



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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**Re: APDs in 2009 or 2010**

1 message

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**Seeley, Kenneth** <kenneth.seeley@bsee.gov>  
To: "Panzer, David" <david.panzer@boem.gov>  
Cc: James Salmons <james.salmons@bsee.gov>

Wed, Feb 27, 2013 at 4:37 PM

(b) (5)

James is going to contact them.

Thanks.

Ken

On Wed, Feb 27, 2013 at 4:30 PM, Panzer, David <david.panzer@boem.gov> wrote:

Hi Ken,

Until the two CERs I wrote in 2010 under the kind tutelage of the Solicitors, I had never written CERs for either APDs or APMs. However, I was aware of the hydraulically fractured well on Gail but only through Nabil and it was not anything of note, mostly information. So, no CER was prepared by me anyway (or anyone in then, OLE) for that well. Recall that on Gail, most if not all the produced water is reinjected, so it is likely that

(b) (5)

(b) (5)

If

On Wed, Feb 27, 2013 at 3:34 PM, Seeley, Kenneth <kenneth.seeley@bsee.gov> wrote:

Dave:

Did you even look at APDs or APMs back in 2009 or 2010? Apparently, according to that article in the VC Reporter, Veneco fracked at Platform Gail in 2009/2010. I'm trying to find out what chemicals they used and how they discharged water...and also whether or not a CER was prepared.

Also, did you ever look at APMs at all? I just realized that there are quite a few of those coming through the District that are never brought to our attention. Not that I really want to start working on all of them or anything like that, but I'd like to be sure we're creating some legal vulnerability.

Ken

-

Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618  
Kenneth.Seeley@BSEE.gov

—  
Dave Panzer  
Chief, Environmental Analysis Section  
805-389-7850  
fax-805-389-7874  
Bureau of Ocean Energy Management  
Pacific OCS Region  
770 Paseo Camarillo, 2nd floor  
Camarillo, Ca 93010

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(C): 805-377-8618  
Kenneth.Seeley@BSEE.gov



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## APM FOR SOCKEYE WELL E8 ST 02 2009 AND 2010

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Tue, Feb 26, 2013 at 5:07 PM

To: Daniel Knowlson <daniel.knowlson@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

Cc: Nathan Sinkula <nathan.sinkula@bsee.gov>, "Ming, Jaron" <Jaron.Ming@bsee.gov>, Bobby Kurtz <geokurtz@gmail.com>

All,

Attached is the original APM and two revisions spanning the period from 12-09 to 2-2010. I needed to look up whether it was a Monterey frac or other. It was Monterey. Just thought I'd send these along in case they're needed by your offices.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

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### 3 attachments

-  **APM E8 ST02 REVISED 1-2010.pdf**  
177K
-  **APM E8 ST02 REVISED 2-2010.pdf**  
834K
-  **APM E8 ST02 12-2009.pdf**  
1021K



Seeley, Kenneth <kenneth.seeley@bsee.gov>

## BLM and Hydraulic fracturing

1 message

Seeley, Kenneth <kenneth.seeley@bsee.gov>

Mon, Mar 11, 2013 at 4:45 PM

To: Jaron Ming <jaron.ming@bsee.gov>, Nabil Masri <nabil.masri@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>

I went to the BLM Bakersfield Office website to see if I could find any links to NEPA documents that cover fracking issues. Fortunately, they had a link to an environmental assessment for their May 22, 2013 oil and gas lease sale right on their home page. The hydraulic fracturing section is short, so I included it here in its entirety. Looks like they've been dealing with many of the same issues.

### Hydraulic fracturing

Hydraulic fracturing is a common and important process to stimulate oil and gas well production, and it has been used more than 1 million times for many years all over the world. Fracturing fluid is pumped under high pressure down the wellbore and into the reservoir rock to create fractures (i.e., cracks) in order to increase the immediate production rate and ultimate total recovery of oil and natural gas over the economic life of the well. In a typical fracturing job, approximately 99.5% of what is injected is water and sand.

In FY 2010, the last year for which data was available, only about 5 percent of the federal wells drilled in California (approx. 15 out of 300+) employed fracturing. None of these used diesel as the fracturing fluid, a source of concern to the public. In addition, none of these were in areas where there were fresh water aquifers, another area of concern.

In response to increased public interest, the Bureau of Land Management (BLM) recently proposed a draft rule to regulate hydraulic fracturing (HF) on public land and Indian land. The rule would (1) provide disclosure to the public of chemicals used in hydraulic fracturing on public land and Indian land, (2) strengthen regulations related to well-bore integrity, and (3) address issues related to flowback water. This rule will provide useful information to the public and assure that hydraulic fracturing is conducted in a way that adequately protects the environment. Comments to the draft rule were accepted from the public through September 10, 2012.

According to industry sources, it is likely that more California wells in the future will be fractured because of recent interest in deep shale prospects. Federal regulations currently require no special reviews or approvals for routine fracturing; however, prudent operating practices are required and no new surface disturbance typically occurs. In the future, HF wells will be subject to whatever final regulation is passed. For non-routine fracturing, the operator already needs prior approval.

A typical well in California that is hydraulically fractured (HF) has little to no resemblance to a typical well that is HF elsewhere in the country. Nearly all of the recent growth in HF wells across the country is in horizontally drilled wells in shale gas reservoirs. In contrast, the parcels in this region of the state are virtually all in areas dominated by oil reservoirs, not gas, and the use of long horizontal wells is not prevalent in California as it is elsewhere. Consequently, the issues related to methane emissions elsewhere are not currently relevant in California. Regardless of whether the wells encounter oil or gas, and regardless of whether a well is HF, all operations are subject to strict air, water, and endangered species related requirements.

Historically, a typical HF well in California uses only a small fraction of the water used elsewhere. According to data recently compiled by Western States Petroleum Association (Bakersfield Californian Newspaper Editorial August 23, 2012), a typical HF job in California uses less than 170,000 gallons of water, about 0.5 acre ft of water. The water typically is purchased from a local commercial water source, at prevailing business rates. By contrast, water consumption by agriculture in Kern County alone is more than 1 million acre-ft per year. Even if all

four projected wells are HF, and even if much larger volumes are used, the volume would be minuscule when compared to the large amounts of water used for other purposes in the project area. In any event, BLM continues to encourage operators to reduce water use wherever possible, reuse those fluids that can be reused, and recycle the flowback fluids where feasible.

Other public concerns, such as those regarding the potential for seismic impacts and the final disposition of produced water, are either speculative in nature, beyond the scope of this EA or else they can only be meaningfully analyzed once a specific proposal has been received. In general, for most of the HF jobs occurring on BLM lands, the flowback water is commonly disposed of in commercial UIC Class II water injection wells, along with other wastewater (several orders of magnitude greater volumes) from a multitude of other sources throughout the project area. These UIC wells are under the jurisdiction of the CDOGGR, regulated according to their agreements with EPA. If additional large volumes of produced water (including HF flowback water) need to be disposed of in the future, that would be a separate project and approval would have to come from CDOGGR under their UIC authority. Regarding seismic impacts, the USGS has not found any increased risk of earthquakes from hydraulic fracturing, nor has the recently completed study by the National Research Council Committee on Induced Seismicity Potential in Energy Technologies (2012). Although there have been some studies that link water disposal wells to increased seismic activity, it should be stressed that the RFD is projecting producing wells, not water disposal wells.

As mentioned above, BLM is seeking ways to reassure the American public that fracturing on BLM land is safe and has begun discussions with interested parties on the practice and regulation of fracturing on BLM land. To that end, BLM California will be working closely with the California Division of Oil and Gas and Geothermal Resources (CDOGGR), other Federal and California State agencies, and industry trade groups (such as the Western States Petroleum Association (WSPA), California Independent Petroleum Association (CIPA), and the Independent Oil Producers' Agency (IOPA) to address the issue. When current studies are complete, BLM will implement any new regulations that may be issued, and those new regulations will be incorporated into our standard Conditions of Approval for new wells and workovers of existing wells. In the meantime, many companies in California are already voluntarily posting extensive data regarding their HF wells on the national HF website "<http://fracfocus.org>."

It should be noted here, that no operations are approved in this document. All on the ground operations will be required to go through a site specific NEPA process once a permit application is received. At the leasing stage it is not yet known which, if any, of the parcels will actually be developed, which wells, if any, would be HF, and if wells are HF, what the specific parameters of the HF job would be. At this stage, no meaningful analysis can be conducted that would affect the decision at hand - whether to lease or not, and what stipulations would be applied. Therefore, the site-specific analysis is more appropriately deferred to when development is proposed. The EA acknowledges the indirect impacts from potential lease development activities and provides the appropriate level of analysis for the lease sale.



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Fwd: [CAfrack] Hydraulic fracturing: Halliburton's new technology enables reuse of produced water

1 message

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Drew Mayerson <drew.mayerson@bsee.gov>

Fri, Mar 8, 2013 at 5:04 PM

To: Nathan Sinkula <nathan.sinkula@bsee.gov>, Bobby Kurtz <Bobby.Kurtz@bsee.gov>

Nathan has started this already. Let's try to make it look good and informative. Tables showing what wells have been fracked and what kind (ie, frack pack, mini frac, ...), good explanations with links to our sources, etc...

Sent from my iPad

Begin forwarded message:

**From:** "Ming, Jaron" <jaron.ming@bsee.gov>

**Date:** March 8, 2013, 9:35:20 AM PST

**To:** Drew Mayerson <drew.mayerson@bsee.gov>

**Cc:** Daniel Knowlson <daniel.knowlson@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>, Nabil Masri <Nabil.Masri@bsee.gov>, Nicholas Pardi <nicholas.pardi@bsee.gov>, Mary Greene <Mary.Greene@bsee.gov>

**Subject:** Re: [CAfrack] Hydraulic fracturing: Halliburton's new technology enables reuse of produced water

It looks like with this question, the inquiry from truth out, and the FOIA from EDC all on fracking in the Pacific OCS, it would be in our best interest to develop a standard response, either in Q&A format or just a narrative so that we can use it to answer these questions efficiently. I would even suggest putting something on the webpage for the public to reference.

Nick, can you help us with that? I am also planning to give you a call in response to your other message. Thanks.

On Thu, Mar 7, 2013 at 8:52 PM, Drew Mayerson <drew.mayerson@bsee.gov> wrote:  
how do you want to handle this?

Sent from my iPad

Begin forwarded message:

**From:** Susan Jordan <sjordan@coastaladvocates.com>

**Date:** March 7, 2013, 11:19:20 AM PST

**To:** Drew Mayerson <Drew.Mayerson@bsee.gov>

**Subject:** Fwd: [CAfrack] Hydraulic fracturing: Halliburton's new technology enables reuse of produced water

Hi Drew,

I have been told that some operators have been fracking in the SB Channel.

Can you please let me know if you have any information on this? If they are fracking, can you tell me if they are using seawater and how they are disposing of the fracking fluid?

Thanks!

Susan

Begin forwarded message:

**From:** Bill Allayaud <bill@ewg.org>  
**Subject:** [CAfrack] Hydraulic fracturing:  
**Halliburton's new technology enables reuse of produced water**  
**Date:** March 7, 2013 8:49:14 AM PST  
**To:** Frack Listserv <cafrackattack@cafrack.org>  
**Reply-To:** bill@ewg.org

Note the bolded statement about currently using seawater for fracking. We understand that are fracking offshore California. They use saltwater? And, what do they do with the produced water?

<http://www.eenews.net/energywire/2013/03/07/5>

**HYDRAULIC FRACTURING:  
Halliburton's new technology enables reuse  
of produced water**

Nathaniel Gronewold, E&E reporter

*Published: Thursday, March 7, 2013*

HOUSTON -- Engineers at Halliburton Co. believe they may be on the cusp of a major breakthrough in hydraulic fracturing that could quench the practice's insatiable thirst for water.

During the annual IHS CERA Week convention happening here, the oil field services giant announced the launch of a suite of technologies and services that can allow drillers to use briny, brackish water or nonpotable water produced in oil and gas extraction for hydraulic fracturing operations, without any treatment.

"We feel like they are game-changing," said Walter Dale, a business manager for water solutions at Halliburton. "You look at the rush of people that are trying to treat the water to high quality, to make a frack fluid, and now we're coming to the market saying: 'Look, let's not treat the water, let's not take the salt out. We can make frack fluids out of it.'"

It is well known that hydraulic fracturing, or fracking, requires consuming large volumes of water -- up to 4 million or 5 million gallons per well. Recycling and reuse is beginning to make inroads into the business but has a long way to go. Although recycling rates are thought to be reaching nearly 70 percent in the eastern Marcellus Shale natural gas zone, in other shale fields recycling and reuse rates are put at 10 percent or less.

The standard industry practice is to blend fresh water with sand or ceramic proppants and chemicals to give the frack fluid the precise properties drillers think they'll need to optimize hydrocarbon extraction. The flowback fluid that is returned when production commences is typically discarded, usually in injection wells. The process is expensive and contributes significantly to the trucking traffic that irks people living near wells.

Fracking without fresh water has been an industry goal and a move that Texas state oil and gas officials have been urging it to take. The Railroad Commission of Texas, which regulates oil and gas, is considering voluntary guidelines for water recycling.

Produced water pulled from wells elsewhere in the oil patch can be moved to frack jobs for use in shale and tight rock formations with Halliburton's technology. Or companies can draw from underground brackish water stores and use that, potentially saving millions of dollars on freshwater purchases while avoiding the ire of local landowners concerned about groundwater depletion.

"We see it as a huge change," Dale said in an interview. **"We started by looking out in the ocean. We're making fracks with seawater every day,** so we had some really sharp guys that knew how to do this and started looking at it, saying, 'Do we need to take all these things out?' And the answer is no."

By "things," Dale is referring to total dissolved solids (TDS), water technology parlance for the salt, dirt, brine and other materials that make water unsuitable for use in households or for agriculture. Halliburton's new application, called H2OForward, combines an existing suite of technologies the company is already commercializing for improving the chemistry of the fluid and reducing harmful organisms that develop in fluids underground.

These systems, marketed by the company as CleanStream and CleanWave, help drillers reduce the volume of fresh water they employ for unlocking oil and gas trapped in tight rock and shale formations thousands of feet underground. Dale says operators now have the option to forgo fresh water entirely in the process and just use the water they may have already pulled out of the ground.

H2OForward works "with any waste stream," including brackish or produced water laded with up to 285,000 parts per million of TDS, Dale said. Conventional and marginal oil and gas wells are known to produce more water than oil -- industrywide the ratio is around three to five barrels of water for every barrel of crude oil.

### **Changing the formulations, and the price**

Halliburton believes the system can revolutionize the way operators are developing the United States' booming shale oil and gas reserves, and the company is eager to market and sell its wares. Dale said the use of the briny and brackish mixture the oil patch can produce does not negatively affect hydrocarbon production volumes.

"We've changed the formulations," he added. "It significantly changes the price point, and we hope it will drive further recycling in the industry to less freshwater use."

Halliburton says it has applied its new system to more than 60 wells in the Permian Basin region of west Texas and the Bakken Shale of North Dakota.

The technology may be ideal there because those formations are known to yield lots of water for drillers to deal with. Deploying it to the south Texas Eagle Ford Shale will prove more difficult, Dale explained, because "the Eagle Ford is very thirsty; it doesn't give back water."

### **No more waste?**

Water management specialists in the oil and gas industry say technologies are emerging that may one day see water waste in drilling reduced by 90 percent or more. Whether to treat and recycle frack fluid, and how much, is primarily an economic question and not a regulatory one, but experts say more companies are willing to take on the extra expense.

"We see every day people willing to pay more per barrel," Johan van Thermaat, vice president of investor relations at the water management services firm High Sierra Water Services, said during a discussion of experts at the conference.

Companies are also, in a few cases, pooling their resources to transport the water they need for oil field hydraulic fracturing by pipeline networks, reducing truck hauls that in some cases encompass 60 percent to 80 percent of a company's water management budget.

As far as these new technologies and practices are coming along, experts in water use for oil and gas extraction don't think

they will eliminate the waste stream. There will still be a need for some disposal down injection wells, they said.

**"There's always going to be a waste product,"** said Kevin Molloy, the oil and gas sector leader at CDM Smith, an engineering and consulting firm.

—  
You received this message because you are subscribed to [cafrackattack@cafrack.org](mailto:cafrackattack@cafrack.org)

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To visit the archive of messages sent prior to 12/6/2012, visit <http://bit.ly/CAfrackattack>



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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**Fwd: [CAfrack] Hydraulic fracturing: Halliburton's new technology enables reuse of produced water**

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Tue, Mar 12, 2013 at 11:05 AM

To: "Ming, Jaron" <Jaron.Ming@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>, "Masri, Nabil"

<Nabil.Masri@bsee.gov>, Nicholas Pardi <nicholas.pardi@bsee.gov>

Thoughts on this response:

Susan,

Sorry to take so long to get back to you. I was out last week on Thursday and Friday. Hydraulic fracturing is rare in the Pacific Region although we have had some operators do it in the past and none would rule out doing it in the future. Our Public Affairs office will be putting together a FAQ that addresses your specific question, as well as others pertinent to offshore hydraulic fracturing at some point in the near future. I will make sure that they will forward it to you.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

----- Forwarded message -----

From: **Susan Jordan** <sjordan@coastaladvocates.com>

Date: Thu, Mar 7, 2013 at 11:19 AM

Subject: Fwd: [CAfrack] Hydraulic fracturing: Halliburton's new technology enables reuse of produced water

To: Drew Mayerson <Drew.Mayerson@bsee.gov>

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Mayerson, Drew <drew.mayerson@bsee.gov>

## Re: [CAfrack] Hydraulic fracturing: Halliburton's new technology enables reuse of produced water

1 message

Susan Jordan <sjordan@coastaladvocates.com>

Fri, Mar 22, 2013 at 5:17 PM

To: "Mayerson, Drew" <Drew.Mayerson@bsee.gov>

Cc: "Ming, Jaron" <Jaron.Ming@bsee.gov>, Nicholas Pardi <nicholas.pardi@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>

Thanks for getting back to me. I am most interested in who, what, where and when and how the disposal of the fluid was handled.

I look forward to receiving the information the agency is preparing.

Best, Susan

*Susan Jordan, Director*

California Coastal Protection Network  
2920 Ventura Drive  
Santa Barbara, CA 93105

Ph: 805-637-3037

Email: sjordan@coastaladvocates.com

"Our lives begin to end the day we become silent about things that matter." - Martin Luther King, Jr:

The information contained in this communication may be confidential, is intended only for the use of the recipient(s) named above, and may be legally privileged. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication, or any of its contents, is strictly prohibited. If you have received this communication in error, please re-send this communication to the sender and delete the original message and any copy of it from your computer system. Thank you.

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NOTE: to access the group's website (including membership/archive), you must  
have a google account. If you don't have one, you can get one with your EXISTING  
(non-google) email here: <https://accounts.google.com/SignUp>

To visit the archive of messages sent prior to 12/6/2012, visit  
<http://bit.ly/CAfrackattack>



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Fwd: DCOR meeting to discuss fracking and upcoming program at Gilda

1 message

---

**Seeley, Kenneth** <kenneth.seeley@bsee.gov>

Mon, Feb 11, 2013 at 11:16 AM

To: James Salmons <james.salmons@bsee.gov>

Do you want to come? One question that came up today is whether or not DCOR discharges fracking compounds from produced water discharges. Is Gilda one of the platforms that discharges? If so, I doubt if

(b) (5)

——— Forwarded message ———

From: **Knowlson, Daniel** <daniel.knowlson@bsee.gov>

Date: Fri, Feb 8, 2013 at 6:46 AM

Subject: Fwd: DCOR meeting to discuss fracking and upcoming program at Gilda

To: Kenneth Seeley <kenneth.seeley@bsee.gov>

——— Forwarded message ———

From: **Jaron Ming** <jaron.ming@bsee.gov>

Date: Thu, Feb 7, 2013 at 11:05 PM

Subject: Re: DCOR meeting to discuss fracking and upcoming program at Gilda

To: Drew Mayerson <drew.mayerson@bsee.gov>

Cc: "Masri, Nabil" <nabil.masri@bsee.gov>, "Knowlson, Daniel" <daniel.knowlson@bsee.gov>, Armen

Voskarian <armen.voskarian@bsee.gov>, John Kaiser <john.kaiser@bsee.gov>

I am available Tuesday morning but I am in LA on Monday helping assess PMF candidates. We should find some time to discuss the concerns Margaret expressed. I also agree that Ken Seeley should attend. We will also have Mary Greene here on detail and I would like her to attend as well. Feel free to meet on Monday without me or we can meet on Tuesday at 8:30 am just before the meeting with DCOR. Thanks.

Sent from my iPad

On Feb 7, 2013, at 4:30 PM, Drew Mayerson <drew.mayerson@bsee.gov> wrote:

We should probably meet on Monday to discuss our fracking discussion with the Deputy Director yesterday.

Sent from my iPad

On Feb 6, 2013, at 4:01 PM, "Masri, Nabil" <nabil.masri@bsee.gov> wrote:

Dan

It is preferable to have the meeting on 2/12 in the morning about 9:00 or 10:00 am. BSEE and BOEM Managers have scheduled a meeting with the new owners of the BETA at 4:00 P.M. on 2/12. Drew and Jaron will respond to you directly . Thanks.

Nabil F. Masri  
Regional Supervisor, Office of Field Operations  
Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
805.389.7581  
nabil.masri@bsee.gov

On Wed, Feb 6, 2013 at 3:20 PM, Knowlson, Daniel <daniel.knowlson@bsee.gov>  
wrote:

Craig Krummrich called to set up a meeting with us on this topic, the sooner the better for them. How about sometime 2/11 or 2/12?? He is willing to come here or he can provide a meeting space at his office. Please let me know your interest to attend and availability ASAP.

Thank You

--  
Daniel R. Knowlson  
DOI/BSEE/POCSR  
CA District Manager  
805-389-7746

--  
Daniel R. Knowlson  
DOI/BSEE/POCSR  
CA District Manager  
805-389-7746

--  
Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618  
Kenneth.Seeley@BSEE.gov



Sinkula, Nathan <nathan.sinkula@bsee.gov>

---

## DCOR State Waters Fracking

3 messages

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**Voskanian, Armen** <armen.voskanian@bsee.gov>

Thu, Feb 14, 2013 at 4:16 PM

To: Drew Mayerson <drew.mayerson@bsee.gov>

Cc: Nathan Sinkula <nathan.sinkula@bsee.gov>

It turns out that DCOR did stimulus fracking near wellbore as well as hydraulic fracturing of the formation at Ester and Eva platforms. When, what, how much volume, how far fracture length coming soon.

—  
*Armen Voskanian, P.E.*  
*Reservoir Engineer*  
*Bureau of Safety and Environmental Enforcement*  
*Pacific OCS Region*  
*Office of Production and Development*  
*770 Paseo Camarillo, Second Floor*  
*Camarillo, CA 93010*  
*805.389.7727*  
*armen.voskanian@bsee.gov*

---

**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Thu, Feb 14, 2013 at 4:18 PM

To: "Voskanian, Armen" <armen.voskanian@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>

interesting, any chance DCOR can supply all that info for the Nuevo wells also? Or is that info coming from the state?

[Quoted text hidden]

---

**Voskanian, Armen** <armen.voskanian@bsee.gov>

Thu, Feb 14, 2013 at 4:50 PM

To: "Sinkula, Nathan" <nathan.sinkula@bsee.gov>

Cc: Drew Mayerson <drew.mayerson@bsee.gov>

It is coming from the State.

[Quoted text hidden]



Sinkula, Nathan <nathan.sinkula@bsee.gov>

---

## DCOR/Nuevo Frac'd well graphs and WF info list.

1 message

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Tue, Feb 19, 2013 at 1:49 PM

To: Drew Mayerson <drew.mayerson@bsee.gov>, Armen Voskanian <armen.voskanian@bsee.gov>

Drew and Armen,

Here are the production graphs from the wells DCOR had listed that Nuevo had Frac'd. The other attachment is any information i could piece together from the well files that may have involved fracking or other procedures that may have influenced production jumps in the graphs.

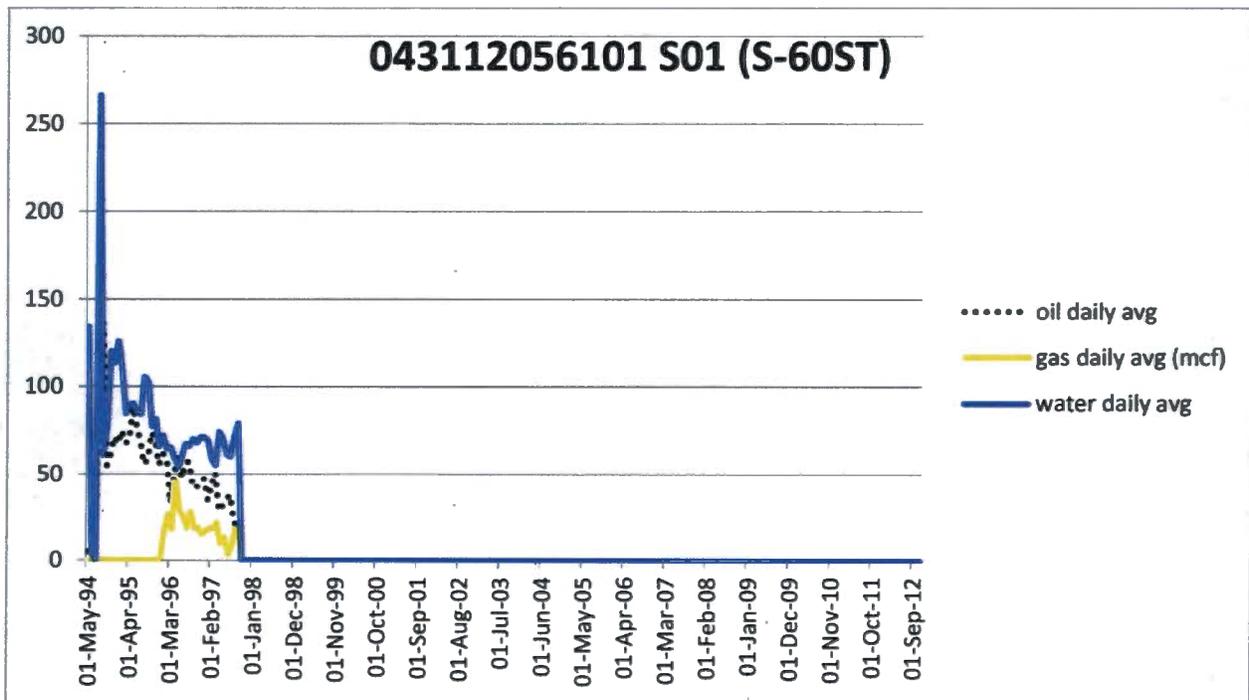
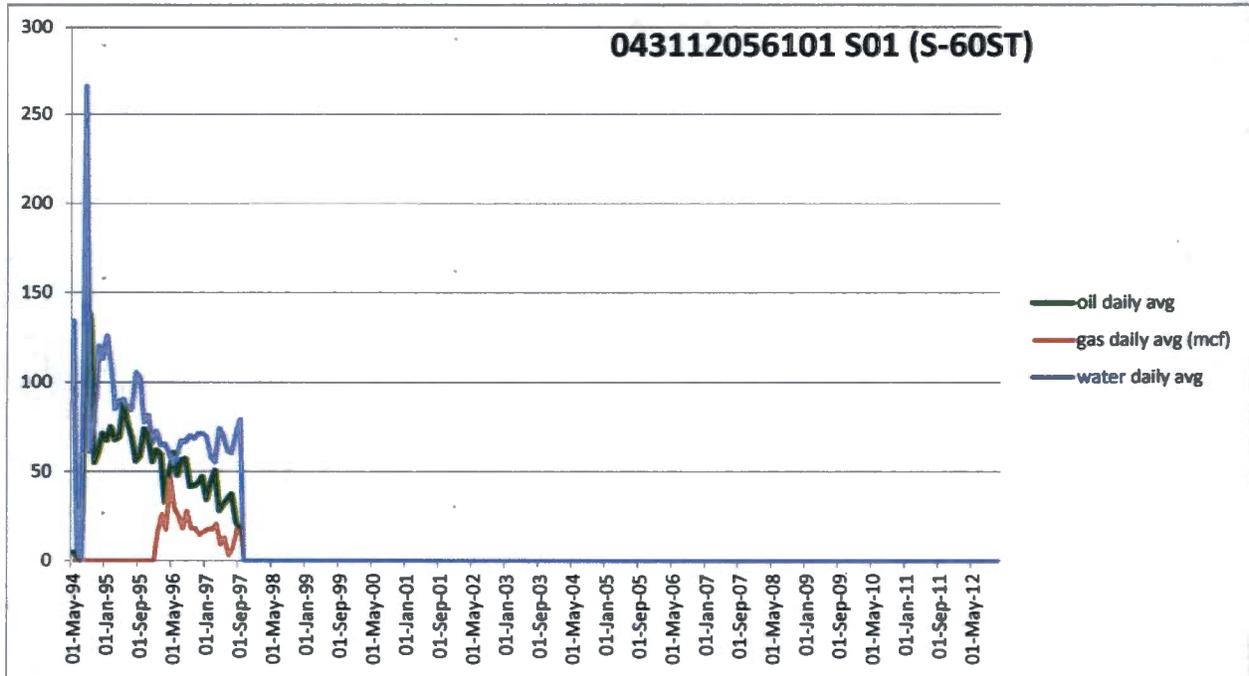
Nathan

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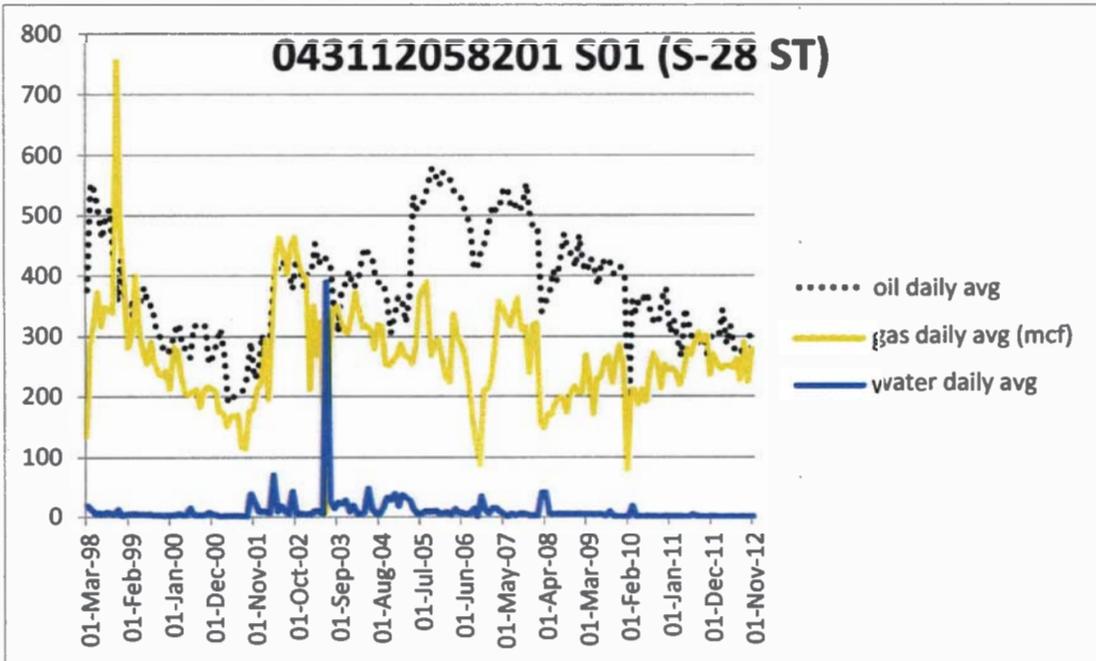
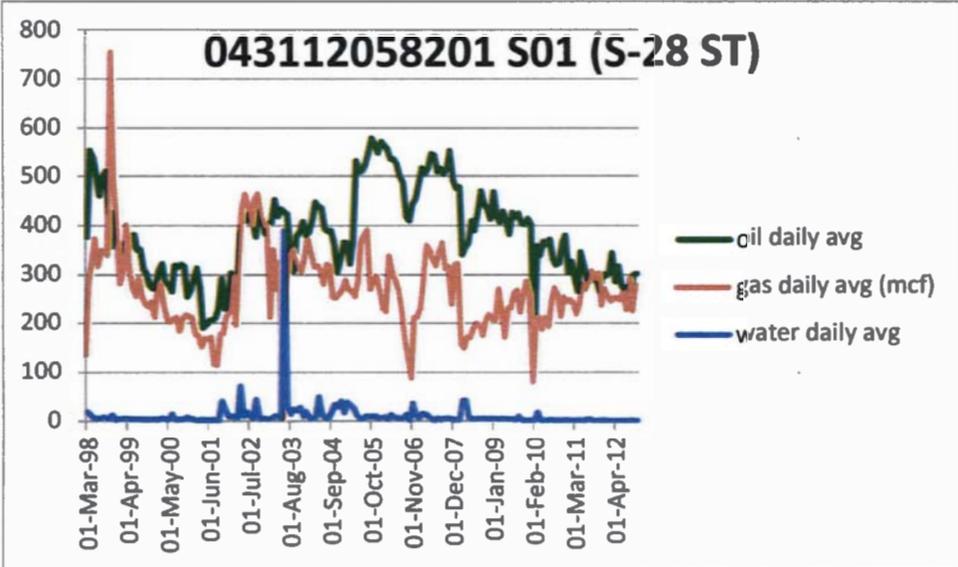
### 2 attachments

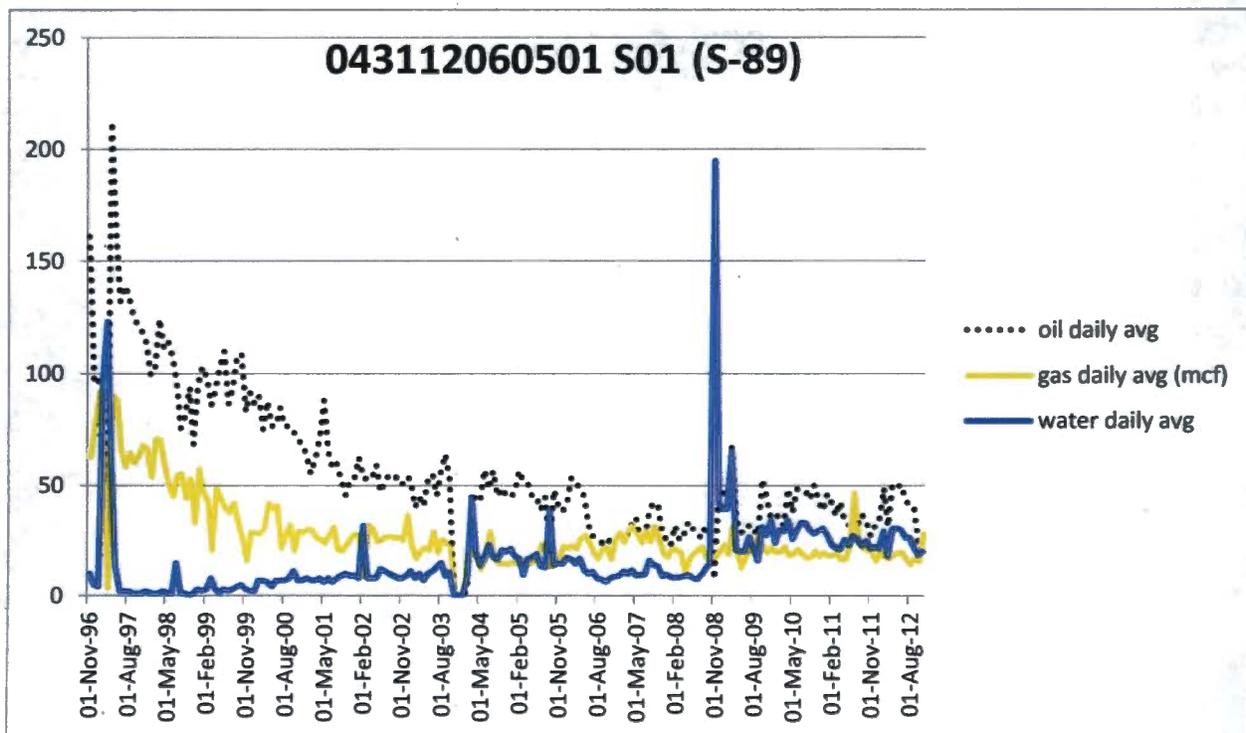
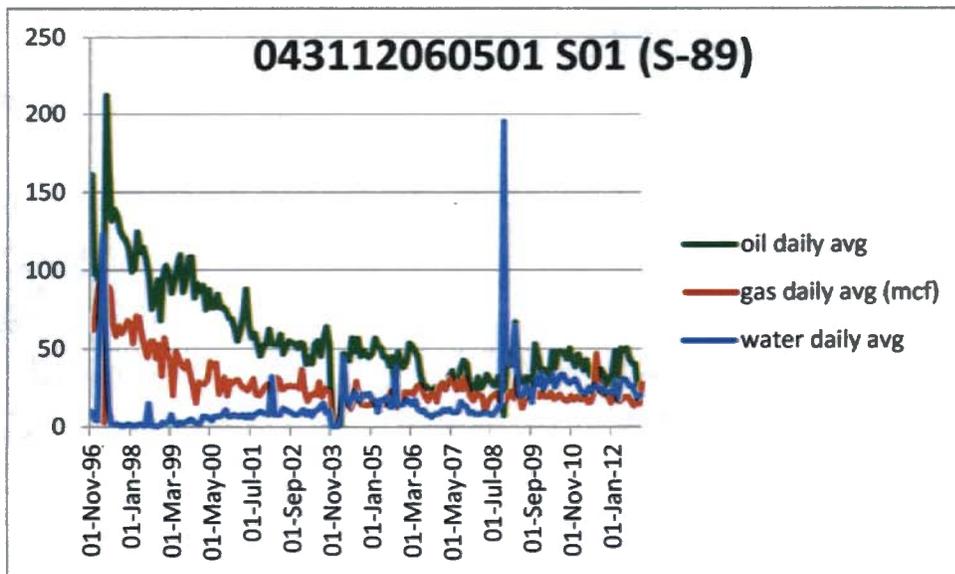
 **Gilda Frac'd wells production graphs.docx**  
834K

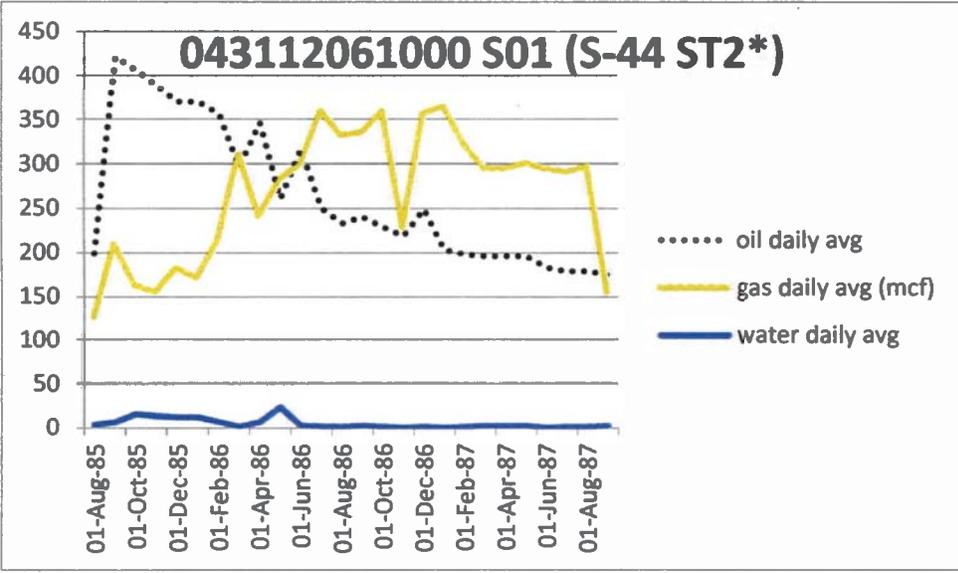
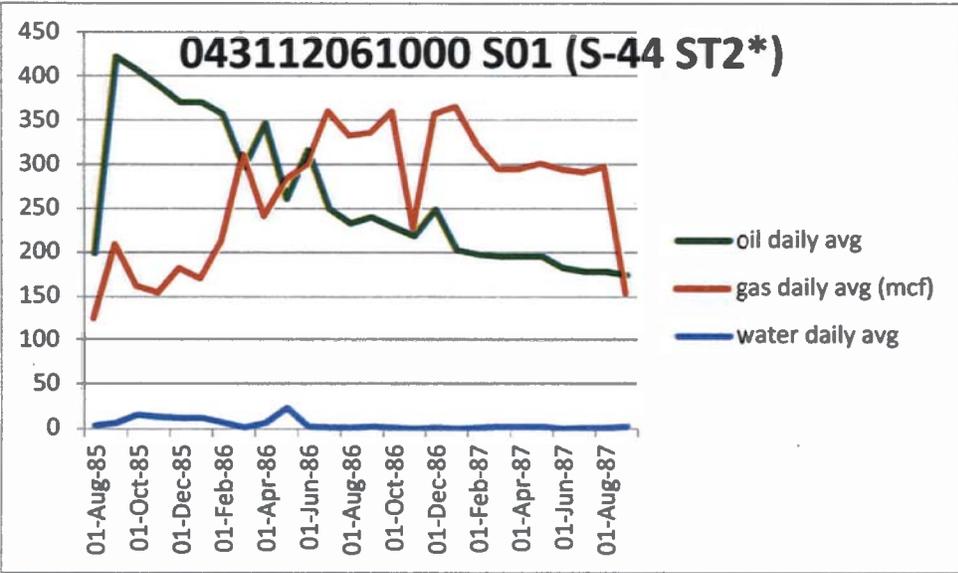
 **Gilda frac'd wells extra sheet.docx**  
17K

