

USGS Groundwater Study in and Near the Orcutt Oil Field Analyzes Data from Groundwater and Oil Wells to Determine if Water and/or Thermogenic Gas from Oil-Bearing Formations Have Mixed with Groundwater

A U.S. Geological Survey (USGS) study in and near the Orcutt Oil Field analyzes newly collected and historical data from groundwater and oil wells to determine if water and/or thermogenic gas (methane, propane, ethane, and butane) from oil-bearing formations have mixed with groundwater. The study "[Occurrence of water and thermogenic gas from oil-bearing formations in groundwater near the Orcutt Oil Field, California, USA](#)" was published in *Journal of Hydrology: Regional Studies*. The USGS is conducting this research under an agreement with the State Water Resources Control Board (State Water Board), in accordance with Senate Bill 4 (Pavley, statutes of 2013), which required the State Water Board to develop and implement a regional groundwater monitoring program.

The findings of this study indicate most groundwater in the area of the Orcutt Oil Field is of good quality based on historical and recent sample data. The chemical and isotopic composition of three of the 15 groundwater samples collected as part of the study indicate potential mixing with water and/or thermogenic gas from oil-bearing formations. However, there was not enough information to distinguish whether these detections resulted from natural or man-made factors. Additional insight on the potential sources and pathways of fluid mixing could be provided by end-member sampling, new monitoring wells and geophysical information, and assessments of potential vertical head gradients.

Data associated with this report are also available online:

- [Water chemistry data for samples collected at groundwater sites near the Orcutt Oil Field, September 2017–March 2018, Santa Barbara County, California](#)
- [Historical produced water chemistry data compiled for the Orcutt and Oxnard oil fields, Santa Barbara and Ventura Counties, southern California](#)
- [Produced water chemistry data collected from the Orcutt oil field, 2018, Santa Barbara County, California](#)

Visit the State Water Board [Oil and Gas Regional Groundwater Monitoring Program](#) and [USGS California Oil, Gas, and Groundwater](#) websites for more information.