, and leaking reserve pits.
- **Impact:** The Trinity Aquifer is critical for both urban and rural water supplies, but contamination from nearby oil and gas wells, including benzene (a known carcinogen), threatens water quality in many regions.

### 5. Gulf Coast Aquifer

- **Contaminants:** Salinity, hydrocarbons, heavy metals, and radionuclides.
- **Sources:** Industrial waste disposal, saltwater intrusion, and oil and gas activities.
- **Impact:** The Gulf Coast Aquifer is heavily impacted by saltwater intrusion, particularly due to over-pumping. In addition, oil and gas operations have introduced hydrocarbons and other toxic chemicals.

### Common Contaminants Across Texas Aquifers:

- **Nitrates:** Common in agricultural areas due to fertilizer runoff.
- **Arsenic and Heavy Metals:** Naturally occurring but elevated due to industrial activities and oil and gas extraction.

- **Volatile Organic Compounds (VOCs):** Often introduced through oil and gas production, VOCs like benzene, toluene, and xylene are frequently found near drilling sites.
- **Salts:** High salinity levels often result from the improper disposal of drilling fluids or oilfield brines, which can seep into the groundwater.