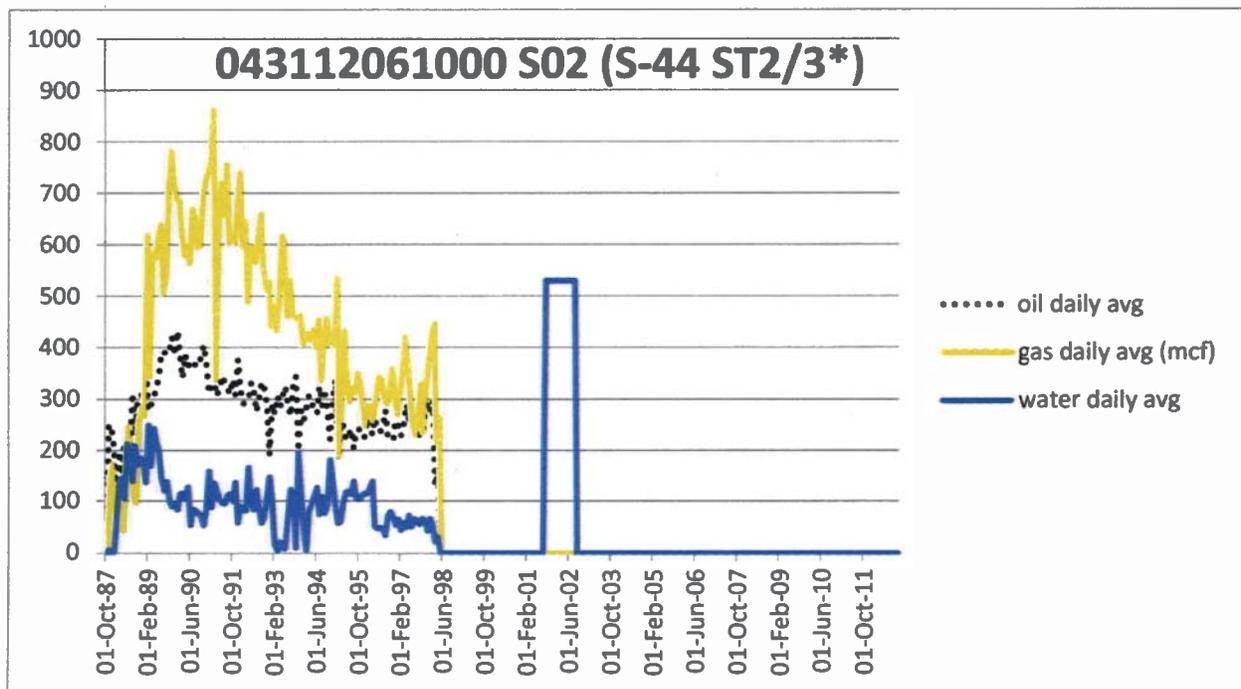
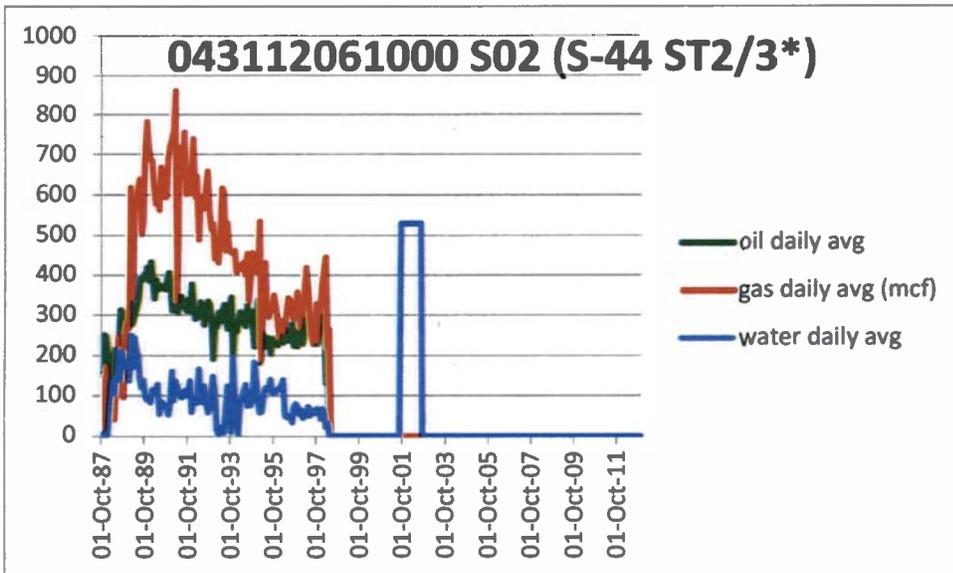


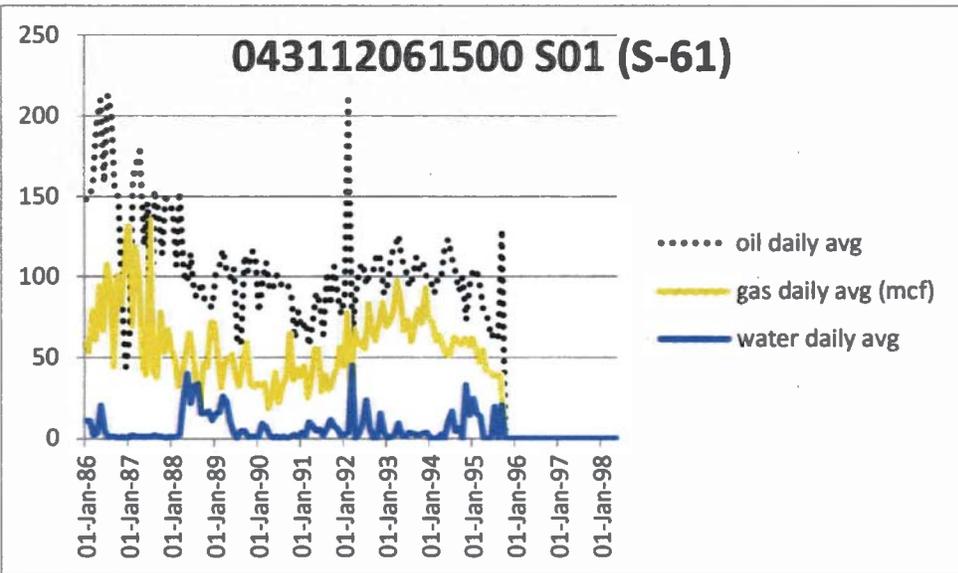
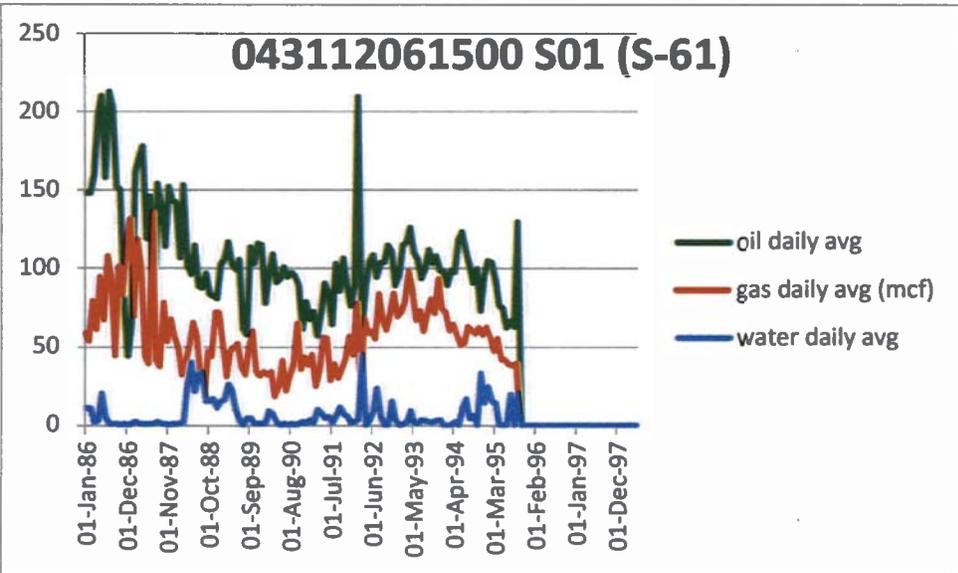
S028 (04311205800) D01, D02, S03 all injection completions

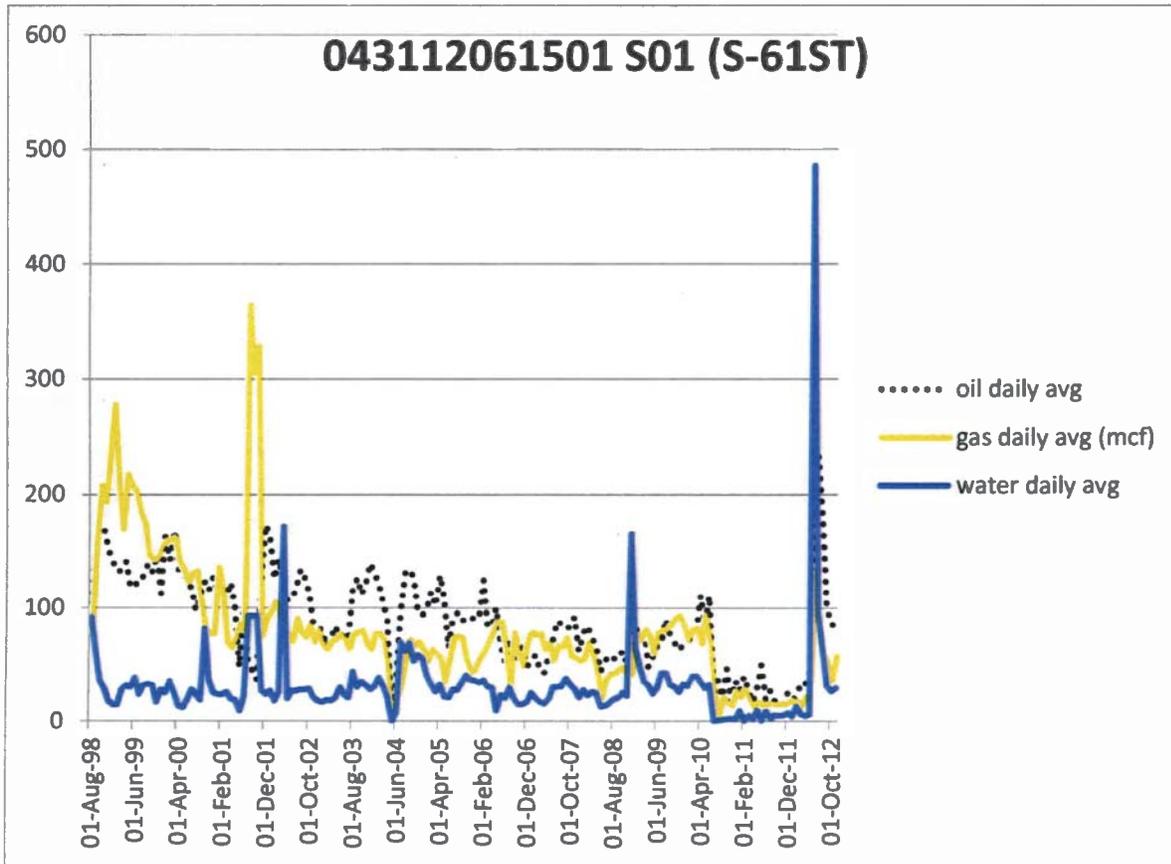
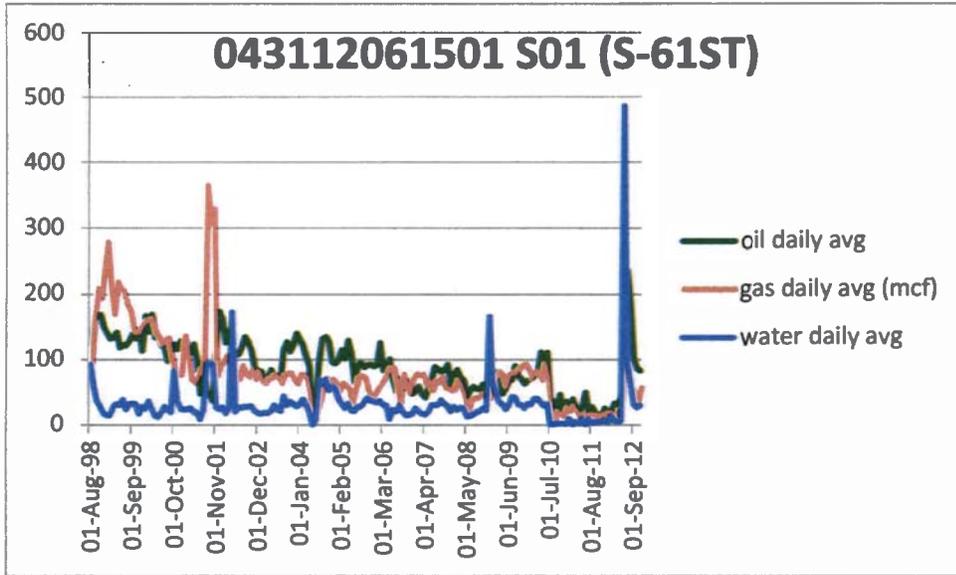


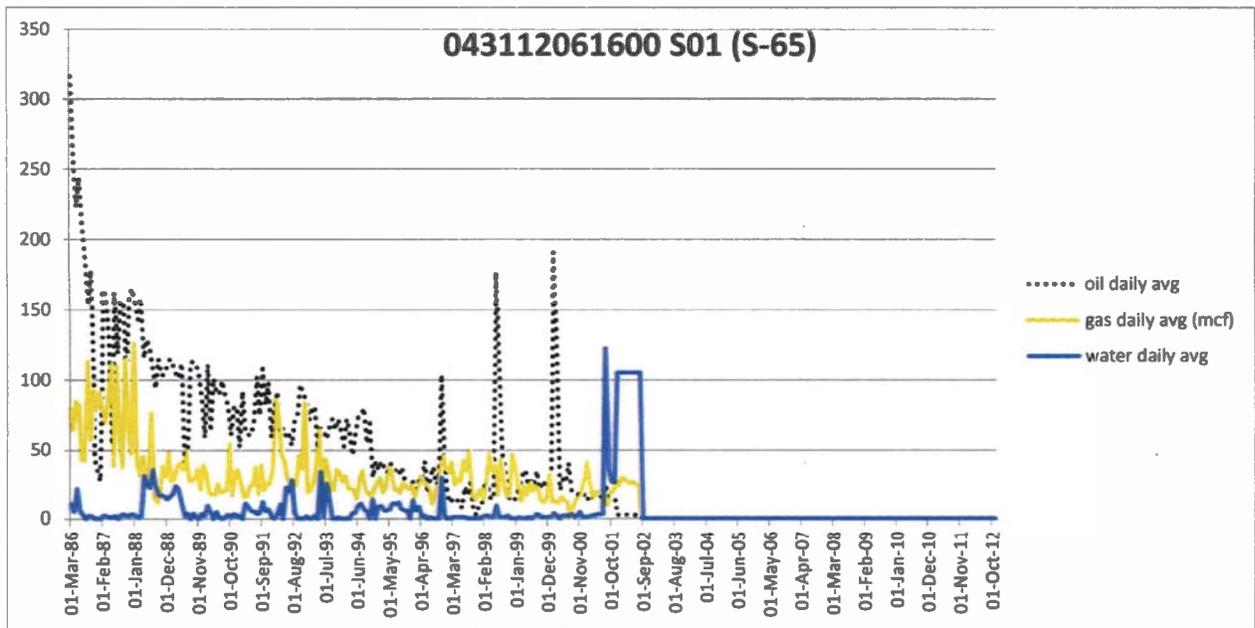
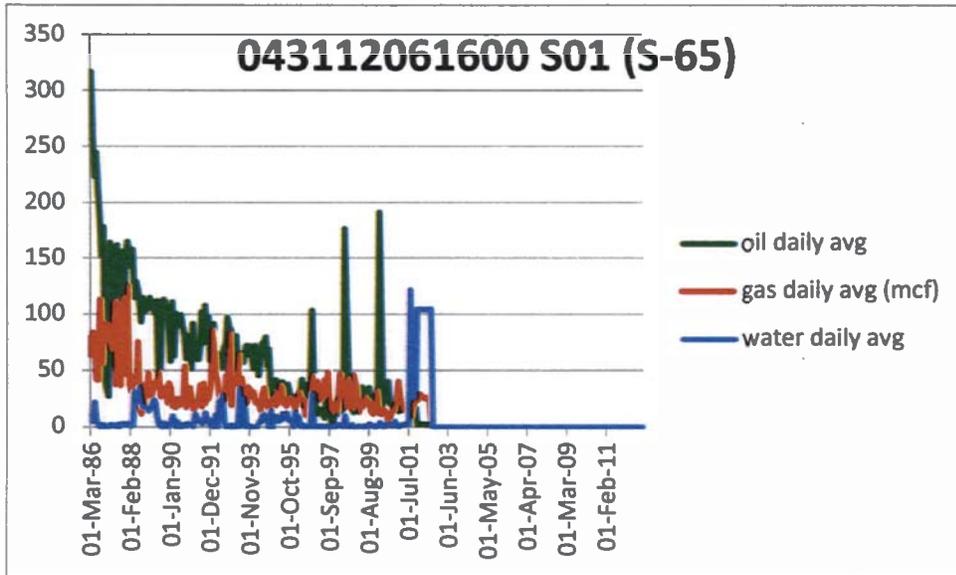


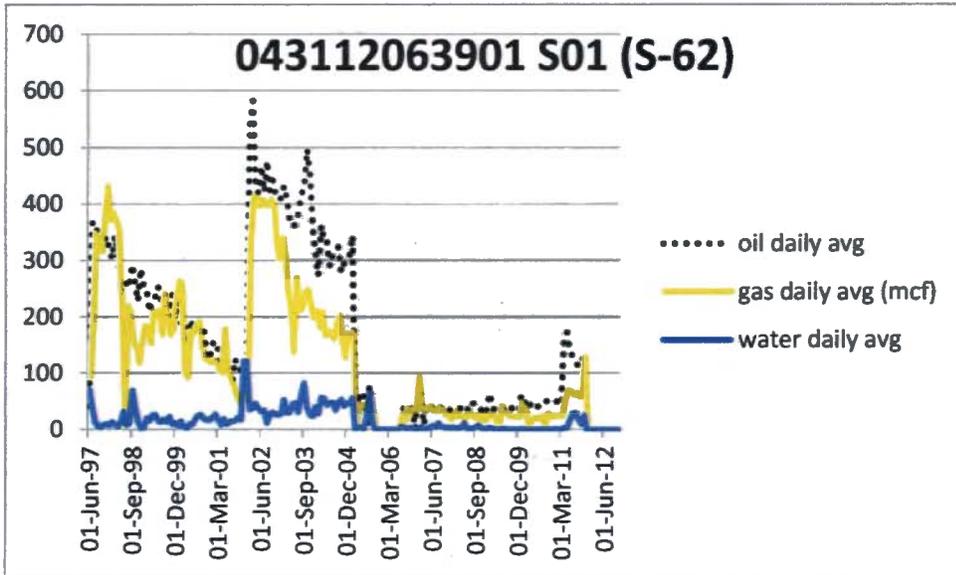
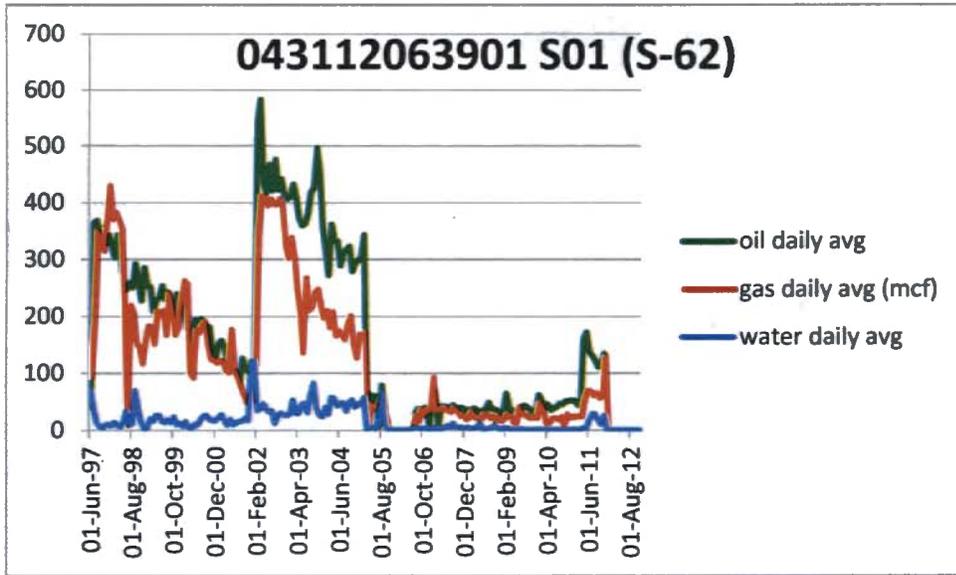


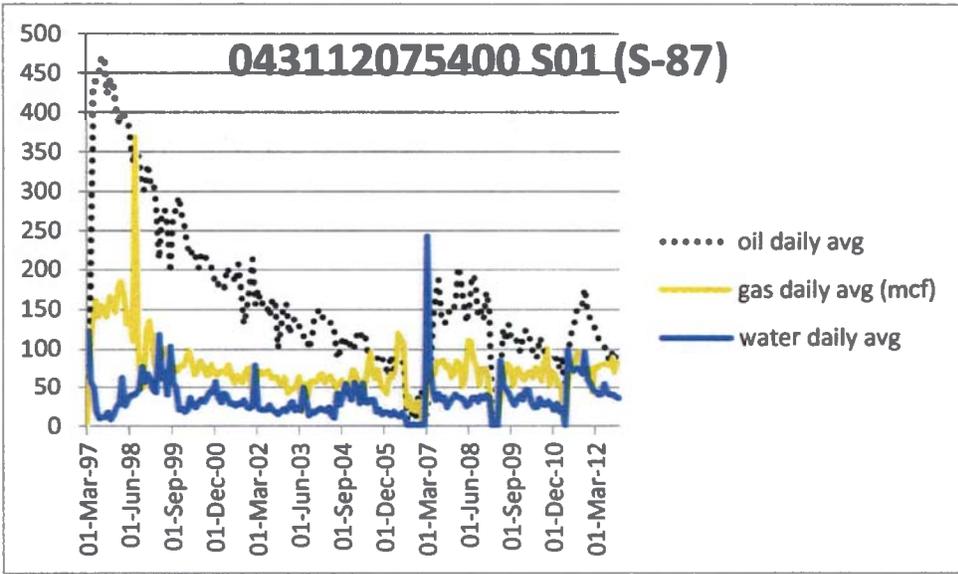
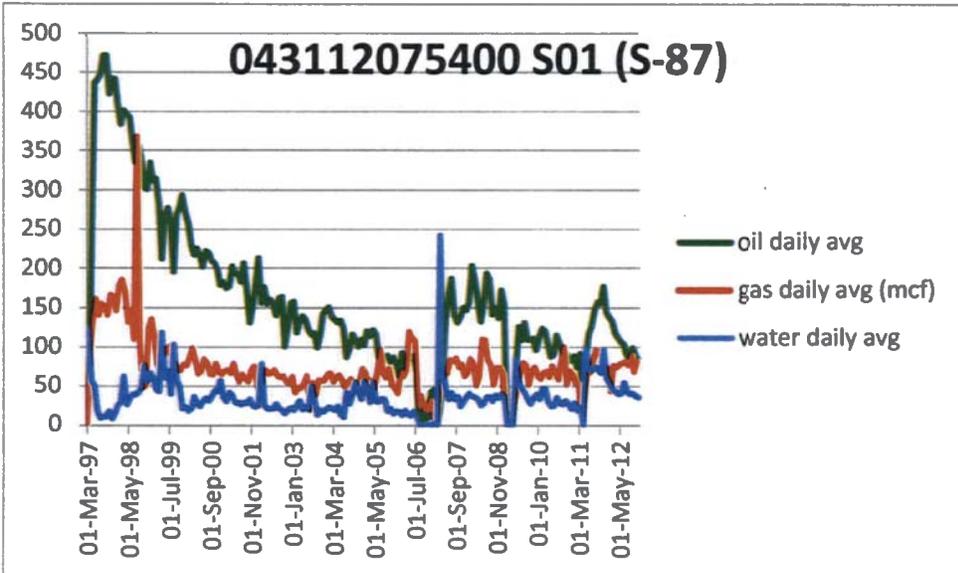












From APOO

- Oct 08, 1996 – Torch
  - o 2 wells planned for capital development of Upper Repetto, redrill of S-53, and new well that are planned with short radius high conductivity frac-packs across the L-PB sands with standard gravel packs across L-PC, and L-PD.
  - o 1 redrill planned for capital development of Lower Repetto, redrill of well S-52. Planned short radius high conductivity frac-pac of the L-PK, L-PL, L-PM, and L-PN zones
- Feb 2, 1998 –Torch on behalf of Nuevo
  - o Drilling program planned depending on production performance states, infill drilling well S-28, S061, S-65 with Lower Repetto Frac Pack, and well S-68 and TBD for Upper Repetto Frac Pack.
- Dec ?, 1999 – Torch on behalf of Nuevo
  - o 4 planned acid stimulations TBD wells
  - o Planned S-44 redrill the M and N zones will be hydraulically fractured and gravel packed.
- Mar. 20 ,2001 – Nuevo
  - o Planned redrill of S44, redrill of S65
  - o Planned perf additions to S50, S62, S64, and S85
- Nov. 20, 2001 - Nuevo
  - o Drilled and completed two Lower Repetto sidetracks (S-65 and S-44),
  - o Pump change on S-23
  - o Planned to convert S-26,S-36,S-42,S-48,S-57, and S-91 to ESP
  - o Planned to add perfs to S-50, S-64, and S-85
- Dec 19, 2002 – Nuevo
  - o S-62 recompletion Upper LP-M (Lower Repetto) had previously been squeezed off because of sand problems and loewer LP-N produced. The Upper LP-M was re-perforated and frac packed with a gravel pack screen and commingled with the LP-N production.
  - o S-28 converted from free flowing to ESP.
  - o ESP changes in S-27, S-23, S-21, S-19, and S-7. S-19 and S-7 were also acidized.

- 043112061500 S01 (S-61) - no frac job, sidetracked and frac'd
- 043112061501 S01 (S-61 ST) – July 2004 pull and replace ESP. Oct. 2000 replace ESP. July/Aug 1998 'data frac #1' from 10470; to btm perms, and 'frac #2' from 10230-10290' (from drilling weekly activity report, do not have the completion APM/APD in the file)
- 043112061600 S01 (S-65) – sidetracked and frac'd in 2001 – sidetrack not in Tims – Frac job 7000 # sand, 299 BBls Gel.
- 043112061000 S01 (S-44 ST2) – was completed in the LP-N sand of the Lower Repetto formation. acidized
- 043112061000 S02 (S-44 ST2/3\*) – was a recomplete where additional perms were added in the Oct 1987 - LP-K, LP-L, and LP-M sections of the Lower Repetto formation. Solvent wash and acidization in March of 1988. Sidetracked and recompleted with a frac job of 83000# in the LP-N, 45000# in the LP-M, and 31,370# in the LP-K in 2001. Notes – in procedure it says they are attempting to create a 69.5 ft frac half-length with Kfw of 6067 md.ft. acidized after frac, and an ESP was put in place downhole. Third sidetracked produced water. 2003 – squeezed top set of perms, clean and stimulate lower frac completions (acid) and return to production with new ESP planned, encountered issues fishing . Curious as to this action as production shows it was only producing water, so why invest the money?
- 043112063901 S01 (S-62 ST) – originally completed in 1997 with Class G + 2% CC –fracture? With perf intervals at 10,325-10352 & 10,818-11,046. The 10,325-10,352 perms were squeezed at some pt, trying to figure out when. Then in 2001 dec, recomplete (reperf'd) with frac job, 802 bbls slurry and 80,000# proppant over a new perf zone of 10,428-10,474'. Also added ESP and commenced with an acid wash of perforation intervals. In 2005 nitrogen lift with coil tubing. In 2011 New tubing with new ESP.
- 043112060501 S01 (S-89) – Completed in Nov 1996, believe it was frac'd but info in the file is limited. Was recompleted with additional perms in Mar 1997 with 'appropriate lift equipment' – assuming ESP since an ESP was later replaced. Mar 2004, esp replacement.
- 043112075400 S01 (S-87) – completed upper repetto March 1997 with a frac job containing 44,000 Lbs of sand and 465 bbls slurry and a downhole ESP. July 2004 replaced ESP. In March 2011, worked over the completion with an acid stimulation job.
- 043112056101 S01 (S-60) – April-May of 1994 completed in the Upper Repetto, first performed perforations from 8908 -8913 with an acid wash, then continued with a frac job 20,000# proppant, then per'd from 8812-8817', Frac'd that zone with 143 bbls pad, 131 bbls gel, at 1-14 ppg of sand. An ESP was also installed. In July-Aug of 1994, had to fish out broken ESP, also reperf'ed from 8747'-8940'. Not frac'd and added new ESP.
- 04311205821 S01 (S-28 ST) – In 1998 the well was completed over the LP-N interval with a Frac completion, designed and expected for use of 40,000#s proppant (EconoProp 20/40). States the LP-M interval will also be completed with a StimFrac (doesn't state expected amounts used). Later a well summary report (2002) states they Frac'd the LP-M zone from 13,896'-13,956' with 83,000# of 20/40 gravel, and the LP-N zone from 14,349' – 14,409' with 64,000#s of gravel. In 2002 the well was switched from free flowing to an ESP.



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## Gilda Frac'd well production graphs

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Feb 12, 2013 at 3:14 PM

Attached are the production graphs for the Gilda frac'd wells (as listed in the presentation from DCOR)

of interest - S-28 ST (prod jump around 2001), S-61 (production increases but before frac programs as listed by DCOR), S-61 ST, S-62 (large prod jump around 2001), S-87 (production jump after frac program time frame)

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 **Gilda Frac'd wells production graphs.docx**  
343K



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**weekly**

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Thu, Feb 14, 2013 at 10:24 AM

To: Bobby Kurtz <bobby.kurtz@bsee.gov>

- New - Looked up 'Frac'd' well info on Gilda wells S-28, S-44 (ST2/3), S-61, S-62, S-65, S-60St, S-87, S-89. Created production graphs with and analysed well files for any relevant informaiton.

- Continued/New - Started TIMS check with Mike that was discussed in previous weeks. Starting with all Well Files associated with Gilda Platform. P-00215 #1,#2,#3,#4, & S-028 WB01, checked.



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## DCOR/Nuevo Frac'd well graphs and WF info list.

1 message

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Tue, Feb 19, 2013 at 1:49 PM

To: Drew Mayerson <drew.mayerson@bsee.gov>, Armen Voskanian <armen.voskanian@bsee.gov>

Drew and Armen,

Here are the production graphs from the wells DCOR had listed that Nuevo had Frac'd. The other attachment is any information i could piece together from the well files that may have involved fracking or other procedures that may have influenced production jumps in the graphs.

Nathan

---

### 2 attachments

 **Gilda Frac'd wells production graphs.docx**  
834K

 **Gilda frac'd wells extra sheet.docx**  
17K



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Gilda Frac'd wells info from APOO files

4 messages

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Tue, Feb 19, 2013 at 4:12 PM

To: Drew Mayerson <drew.mayerson@bsee.gov>, Armen Voskianian <armen.voskianian@bsee.gov>

Drew,

not too much useful information in the APOO's but a little. Attached is what i could find for Gilda between the timeframes submitted by DCOR of Nuevos Frac programs.

Nathan

---

 **From APOO Gilda Frac well info.docx**  
15K

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Tue, Feb 19, 2013 at 5:43 PM

To: "Sinkula, Nathan" <nathan.sinkula@bsee.gov>

When they switch language from frac pack to hydraulic fracturing as they did....is it a different process they're referring to....in other words is the latter more invasive into the formation?

**Drew Mayerson**  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

[Quoted text hidden]

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Wed, Feb 20, 2013 at 8:06 AM

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Not sure, the info. from the APOO's isnt always that in depth about the specific procedure. Since it was only a year after the 1st rd of Frac jobs in 1997, and since I assume they still had the same constraints DCOR stated (smallish sized equipment hindered capabilities) that it was similar to the earlier frac packs that are short radius high conductivity fracs (which i would consider more along the lines of a Frac-Pack than a larger hydraulically stimulated frac wing), however that is not very useful since im just assuming. I plan on trying to pick DCORs brain when they come in next week.

Nathan

[Quoted text hidden]

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Wed, Feb 20, 2013 at 8:07 AM

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

but yes normally in my understanding a hydraulic stimulation frac usually refers to a larger radius frac wing than a frac-pack completion (more used for sand control and near wellbroe stimulation)

[Quoted text hidden]



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## Gilda frac wells production graphs take 2

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Sinkula, Nathan <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Feb 12, 2013 at 3:41 PM

attached is the graph with both standard colors and altered colors for ease of use.

Nathan



**Gilda Frac'd wells production graphs.docx**  
834K



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## Take 3 on Gilda frac'd production graphs

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Feb 12, 2013 at 4:09 PM

ok this time the attachment has the adjusted colors underneath the normal ones.

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 **Gilda Frac'd wells production graphs.docx**  
834K

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Bobby Kurtz <bobby.kurtz@bsee.gov>

Wed, Feb 13, 2013 at 7:48 AM

[Quoted text hidden]

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 **Gilda Frac'd wells production graphs.docx**  
834K



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## disposal of hydraulic fracturing fluids

1 message

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**Seeley, Kenneth** <kenneth.seeley@bsee.gov>  
To: Ramona Sanders <ramona.sanders@bsee.gov>

Tue, Feb 12, 2013 at 3:14 PM

Ramona:

In the Gulf, what happens to flowback water from fracking operations? Does it end up in produced water discharges, injected back into the formation, or treated? We have an operator proposing to use "hydraulic stimulation" (which has not been done very often here) and I'm trying to run through the list of potential concerns. The operator says their produced water is Superclean! but the way they responded to my questions kind of made me think this was worth following up on. Thanks,

Ken

--

Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618  
Kenneth.Seeley@BSEE.gov



Seeley, Kenneth <kenneth.seeley@bsee.gov>

---

## Re: Draft Fracking Language for Carpinteria Re-Development ADEIR/EIS

1 message

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**Seeley, Kenneth** <kenneth.seeley@bsee.gov>

Fri, Feb 1, 2013 at 3:25 PM

To: "Ming, Jaron" <jaron.ming@bsee.gov>

Cc: Susan Zaleski <susan.zaleski@boem.gov>

Sorry for the delayed response. I read the attached section and also talked to Dave about this earlier in the week, and I think this is absolutely the correct approach. Fracking is going to be highly controversial and since it isn't even on the table for the current proposal, I think it would be better left to a separate NEPA assessment when and if an operator actually proposes it. As Jaron said in our meeting, it might even be better to deal with it in a future programmatic document that covers the entire region.

Also, I'll do my best to get comments to Susan on the draft document by the 5th.

Ken

On Wed, Jan 30, 2013 at 4:40 PM, Ming, Jaron <jaron.ming@bsee.gov> wrote:

I don't have any comments on the proposed language, but I am copying Ken to see if he would like to include any further detail regarding the NEPA requirements for a frack job. Thanks.

——— Forwarded message ———

From: **Zaleski, Susan** <susan.zaleski@boem.gov>

Date: Fri, Jan 25, 2013 at 2:11 PM

Subject: Draft Fracking Language for Carpinteria Re-Development ADEIR/EIS

To: Jaron Ming <jaron.ming@bsee.gov>, Joan Barminski <joan.barminski@boem.gov>

Cc: "Panzer, David" <David.Panzer@boem.gov>, Richard Yarde <richard.yarde@boem.gov>

Hi Joan and Jaron,

Please take a look at the attached document with the draft fracking language from CSLC and the two edits I made in track changes. Let me know if the language is ok for both of you or please make edits.

Thanks,  
Susan

Susan F. Zaleski

Biological Oceanographer

Pacific Region

Bureau of Ocean Energy Management

770 Paseo Camarillo

Camarillo, CA 93010

Phone #805-389-7558

Fax #805-389-7874

susan.zaleski@boem.gov

—  
Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618  
Kenneth.Seeley@BSEE.gov

## 2.3 PROPOSED PROJECT OVERVIEW

The following section describes details of the proposed Project, including the well development program and changes to the existing operations of the Project facilities.

The Applicants propose redevelopment of State Leases PRC 4000, PRC 7911, and PRC 3133, which are estimated to contain sufficient recoverable reserves to enable commercial production. The Applicants submitted a detailed POD application to the CSLC for the proposed Project and a DPP revision to BOEM in order to enable the use of the Federal platform to access the oil and gas reserves in the State tidelands. The goal of both documents is to make full use of the existing infrastructure and develop the reserves in the most economical way.

The Applicants propose to drill up to 25 new wells (primarily production and some injection), drilling one well at a time. Drilling, completing, and producing the State lease wells would be accomplished from Platform Hogan. Equipment at Platform Hogan would be used for commingling of production from the State and Federal leases. Production would be sent to shore via the existing pipelines and processed at the La Conchita Facility.

The Applicants' proposal does not include hydraulic fracturing (commonly known as fracking) of any wells on Platform Hogan drilled into State waters. Any future proposal by the Applicants for hydraulic fracturing will be subject to additional environmental review in accordance with CEQA and ~~NEPA~~ and all other regulations pertaining to hydraulic fracturing in effect at that time. The Applicants will be required to seek agency approvals from the CSLC and ~~BOEM~~BSEE, among other necessary agency approvals prior to the fracturing of any wells drilled into State waters. Therefore, hydraulic fracturing is not included in the environmental analysis for this project, and the project to be considered by the CSLC and BOEM does not include hydraulic fracturing.



Kurtz, Bobby <bobby.kurtz@bsee.gov>

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## Fwd: Draft Fracking Regulations from DOGGR

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**Bobby Kurtz** <geokurtz@gmail.com>  
To: bobby.kurtz@bsee.gov

Wed, Dec 19, 2012 at 11:40 AM

Sent from my iPhone

Begin forwarded message:

**From:** "Mayerson, Drew" <drew.mayerson@bsee.gov>  
**Date:** December 19, 2012 9:30:00 AM PST  
**To:** "Masri, Nabil" <Nabil.Masri@bsee.gov>, Michael Mitchell <michael.mitchell@bsee.gov>, "Ming, Jaron" <Jaron.Ming@bsee.gov>  
**Cc:** Bobby Kurtz <geokurtz@gmail.com>, Allan Shareghi <allan.shareghi@bsee.gov>, "Dame, Robert" <Robert.Dame@bsee.gov>, "Michael Brickey" <michael.brickey@bsee.gov>, Armen Voskanian <armen.voskanian@bsee.gov>  
**Subject:** Draft Fracking Regulations from DOGGR

Attached are draft regulations. I suspect that (b) (5) [REDACTED]. As far as we can Venoco fracked well E11 off Gail in August 1992. The target was Upper Sespe and there was a slight bump in production. The Sespe was abandoned in March of 1993 and Venoco moved uphole to the Upper Topanga.

Bobby and Allan also researched and found that well C-11 off of Hidalgo in the Pt. Arguello Field had an attempted Frack in the Monterey in April of 1997. We're still looking into it but per Tom Goeres' memory, Chevron couldn't muster to the pump power to do a complete job and had to abort.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

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CDOGGER FRACKING DISCUSSION DRAFT.pdf  
98K



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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**drew.mayerson@bsee.gov has shared Is Fracking Endangered by Incessant Studies? – TransCanada Corporation (USA) (TRP), Plains Exploration & Production Company (PXP) - Insider Monkey**

message

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drew.mayerson@bsee.gov <drew.mayerson@bsee.gov>

Wed, Mar 6, 2013 at 3:55 PM

To: nathan.sinkula@bsee.gov, bobby.kurtz@bsee.gov, michael.brickey@bsee.gov

Thought you'd like this.

Is Fracking Endangered by Incessant Studies? – TransCanada Corporation (USA) (TRP), Plains Exploration & Production Company (PXP) - Insider Monkey

<http://www.insidermonkey.com/blog/is-fracking-endangered-by-incessant-studies-transcanada-corporation-usa-trp-plains-exploration-production-company-pxp-80736/2#IOL92E5dCsHCMes.03>

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drew.mayerson@bsee.gov shared this using Po.st



Masri, Nabil <nabil.masri@bsee.gov>

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## Fwd: E-8 Fracture Stimulation Detail

1 message

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**Knowlson, Daniel** <daniel.knowlson@bsee.gov>

Fri, Mar 1, 2013 at 9:18 AM

To: Kenneth Seeley <kenneth.seeley@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>

Not sure how much this helps at this point, we will have to contact BJ and find out what these products are!!

——— Forwarded message ———

From: **Zach Schock** <za.schock@venocoinc.com>

Date: Thu, Feb 28, 2013 at 12:51 PM

Subject: E-8 Fracture Stimulation Detail

To: "Daniel.Knowlson@bsee.gov" <Daniel.Knowlson@bsee.gov>

Cc: Larry Huskins <larry.huskins@venocoinc.com>, Brian Musso <brian.musso@venocoinc.com>, Jon Snyder <jon.snyder@venocoinc.com>

Dan,

Attached is the E-8 Frac Data Summary I was referring to in our phone call yesterday afternoon. Please note the job dates are incorrect on the reports, they should be January 7-12, 2010.

