



# DEPARTMENT OF CONSERVATION

*Managing California's Working Lands*

## Division of Oil, Gas, & Geothermal Resources

801 K STREET • MS 20-20 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 445-9686 • FAX 916 / 323-0424 • TDD 916 / 324-2555 • WEB SITE [conservation.ca.gov](http://conservation.ca.gov)

February 16, 2011

The Honorable Fran Pavley  
California State Senate  
23rd State Senate District Office  
2716 Ocean Park Blvd. Ste 3088  
Santa Monica, CA 90405

Dear Senator Pavley;

I appreciate your letter concerning the practice of "hydraulic fracturing" as it relates to the recovery of natural gas in California. Recent news events have brought to light the use of hydraulic fracturing in gas shale, similar to those found in Texas, such as the Barnett Shale and the Marcellus Shale, which are located in the eastern states of New York and Pennsylvania, respectively. In these shale formations, the gas production is not associated with oil production and is referred to as *non-associated gas production*. Although California, as the fourth largest oil and gas producing state in the nation, indeed has some oil and gas production from shale formations, it is not noted for shale non-associated natural gas production. Over 90 percent of California's non-associated gas production occurs in northern California, north of Stockton, and is produced from sands, rather than from shale. This is because sands do not respond well to hydraulic fracturing. While the Division is aware of industry white papers touting the potential for increasing non-associated natural gas production in the state through hydraulic fracturing, the associated costs of production may remain too high to be beneficial at present natural gas prices. Since 2006, the non-associated gas production in California has been on the decline. (2008 Annual Report of the Oil and Gas Supervisor.)

### History and Definition of Hydraulic Fracturing

Hydraulic fracturing, which was first introduced in western Kansas in 1947, has been used primarily to overcome wellbore damage and to create deep-penetrating reservoir fractures to improve the productivity of a well.

Hydraulic fracturing associated to natural gas production from shale and other underground deposits is related to creating deep-penetrating reservoir fractures to improve the productivity of a well. More specifically, hydraulic fracturing is a process that involves injecting fluids into a wellbore at pressures that exceed the strength of the formation (rock), thereby resulting in the formation breaking down or fracturing. Typically, a propping agent, such as sand, is also injected into the well to ensure the

fractures in the formation remain open. This process increases the permeability of the formation and, therefore, increases the production of the resource.

Responses to your questions are presented below in the order included in your letter:

- **What is the extent to which hydraulic fracturing is used, including number and location of wells?** The Division is unable to identify where and how often hydraulic fracturing occurs within the state. The limited data we have is unreliable as there are neither reporting requirements nor regulatory parameters of when, how, and what needs to be reported when applying for permits. Although the Division has statutory authority to regulate hydraulic fracturing under Section 3106 of the Public Resources Code, the Division has not yet developed regulations to address this activity. A BCP was approved last year to provide additional resources to address deficiencies in the Underground Injection Control Program (UIC). These resources were to put engineers in the field for inspections, monitoring, compliance, and equipment testing functions; to provide an environmental planner to address CEQA issues, and an environmental planner to address regulatory and CEQA tasks. Late passage of the Budget, the subsequent hiring freeze, ensuing retirements, and existing vacancies have delayed much progress for this program. As we are able to thoroughly assess the UIC Program, the Division will begin the process of determining what regulations are needed as well as identifying any necessary additional resources to ensure the Division and the industry is in compliance with state and federal law.
- **What is the amount of energy produced using hydraulic fracturing?** The Division permits well drilling, re-drilling, deepening, and any permanent alteration of well casing. The Division collects annual assessment amounts from the operators based upon each barrel of oil and/or metric cubic feet (mcf) of gas produced. However, the Division is not aware of the amount of energy produced using hydraulic fracturing, since there is no provision in the statutes requiring the reporting or collection of this information.
- **What is the amount of water used in the hydraulic fracturing process?** Recent literature indicates that in the Barnett Shale (located in Texas) an estimated 70,000 barrels of water per well are injected for hydraulic fracturing. Again, because California has no such reporting requirements for this specific information, the Division does not have information specific to the practice here.
- **Does the Division have any information regarding the safety, efficacy, and necessity of hydraulic fracturing as it is currently employed in California?** Again, because there are no reporting requirements for hydraulic fracturing, the Division has no data on the safety, efficacy, and necessity as currently employed in California. The Division's mission is to prevent damage to life, health, property, natural resources, and underground and surface waters suitable for irrigation or domestic purposes. (CA Public Resources Code Section 3106). The Division has no known reports of damage occurring in relation to hydraulic fracturing.

