



Date: July 23, 2015  
To: Patrick H. West, City Manager *PWest*  
From: Christopher J. Garner, Director of Long Beach Gas and Oil *C. Garner*  
For: Mayor and Members of the City Council  
Subject: Permits for Hydraulic Fracturing

---

Last month, the City's contractor, THUMS, received 13 permits to hydraulically fracture wells located on the oil islands. The permits were approved by the State's Division of Oil, Gas and Geothermal Resources (DOGGR) and comply with the added regulations required by Senate Bill 4. To receive the permit from DOGGR, THUMS is required to install a groundwater monitoring well to verify that the hydraulic stimulation does not in any way impact fresh water aquifers. The City is also working with the Coastal Commission to ensure we have all the required approvals.

There is no confirmed start date for the hydraulic stimulations at this time as the economics are still being evaluated. The current lower oil prices make it highly unlikely that all, if any, of the permitted stimulations will be completed.

Hydraulic fracturing is sparingly used in the local oil operations. On average, less than 10% of the wells THUMS drills are hydraulically fractured and there has been no hydraulic fracturing in the THUMS operations since 2013. Attached is a document that elaborates on how hydraulic fracturing is conducted in Long Beach and the measures taken to ensure it is completed safely. Please contact my office should you have any further questions.

CG:KT:ls

Attachment

## HYDRAULIC FRACTURING IN LONG BEACH

Hydraulic fracturing or “fracking” is a process that injects fluids, primarily water and sand, under pressure into an oil well bore so as to create or extend cracks in a targeted geologic formation to enhance production of oil and natural gas. The decision to utilize hydraulic fracturing takes into consideration the specific rock characteristics of the formation as well as the economics involved. Hydraulic fracturing is an expensive method that is normally considered only when there are significant oil reserves that may not be conventionally produced due to a “tight” rock that does not readily yield to fluid flow.

Hydraulic fracturing was first utilized on the Thums Islands in the early 1970s and has been consistently used since the mid-1990s. To date, 196 wells have been hydraulically fractured from the offshore islands without any evidence of harm to the environment. The hydraulic fracture jobs are executed by the City’s contractor, California Resources Corporation (CRC). The Long Beach Gas and Oil Department (LBGO) rigorously reviews the conceptualization of field development activities with its contractor prior to their approval. Input in this review is also provided from the State Lands Commission (SLC) technical staff. Every month, all proposed projects including any hydraulic fracturing candidates proposed by CRC are vetted at an Engineering Committee meeting comprised of LBGO, SLC, and CRC engineers and geologists (many who are registered professional engineers and geologists) representing all stakeholder interests. A Notice of Intent to drill a well is submitted to the State of California Division of Oil, Gas and Geothermal Resources (DOGGR), which approves the well only if it satisfies DOGGR’s drilling and well construction standards designed to ensure that there is no harm to groundwater.

LBGO has always followed and will continue to follow all Federal and State regulations. Beginning in 2014, DOGGR began requiring permits to fracture stimulate. To receive a permit, DOGGR requires seismic monitoring and testing of the fresh water zones before and after a fracture stimulation. Any hydraulic fracturing conducted by Thums will fully abide by this new requirement.

Below is a summary of the steps LBGO has taken to safely conduct hydraulic fracturing in Long Beach:

### **FRESH WATER USE**

Fresh water is not used in the Long Beach hydraulic fracturing jobs. Produced water, water from the oil reservoir, is utilized as the hydraulic fracturing fluid. Produced water is not suitable for drinking or any other beneficial use. The use of fresh water in hydraulic fracturing jobs was eliminated in 2013 by Thums in a concerted effort to reduce the use of fresh water.

### **AIR EMISSIONS**

A “blowout preventer” is placed on the well to prevent release of fluid or gas to the atmosphere during a fracture stimulation. Also, all of the processing tanks on the Thums islands have vapor recovery to capture all gases that are produced.

## **PROTECTION OF GROUNDWATER**

Wells undergoing fracture stimulation are not in the immediate vicinity of local groundwater production. Zonal isolation (the method of ensuring fluids stay in the intended injection zone) at the well is handled through proper casing design which is approved by DOGGR. Normally, over a half mile or more of solid rock separates the shallowest oil and gas interval that is hydraulically fractured from the deepest fresh groundwater zone. The base of the local Underground Safe Drinking Water (USDW) is at approximately 1,750 feet and key fracturing intervals are at around 4,500 feet and deeper. Geological surveys conducted have validated that fracturing is confined to the targeted productive interval. Tests of locally produced groundwater have not shown any contamination from the oil operation.

## **DISPOSAL OF FRACTURE FLUID**

The majority of the initial production from a hydraulically fractured well is the “carrier” fluid. This is sometimes referred to as flow back fluid. The flow back fluid is predominantly produced water and it is recycled in a closed system. No fracturing fluids are disposed in pits, offsite or into the ocean. The recycled fluid is used in injection wells to control subsidence and improve oil recovery.

## **SEISMIC EVENTS**

There has been no credible link between hydraulic fracturing and earthquakes in Long Beach. LBGO’s assessment of the local geology suggests that the geological structures (faults) present in the oil field are incapable of generating the amount of energy required to cause a measurable earthquake. To further the understanding, both CRC and LBGO are active participants of the Induced Seismicity Consortium (ISC) run by the University of Southern California. The goal of ISC is to determine the risk assessment of induced seismicity in connection with hydraulic fracturing and other oil field activities.

## **OVERSIGHT OF OIL OPERATIONS BY GOVERNMENTAL AGENCIES**

- U.S. Coast Guard - Certification to operate crew boats
- U.S. Army Corps of Engineers - Permit required to repair Thums islands or subsea lines
- CA Division of Occupational Safety and Health - Trench excavation permits
- CA Division of Oil, Gas, & Geothermal Resources - Drilling and well work permits
- Department of Transportation - Regulate pipelines under public roads, waterways, and rail
- South Coast Air Quality Management District - Air Permits for stationary equipment
- Regional Water Quality Control Board - dredging permits to repair or replace subsea pipelines
- City of Long Beach - Permit franchise pipelines, drilling, building and electrical
- City Fire Department - Hazardous materials disclosure permit and emergency plan review
- City Health Department - Hazardous waste producer permit