Thanks,

Zach Schock

Petroleum Engineer

Venoco Inc.

office: (805) 745-2172

cell: (303) 330-2939

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Daniel R. Knowlson  
DOI/BSEE/POCSR  
CA District Manager  
805-389-7746

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**E-8 Frac Details.pdf**

**Frac Data Summary**



Customer: Venoco  
 Customer Rep: Don Schmohr  
 Well/ Field: E-8ST2  
 Job Date: January 7, 2009  
 Job Number: 1001544406

Formation: M2  
 Interval/Stage: Stage 1 Injection  
 BHST: 125°F  
 BJ Rep: Berny Lopez/Chris Smith  
 TMV: Offshore Unit

| Tubulars           |         |        |         |       |
|--------------------|---------|--------|---------|-------|
|                    | Size/wt | Length | bbl/ft  | bbls  |
| Tubulars           | 3.5"    | 0      | 0.0087  | 0.0   |
| Casing             | 4.5"    | 9380   | 0.01522 | 142.8 |
| Surface Line       | 2.75    | 30     | 0.00735 | 0.2   |
| Volume to Top Perf |         |        |         | 143.0 |
| Flush              |         |        |         | 138.0 |

| Injection Data | Inj #1  | Inj #2  | Mini Frac | Main Frac |
|----------------|---------|---------|-----------|-----------|
| Volume to fill | 0.2     | 0       | -         | 0         |
| Rate           | 11.3    | 17.8    | -         | 18.1      |
| STP            | 1773    | 2827    | -         | 3110      |
| FG             | 0.62    | 0.64    | -         | 0.68      |
| Volume         | 16.7    | 54.1    | -         | 443.6     |
| ET@Startup     | 6:45 PM | 7:48 PM | -         | 9:20 PM   |
| ET@Shutdown    | 6:52 PM | 7:53 PM | -         | 9:52 PM   |
| Pump Time      | 0:07    | 0:05    | -         | 0:32      |
| ISIP           | 840     | 916     | -         | 1100      |
| .5 min SIP     | 721     | 723     | -         | 925       |
| 10 min SIP     | 666     | 654     | -         | 849       |
| 15 min SIP     | 598     | 592     | -         | 787       |

| Step Down Data |      |      |      |      |
|----------------|------|------|------|------|
| Inj. # 2       | 1    | 2    | 3    | 4    |
| Rate(bpm)      | 17.8 | 14.4 | 10.6 | 5.5  |
| STP(psi)       | 2827 | 2294 | 1734 | 1164 |

| Step Down Data |   |   |   |   |
|----------------|---|---|---|---|
| Minifrac       | 1 | 2 | 3 | 4 |
| Rate(bpm)      | - | - | - | - |
| STP(psi)       | - | - | - | - |

| Main Frac |      |      |      |      |
|-----------|------|------|------|------|
|           | 1    | 2    | 3    | 4    |
| Rate(bpm) | 18.1 | 16.2 | 15.1 | 12.3 |
| STP(psi)  | 3110 | 2610 | 2108 | 1179 |

| Proppant Type: 20/40 White |               |            |  |          |
|----------------------------|---------------|------------|--|----------|
| Proppant Type:             | Proppant Data |            |  |          |
| Program                    | 51,744 lbs    |            |  | 2.65     |
| Computer                   | 6,323 lbs     |            |  | 928.2 SG |
| Blender                    | 7,723 lbs     |            |  | lbs/bbl  |
| BH Sand                    | 6,311 lbs     | Dirty bbls |  | 515      |
| Casing Placed              | 11 lbs        | Clean bbls |  | 508      |
|                            | 12% by design |            |  |          |

| Detail         | MD    | TVD  | units |
|----------------|-------|------|-------|
| Top Perf       | 9380  | 4704 | ft    |
| Bottom Perf    | 9381  | 4704 | ft    |
| Mid Zone       | 9381  | 4704 | ft    |
| Gross Interval | 1     | 0    | ft    |
| Net Interval   | 1     | 0    | ft    |
| Fluid SG / HH  | 1.027 | 2095 | psi   |
| Shots/foot     | 3     | 3    | holes |
| Size           | 0.63  |      | inch  |

| Fluid System  |  | SpectraFrac G 3000 |
|---------------|--|--------------------|
| Additives     |  |                    |
|               |  | Seawater           |
| 7.50 GPT      |  | GLFC-1B            |
| 3.00 GPT      |  | XLW-56             |
| 1.50 GPT      |  | BF-8L              |
| 1.00 GPT      |  | Claymaster 5C      |
| 2.00 GPT      |  | MA 844W            |
| 1.00/2.00 GPT |  | BC-3               |
| 2.00 GPT      |  | GBW-12             |

| Treatment Schedule |                       |                 |                       |                 |
|--------------------|-----------------------|-----------------|-----------------------|-----------------|
|                    | Slurry Volumes(bbls)  |                 |                       |                 |
|                    | Design Treatment bbls | Treatment Stage | Actual Treatment bbls | Treatment Stage |
| 1                  | 100                   | Load Hole       | 0.2                   | Load Hole       |
| 2                  | 100                   | Injection       | 16.7                  | Injection       |
| 3                  | 100                   | Injection 2     | 54.1                  | Injection 2     |
| 4                  | 30                    | XO              | 16.4                  | XO              |
| 5                  | 75                    | Pad             | 75.2                  | Pad             |
| 6                  | 10                    | 1 ppa           | 10.2                  | 2 ppa           |
| 7                  | 75                    | Pad             | 75                    | Pad             |
| 8                  | 55                    | 2 ppa           | 59.5                  | 2 ppa           |
| 9                  | 57                    | 3 ppa           | 29.9                  | 3 ppa           |
| 10                 | 59                    | 4 ppa           | 177.4                 | Overflush       |
| 11                 | 61                    | 5 ppa           |                       |                 |
| 12                 | 44                    | 6 ppa           |                       |                 |
| 13                 | 48                    | 8 ppa           |                       |                 |
| 14                 | 7                     | Sand Plug       |                       |                 |
| 15                 | 138                   | Flush           |                       |                 |
| 16                 |                       |                 |                       |                 |
| 17                 |                       |                 |                       |                 |
| 18                 |                       |                 |                       |                 |
| 19                 |                       |                 |                       |                 |
| 20                 |                       |                 |                       |                 |

Closure occurred at 459 psi surface, 2553 psi bottomhole with a gradient of 0.543 psi/ft, efficiency of 72.2%, and closure time of 23.6 minutes based on injection #1. During the 3 ppa stage, the proppant silo could not keep up with the pumping rate. The decision to overflush the well with seawater was made by company man.

**Frac Data Summary**



Customer: Venoco  
 Customer Rep: Don Schmohr  
 Well/ Field: E-8ST2  
 Job Date: January 9, 2009  
 Job Number: 1001544407

Formation: M2  
 Interval/Stage: Stage 2  
 BHST: 125°F  
 BJ Rep: Chris Zoda/Chris Smith/Mike Sansinena  
 TMV: Offshore Unit

| Tubulars           |         |        |         |       |
|--------------------|---------|--------|---------|-------|
|                    | Size/wt | Length | bbl/ft  | bbls  |
| Tubulars           | 3.5"    | 0      | 0.0087  | 0.0   |
| Casing             | 4.5"    | 8770   | 0.01522 | 133.5 |
| Surface Line       | 2.75    | 30     | 0.00735 | 0.2   |
| Volume to Top Perf |         |        |         | 133.7 |
| Flush              |         |        |         | 126.0 |

| Injection Data | Inj #1  | Inj #2 | Main Frac |   |
|----------------|---------|--------|-----------|---|
| Volume to fill | 0       | -      | 0         | - |
| Rate           | 11.7    | -      | 15.8      | - |
| STP            | 3844    | -      | 3682      | - |
| FG             | 0.65    | -      | 1.70      | - |
| Volume         | 64.3    | -      | 524.8     | - |
| ET@Startup     | 8:25 PM | -      | 10:46 PM  | - |
| ET@Shutdown    | 8:35 PM | -      | 11:35 PM  | - |
| Pump Time      | 0:10    | -      | 0:49      | - |
| ISIP           | 942     | -      | 5893      | - |
| 5 min SIP      | 686     | -      | 4389      | - |
| 10 min SIP     | 560     | -      | 3600      | - |
| 15 min SIP     | 473     | -      | -         | - |

| Step Down Data |      |      |      |      |
|----------------|------|------|------|------|
| Inj. # 1       | 1    | 2    | 3    | 4    |
| Rate(bpm)      | 11.7 | 10   | 8.1  | 2.8  |
| STP(psi)       | 3844 | 3140 | 2509 | 1191 |

| Step Down Data |   |   |   |   |
|----------------|---|---|---|---|
| Minifrac       | 1 | 2 | 3 | 4 |
| Rate(bpm)      | - | - | - | - |
| STP(psi)       | - | - | - | - |

| Main Frac |   |   |   |   |
|-----------|---|---|---|---|
|           | 1 | 2 | 3 | 4 |
| Rate(bpm) | - | - | - | - |
| STP(psi)  | - | - | - | - |

| Proppant Type: 20/40 White |               |            |     |  |
|----------------------------|---------------|------------|-----|--|
| Proppant Type:             | Proppant Data |            |     |  |
| Program                    | 53,726 lbs    | 2.65       |     |  |
| Computer                   | 57,210 lbs    | 928.2 SG   |     |  |
| Blender                    | 53,874 lbs    | lbs/bbl    |     |  |
| BH Sand                    | 37,393 lbs    | Dirty bbls | 525 |  |
| Casing                     | 19,817 lbs    |            |     |  |
| Placed                     | 70% by design | Clean bbls | 461 |  |

| Detail         | MD    | TVD  | units |
|----------------|-------|------|-------|
| Top Perf       | 8770  | 4702 | ft    |
| Bottom Perf    | 8770  | 4702 | ft    |
| Mid Zone       | 8770  | 4702 | ft    |
| Gross Interval | 0     | 0    | ft    |
| Net Interval   | 0     | 0    | ft    |
| Fluid SG / HH  | 1.027 | 2094 | psi   |
| Shots/foot     | 3     | 3    | holes |
| Size           | 0.63  |      | inch  |

| Fluid System  | SpectraFrac G 3000 |
|---------------|--------------------|
| Additives     |                    |
|               | Seawater           |
| 7.50 GPT      | GLFC-1B            |
| 3.00 GPT      | XLW-56             |
| 1.50 GPT      | BF-8L              |
| 1.00 GPT      | Claymaster 5C      |
| 2.00 GPT      | MA 844W            |
| 1.00/2.00 GPT | BC-3               |
| 2.00 GPT      | GBW-12             |

| Treatment Schedule - Slurry Volumes(bbls) |        |           |        |           |
|---|--------|-----------|--------|-----------|
|   | Design | Treatment | Actual | Treatment |
|   | bbls   | Stage     | bbls   | Stage     |
| 1   | 10     | Load Hole | 0      | Load Hole |
| 2   | 100    | Injection | 64.3   | Injection |
| 3   | 30     | XO        | 19.8   | XO        |
| 4   | 50     | Pad       | 50.1   | Pad       |
| 5   | 21     | 1 ppa     | 21.4   | 1 ppa     |
| 6   | 50     | Pad       | 50.3   | Pad       |
| 7   | 49     | 2 ppa     | 49.7   | 2 ppa     |
| 8   | 51     | 3 ppa     | 51.3   | 3 ppa     |
| 9   | 41     | 4 ppa     | 41.2   | 4 ppa     |
| 10  | 43     | 5 ppa     | 43.2   | 5 ppa     |
| 11  | 44     | 6 ppa     | 44.5   | 6 ppa     |
| 12  | 34     | 8 ppa     | 34.1   | 8 ppa     |
| 13  | 36     | 10 ppa    | 36.9   | 10 ppa    |
| 14  | 7      | Sand Plug | 11.2   | Sand Plug |
| 15  | 128    | Flush     | 71.1   | Flush     |
| 16  |        |           |        |           |
| 17  |        |           |        |           |
| 18  |        |           |        |           |
| 19  |        |           |        |           |
| 20  |        |           |        |           |

Closure occurred at 547 psi surface, 2640 psi bottomhole with a gradient of 0.56 psi/ft, efficiency of 41.5%, and closure time of 10.44 minutes. The well screened out 71.1 bbl into a 128 bbl flush.

**Frac Data Summary**



Customer: Venoco  
 Customer Rep: Don Schmohr  
 Well/ Field: E-8ST2  
 Job Date: January 10, 2009  
 Job Number: 1001544408

Formation: M2  
 Interval/Stage: Stage 3  
 BHST: 125°F  
 BJ Rep: Berny Lopez/Chris Smith  
 TMV: Offshore Unit

| Tubulars           |         |        |         |       |
|--------------------|---------|--------|---------|-------|
|                    | Size/wt | Length | bbl/ft  | bbls  |
| Tubulars           | 3.5"    | 0      | 0.0087  | 0.0   |
| Casing             | 4.5"    | 8000   | 0.01522 | 121.8 |
| Surface Line       | 2.75    | 30     | 0.00735 | 0.2   |
| Volume to Top Perf |         |        |         | 122.0 |
| Flush              |         |        |         | 114.0 |

| Injection Data | Inj #1   | Inj #2 | Main Frac |   |
|----------------|----------|--------|-----------|---|
| Volume to fill | 0        | -      | 0         | - |
| Rate           | 10.8     | -      | 17.7      | - |
| STP            | 3146     | -      | 3638      | - |
| FG             | 0.70     | -      | 0.84      | - |
| Volume         | 127.8    | -      | 585       | - |
| ET@Startup     | 12:01 PM | -      | 2:27 PM   | - |
| ET@Shutdown    | 12:15 PM | -      | 3:03 PM   | - |
| Pump Time      | 0:14     | -      | 0:36      | - |
| ISIP           | 1164     | -      | 1800      | - |
| 5 min SIP      | 707      | -      | -         | - |
| 10 min SIP     | 586      | -      | -         | - |
| 15 min SIP     | 493      | -      | -         | - |

| Step Down Data |      |      |      |   |
|----------------|------|------|------|---|
| Inj. # 1       | 1    | 2    | 3    | 4 |
| Rate(bpm)      | 10.8 | 9    | 4.3  | - |
| STP(psi)       | 3146 | 2718 | 1792 | - |

| Step Down Data |   |   |   |   |
|----------------|---|---|---|---|
| Minifrac       | 1 | 2 | 3 | 4 |
| Rate(bpm)      | - | - | - | - |
| STP(psi)       | - | - | - | - |

| Main Frac |      |      |   |   |
|-----------|------|------|---|---|
|           | 1    | 2    | 3 | 4 |
| Rate(bpm) | 17.7 | 4.9  | - | - |
| STP(psi)  | 3638 | 2073 | - | - |

| Proppant Type: 20/40 White |               |            |     |  |
|----------------------------|---------------|------------|-----|--|
| Proppant Type:             | Proppant Data |            |     |  |
| Program                    | 52,122 lbs    | 2.65       |     |  |
| Computer                   | 53,084 lbs    | 928.2 SG   |     |  |
| Blender                    | 49,690 lbs    | lbs/bbl    |     |  |
| BH Sand                    | 50,181 lbs    | Dirty bbls | 585 |  |
| Casing Placed              | 2,903 lbs     | Clean bbls | 525 |  |
|                            | 96% by design |            |     |  |

| Detail         | MD    | TVD  | units |
|----------------|-------|------|-------|
| Top Perf       | 8000  | 4603 | ft    |
| Bottom Perf    | 8001  | 4603 | ft    |
| Mid Zone       | 8001  | 4603 | ft    |
| Gross Interval | 1     | 0    | ft    |
| Net Interval   | 1     | 0    | ft    |
| Fluid SG / HH  | 1.027 | 2050 | psi   |
| Shots/foot     | 3     | 3    | holes |
| Size           | 0.63  |      | inch  |

| Fluid System  |  | SpectraFrac G 3000 |
|---------------|--|--------------------|
| Additives     |  |                    |
|               |  | Seawater           |
| 7.50 GPT      |  | GLFC-1B            |
| 3.00 GPT      |  | XLW-56             |
| 1.00 GPT      |  | BF-8L              |
| 1.00 GPT      |  | Claymaster 5C      |
| 2.00 GPT      |  | MA 844W            |
| 1.00/2.00 GPT |  | BC-3               |
| 2.00 GPT      |  | GBW-12             |

| Treatment Schedule |                       |                 |                       |                 |
|--------------------|-----------------------|-----------------|-----------------------|-----------------|
|                    | Slurry Volumes(bbls)  |                 |                       |                 |
|                    | Design Treatment bbls | Treatment Stage | Actual Treatment bbls | Treatment Stage |
| 1                  |                       | Load Hole       | 0                     | Load Hole       |
| 2                  |                       | Injection       | 127.8                 | Injection       |
| 3                  | 30                    | XO              | 33.1                  | XO              |
| 4                  | 30                    | Pad             | 30.5                  | Pad             |
| 5                  | 16                    | 1 ppa           | 16.1                  | 1 ppa           |
| 6                  | 30                    | Pad             | 30.1                  | Pad             |
| 7                  | 16                    | 2 ppa           | 16.2                  | 2 ppa           |
| 8                  | 30                    | Pad             | 30                    | Pad             |
| 9                  | 44                    | 2 ppa           | 44.3                  | 2 ppa           |
| 10                 | 45                    | 3 ppa           | 45.2                  | 3 ppa           |
| 11                 | 47                    | 4 ppa           | 47                    | 4 ppa           |
| 12                 | 49                    | 5 ppa           | 49.2                  | 5 ppa           |
| 13                 | 89                    | 6 ppa           | 89.3                  | 6 ppa           |
| 14                 | 27                    | 8 ppa           | 27.2                  | 8 ppa           |
| 15                 | 7                     | Sand Plug       | 8.2                   | Sand Plug       |
| 16                 | 114                   | Flush           | 118.6                 | Flush           |
| 17                 |                       |                 |                       |                 |
| 18                 |                       |                 |                       |                 |
| 19                 |                       |                 |                       |                 |
| 20                 |                       |                 |                       |                 |

Closure occurred at 467 psi surface, 2516 psi bottomhole with a gradient of 0.547 psi/ft, efficiency of 45.1%, and closure time of 17.4 minutes. The sand plug was successfully set.

**Frac Data Summary**



Customer: Venoco  
 Customer Rep: Don Schmoor  
 Well/ Field: E-8ST2  
 Job Date: January 10, 2009  
 Job Number: 1001544409

Formation: M2  
 Interval/Stage: Stage 4  
 BHST: 125°F  
 BJ Rep: Chris Zoda/Chris Smith  
 TMV: Offshore Unit

| Tubulars           |         |        |         |       |
|--------------------|---------|--------|---------|-------|
|                    | Size/wt | Length | bbf/ft  | bbls  |
| Tubulars           | 3.5"    | 0      | 0.0087  | 0.0   |
| Casing             | 4.5"    | 7500   | 0.01522 | 114.2 |
| Surface Line       | 2.75    | 30     | 0.00735 | 0.2   |
| Volume to Top Perf |         |        |         | 114.4 |
| Flush              |         |        |         | 108.0 |

| Injection Data | Inj #1  | Inj #2 | Inj #3 |   |
|----------------|---------|--------|--------|---|
| Volume to fill | 0       | -      | -      | - |
| Rate           | 10.6    | -      | -      | - |
| STP            | 5671    | -      | -      | - |
| FG             | -       | -      | -      | - |
| Volume         | 16.8    | -      | -      | - |
| ET@Startup     | 7:19 PM | -      | -      | - |
| ET@Shutdown    | 7:24 PM | -      | -      | - |
| Pump Time      | 0:05    | -      | -      | - |
| ISIP           | -       | -      | -      | - |
| 5 min SIP      | -       | -      | -      | - |
| 10 min SIP     | -       | -      | -      | - |
| 15 min SIP     | -       | -      | -      | - |

| Step Down Data |   |   |   |   |
|----------------|---|---|---|---|
| Inj. # 1       | 1 | 2 | 3 | 4 |
| Rate(bpm)      | - | - | - | - |
| STP(psi)       | - | - | - | - |

| Step Down Data |   |   |   |   |
|----------------|---|---|---|---|
| Minifrac       | 1 | 2 | 3 | 4 |
| Rate(bpm)      | - | - | - | - |
| STP(psi)       | - | - | - | - |

| Main Frac |   |   |   |   |
|-----------|---|---|---|---|
|           | 1 | 2 | 3 | 4 |
| Rate(bpm) | - | - | - | - |
| STP(psi)  | - | - | - | - |

| Proppant Type: 20/40 White |               |            |    |  |
|----------------------------|---------------|------------|----|--|
| Proppant Type:             | Proppant Data |            |    |  |
| Program                    | 52,122 lbs    | 2.65       |    |  |
| Computer                   | - lbs         | 928.2 SG   |    |  |
| Blender                    | - lbs         | lbs/bbl    |    |  |
| BH Sand                    | - lbs         | Dirty bbls | 17 |  |
| Casing                     | - lbs         |            |    |  |
| Placed                     | 0% by design  | Clean bbls | 17 |  |

| Detail         | MD    | TVD  | units |
|----------------|-------|------|-------|
| Top Perf       | 7500  | 4563 | ft    |
| Bottom Perf    | 7501  | 4563 | ft    |
| Mid Zone       | 7501  | 4563 | ft    |
| Gross Interval | 1     | 0    | ft    |
| Net Interval   | 1     | 0    | ft    |
| Fluid SG / HH  | 1.027 | 2032 | psi   |
| Shots/foot     | 3     | 3    | holes |
| Size           | 0.63  |      | inch  |

| Fluid System  |  | SpectraFrac G 3000 |
|---------------|--|--------------------|
| Additives     |  |                    |
|               |  | Seawater           |
| 7.50 GPT      |  | GLFC-1B            |
| 3.00 GPT      |  | XLW-56             |
| 1.00 GPT      |  | BF-8L              |
| 1.00 GPT      |  | Claymaster 5C      |
| 2.00 GPT      |  | MA 844W            |
| 1.00/2.00 GPT |  | BC-3               |
| 2.00 GPT      |  | GBW-12             |

| Treatment Schedule - Slurry Volumes(bbls) |                       |                 |                       |                 |
|---|-----------------------|-----------------|-----------------------|-----------------|
|   | Design Treatment bbls | Treatment Stage | Actual Treatment bbls | Treatment Stage |
| 1   | 10                    | Load Hole       | 0                     | Load Hole       |
| 2   | 120                   | Injection #1    | 16.8                  | Injection #1    |
| 3   | 30                    | XO              |                       |                 |
| 4   | 30                    | Pad             |                       |                 |
| 5   | 16                    | 1 ppa           |                       |                 |
| 6   | 30                    | Pad             |                       |                 |
| 7   | 16                    | 2 ppa           |                       |                 |
| 8   | 30                    | Pad             |                       |                 |
| 9   | 44                    | 2 ppa           |                       |                 |
| 10  | 45                    | 3 ppa           |                       |                 |
| 11  | 47                    | 4 ppa           |                       |                 |
| 12  | 49                    | 5 ppa           |                       |                 |
| 13  | 89                    | 6 ppa           |                       |                 |
| 14  | 27                    | 8 ppa           |                       |                 |
| 15  | 7                     | Sand Plug       |                       |                 |
| 16  | 114                   | Flush           |                       |                 |
| 17  |                       |                 |                       |                 |
| 18  |                       |                 |                       |                 |
| 19  |                       |                 |                       |                 |
| 20  |                       |                 |                       |                 |

The well pressured up when a seawater injection was performed.

**Frac Data Summary**



Customer: Venoco  
 Customer Rep: Don Schmohr  
 Well/ Field: E-8ST2  
 Job Date: January 11, 2009  
 Job Number: 1001544410

Formation: M2  
 Interval/Stage: Stage 5  
 BHST: 125°F  
 BJ Rep: Berny Lopez/Chris Smith/Mike Sansinena  
 TMV: Offshore Unit

| Tubulars           |         |        |         |       |
|--------------------|---------|--------|---------|-------|
|                    | Size/wt | Length | bbl/ft  | bbls  |
| Tubulars           | 3.5"    | 0      | 0.0087  | 0.0   |
| Casing             | 4.5"    | 7350   | 0.01522 | 111.9 |
| Surface Line       | 2.75    | 30     | 0.00735 | 0.2   |
| Volume to Top Perf |         |        |         | 112.1 |
| Flush              |         |        |         | 104.0 |

| Injection Data | Inj #1  | Inj #2 | Main Frac |   |
|----------------|---------|--------|-----------|---|
| Volume to fill | 0.3     | -      | 0         | - |
| Rate           | 11.5    | -      | 15.3      | - |
| STP            | 3614    | -      | 3351      | - |
| FG             | 0.71    | -      | -         | - |
| Volume         | 27.2    | -      | 487.4     | - |
| ET@Startup     | 8:08 AM | -      | 10:03 AM  | - |
| ET@Shutdown    | 8:12 AM | -      | 10:54 AM  | - |
| Pump Time      | 0:04    | -      | 0:51      | - |
| ISIP           | 1222    | -      | -         | - |
| -5 min SIP     | 297     | -      | -         | - |
| 10 min SIP     | 200     | -      | -         | - |
| 15 min SIP     | 154     | -      | -         | - |

| Step Down Data |      |      |      |   |
|----------------|------|------|------|---|
| Inj. # 1       | 1    | 2    | 3    | 4 |
| Rate(bpm)      | 11.5 | 9.5  | 4.8  | - |
| STP(psi)       | 3614 | 3382 | 2330 | - |

| Step Down Data |   |   |   |   |
|----------------|---|---|---|---|
| Minifrac       | 1 | 2 | 3 | 4 |
| Rate(bpm)      | - | - | - | - |
| STP(psi)       | - | - | - | - |

| Main Frac |   |   |   |   |
|-----------|---|---|---|---|
|           | 1 | 2 | 3 | 4 |
| Rate(bpm) | - | - | - | - |
| STP(psi)  | - | - | - | - |

| Proppant Type: 20/40 White |               |               |  |          |
|----------------------------|---------------|---------------|--|----------|
| Proppant Type:             |               | Proppant Data |  |          |
| Program                    | 52,122 lbs    |               |  | 2.65     |
| Computer                   | 21,219 lbs    |               |  | 928.2 SG |
| Blender                    | 19,829 lbs    |               |  | lbs/bbl  |
| BH Sand                    | 9,016 lbs     | Dirty bbls    |  | 516      |
| Casing Placed              | 12,202 lbs    | Clean bbls    |  | 493      |
|                            | 17% by design |               |  |          |

| Detail         | MID   | TVD  | units |
|----------------|-------|------|-------|
| Top Perf       | 7350  | 4555 | ft    |
| Bottom Perf    | 7351  | 4555 | ft    |
| Mid Zone       | 7351  | 4555 | ft    |
| Gross Interval | 1     | 0    | ft    |
| Net Interval   | 1     | 0    | ft    |
| Fluid SG / HH  | 1.027 | 2029 | psi   |
| Shots/foot     | 3     | 3    | holes |
| Size           | 0.63  |      | inch  |

| Fluid System  |  | SpectraFrac G 3500 |
|---------------|--|--------------------|
| Additives     |  |                    |
|               |  | Seawater           |
| 8.75 GPT      |  | GLFC-1B            |
| 3.00 GPT      |  | XLW-56             |
| 1.00 GPT      |  | BF-8L              |
| 1.00 GPT      |  | Claymaster 5C      |
| 2.00 GPT      |  | MA 844W            |
| 1.00/2.00 GPT |  | BC-3               |
| 2.00 GPT      |  | GBW-12             |

| Treatment Schedule Slurry Volumes(bbls) |                       |                 |                       |                 |
|---|-----------------------|-----------------|-----------------------|-----------------|
|   | Design Treatment bbls | Treatment Stage | Actual Treatment bbls | Treatment Stage |
| 1                                       | 10                    | Load Hole       | 0.3                   | Load Hole       |
| 2                                       | 100                   | Injection       | 27.2                  | Injection       |
| 3                                       | 30                    | XO              | 64.7                  | XO              |
| 4                                       | 40                    | Pad             | 40                    | Pad             |
| 5                                       | 16                    | 1 ppa           | 16                    | 1 ppa           |
| 6                                       | 30                    | Pad             | 30.1                  | Pad             |
| 7                                       | 16                    | 2 ppa           | 16                    | 2 ppa           |
| 8                                       | 50                    | Pad             | 99.9                  | Pad             |
| 9                                       | 44                    | 2 ppa           | 44.1                  | 1 ppa           |
| 10                                      | 45                    | 3 ppa           | 44.1                  | 2 ppa           |
| 11                                      | 47                    | 4 ppa           | 45.1                  | 3 ppa           |
| 12                                      | 49                    | 5 ppa           | 62.4                  | 4 ppa           |
| 13                                      | 89                    | 6 ppa           | 25                    | Flush           |
| 14                                      | 27                    | 8 ppa           |                       |                 |
| 15                                      | 7                     | Sand Plug       |                       |                 |
| 16                                      | 104                   | Flush           |                       |                 |
| 17                                      |                       |                 |                       |                 |
| 18                                      |                       |                 |                       |                 |
| 19                                      |                       |                 |                       |                 |
| 20                                      |                       |                 |                       |                 |

Closure occurred at 507 psi surface, 2536 psi bottomhole with a gradient of 0.56 psi/ft, efficiency of 24.2 %, and closure time of 1.74 minutes. The pumping schedule was changed during the job to account for high treating pressures. The well screened out approximately 25 bbl into a 104 bbl flush.

**Frac Data Summary**



Customer: Venoco  
 Customer Rep: Don Schmohr  
 Well/ Field: E-8ST2  
 Job Date: January 12, 2009  
 Job Number: 1001544411

Formation: M2  
 Interval/Stage: Stage 6  
 BHST: 125°F  
 BJ Rep: Berny Lopez/Chris Smith/Mike Sansinena  
 TMV: Offshore Unit

| Tubulars           |         |        |         |              |
|--------------------|---------|--------|---------|--------------|
|                    | Size/wt | Length | bbl/ft  | bbls         |
| Tubulars           | 3.5"    | 0      | 0.0087  | 0.0          |
| Casing             | 4.5"    | 6741   | 0.01522 | 102.6        |
| Surface Line       | 2.75    | 30     | 0.00735 | 0.2          |
| Volume to Top Perf |         |        |         | <b>102.8</b> |
| Flush              |         |        |         | <b>100.0</b> |

| Injection Data | Inj #1  | Inj #2  | Main Frac |   |
|----------------|---------|---------|-----------|---|
| Volume to fill | 0       | 0       | 1.1       | - |
| Rate           | 6.6     | 6.4     | -         | - |
| STP            | 3733    | 3657    | -         | - |
| FG             | 0.82    | 0.89    | -         | - |
| Volume         | 84.7    | 43.7    | 42.8      | - |
| ET@Startup     | 7:04 AM | 8:29 AM | 12:00 PM  | - |
| ET@Shutdown    | 7:28 AM | 8:39 AM | 12:29 PM  | - |
| Pump Time      | 0:24    | 0:10    | 0:29      | - |
| ISIP           | 1690    | 1982    | -         | - |
| 5 min SIP      | 722     | 836     | -         | - |
| 10 min SIP     | 587     | 693     | -         | - |
| 15 min SIP     | 572     | -       | -         | - |

| Step Down Data |      |      |      |   |
|----------------|------|------|------|---|
| Injection #2   | 1    | 2    | 3    | 4 |
| Rate(bpm)      | 6.6  | 4.7  | 3.3  | - |
| STP(psi)       | 3733 | 3251 | 2840 | - |

| Step Down Data |      |      |      |   |
|----------------|------|------|------|---|
| Injection #2   | 1    | 2    | 3    | 4 |
| Rate(bpm)      | 6.4  | 4.7  | 1.7  | - |
| STP(psi)       | 3657 | 3290 | 2729 | - |

| Main Frac |   |   |   |   |
|-----------|---|---|---|---|
|           | 1 | 2 | 3 | 4 |
| Rate(bpm) | - | - | - | - |
| STP(psi)  | - | - | - | - |

| Proppant Type: 20/40 White |              |               |    |  |
|----------------------------|--------------|---------------|----|--|
| Proppant Type:             |              | Proppant Data |    |  |
| Program                    | 29,484 lbs   | 2.65          |    |  |
| Computer                   | - lbs        | 928.2 SG      |    |  |
| Blender                    | - lbs        | lbs/bbl       |    |  |
| BH Sand                    | - lbs        | Dirty bbls    | 97 |  |
| Casing                     | - lbs        |               |    |  |
| Placed                     | 0% by design | Clean bbls    | 97 |  |

| Detail         | MD    | TVD  | units |
|----------------|-------|------|-------|
| Top Perf       | 6740  | 4472 | ft    |
| Bottom Perf    | 6742  | 4472 | ft    |
| Mid Zone       | 6741  | 4472 | ft    |
| Gross Interval | 2     | 0    | ft    |
| Net Interval   | 2     | 0    | ft    |
| Fluid SG / HH  | 1.027 | 1992 | psi   |
| Shots/foot     | 3     | 3    | holes |
| Size           | 0.63  |      | inch  |

| Fluid System  |  | SpectraFrac G 3500 |
|---------------|--|--------------------|
| Additives     |  |                    |
|               |  | Seawater           |
| 8.75 GPT      |  | GLFC-1B            |
| 3.00 GPT      |  | XLW-56             |
| 1.00 GPT      |  | BF-8L              |
| 1.00 GPT      |  | Claymaster 5C      |
| 2.00 GPT      |  | MA 844W            |
| 1.00/2.00 GPT |  | BC-3               |
| 2.00 GPT      |  | GBW-12             |

| Treatment Schedule - Slurry Volumes(bbls) |             |                 |                       |                 |
|---|-------------|-----------------|-----------------------|-----------------|
|   | Design bbls | Treatment Stage | Actual Treatment bbls | Treatment Stage |
| 1   | 10          | Load Hole       | 0                     | Load Hole       |
| 2   | 120         | Injection #1    | 84.7                  | Injection #1    |
| 3   | 120         | Injection #2    | 43.7                  | Injection #2    |
| 4   | 30          | XO              | 10.6                  | XO              |
| 5   | 50          | Pad             | 38                    | Pad             |
| 6   | 25          | 1 ppa 100M      | 4.8                   | Water           |
| 7   | 50          | Pad             |                       |                 |
| 8   | 26          | 2 ppa 100 M     |                       |                 |
| 9   | 40          | Pad             |                       |                 |
| 10  | 10          | 1 ppa           |                       |                 |
| 11  | 50          | Pad             |                       |                 |
| 12  | 42          | 1 ppa           |                       |                 |
| 13  | 65          | 2 ppa           |                       |                 |
| 14  | 68          | 3 ppa           |                       |                 |
| 15  | 83          | 4 ppa           |                       |                 |
| 16  | 100         | Flush           |                       |                 |
| 17  |             |                 |                       |                 |
| 18  |             |                 |                       |                 |
| 19  |             |                 |                       |                 |
| 20  |             |                 |                       |                 |

The original holes were at 6740'. However, after injection #1, new holes were cut at 6741'. Near-wellbore from injection #1 was 1380 psi, perf friction was 475 psi, with a beta factor of 0.77 and 1.37 open holes. Near-wellbore from injection #2 was 982 psi, perf friction was 290 psi, with a beta factor of 0.68 and 1.72 open holes. Closure was not found. The job started to pressure out approximately 38 bbls in the pad, so the company decided to go to water. No frac was performed.



Kurtz, Bobby <bobby.kurtz@bsee.gov>

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## Enhanced-recovery operations

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**Kurtz, Bobby** <bobby.kurtz@bsee.gov>

Fri, Jan 11, 2013 at 10:10 AM

To: bzahner@venocoinc.com

Cc: mcarlsen@venocoinc.com, chris.peltonen@venocoinc.com

Bob,

I am drafting a response for the director of the BSEE (formerly MMS) to the recent VC Reporter article on offshore fracking and was hoping that you (or Monica and Chris) could verify my findings before I pass them along. According to our well files, the VC Reporter claim that Venoco, Inc. performed a fracking procedure on a Platform Gail well in 2009 is inaccurate. The only record we have of fracking by Venoco, Inc. shows that fracking was performed on only one occasion with unfavorable results in well E-11 from Platform Gail, Sockeye Field, in August 1992. Can you please confirm that this information is accurate as soon as possible.

Thank you very much,

—

**Bobby Kurtz**

*Geologist*

*Production and Development*

*Pacific OCS Region*

*Bureau of Safety and Environmental Enforcement*

*(805)389-7713*



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Re: Follow up on Platform Gilda discussion

1 message

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**Margaret Schneider** <margaret.schneider@bsee.gov>

Mon, Feb 18, 2013 at 3:27 PM

To: "Ming, Jaron" <jaron.ming@bsee.gov>

Cc: Chuck Barbee <Chuck.Barbee@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

thanks for the heads up. OK to proceed.

Sent from my iPad

On Feb 14, 2013, at 1:59 PM, "Ming, Jaron" <jaron.ming@bsee.gov> wrote:

Hi Margaret:

I just wanted fill you in on what is occurring here in the Pacific Region on the fracking issue that came up last week.

As we mentioned, one of our operators, DCOR, successfully used hydraulic fracturing in the past to stimulate a well and intends repeat the process on other wells in the future. Representatives from DCOR came to our office this week to meet and discuss the status of one of their APDs that included the use of hydraulic fracturing. The APD received a safety and environmental review and after a categorical exclusion under NEPA, DCOR was given a verbal approval (however a final letter had not been sent). They presented information to us on the process and materials they planned to use in their hydraulic fracturing proposal. We told them that we would get back to them on whether there would be any additional conditions on their APD. Subsequently, the REO, Ken Seeley conferred with EPA and reviewed the proposal to see if any additional NEPA work might be necessary. His discussion and conclusions are included below. Taking his findings into consideration, we would like to advise (b) (5)

Please let me know if you have any objection to proceeding in this manner. I am also available to discuss further over the phone if necessary. Thanks very much.

Jaron

—— Forwarded message ——

From: **Seeley, Kenneth** <kenneth.seeley@bsee.gov>

Date: Thu, Feb 14, 2013 at 10:13 AM

Subject: Follow up on Platform Gilda discussion

To: Jaron Ming <jaron.ming@bsee.gov>, Nabil Masri <nabil.masri@bsee.gov>, John Kaiser <john.kaiser@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>

Hi everyone:

Since we met on Tuesday, I've taken a crash course on fracking and relevant regulations.

Chemicals used in fracking were exempted from requirements of the Safe Water Drinking Act back in 2005. They were not exempted from the Clean Water Act, and EPA could allow discharges of flowback water to surface waters, provided that "treatment" occurred beforehand. I contacted Eugene Bromley of EPA's NPDES program (see below) to get his take on how EPA would handle

chemicals used in fracking in their discharge permits. (b) (5)

Finally, I went back and looked at the APD, and DCOR clearly states in that document that they **do not** intend to discharge ("This will be a closed drilling system with no overboard discharge.").

(b) (5) (b) (5) unless DCOR has indicated they want to change that. So given all of this, and unless DCOR has changed their plan, I think that (b) (5)

From the potential issues that Drew brought up (b) (5)

I think the (b) (5)

Thanks Eugene, that's very helpful. I'm not actually aware of any chemicals being proposed for overboard discharge at this time, but with heightened public attention it's probably a good idea to familiarize myself with all of these issues. (b) (5)

On Wed, Feb 13, 2013 at 3:58 PM, <Bromley.Eugene@epamail.epa.gov> wrote:

Ken,

Our OCS general permit authorizes the discharge of 22 types of discharges from offshore platforms, including well treatment fluids which are defined as:

"Well treatment fluids" shall refer to any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled. (40 CFR Part 435.11)

(b) (5) EPA's offshore oil regs include effluent limitations guidelines for well treatment fluids which were finalized in 1993, based on what was known about the discharge at that time (which was before fracking). Our permit authorizes chemicals "ordinarily present" in a discharge, which means chemicals or classes of chemicals recognized as being used for offshore operations in the development document for the 1993 regs.

The definition of produced water in the permit also recognizes that various chemicals may be discharged in produced water, and the permit also recognizes that well treatment fluids may be commingled with produced water.

With regards to special requirements for fracking fluids:

We have broad authority to require an individual permit when the general permit is not appropriate; this could include discharges with chemicals outside the scope of what was intended by the permit, and special effluent limits could be developed, or discharge authorization could be denied altogether.

We could also require an individual permit (or deny any permit authorization) for chemicals which could cause unreasonable degradation of the marine environment (section 403 of the CWA).

Under section 308 of the CWA, we could also ask for more info on fracking chemicals that may be in use.

It would be helpful to let us know of any fracking chemicals you are aware of that are being used and discharged at the platforms that could pose a threat to the marine environment

Eugene Bromley  
NPDES Permits Office (WTR-5)  
EPA Region 9  
75 Hawthorne Street  
San Francisco, CA 94105  
[bromley.eugene@epa.gov](mailto:bromley.eugene@epa.gov)  
(415) 972-3510  
(415) 947-3549 (fax)

From: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>  
To: Eugene Bromley/R9/USEPA/US@EPA,  
Cc: James Salmons <james.salmons@bsee.gov>  
Date: 02/13/2013 01:11 PM  
Subject: offshore fracking and NPDES

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Hi Eugene:

I'm trying to get a better handle on what authority EPA has regarding discharges of flowback water that might be contaminated with chemicals used in hydraulic fracturing. I understand that these chemicals are exempted from requirements of the Safe Drinking Water Act, but I read on EPA's webpage that flowback water can be discharged with produced water, provided that is treated beforehand.