- **Is the Division able to provide any information regarding potential risks to human or environmental health associated with hydraulic fracturing?** On February 7, 2011 the US EPA released a, “Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources.” The Plan and additional information on this subject are available at:  
<http://yosemite.epa.gov/sab/SABPRODUCT.NSF/PeopleSearch/D3483AB445AE61418525775900603E79?OpenDocument>.

#### Siting and Permitting

- **What is the current permitting process, including the duration of permits, in California for the recovery of natural gas via hydraulic fracturing?** There is currently no permitting process for the recovery of natural gas via hydraulic fracturing in the State.
- **What specific statutory and regulatory authority is in place to regulate this drilling technique, including the chemical components of the fluids that are injected into the strata during the drilling process?** As noted above, there are no regulations currently in place specific to hydraulic fracturing. In Public Resources Code Section 3106, the Supervisor permits the owners or operators of wells to, “utilize all methods and practices known to the oil industry for the purpose of increasing the ultimate recovery of underground hydrocarbons . . . [and to] do what a prudent operator using reasonable diligence would do . . . including, but not limited to, the injection of air, gas, water, or other fluids into the productive strata, the application of pressure heat or other means for the reduction of viscosity of the hydrocarbons, the supplying of additional motive force, or the creating of enlarged or new channels for the underground movement of hydrocarbons into production wells.”

However, the Division does have a UIC Program in place to address enhanced oil recovery (EOR), water disposal, and gas storage. Historically, these three methods have been treated by the Division as sustained injection. The Federal Code of Regulations defines hydraulic fracturing as one of several processes used for well stimulation to, “clean the well bore, enlarge channels, and increase pore space in the interval to be injected thus making it possible for wastewater to move more readily into the formation . . . ” (40 CFR Ch.1 Section 146.3).

Additionally, the Division has state and federal authority to permit Class II injection wells, which allow for injection of fluids produced in the course of oil and natural gas production operations. The US EPA has delegated its authority under the Safe Drinking Water Act (SDWA) to the Division to permit Class II injection wells. The SDWA specifically excludes hydraulic fracture, except when diesel fuel is used as the fracking agent. The Division has not permitted the injection of diesel fuel as it is a refined product rather than a crude product.

Before a permit is issued, the proposed injection project is studied by Division engineers and reviewed by the appropriate Regional Water Quality Control Board.

Injection project permits often include conditions, such as approved injection zones, allowable injection pressures, and testing requirements. State regulations, beginning at CA Code of Regulations Section 1724.6 *et seq.*, were designed to ensure that injected fluids are confined to the project area and zone, and that formation pressures are not exceeded to the extent that damage occurs.

- **If possible, please provide the results of any risk assessments that the State of California has conducted regarding potential groundwater contamination associated with hydraulic fracturing.** The Division does not know of any state risk assessment regarding potential groundwater contamination associated with hydraulic fracture.

Thank you for this opportunity to address your questions. If you have additional questions for the Division, please contact Marni Weber, Assistant Director, Office of Governmental and Environmental Relations, at (916) 445-8733. We would be pleased set an appointment to come to your office to provide more information and answer any further questions you may have on this issue.

Sincerely,



Elena M. Miller  
State Oil and Gas Supervisor

cc: John Laird, Secretary, California Natural Resources Agency  
Derek Chernow, Acting Director, Department of Conservation  
Marni Weber, Assistant Director, Department of Conservation