

## **The United States Geological Survey's Preliminary Findings Confirm that Ventura County Must Immediately Implement a Moratorium on Drilling and Steam Injection**

*The Ventura County Board of Supervisors has proposed an immediate moratorium on drilling new oil and gas wells, re-drilling existing wells and producing oil through steam injection in the Oxnard Plain.<sup>1</sup> This urgent request is based on preliminary findings from the United States Geological Survey (USGS) that identified oil-related gases in groundwater samples from and within the vicinity of the Fox Canyon aquifer system.<sup>2</sup> This motion must be passed to protect water resources and keep an oil exploration firm from using dangerous extraction methods to tap crude oil in the Vaca Tar Sands.<sup>3</sup>*

### **USGS's Preliminary Findings**

In February 2019, the USGS presented preliminary findings on groundwater quality results in the Oxnard oil field to a public stakeholder meeting. The study is being conducted as part of the State Water Resources Control Board's (SWRCB) Oil and Gas Regional Groundwater Monitoring Program. About 100 onshore oil fields were examined by the USGS, including Oxnard, which was selected by the SWRCB for a detailed study in 2017.<sup>4</sup>

The USGS collected samples from 14 groundwater wells within and around the Oxnard oil field, and detected thermogenic methane (oil-related gases) in 3 of the wells. The gas contamination occurred in wells near the highest density of oil activity and in areas further away, suggesting that the gas also migrated through underground pathways.<sup>5</sup>

The USGS told the *Ventura County Star* that they are “pretty confident that the thermogenic gases indicate a connection between the oil and gas formations, and the water that [they] sampled in the agricultural [groundwater] wells.”<sup>6</sup>

### **A Moratorium Must Be Enacted**

The Fox Canyon aquifer system provides irrigation water for thousands of acres of agricultural land and drinking water for hundreds of thousands of Ventura County residents.<sup>7</sup> It's clear from the USGS's preliminary findings that existing oil activity has compromised the integrity of the groundwater, possibly from impaired infrastructure like faulty well casings, which are a common cause of oil- and gas-related groundwater pollution.<sup>8</sup> Moreover, the risk of groundwater contamination is greater with cyclic steam injection than other drilling techniques because of its propensity for breaking well casings.<sup>9</sup>

#### *Peak Operator's Oxnard Oil Plans*

Peak Operator is planning to drill as many as 200 new wells<sup>10</sup> in Oxnard's Vaca Tar Sands using a combination of technologies known as Cyclic Steam Injection (also referred to as steam-fracking) and Steam Assisted Gravity Drainage.<sup>11</sup> The proposed wells are above Oxnard's groundwater basin and just over a mile away from two additional aquifers.<sup>12</sup>

The underground pressure from steam injection can push the bitumen (the tar sands oil) — and its contaminants — into nearby rock formations and aquifers through naturally occurring fissures and faults.<sup>13</sup> Moreover, tar sands steam injection poses extra risks because bitumen is naturally comprised of the carcinogenic chemicals benzene, toluene, ethylbenzene, and xylene, which can also cause liver lesions and central nervous system irritation.<sup>14</sup>

### **Act Now!**

The Ventura County Board of Supervisors must pass the proposed emergency moratorium on drilling and steam injection to protect our water and further look into projects like the one being proposed by Peak Operator. Sign the petition: <https://fwwat.ch/protect-ventura-water>.