Would a situation like that be covered under the general NPDES permit, or would an individual permit be required and are discharge limits determined on a case by case basis?

Thanks,

Ken

—

Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618

| [Kenneth.Seeley@BSEE.gov](mailto:Kenneth.Seeley@BSEE.gov)

—

Kenneth R. Seeley, Ph.D.  
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770 Paseo Camarillo  
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[Kenneth.Seeley@BSEE.gov](mailto:Kenneth.Seeley@BSEE.gov)



Sinkula, Nathan <nathan.sinkula@bsee.gov>

**Fwd: Frack**

4 messages

**Mayerson, Drew** <drew.mayerson@bsee.gov>  
To: Nathan Sinkula <nathan.sinkula@bsee.gov>  
Cc: Bobby Kurtz <geokurtz@gmail.com>

Thu, Mar 14, 2013 at 9:08 AM

(b) (5)  
[Redacted]

Drew  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

—— Forwarded message ——  
From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>  
Date: Thu, Mar 14, 2013 at 8:36 AM  
Subject: Frack  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Would you say this is accurate for the Pacific:

(b) (5)  
[Redacted]

**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Thu, Mar 14, 2013 at 9:21 AM

i think (b) (5)  
[Redacted]

[Redacted]  
treatment"

Nathan

as a rewrite,

(b) (5)  
[Redacted text block]

[Quoted text hidden]

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Bobby Kurtz <bobby.kurtz@bsee.gov>

Thu, Mar 14, 2013 at 9:21 AM

[Quoted text hidden]

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Thu, Mar 14, 2013 at 9:39 AM

(b) (5)  
[Redacted text block]



Mayerson, Drew <drew.mayerson@bsee.gov>

**Frack**

4 messages

**Pardi, Nicholas** <nicholas.pardi@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Thu, Mar 14, 2013 at 8:36 AM

Would you say this is accurate for the Pacific:

(b) (5)  
[Redacted]

**Mayerson, Drew** <drew.mayerson@bsee.gov>  
To: Nathan Sinkula <nathan.sinkula@bsee.gov>  
Cc: Bobby Kurtz <geokurtz@gmail.com>

Thu, Mar 14, 2013 at 9:08 AM

What do you think? (b) (5)  
[Redacted]

Drew  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region  
[Quoted text hidden]

**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Thu, Mar 14, 2013 at 9:21 AM

i think it (b) (5)  
[Redacted]

Nathan  
as a rewrite,

(b) (5)  
[Redacted text block]

[Quoted text hidden]

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Thu, Mar 14, 2013 at 9:39 AM

(b) (5)  
[Redacted text block]

On Thu, Mar 14, 2013 at 9:21 AM, Sinkula, Nathan <nathan.sinkula@bsee.gov> wrote:  
[Quoted text hidden]



Sinkula, Nathan &lt;nathan.sinkula@bsee.gov&gt;

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**Fwd: Fracking**

1 message

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**Voskianian, Armen** <armen.voskianian@bsee.gov>  
To: Nathan Sinkula <nathan.sinkula@bsee.gov>

Tue, Jan 15, 2013 at 3:17 PM

FYI

—— Forwarded message ——  
From: **Mayerson, Drew** <drew.mayerson@bsee.gov>  
Date: Tue, Jan 15, 2013 at 1:10 PM  
Subject: Fwd: Fracking  
To: BSEE PAC OPD <bseepacopd@bsee.gov>

fyi  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

—— Forwarded message ——  
From: **Ming, Jaron** <jaron.ming@bsee.gov>  
Date: Tue, Jan 15, 2013 at 12:59 PM  
Subject: Fracking  
To: Daniel Knowlson <daniel.knowlson@bsee.gov>  
Cc: "Masri, Nabil" <Nabil.Masri@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>

As you know, fracking has been of great interest to the Department and the general public in recent months. For that reason, I am asking you to pay close attention to any APDs and/or APMs that we receive and let me know if you believe any of them would be considered a "frac job". Thanks and feel free to contact me if you have any questions.

Jaron

—  
**Armen Voskianian, P.E.**  
*Reservoir Engineer  
Bureau of Safety and Environmental Enforcement  
Pacific OCS Region  
Office of Production and Development  
770 Paseo Camarillo, Second Floor  
Camarillo, CA 93010  
805.389.7727  
armen.voskianian@bsee.gov*



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Fracking Article from Dec in VC Reporter

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Wed, Feb 27, 2013 at 10:48 AM

To: Bobby Kurtz <geokurtz@gmail.com>, "Dame, Robert" <Robert.Dame@bsee.gov>, Michael Brickey <michael.brickey@bsee.gov>, Armen Voskanian <armen.voskanian@bsee.gov>, Nathan Sinkula <nathan.sinkula@bsee.gov>

As you know yesterday Dan, Nabil, Ken Seeley, and I were asked to provide a point by point response to the comments and allegations made in the subject article.

My assignment was to handle the geologic comments, Dan to handle the drilling and fluid comments, and Ken to handle the environmental aspects of the article.

Attached is my first run through of the article with point by point geo coments. p

Please take a look and see if 1) I missed anything, and 2) I'm in error.

Can I get it back by 2pm today? If you have no comments, please state that.

Thanks,  
Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

---

 **Point by point response to VC Reporter Article.docx**  
41K



Mayerson, Drew <drew.mayerson@bsee.gov>

## Re: Fw: Fracking issue

1 message

Ming, Jaron <jaron.ming@bsee.gov>

Thu, Jan 3, 2013 at 9:49 AM

To: "Gregory, John" <john.gregory@bsee.gov>

Cc: Rosalind Barr <Rosalind.Barr@boemre.gov>, Ericka Williams <ericka.williams@boem.gov>

Bcc: drew.mayerson@bsee.gov

BOEM and BSEE in the Pacific are working together to prepare a response. The BOEM POC will be back in the office next week so we can finalize it. Thanks.

On Thu, Jan 3, 2013 at 9:29 AM, Gregory, John <john.gregory@bsee.gov> wrote:

Hello All,

I have a couple of related letters to the one attached here and was not sure where to task them:

WIC: "Venoco has fracked its oil fields along the Santa Barbara coast, an alarming expansion of this dangerous drilling process (tasked to "BSEE" and "Closed")

&

Concerned about oil company Venoco's use of hydraulic fracturing off coast of California. ("BSEE" "Closed")

I will take them to you in ODM (BOEM) so you can see them and give me an idea what needs to be done.

Thanks,  
John

----- Forwarded message -----

From: **Thomas Lillie** <thomas.lillie@bsee.gov>

Date: Fri, Dec 21, 2012 at 10:08 AM

Subject: Fw: Fracking issue

To: jaron.ming@bsee.gov

Cc: james.watson@bsee.gov, margaret.schneider@bsee.gov, Lisa\_Cannuscio@ios.doi.gov, douglas.morris@bsee.gov

Jaron: please work with BOEM on drafting a response to this. My note to Walter is an initial read. Not sure if I summarized the approach correctly, but take a look and let us know your thoughts. Happy holidays. Tom

**From:** Lillie, Thomas [mailto:thomas.lillie@bsee.gov]

**Sent:** Tuesday, December 18, 2012 10:34 AM

**To:** Aronson, Ellen <ellen.aronson@boem.gov>

**Subject:** Re: Fracking issue

Ellen: Here is the letter and my note to Walter. He is out of the office until tomorrow. Tom

Walter: I reviewed the letter regarding fracking offshore California. It alleges that fracking has occurred at a platform operated by Venoco off the Santa Barbara coast. The author makes a statement, but provides no evidence to support it. The response should address: (1) has Venoco or any other operator actually conducted any fracking offshore California as alleged in the letter (a BSEE issue); (2) is the alleged activity being conducted in the Federal OCS or state offshore property (a BOEM issue); (3) has fracking ever been considered in a five-year plan and been assessed in any NEPA document for the area in question (i.e., is it even allowed; a BOEM issue); (4) If so, has Venoco or any other operator ever submitted an application for permit to conduct fracking in the Pacific Region (a BSEE issue). Let me know when you get in. Thanks.

On Tue, Dec 18, 2012 at 1:25 PM, Aronson, Ellen <ellen.aronson@boem.gov> wrote:

Could you send me the letter, please. I cannot seem to download it in the chain of emails. Thank you.

—  
**Ellen G. Aronson**

*Regional Director  
Pacific Region, Bureau of Ocean Energy Management  
770 Paseo Camarillo  
Camarillo, CA 93010  
(805) 389-7502  
(805) 389-72511 (Direct)*

—  
Tom Lillie  
Chief of Staff  
Bureau of Safety and Environmental Enforcement  
(202) 208-6286  
thomas.lillie@bsee.gov

—  
Tom Lillie  
Chief of Staff  
Bureau of Safety and Environmental Enforcement  
(202) 208-6286  
thomas.lillie@bsee.gov



Kurtz, Bobby <bobby.kurtz@bsee.gov>

---

## Fwd: Fracking letter

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**Bobby Kurtz** <geokurtz@gmail.com>  
To: bobby.kurtz@bsee.gov

Tue, Jan 8, 2013 at 6:41 PM

Sent from my iPhone

Begin forwarded message:

**From:** "Mayerson, Drew" <drew.mayerson@bsee.gov>  
**Date:** January 8, 2013 3:06:46 PM PST  
**To:** Bobby Kurtz <geokurtz@gmail.com>  
**Subject:** Fracking letter

Some things to think about:

Fracking is extremely rare in the Pacific OCS having only occurred twice in the last 20 years with the last time in 1998 or 97.

All well operations are reviewed by BSEE engineers prior to approval.

My guess is to (b) (5)

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region



Kurtz, Bobby &lt;bobby.kurtz@bsee.gov&gt;

## Fracking response (long draft)

Kurtz, Bobby <bobby.kurtz@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Fri, Jan 11, 2013 at 12:48 PM

Dear Marie C. Vought,

Dear Leopoldo L. Lopez,

Secretary Salazar has asked that I respond to your concerns on his behalf regarding fracking in oil and gas reservoirs of the Pacific Federal Outer Continental Shelf Region. There have only been two occasions when hydraulic fracturing was utilized as a recovery technique in Federal waters off the California coast. According to the State Lands Commission which governs oil and gas operations in California state waters which extend 3 miles offshore, no fracking has been performed on any wells under their jurisdiction. Onshore fracking activities in California have generally been performed at true vertical depths ranging from 2500-6000' below the Earth's surface. The well casing perforation method described in the VC Reporter article as "drop a bomb" is inaccurate. In reality most oil and gas wells, including those that do not employ hydraulic fracturing, are completed at hydrocarbon-bearing zones by perforating the casing of the well with a lowered tool containing a grid of multiple directional charges designed to blast small, individual holes in the casing for production. Some oil and gas wells still utilize the earlier technology of open-hole completions when productive intervals are thick and reservoir pressures are low.

The only occasion that Venoco, Inc. utilized fracking for reservoir stimulation in the Pacific OCS region was in August 1992 in the Santa Barbara Channel approximately 10 miles off the coast of Oxnard, CA. The frac job was performed on well E-11 (API: 043112068200) off of Platform Gail in the Sockeye Field of the Santa Clara Unit, Federal lease P-205. The target was three intervals which were completed (perforated) in sandstone of the Upper Sespe Formation from: 6,288-6,287', 6,206-6,224', and 6,206-6,224' in measured depth, approximately 5,600' in true vertical depth beneath the drilling deck of the platform. At the location of Platform Gail the water depth is 730'. Oil and gas production from this well had dropped significantly in May 1992 from 2,700bbl/5,300Mcf per month to 1,500bbl/1,300Mcf per month, then steadily declined to 300bbl/4,000Mcf by August prior to the frac job. The hydraulic fracturing was unsuccessful and Venoco was only able to recover production to 833bbl/9,900Mcf per month which was quickly stunted to zero production by February 1993. The target was abandoned in March 1993 and the Sespe Formation intervals of the well were plugged. Venoco moved up hole to the Upper Topanga Formation which they have been producing through traditional recovery techniques for this region, not involving hydraulic fracturing.

The second instance of hydraulic fracturing was in late April 1997 when Chevron attempted to frac well C-11 (API: 560452006701) off Platform Hidalgo in the Pt. Arguello Field, Federal lease P-450 where the water depth is 430' approximately 6 miles offshore Vandenberg Air Force Base. The target was the M-1 zone of the Monterey Formation. They isolated a zone from 10,775' to 11,248' in measured depth at approximately 10,500' in true vertical depth, leaving a deeper Monterey completion unaffected by the frac job. Perforations were added to the isolated zone with 50 holes between 11,051'-11,061' MD. The planned operation was to inject 50,000gals of frac fluid containing 90,000lbs of proppant to maintain void space induced by the procedure at 30-40bpm into the reservoir maintaining a pressure of 5,500-7,500psi. It appears that they underestimated the requisite pressure to perform the job effectively causing the frac fluids to back up in the wellbore. They were only able to inject 62,622gals of frac fluid with 29,736lbs of proppant. The maximum flowback rate achieved after the main frac was 1.1bpm. As a result of the attempted fracking, production was decreased substantially in May and June 1997 from a steady 4,000bbl/mo prior down to 2,800bbl and 842bbl respectively. In June 1997 an enzyme breaker was injected into the reservoir and recovered steady production to approximately 4,000bbl/mo.

Flowback fluids from these frac jobs were cleaned and disposed of according to federal regulations just as any produced water from oil and gas operations. At the time of the oil spill on Platform Gail in 2010 there were no fracking operations being conducted and the claim that fracking had been performed in 2009 is inaccurate. In

the event of an oil spill, detailed spill contingency plans take effect which are required to be submitted, approved, and readied prior to oil and gas operations. On December 18, 2012 the California Division of Oil, Gas, and Geothermal Resources and the Department of Conservation released a draft of onshore regulations that are being developed for governing hydraulic fracturing operations including well design competency testing, well monitoring during and for 5 years following fracking activities, geologic modeling of the propagation of induced fractures, disclosure of operations on the currently active website fracfocusdata.org, the disclosure of frac fluid components, and the storage and handling of frac fluids. The Bureau of Land Management began an overhaul in 2012 of hydraulic fracturing regulations for Federal public and Indian lands that it oversees requiring similar disclosure and operational scrutiny. All regulations and findings determined by these agencies will be carefully evaluated when adopting future policies governing hydraulic fracturing operations in the Federal Pacific Outer Continental Shelf region.

If onshore fracking of the Monterey Formation turns out to be a successful, long-term recovery technique it may follow that operators who produce the Monterey in offshore regions of California may look to fracking as a viable enhanced-recovery technique. I assure you that at such time, the BSEE will treat these applications with the utmost scrutiny and will not allow such operations to be conducted until detailed environmental impact assessments, such as the EPA study of affects on drinking water due in 2014, are conducted and effective operating procedures are determined so that they may be enforced to preserve our environment and natural resources.

--

**BSEE Director James Watson**



Kurtz, Bobby <bobby.kurtz@bsee.gov>

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## Fracking response (short draft)

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Kurtz, Bobby <bobby.kurtz@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Fri, Jan 11, 2013 at 12:48 PM

Dear Marie C. Vought,

Secretary Salazar has asked that I respond to your concerns on his behalf regarding fracking in oil and gas reservoirs of the Pacific Federal Outer Continental Shelf Region. There have only been two occasions when hydraulic fracturing was utilized as a recovery technique in Federal waters off the California coast.

The only occasion that Venoco, Inc. utilized fracking for reservoir stimulation in the Pacific OCS region was in August 1992 in the Santa Barbara Channel approximately 10 miles off the coast of Oxnard, CA. The frac job was performed on well E-11 (API: 043112068200) off of Platform Gail in the Sockeye Field of the Santa Clara Unit, Federal lease P-205. The target was approximately 5,600' in true vertical depth beneath the drilling deck of the platform. At the location of Platform Gail the water depth is 730'. The hydraulic fracturing was unsuccessful and the target was abandoned in March 1993 and the Sespe Formation intervals of the well were plugged.

The second instance of hydraulic fracturing was in late April 1997 when Chevron attempted to frac well C-11 (API: 560452006701) off Platform Hidalgo in the Pt. Arguello Field, Federal lease P-450 where the water depth is 430' approximately 6 miles offshore Vandenberg Air Force Base. The target was the M-1 zone of the Monterey Formation. They isolated a zone at approximately 10,500' in true vertical depth, leaving a deeper Monterey completion unaffected by the frac job. As a result of the attempted fracking, production was decreased substantially.

Flowback fluids from these frac jobs were cleaned and disposed of according to federal regulations just as any produced water from oil and gas operations. At the time of the oil spill on Platform Gail in 2010 there were no fracking operations being conducted and the claim that fracking had been performed in 2009 is inaccurate. In the event of an oil spill, detailed spill contingency plans take effect which are required to be submitted, approved, and readied prior to oil and gas operations. On December 18, 2012 the California Division of Oil, Gas, and Geothermal Resources and the Department of Conservation released a draft of onshore regulations that are being developed for governing hydraulic fracturing operations including well design competency testing, well monitoring during and for 5 years following fracking activities, geologic modeling of the propagation of induced fractures, disclosure of operations on the currently active website [fracfocusdata.org](http://fracfocusdata.org), the disclosure of frac fluid components, and the storage and handling of frac fluids. The Bureau of Land Management began an overhaul in 2012 of hydraulic fracturing regulations for Federal public and Indian lands that it oversees requiring similar disclosure and operational adherence. All regulations and findings determined by these agencies will be carefully evaluated when adopting future policies governing hydraulic fracturing operations in the Federal Pacific Outer Continental Shelf region.

If onshore fracking of the Monterey Formation turns out to be a successful, long-term strategy it may follow that operators who produce the Monterey in offshore regions of California may look to fracking as a viable enhanced-recovery technique. I assure you that at such time, the BSEE will treat these applications with the utmost scrutiny and will not allow such operations to be conducted until detailed environmental impact assessments, such as the EPA study of affects on drinking water due in 2014, are conducted and effective operating procedures are determined so that they may be enforced to preserve our environment and natural resources.

--

**BSEE Director James Watson**



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Fwd: Fracking Response

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Mon, Feb 25, 2013 at 3:28 PM

To: "Masri, Nabil" <Nabil.Masri@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>

THIS IS A DRAFT OF WHAT WAS SENT TO JARON FOR HIS APPROVAL BEFORE SENDING TO TOM LILLIE.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

——— Forwarded message ———

From: **Mayerson, Drew** <drew.mayerson@bsee.gov>

Date: Wed, Feb 20, 2013 at 5:17 PM

Subject: Fracking Response

To: "Ming, Jaron" <Jaron.Ming@bsee.gov>

Jaron,

I've updated the original paper we sent to Tom Lillie to reflect DCOR's revelations. See what you think. I've also updated the fact sheet. If ok, you can send to Tom or send back to me and I'll do it tomorrow.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

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### 2 attachments

 **Hydraulic Fracturing in the Federal Offshore Facts Revised 2-20-13.docx**  
18K

 **Draft secretary response to public comments revised 2-20-13.docx**  
14K

## Hydraulic Fracturing in the Federal Offshore, California Facts and Figures

- The Monterey Shale (Monterey Formation) is present in onshore and offshore California.
- The Monterey Formation is the most prolific oil and gas reservoir in the Pacific Region.
- Approximately 750 million barrels of oil (60% of the Region's production) has been produced from the POCS Monterey Formation. Over 1.2 billion barrels of oil have been produced from all Pacific Region reservoirs, including non-shale reservoirs.
- The Department of Energy estimates that approximately 15 billion barrels of oil are recoverable from the onshore Monterey formation using conventionally available technology.
- Hydraulic fracturing has only occurred 11 times in the last 25 years in the Federal offshore and none of the wells were horizontal (see table below).

| Date         | Lease & Well                          | Operator     | Comments   |
|--------------|---------------------------------------|--------------|--|
| 1990's       | OCS-P 0205<br>Well E-11               | Venoco, Inc. | Not a Monterey formation frac. Upper Sespe formation fracked with limited success. |
|              | OCS-P 0450<br>Well C-11               | Chevron      | Unsuccessful in increasing production.   |
|              | 6 well program                        | Torch/Nuevo  | Short radius "frac-packs." Somewhat successful. Not Monterey.                      |
|              | 3 well program                        | Torch/Nuevo  | 1 well very successful. Re-frac of 1 well. Not Monterey.                           |
| 2001         |                                       |              |  |
| January 2010 | OCS-P 0XXX<br>Well E-8<br>Sidetrack 2 | Venoco, Inc. | Small increase in production, but not enough to be commercial.                     |

- Most hydraulic fracturing has been near well "frac-packs" or "mini-fracs" in sandstone with frac wings extending 30 to 50 feet from the well.
- During that time approximately 335 wells have been drilled in the Federal offshore, California.
- A telephone survey of POCS operators revealed that only one operator has plans for hydraulic fracturing in the near future although most did not want to rule out the possibility of hydraulic fracturing in the distant future.
- The POCS is currently reviewing the APD for DCOR, LLC to use hydraulic fracturing in their next sandstone well. This could be termed a "moderate" fracture job in terms of the projected length of fractures (200-300 feet) from the well, and using about 30 to 50 times less water as fracture jobs in the Bakken and Eagle Ford shales onshore.
- Some of the petroleum engineers responding to the telephone survey commented that the offshore Monterey Formation is much more brittle than its onshore counterpart and, as a result, responded to hydraulic fracturing by only fracturing the area nearest the well bore instead of propagating outward from the well bore. Therefore, any increased recovery was short-lived.

Dear \_\_\_\_\_,

Secretary Salazar asked that I respond to your recent letter regarding hydraulic fracturing of wells in Federal waters offshore California. As the Director of the Bureau of Safety and Environmental Enforcement, the agency that issues drilling permits in Federal waters, it is my responsibility to ensure the enforcement of our nation's environmental laws pertaining to offshore oil and gas exploration, development and production. Oil and gas drilling operations in Federal waters offshore California are administered by our Pacific Region office in Camarillo, California. I spoke with the Regional Director at that office to ascertain the frequency of this operation in this area. He responded that hydraulic fracturing is extremely rare in the Pacific Region, having occurred in very few wells in the last 25 years out of the several hundred wells drilled in the Pacific Region.

Please be aware that all drilling and well workover operations proposed by offshore operators are reviewed by our drilling and/or production engineering staff. Any concerns or questions that we have are fully addressed before the operations can begin.

Thank you for taking the time to express your concerns to the Secretary. At the Department, we are always mindful of the trust the public has placed in us and our obligation to enhance the safety and environmental protection of the operations that we permit.

Sincerely,

James Watson  
Director



Sinkula, Nathan &lt;nathan.sinkula@bsee.gov&gt;

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## Fracking Workshop

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Wed, Mar 6, 2013 at 3:32 PM

To: BSEE PAC OPD &lt;bseepacopd@bsee.gov&gt;

I'm checking with Jaron re attendance. There may be more interest from the other offices too, and ordinarily it wouldn't be a problem.

If we have to limit attendance or costs then we could prioritize by those that are/have been dealing with the issue  
Those that want to spend the night vs those that will drive  
Split between LB and Bakersfield so as not to have all gone at once.

I'll press Jaron next week when I return.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Fwd: Fracturing Response for Secretary/Director

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>  
To: Kenneth Seeley <kenneth.seeley@bsee.gov>

Mon, Feb 11, 2013 at 2:03 PM

Ken,

Attached are 2 items sent back to HQ in response to about 1200 form letters that were sent to the Secretary after the article(s) were published. You should know that in the letter and the facts and figures are now wrong since DCOR's belated response on Jan 31. After tomorrow we should modify the letter to read correctly that there were 4 frac jobs in the past, one successful, and that DCOR has plans to do more.

We'll find out tomorrow.

PS: According to Tom Lillie, the Director's COS, the letter that we drafted is just sitting in his office right now because the form letters that came in did not request a response.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

——— Forwarded message ———

From: **Mayerson, Drew** <drew.mayerson@bsee.gov>  
Date: Tue, Jan 15, 2013 at 12:10 PM  
Subject: Fracturing Response for Secretary/Director  
To: "Ming, Jaron" <Jaron.Ming@bsee.gov>  
Cc: BSEE PAC Managers/Supervisors <BSEEPACManagers\_Supervisors@boemre.gov>, Joan Barminski <Joan.Barminski@boem.gov>

Jaron,

Attached is a draft version of the response to the letters the Secretary has received on POCS hydraulic fracturing. I've also include a Facts and Figures sheet for Tom.

I've made the response from the Director for the Secretary. I hope this is what they want.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

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### 2 attachments



**Draft secretary response to public comments 1.docx**  
14K



**Hydraulic Fracturing in the Federal Offshore Facts and Figures.docx**  
17K

Dear \_\_\_\_\_,

Secretary Salazar asked that I respond to your recent letter regarding hydraulic fracturing of wells in Federal waters offshore California. As the Director of the Bureau of Safety and Environmental Enforcement, the agency that issues drilling permit in Federal waters, it is my responsibility to ensure the enforcement of our nation's environmental laws pertaining to offshore oil and gas exploration, development and production. Oil and gas drilling operations in Federal waters offshore California are administered by our Pacific Region office in Camarillo, California. I spoke with the Regional Director at that office to ascertain the frequency of this operation in this area. He responded that hydraulic fracturing is extremely rare in the Pacific Region, having occurred in only 3 wells out of the 300 plus wells drilled in the Pacific (1992, 1997, and 2010). Additionally, a poll taken of the offshore operators in the Pacific Region indicated that none had any plans to pursue hydraulic fracturing in the near future.

Lastly, please be aware that all drilling and well workover operations proposed by offshore operators are reviewed by our drilling and/or production engineering staff. Any concerns or questions that we have are fully addressed before the operations can begin.

Thank you for taking the time to express your concerns to the Secretary. At the Department, we are always mindful of the trust the public has placed in us and our obligation to enhance the safety and environmental protection of the operations that we permit.

Sincerely,

James Watson  
Director

## Hydraulic Fracturing in the Federal Offshore, California Facts and Figures

- The Monterey Shale (Monterey Formation) is present in onshore and offshore California.
- The Monterey Formation is the most prolific oil and gas reservoir in the Pacific Region.
- Approximately 750 million barrels of oil (60% of the Region's production) has been produced from the POCS Monterey Formation. Over 1.2 billion barrels of oil have been produced from all Pacific Region reservoirs, including non-shale reservoirs.
- The Department of Energy estimates that approximately 15 billion barrels of oil are recoverable from the onshore Monterey formation using conventionally available technology.
- Hydraulic fracturing has only occurred 3 times in the last 21 years in the Federal offshore (see table below).

| Date         | Lease & Well                          | Operator     | Comments   |
|--------------|---------------------------------------|--------------|--|
| August 1992  | OCS-P 0205<br>Well E-11               | Venoco, Inc. | Not a Monterey formation frac. Upper Sespe formation fracked with limited success. |
| April 1997   | OCS-P 0450<br>Well C-11               | Chevron      | Unsuccessful in increasing production.   |
| January 2010 | OCS-P 0XXX<br>Well E-8<br>Sidetrack 2 | Venoco, Inc. | Small increase in production, but not enough to be commercial.                     |

- During that time 335 wells have been drilled in the Federal offshore, California.
- A telephone survey of POCS operators (1/14/13) revealed no immediate plans for hydraulic fracturing in the near future although most did not want to rule out the possibility of hydraulic fracturing in the distant future.
- Some of the petroleum engineers responding to the telephone survey commented that the offshore Monterey Formation is much more brittle than its onshore counterpart and, as a result, responded to hydraulic fracturing by only fracturing the area nearest the well bore instead of propagating outward from the well bore. Therefore, any increased recovery was short-lived.



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Fwd: Hydraulic fracturing

5 messages

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**Mayerson, Drew** <drew.mayerson@bsee.gov>  
To: Nathan Sinkula <nathan.sinkula@bsee.gov>

Thu, Mar 14, 2013 at 12:31 PM

Let's discuss this about 2pm  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

—— Forwarded message ——

From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>  
Date: Thu, Mar 14, 2013 at 11:21 AM  
Subject: Hydraulic fracturing  
To: Jaron Ming <Jaron.Ming@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>, Nabil Masri <Nabil.Masri@bsee.gov>, Eileen Angelico <eileen.angelico@bsee.gov>

We have started to get some questions on hydraulic fracturing and have kicked around the idea of establishing an informational webpage to describe the process. Something basic that we could point folks towards if asked. I will admit to not being a trained geologist or engineer so I won't try and fake it but I did some basic research along with some information I got from you and came up with the following. Please let me know if you have any comments or suggestions.

Though uncommon, hydraulic fracturing does occur from time to time within BSEE's Gulf of Mexico and Pacific Regions.

### What is Hydraulic Fracturing?

Hydraulic fracturing produces fractures in the rock formation that stimulate the flow of natural gas or oil, increasing the volumes that can be recovered. Fractures are created by pumping large quantities of fluids at high pressure down a wellbore and into the target rock formation. Hydraulic fracturing fluid commonly consists of water, proppant and chemical additives that open and enlarge fractures within the rock formation. These fractures can extend several hundred feet away from the wellbore. The proppants - sand, ceramic pellets or other small incompressible particles - hold open the newly created fractures.

Once the injection process is completed, the internal pressure of the rock formation causes fluid to return to the surface through the wellbore. This fluid is known as both "flowback" and "produced water" and may contain the injected chemicals plus naturally occurring materials such as brines, metals, radionuclides, and hydrocarbons. The flowback and produced water is then treated and either injected underground for disposal or treated and reused or processed by a wastewater treatment facility and then discharged in accordance with an

Environmental Protection Agency issued discharge permit.

**Hydraulic Fracturing Offshore**

Within the BSEE Gulf of Mexico Region, hydraulic fracturing is not a widespread operation due to the productive nature of the geologic formations. Operators will occasionally utilize a process called "frac-packing" which is an application for sand control that improves production sustainability and well completion in unconsolidated offshore sand reservoirs. The process creates short, highly-conductive fractures near the wellbore where the proppant interacts with the formation, creating a barrier that prevents sand production. The fractures that are created often do not extend more than a few feet from the well bore.

(b) (5)  
[Redacted text block]

BSEE ensures that all drilling operations proposed by offshore operators receive an environmental review in accordance with the National Environmental Policy Act while coordinating with the Environmental Protection Agency and other federal agencies to ensure that proposed activities are consistent with all applicable rules and regulations. Additionally, BSEE drilling and production engineering staff fully review proposals for safety issues.

**A Closer Look at Hydraulic Fracturing**

View "Breaking Fuel From the Rock," an interactive feature from National Geographic showing the drilling technique that some energy producers have used to unlock natural gas in shale rock. Though this guide covers onshore production, some of the basic drilling techniques are used offshore-

<http://news.nationalgeographic.com/news/2010/10/101022-breaking-fuel-from-the-rock/>

**Mayerson, Drew** <drew.mayerson@bsee.gov> Thu, Mar 14, 2013 at 3:38 PM  
To: "Pardi, Nicholas" <nicholas.pardi@bsee.gov>  
Cc: Nathan Sinkula <nathan.sinkula@bsee.gov>, Bobby Kurtz <geokurtz@gmail.com>, "Ming, Jaron" <Jaron.Ming@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>

Nick,  
Attached, in Word, is a rewrite that Nathan (PE), Bobby (Geol.), and I worked on. We've tried to keep it simple but wanted to make sure that we captured the actual methodology. See what you think.  
Drew

**Drew Mayerson**  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

[Quoted text hidden]

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 **Public Affairs Web Explanation.docx**  
32K

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**Drew Mayerson** <drew.mayerson@bsee.gov>  
To: Nathan Sinkula <nathan.sinkula@bsee.gov>  
Cc: Robert Dame <Robert.Dame@bsee.gov>

Tue, Mar 26, 2013 at 10:18 AM

The attachment is the corrected version

Sent from my iPad

Begin forwarded message:

**From:** "Mayerson, Drew" <drew.mayerson@bsee.gov>  
**Date:** March 14, 2013, 3:38:59 PM PDT  
**To:** "Pardi, Nicholas" <nicholas.pardi@bsee.gov>  
**Cc:** Nathan Sinkula <nathan.sinkula@bsee.gov>, Bobby Kurtz <geokurtz@gmail.com>, "Ming, Jaron" <Jaron.Ming@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>  
**Subject:** Re: Hydraulic fracturing

[Quoted text hidden]

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 **Public Affairs Web Explanation.docx**  
32K

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Mar 26, 2013 at 4:12 PM

hey thanks sorry got busy with well files.

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Thanks

Nathan

[Quoted text hidden]

---

**Drew Mayerson** <drew.mayerson@bsee.gov>  
To: "Sinkula, Nathan" <nathan.sinkula@bsee.gov>  
Cc: Jaron Ming <Jaron.Ming@bsee.gov>, Robert Dame <Robert.Dame@bsee.gov>

Tue, Mar 26, 2013 at 5:06 PM

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Sent from my iPad

[Quoted text hidden]



Mayerson, Drew &lt;drew.mayerson@bsee.gov&gt;

## Re: Hydraulic fracturing

1 message

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On Tue, Mar 26, 2013 at 10:18 AM, Drew Mayerson &lt;drew.mayerson@bsee.gov&gt; wrote:

The attachment is the corrected version

Sent from my iPad

Begin forwarded message:

**From:** "Mayerson, Drew" <drew.mayerson@bsee.gov>  
**Date:** March 14, 2013, 3:38:59 PM PDT  
**To:** "Pardi, Nicholas" <nicholas.pardi@bsee.gov>  
**Cc:** Nathan Sinkula <nathan.sinkula@bsee.gov>, Bobby Kurtz <geokurtz@gmail.com>, "Ming, Jaron" <Jaron.Ming@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>  
**Subject:** Re: Hydraulic fracturing

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Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

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Though uncommon, hydraulic fracturing does occur from time to time within BSEE's Gulf of Mexico and Pacific Regions.

#### **What is Hydraulic Fracturing?**

Hydraulic fracturing produces fractures in the rock formation that stimulate the flow of natural gas or oil, increasing the volumes that can be recovered. Fractures are created by pumping large quantities of fluids at high pressure down a wellbore and into the target rock formation. Hydraulic fracturing fluid commonly consists of water, proppant and chemical additives that open and enlarge fractures within the rock formation. These fractures can extend several hundred feet away from the wellbore. The proppants - sand, ceramic pellets or other small incompressible particles - hold open the newly created fractures.

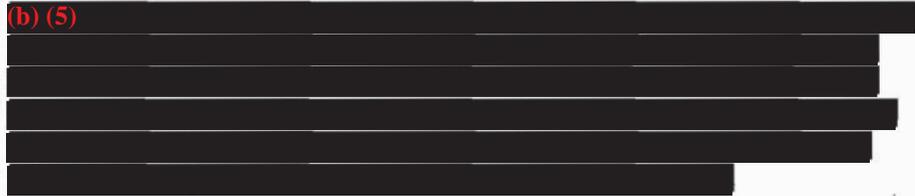
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#### **Hydraulic Fracturing Offshore**

Within the BSEE Gulf of Mexico Region, hydraulic fracturing is not a widespread operation due to the productive nature of the geologic formations. Operators will occasionally utilize a process called "frac-packing" which is an

application for sand control that improves production sustainability and well completion in unconsolidated offshore sand reservoirs. The process creates short, highly-conductive fractures near the wellbore where the proppant interacts with the formation, creating a barrier that prevents sand production. The fractures that are created often do not extend more than a few feet from the well bore.

(b) (5)

A large rectangular area of the document is redacted with black bars. The redaction covers approximately five lines of text.

BSEE ensures that all drilling operations proposed by offshore operators receive an environmental review in accordance with the National Environmental Policy Act while coordinating with the Environmental Protection Agency and other federal agencies to ensure that proposed activities are consistent with all applicable rules and regulations. Additionally, BSEE drilling and production engineering staff fully review proposals for safety issues.

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View "Breaking Fuel From the Rock," an interactive feature from National Geographic showing the drilling technique that some energy producers have used to unlock natural gas in shale rock. Though this guide covers onshore production, some of the basic drilling techniques are used offshore-

<http://news.nationalgeographic.com/news/2010/10/101022-breaking-fuel-from-the-rock/>



Mayerson, Drew <drew.mayerson@bsee.gov>

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1 message

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**Public Affairs Web Explanation.docx**

32K

Though uncommon, hydraulic fracturing does occur from time to time within BSEE's on the OCS in the Gulf of Mexico and Pacific Regions, although not to the levels and magnitude seen onshore in areas like North Dakota and Texas.

People (5)  
Pardi, Nicholas  
BSEE

### What is Hydraulic Fracturing?

Show details

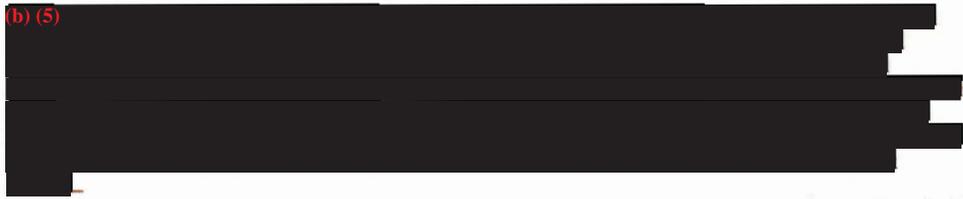
Hydraulic fracturing produces fractures in the rock formation that stimulate the flow of natural gas or oil, increasing the volumes that can be recovered. Fractures are created by pumping large quantities of fluids at high pressure down a wellbore and into the target rock formation. Hydraulic fracturing fluid is mostly water with minor amounts of chemical additives. Proppants, such as sand or ceramic pellets are injected with the fluid under high pressures into the target formation. The pressurized slurry fractures the rock with the proppants helping hold open the newly created fractures. The slurry commonly consists of water, proppant and chemical additives that open and enlarge fractures within the rock formation. These fractures can extend several hundred feet away from the wellbore. The proppants—sand, ceramic pellets or other small incompressible particles—hold open the newly created fractures.

Once the injection process is completed, the internal pressure of the rock formation causes fluid to return to the surface through the wellbore. This fluid is known as both "flowback" and "produced water" and may contain the injected water and the injected chemicals plus naturally occurring materials from the reservoir, including such as brines, metals, radionuclides, and hydrocarbons. The flowback and along with produced water is then treated and either injected underground for disposal or treated and reused or processed by a wastewater treatment facility and then reused or discharged in accordance with an Environmental Protection Agency issued discharge permit.

### Hydraulic Fracturing Offshore

Within the BSEE Gulf of Mexico Region, large scale hydraulic fracturing is not a widespread operation due to the productive nature of the geologic formations. However, operators often will occasionally utilize a process called "frac-packing" which is an application mainly used for sand control that improves production sustainability and well completion stability in poorly unconsolidated offshore sand reservoirs. The process creates short, highly-conductive fractures near the wellbore, where the proppant interacts with the formation, creating an barrier interface that prevents minimizes sand production into the well. The fractures that are created often do not extend more than a few feet from the well bore.

(b) (5)



Within the BSEE Pacific Region, hydraulic fracturing is rarely utilized. When it does occur, operators use hydraulic fracturing for a brief period to stimulate production. The vast majority of these have been "mini-frac" which occur in the immediate vicinity of the wellbore and are used to cleanup sand that may plug the perforations. A "mini-frac" is performed without a proppant with the intent of breaking down the formation to create a short fracture.

BSEE ensures that all drilling operations proposed by offshore operators receive an environmental review in accordance with the National Environmental Policy Act while coordinating with the Environmental Protection Agency and other federal agencies to ensure that proposed activities are consistent with all applicable rules and regulations. Additionally, BSEE ~~drilling and production engineering engineers and geoscientists~~ staff fully review proposals for safety issues.

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Send

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Mayerson, Drew <drew.mayerson@bsee.gov>

---

## Hydraulic Fracturing 101 Presentation

1 message

---

Joe Lima <lima1@slb.com>  
To: "Drew.Mayerson@bsee.gov" <Drew.Mayerson@bsee.gov>

Tue, Apr 2, 2013 at 9:24 AM

Drew,

As discussed yesterday, next week looks good for me. My thoughts are sometime on Thursday, Apr 11. How does that work for you? And if it is a good day, is there a time that is best?

Regards, Joe

Joe Lima

Schlumberger

lima1@slb.com

(O) 303-352-1261

(C) 720-281-8699



Mayerson, Drew <drew.mayerson@bsee.gov>

---

## Re: Hydraulic Fracturing 101 Presentation

1 message

---

**Drew Mayerson** <drew.mayerson@bsee.gov>  
To: Joe Lima <lima1@slb.com>

Thu, Apr 4, 2013 at 7:00 AM

Joe,

We're on the 2nd floor at 770 Paseo Camarillo, Camarillo, CA 93010. When you get off the elevator there is a phone. You can dial ext. 17707 and I'll come and get you. If I don't pick up I'm most likely in our conference room which is through the double doors on your right immediately after you exit the elevator.

Drew

Sent from my iPad

On Apr 4, 2013, at 5:40 AM, Joe Lima <lima1@slb.com> wrote:

Drew,

Can you please send me your office address... I assume we would meet there?

