DEPARTMENT OF CONSERVATION

Managing California's Working Lands

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February 8, 2013

The Honorable Fran Pavley, Chair
Senate Committee on
Natural Resources and Water
State Capitol Room 4035
Sacramento, CA 95814

The Honorable Michael Rubio, Chair
Senate Committee on
Environmental Quality
State Capitol Room 2205
Sacramento, CA 95814

Dear Senator Pavley and Senator Rubio:

INVITATION TO PARTICIPATE IN JOINT CALIFORNIA SENATE INFORMATIONAL HEARING ON THE REGULATION OF HYDRAULIC FRACTURING IN OIL AND GAS PRODUCTION.

Thank you for the opportunity to participate in the Senate Committees on Natural Resources and Water and Environmental Quality joint informational hearing on the regulation of hydraulic fracturing in oil and gas production. On December 18, 2012, the Department of Conservation's (Department) Division of Oil, Gas, and Geothermal Resources (Division) released a discussion draft of regulations for hydraulic fracturing. The discussion draft regulations include provisions for pre-fracturing well testing, advance notification, monitoring during and after fracturing operations, disclosure of materials used in fracturing fluid, trade secrets, and storage and handling of hydraulic fracturing fluids. Additionally, the Department made available online a narrative about the development of the discussion draft regulations, and a series of frequently asked questions. Since the release, the Department has received over 15,000 comments. The Department and the Division look forward to working with the Legislature, other State agencies, the public, and key stakeholders to develop a set of regulations aimed at the protection of public health and natural resources.

Overview

The proposed placement of the regulations within Title 14, Division 2, Chapter 4, Subchapter 2 "Environmental Protection" of California Code of Regulations clarifies that the regulations will be applicable to all regulated wells in the State, both onshore and offshore. The hydraulic fracturing

regulations are of the highest priority to the Division, and any other rulemaking should not affect the hydraulic fracturing rulemaking process. The Division anticipates additional rulemakings on the Underground Injection Control (UIC) Program and well construction.

Permitting

For chemical composition disclosure for Class II wells, operators supply a geochemical analysis before any injection and prior to any change in the injection fluid source.

Hydraulic fracturing regulation "beyond the well-head"

The Department does not have sole authority over hydraulic fracturing and the disposal of waste hydraulic fracturing fluids. The Department has taken proactive steps to reach out to the State Water Resources Control Board, the Department of Toxic Substances Control, the Division of Occupational Safety and Health (Cal/OSHA), and the Air Resources Board to discuss any shared authority regarding the entirety of the hydraulic fracturing process. Currently, Division regulations and the discussion draft do not address air or water quality monitoring in the vicinity of hydraulic fracturing operations.

Public health and safety

As currently drafted, the proposed regulations allow a health professional to obtain the trade secret information to assist in the diagnosis or treatment of an individual who has sought medical care for exposure to hydraulic fracturing.

The proximity to a school, hospital, daycare center, or other sensitive location where hydraulic fracturing operations could be conducted would be decided by the local land-use authorities. The Division does have additional drilling safety requirements for wells in the vicinity of occupied buildings and areas. However, those regulations do not impose any restrictions on the hydraulic fracturing of the well.

Definitions

It is anticipated that definitions will be further refined as we work through the workshops. Well stimulation operations may be used on wells that comprise Class II underground injection control well projects.

Trade secret information

The California Civil Code section 3426.1 defines "trade secret" as information, including a formula, pattern, compilation, program, device, method, technique, or process that derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use; and is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

Records that are subject to trade secret protection are exempt from disclosure under the Public Records Act. The Division's concern about being a custodian of trade secret records is that possession of those records will result in the Division being a necessary party to extensive litigation of trade secret claims. For this reason, the Division has limited possession of trade secret information to situations where the information would fulfill specific regulatory purposes. The regulatory purposes for obtaining trade secret information that are identified in the discussion draft are for investigation or response to evidence of spills or other incidents. It is anticipated that other specific regulatory purposes will be identified and added in the course of the ongoing dialogue with stakeholders. The Department is also developing statutory language to provide a framework for resolving disputes involving trade secret claims, require information be provided to the Division, ensure the information is available to State and federal entities and health care professionals to address emergency and health care issues, and that unauthorized disclosure is a misdemeanor offense.

If a trade secret is claimed by an oil services supplier that goes out of business and there is no successor entity, the Division would attempt to obtain the information from the well owner/operator. However, this may prove difficult if the information was never transmitted to the owner/operator.

Technology

Stimulation
Stimulation techniques used in California can be classified as: chemical, physical, or a combination of chemical and physical. These techniques include acidization, injection of emulsion breakers, and thermal stimulation. These techniques are used to reduce scaling, clean and clear perforations, and help break down build-up that slows the flow of the natural resource. Any technique that mechanically alters the well's construction (i.e. perforating) must receive pre-approval from the local district office and then file a history of the work done.

Completion
Before penetrating oil or gas reservoirs, most wells pass through freshwater and saline aquifers. For their mutual protection, aquifer and reservoir fluids must not be allowed to migrate outside of the casing and infiltrate other strata. Such intermingling can destroy aquifer quality and impair well production.

Therefore, once a well has penetrated oil or gas sands, pipe, called casing, is used to segregate these zones from water zones. The casing is placed in the well, usually from the top of the productive oil or gas sand to the surface. To secure the casing, cement is pumped through the casing down the well bore, out the bottom of the casing, and up between the casing and the well wall. In California, such casing is called a water string.