## Endnotes

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- <sup>1</sup> Bennet, Steve. Ventura County Supervisor Chair, Supervisor of the First District. Letter to Board of Supervisors. “Recommendation of Supervisor Bennett To Direct the Planning Division To Promptly Return to the Board with a Proposed Interim Ordinance Pursuant To Government Code Section 65858 To Temporarily Prohibit The County’s Approval Of New Oil And Gas Wells, And Re-Drilling Of Existing Oil And Gas Wells, For Oil Production That Will Utilize Steam Injection In The Vicinity of Potable Groundwater Aquifers While the County Studies Potential Regulations For This Land Use; All Supervisorial Districts.” April 9, 2019 at 1.
- <sup>2</sup> U.S. Geological Survey Stakeholder Meeting, February 25, 2019. Available at [https://www.waterboards.ca.gov/board\\_info/media/feb2019/usgs\\_stakeholder\\_meeting%20022519.html?fbclid=IwAR1DHAoqeY8nL4sxEeKUuPhOc30na2Tb\\_Rh8t0E\\_OFtf0UBcbuUH4ybmvs](https://www.waterboards.ca.gov/board_info/media/feb2019/usgs_stakeholder_meeting%20022519.html?fbclid=IwAR1DHAoqeY8nL4sxEeKUuPhOc30na2Tb_Rh8t0E_OFtf0UBcbuUH4ybmvs); Bennet (2019) at 1 and 2.
- <sup>3</sup> Allison, Bruce. “Squeezing more oil out.” *McClatchy -Tribune Business News*. June 26, 2010; Natural Resources Agency of California. Department of Conservation. Division of Oil, Gas and Geothermal. “Report of Property and Well Transfer: Oxnard Field, Ventura County.” February 15, 2017.
- <sup>4</sup> Email correspondence with USGS California Water Science Center Program Office. April 17, 2019. On file with Food & Water Watch.
- <sup>5</sup> Rosencrans, Celia et al. United States Geological Survey. Meeting abstract. “Groundwater Quality Results from the Regional Monitoring Program Study of the Oxnard Oil Field, Presented at California State Water Resources Control Board Stakeholder.” February 2019.
- <sup>6</sup> Wilson, Kathleen. “Moratorium proposed on new oil drilling based on water issues.” *Ventura County Star*. April 10, 2019.
- <sup>7</sup> Bennet (2019) at 1.
- <sup>8</sup> Jackson, R.E. et al. “Groundwater Protection and Unconventional Gas Extraction: The Critical Need for Field-Based Hydrogeological Research.” *Ground Water*. Vol. 51. 2013 at 488-510; Davies, Richard J. et al. “Oil and Gas Wells and their Integrity: Implications for Shale and Unconventional Resource Exploitation.” *Marine and Petroleum Geology*. Vol. 56. 2014 at 239 to 254; Darrah, Thomas H. et al. “Noble Gases Identify the Mechanisms of Fugitive Gas Contamination in Drinking-Water Wells Overlying the Marcellus and Barnett Shales.” *Proceedings of the National Academy of Science*. Vol. 111, No. 39. 2014 at 14076 to 14081.
- <sup>9</sup> Khakim, M. Yusus Nur et al. “Geomechanical modeling for InSAR-derived surface deformation at steam-injection oil sand fields.” *Journal of Petroleum Science and Engineering*. Vol. 96-97. 2012 at 152, 154 and 160; Talebi, S. et al. “Seismicity and Casing Failures Due to Steam Stimulation in Oil Sands.” *Pure and Applied Geophysics*. Vol. 153. 1998 at 220, 221 and 228.
- <sup>10</sup> Bell, Robert A. (Bob). President & CEO, Peak Operator LLC. E-Mail to Vlasko, Leila California Department of Conservation. February 2, 2018; Lilis Energy. [Press Release]. “Nuno Brandolini and Robert Bell Join Lilis Energy’s Board of Directors.” February 13, 2014; Peak Operator LLC. “Field Development Applications.” Available at [http://peakoperator.com/?page\\_id=155](http://peakoperator.com/?page_id=155). Accessed March 2018; Peak Operator LLC. “Operations.” Available at [http://peakoperator.com/?page\\_id=42](http://peakoperator.com/?page_id=42). Accessed March 2018.
- <sup>11</sup> Peak Operator LLC. “Field Development Applications.” Available at [http://peakoperator.com/?page\\_id=155](http://peakoperator.com/?page_id=155). Accessed March 2018; Peak Operator LLC. “Home.” Available at <http://peakoperator.com/>. Accessed March 2018; Cox, John. “State loosens ‘fracking’ ban near Taft.” *Bakersfield Californian*. February 28, 2012; Mukhametshina, Albina et al. “Asphaltene Precipitation During Bitumen Extraction with Expanding-Solvent Steam-Assisted Gravity Drainage: Effects on Pore-Scale Displacement.” *SPE Journal*. April 2016 at 380, 381 and 383.
- <sup>12</sup> Food & Water Watch mapped the relative position of underlying groundwater basins and planned/existing tar sand wells. California Division of Oil, Gas & Geothermal “DOGGR Well” and “Oil/Gas Fields” data for the location and ownership of the wells is available at <https://maps.conservation.ca.gov/doggr/wellfinder/#close>. Accessed April 2018; California Department of Water Resources “Bulletin 118” data for extent and position of ground water basins is available at <https://www.water.ca.gov/Programs/Groundwater-Management/Bulletin-118> access. Accessed April 5, 2018; A two-kilometer buffer of the Oxnard oil field was created using the “create buffer” tool and overlaps was visually confirmed. Two-kilometer range of contamination observed by Korosi, Jennifer. “In-situ bitumen extraction associated with increased petrogenic polycyclic aromatic compounds in lake sediments from the Cold Lake heavy oil fields.” *Environmental Pollution*. Vol. 218. 2016 at 1 to 2.
- <sup>13</sup> Korosi (2016) at 1 to 2; Kelly, Erin N. “Oil Sands Development Contributes Elements Toxic at Low Concentrations to the Athabasca River and Its Tributaries.” *Proceedings of the National Academy of Sciences of the United States of America*. Vol. 107, No. 37.2010 at 16178 and 16182.
- <sup>14</sup> National Academies of Sciences Engineering, and Medicine. (2016) at 60; Fayemiwo, OM et al. “BTEX Compounds in Water – Future Trends and Directions for Water Treatment.” *Water S.A.* Vol. 43, No. 4. October 2017 at 602; Nwaichi, Eucharia O. et al. “Evaluation and Decontamination of Crude Oil-Polluted Soils Using *Centrosema pubescens* Benth and Amendment-Support Options.” *International Journal of Phytoremediation*. Vol. 13. 2011 at 373.