Regards, Joe

---

**From:** Joe Lima  
**Sent:** Tuesday, April 02, 2013 7:09 PM  
**To:** Mayerson, Drew  
**Subject:** Re: Hydraulic Fracturing 101 Presentation

Drew

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Schlumberger



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## Fwd: Hydraulic Fracturing 101 Presentation

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Mayerson, Drew <drew.mayerson@bsee.gov>

Mon, Apr 8, 2013 at 3:53 PM

To: Joe Lima <lima1@slb.com>

Joe,

I asked around about what topics staff had questions about wrt to hydraulic fracturing and received a large list so I'm trying to boil it down:

- What is the difference between a Frac-Pack, Mini-Frac, and a large wing hydraulic fracture?
- Is the process conducted in stages? How does that work? How long for each stage?
- What quantity of fluid is required for each of the above (e.g., mini Frac, large frac, etc...)
- What are the limits on offshore fracking vs. onshore?
- What is the fracking fluid ingredients?
- Is freshwater necessary or can saltwater be used?
- What pressures are needed and how is that calculated?
- What type of equipment is needed? What horsepower? Diesel? Electric?
- How is the frac tested to make sure it did what it was supposed to do?
- Difference between a frac of a gas well vs. an oil well.
- What is the difference between horizontal vs vertical well fracking?
- Do fracked wells need acid stimulation also?
- Are different frac procedures used for sandstone vs shale?
- Much of our area produces from naturally fractured Monterey shale, would a frac be appropriate in a formation that is already highly naturally fractured?
- Proppants...what is used, how are they used, how long do they last?
- How long does it take for the frack fluid to return to the well? How long does it last?
- What part of fracking is considered trade secret?

The questions are not in any particular order. I'm sure they'll be even more questions as the afternoon evolves. I just wanted to let you know what people were curious about here. No need to know all the answers, but we just thought we'd ask.

Drew  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

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## Hydraulic Fracturing in the Federal Offshore, California Facts and Figures

- The Monterey Shale (Monterey Formation) is present in onshore and offshore California.
- The Monterey Formation is the most prolific oil and gas reservoir in the Pacific Region.
- Approximately 750 million barrels of oil (60% of the Region's production) has been produced from the POCS Monterey Formation. Over 1.2 billion barrels of oil have been produced from all Pacific Region reservoirs, including non-shale reservoirs.
- The Department of Energy estimates that approximately 15 billion barrels of oil are recoverable from the onshore Monterey formation using conventionally available technology.
- Hydraulic fracturing has only occurred 11 times in the last 25 years in the Federal offshore and none of the wells were horizontal (see table below).

| Date         | Lease & Well                          | Operator     | Comments   |
|--------------|---------------------------------------|--------------|--|
| 1990's       | OCS-P 0205<br>Well E-11               | Venoco, Inc. | Not a Monterey formation frac. Upper Sespe formation fracked with limited success. |
|              | OCS-P 0450<br>Well C-11               | Chevron      | Unsuccessful in increasing production.   |
|              | 6 well program                        | Torch/Nuevo  | Short radius "frac-packs." Somewhat successful. Not Monterey.                      |
|              | 3 well program                        | Torch/Nuevo  | 1 well very successful. Re-frac of 1 well. Not Monterey.                           |
| 2001         |                                       |              |  |
| January 2010 | OCS-P 0XXX<br>Well E-8<br>Sidetrack 2 | Venoco, Inc. | Small increase in production, but not enough to be commercial.                     |

- Most hydraulic fracturing has been near well "frac-packs" or "mini-fracs" in sandstone with frac wings extending 30 to 50 feet from the well.
- During that time approximately 335 wells have been drilled in the Federal offshore, California.
- A telephone survey of POCS operators revealed that only one operator has plans for hydraulic fracturing in the near future although most did not want to rule out the possibility of hydraulic fracturing in the distant future.
- The POCS is currently reviewing the APD for DCOR, LLC to use hydraulic fracturing in their next sandstone well. This could be termed a "moderate" fracture job in terms of the projected length of fractures (200-300 feet) from the well, and using about 30 to 50 times less water as fracture jobs in the Bakken and Eagle Ford shales onshore.
- Some of the petroleum engineers responding to the telephone survey commented that the offshore Monterey Formation is much more brittle than its onshore counterpart and, as a result, responded to hydraulic fracturing by only fracturing the area nearest the well bore instead of propagating outward from the well bore. Therefore, any increased recovery was short-lived.

## **Hydraulic Fracturing Questions Posed by the Office of Public Affairs – April 2013**

### **1. Has BSEE approved a permit to conduct hydraulic fracturing?**

Hydraulic fracturing is extremely rare in the Pacific Region. Our review of well files to date indicates that hydraulic fracturing has occurred in very few wells in the last 25 years out of the several hundred wells drilled in the Pacific Region. A recent poll of POCS operators confirmed this claim however none would rule out hydraulic fracturing as a stimulation technique in the future. In fact, we recently approved an APM for the completion of S-05 on 3-7-13 and the APD on 3-7-13 on Platform Gilda. The well has not been started yet because the platform is down for repairs for the next few weeks.

### **2. Where is this taking place?**

The proposed hydraulic fracturing is on Platform Gilda, well S-05. No others have been submitted or approved.

### **3. How long will operations occur?**

The proposed hydraulic fracture on Platform Gilda will take 2-3-days with lots of down time while changing intervals.

### **4. Is this the same procedure as occurs onshore?**

Many aspects of the actual fracking procedure are identical to those that occur onshore, however due to cost and logistical constraints that occur with offshore platforms, the size of jobs offshore are much smaller than some of the large fracture jobs seen onshore in the Bakken, Marcellus and Barnett shales, for example. The limited number of hydraulic fracture operations in the POCS has been an order of magnitude smaller than those seen in onshore shale plays. Typical proppant amounts used have been between 30,000 and 160,000 pounds while onshore shale developments can reach amounts of up to 5,000,000 pounds of proppant. Typical water usage for offshore hydraulic fracturing is around 50,000-100,000 gallons compared to 1-3 million gallons used in onshore shale fracturing jobs. Most of the hydraulic fracture jobs occurring offshore are of the "Frac-Pack" variety for sandstone formations, which are smaller than those seen in the onshore shales. Fracking has been tried in the offshore shales but with little success to date, due to lithological properties of the Monterey Shale offshore California (it is naturally fractured), and due to equipment and cost constraints of working offshore.

### **5. Have you conducted the necessary environmental reviews to ensure that the activities are safe?**

Approval of the Application for Permit to Drill sidetracked well S-005 at Platform Gilda was a categorically excluded action under NEPA. Specifically, we applied Categorical Exclusion C(12), which covers "Approval of Application for Permit to Drill (APD) an offshore oil and gas exploration or development well when said well and appropriate

mitigation measures are described in an approved exploration plan, development plan, production plan or development operations coordination document. (516 DM 6).

## 6. What reviews did you conduct?

In order to ensure that this action fell into the excluded category of actions, we determined that none of the extraordinary circumstances that would typically trigger more extensive environmental review existed in the case of Well S-005 at Platform Gilda. These extraordinary circumstances include the following:

- Will the action have significant impacts on public health or safety?
- Will the action have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas?
- Will the action have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section I 02(2)(E)]?  
*Note that in a NEPA context, the issue of whether an action is controversial is based on the degree of conflict or disagreement over the available science, not because issues were raised out of context in a local newspaper article. While it's true that there is considerable controversy over the impacts of some of the fracking that occurs onshore, the type of fracking that has been proposed at Platform Gilda does not appear to have generated the same level of scientific controversy. Therefore, we concluded that this extraordinary circumstance was not triggered.*
- Will the action have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?
- Will the action establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?
- Will the action have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects?
- Will the action have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places?
- Will the action have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?
- Will the action violate a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment?

- Will the action have a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898)?
- Will the action limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007)?
- Will the action contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?

In addition to the categorical exclusion review described above, we contacted the U.S. EPA Region 9 Headquarters in San Francisco to ensure that chemicals used in hydraulic stimulation of wells were covered under EPA's Authorization to Discharge under the National Pollutant Discharge Elimination System for Oil and Gas Exploration, Development, and Production Facilities. In their response, EPA stated that: *"...discharges related to hydraulic fracturing would be considered to be well treatment fluids and authorized for discharge subject to the requirements of our general permit for this discharge; no special requirements or approvals would be needed."* ...thereby resolving any concerns that we had regarding the legality of including chemicals used in hydraulic stimulation in EPA permitted discharges.

Finally, we toured DCOR's Mandalay on-shore treatment facility in order to gain an understanding of their on-shore water treatment processes and assess overall site conditions. Specifically, we wanted to determine how flowback water potentially containing compounds used in hydraulic stimulation would be treated. Essentially, water will be piped from the platform and treated onshore to remove oil and other contaminants before being piped back to the platform for overboard discharge. Furthermore, DCOR will increase water sampling during hydraulic stimulation activities to ensure that these compounds of concern are not present in the discharge. We intend to conduct our own independent sampling and toxicity testing of treated process water from the facility during drilling operations. Results of operator-sponsored third party analysis will be made available to us for review.

#### **7. What will be discharged into the ocean, any chemicals?**

As stated above, at this time we believe that DCOR's treatment process will eliminate most or all of the compounds used in hydraulic stimulation prior to overboard discharge. However, the presence of these compounds in the discharge is allowed under the general NPDES permit for OCS oil and gas operations. The primary constituent proposed by DCOR for use in hydraulic stimulation is guar gum (for suspension of the proppant), which is commonly used as an ingredient in a wide variety of food products, such as salad dressings. A review of available toxicity information for guar gum indicates that it is practically non-toxic.

**8. Will any of the chemicals injected seep up into the ocean?**

This is highly unlikely. The chemicals used in hydraulic fracturing would need a conduit to the sea floor, usually along a fault. Although offshore California is highly faulted, faults are avoided during fracking operations since losing fluids along the fault would compromise the effectiveness of the hydraulic fracture. Fluid and pressure losses are closely monitored during fracking operations. Also the area where the fracking fluids are injected (near wellbore) will be the first areas drained during flowback and production. Leaks through casing are unlikely and are monitored and checked regularly.

**9. Will the discharges harm the environment?**

We do not believe that the expected discharges will harm the environment.

**10. Will this contribute to additional earthquakes in the area?**

The scientific community has not come to a consensus on the effect of hydraulic fracturing operations on seismic events. A recent article in the journal 'Geology' indicated that some earthquakes in Oklahoma in November of 2011 were linked to fracking fluid disposal. The authors stated that the actual fracking of the reservoir rock has not been shown to have a great effect on seismic activity; rather it is the disposal of the fracking fluids through injection wells over an 18 year period that was linked to increased seismic activity. However, the Oklahoma Geological Survey, working with the Oklahoma Corporation Commission and the U.S. Environmental Protection Agency recently announced their interpretation that the earthquakes most likely were from natural causes.

**11. Is it safe to fish in the same area as these operations are occurring?**

We believe that these operations will have no impact on fishing

A contract review meeting is scheduled for 4/09 with Helicopter Express, our new helicopter contractor.

**Fracking Information Requests**

The Region continues to work to respond to multiple public information requests and FOIA requests for information on hydraulic fracturing offshore California. Request have now come from the Associated Press, Truthout, the California Coastal Commission, and Coastal Advocates; and the Environmental Defense Center.

A representative from Schlumberger will be in the office on Thursday April 11th to provide an overview of hydraulic fracturing technology and to answer the Region's questions regarding the technological aspects of hydraulic fracturing in the offshore.



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Fwd: Media Inquiry for PAC region

1 message

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**Seeley, Kenneth** <kenneth.seeley@bsee.gov>

Wed, Feb 27, 2013 at 2:41 PM

To: Drew Mayerson <drew.mayerson@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>, Nabil Masri <nabil.masri@bsee.gov>, Jaron Ming <jaron.ming@bsee.gov>

I highlighted the sections of the VC Reporter story that I thought I should address. If anyone thinks there are others let me know.

Ken

—— Forwarded message ——

From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>

Date: Tue, Feb 26, 2013 at 8:54 AM

Subject: Re: Media Inquiry for PAC region

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Cc: "Ming, Jaron" <Jaron.Ming@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

For your awareness, this latest inquiry is the result of the following article:

### **Fracking offshore**

*Lack of transparency for the controversial practice raises major concerns for locals*

[http://www.vcreporter.com/cms/story/detail/fracking\\_offshore/10432/](http://www.vcreporter.com/cms/story/detail/fracking_offshore/10432/)

In the summer leading up to Hurricane Sandy, crowds surrounded the state capitol at Albany, N.Y. They wanted to know what would happen in case of a natural gas leak, or a bigger natural gas disaster, to their drinking water. What sparked them? Many had seen the footage of water so contaminated from natural gas frack drilling that it turned brown or caught fire. These water debacles sparked a nationwide movement against natural gas fracking. Fewer people know about fracking in California, and the anti-fracking movement is smaller, but the tide has turned since the time when natural gas was considered a safer alternative energy.

The days when oil companies could find enough oil through conventional drilling are long over on the Central Coast. Drillers cannot get oil trapped tightly in the shale the older ways. It is trapped in rock and has to be coerced out through fracking. Now they need an Olympic-size pool's worth of water infused with chemicals to splinter the rock and discharge the oil from it. They drill a hole, lay a pipe, and drop a bomb where it explodes and tears into the pipe. Making its way down through the pipe hole are sand and chemical water at such force that it splinters the shale and dislodges the oil from it. Central Coast frack drilling can tunnel down a mile and through the water table. Scientists are split on whether fracking can contaminate our drinking supply or cause earthquakes. Wastewater composed of toxic, safe and unknown chemicals is injected into a well and pushed down thousands of feet, where it builds pressure. That pressure under the earth could be a problem.

Oil company executives can describe the thick and sticky shale oil with the same kind of loving tenderness and

cravings as any Central Coast reckless wine sipper. Washington and Sacramento have simultaneously fed and regulated the thirst for it. The Dick Cheney-created Halliburton loophole made fracking exempt from much EPA regulation and from the Safe Drinking Water Act. This means frackers do not have to disclose the chemicals they use. Drillers in California are not required to notify landowners or residents who utilize nearby water sources of their intent to frack. This lack of transparency has been a sore spot for the often-locked-in-conflict local farmers, commercial fishing industry and environmentalists who now find themselves allied in the battle against fracking's quest for water. Because so little transparency exists, rumors swirl around the where and when of offshore fracking.

#### The view from McGrath State Beach

Last June, fresh off the primary election, local campaigning Democrats staged a press conference for Oxnard's McGrath Beach, which was reopening after being closed for lack of funding following Department of Parks and Recreation's sordid fund hoarding. Das Williams, D-Santa Barbara, who was running for re-election for the State Assembly district stretching from Santa Barbara to parts of Oxnard, took advantage of the news cameras and changed from an orange T-shirt into a full wetsuit and bright-yellow boogie board, walked into the ocean, and rode the whitewash of the small choppy waves for more shoots. What the camera could not capture was the crossing of slant- and horizontally-laid oil pipes underneath the waves, chemical injection wells on federally regulated oil rigs beyond the white wash, and the Channel Islands thrust fault capable of producing a magnitude 7.2 earthquake. From Williams' vantage point, he could see the reeds and fences hiding more oil company chemically injected and disposal wells. If he had walked south down the beach past McGrath Lake, he would have found Well 1218 producing more than 32,000 barrels so far this year alone.

Williams splashed around over one of the county's major access points to the oil-abundant underground geological development called the Monterey Shale. This now-commercialized piece of geological property encompasses parts of Ventura, Santa Barbara and Monterey counties. Tim Marquez, president of Venoco, told the Oil & Gas Financial Journal that "We knew that our future efforts were going to be focused on the Monterey Shale." Venoco literature claims the company has explored the shale since 1997.

Fracking is a new frontier and Marquez embraces its Wild West nature and its financial and environmental riskiness. The Monterey Shale is about the closest thing an energy company can get to a new oil frontier on the Central Coast in decades. But like the old Wild West, the federal government is still bankrolling while letting companies use its national forests and federal waters.

According to a Venoco report, the company is leasing 380,000 acres in California valued at \$1.4 billion. It claims that it has already devoted millions of dollars into setting up new wells and exploring the shale, including the Sockeye field offshore from McGrath Beach. Evidence points to more local shale in its future. Venoco recently advertised for a Monterey Shale expertise job for its Carpinteria office.

What wells has Venoco fracked so far? The company dodges that question. The anti-fracking movement has grown large enough to put oil companies on edge. Calls to Venoco were not returned. But just two years ago, the mood was different. Scarlett Johansson was not hosting celebrity screenings for Gasland, the anti-fracking movie that had not yet won an Academy Award. New York farmers, chefs, wine connoisseurs and environmentalists had not yet joined to push New York Gov. Andrew Cuomo, Democrat, to regulate fracking. Matt Damon was not releasing an anti-fracking movie called #Promised Land# that he would use as his next Oscar platform.

But in the more frack-friendly year 2010, Venoco's promotional literature claimed it had fracked and horizontally drilled one well and acidized a second to get to the shale offshore from McGrath Beach. Nestled in federal waters between Oxnard and Santa Cruz Island is Platform Gail. The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. Where did the wastewater from the offshore frack go? What was the chemical composition? So far, the only two institutions likely to know for certain are Venoco

and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public.

As for spills and water contamination, frack watchers are still trying to get at the chemical formulas of fracking fluid. A 2005 Venoco document reveals XC polymer, a xanthum gum manufactured by Halliburton. Reporters from the nonprofit investigative unit Propublica found hazardous chemicals such as benzene, formaldehyde, sulfuric acid, kerosene, hydrofluoric acid, hydrochloric acid, formic acid and lead. Researchers at the State University of New York at Albany found radioactive materials such as uranium, radium and radon in tests of fracking wastewater. The National Resources Defense Council found a chemical connected to cancer development, arsenic. The Breast Cancer Fund has reported on the risks for breast cancer from toluene and endocrine-disrupting compounds such as phthalate DEHP found in fracking fluid. EPA studies show that toluene can cause spontaneous abortion. Then there is the question that remains of how the hundreds of thousands of gallons of chemical wastewater are disposed of.

According to the Environmental Defense Center, Venoco fracked platform Gail in Sockeye field in the Santa Barbara Channel.

According to the Ventura County Star, Venoco spilled 63 barrels of oil in 2010 from Platform Gail, the year following the reported frack job. Ordinarily, a 63-barrel leak is not controversial, but if it includes fracking fluid or its waste, a concern exists. A frack spill is not an ordinary oil spill. When the chemicals get into the water they are difficult to get out. They spread fast and easy, do not easily breakdown, and can cause more health hazards than crude oil (So, they don't know what the chemicals are, but they can conclude that they spread fast and easy, don't break down, are more hazardous and harder to clean up. Interesting).

The acidity of carbon waste through oil spills threatens marine life and commercial fishing. Shellfish can be especially vulnerable to the acidic water that comes with fracking. But it's not just commercial fishing that fracking can threaten. Venoco's fracking and well acidization next to the Channel Islands Marine Reserve undermines the mission of protecting marine life and habitats, much as state and national parks protect wildlife on land. Little research exists on the impact of fracking chemicals on ocean life.

Fracking started 60 years ago. So why all the fuss? For many, the newer form of horizontal drilling, that is drilling (that goes down, then across) is what makes the new practices more dangerous than those old Fillmore and Los Padres National Forest frack jobs. With horizontal's criss-crossing through the water table, it is more likely to cause contamination.

Venoco's drilling onshore and offshore from McGrath, with its slant and horizontal drilling, has created a regulatory conundrum. Fracking skeptics argue that it is specifically what makes slant and horizontal drilling so appealing. Horizontal drilling can start onshore, then cross to offshore. If there is another spill like in 2010, who regulates this? The federal government? The state? When asked about who regulates a frack job that burrows underneath both land and ocean, Erin Curtis, Federal Bureau of Land Management's external affairs representative, told me that "Whoever is responsible is who is permitting the oil company. That is who should regulate." But if Venoco should spill again as it did in 2010, and it pollutes both offshore and onshore, who will be in charge of remedying that? There is no clear answer from Venoco's office about this question.

The campaigning Democratic candidates also had a wonderful view of the Santa Clara River running through McGrath State Beach and into the ocean. As of August, conversations with the United Water Conservation District, the local agency regulating drinking water coming from the Santa Clara River, revealed that fracking was

not even on the radar. This is the agency that must divvy out scarce water.

#### Aera Energy off McGrath Beach

According to interviews with the California Department of Land Conservation, the state agency in charge of regulating the energy industry, fracking waste fluid can end up in either a waterflood injection well or a water disposal well. While oil and gas companies are not required to report on their fracking chemical compositions, or where they have drilled or injected it into the earth, they do have to get approvals to build wells to dispose of the waste. Wherever one can find an injection or a water disposal well, it is likely some fracking happened nearby.

Two of the biggest global oil companies, Shell and ExxonMobil, teamed up to form Aera Energy. Aera has a new waterflow well near McGrath Beach. This well has only August production on record with the California Department of Conservation. In that month, Aera injected 13,262 barrels of waste.

Our region is what seismologists call seismically active. Several earthquakes have been caused by faults that extend into the Santa Barbara-Ventura ocean basin. We have San Andreas and the Santa Ynez River fault zone to the north, the San Cayetano fault to the east, the offshore Pitas Point near Carpinteria, Red Mountain fault to the east, the Oak Ridge lying on both Ventura and Oxnard, and the offshore Santa Cruz Island and Channel Islands faults to the west. Even the Pacific Operators Offshore LLC (PACOPS), a local offshore driller, in a report to the Federal Bureau of Energy Management (BOEM) admits that all these faults can produce shaking around the wells. The cracking of the shale and the reinjection of waste water back to the strata causes pressure. All this happens on these fault systems.

Aera is no stranger to fracking. Last May, Aera fracked in the mountains above Ventura Avenue. This job used 32,004 gallons of water and drilled down 4,960 feet. Aera admits to using methanol, a common chemical used in fracking and also found in fuel, antifreeze and paint solvent. Inhaling methanol can cause eye irritation, headaches and can be fatal. Ingesting it can produce eye damage or death. Aera's chemical cocktail also included, boric acid, insecticide and flame retardants.

According to a joint study by the U.S. Department of Energy, the National Academy of Sciences, the Institute of Medicine and the National Research Council, fracturing of rock has a lower risk of earthquake, but the disposal of the waste fluid into a well is high risk. Where lies an injection well also lies an earthquake risk. According to this study, the hundreds of thousands of gallons of waste do not simply disappear in the earth's strata. Underground, the waste builds pressure and causes more cracks in the already cracked earth. Conducting the frack jobs on fault zones just exacerbates the earthquake risk.

What makes this study unique is that its researchers and peer reviewers did not possess ties to energy companies. This is not as common as one might expect. A Plains Exploration study claimed fracking in the Baldwin Hills in Los Angeles was safe, but community groups complained that the peer reviewer had connections to oil and gas. Plains Exploration reportedly paid a Texas geologist \$400,000 to write a study that showed that fracking did not contaminate ground water. The oil and gas industry gave State University of New York at Buffalo's geology department \$6 million. A new term has been coined to describe these Ph.D.s: frackademics.

#### Greka's Rincon

Nestled between Carpinteria and Ventura is the Rincon oil field, the desirable piece of ocean property with

legendary breaks that has surfers, environmentalists and oil interests competing for its future. Where the state's Conservation Department gave Venoco safety awards in spite of its 32 violations for not following operating procedures from 2005 to 2010, Greka, with its perishing pipelines and rusting facilities, has the opposite reputation with 21 separate crude oil spills in Santa Barbara waterways from 2005 through 2010. One of the spills included a 67,000-gallon oil spill in early December 2007 followed by an 84,000-gallon spill in 2008. Greka's poor public image prompted a name change to HVI Canyon Cat last year. The Santa Barbara Independent reported that the U.S. Department of Justice alleges that HVI Cat Canyon failed to implement adequate plans to prevent spills, which is required by the Clean Water Act.

Photo by Matthew Hill

Venoco has operations on the pier off the coast in Carpinteria, where, apparently, work has ramped up recently.

In 2002, the company acquired Rincon Island Partnership. According to California Department of Conservation records, Rincon Island Partnership has at least five waterflood injection wells. Two are drilled either on a slant or horizontally. **Greka has a thing for horizontal drilling. One of its holdings is Horizontal Ventures, so it is likely that some of its wells are horizontally drilled.** (Using that logic, you could also say it is likely that they sell mattresses).

Venoco and Carpinteria's uneasy relationship

Venoco has operations in Carpinteria right near the beach and leases the pier that the city owns. Former Carpinteria mayor Richard Weinberg has witnessed increased Venoco activity near his house, a short distance from the pier — "Trucks go by day and night," he says. Miguel Checa, a member of the board of directors of the advocacy organization, the Carpinteria Valley Association, once only saw a few trucks a day going to the pier a day. Now he notices "six to eight." Some question whether this means offshore fracking is a fixation of many Carpinteria residents. Buzz spreads around Carpinteria environmental circles that Venoco could slant-drill offshore to get entrance to oil under the city limits, but Nathan Alley, a staff attorney with the Environmental Defense Center, claims that would be a feat of engineering.

Carpinteria resident Ted Rhodes has had Venoco in his sites since the company created Carpinteria's 2010 Measure J that would have produced more drilling in the city near the aquifer. His mind is on the municipal water and he has no reservoir of good will for Venoco. The company can bypass local laws by going through federal land management instead of the city.

Weinberg thinks Venoco's plan is to drill slant or horizontal to reach the oil under the city without having to abide by local laws or answer to local activists. The last time Venoco wanted to dramatically increase drilling through city legislation, environmentalists staged a paddling protest. They jumped in the water and paddled out to sea. The paddlers included Rhodes and Weinberg.

Weinberg calls federal and state land management "weak." Federal and state land management will not be as open to citizens' participation. Weinberg may be correct. In October, Alley found that Venoco will drill just north of the city and slant-drill to the oil underneath the city.

The Carpinteria Valley Association hired hydrogeologist from UCSB Hugo Loáiciga to defend against Measure J. Loáiciga publicly testified drilling beneath the city would be detrimental to the aquifer. Although environmentalists point to the dishonesty of oil companies, the prediction tools that oil companies use could be a factor. Sophisticated oil company mapping has provided innumerable safety gains by predicting a picture of the underground. But all these layers might be more fractured and uniform than the technology shows. The

assumption of safety depends on the premise that layers of underground rock tightly hold the injected chemicals. But the underground may be more fractured and cracked than these programs predict. More cracks mean more chemicals moving about.

UCSB: gas to the south, oil to the north

Venoco has had its share of Southern California controversy. It had a run-in with famous local environmentalist Erin Brockovich over fracking at Beverly Hills High right next to the track. Where Pennsylvania may allow fracking right on public university campuses, UCSB has the status of having likely oil fracking directly north and PG&E gas south of the campus. Entering the campus on Highway 217, you can see the natural gas field. It is estimated that 90 percent of natural gas wells are fracked.

Elwood lies just north of the campus. Venoco claims, in a 2010 business magazine, to have been drilling to the Monterey Shale at Elwood since 1999. It only took a few short years for this exploration to transform into abundant shale oil collection. In 2007, Venoco wrote to the California Department of Conservation to say it will be injecting waste from the Elwood well offshore to platform Holly. In that letter, Venoco writes, "We have three wells injecting the produced water back to the Monterey Shale." Produced water is the wastewater that is laden with chemicals. Venoco also claims to have injected this produced water on Holly beginning April 2006. Platform Holly has been productive. The state lands commission filed a lawsuit last year claiming Venoco owes the state \$9.5 million in royalties.

Venoco ships some of this waste to a water disposal well north of UCSB, in between the posh Bacara resort and the Sandpiper Golf Course. The company has another water disposal well offshore in front of UCSB. It has disposed of 1.3 million barrels of wastewater from the beginning of 2012 through August.

The EPA classifies an oil company's waste disposal well as class II disposal. If some of the fracking chemicals were to be used instead in manufacturing or farming, the EPA would give it a more hazardous classification. Oil and gas companies have exceptions other industries do not.

Bureaucracy and politicians

Checa and Weinberg joined 173 other people in a May 20 meeting at Ventura County Government Center on fracking, organized by the state's Department of Conservation. It was public comment time before the state came out with a draft of fracking rules to be passed around to various environmental groups and the industry. Erin Curtis, the spokeswoman from Federal Bureau of Land Management, says, "We are in rule-making on hydraulic fracturing." Like the state Department of Conservation, that office is inviting public input before making draft regulations. Alley recommends that locals get involved and work toward making fracking transparent. Of course it is much easier to be part of the rulemaking process if you are a mover and shaker at environmental organizations. For ordinary folks, like those at Albany, N.Y., protesting is the only way to get their voice heard.

Ventura County will have to address protecting agriculture, water and property despite the revenues received from oil companies. As for rising oil prices, more local drilling does not translate into cheaper prices at the pump for Ventura County residents. The fracked oil from underneath our feet gets traded to the highest bidder on the international market just like any other oil.

As for local electoral connections to fracking, only state Sen. Fran Pavely, D-Agoura Hills, has put fracking front and center on her agenda, going as far as writing a bill requiring drillers to notify nearby property owners before fracking. Though one bill died earlier this year, Pavley has reintroduced another bill this month that would regulate fracking, which includes advance notice to neighbors of planned fracking and disclosure of the chemicals used in the process. State Assemblyman Jeff Gorell, R-Camarillo, had Venoco as a client during his lobbyist days.

Venoco later joined ExxonMobile in contributing to his campaign. Recently retired Carpinteria City Councilman Joe Armendariz started a consulting firm. His new client is Western Petroleum Association. Councilwoman Carmen Ramirez, who also attended the McGrath Beach opening, might be the next local leader likely to take this up as an agenda item. The Sierra Club adores her. She earned their admiration for fighting to keep development off Ormond Beach.

On the federal level, ProPublica found that Exxon is pushing for legislation so it does not have to reveal fracking chemicals, but federal regulators have their own agenda. John Romero at the Bureau of Ocean Energy Management said that office will not be issuing any more federal offshore permits, but is working on environmental studies for offshore wind power. Even if the local and state governments conflict on offshore agendas, the feds are installing more alternative energy regardless of who is in office. As for when this will happen, UCSB biologist Milton Love is already conducting an environmental impact study for the federal government to bring offshore wind power to our region. The Department of Defense has already made plans to develop more wind power on San Nicolas Island.

A few months after the Democratic candidate at McGrath Beach, I asked a ranger about the fracking rumors. "I have heard them," he says, "but we have cameras. Cameras are all over the park." But the cameras do not show everything behind the walls of the rigs and wells. So I ask him if he sees anything else bad happening in the park. "Yes," and then he laughs.

On Mon, Feb 25, 2013 at 5:03 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:

Is 1:30 pm pst ok? or anytime thereafter.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 1:39 PM, Nicholas Pardi <nicholas.pardi@bsee.gov> wrote:

Sure, what works for you?

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**From:** Mayerson, Drew [mailto:drew.mayerson@bsee.gov]  
**Sent:** Monday, February 25, 2013 01:28 PM  
**To:** Pardi, Nicholas <nicholas.pardi@bsee.gov>  
**Cc:** Ming, Jaron <jaron.ming@bsee.gov>; Masri, Nabil <Nabil.Masri@bsee.gov>; Kenneth Seeley <kenneth.seeley@bsee.gov>  
**Subject:** Re: Media Inquiry for PAC region

Any chance we can move it to the afternoon here? I was just informed I have a contractor coming to our house and I have to be there to guide him in the morning.  
Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 12:36 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Thanks! (b) (5)

On Mon, Feb 25, 2013 at 3:26 PM, Ming, Jaron <jaron.ming@bsee.gov> wrote:

Just FYI, Platform Holly is a State facility. We are aware of this issue and should be able to provide you a response. Thanks.

On Mon, Feb 25, 2013 at 11:58 AM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Of note, he added Platform Holly to that list, another Venoco platform. So that's Platforms Holly, Gail and Grace.

On Mon, Feb 25, 2013 at 2:43 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Hi Jaron,

I got an inquiry from a news organization on the following:

- BSEE permits and operational/inspection documents for drilling operations on Venoco's Platform Gail and Platform Grace off the California coast in the Monterey Shale play. Gail produces from the Sockeye Field and Grace produces in the Santa Clara field.

- Injection well permits for these platforms, if any, and any information on offshore injection well programs, if any.

- Here's why - There are concerns that hydraulic fracturing operations on Platform Gail in 2009 and 2010 produced wastewater, and the disposal of this wastewater was not tracked by BOEM or BSEE, or that BOEM/BSEE are not informing the public.

Here's from the VC Reporter - "The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. Where did the wastewater from the offshore frack go? What was the chemical composition? So far, the only two institutions likely to know for certain are Venoco and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public."

Do you have a minute today or tomorrow to chat about this?

cheers,  
Nick

—  
**Nicholas Pardi**  
Press Secretary  
Bureau of Safety and Environmental Enforcement  
U.S. Department of the Interior  
Direct (202) 208-7746.  
Main (202) 208-3985  
nicholas.pardi@bsee.gov

—  
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—  
Kenneth R. Seeley, Ph.D.

Regional Environmental Officer, Pacific OCS Region

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Kenneth.Seeley@BSEE.gov



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Fwd: Media Inquiry for PAC region

1 message

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**Seeley, Kenneth** <kenneth.seeley@bsee.gov>

Wed, Feb 27, 2013 at 10:07 AM

To: Chuck Barbee <chuck.barbee@bsee.gov>

Cc: Tiffany Parson <tiffany.parson@bsee.gov>, Ramona Sanders <ramona.sanders@bsee.gov>, "Missal, Jeffrey H" <Jeffrey.Missal@bsee.gov>, "T.J. Broussard" <t.j.broussard@bsee.gov>, Daniel Leedy <daniel.leedy@bsee.gov>

Chuck:

This is related to the meeting I told you about with Margaret, Jaron, Nick Pardi, Nabil and others yesterday. Even though fracking is not a big issue here in the Pacific, it's being pushed by some local environmental groups and an article in a local paper (linked below) has created a good bit of attention, even though the article is full of inaccuracies and distortions. The timing is interesting because even though the article below discusses frack jobs from 2010, we are currently reviewing an APD/APM that would involve well-conditioning/hydraulic stimulation (which is basically fracking). However, the issues on the outer continental shelf are very different than those onshore, where most of the controversy is being generated - there's no chance for contamination of drinking water, most areas don't really lend themselves to fracking, and the area that is fractured is not nearly as large. I can call you to fill you in on the meeting, but it was driven by the fact that an investigative journalist that works with Truth Out.org liked the article and intends to follow up on it. We've been asked to go through the article linked below and prepare talking points/responses to any of the accusations. Just wanted to give you a heads up in case Margaret or anyone else raises the issue with you. Also, Ramona and I have talked about this at length a couple of times to make sure we're being consistent.

Ken

----- Forwarded message -----

From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>

Date: Tue, Feb 26, 2013 at 1:32 PM

Subject: Re: Media Inquiry for PAC region

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Cc: "Ming, Jaron" <Jaron.Ming@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

Call in number is 866-819-6658  
code 2988276

On Tue, Feb 26, 2013 at 4:10 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:

Nick, do you have a dial-in number.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Tue, Feb 26, 2013 at 8:54 AM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

For your awareness, this latest inquiry is the result of the following article:

## **Fracking offshore**

### ***Lack of transparency for the controversial practice raises major concerns for locals***

[http://www.vcreporter.com/cms/story/detail/fracking\\_offshore/10432/](http://www.vcreporter.com/cms/story/detail/fracking_offshore/10432/)

In the summer leading up to Hurricane Sandy, crowds surrounded the state capitol at Albany, N.Y. They wanted to know what would happen in case of a natural gas leak, or a bigger natural gas disaster, to their drinking water. What sparked them? Many had seen the footage of water so contaminated from natural gas frack drilling that it turned brown or caught fire. These water debacles sparked a nationwide movement against natural gas fracking. Fewer people know about fracking in California, and the anti-fracking movement is smaller, but the tide has turned since the time when natural gas was considered a safer alternative energy.

The days when oil companies could find enough oil through conventional drilling are long over on the Central Coast. Drillers cannot get oil trapped tightly in the shale the older ways. It is trapped in rock and has to be coerced out through fracking. Now they need an Olympic-size pool's worth of water infused with chemicals to splinter the rock and discharge the oil from it. They drill a hole, lay a pipe, and drop a bomb where it explodes and tears into the pipe. Making its way down through the pipe hole are sand and chemical water at such force that it splinters the shale and dislodges the oil from it. Central Coast frack drilling can tunnel down a mile and through the water table. Scientists are split on whether fracking can contaminate our drinking supply or cause earthquakes. Wastewater composed of toxic, safe and unknown chemicals is injected into a well and pushed down thousands of feet, where it builds pressure. That pressure under the earth could be a problem.

Oil company executives can describe the thick and sticky shale oil with the same kind of loving tenderness and cravings as any Central Coast reckless wine sipper. Washington and Sacramento have simultaneously fed and regulated the thirst for it. The Dick Cheney-created Halliburton loophole made fracking exempt from much EPA regulation and from the Safe Drinking Water Act. This means frackers do not have to disclose the chemicals they use. Drillers in California are not required to notify landowners or residents who utilize nearby water sources of their intent to frack. This lack of transparency has been a sore spot for the often-locked-in-conflict local farmers, commercial fishing industry and environmentalists who now find themselves allied in the battle against fracking's quest for water. Because so little transparency exists, rumors swirl around the where and when of offshore fracking.

#### **The view from McGrath State Beach**

Last June, fresh off the primary election, local campaigning Democrats staged a press conference for Oxnard's McGrath Beach, which was reopening after being closed for lack of funding following Department of Parks and Recreation's sordid fund hoarding. Das Williams, D-Santa Barbara, who was running for re-election for the State Assembly district stretching from Santa Barbara to parts of Oxnard, took advantage of the news cameras and changed from an orange T-shirt into a full wetsuit and bright-yellow boogie board, walked into the ocean, and rode the whitewash of the small choppy waves for more shoots. What the camera could not capture was the crossing of slant- and horizontally-laid oil pipes underneath the waves, chemical injection wells on federally regulated oil rigs beyond the white wash, and the Channel Islands thrust fault capable of producing a magnitude 7.2 earthquake. From Williams' vantage point, he could see the reeds and fences hiding more oil company chemically injected and disposal wells. If he had walked south down the beach past McGrath Lake, he would have found Well 1218 producing more than 32,000 barrels so far this year alone.

Williams splashed around over one of the county's major access points to the oil-abundant underground geological development called the Monterey Shale. This now-commercialized piece of geological property encompasses parts of Ventura, Santa Barbara and Monterey counties. Tim Marquez, president of Venoco, told the Oil & Gas Financial Journal that "We knew that our future efforts were going to be focused on the Monterey Shale." Venoco literature claims the company has explored the shale since 1997.

Fracking is a new frontier and Marquez embraces its Wild West nature and its financial and environmental riskiness. The Monterey Shale is about the closest thing an energy company can get to a new oil frontier on the Central Coast in decades. But like the old Wild West, the federal government is still bankrolling while letting companies use its national forests and federal waters.

According to a Venoco report, the company is leasing 380,000 acres in California valued at \$1.4 billion. It claims that it has already devoted millions of dollars into setting up new wells and exploring the shale, including the Sockeye field offshore from McGrath Beach. Evidence points to more local shale in its future. Venoco recently advertised for a Monterey Shale expertise job for its Carpinteria office.

What wells has Venoco fracked so far? The company dodges that question. The anti-fracking movement has grown large enough to put oil companies on edge. Calls to Venoco were not returned. But just two years ago, the mood was different. Scarlett Johansson was not hosting celebrity screenings for Gasland, the anti-fracking movie that had not yet won an Academy Award. New York farmers, chefs, wine connoisseurs and environmentalists had not yet joined to push New York Gov. Andrew Cuomo, Democrat, to regulate fracking. Matt Damon was not releasing an anti-fracking movie called #Promised Land# that he would use as his next Oscar platform.

But in the more frack-friendly year 2010, Venoco's promotional literature claimed it had fracked and horizontally drilled one well and acidized a second to get to the shale offshore from McGrath Beach. Nestled in federal waters between Oxnard and Santa Cruz Island is Platform Gail. The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. Where did the wastewater from the offshore frack go? What was the chemical composition? So far, the only two institutions likely to know for certain are Venoco and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public.

As for spills and water contamination, frack watchers are still trying to get at the chemical formulas of fracking fluid. A 2005 Venoco document reveals XC polymer, a xanthum gum manufactured by Halliburton. Reporters from the nonprofit investigative unit Propublica found hazardous chemicals such as benzene, formaldehyde, sulfuric acid, kerosene, hydrofluoric acid, hydrochloric acid, formic acid and lead. Researchers at the State University of New York at Albany found radioactive materials such as uranium, radium and radon in tests of fracking wastewater. The National Resources Defense Council found a chemical connected to cancer development, arsenic. The Breast Cancer Fund has reported on the risks for breast cancer from toluene and endocrine-disrupting compounds such as phthalate DEHP found in fracking fluid. EPA studies show that toluene can cause spontaneous abortion. Then there is the question that remains of how the hundreds of thousands of gallons of chemical wastewater are disposed of.

According to the Environmental Defense Center, Venoco fracked platform Gail in Sockeye field in the Santa Barbara Channel.

According to the Ventura County Star, Venoco spilled 63 barrels of oil in 2010 from Platform Gail, the year

following the reported frack job. Ordinarily, a 63-barrel leak is not controversial, but if it includes fracking fluid or its waste, a concern exists. A frack spill is not an ordinary oil spill. When the chemicals get into the water they are difficult to get out. They spread fast and easy, do not easily breakdown, and can cause more health hazards than crude oil.

The acidity of carbon waste through oil spills threatens marine life and commercial fishing. Shellfish can be especially vulnerable to the acidic water that comes with fracking. But it's not just commercial fishing that fracking can threaten. Venoco's fracking and well acidization next to the Channel Islands Marine Reserve undermines the mission of protecting marine life and habitats, much as state and national parks protect wildlife on land. Little research exists on the impact of fracking chemicals on ocean life.

