Oil Industry Wastewater Injection Has Overpressurized Aquifers For Decades, Threatening California Drinking Water

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A new report from the Washington, D.C-based Environmental Action Center (EAC) on California's underground injection program finds that oil industry wells in the state have been overpressurizing some aquifers for decades, risking the contamination of neighboring aquifers that might contain drinkable water. Despite full awareness of the problem, state regulators have done little to stop them.

Oil and gas operations use millions of gallons of water each year, and one of the most economical — as well as problematic — methods of wastewater disposal is to inject it back into underground rock formations known as "geologic zones." These geologic zones are deemed suitable for wastewater disposal based on their depth, permeability, and confinement characteristics.

They are also required by law to not serve as potential sources of drinking water based on the chemical characteristics of the water already present in the rock formation.

There are tens of thousands of wastewater disposal and enhanced oil recovery wells across the Golden State. California's Division of Oil, Gas, and Geothermal Resources (DOGGR), which oversees the state's underground injection program, has admitted that many of these wells lack legally-required data and documentation to ensure their operations are safe, according to the EAC report, but the agency continues to allow them to operate nonetheless.

Oilfield wastewater can contain a wide range of contaminants, including toxic volatile organic compounds known as BTEX compounds, which occur naturally in crude oil, as well as heavy metals and other toxic compounds.

When wastewater injection is not properly managed, migration of these compounds out of the intended injection zone can occur, which, in turn, contaminates surrounding aquifers. Overpressurization of wastewater injection zones, specifically, is known to lead to the contamination of underground sources of drinking water.

The EAC study reviews DOGGR's own data and documentation for a project in the San Ardo field, a large oil field in Monterey County, California within the Salinas Valley Groundwater Basin, which the group says has been used for injection of waste fluids "despite repeated technical failures, evidence of fluid migration out of the intended geologic zone, and other clear contamination risks."

"The records show that for decades, and continuing through the present day, DOGGR has allowed the injection of waste fluids into areas where there is excessive hydrostatic pressure, i.e. local pressure resistance and volumetric capacity in the injection zone is exceeded by the volume and pressure of waste fluids injected," EAC said in a statement about its findings. "The industry and DOGGR have repeatedly sought short-term fixes for continued injection of waste fluids, including drilling new disposal wells in already overpressured zones."

DOGGR sent a letter in mid-2015 notifying Chevron, the operator of the wastewater injection wells in question, that overpressured zones within the San Ardo field required exemptions from the EPA for wastewater disposal wells to continue to operate. "Each of these zones, some as shallow as 2000 feet, have yet to receive an aquifer exemption," EAC found, adding: "These injection operations continue today."

The EAC reported found similar programmatic failures have allowed risky oilfield wastewater injection to continue in Fresno County. "Injection well projects in the city of Riverdale and Raisin City, located within the boundaries of Fresno's Sole Source Aquifer, were initially permitted and have continued operating despite lacking legally-required geologic and engineering data and documentation," the group said.

"DOGGR has failed for years to force operators to comply with waste injection rules in Monterey and Fresno counties," EAC's David Reed told DeSmogBlog. "During our research we discovered several cases where these regulatory failures, and an accommodating agency culture, impacted DOGGR's oversight of industry. In Monterey and Fresno counties, injection projects were allowed to continue despite clear evidence of technical failures, injection zone pressure issues, and missing data and documentation; regulatory measures not only required by law, but critical to safe operation."

These case studies are just two examples of how DOGGR is letting oil companies flout federal and state law rather than disrupt their operations. DOGGR is currently pursuing exemptions for as many as 60 aquifers after it was revealed last year that the agency had improperly permitted thousands of wastewater injection wells to operate in zones that should have been protected by law.

"This broken regulatory culture promotes far too much accommodation for industry, particularly in light of the close proximity of many of the injection projects to shallow aquifers and aquifer recharge areas," Reed said.

EAC submitted a petition yesterday requesting that DOGGR amend its well stimulation treatment and chemical testing and disclosure requirement regulations. “Current oil and gas regulations fail to address the real risks of migration of injection fluids, through induced fractures and overpressurization during exploration, production and disposal,” Reed said. “Similarly, the absence of chemical testing and disclosure requirements allows a proprietary cocktail of industrial fluids to be injected into shallow groundwater zones, despite the known toxicity of many of these chemical constituents.”

California’s drinking water supply is already in danger and these operations risk damaging it further, Reed added, saying, “We have submitted this petition to try to protect California and its water sources.”

Hollin Kretzmann of the Center for Biological Diversity, who was not involved in the EAC report, noted that Monterey County voters can reduce the risks caused by reckless oil company injections by approving the Measure Z ballot initiative in this November’s election cycle. Measure Z would ban the use of fracking and other high-intensity methods of oil and gas extraction such as acid stimulation, as well as ban new oil and gas operations and phase out operational oil and gas wells in the county.

“This report raises troubling concerns about water-pollution risks from oil industry injection wells in Monterey County,” Kretzmann told DeSmogBlog. “The oil industry has been over-pressurizing aquifers in the San Ardo oilfield and elsewhere, which has likely led to migration of oil waste fluid. That could cause contamination of nearby water sources, yet state oil officials have done almost nothing to check this dangerous practice.”