After the water string is cemented and the cement has set, the well is drilled to the bottom of the oil zone and completed. (The oil zone may include a number of oil sand layers separated by beds of shale).

Perforated casing, called a liner, is placed in the hole throughout the oil zone. This prevents oil sand from caving into the hole while the oil enters the well through the perforations. The top of the liner usually extends only a short distance up inside the water string.

Another common type of completion in California is to cement an un-perforated string of casing through the oil zone, with cement extending through and above all possible productive intervals. After the cement has set, the casing is perforated at the appropriate point(s) in the oil or gas zone. Perforating is accomplished by lowering a perforating gun to the desired depth in the hole and firing a special type of shaped charge (jet) through the casing.

After the liner is run or the casing is perforated, tubing that is usually 2-to-3-1 /2 inches in diameter is suspended from the surface with the lower end a short distance above the top perforations. Oil or gas is produced through the tubing.

Evaluation and enforcement

The Division will strive to witness all new zone hydraulic fracturing operations and, as resources allow, a high percent of routine hydraulic fracturing operations. Generally, the Division will witness one blow-out preventer equipment (BOPE) test, occasionally two BOPE tests on deep wells before hydraulic fracturing operations, and up to four cement plug tests at plugging and abandonment following hydraulic fracturing operations. For 2012, the Division either witnessed testing (713) or inspected (366) of BOPE installations on 1,079 new drill wells; 237 of such tests were "waived." The Division was able to witness or inspect 82 percent of permits that required BOPE installations.

The Division will evaluate the hydraulic fracturing program as it progresses through routine witnessing of hydraulic fracturing operations, detailed records review, well pressure monitoring, and detailed discussions with well operators. Editing of the discussion draft regulations is needed to clarify the Division's intention that the monitoring applies to non-producing wells such as exploratory and idle wells. Monitoring data is required to be maintained by the operator and will be used by the Division as necessary to evaluate the hydraulic fracturing program. To the extent the data is submitted as production data (i.e. well pressures) or well work information (i.e. well history), it well be indefinitely stored in the Division's data management systems.

The Division does not have specific well casing failures collated on a per-year basis. Data on a well casing failure would be located in the well file. The Division collates the number of well casing failures for the Class II program to provide required information annually to the US Environmental Protection Agency.

For enforcement actions, the Division averages about 7,000 deficiency notices and about 350 violation notices to operators per year. In 2012, the Division issued 30 "orders" of the State Oil and Gas Supervisor that either assessed a penalty or compelled operators to take remedial action(s). If a sub-contractor fails to report data, the Division has an array of established enforcement authorities, including administrative, civil, and even criminal options.

Induced seismicity

Technical basis for induced seismicity

Seismic events attributable to human activities are called "induced seismic events," or induced seismicity. This is in contrast to seismic events that occur because of naturally developed conditions. Both "induced" and "natural" seismic events are the results of adjustments to changes in the stresses present in the Earth's crust. Induced seismic events are caused by several types of human endeavors such as reservoir impoundment, mines and quarries, geothermal production, waste water injection, and hydraulic fracturing.

Waste Water Injection (Salt Water Disposal [SWD]): The injection of high volumes of waste water, often under moderate-to-high pressures for lengthy periods of time, has been shown to induce seismic events when that waste water significantly changes the rocks' pore pressures in and around an existing fault. This was clearly demonstrated in the 1960's near Denver, Colorado at the Rocky Mountain Arsenal when large volumes of waste chemicals were injected under high pressure into hitherto unknown existing faults, causing earthquakes in the Magnitude 5.0 range.

A few earthquakes have been caused recently (2010, 2011, 2012) by activities related to SWD wells in Arkansas (Magnitude 4.7), Ohio (Magnitude 4.0), Oklahoma (Magnitude ~3.0), Texas (Magnitude ~ 3.0), and Colorado. These induced seismic events have been shown to have been caused by the injection, under high pressure, of large volumes of spent hydraulic fracturing fluids and native formation waters into previously unmapped deep-seated faults. The dynamic imbalance in natural pore pressures caused these faults to slip as they adjusted to the newly imposed stress regimes.

Hydraulic Fracturing (and High Volume Hydraulic Fracturing HVHF): Traditionally drilled vertical wells typically use traditional hydraulic fracturing methods (less pressure, less hydraulic fluid) than the newer horizontally drilled wells that require higher volumes of hydraulic fracturing fluids injected under greater pressures (HVHF). Unlike SWD wells, the injection of hydraulic fracture fluids is designed to fracture the reservoir rock, but is delivered over a relatively short interval of time in stages (a few hours per stage).

It is well documented that hydraulic fracturing (conventional and HVHF) induces micro-earthquakes with Magnitudes less than 1.0 (in the range of Magnitude minus 4.0 to minus 1.0). These micro-seismic events can only be detected by sensitive instruments, and pose no dangers to the built infrastructure.

Under existing authority, the Division monitors underground injection projects to ensure injection does not excessively overpressurize the injection zone, but does not monitor seismicity in the vicinity of oil and gas wells. The Division's regulations require subsurface geologic evaluations before any injection project approval. The evaluation considers injection well/zone location relative to faults. Further, regulations do not specifically require a risk analysis, but an analysis can be required when necessary.

Thank you for this opportunity to address your questions. If you have additional questions for the Department, please contact Marni Weber, Assistant Director, Office of Governmental and Environmental Relations, at 445-8733.

Sincerely,

Mark Nechodom
Director

Tim Kustic
State Oil and Gas Supervisor
Department of Conservation