Fracking started 60 years ago. So why all the fuss? For many, the newer form of horizontal drilling, that is drilling (that goes down, then across) is what makes the new practices more dangerous than those old Fillmore and Los Padres National Forest frack jobs. With horizontal's criss-crossing through the water table, it is more likely to cause contamination.

Venoco's drilling onshore and offshore from McGrath, with its slant and horizontal drilling, has created a regulatory conundrum. Fracking skeptics argue that it is specifically what makes slant and horizontal drilling so appealing. Horizontal drilling can start onshore, then cross to offshore. If there is another spill like in 2010, who regulates this? The federal government? The state? When asked about who regulates a frack job that burrows underneath both land and ocean, Erin Curtis, Federal Bureau of Land Management's external affairs representative, told me that "Whoever is responsible is who is permitting the oil company. That is who should regulate." But if Venoco should spill again as it did in 2010, and it pollutes both offshore and onshore, who will be in charge of remedying that? There is no clear answer from Venoco's office about this question.

The campaigning Democratic candidates also had a wonderful view of the Santa Clara River running through McGrath State Beach and into the ocean. As of August, conversations with the United Water Conservation District, the local agency regulating drinking water coming from the Santa Clara River, revealed that fracking was not even on the radar. This is the agency that must divvy out scarce water.

#### Aera Energy off McGrath Beach

According to interviews with the California Department of Land Conservation, the state agency in charge of regulating the energy industry, fracking waste fluid can end up in either a waterflood injection well or a water disposal well. While oil and gas companies are not required to report on their fracking chemical compositions, or where they have drilled or injected it into the earth, they do have to get approvals to build wells to dispose of the waste. Wherever one can find an injection or a water disposal well, it is likely some fracking happened nearby.

Two of the biggest global oil companies, Shell and ExxonMobil, teamed up to form Aera Energy. Aera has a new waterflow well near McGrath Beach. This well has only August production on record with the California Department of Conservation. In that month, Aera injected 13,262 barrels of waste.

Our region is what seismologists call seismically active. Several earthquakes have been caused by faults that extend into the Santa Barbara-Ventura ocean basin. We have San Andreas and the Santa Ynez River

fault zone to the north, the San Cayetano fault to the east, the offshore Pitas Point near Carpinteria, Red Mountain fault to the east, the Oak Ridge lying on both Ventura and Oxnard, and the offshore Santa Cruz Island and Channel Islands faults to the west. Even the Pacific Operators Offshore LLC (PACOPS), a local offshore driller, in a report to the Federal Bureau of Energy Management (BOEM) admits that all these faults can produce shaking around the wells. The cracking of the shale and the reinjection of waste water back to the strata causes pressure. All this happens on these fault systems.

Aera is no stranger to fracking. Last May, Aera fracked in the mountains above Ventura Avenue. This job used 32,004 gallons of water and drilled down 4,960 feet. Aera admits to using methanol, a common chemical used in fracking and also found in fuel, antifreeze and paint solvent. Inhaling methanol can cause eye irritation, headaches and can be fatal. Ingesting it can produce eye damage or death. Aera's chemical cocktail also included, boric acid, insecticide and flame retardants.

According to a joint study by the U.S. Department of Energy, the National Academy of Sciences, the Institute of Medicine and the National Research Council, fracturing of rock has a lower risk of earthquake, but the disposal of the waste fluid into a well is high risk. Where lies an injection well also lies an earthquake risk. According to this study, the hundreds of thousands of gallons of waste do not simply disappear in the earth's strata. Underground, the waste builds pressure and causes more cracks in the already cracked earth. Conducting the frack jobs on fault zones just exacerbates the earthquake risk.

What makes this study unique is that its researchers and peer reviewers did not possess ties to energy companies. This is not as common as one might expect. A Plains Exploration study claimed fracking in the Baldwin Hills in Los Angeles was safe, but community groups complained that the peer reviewer had connections to oil and gas. Plains Exploration reportedly paid a Texas geologist \$400,000 to write a study that showed that fracking did not contaminate ground water. The oil and gas industry gave State University of New York at Buffalo's geology department \$6 million. A new term has been coined to describe these Ph.D.s: frackademics.

#### Greka's Rincon

Nestled between Carpinteria and Ventura is the Rincon oil field, the desirable piece of ocean property with legendary breaks that has surfers, environmentalists and oil interests competing for its future. Where the state's Conservation Department gave Venoco safety awards in spite of its 32 violations for not following operating procedures from 2005 to 2010, Greka, with its perishing pipelines and rusting facilities, has the opposite reputation with 21 separate crude oil spills in Santa Barbara waterways from 2005 through 2010. One of the spills included a 67,000-gallon oil spill in early December 2007 followed by an 84,000-gallon spill in 2008. Greka's poor public image prompted a name change to HVI Canyon Cat last year. The Santa Barbara Independent reported that the U.S. Department of Justice alleges that HVI Cat Canyon failed to implement adequate plans to prevent spills, which is required by the Clean Water Act.

#### Photo by Matthew Hill

Venoco has operations on the pier off the coast in Carpinteria, where, apparently, work has ramped up recently.

In 2002, the company acquired Rincon Island Partnership. According to California Department of Conservation records, Rincon Island Partnership has at least five waterflood injection wells. Two are drilled either on a slant or horizontally. Greka has a thing for horizontal drilling. One of its holdings is Horizontal Ventures, so it is likely that some of its wells are horizontally drilled.

### Venoco and Carpinteria's uneasy relationship

Venoco has operations in Carpinteria right near the beach and leases the pier that the city owns. Former Carpinteria mayor Richard Weinberg has witnessed increased Venoco activity near his house, a short distance from the pier — "Trucks go by day and night," he says. Miguel Checa, a member of the board of directors of the advocacy organization, the Carpinteria Valley Association, once only saw a few trucks a day going to the pier a day. Now he notices "six to eight." Some question whether this means offshore fracking is a fixation of many Carpinteria residents. Buzz spreads around Carpinteria environmental circles that Venoco could slant-drill offshore to get entrance to oil under the city limits, but Nathan Alley, a staff attorney with the Environmental Defense Center, claims that would be a feat of engineering.

Carpinteria resident Ted Rhodes has had Venoco in his sites since the company created Carpinteria's 2010 Measure J that would have produced more drilling in the city near the aquifer. His mind is on the municipal water and he has no reservoir of good will for Venoco. The company can bypass local laws by going through federal land management instead of the city.

Weinberg thinks Venoco's plan is to drill slant or horizontal to reach the oil under the city without having to abide by local laws or answer to local activists. The last time Venoco wanted to dramatically increase drilling through city legislation, environmentalists staged a paddling protest. They jumped in the water and paddled out to sea. The paddlers included Rhodes and Weinberg.

Weinberg calls federal and state land management "weak." Federal and state land management will not be as open to citizens' participation. Weinberg may be correct. In October, Alley found that Venoco will drill just north of the city and slant-drill to the oil underneath the city.

The Carpinteria Valley Association hired hydrogeologist from UCSB Hugo Loáiciga to defend against Measure J. Loáiciga publicly testified drilling beneath the city would be detrimental to the aquifer. Although environmentalists point to the dishonesty of oil companies, the prediction tools that oil companies use could be a factor. Sophisticated oil company mapping has provided innumerable safety gains by predicting a picture of the underground. But all these layers might be more fractured and uniform than the technology shows. The assumption of safety depends on the premise that layers of underground rock tightly hold the injected chemicals. But the underground may be more fractured and cracked than these programs predict. More cracks mean more chemicals moving about.

### UCSB: gas to the south, oil to the north

Venoco has had its share of Southern California controversy. It had a run-in with famous local environmentalist Erin Brockovich over fracking at Beverly Hills High right next to the track. Where Pennsylvania may allow fracking right on public university campuses, UCSB has the status of having likely oil fracking directly north and PG&E gas south of the campus. Entering the campus on Highway 217, you can see the natural gas field. It is estimated that 90 percent of natural gas wells are fracked.

Elwood lies just north of the campus. Venoco claims, in a 2010 business magazine, to have been drilling to the Monterey Shale at Elwood since 1999. It only took a few short years for this exploration to transform into abundant shale oil collection. In 2007, Venoco wrote to the California Department of Conservation to say it will be injecting waste from the Elwood well offshore to platform Holly. In that letter, Venoco writes, "We have three wells injecting the produced water back to the Monterey Shale." Produced water is the wastewater that is laden with chemicals. Venoco also claims to have injected this produced water on Holly beginning April 2006. Platform Holly has been productive. The state lands commission filed a lawsuit last year claiming Venoco owes the state \$9.5 million in royalties.

Venoco ships some of this waste to a water disposal well north of UCSB, in between the posh Bacara resort and the Sandpiper Golf Course. The company has another water disposal well offshore in front of UCSB. It has disposed of 1.3 million barrels of wastewater from the beginning of 2012 through August.

The EPA classifies an oil company's waste disposal well as class II disposal. If some of the fracking chemicals were to be used instead in manufacturing or farming, the EPA would give it a more hazardous classification. Oil and gas companies have exceptions other industries do not.

#### Bureaucracy and politicians

Checa and Weinberg joined 173 other people in a May 20 meeting at Ventura County Government Center on fracking, organized by the state's Department of Conservation. It was public comment time before the state came out with a draft of fracking rules to be passed around to various environmental groups and the industry. Erin Curtis, the spokeswoman from Federal Bureau of Land Management, says, "We are in rule-making on hydraulic fracturing." Like the state Department of Conservation, that office is inviting public input before making draft regulations. Alley recommends that locals get involved and work toward making fracking transparent. Of course it is much easier to be part of the rulemaking process if you are a mover and shaker at environmental organizations. For ordinary folks, like those at Albany, N.Y., protesting is the only way to get their voice heard.

Ventura County will have to address protecting agriculture, water and property despite the revenues received from oil companies. As for rising oil prices, more local drilling does not translate into cheaper prices at the pump for Ventura County residents. The fracked oil from underneath our feet gets traded to the highest bidder on the international market just like any other oil.

As for local electoral connections to fracking, only state Sen. Fran Pavley, D-Agoura Hills, has put fracking front and center on her agenda, going as far as writing a bill requiring drillers to notify nearby property owners before fracking. Though one bill died earlier this year, Pavley has reintroduced another bill this month that would regulate fracking, which includes advance notice to neighbors of planned fracking and disclosure of the chemicals used in the process. State Assemblyman Jeff Gorell, R-Camarillo, had Venoco as a client during his lobbyist days. Venoco later joined ExxonMobile in contributing to his campaign. Recently retired Carpinteria City Councilman Joe Armendariz started a consulting firm. His new client is Western Petroleum Association. Councilwoman Carmen Ramirez, who also attended the McGrath Beach opening, might be the next local leader likely to take this up as an agenda item. The Sierra Club adores her. She earned their admiration for fighting to keep development off Ormond Beach.

On the federal level, ProPublica found that Exxon is pushing for legislation so it does not have to reveal fracking chemicals, but federal regulators have their own agenda. John Romero at the Bureau of Ocean Energy Management said that office will not be issuing any more federal offshore permits, but is working on environmental studies for offshore wind power. Even if the local and state governments conflict on offshore agendas, the feds are installing more alternative energy regardless of who is in office. As for when this will happen, UCSB biologist Milton Love is already conducting an environmental impact study for the federal government to bring offshore wind power to our region. The Department of Defense has already made plans to develop more wind power on San Nicolas Island.

A few months after the Democratic candidate at McGrath Beach, I asked a ranger about the fracking rumors. "I have heard them," he says, "but we have cameras. Cameras are all over the park." But the cameras do not show everything behind the walls of the rigs and wells. So I ask him if he sees anything else bad happening in the park. "Yes," and then he laughs.

On Mon, Feb 25, 2013 at 5:03 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:  
Is 1:30 pm pst ok? or anytime thereafter.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 1:39 PM, Nicholas Pardi <nicholas.pardi@bsee.gov> wrote:  
Sure, what works for you?

---

**From:** Mayerson, Drew [mailto:drew.mayerson@bsee.gov]  
**Sent:** Monday, February 25, 2013 01:28 PM  
**To:** Pardi, Nicholas <nicholas.pardi@bsee.gov>  
**Cc:** Ming, Jaron <jaron.ming@bsee.gov>; Masri, Nabil <Nabil.Masri@bsee.gov>; Kenneth Seeley <kenneth.seeley@bsee.gov>  
**Subject:** Re: Media Inquiry for PAC region

Any chance we can move it to the afternoon here? I was just informed I have a contractor coming to our house and I have to be there to guide him in the morning.  
Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 12:36 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Thanks! The VC article is (b) (5)

[REDACTED]

On Mon, Feb 25, 2013 at 3:26 PM, Ming, Jaron <jaron.ming@bsee.gov> wrote:

Just FYI, Platform Holly is a State facility. We are aware of this issue and should be able to provide you a response. Thanks.

On Mon, Feb 25, 2013 at 11:58 AM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Of note, he added Platform Holly to that list, another Venoco platform. So that's Platforms Holly, Gail and Grace.

On Mon, Feb 25, 2013 at 2:43 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Hi Jaron,

I got an inquiry from a news organization on the following:

- BSEE permits and operational/inspection documents for drilling operations on Venoco's

Platform Gail and Platform Grace off the California coast in the Monterey Shale play. Gail produces from the Sockeye Field and Grace produces in the Santa Clara field.

- Injection well permits for these platforms, if any, and any information on offshore injection well programs, if any.

- Here's why - There are concerns that hydraulic fracturing operations on Platform Gail in 2009 and 2010 produced wastewater, and the disposal of this wastewater was not tracked by BOEM or BSEE, or that BOEM/BSEE are not informing the public.

Here's from the VC Reporter - "The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. Where did the wastewater from the offshore frack go? What was the chemical composition? So far, the only two institutions likely to know for certain are Venoco and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public."

Do you have a minute today or tomorrow to chat about this?

cheers,  
Nick

-  
**Nicholas Pardi**  
Press Secretary  
Bureau of Safety and Environmental Enforcement  
U.S. Department of the Interior  
Direct (202) 208-7746  
Main (202) 208-3985  
nicholas.pardi@bsee.gov

-  
**Nicholas Pardi**  
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| | [nicholas.pardi@bsee.gov](mailto:nicholas.pardi@bsee.gov)

—  
**Nicholas Pardi**

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—  
Kenneth R. Seeley, Ph.D.

Regional Environmental Officer, Pacific OCS Region

Bureau of Safety and Environmental Enforcement

770 Paseo Camarillo

Camarillo, CA 93010

(P): 805-389-7799

(F): 805-389-7592

(C): 805-377-8618

[Kenneth.Seeley@BSEE.gov](mailto:Kenneth.Seeley@BSEE.gov)



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## [Update] Meeting with DCOR regarding Fracking

1 message

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**daniel.knowlson@bsee.gov** <daniel.knowlson@bsee.gov>

Tue, Feb 12, 2013 at 8:28 AM

Reply-To: "daniel.knowlson@bsee.gov" <daniel.knowlson@bsee.gov>

To: "kenneth.seeley@bsee.gov" <kenneth.seeley@bsee.gov>, "james.salmons@bsee.gov" <james.salmons@bsee.gov>, "daniel.knowlson@bsee.gov" <daniel.knowlson@bsee.gov>

Cc: kenneth.seeley@bsee.gov, james.salmons@bsee.gov

Not sure if you guys know about this meeting but just a reminder if one of you are interested, trying to get it rescheduled to the training room

### Meeting with DCOR regarding Fracking

Dan Knowlson - Meeting with DCOR

When Tue Feb 12, 2013 9am – 12pm Pacific Time

Where BSEE-CAM-Conference Project Room ([map](#))

Who

- Pamela Rados - organizer
- Drew Mayerson
- Jaron Ming
- Nabil Masri
- Daniel Knowlson



Seeley, Kenneth <kenneth.seeley@bsee.gov>

---

## My additions to the VC Reporter article comments

1 message

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**Seeley, Kenneth** <kenneth.seeley@bsee.gov>

Fri, Mar 1, 2013 at 11:51 AM

To: Nabil Masri <nabil.masri@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>, James Salmons <james.salmons@bsee.gov>

Here's what I have. I think it's possible to (b) (5)

Let me know if you have any questions or concerns about my responses - they are all highlighted in yellow.

Ken

—  
Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618  
[Kenneth.Seeley@BSEE.gov](mailto:Kenneth.Seeley@BSEE.gov)

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 **Point by point response to VC Reporter Article (1).docx**  
45K

## Fracking offshore

*Lack of transparency for the controversial practice raises major concerns for locals*

[http://www.vcreporter.com/cms/story/detail/fracking\\_offshore/10432/](http://www.vcreporter.com/cms/story/detail/fracking_offshore/10432/)

In the summer leading up to Hurricane Sandy, crowds surrounded the state capitol at Albany, N.Y. They wanted to know what would happen in case of a natural gas leak, or a bigger natural gas disaster, to their drinking water. What sparked them? Many had seen the footage of water so contaminated from natural gas frack drilling that it turned brown or caught fire. These water debacles sparked a nationwide movement against natural gas fracking. Fewer people know about fracking in California, and the anti-fracking movement is smaller, but the tide has turned since the time when natural gas was considered a safer alternative energy.

The days when oil companies could find enough oil through conventional drilling are long over on the Central Coast. Drillers cannot get oil trapped tightly in the shale the older ways. It is trapped in rock and has to be coerced out through fracking. Now they need an Olympic-size pool's worth of water infused with chemicals to splinter the rock and discharge the oil from it. They drill a hole, lay a pipe, and drop a bomb where it explodes and tears into the pipe. Making its way down through the pipe hole are sand and chemical water at such force that it splinters the shale and dislodges the oil from it. Central Coast frack drilling can tunnel down a mile and through the water table. Scientists are split on whether fracking can contaminate our drinking supply or cause earthquakes. Wastewater composed of toxic, safe and unknown chemicals is injected into a well and pushed down thousands of feet, where it builds pressure. That pressure under the earth could be a problem.

Oil company executives can describe the thick and sticky shale oil with the same kind of loving tenderness and cravings as any Central Coast reckless wine sipper. Washington and Sacramento have simultaneously fed and regulated the thirst for it. The Dick Cheney-created Halliburton loophole made fracking exempt from much EPA regulation and from the Safe Drinking Water Act. This means frackers do not have to disclose the chemicals they use. **This is true under the Safe Drinking Water Act, but that does not apply in the case of OCS operations. Discharges of fracking fluids are covered under EPA's General Discharge Permit for OCS oil and gas operations.** Drillers in California are not required to notify landowners or residents who utilize nearby water sources of their intent to frack. This lack of transparency has been a sore spot for the often-locked-in-conflict local farmers, commercial fishing industry and environmentalists who now find themselves allied in the battle against fracking's quest for water. Because so little transparency exists, rumors swirl around the where and when of offshore fracking.

### The view from McGrath State Beach

Last June, fresh off the primary election, local campaigning Democrats staged a press conference for Oxnard's McGrath Beach, which was reopening after being closed for lack of funding following Department of Parks and Recreation's sordid fund hoarding. Das Williams, D-Santa Barbara, who was running for re-election for the State Assembly district stretching from Santa Barbara to parts of Oxnard, took advantage of the news cameras and changed from an orange T-shirt into a full wetsuit and bright-yellow boogie board, walked into the ocean, and rode the whitewash of the small choppy waves for more shoots. What the camera could not capture was the crossing of slant- and horizontally-laid oil pipes underneath the waves, chemical injection wells on federally regulated oil rigs beyond the white wash, and the Channel Islands thrust fault capable of producing a magnitude 7.2 earthquake. **ACCORDING TO REPORTS FROM THE CALIFORNIA DIVISION OF MINES AND GEOLOGY AND THE USGS IN 1996 (OFR 96-08**

AND 96-706, RESPECTIVELY), THE CHANNEL ISLANDS THRUST IS APPROXIMATELY 65 KM LONG AND CAN PRODUCE A MAX MAGNITUDE 7.4 EARTHQUAKE. AN EARLIER PAPER FROM SHAW AND SUPPE (1994 IN THE GEOLOGICAL SOCIETY OF AMERICA BULLETIN) ESTIMATED A MAGNITUDE 7.2 WAS POSSIBLE. From Williams' vantage point, he could see the reeds and fences hiding more oil company chemically injected and disposal wells. If he had walked south down the beach past McGrath Lake, he would have found Well 1218 **THIS IS A STATE WELL**. producing more than 32,000 barrels so far this year alone.

Williams splashed around over one of the county's major access points to the oil-abundant underground geological development called the Monterey Shale. This now-commercialized piece of geological property encompasses parts of Ventura, Santa Barbara and Monterey counties. Tim Marquez, president of Venoco, told the Oil & Gas Financial Journal that "We knew that our future efforts were going to be focused on the Monterey Shale." Venoco literature claims the company has explored the shale since 1997. **THE MONTEREY SHALE IS ONE OF THE PRIMARY PRODUCING FORMATIONS IN CALIFORNIA. IT IS PROLIFIC ONSHORE AS WELL AS OFFSHORE. IN THE OCS IT ACCOUNTS FOR ABOUT 40,000 BARRELS PER DAY OF THE 54,000 BARRELS PRODUCED. NONE OF THE OIL IS THE RESULT OF HYDRAULIC FRACTURING. IN THE OFFSHORE, THE MONTEREY IS NATURALLY FRACTURED.**

Fracking is a new frontier **HYDRAULIC FRACTURING HAS BEEN AROUND FOR 60 YEARS** and Marquez embraces its Wild West nature and its financial and environmental riskiness. The Monterey Shale is about the closest thing an energy company can get to a new oil frontier on the Central Coast in decades. **THE MONTEREY SHALE FIRST PRODUCED IN CALIFORNIA ABOUT 1902. BY 1956 ALMOST 300,000,000 BARRELS OF OIL HAD BEEN PRODUCED FROM THE MONTEREY IN THE ONSHORE SANTA MARIA AREA AND SAN JOAQUIN BASIN IN THE CENTRAL VALLEY. THE MONTEREY IS HARDLY A NEW FRONTIER HOWEVER; THE AUTHOR MAY BE REFERRING TO BAKKEN LIKE HYDRAULIC FRACTURING AS A NEW FRONTIER THAT COULD BE APPLIED TO THE MONTEREY FORMATION.** But like the old Wild West, the federal government is still bankrolling while letting companies use its national forests and federal waters.

According to a Venoco report, the company is leasing 380,000 acres in California valued at \$1.4 billion. **VENOCO HAS 5 OCS BLOCKS TOTTALLING ABOUT 29,000 ACRES.** It claims that it has already devoted millions of dollars into setting up new wells and exploring the shale, including the Sockeye field offshore from McGrath Beach. **PER VENOCO'S OPERATIONS MANAGER, THEIR 2010 FRAC WAS NOT VERY SUCCESSFUL AND ALTHOUGH THEY DIDN'T WANT TO RULE OUT A FRAC AGAIN THEY INDICATED THEY DID NOT HAVE PLANS TO FRAC IN THE NEAR FUTURE.** Evidence points to more local shale in its future. Venoco recently advertised for a Monterey Shale expertise job for its Carpinteria office. **THIS WOULD NOT BE UNUSUAL....VENOCO PRODUCES FROM NATURALLY FRACTURED MONTEREY ON THE OCS AND FROM THE PLATFORM IN STATE WATERS.**

What wells has Venoco fracked so far? **WELL E-11 DURING THE 1990's (note: this was a frac in the Sespe sandstone, not Monterey) & WELL E-8 SIDETRACK 2 IN 2010.** The company dodges that question. The anti-fracking movement has grown large enough to put oil companies on edge. Calls to Venoco were not returned. But just two years ago, the mood was different. Scarlett Johansson was not hosting celebrity screenings for Gasland, the anti-fracking movie that had not yet won an Academy Award. New York farmers, chefs, wine connoisseurs and environmentalists had not yet joined to push New York Gov. Andrew Cuomo, Democrat, to regulate fracking. Matt Damon was not releasing an anti-fracking movie called #Promised Land# that he would use as his next Oscar platform **HOW'D THAT WORK OUT?.**

But in the more frack-friendly year 2010, Venoco's promotional literature claimed it had fracked and horizontally drilled one well and acidized a second to get to the shale offshore from McGrath Beach. Nestled in federal waters between Oxnard and Santa Cruz Island is Platform Gail. The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. **Where did the wastewater from the offshore frack go? What was the chemical composition?** Still waiting on this information from Venoco, but it appears that only 941 gallons of water were discharged under the general discharge permit during February, March and April of 2010 and these discharges were related to maintenance activities. So far, the only two institutions likely to know for certain are Venoco and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public actually, EPA would be the appropriate agency to ask, since the discharges would have been under their authority.

As for spills and water contamination, frack watchers are still trying to get at the chemical formulas of fracking fluid. **A 2005 Venoco document reveals XC polymer, a xanthum gum manufactured by Halliburton.** It's not clear what this report from 2005 is about, or if it is related to 2010 fracking at Gail, in which case, it's not clear why a 2005 report would be relevant. Xanthum gum is used in large quantities in the oil industry, usually to thicken drilling mud. It is also commonly used as a food additive, for example, as a thickening agent in salad dressings. Discharge of XC polymer is covered under EPA's general NPDES discharge permit for OCS oil operations (as Discharge 001: Drilling Fluids and Cuttings). **Reporters from the nonprofit investigative unit Propublica found hazardous chemicals such as benzene, formaldehyde, sulfuric acid, kerosene, hydrofluoric acid, hydrochloric acid, formic acid and lead. Researchers at the State University of New York at Albany found radioactive materials such as uranium, radium and radon in tests of fracking wastewater.** This statement is too general and vague to respond to – these reports could be about anything, but we have no evidence to suggest that similar chemicals have been discharged at Gail, although if they had been, it would have fallen under EPA's purview under the Clean Water Act, and they would have had to determine if a violation of the general discharge permit had occurred. The National Resources Defense Council found a chemical connected to cancer development, arsenic. The Breast Cancer Fund has reported on the risks for breast cancer from toluene and endocrine-disrupting compounds such as phthalate DEHP found in fracking fluid. EPA studies show that toluene can cause spontaneous abortion. Then there is the question that remains of how the hundreds of thousands of gallons of chemical wastewater are disposed of. Again, we have no evidence to support or refute this claim, but the mere presence of a contaminant in a permitted discharge does not constitute a violation of the discharge permit. EPA sets discharge limits based on the toxicity of the chemicals of concern. During the period in question, we do know that Venoco was reinjecting produced water from Gail back into the formation for the waterflood program.

According to the Environmental Defense Center, Venoco fracked platform Gail in Sockeye field in the Santa Barbara Channel.

According to the Ventura County Star, **Venoco spilled 63 barrels of oil in 2010 from Platform Gail**, the year following the reported frack job. Ordinarily, a 63-barrel leak is not controversial, but if it includes fracking fluid or its waste, a concern exists. A frack spill is not an ordinary oil spill. When the chemicals get into the water they are difficult to get out. They spread fast and easy, do not easily breakdown, and can cause more health hazards than crude oil. This could probably be easily refuted if we had information on the chemicals used by Venoco.

The acidity of carbon waste through oil spills threatens marine life and commercial fishing.<sup>1</sup> Shellfish can be especially vulnerable to the acidic water that comes with fracking. But it's not just commercial fishing that fracking can threaten. Venoco's fracking and well acidization next to the Channel Islands Marine Reserve undermines **I think the author is trying to imply that the mere presence of these activities near the marine reserve undermines its mission, but there is no evidence to support that activities at Platform Gail have negatively impacted that mission to date. Furthermore, the spill volume mentioned above is grossly exaggerated (the volume reported is approximately 126 times greater than the actual volume and there's no acknowledgement that the spill was cleaned up before significant impacts were allowed to occur), finally, there is no evidence or reason to believe that fracking fluids in any significant quantities, if at all, were in the oil that was spilled** the mission of protecting marine life and habitats, much as state and national parks protect wildlife on land. Little research exists on the impact of fracking chemicals on ocean life. **THE FOLLOWING WERE EXCERPTED FROM 15 CFR PART 922.71-74, THE GOVERNING REGULATIONS FOR THE CHANNEL ISLANDS NATIONAL MARINE SANCTUARY**

**§ 922.72 Prohibited or otherwise regulated activities—Sanctuary-wide.**

**(1) Exploring for, developing, or producing hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons. THE VENOCO LEASES IN FEDERAL WATERS WERE ISSUED IN 1968 (LEASE SALE P4).**

**(2) Exploring for, developing, or producing minerals within the Sanctuary, except producing byproducts incidental to hydrocarbon production allowed by paragraph (a)(1) of this section.**

**(3)(i) Discharging or depositing from within or into the Sanctuary any material or other matter except:**

**(E) Effluent routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production allowed by paragraph (a)(1) of this section; or**

**(4) Drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary; or constructing or placing any structure, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:**

**(i) Anchor a vessel;**

**(ii) Install an authorized navigational aid;**

**(iii) Conduct lawful fishing activity;**

**(iv) Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or**

**(v) Explore for, develop, or produce hydrocarbons as allowed by paragraph (a)(1) of this section.**

Fracking started 60 years ago. So why all the fuss? For many, the newer form of horizontal drilling, that is drilling (that goes down, then across) is what makes the new practices more dangerous than those old Fillmore and Los Padres National Forest frack jobs. With horizontal's criss-crossing through the water table, it is more likely to cause contamination. **THE E8 WELL WAS HORIZONTAL AT THE DEPTHS WHERE FRACKING WAS DONE, THE E11 WELL WAS NOT.**

Venoco's drilling onshore and offshore from McGrath, with its slant and horizontal drilling, has created a regulatory conundrum. **McGRATH IS IN STATE TIDELANDS.** Fracking skeptics argue that it is specifically what makes slant and horizontal drilling so appealing. Horizontal drilling can start onshore, then cross to offshore. If there is another spill like in 2010, who regulates this? **The U.S. Coast Guard would lead a response to a spill in Federal waters, with the State responding to any spills that impact State waters or resources.** If the spill is the result of an unauthorized discharge from a permitted produced water discharge, EPA would have jurisdiction under the **Clean Water Act.** The federal government? The state? When asked about who regulates a frack job that burrows underneath both land and ocean, Erin Curtis, Federal Bureau of Land Management's external affairs representative, told me that "Whoever is responsible is who is permitting the oil company. That is who should regulate." **That's misleading and it is not clear why the author would have approached BLM on this issue, rather than BOEM or BSEE, or EPA or the U.S. Coast Guard.** But if Venoco should spill again as it did in 2010, and it pollutes both offshore and onshore, who will be in charge of remedying that? There is no clear answer from Venoco's office about this question **Spill response plans are in place and response drills take place regularly; there's no real mystery regarding which agency will lead spill response efforts.**

The campaigning Democratic candidates also had a wonderful view of the Santa Clara River running through McGrath State Beach and into the ocean. As of August, conversations with the United Water Conservation District, the local agency regulating drinking water coming from the Santa Clara River, revealed that fracking was not even on the radar. This is the agency that must divvy out scarce water. **Drinking water aquifers in this area are not impacted by offshore drilling activities on the Pacific OCS.**

#### Aera Energy off McGrath Beach

According to interviews with the California Department of Land Conservation, the state agency in charge of regulating the energy industry, fracking waste fluid can end up in either a waterflood injection well or a water disposal well. While oil and gas companies are not required to report on their fracking chemical compositions, or where they have drilled or injected it into the earth, they do have to get approvals to build wells to dispose of the waste. Wherever one can find an injection or a water disposal well, it is likely some fracking happened nearby. **THIS IS A GROSS EXAGERATION. THERE ARE NO DISPOSAL WELLS AT SOCKEYE AND ABOUT 12 WATER INJECTION WELLS THAT ARE USED FOR PRESSURE SUPPORT OF THE RESERVOIR (this is standard conservation practice). THE INJECTED WATER HAS TO BE COMPATIBLE WITH THE WATER IN THE RESERVOIR TO AVOID VARIOUS MALADIES THAT MIGHT INHIBIT INJECTION (E.G., BACTERIAL GROWTH, SCALE FORMATION, CLAY SWELLING, ETC...). THE ENTIRE POCS HAS ABOUT 70 WATER INJECTION WELLS ONGOING AT ANY ONE TIME, MOSTLY TO PROVIDE PRESSURE SUPPORT FOR THE RESERVOIR. FRACKING HAS BEEN RARE, OCCURRING ONLY ABOUT 11 TIMES IN THE LAST 20+ YEARS, MOST BEING "MINI FRACKS" IN THE IMMEDIATE VICINITY AROUND THE WELLBORE TO CLEAN UP SAND THAT MAY PLUG THE PERFORATIONS.**

Two of the biggest global oil companies, Shell and ExxonMobil, teamed up to form Aera Energy. Aera has a new waterflow well near McGrath Beach. This well has only August production on record with the California Department of Conservation. In that month, Aera injected 13,262 barrels of waste.

Our region is what seismologists call seismically active. **TRUE.** Several earthquakes have been caused by faults that extend into the Santa Barbara-Ventura ocean basin **EARTHQUAKES OCCUR ON FAULTS.** We have San Andreas and the Santa Ynez River fault zone to the north, the San Cayetano fault to the east, the offshore Pitas Point near Carpinteria, Red Mountain fault to the east, the Oak Ridge lying on both Ventura and Oxnard, and the offshore Santa Cruz Island and Channel Islands faults to the west. Even the Pacific Operators Offshore LLC (PACOPS), a local offshore driller, in a report to the Federal Bureau of Energy Management (BOEM) admits that all these faults can produce shaking around the wells. The cracking of the shale and the reinjection of waste water back to the strata causes pressure. **WATER INJECTION FOR WATERFLOOD PROGRAMS REPLACES THE PRESSURE THAT HAS BEEN BLED OFF THROUGH OIL AND GAS DEVELOPMENT. THE IDEA IS TO MATCH THE ORIGINAL RESERVOIR PRESSURE AND AVOID INADVERTANTLY FRACTURING THE FORMATION, THEREBY POSSIBLY NEGATING THE BENEFITS OF REPRESSURIZATION OR SENDING THE INJECTED WATER INTO THE OIL AND CHOKING OFF OIL PRODUCTION IN THE WELLS THAT WERE TO BE THE BENEFICIARY OF RESTORED PRESSURE. FOR THIS REASON ALL WATER INJECTION WELLS ARE MONITORED CAREFULLY TO SEE THAT THIS DOES NOT HAPPEN.** All this happens on these fault systems.

Aera is no stranger to fracking. Last May, Aera fracked in the mountains above Ventura Avenue. This job used 32,004 gallons of water and drilled down 4,960 feet. Aera admits to using methanol, a common chemical used in fracking and also found in fuel, antifreeze and paint solvent. Inhaling methanol can cause eye irritation, headaches and can be fatal. Ingesting it can produce eye damage or death. Aera's chemical cocktail also included, boric acid, insecticide and flame retardants.

According to a joint study by the U.S. Department of Energy, the National Academy of Sciences, the Institute of Medicine and the National Research Council, fracturing of rock has a lower risk of earthquake, but the disposal of the waste fluid into a well is high risk. Where lies an injection well also lies an earthquake risk. According to this study, the hundreds of thousands of gallons of waste do not simply disappear in the earth's strata. Underground, the waste builds pressure and causes more cracks in the already cracked earth. Conducting the frack jobs on fault zones just exacerbates the earthquake risk. **THE FOLLOWING IS THE PRESS RELEASE FROM THE NAS DATED 6/15/2012**

*Hydraulic Fracturing Poses Low Risk for Causing Earthquakes,  
But Risks Higher for Wastewater Injection Wells*

*WASHINGTON — Hydraulic fracturing has a low risk for inducing earthquakes that can be felt by people, but underground injection of wastewater produced by hydraulic fracturing and other energy technologies has a higher risk of causing such earthquakes, says a new report from the National Research Council. In addition, carbon capture and storage may have the potential for inducing seismic events, because significant volumes of fluids are injected underground over long periods of time. However, insufficient information exists to understand the potential of carbon capture and storage to cause earthquakes, because no large-scale projects are as yet in operation. The committee that wrote the report said continued research will be needed to examine the potential for induced seismicity in large-scale carbon capture and storage projects.*

*The report examines the potential for energy technologies — including shale gas recovery, carbon capture and storage, geothermal energy production, and conventional oil and gas development — to cause earthquakes. Hydraulic fracturing, commonly known as fracking, extracts natural gas by injecting a mixture of water, sand, and chemicals in short bursts at high pressure into deep underground wells. The process cracks the shale rock formation and allows natural gas to escape and flow up the well, along with some wastewater. The wastewater can be discarded in several ways, including injection underground at a*

separate site. Carbon capture and storage, also known as carbon capture and sequestration, involves collecting carbon dioxide from power plants, liquefying it, and pumping it at high rates into deep underground geologic formations for permanent disposal. Geothermal energy harnesses natural heat from within the Earth by capturing steam or hot water from underground.

Although induced seismic events associated with these energy technologies have not resulted in loss of life or significant damage in the United States, some effects have been felt by local residents and have raised concern about additional seismic activity and its consequences in areas where energy development is ongoing or planned. While scientists understand the general mechanisms that induce seismic events, they are unable to accurately predict the magnitude or occurrence of these earthquakes due to insufficient information about the natural rock systems and a lack of validated predictive models at specific energy development sites.

The factor most directly correlated with induced earthquakes is the total balance of fluid introduced or removed underground, the committee said. Because oil and gas development, carbon capture and storage, and geothermal energy production each involve net fluid injection or withdrawal, all have at least the potential to induce earthquakes that could be felt by people. However, technologies designed to maintain a balance between the amounts of fluid being injected and withdrawn, such as most geothermal and conventional oil and gas development, appear to produce fewer induced seismic events than technologies that do not maintain fluid balance.

A number of federal and state agencies have regulatory oversight related to different aspects of underground injection activities associated with energy technologies. Responses from these agencies to energy development-related seismic events have been successful, the report says, but interagency cooperation is warranted as the number of earthquakes could increase due to expanding energy development.

The study was sponsored by the U.S. Department of Energy. The National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council make up the National Academies. They are independent, nonprofit institutions that provide science, technology, and health policy advice under an 1863 congressional charter. Panel members, who serve pro bono as volunteers, are chosen by the Academies for each study based on their expertise and experience and must satisfy the Academies' conflict-of-interest standards. The resulting consensus reports undergo external peer review before completion. For more information, visit <http://national-academies.org/studycommitteeprocess.pdf>.

What makes this study unique is that its researchers and peer reviewers did not possess ties to energy companies. This is not as common as one might expect. A Plains Exploration study claimed fracking in the Baldwin Hills in Los Angeles was safe, but community groups complained that the peer reviewer had connections to oil and gas. Plains Exploration reportedly paid a Texas geologist \$400,000 to write a study that showed that fracking did not contaminate ground water. The oil and gas industry gave State University of New York at Buffalo's geology department \$6 million. A new term has been coined to describe these Ph.D.s: frackademics.

#### Greka's Rincon

Nestled between Carpinteria and Ventura is the Rincon oil field, the desirable piece of ocean property with legendary breaks that has surfers, environmentalists and oil interests competing for its future. Where the state's Conservation Department gave Venoco safety awards in spite of its 32 violations for not following operating procedures from 2005 to 2010, Greka, with its perishing pipelines and rusting facilities, has the opposite reputation with 21 separate crude oil spills in Santa Barbara waterways from 2005 through 2010. One of the spills included a 67,000-gallon oil spill in early December 2007 followed by an 84,000-gallon spill in 2008. Greka's poor public image prompted a name change to HVI Canyon Cat last year. The Santa Barbara Independent

reported that the U.S. Department of Justice alleges that HVI Cat Canyon failed to implement adequate plans to prevent spills, which is required by the Clean Water Act.

Photo by Matthew Hill

Venoco has operations on the pier off the coast in Carpinteria, where, apparently, work has ramped up recently.

In 2002, the company acquired Rincon Island Partnership. According to California Department of Conservation records, Rincon Island Partnership has at least five waterflood injection wells. Two are drilled either on a slant or horizontally. Greka has a thing for horizontal drilling. One of its holdings is Horizontal Ventures, so it is likely that some of its wells are horizontally drilled.

Venoco and Carpinteria's uneasy relationship

Venoco has operations in Carpinteria right near the beach and leases the pier that the city owns. Former Carpinteria mayor Richard Weinberg has witnessed increased Venoco activity near his house, a short distance from the pier — "Trucks go by day and night," he says. Miguel Checa, a member of the board of directors of the advocacy organization, the Carpinteria Valley Association, once only saw a few trucks a day going to the pier a day. Now he notices "six to eight." Some question whether this means offshore fracking is a fixation of many Carpinteria residents. Buzz spreads around Carpinteria environmental circles that Venoco could slant-drill offshore to get entrance to oil under the city limits, but Nathan Alley, a staff attorney with the Environmental Defense Center, claims that would be a feat of engineering.

Carpinteria resident Ted Rhodes has had Venoco in his sites since the company created Carpinteria's 2010 Measure J that would have produced more drilling in the city near the aquifer. His mind is on the municipal water and he has no reservoir of good will for Venoco. The company can bypass local laws by going through federal land management instead of the city.

Weinberg thinks Venoco's plan is to drill slant or horizontal to reach the oil under the city without having to abide by local laws or answer to local activists. The last time Venoco wanted to dramatically increase drilling through city legislation, environmentalists staged a paddling protest. They jumped in the water and paddled out to sea. The paddlers included Rhodes and Weinberg.

Weinberg calls federal and state land management "weak." Federal and state land management will not be as open to citizens' participation. Weinberg may be correct. In October, Alley found that Venoco will drill just north of the city and slant-drill to the oil underneath the city.

The Carpinteria Valley Association hired hydrogeologist from UCSB Hugo Loáiciga to defend against Measure J. Loáiciga publicly testified drilling beneath the city would be detrimental to the aquifer. Although environmentalists point to the dishonesty of oil companies, the prediction tools that oil companies use could be a factor. Sophisticated oil company mapping has provided innumerable safety gains by predicting a picture of the underground. But all these layers might be more fractured and uniform than the technology shows. The assumption of safety depends on the premise that layers of underground rock tightly hold the injected chemicals. But the underground may be more fractured and cracked than these programs predict. More cracks mean more chemicals moving about.

UCSB: gas to the south, oil to the north

Venoco has had its share of Southern California controversy. It had a run-in with famous local environmentalist Erin Brockovich over fracking at Beverly Hills High right next to the track. Where

Pennsylvania may allow fracking right on public university campuses, UCSB has the status of having likely oil fracking directly north and PG&E gas south of the campus. Entering the campus on Highway 217, you can see the natural gas field. It is estimated that 90 percent of natural gas wells are fracked.

Elwood lies just north of the campus. **THE ELWOOD FIELD (PLATFORM HOLLY) IS IN STATE WATERS.** Venoco claims, in a 2010 business magazine, to have been drilling to the Monterey Shale at Elwood since 1999. It only took a few short years for this exploration to transform into abundant shale oil collection. In 2007, Venoco wrote to the California Department of Conservation to say it will be injecting waste from the Elwood well offshore to platform Holly. In that letter, Venoco writes, "We have three wells injecting the produced water back to the Monterey Shale." Produced water is the wastewater that is laden with chemicals. Venoco also claims to have injected this produced water on Holly beginning April 2006. Platform Holly has been productive. The state lands commission filed a lawsuit last year claiming Venoco owes the state \$9.5 million in royalties.

Venoco ships some of this waste to a water disposal well north of UCSB, in between the posh Bacara resort and the Sandpiper Golf Course. The company has another water disposal well offshore in front of UCSB. It has disposed of 1.3 million barrels of wastewater from the beginning of 2012 through August.

The EPA classifies an oil company's waste disposal well as class II disposal. If some of the fracking chemicals were to be used instead in manufacturing or farming, the EPA would give it a more hazardous classification. Oil and gas companies have exceptions other industries do not.

#### Bureaucracy and politicians

Checa and Weinberg joined 173 other people in a May 20 meeting at Ventura County Government Center on fracking, organized by the state's Department of Conservation. It was public comment time before the state came out with a draft of fracking rules to be passed around to various environmental groups and the industry. Erin Curtis, the spokeswoman from Federal Bureau of Land Management, says, "We are in rule-making on hydraulic fracturing." Like the state Department of Conservation, that office is inviting public input before making draft regulations. Alley recommends that locals get involved and work toward making fracking transparent. Of course it is much easier to be part of the rulemaking process if you are a mover and shaker at environmental organizations. For ordinary folks, like those at Albany, N.Y., protesting is the only way to get their voice heard.

Ventura County will have to address protecting agriculture, water and property despite the revenues received from oil companies. As for rising oil prices, more local drilling does not translate into cheaper prices at the pump for Ventura County residents. The fracked oil from underneath our feet gets traded to the highest bidder on the international market just like any other oil. **43 USC 1354 PLACED LIMITATIONS ON THE EXPORT OF OIL OR GAS. IT READS IN PART AS FOLLOWS. I DON'T KNOW IF THIS HAS CHANGED:**

#### ***(a) Application of Export Administration provisions***

*Except as provided in subsection (d) of this section, any oil or gas produced from the outer Continental Shelf shall be subject to the requirements and provisions of the Export Administration Act of 1969.*

***(b) Condition precedent to exportation; express finding by President of no increase in reliance on imported oil or gas***

*Before any oil or gas subject to this section may be exported under the requirements and provisions of the Export Administration Act of 1969, the President shall make and publish an express finding that such exports will not increase reliance on imported oil or gas, are in the national interest, and are in accord with the provisions of the Export Administration Act of 1969.*

As for local electoral connections to fracking, only state Sen. Fran Pavley, D-Agoura Hills, has put fracking front and center on her agenda, going as far as writing a bill requiring drillers to notify nearby property owners before fracking. Though one bill died earlier this year, Pavley has reintroduced another bill this month that would regulate fracking, which includes advance notice to neighbors of planned fracking and disclosure of the chemicals used in the process. State Assemblyman Jeff Gorell, R-Camarillo, had Venoco as a client during his lobbyist days. Venoco later joined ExxonMobile in contributing to his campaign. Recently retired Carpinteria City Councilman Joe Armendariz started a consulting firm. His new client is Western Petroleum Association. Councilwoman Carmen Ramirez, who also attended the McGrath Beach opening, might be the next local leader likely to take this up as an agenda item. The Sierra Club adores her. She earned their admiration for fighting to keep development off Ormond Beach.

On the federal level, ProPublica found that Exxon is pushing for legislation so it does not have to reveal fracking chemicals, but federal regulators have their own agenda. John Romero at the Bureau of Ocean Energy Management said that office will not be issuing any more federal offshore permits, but is working on environmental studies for offshore wind power. **THIS PASSAGE LEAVES THE IMPRESSION THAT THE GOVERNMENT WILL NOT BE ISSUING ANY MORE OFFSHORE PERMITS SINCE MOST READERS WON'T KNOW BOEM FROM BSEE. CLARIFY THAT THIS RESPONSIBILITY LIES WITH BSEE AND THAT PERMITS WILL BE ISSUED.** Even if the local and state governments conflict on offshore agendas, the feds are installing more alternative energy regardless of who is in office. As for when this will happen, UCSB biologist Milton Love is already conducting an environmental impact study for the federal government to bring offshore wind power to our region. The Department of Defense has already made plans to develop more wind power on San Nicolas Island.

A few months after the Democratic candidate at McGrath Beach, I asked a ranger about the fracking rumors. "I have heard them," he says, "but we have cameras. Cameras are all over the park." But the cameras do not show everything behind the walls of the rigs and wells. So I ask him if he sees anything else bad happening in the park. "Yes," and then he laughs.

On Mon, Feb 25, 2013 at 5:03 PM, Mayerson, Drew <[drew.mayerson@bsee.gov](mailto:drew.mayerson@bsee.gov)> wrote:  
Is 1:30 pm pst ok? or anytime thereafter.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 1:39 PM, Nicholas Pardi <[nicholas.pardi@bsee.gov](mailto:nicholas.pardi@bsee.gov)> wrote:  
Sure, what works for you?

**From:** Mayerson, Drew [mailto:drew.mayerson@bsee.gov]  
**Sent:** Monday, February 25, 2013 01:28 PM  
**To:** Pardi, Nicholas <nicholas.pardi@bsee.gov>  
**Cc:** Ming, Jaron <jaron.ming@bsee.gov>; Masri, Nabil <Nabil.Masri@bsee.gov>; Kenneth Seeley <kenneth.seeley@bsee.gov>  
**Subject:** Re: Media Inquiry for PAC region

Any chance we can move it to the afternoon here? I was just informed I have a contractor coming to our house and I have to be there to guide him in the morning.  
Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 12:36 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Thanks! (b) (5)

On Mon, Feb 25, 2013 at 3:26 PM, Ming, Jaron <jaron.ming@bsee.gov> wrote:

Just FYI, Platform Holly is a State facility. We are aware of this issue and should be able to provide you a response. Thanks.

On Mon, Feb 25, 2013 at 11:58 AM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Of note, he added Platform Holly to that list, another Venoco platform. So that's Platforms Holly, Gail and Grace.

On Mon, Feb 25, 2013 at 2:43 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

Hi Jaron,

I got an inquiry from a news organization on the following:

- BSEE permits and operational/inspection documents for drilling operations on Venoco's Platform Gail and Platform Grace off the California coast in the Monterey Shale play. Gail produces from the Sockeye Field and Grace produces in the Santa Clara field.

- Injection well permits for these platforms, if any, and any information on offshore injection well programs, if any.

- Here's why - There are concerns that hydraulic fracturing operations on Platform Gail in 2009 and 2010 produced wastewater, and the disposal of this wastewater was not tracked by BOEM or BSEE, or that BOEM/BSEE are not informing the public.

Here's from the VC Reporter - "The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. Where did the wastewater from the offshore frack go? What was the chemical composition? So far, the only two institutions likely to know for certain are Venoco and a few of the

federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public."

Do you have a minute today or tomorrow to chat about this?

cheers,  
Nick



Seeley, Kenneth <kenneth.seeley@bsee.gov>

---

**Fwd: offshore fracking and NPDES**

1 message

---

**Seeley, Kenneth** <kenneth.seeley@bsee.gov>  
To: Ramona Sanders <ramona.sanders@bsee.gov>

Fri, Feb 22, 2013 at 12:53 PM

here's the e-mail exchange I had with EPA.

——— Forwarded message ———

From: **VON VACANO, MARCELA** <VonVacano.Marcela@epa.gov>  
Date: Wed, Feb 20, 2013 at 5:01 PM  
Subject: RE: offshore fracking and NPDES  
To: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>, "Bromley, Eugene" <Bromley.Eugene@epa.gov>  
Cc: "Smith, DavidW" <Smith.DavidW@epa.gov>

(b) (5) . Eugene, what do you think?

---

**From:** Seeley, Kenneth [mailto:kenneth.seeley@bsee.gov]  
**Sent:** Wednesday, February 20, 2013 3:18 PM  
**To:** Bromley, Eugene  
**Cc:** Smith, DavidW; VON VACANO, MARCELA  
**Subject:** Re: offshore fracking and NPDES

(b) (5)

Thanks again,

Ken

On Wed, Feb 13, 2013 at 3:58 PM, <Bromley.Eugene@epamail.epa.gov> wrote:

Ken,

Our OCS general permit authorizes the discharge of 22 types of discharges from offshore platforms, including well treatment fluids which are defined as:

"Well treatment fluids" shall refer to any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled. (40 CFR Part 435.11)

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It would be helpful to let us know of any fracking chemicals you are aware of that are being used and discharged at the platforms that could pose a threat to the marine environment

Eugene Bromley  
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EPA Region 9  
75 Hawthorne Street  
San Francisco, CA 94105  
bromley.eugene@epa.gov  
(415) 972-3510  
(415) 947-3549 (fax)

From: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>  
To: Eugene Bromley/R9/USEPA/US@EPA,  
Cc: James Salmons <james.salmons@bsee.gov>  
Date: 02/13/2013 01:11 PM  
Subject: offshore fracking and NPDES

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Hi Eugene:

I'm trying to get a better handle on what authority EPA has regarding discharges of flowback water that might be contaminated with chemicals used in hydraulic fracturing. I understand that these chemicals are exempted from requirements of the Safe Drinking Water Act, but I read on EPA's webpage that flowback water can be discharged with produced water, provided that is treated beforehand. Would a situation like that be covered under the general NPDES permit, or would an individual permit be required and are discharge limits determined on a case by case basis?

Thanks,

Ken

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Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
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Seeley, Kenneth <kenneth.seeley@bsee.gov>

---

## Re: offshore fracking and NPDES

1 message

---

**Seeley, Kenneth** <kenneth.seeley@bsee.gov>  
To: "Bromley, Eugene" <Bromley.Eugene@epa.gov>

Fri, Feb 22, 2013 at 3:50 PM

Thanks Eugene. That's very helpful.

On Fri, Feb 22, 2013 at 3:21 PM, Bromley, Eugene <Bromley.Eugene@epa.gov> wrote:

Ken,

We have checked with our HQ and found that discharges related to hydraulic fracturing would be considered to be well treatment fluids and authorized for discharge subject to the requirements of our general permit for this discharge; no special requirements or approvals would be needed.

Note also the following Q&A which indicates this wastestream and the pollutants which may present were considered in the development documents for the existing effluent limitations guidelines for this industry.

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**Sent:** Wednesday, February 20, 2013 3:18 PM  
**To:** Bromley, Eugene  
**Cc:** Smith, DavidW; VON VACANO, MARCELA

**Subject:** Re: offshore fracking and NPDES

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From: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>  
To: Eugene Bromley/R9/USEPA/US@EPA,  
Cc: James Salmons <james.salmons@bsee.gov>  
Date: 02/13/2013 01:11 PM  
Subject: offshore fracking and NPDES

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Seeley, Kenneth <kenneth.seeley@bsee.gov>

---

## Re: offshore fracking and NPDES

1 message

---

Sanders, Ramona <ramona.sanders@bsee.gov>

Fri, Feb 22, 2013 at 4:50 PM

To: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>

Ken,

Classifying fracking fluid as well treatment fluid is consistent with the guidance I received from BOEM today. The only other thing I would ask about is whether the operator intends to add a propping agent in addition to the well treatment fluid as part of the hydraulic fracking operations. If so, what is the composition and does it meet the NPDES permit definition for produced sand? For Region 4 and 6 permits, the definition of produced sand includes, but is not limited to, slurred particles (i.e. propping agent) used in hydraulic fracturing which is prohibited from discharge and must be transported to shore.

On Fri, Feb 22, 2013 at 6:11 PM, Seeley, Kenneth <kenneth.seeley@bsee.gov> wrote:

Hi Everyone:

I've had a number of e-mail exchanges with EPA's NPDES group in Region 9 regarding discharge of fracking chemicals in produced water discharges. As you can see below, their latest position is that discharge of fracking chemicals would be allowed under the general discharge permit, and apparently without further consideration. That's changed somewhat from their initial statements, but apparently that's the answer they got back after discussions with their headquarters.

So given that, I believe this action (approval of the APD) is still covered under the original categorical exclusion. However, in my last e-mail, I based that opinion primarily on the operator's statement that they did not intend to discharge. Now we know that they do intend to discharge and that EPA believes that such discharges are already covered under the general permit. So, I don't know if Margaret's original concerns would still be relevant here, considering that discharges will occur, but I can't think of any other NEPA issues that would keep this from moving forward.

I do have one question for Dan. Based on a conversation I had with my counterpart in GOMR, I was wondering if the fracking portion of this project would normally be dealt with in an APM, instead of including it in the APD like DCOR did in this case? I don't know if that matters, but I was wondering if that would explain their original statement about a closed drilling loop that would not require discharges.

Let me know if you need an additional write up from me. I assume the original CER is adequate though.

Ken

----- Forwarded message -----

From: **Bromley, Eugene** <Bromley.Eugene@epa.gov>

Date: Fri, Feb 22, 2013 at 3:21 PM

Subject: RE: offshore fracking and NPDES

To: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>

Cc: "Smith, DavidW" <Smith.DavidW@epa.gov>, "VON VACANO, MARCELA"

<VonVacano.Marcela@epa.gov>

Ken,

We have checked with our HQ and found that discharges related to hydraulic fracturing would be considered to be well treatment fluids and authorized for discharge subject to the requirements of our general permit for this discharge; no special requirements or approvals would be needed.

Note also the following Q&A which indicates this wastestream and the pollutants which may present were considered in the development documents for the existing effluent limitations guidelines for this industry.

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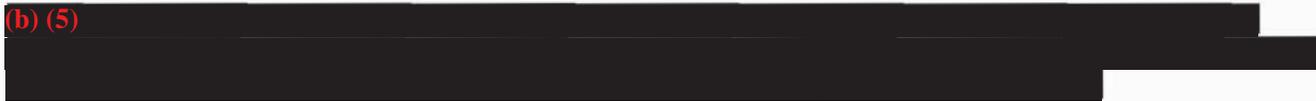
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**From:** Seeley, Kenneth [mailto:kenneth.seeley@bsee.gov]  
**Sent:** Wednesday, February 20, 2013 3:18 PM  
**To:** Bromley, Eugene  
**Cc:** Smith, DavidW; VON VACANO, MARCELA  
**Subject:** Re: offshore fracking and NPDES

(b) (5)

A large black rectangular redaction box covers the majority of the email body text below the header.

Thanks again,

Ken

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—  
Regards,

**Ramona Sanders**

Chief, Environmental Inspection and Enforcement Unit  
Environmental Enforcement Branch  
Bureau of Safety and Environmental Enforcement  
1201 Elmwood Park Blvd.  
New Orleans, LA 70123  
ramona.sanders@bsee.gov  
504.736.2504



Seeley, Kenneth <kenneth.seeley@bsee.gov>

---

## Re: offshore fracking and NPDES

1 message

---

Knowlson, Daniel <daniel.knowlson@bsee.gov>

Sat, Feb 23, 2013 at 12:39 PM

To: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>

Cc: Jaron Ming <jaron.ming@bsee.gov>, Nabil Masri <nabil.masri@bsee.gov>, Chuck Barbee <chuck.barbee@bsee.gov>, James Salmons <james.salmons@bsee.gov>, Ramona Sanders <ramona.sanders@bsee.gov>

Ken, thanks for the followup, once again I'll try to explain DCOR's statement in their APD:

**This will be a closed drilling system with no overboard discharge.**

Note that this statement refers to the 'drilling system'. Well-completions are a separate function of well operations. With this particular operation (i.e. sidetrack) drilling will almost immediately occur within a hydrocarbon bearing formation, therefore DCOR is referring to mud and cuttings which would most likely not pass the sheen test per the NPDES permit. The frac-ing fluids are not part of this equation because they are part of the final well-completion phase of this operation. The frac fluids would be recovered along with completion fluids mainly when the well is initially placed on production. All production fluids are piped to the gross fluids pipeline to shore, where they are processed, filtered and returned to the platform for disposal. The statement that DCOR makes in their APD does not refer to completion and production fluids, only drilling fluids and cuttings. Also, even if you did consider frac fluids as part of the drilling system they would be mixed with hydrocarbons and not pass the sheen test as they are initially injected into the perforated pay-zone (i.e. hydrocarbons are present in hopefully great quantities).

As far as the approval goes, 30CFR250.513(a) states:

### **§ 250.513 Approval and reporting of well-completion operations.**

(a) No well-completion operation may begin until the lessee receives written approval from the District Manager. If completion is planned and the data are available at the time you submit the Application for Permit to Drill and Supplemental APD Information Sheet (Forms BSEE-0123 and BSEE-0123S), you may request approval for a well-completion on those forms (see §§ 250.410 through 250.418 of this part). If the District Manager has not approved the completion or if the completion objective or plans have significantly changed, you must submit an Application for Permit to Modify (Form BSEE-0124) for approval of such operations.

Also, please see DCOR's additional statement on page 27 of the APD regarding detailed Completion Procedure. An APM may also be required prior to completion if conditions or plans change, or if additional information is needed. If you have any further questions or concerns please don't hesitate to contact me.

Thank You

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Our OCS general permit authorizes the discharge of 22 types of discharges from offshore platforms, including well treatment fluids which are defined as:

"Well treatment fluids" shall refer to any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled. (40 CFR Part 435.11)

(b) (5). EPA's offshore oil regs include effluent limitations guidelines for well treatment fluids which were finalized in 1993, based on what was known about the discharge at that time (which was before fracking). Our permit authorizes chemicals "ordinarily present" in a discharge, which means chemicals or classes of chemicals recognized as being used for offshore operations in the development document for the 1993 regs.

The definition of produced water in the permit also recognizes that various chemicals may be discharged in produced water, and the permit also recognizes that well treatment fluids may be commingled with produced water.

With regards to special requirements for fracking fluids:

We have broad authority to require an individual permit when the general permit is not appropriate; this could include discharges with chemicals outside the scope of what was intended by the permit, and special effluent limits could be developed, or discharge authorization could be denied altogether.

We could also require an individual permit (or deny any permit authorization) for chemicals which could cause

unreasonable degradation of the marine environment (section 403 of the CWA). Under section 308 of the CWA, we could also ask for more info on fracking chemicals that may be in use.

It would be helpful to let us know of any fracking chemicals you are aware of that are being used and discharged at the platforms that could pose a threat to the marine environment

Eugene Bromley  
NPDES Permits Office (WTR-5)  
EPA Region 9  
75 Hawthorne Street  
San Francisco, CA 94105  
bromley.eugene@epa.gov  
(415) 972-3510  
(415) 947-3549 (fax)

From: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>  
To: Eugene Bromley/R9/USEPA/US@EPA,  
Cc: James Salmons <james.salmons@bsee.gov>  
Date: 02/13/2013 01:11 PM  
Subject: offshore fracking and NPDES

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Hi Eugene:

I'm trying to get a better handle on what authority EPA has regarding discharges of flowback water that might be contaminated with chemicals used in hydraulic fracturing. I understand that these chemicals are exempted from requirements of the Safe Drinking Water Act, but I read on EPA's webpage that flowback water can be discharged with produced water, provided that is treated beforehand. Would a situation like that be covered under the general NPDES permit, or would an individual permit be required and are discharge limits determined on a case by case basis?

Thanks,

Ken

—  
Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
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770 Paseo Camarillo  
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—  
Daniel R. Knowlson  
DOI/BSEE/POCSR  
CA District Manager  
805-389-7746



Mayerson, Drew <drew.mayerson@bsee.gov>

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## OPD Weekly Report: April 7-13, 2013

1 message

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Mayerson, Drew <drew.mayerson@bsee.gov>

Thu, Apr 11, 2013 at 5:41 PM

To: BSEE PAC OPD <bseepacopd@bsee.gov>, BSEE PAC Managers/Supervisors <BSEEPACManagers\_Supervisors@boemre.gov>

## Weekly Report: April 7-13, 2013

### Items for the Regional Director

#### Conservation Related

Non-relevant



Two representatives from Schlumberger visited the POCSR and provided a primer they called "Hydraulic Fracturing 101." About 20 BSEE staff attended. The presentation lasted about 3 hours and many of the region's questions were answered. The information will be used to respond to public inquiries regarding hydraulic fracturing in the offshore.

Non-relevant





Mayerson, Drew <drew.mayerson@bsee.gov>

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## OPD WEEKLY REPORT FOR THE WEEK January 6-12, 2013

1 message

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Mayerson, Drew <drew.mayerson@bsee.gov>

Thu, Jan 10, 2013 at 4:12 PM

To: BSEE PAC OPD <bseepacopd@bsee.gov>, BSEE PAC Managers/Supervisors  
<BSEEPACManagers\_Supervisors@boemre.gov>

## OPD WEEKLY REPORT FOR THE WEEK January 6-12, 2013

### Items for the Regional Director

PD is drafting a response to speculations and concerns brought to the Secretary by concerned citizens regarding fracking activities in the Pacific OCS region. Hydraulic fracturing is not a recovery technique utilized in the POCS region, but has been unsuccessfully attempted twice over 15 years ago by Chevron and Venoco under the review and approval of the MMS.

Non-relevant





Mayerson, Drew &lt;drew.mayerson@bsee.gov&gt;

## Platform Gail 2010 water handling

2 messages

Kurtz, Bobby &lt;bobby.kurtz@bsee.gov&gt;

Wed, Feb 27, 2013 at 7:17 AM

To: Daniel Knowlson &lt;daniel.knowlson@bsee.gov&gt;

Cc: Drew Mayerson &lt;drew.mayerson@bsee.gov&gt;, Nathan Sinkula &lt;nathan.sinkula@bsee.gov&gt;

Hi Dan,

The table below contains the water handling info for Platform Gail in 2010. Nearly all of their produced water was reinjected into Sockeye for the waterflood program. There was no water injection classified as disposal. Please let us know if we can help with anything else.

| <b>Sockeye Field (Platform Gail)</b> |                             |   |
|--------------------------------------|-----------------------------|---|
| <b>Date</b>                          | <b>Water Produced (bbl)</b> | <b>Water Injected for Reservoir Support (bbl)</b> |
| Jan-2010                             | 1,044,262                   | 1,044,262   |
| Feb-2010                             | 961,243                     | 960,746   |
| Mar-2010                             | 1,007,144                   | 1,006,941   |
| Apr-2010                             | 836,589                     | 836,348   |
| May-2010                             | 1,077,646                   | 1,077,646   |
| Jun-2010                             | 1,092,910                   | 1,092,910   |
| Jul-2010                             | 1,143,570                   | 1,143,570   |
| Aug-2010                             | 1,132,612                   | 1,132,612   |
| Sep-2010                             | 1,100,679                   | 1,100,679   |
| Oct-2010                             | 1,068,210                   | 1,068,210   |
| Nov-2010                             | 1,082,729                   | 1,082,729   |
| Dec-2010                             | 1,149,259                   | 1,149,259   |
| <b>2010 Totals:</b>                  | <b>12,696,853</b>           | <b>12,695,912</b>                                 |

Thanks,

Bobby Kurtz

Geologist

Production and Development

Pacific OCS Region

Bureau of Safety and Environmental Enforcement

(805)389-7713

**Mayerson, Drew** <drew.mayerson@bsee.gov>

Wed, Feb 27, 2013 at 8:35 AM

To: "Kurtz, Bobby" <bobby.kurtz@bsee.gov>

Cc: Daniel Knowlson <daniel.knowlson@bsee.gov>, Nathan Sinkula <nathan.sinkula@bsee.gov>

THANKS FOR THE QUICK WORK. VERY HELPFUL.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region  
[Quoted text hidden]



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## POINT BY POINT COMMENTARY ON FRACKING ARTICLE

1 message

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Wed, Feb 27, 2013 at 2:22 PM

To: "Masri, Nabil" <Nabil.Masri@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

Cc: "Ming, Jaron" <Jaron.Ming@bsee.gov>

Attached is my commentary on the points that I identified as being geologic in nature, or that I had a pretty decent handle on (e.g., the CINMS). My comments are in bold red.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region



**Point by point response to VC Reporter Article.docx**

42K

## Fracking offshore

*Lack of transparency for the controversial practice raises major concerns for locals*

[http://www.vcreporter.com/cms/story/detail/fracking\\_offshore/10432/](http://www.vcreporter.com/cms/story/detail/fracking_offshore/10432/)

In the summer leading up to Hurricane Sandy, crowds surrounded the state capitol at Albany, N.Y. They wanted to know what would happen in case of a natural gas leak, or a bigger natural gas disaster, to their drinking water. What sparked them? Many had seen the footage of water so contaminated from natural gas frack drilling that it turned brown or caught fire. These water debacles sparked a nationwide movement against natural gas fracking. Fewer people know about fracking in California, and the anti-fracking movement is smaller, but the tide has turned since the time when natural gas was considered a safer alternative energy.

The days when oil companies could find enough oil through conventional drilling are long over on the Central Coast. Drillers cannot get oil trapped tightly in the shale the older ways. It is trapped in rock and has to be coerced out through fracking. Now they need an Olympic-size pool's worth of water infused with chemicals to splinter the rock and discharge the oil from it. They drill a hole, lay a pipe, and drop a bomb where it explodes and tears into the pipe. Making its way down through the pipe hole are sand and chemical water at such force that it splinters the shale and dislodges the oil from it. Central Coast frack drilling can tunnel down a mile and through the water table. Scientists are split on whether fracking can contaminate our drinking supply or cause earthquakes. Wastewater composed of toxic, safe and unknown chemicals is injected into a well and pushed down thousands of feet, where it builds pressure. That pressure under the earth could be a problem.

Oil company executives can describe the thick and sticky shale oil with the same kind of loving tenderness and cravings as any Central Coast reckless wine sipper. Washington and Sacramento have simultaneously fed and regulated the thirst for it. The Dick Cheney-created Halliburton loophole made fracking exempt from much EPA regulation and from the Safe Drinking Water Act. This means frackers do not have to disclose the chemicals they use. Drillers in California are not required to notify landowners or residents who utilize nearby water sources of their intent to frack. This lack of transparency has been a sore spot for the often-locked-in-conflict local farmers, commercial fishing industry and environmentalists who now find themselves allied in the battle against fracking's quest for water. Because so little transparency exists, rumors swirl around the where and when of offshore fracking.

### The view from McGrath State Beach

Last June, fresh off the primary election, local campaigning Democrats staged a press conference for Oxnard's McGrath Beach, which was reopening after being closed for lack of funding following Department of Parks and Recreation's sordid fund hoarding. Das Williams, D-Santa Barbara, who was running for re-election for the State Assembly district stretching from Santa Barbara to parts of Oxnard, took advantage of the news cameras and changed from an orange T-shirt into a full wetsuit and bright-yellow boogie board, walked into the ocean, and rode the whitewash of the small choppy waves for more shoots. What the camera could not capture was the crossing of slant- and horizontally-laid oil pipes underneath the waves, chemical injection wells on federally regulated oil rigs beyond the white wash, and the Channel Islands thrust fault capable of producing a magnitude 7.2 earthquake. **ACCORDING TO REPORTS FROM THE CALIFORNIA DIVISION OF MINES AND GEOLOGY AND THE USGS IN 1996 (OFR 96-08 AND 96-706, RESPECTIVELY), THE CHANNEL ISLANDS THRUST IS APPROXIMATELY 65 KM LONG AND CAN PRODUCE A MAX MAGNITUDE 7.4 EARTHQUAKE. AN EARLIER**

**PAPER FROM SHAW AND SUPPE (1994 IN THE GEOLOGICAL SOCIETY OF AMERICA BULLETIN) ESTIMATED A MAGNITUDE 7.2 WAS POSSIBLE.** From Williams' vantage point, he could see the reeds and fences hiding more oil company chemically injected and disposal wells. If he had walked south down the beach past McGrath Lake, he would have found Well 1218 **THIS IS A STATE WELL.** producing more than 32,000 barrels so far this year alone.

Williams splashed around over one of the county's major access points to the oil-abundant underground geological development called the Monterey Shale. This now-commercialized piece of geological property encompasses parts of Ventura, Santa Barbara and Monterey counties. Tim Marquez, president of Venoco, told the Oil & Gas Financial Journal that "We knew that our future efforts were going to be focused on the Monterey Shale." Venoco literature claims the company has explored the shale since 1997. **THE MONTEREY SHALE IS ONE OF THE PRIMARY PRODUCING FORMATIONS IN CALIFORNIA. IT IS PROLIFIC ONSHORE AS WELL AS OFFSHORE. IN THE OCS IT ACCOUNTS FOR ABOUT 40,000 BARRELS PER DAY OF THE 54,000 BARRELS PRODUCED. NONE OF THE OIL IS THE RESULT OF HYDRAULIC FRACTURING. IN THE OFFSHORE, THE MONTEREY IS NATURALLY FRACTURED.**

Fracking is a new frontier **HYDRAULIC FRACTURING HAS BEEN AROUND FOR 60 YEARS** and Marquez embraces its Wild West nature and its financial and environmental riskiness. The Monterey Shale is about the closest thing an energy company can get to a new oil frontier on the Central Coast in decades. **THE MONTEREY SHALE FIRST PRODUCED IN CALIFORNIA ABOUT 1902. BY 1956 ALMOST 300,000,000 BARRELS OF OIL HAD BEEN PRODUCED FROM THE MONTEREY IN THE ONSHORE SANTA MARIA AREA AND SAN JOAQUIN BASIN IN THE CENTRAL VALLEY. THE MONTEREY IS HARDLY A NEW FRONTIER HOWEVER; THE AUTHOR MAY BE REFERRING TO BAKKEN LIKE HYDRAULIC FRACTURING AS A NEW FRONTIER THAT COULD BE APPLIED TO THE MONTEREY FORMATION.** But like the old Wild West, the federal government is still bankrolling while letting companies use its national forests and federal waters.

According to a Venoco report, the company is leasing 380,000 acres in California valued at \$1.4 billion. **VENOCO HAS 5 OCS BLOCKS TOTTALLING ABOUT 29,000 ACRES.** It claims that it has already devoted millions of dollars into setting up new wells and exploring the shale, including the Sockeye field offshore from McGrath Beach. **PER VENOCO'S OPERATIONS MANAGER, THEIR 2010 FRAC WAS NOT VERY SUCCESSFUL AND ALTHOUGH THEY DIDN'T WANT TO RULE OUT A FRAC AGAIN THEY INDICATED THEY DID NOT HAVE PLANS TO FRAC IN THE NEAR FUTURE.** Evidence points to more local shale in its future. Venoco recently advertised for a Monterey Shale expertise job for its Carpinteria office. **THIS WOULD NOT BE UNUSUAL....VENOCO PRODUCES FROM NATURALLY FRACTURED MONTEREY ON THE OCS AND FROM THE PLATFORM IN STATE WATERS.**

What wells has Venoco fracked so far? **WELL E-11 DURING THE 1990's (note: this was a frac in the Sespe sandstone, not Monterey) & WELL E-8 SIDETRACK 2 IN 2010.** The company dodges that question. The anti-fracking movement has grown large enough to put oil companies on edge. Calls to Venoco were not returned. But just two years ago, the mood was different. Scarlett Johansson was not hosting celebrity screenings for Gasland, the anti-fracking movie that had not yet won an Academy Award. New York farmers, chefs, wine connoisseurs and environmentalists had not yet joined to push New York Gov. Andrew Cuomo, Democrat, to regulate fracking. Matt Damon was not releasing an anti-fracking movie called #Promised Land# that he would use as his next Oscar platform **HOW'D THAT WORK OUT?.**

But in the more frack-friendly year 2010, Venoco's promotional literature claimed it had fracked and horizontally drilled one well and acidized a second to get to the shale offshore from McGrath Beach. Nestled in federal waters between Oxnard and Santa Cruz Island is Platform Gail. The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. **Where did the wastewater from the offshore frack go? What was the chemical composition?** So far, the only two institutions likely to know for certain are Venoco and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public.

As for spills and water contamination, frack watchers are still trying to get at the chemical formulas of fracking fluid. **A 2005 Venoco document reveals XC polymer, a xanthum gum manufactured by Halliburton. Reporters from the nonprofit investigative unit Propublica found hazardous chemicals such as benzene, formaldehyde, sulfuric acid, kerosene, hydrofluoric acid, hydrochloric acid, formic acid and lead. Researchers at the State University of New York at Albany found radioactive materials such as uranium, radium and radon in tests of fracking wastewater.** The National Resources Defense Council found a chemical connected to cancer development, arsenic. The Breast Cancer Fund has reported on the risks for breast cancer from toluene and endocrine-disrupting compounds such as phthalate DEHP found in fracking fluid. EPA studies show that toluene can cause spontaneous abortion. Then there is the question that remains of how the hundreds of thousands of gallons of chemical wastewater are disposed of.

According to the Environmental Defense Center, Venoco fracked platform Gail in Sockeye field in the Santa Barbara Channel.

According to the Ventura County Star, **Venoco spilled 63 barrels of oil in 2010 from Platform Gail**, the year following the reported frack job. Ordinarily, a 63-barrel leak is not controversial, but if it includes fracking fluid or its waste, a concern exists. A frack spill is not an ordinary oil spill. When the chemicals get into the water they are difficult to get out. They spread fast and easy, do not easily breakdown, and can cause more health hazards than crude oil.

The acidity of carbon waste through oil spills threatens marine life and commercial fishing. Shellfish can be especially vulnerable to the acidic water that comes with fracking. But it's not just commercial fishing that fracking can threaten. Venoco's fracking and well acidization next to the Channel Islands Marine Reserve undermines the mission of protecting marine life and habitats, much as state and national parks protect wildlife on land. *Little research exists on the impact of fracking chemicals on ocean life.* **THE FOLLOWING WERE EXCERPTED FROM 15 CFR PART 922.71-74, THE GOVERNING REGULATIONS FOR THE CHANNEL ISLANDS NATIONAL MARINE SANCTUARY**

**§ 922.72 Prohibited or otherwise regulated activities—Sanctuary-wide.**

- (1) Exploring for, developing, or producing hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons. THE VENOCO LEASES IN FEDERAL WATERS WERE ISSUED IN 1968 (LEASE SALE P4).**

**(2) Exploring for, developing, or producing minerals within the Sanctuary, except producing byproducts incidental to hydrocarbon production allowed by paragraph (a)(1) of this section.**

**(3)(i) Discharging or depositing from within or into the Sanctuary any material or other matter except:**

**(E) Effluent routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production allowed by paragraph (a)(1) of this section; or**

**(4) Drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary; or constructing or placing any structure, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:**

**(i) Anchor a vessel;**

**(ii) Install an authorized navigational aid;**

**(iii) Conduct lawful fishing activity;**

**(iv) Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or**

**(v) Explore for, develop, or produce hydrocarbons as allowed by paragraph (a)(1) of this section.**

Fracking started 60 years ago. So why all the fuss? For many, the newer form of horizontal drilling, that is drilling (that goes down, then across) is what makes the new practices more dangerous than those old Fillmore and Los Padres National Forest frack jobs. With horizontal's criss-crossing through the water table, it is more likely to cause contamination. **THE E8 WELL WAS HORIZONTAL AT THE DEPTHS WHERE FRACKING WAS DONE, THE E11 WELL WAS NOT.**

Venoco's drilling onshore and offshore from McGrath, with its slant and horizontal drilling, has created a regulatory conundrum. **McGRATH IS IN STATE TIDELANDS.** Fracking skeptics argue that it is specifically what makes slant and horizontal drilling so appealing. Horizontal drilling can start onshore, then cross to offshore. If there is another spill like in 2010, who regulates this? The federal government? The state? When asked about who regulates a frack job that burrows underneath both land and ocean, Erin Curtis, Federal Bureau of Land Management's external affairs representative, told me that "Whoever is responsible is who is permitting the oil company. That is who should regulate." But if Venoco should spill again as it did in 2010, and it pollutes both offshore and onshore, who will be in charge of remedying that? There is no clear answer from Venoco's office about this question.

The campaigning Democratic candidates also had a wonderful view of the Santa Clara River running through McGrath State Beach and into the ocean. As of August, conversations with the United Water Conservation District, the local agency regulating drinking water coming from the Santa Clara River, revealed that fracking was not even on the radar. This is the agency that must divvy out scarce water.

#### **Aera Energy off McGrath Beach**

According to interviews with the California Department of Land Conservation, the state agency in charge of regulating the energy industry, fracking waste fluid can end up in either a waterflood injection well or a water disposal well. While oil and gas companies are not required to report on their fracking chemical compositions, or where they have drilled or injected it into the earth, they

do have to get approvals to build wells to dispose of the waste. Wherever one can find an injection or a water disposal well, it is likely some fracking happened nearby. **THIS IS A GROSS EXAGGERATION. THERE ARE NO DISPOSAL WELLS AT SOCKEYE AND ABOUT 12 WATER INJECTION WELLS THAT ARE USED FOR PRESSURE SUPPORT OF THE RESERVOIR (this is standard conservation practice). THE INJECTED WATER HAS TO BE COMPATIBLE WITH THE WATER IN THE RESERVOIR TO AVOID VARIOUS MALADIES THAT MIGHT INHIBIT INJECTION (E.G., BACTERIAL GROWTH, SCALE FORMATION, CLAY SWELLING, ETC...).** THE ENTIRE POCS HAS ABOUT 70 WATER INJECTION WELLS ONGOING AT ANY ONE TIME, MOSTLY TO PROVIDE PRESSURE SUPPORT FOR THE RESERVOIR. FRACKING HAS BEEN RARE, OCCURRING ONLY ABOUT 11 TIMES IN THE LAST 20+ YEARS, MOST BEING "MINI FRACKS" IN THE IMMEDIATE VICINITY AROUND THE WELLBORE TO CLEAN UP SAND THAT MAY PLUG THE PERFORATIONS.

Two of the biggest global oil companies, Shell and ExxonMobil, teamed up to form Aera Energy. Aera has a new waterflow well near McGrath Beach. This well has only August production on record with the California Department of Conservation. In that month, Aera injected 13,262 barrels of waste.

Our region is what seismologists call seismically active. **TRUE.** Several earthquakes have been caused by faults that extend into the Santa Barbara-Ventura ocean basin **EARTHQUAKES OCCUR ON FAULTS.** We have San Andreas and the Santa Ynez River fault zone to the north, the San Cayetano fault to the east, the offshore Pitas Point near Carpinteria, Red Mountain fault to the east, the Oak Ridge lying on both Ventura and Oxnard, and the offshore Santa Cruz Island and Channel Islands faults to the west. Even the Pacific Operators Offshore LLC (PACOPS), a local offshore driller, in a report to the Federal Bureau of Energy Management (BOEM) admits that all these faults can produce shaking around the wells. The cracking of the shale and the reinjection of waste water back to the strata causes pressure. **WATER INJECTION FOR WATERFLOOD PROGRAMS REPLACES THE PRESSURE THAT HAS BEEN BLED OFF THROUGH OIL AND GAS DEVELOPMENT. THE IDEA IS TO MATCH THE ORIGINAL RESERVOIR PRESSURE AND AVOID INADVERTANTLY FRACTURING THE FORMATION, THEREBY POSSIBLY NEGATING THE BENEFITS OF REPRESSURIZATION OR SENDING THE INJECTED WATER INTO THE OIL AND CHOKING OFF OIL PRODUCTION IN THE WELLS THAT WERE TO BE THE BENEFICIARY OF RESTORED PRESSURE. FOR THIS REASON ALL WATER INJECTION WELLS ARE MONITORED CAREFULLY TO SEE THAT THIS DOES NOT HAPPEN.** All this happens on these fault systems.

Aera is no stranger to fracking. Last May, Aera fracked in the mountains above Ventura Avenue. This job used 32,004 gallons of water and drilled down 4,960 feet. Aera admits to using methanol, a common chemical used in fracking and also found in fuel, antifreeze and paint solvent. Inhaling methanol can cause eye irritation, headaches and can be fatal. Ingesting it can produce eye damage or death. Aera's chemical cocktail also included, boric acid, insecticide and flame retardants.

According to a joint study by the U.S. Department of Energy, the National Academy of Sciences, the Institute of Medicine and the National Research Council, fracturing of rock has a lower risk of earthquake, but the disposal of the waste fluid into a well is high risk. Where lies an injection well also lies an earthquake risk. According to this study, the hundreds of thousands of gallons of waste do not simply disappear in the earth's strata. Underground, the waste builds pressure and

causes more cracks in the already cracked earth. Conducting the frack jobs on fault zones just exacerbates the earthquake risk. **THE FOLLOWING IS THE PRESS RELEASE FROM THE NAS DATED 6/15/2012**

*Hydraulic Fracturing Poses Low Risk for Causing Earthquakes,  
But Risks Higher for Wastewater Injection Wells*

WASHINGTON — Hydraulic fracturing has a low risk for inducing earthquakes that can be felt by people, but underground injection of wastewater produced by hydraulic fracturing and other energy technologies has a higher risk of causing such earthquakes, says a new report from the National Research Council. In addition, carbon capture and storage may have the potential for inducing seismic events, because significant volumes of fluids are injected underground over long periods of time. However, insufficient information exists to understand the potential of carbon capture and storage to cause earthquakes, because no large-scale projects are as yet in operation. The committee that wrote the report said continued research will be needed to examine the potential for induced seismicity in large-scale carbon capture and storage projects.

The report examines the potential for energy technologies — including shale gas recovery, carbon capture and storage, geothermal energy production, and conventional oil and gas development — to cause earthquakes. Hydraulic fracturing, commonly known as fracking, extracts natural gas by injecting a mixture of water, sand, and chemicals in short bursts at high pressure into deep underground wells. The process cracks the shale rock formation and allows natural gas to escape and flow up the well, along with some wastewater. The wastewater can be discarded in several ways, including injection underground at a separate site. Carbon capture and storage, also known as carbon capture and sequestration, involves collecting carbon dioxide from power plants, liquefying it, and pumping it at high rates into deep underground geologic formations for permanent disposal. Geothermal energy harnesses natural heat from within the Earth by capturing steam or hot water from underground.

Although induced seismic events associated with these energy technologies have not resulted in loss of life or significant damage in the United States, some effects have been felt by local residents and have raised concern about additional seismic activity and its consequences in areas where energy development is ongoing or planned. While scientists understand the general mechanisms that induce seismic events, they are unable to accurately predict the magnitude or occurrence of these earthquakes due to insufficient information about the natural rock systems and a lack of validated predictive models at specific energy development sites.

The factor most directly correlated with induced earthquakes is the total balance of fluid introduced or removed underground, the committee said. Because oil and gas development, carbon capture and storage, and geothermal energy production each involve net fluid injection or withdrawal, all have at least the potential to induce earthquakes that could be felt by people. However, technologies designed to maintain a balance between the amounts of fluid being injected and withdrawn, such as most geothermal and conventional oil and gas development, appear to produce fewer induced seismic events than technologies that do not maintain fluid balance.

A number of federal and state agencies have regulatory oversight related to different aspects of underground injection activities associated with energy technologies. Responses from these agencies to energy development-related seismic events have been successful, the report says, but interagency cooperation is warranted as the number of earthquakes could increase due to expanding energy development.

The study was sponsored by the U.S. Department of Energy. The National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council make up the National Academies. They are independent, nonprofit institutions that provide science, technology, and health policy advice under an 1863 congressional charter. Panel members, who serve pro bono as volunteers, are chosen by the Academies for each study based on their expertise and experience and must satisfy the

*Academies' conflict-of-interest standards. The resulting consensus reports undergo external peer review before completion. For more information, visit <http://national-academies.org/studycommitteeprocess.pdf>.*

What makes this study unique is that its researchers and peer reviewers did not possess ties to energy companies. This is not as common as one might expect. A Plains Exploration study claimed fracking in the Baldwin Hills in Los Angeles was safe, but community groups complained that the peer reviewer had connections to oil and gas. Plains Exploration reportedly paid a Texas geologist \$400,000 to write a study that showed that fracking did not contaminate ground water. The oil and gas industry gave State University of New York at Buffalo's geology department \$6 million. A new term has been coined to describe these Ph.D.s: frackademics.

#### Greka's Rincon

Nestled between Carpinteria and Ventura is the Rincon oil field, the desirable piece of ocean property with legendary breaks that has surfers, environmentalists and oil interests competing for its future. Where the state's Conservation Department gave Venoco safety awards in spite of its 32 violations for not following operating procedures from 2005 to 2010, Greka, with its perishing pipelines and rusting facilities, has the opposite reputation with 21 separate crude oil spills in Santa Barbara waterways from 2005 through 2010. One of the spills included a 67,000-gallon oil spill in early December 2007 followed by an 84,000-gallon spill in 2008. Greka's poor public image prompted a name change to HVI Canyon Cat last year. The Santa Barbara Independent reported that the U.S. Department of Justice alleges that HVI Cat Canyon failed to implement adequate plans to prevent spills, which is required by the Clean Water Act.

#### Photo by Matthew Hill

Venoco has operations on the pier off the coast in Carpinteria, where, apparently, work has ramped up recently.

In 2002, the company acquired Rincon Island Partnership. According to California Department of Conservation records, Rincon Island Partnership has at least five waterflood injection wells. Two are drilled either on a slant or horizontally. Greka has a thing for horizontal drilling. One of its holdings is Horizontal Ventures, so it is likely that some of its wells are horizontally drilled.

#### Venoco and Carpinteria's uneasy relationship

Venoco has operations in Carpinteria right near the beach and leases the pier that the city owns. Former Carpinteria mayor Richard Weinberg has witnessed increased Venoco activity near his house, a short distance from the pier — "Trucks go by day and night," he says. Miguel Checa, a member of the board of directors of the advocacy organization, the Carpinteria Valley Association, once only saw a few trucks a day going to the pier a day. Now he notices "six to eight." Some question whether this means offshore fracking is a fixation of many Carpinteria residents. Buzz spreads around Carpinteria environmental circles that Venoco could slant-drill offshore to get entrance to oil under the city limits, but Nathan Alley, a staff attorney with the Environmental Defense Center, claims that would be a feat of engineering.

Carpinteria resident Ted Rhodes has had Venoco in his sites since the company created Carpinteria's 2010 Measure J that would have produced more drilling in the city near the aquifer. His mind is on the municipal water and he has no reservoir of good will for Venoco. The company can bypass local laws by going through federal land management instead of the city.

Weinberg thinks Venoco's plan is to drill slant or horizontal to reach the oil under the city without having to abide by local laws or answer to local activists. The last time Venoco wanted to dramatically increase drilling through city legislation, environmentalists staged a paddling protest. They jumped in the water and paddled out to sea. The paddlers included Rhodes and Weinberg.

Weinberg calls federal and state land management "weak." Federal and state land management will not be as open to citizens' participation. Weinberg may be correct. In October, Alley found that Venoco will drill just north of the city and slant-drill to the oil underneath the city.

The Carpinteria Valley Association hired hydrogeologist from UCSB Hugo Loáiciga to defend against Measure J. Loáiciga publicly testified drilling beneath the city would be detrimental to the aquifer. Although environmentalists point to the dishonesty of oil companies, the prediction tools that oil companies use could be a factor. Sophisticated oil company mapping has provided innumerable safety gains by predicting a picture of the underground. But all these layers might be more fractured and uniform than the technology shows. The assumption of safety depends on the premise that layers of underground rock tightly hold the injected chemicals. But the underground may be more fractured and cracked than these programs predict. More cracks mean more chemicals moving about.

UCSB: gas to the south, oil to the north

Venoco has had its share of Southern California controversy. It had a run-in with famous local environmentalist Enn Brockovich over fracking at Beverly Hills High right next to the track. Where Pennsylvania may allow fracking right on public university campuses, UCSB has the status of having likely oil fracking directly north and PG&E gas south of the campus. Entering the campus on Highway 217, you can see the natural gas field. It is estimated that 90 percent of natural gas wells are fracked.

Elwood lies just north of the campus. **THE ELWOOD FIELD (PLATFORM HOLLY) IS IN STATE WATERS.** Venoco claims, in a 2010 business magazine, to have been drilling to the Monterey Shale at Elwood since 1999. It only took a few short years for this exploration to transform into abundant shale oil collection. In 2007, Venoco wrote to the California Department of Conservation to say it will be injecting waste from the Elwood well offshore to platform Holly. In that letter, Venoco writes, "We have three wells injecting the produced water back to the Monterey Shale." Produced water is the wastewater that is laden with chemicals. Venoco also claims to have injected this produced water on Holly beginning April 2006. Platform Holly has been productive. The state lands commission filed a lawsuit last year claiming Venoco owes the state \$9.5 million in royalties.

Venoco ships some of this waste to a water disposal well north of UCSB, in between the posh Bacara resort and the Sandpiper Golf Course. The company has another water disposal well offshore in front of UCSB. It has disposed of 1.3 million barrels of wastewater from the beginning of 2012 through August.

The EPA classifies an oil company's waste disposal well as class II disposal. If some of the fracking chemicals were to be used instead in manufacturing or farming, the EPA would give it a more hazardous classification. Oil and gas companies have exceptions other industries do not.

Bureaucracy and politicians

Checa and Weinberg joined 173 other people in a May 20 meeting at Ventura County Government Center on fracking, organized by the state's Department of Conservation. It was public comment time before the state came out with a draft of fracking rules to be passed around

to various environmental groups and the industry. Erin Curtis, the spokeswoman from Federal Bureau of Land Management, says, "We are in rule-making on hydraulic fracturing." Like the state Department of Conservation, that office is inviting public input before making draft regulations. Alley recommends that locals get involved and work toward making fracking transparent. Of course it is much easier to be part of the rulemaking process if you are a mover and shaker at environmental organizations. For ordinary folks, like those at Albany, N.Y., protesting is the only way to get their voice heard.

Ventura County will have to address protecting agriculture, water and property despite the revenues received from oil companies. As for rising oil prices, more local drilling does not translate into cheaper prices at the pump for Ventura County residents. The fracked oil from underneath our feet gets traded to the highest bidder on the international market just like any other oil. **43 USC 1354 PLACED LIMITATIONS ON THE EXPORT OF OIL OR GAS. IT READS IN PART AS FOLLOWS. I DON'T KNOW IF THIS HAS CHANGED:**

***(a) Application of Export Administration provisions***

*Except as provided in subsection (d) of this section, any oil or gas produced from the outer Continental Shelf shall be subject to the requirements and provisions of the Export Administration Act of 1969.*

***(b) Condition precedent to exportation; express finding by President of no increase in reliance on imported oil or gas***

*Before any oil or gas subject to this section may be exported under the requirements and provisions of the Export Administration Act of 1969, the President shall make and publish an express finding that such exports will not increase reliance on imported oil or gas, are in the national interest, and are in accord with the provisions of the Export Administration Act of 1969.*

As for local electoral connections to fracking, only state Sen. Fran Pavely, D-Agoura Hills, has put fracking front and center on her agenda, going as far as writing a bill requiring drillers to notify nearby property owners before fracking. Though one bill died earlier this year, Pavley has reintroduced another bill this month that would regulate fracking, which includes advance notice to neighbors of planned fracking and disclosure of the chemicals used in the process. State Assemblyman Jeff Gorell, R-Camarillo, had Venoco as a client during his lobbyist days. Venoco later joined ExxonMobile in contributing to his campaign. Recently retired Carpinteria City Councilman Joe Armendariz started a consulting firm. His new client is Western Petroleum Association. Councilwoman Carmen Ramirez, who also attended the McGrath Beach opening, might be the next local leader likely to take this up as an agenda item. The Sierra Club adores her. She earned their admiration for fighting to keep development off Ormond Beach.

On the federal level, ProPublica found that Exxon is pushing for legislation so it does not have to reveal fracking chemicals, but federal regulators have their own agenda. John Romero at the Bureau of Ocean Energy Management said that office will not be issuing any more federal offshore permits, but is working on environmental studies for offshore wind power. **THIS PASSAGE LEAVES THE IMPRESSION THAT THE GOVERNMENT WILL NOT BE ISSUING ANY MORE OFFSHORE PERMITS SINCE MOST READERS WON'T KNOW BOEM FROM BSEE. CLARIFY THAT THIS RESPONSIBILITY LIES WITH BSEE AND THAT PERMITS WILL BE ISSUED.** Even if the local and state governments conflict on offshore agendas, the feds are installing more alternative energy regardless of who is in office. As for when this will happen, UCSB biologist Milton Love is already conducting an environmental impact study for the federal government to bring offshore wind power to our region. The Department of Defense has already made plans to develop more wind power on San Nicolas Island.

A few months after the Democratic candidate at McGrath Beach, I asked a ranger about the fracking rumors. "I have heard them," he says, "but we have cameras. Cameras are all over the park." But the cameras do not show everything behind the walls of the rigs and wells. So I ask him if he sees anything else bad happening in the park. "Yes," and then he laughs.

On Mon, Feb 25, 2013 at 5:03 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:  
Is 1:30 pm pst ok? or anytime thereafter.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 1:39 PM, Nicholas Pardi <nicholas.pardi@bsee.gov> wrote:  
Sure, what works for you?

**From:** Mayerson, Drew [mailto:drew.mayerson@bsee.gov]  
**Sent:** Monday, February 25, 2013 01:28 PM  
**To:** Pardi, Nicholas <nicholas.pardi@bsee.gov>  
**Cc:** Ming, Jaron <jaron.ming@bsee.gov>; Masri, Nabil <Nabil.Masri@bsee.gov>; Kenneth Seeley <kenneth.seeley@bsee.gov>  
**Subject:** Re: Media Inquiry for PAC region

Any chance we can move it to the afternoon here? I was just informed I have a contractor coming to our house and I have to be there to guide him in the morning.  
Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Mon, Feb 25, 2013 at 12:36 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:

(b) (5)

On Mon, Feb 25, 2013 at 3:26 PM, Ming, Jaron <jaron.ming@bsee.gov> wrote:  
Just FYI, Platform Holly is a State facility. We are aware of this issue and should be able to provide you a response. Thanks.

On Mon, Feb 25, 2013 at 11:58 AM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:  
Of note, he added Platform Holly to that list, another Veneto platform. So that's Platforms Holly, Gail and Grace.

On Mon, Feb 25, 2013 at 2:43 PM, Pardi, Nicholas <nicholas.pardi@bsee.gov> wrote:  
Hi Jaron,

I got an inquiry from a news organization on the following:

- BSEE permits and operational/inspection documents for drilling operations on Venoco's Platform Gail and Platform Grace off the California coast in the Monterey Shale play. Gail produces from the Sockeye Field and Grace produces in the Santa Clara field.

- Injection well permits for these platforms, if any, and any information on offshore injection well programs, if any.

- Here's why - There are concerns that hydraulic fracturing operations on Platform Gail in 2009 and 2010 produced wastewater, and the disposal of this wastewater was not tracked by BOEM or BSEE, or that BOEM/BSEE are not informing the public.

Here's from the VC Reporter - "The Santa Barbara-based Environmental Defense Center found that Venoco fracked Platform Gail in Sockeye offshore. Where did the wastewater from the offshore frack go? What was the chemical composition? So far, the only two institutions likely to know for certain are Venoco and a few of the federal regulatory bureaucracies such as the Bureau of Ocean Management or Bureau of Safety and Environmental Enforcement. But none is informing the public."

Do you have a minute today or tomorrow to chat about this?

cheers,  
Nick



Mayerson, Drew <drew.mayerson@bsee.gov>

## Re: Fw: Question on offshore fracking

7 messages

Ming, Jaron <jaron.ming@bsee.gov>

Mon, Dec 17, 2012 at 1:16 PM

To: "Barminski, Joan" <joan.barminski@boem.gov>

Cc: Drew Mayerson <drew.mayerson@bsee.gov>

I'm available after 3 pm and I would like to have Drew meet with us as well. Just let me know what time works best for you. Thanks.

On Mon, Dec 17, 2012 at 11:58 AM, Barminski, Joan <joan.barminski@boem.gov> wrote:

Jaron, I'd like to discuss with you today, so that I can respond to BOEM management this afternoon. Thanks.

----- Forwarded message -----

From: **Walter Cruickshank** <walter.cruickshank@boem.gov>

Date: Mon, Dec 17, 2012 at 11:01 AM

Subject: Fw: Question on offshore fracking

To: ellen.aronson@boem.gov, joan.barminski@boem.gov

Cc: Emily.Lindow@boem.gov

I can't read the attachment on the berry, but from the title, looks like it should go to you. Please let mw know what you think.

Thanks,  
Walter

**From:** Cannuscio, Lisa [mailto:lisa\_cannuscio@ios.doi.gov]

**Sent:** Monday, December 17, 2012 11:00 AM

**To:** Walter Cruickshank <walter.cruickshank@boem.gov>

**Subject:** Question on offshore fracking

Ciao!

Tom Lillie suggested I check with you on whether BOEM has an interest in this topic at this time. I have a Write-in Campaign and some public comment letters on both onshore and offshore hydraulic fracturing on California coast (Venoco).

Could you please give a brief review and let me know what you think - whether BOEM or BLM?

Thank you!  
-Lisa

----- Forwarded message -----

From: **Lillie, Thomas** <thomas.lillie@bsee.gov>

Date: Mon, Dec 17, 2012 at 12:37 PM

Subject: Re: BSEE Correspondence update

To: "Gregory, John" <john.gregory@bsee.gov>

Cc: "Cannuscio, Lisa" <lisa\_cannuscio@ios.doi.gov>, Anita Childs <anita.childs@bsee.gov>

On shore fracking is BLM. Offshore would go to BOEM if it is being proposed for the Federal OCS.

On Mon, Dec 17, 2012 at 12:04 PM, Gregory, John <john.gregory@bsee.gov> wrote:

This is what is listed in CATS:

11/14 mailed to Chuck Barbee for response.

John

On Mon, Dec 17, 2012 at 12:02 PM, Cannuscio, Lisa <lisa\_cannuscio@ios.doi.gov> wrote:

Ciao!

Could you please provide an update on the following:

**ESO 42584 Simpson**

Also, please let me know if these letters fall within BSEE's purview (Venoco Oil Company and hydraulic fracturing in California). We have a Write-In Campaign on fracking onshore and offshore, and I am trying to determine if it should go to BSEE or BLM.

Grazie!

-Lisa

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Lisa Cannuscio  
Office of the Executive Secretariat  
1849 C Street, N.W., Room 7323  
Washington, D.C. 20240  
Office: (202) 208-2443  
Email: Lisa\_Cannuscio@ios.doi.gov

--  
Tom Lillie  
Chief of Staff  
Bureau of Safety and Environmental Enforcement  
(202) 208-6286  
thomas.lillie@bsee.gov

--  
Lisa Cannuscio  
Office of the Executive Secretariat  
1849 C Street, N.W., Room 7323  
Washington, D.C. 20240  
Office: (202) 208-2443  
Email: Lisa\_Cannuscio@ios.doi.gov

—  
*Joan Barminski*  
Regional Supervisor, Strategic Resources  
Pacific OCS Region  
805.389.7509

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**Mayerson, Drew** <drew.mayerson@bsee.gov>  
To: "Ming, Jaron" <jaron.ming@bsee.gov>

Mon, Dec 17, 2012 at 1:28 PM

Jaron,

I'll be there. Ordinarily fracking would be a downhole operation similar other downhole operations. It is permitted using an APM and has never (to my knowledge) been an event that need be placed in the DPP. It is essentially an primary recovery methodology like acid stimulation....although the pumps may be more powerful. I'm not an expert.

Also, I believe we've only had two instances when fracking was done. One by Venoco, and possibly one by PXP at Irene.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region  
[Quoted text hidden]

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**Barminski, Joan** <joan.barminski@boem.gov>  
To: Jaron Ming <jaron.ming@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Dec 18, 2012 at 11:18 AM

hi, we need to discuss again, as outlined needs in Lillie's message below involve BOEM and BSEE Pacific as well as some HQ in BOEM, from waht I can see. WE need to come up with a plan to address. I have asked what the due date is from HQ and IOS.

—— Forwarded message ——  
From: **Walter Cruickshank** <walter.cruickshank@boem.gov>  
Date: Tue, Dec 18, 2012 at 9:02 AM  
Subject: Fw: Fw: Question on offshore fracking  
To: joan.barminski@boem.gov, ellen.aronson@boem.gov  
Cc: Emily.Lindow@boem.gov

I still can't read the letter, but looks like we might need both bureaus weighing in: See Tom Lillie's e-mail below.

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**From:** Lillie, Thomas [mailto:thomas.lillie@bsee.gov]  
**Sent:** Tuesday, December 18, 2012 06:06 AM  
**To:** Walter Cruickshank <walter.cruickshank@boem.gov>  
**Subject:** Re: Fw: Question on offshore fracking

Walter: I reviewed the letter regarding fracking offshore California. It alleges that fracking has occurred at a platform operated by Venoco off the Santa Barbara coast. The author makes a statement, but provides no evidence to support it. The response should address: (1) has Venoco or any other operator actually conducted any fracking offshore California as alleged in the letter (a BSEE issue); (2) is the alleged activity being conducted in the Federal OCS or state offshore property (a BOEM issue); (3) has fracking ever been considered in a five-year plan and been assessed in any NEPA document for the area in question (i.e., is it even allowed; a BOEM issue); (4) If so, has Venoco or any other operator ever submitted an application for permit to conduct fracking in the Pacific Region (a BSEE issue). Let me know when you get in. Thanks. Tom

On Mon, Dec 17, 2012 at 7:54 PM, Walter Cruickshank <walter.cruickshank@boem.gov> wrote:  
Okay. I'll look at it when I get back too.

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**From:** Thomas Lillie [mailto:thomas.lillie@bsee.gov]  
**Sent:** Monday, December 17, 2012 05:53 PM

**To:** walter.cruickshank@boem.gov <walter.cruickshank@boem.gov>  
**Subject:** Re: Fw: Question on offshore fracking

My comment is based on discussion with Lisa in Exec Sec. I will need to look at the letter in the morning.

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**From:** Walter Cruickshank [mailto:walter.cruickshank@boem.gov]  
**Sent:** Monday, December 17, 2012 04:47 PM  
**To:** thomas.lillie@bsee.gov <thomas.lillie@bsee.gov>  
**Subject:** Re: Fw: Question on offshore fracking

I can't read the letter on my blackberry (I'm stuck in SC -- all flights cancelled). Does the incoming point to NEPA or environmental review more generally?

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**From:** Thomas Lillie [mailto:thomas.lillie@bsee.gov]  
**Sent:** Monday, December 17, 2012 05:37 PM  
**To:** walter.cruickshank@boem.gov <walter.cruickshank@boem.gov>  
**Subject:** Re: Fw: Question on offshore fracking

Has there been an EIS to assess the environmental consequences of fracking on the OCS? How can we begin to review permit requests without that?

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**From:** Walter Cruickshank [mailto:walter.cruickshank@boem.gov]  
**Sent:** Monday, December 17, 2012 04:11 PM  
**To:** thomas.lillie@bsee.gov <thomas.lillie@bsee.gov>  
**Subject:** Fw: Fw: Question on offshore fracking

Tom,

Looks like this is coming full circle. Both the BOEM and BSEE folks in PACR think this is a BSEE matter. (See below)

Walter

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**From:** Barminski, Joan [mailto:joan.barminski@boem.gov]  
**Sent:** Monday, December 17, 2012 04:57 PM

**To:** Walter Cruickshank <walter.cruickshank@boem.gov>  
**Cc:** ellen.aronson@boem.gov <ellen.aronson@boem.gov>; Emily.Lindow@boem.gov <Emily.Lindow@boem.gov>  
**Subject:** Re: Fw: Question on offshore fracking

Walter,

Discussed here with RD Jaron Ming and Drew Mayerson, BSEE Pacific. We agree (as does Ellen) that this is BSEE's purview for offshore areas. Downhole activity that would be permitted on a well basis via an Application for Permit to Modify (APM) at the District Office level. I recommend that the inquiry be redirected to BSEE.

Joan

On Mon, Dec 17, 2012 at 11:57 AM, Barminski, Joan <joan.barminski@boem.gov> wrote:

Walter, will consider here, and discuss with BSEE as fracking is usually considered to be a well operation and would reside as a permit approval with BSEE in the District Office. I will clarify with folks here and get back to you and Emily as soon as possible.

[Quoted text hidden]

[Quoted text hidden]

[Quoted text hidden]

[Quoted text hidden]

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**Ming, Jaron** <jaron.ming@bsee.gov>  
To: "Barminski, Joan" <joan.barminski@boem.gov>  
Cc: Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Dec 18, 2012 at 11:30 AM

Ok. A conference call maybe?

[Quoted text hidden]

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**Ming, Jaron** <jaron.ming@bsee.gov>  
To: "Barminski, Joan" <joan.barminski@boem.gov>  
Cc: Drew Mayerson <drew.mayerson@bsee.gov>

Mon, Jan 7, 2013 at 4:13 PM

I have received hard copies of the letters from BSEE HQ. Would you like to meet to discuss tomorrow? Thanks.

[Quoted text hidden]

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**Barminski, Joan** <joan.barminski@boem.gov>  
To: "Ming, Jaron" <jaron.ming@bsee.gov>  
Cc: Drew Mayerson <drew.mayerson@bsee.gov>

Mon, Jan 7, 2013 at 4:43 PM

tomorrow would be good. Time available except for 9-1030, and 330-430. Also don't know when Ekholm meeting with BOEM is yet.

[Quoted text hidden]

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**Ming, Jaron** <jaron.ming@bsee.gov>  
To: "Barminski, Joan" <joan.barminski@boem.gov>  
Cc: Drew Mayerson <drew.mayerson@bsee.gov>

Mon, Jan 7, 2013 at 4:58 PM

Ok. Let's try for 2 pm and see how the IT meetings develop. Thanks.

[Quoted text hidden]



Seeley, Kenneth <kenneth.seeley@bsee.gov>

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## Fwd: Request for some MSDS on fracking technologies.

1 message

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**Masri, Nabil** <nabil.masri@bsee.gov>

Tue, Mar 5, 2013 at 12:06 PM

To: Kenneth Seeley <kenneth.seeley@bsee.gov>

Cc: Daniel Knowlson <daniel.knowlson@bsee.gov>, Craig Ogawa <craig.ogawa@bsee.gov>, Janice Hall <janice.hall@bsee.gov>, Jaron Ming <jaron.ming@bsee.gov>

FYI

Nabil F. Masri  
Regional Supervisor, Office of Field Operations  
Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
805.389.7581  
nabil.masri@bsee.gov

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—— Forwarded message ——

From: **Chandler, Kimberly** <Kimberly.Chandler@bakerhughes.com>

Date: Tue, Mar 5, 2013 at 11:19 AM

Subject: RE: Request for some MSDS on fracking technologies.

To: "Finie, Patrick" <patrick.finie@bsee.gov>

Cc: "Masri, Nabil" <Nabil.Masri@bsee.gov>, Theresa Bell <theresa.bell@bsee.gov>, Catherine Hoffman <catherine.hoffman@bsee.gov>

Dear Mr. Finie,

Please find attached a zip file containing the PDF versions of the MSDSs that you requested. Please let me know if you have any questions.

Best regards,

Kim

**Kim Chandler** | Products and Technology Counsel  
**Baker Hughes** | Pressure Pumping, Water Management, Liner Hangers, Packers, and Safety Systems  
Portfolios

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**From:** Finie, Patrick [mailto:patrick.finie@bsee.gov]  
**Sent:** Friday, March 01, 2013 2:57 PM  
**To:** Chandler, Kimberly  
**Cc:** Masri, Nabil; Theresa Bell; Catherine Hoffman  
**Subject:** Request for some MSDS on fracking technologies.

I called you earlier about getting some MSDS sheets on some fracking chemicals. Below is a list of the chemicals i was asked to get the MSDS sheets on

GLFC-1B

XLW-56

BF-8L

Claymaster 5C

MA 844W

BC-3

GBW-12

X-cide 207

BF-7L

GS-1L

If you could email me back and CC the following people i would greatly appreciate it. Masri, Nabil  
Nabil.Masri@bsee.gov , Theresa Bell theresa.bell@bsee.gov ,

Thank you

Patrick Finie

Pacific OCS Region/Office of Field Operations

Bureau of Safety and Environmental Enforcement

(805) 389-7587

Main line (805) 389-7550

Fax (805) 389-7592

Email Patrick.Finie@bsee.gov

---

 **MSDS.ZIP**  
677K



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : BF-8L  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Buffer  
**Code** : 425143  
**Validation date** : 1/9/2012.  
**Print date** : 1/9/2012.  
**Version** : 1

**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid.  
**Odor** : Ammonia. [Slight]  
**Color** : Light

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Emergency overview** : DANGER!  
COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE AND SKIN BURNS. HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. HARMFUL OR FATAL IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. ASPIRATION HAZARD.

At elevated temperatures, vapors can form an ignitable or explosive mixture with air. Can form explosive mixtures at temperatures at or above the flash point. Static discharges can cause ignition or explosion when container is not bonded. Keep away from heat, sparks and flame. Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. Vapors can travel to a source of ignition and flashback. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

**Routes of entry** : Dermal contact. Eye contact.

**Potential acute health effects**

**Inhalation** : Toxic by inhalation. Irritating to respiratory system.  
**Ingestion** : Harmful if swallowed. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause burns to mouth, throat and stomach.  
**Skin** : Corrosive to the skin. Causes burns. Harmful in contact with skin. May cause sensitization by skin contact.  
**Eyes** : Corrosive to eyes. Causes burns.

**Potential chronic health effects**

**Chronic effects** : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

## 2. Hazards identification

**Target organs** : Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes, central nervous system (CNS).

### Over-exposure signs/symptoms

**Inhalation** : respiratory tract irritation, coughing

**Ingestion** : stomach pains, nausea or vomiting

**Skin** : pain or irritation, redness, blistering may occur

**Eyes** : pain, watering, redness

**Medical conditions aggravated by over-exposure** : Pre-existing skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

## 3. Composition/information on ingredients

| <u>Name</u>      | <u>CAS number</u> | <u>%</u> |
|------------------|-------------------|----------|
| Monoethanolamine | 141-43-5          | 60 - 100 |

## 4. First aid measures

**Eye contact** : Get medical attention immediately. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open.

**Skin contact** : Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

**Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

## 5. Fire-fighting measures

**Flammability of the product** : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

### Extinguishing media

**Suitable** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.

**Not suitable** : Do not use water jet.

**Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide, nitrogen oxides.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Separate from acids. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits |               | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|------------------------------|---------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                 | List name     | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| Monoethanolamine             | US ACGIH      | 3             | 7.5               | -     | 6              | 15                | -     | -       | -                 | -     |           |
|                              | OSHA PEL      | 3             | 6                 | -     | -              | -                 | -     | -       | -                 | -     |           |
|                              | OSHA PEL 1989 | 3             | 8                 | -     | 6              | 15                | -     | -       | -                 | -     |           |

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

## 8 . Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Use explosion-proof ventilation equipment.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.
- Personal protection**
- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves: Rubber gloves. / Neoprene gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

## 9 . Physical and chemical properties

- Physical state** : Liquid.
- Flash point** : Closed cup: 63.33 °C (146 °F) [PMCC]
- Auto-ignition temperature** : Not available.
- Flammable limits** : Lower: 5%  
Upper: 17%
- Color** : Light
- Odor** : Ammonia. [Slight]
- pH** : 12
- Boiling/condensation point** : Not available.
- Initial Boiling Point** : Not available.
- Melting/freezing point** : Not available.
- Relative density** : 1.03
- Density** : 8.6 (lbs/gal)
- Vapor density** : Not available.
- Odor threshold** : Not available.
- Evaporation rate** : Not available.
- VOC** : Not available.
- Viscosity** : Kinematic (37.7 °C): <20 cSt
- Solubility (Water)** : > 10 %
- Vapor pressure** : Not available.
- Pour Point** : Not available.
- Partition coefficient (LogKow)** : Not available.

## 10 . Stability and Reactivity

- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
- Materials to avoid** : Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis.  
Incompatible with halogenated organic compounds, aldehydes, ketones, and acrylates.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Conditions of reactivity** : Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

## 11 . Toxicological information

### Acute toxicity

| Product/ingredient name | Result      | Species | Dose        | Exposure |
|-------------------------|-------------|---------|-------------|----------|
| Monoethanolamine        | LD50 Dermal | Rabbit  | 1 mL/kg     | -        |
|                         | LD50 Oral   | Rabbit  | 1 g/kg      | -        |
|                         | LD50 Oral   | Rat     | 1720 mg/kg  | -        |
| BF-8L                   | LD50 Oral   | Rat     | 1 to 2 g/kg | -        |

### Chronic toxicity Remarks

1) Monoethanolamine

Not available.

## 12 . Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result                               | Species  | Exposure |
|-------------------------|--------------------------------------|--|----------|
| Monoethanolamine        | Acute LC50 >100000 ug/L Marine water | Crustaceans - Common shrimp, sand shrimp - Crangon crangon - Adult         | 48 hours |
|                         | Acute LC50 150 mg/L Fresh water      | Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss - Yolk-sac fry | 96 hours |

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Disposal should be in accordance with applicable regional, national and local laws and regulations.**

**Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.**

## 14 . Transport information

| Regulatory information | UN number | Proper shipping name  | Classes | PG* | Label   | Additional information                       |
|------------------------|-----------|-----------------------|---------|-----|---|--|
| DOT Classification     | UN2491    | Ethanolamine solution | 8       | III |  | -  |
| TDG Classification     | UN2491    | Ethanolamine solution | 8       | III |  | -  |
| IMDG Class             | UN2491    | Ethanolamine solution | 8       | III |  | <b>Emergency schedules (EmS)</b><br>F-A, S-B |
| IATA-DGR Class         | UN2491    | Ethanolamine solution | 8       | III |  | -  |

PG\* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : 153

## 15 . Regulatory information

**HCS Classification** : Combustible liquid  
Toxic material  
Corrosive material  
Sensitizing material  
Target organ effects

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances**: No products were found.  
**SARA 302/304 emergency planning and notification**: No products were found.  
**SARA 302/304/311/312 hazardous chemicals**: Ethanolamine  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: BF-8L: Immediate (acute) health hazard, Delayed (chronic) health hazard  
CERCLA: Hazardous substances.: No products were found.  
**Clean Water Act (CWA) 307**: No products were found.  
**Clean Water Act (CWA) 311**: No products were found.  
**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.  
**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.  
**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** :  
Not listed

**United States inventory (TSCA 8b)** : All components are listed or exempted.

### Canada

**WHMIS (Canada)** : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).  
Class D-2B: Material causing other toxic effects (Toxic).  
Class E: Corrosive material

**Canada (CEPA DSL)** : All components are listed or exempted.

## 16 . Other information

**Label requirements** : COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE AND SKIN BURNS. HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. HARMFUL OR FATAL IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. ASPIRATION HAZARD.

**Hazardous Material Information System (U.S.A.)** :

|                     |   |
|---------------------|---|
| Health              | 3 |
| Flammability        | 2 |
| Physical hazards    | 0 |
| Personal protection | i |

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection Association (U.S.A.)** :



**Date of printing** : 1/9/2012.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

**NOTE:** The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# BAKER HUGHES COMPANY MATERIAL SAFETY DATA SHEET

Region  
USA

International MSDS  
MATERIAL SAFETY DATA SHEET

## 1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: **GLFC-1B**  
Item Number: 398367  
Product Use: Gellant - Water  
Supplier: BJ Services Company  
11211 FM 2920  
Tomball, TX 77375  
(281)351-8131

**IN CASE OF EMERGENCY CALL: (800) 424-9300 for CHEMTREC  
(703) 527-3887 for International**

### HMIS HAZARD INDEX

HEALTH: 1  
FLAMMABILITY: 1  
REACTIVITY: 0  
PERSONAL PROTECTION: h

## 2 COMPOSITION/INFORMATION ON INGREDIENTS

| Hazardous Component | CAS#        | Percent | Hazard   |
|---------------------|-------------|---------|----------|
| Alkanes / Alkenes   | Multiple    | 40 - 45 | Irritant |
| Guar gum            | 009000-30-0 | 45 - 50 | Irritant |

## 3 HAZARDS IDENTIFICATION

PRIMARY ROUTES OF EXPOSURE: Inhalation. Skin contact. Eye contact.

### ACUTE OVEREXPOSURE EFFECTS:

**INHALATION:** May cause central nervous system depression.

**INGESTION:** Product has a low order of acute oral toxicity, but minute amounts aspirated into the lungs during ingestion may cause severe pulmonary injury or death.

**EYE CONTACT:** May cause mild eye irritation.

**SKIN CONTACT:** May cause mild skin irritation. Prolonged contact may cause drying of skin.

**EXPOSURE LIMITS:**

| HAZARDOUS COMPONENT | ACGIH TLV           | OSHA PEL            | LC50 (inhalation) | LD50 (oral)    |
|---------------------|---------------------|---------------------|-------------------|----------------|
| Alkanes / Alkenes   | 5 mg/m <sup>3</sup> | 5 mg/m <sup>3</sup> | NA                | NA             |
| Guar gum            | NA                  | NA                  | NA                | 6770 mg/kg rat |

## **4 FIRST AID MEASURES**

### **INHALATION:**

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Only trained personnel should administer oxygen. Get medical attention.

### **INGESTION:**

DO NOT induce vomiting. Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

### **EYES:**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

### **SKIN:**

Flush skin with water or soap and water, if available, for at least 15 minutes. Remove contaminated clothing and shoes. Seek medical attention if irritation persists.

## **5 FIRE FIGHTING MEASURES**

FLASHPOINT (METHOD): > 200°F (SFCC)

LOWER EXPLOSION LIMIT (% v/v): Not applicable/available

UPPER EXPLOSION LIMIT (% v/v): Not applicable/available

AUTO-IGNITION TEMPERATURE: Not available/applicable

**SPECIAL HAZARDS:**

None.

**EXTINGUISHING MEDIA:**

On small fires, dry chemical, dry sand, or CO<sub>2</sub> may also be effective in large quantities. For large fire, water spray or fog. Foam.

**SPECIAL FIREFIGHTING PROCEDURES:**

Cool exposed containers with water spray. Fire-fighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires.

**HAZARDOUS COMBUSTION PRODUCTS:**

Oxides of carbon.

## **6 ACCIDENTAL RELEASE MEASURES**

Dike to contain. Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal.

## **7 HANDLING AND STORAGE**

**HANDLING:**

Avoid contact with skin and eyes. Do not inhale vapors.

**STORAGE REQUIREMENTS:**

Keep container closed when not in use. Keep away from ignition sources.

## **8 EXPOSURE CONTROLS/PERSONAL PROTECTION**

### **SPECIFIC ENGINEERING CONTROLS:**

Adequate ventilation should be provided to keep concentrations below acceptable exposure limits.

### **PERSONAL PROTECTIVE EQUIPMENT:**

Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure. Safety glasses. Neoprene gloves. Rubber gloves.

## **9 PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE: Liquid

COLOR: Light brown, Tan

ODOR: Mild Hydrocarbon

ODOR THRESHOLD: Not available/applicable

SPECIFIC GRAVITY: 1.06 - 1.07

VAPOR PRESSURE: Not available/applicable

VAPOR DENSITY (air = 1): Not available/applicable

EVAPORATION RATE: Not available/applicable

BOILING POINT: Not available/applicable

FREEZING POINT: Not available/applicable

pH: Not available/applicable

VISCOSITY (F): Not available/applicable

SOLUBILITY IN WATER: Insoluble

## **10 STABILITY AND REACTIVITY**

### **STABILITY:**

Stable.

### **INCOMPATIBILITY/CONDITIONS OF REACTIVITY:**

Strong oxidizers.

### **HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:**

Carbon monoxide. Carbon dioxide.

### **HAZARDOUS POLYMERIZATION:**

Will not occur.

## **11 TOXICOLOGICAL PROPERTIES**

### **CHRONIC EFFECTS:**

None known.

### **SENSITIZATION:**

Not known.

### **CARCINOGENICITY:**

None of the components of this product have been listed as carcinogenic by IARC, NTP or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

**MUTAGENICITY:**

Not known.

**REPRODUCTIVE TOXICITY:**

Not known.

**12 ECOLOGICAL INFORMATION**

No specific information available

**13 DISPOSAL CONSIDERATIONS****WASTE DISPOSAL:**

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

**14 TRANSPORT INFORMATION****LAND TRANSPORT (DOT)**

Proper Shipping Name: NOT RESTRICTED

UN No.: NA

**AIR TRANSPORT (ICAO/IATA)**

Proper Shipping Name: NOT RESTRICTED

UN/ID No.: NA

**MARINE TRANSPORT (IMDG/IMO)**

Proper Shipping Name: NOT RESTRICTED

UN/ID No.: NA

**15 REGULATORY INFORMATION****SARA TITLE III:**

SECTION 302/304 This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTION 311/312 Immediate

SECTION 313 This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

TSCA INVENTORY: The substances in this product are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

CALIFORNIA PROP 65: This product does not contain substances which require warning under California Proposition 65.

**16 OTHER INFORMATION**

**ISSUE DATE:** 12/14/2004

**PREPARED BY:** BJ SERVICES ENVIRONMENTAL GROUP

**REFERENCES:**

Suppliers' Literature.  
Suspect Chemicals Sourcebook  
Guide to Occupational Exposure Values - 2004, American Conference of Governmental Industrial Hygienists, 2004.  
Dangerous Properties of Industrial Materials, 9th ed.; N. Irving Sax, 1996.

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

Revision: 2 Status: Approved & Released MSDS

▼  
Revision History:

| Revision: | Sec/Para Changed | Change Made:              | Date     |
|-----------|------------------|---------------------------|----------|
| 1         | N/A              | Initial Issue of Document | Today    |
| 2         | I                | Address Change            | 10/27/06 |
|           |                  |                           |          |
|           |                  |                           |          |

First Approver | Second Approver | History

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Revised by Sue Brusenhan -- 10/27/2006  
MSDS submitted for Final Approval by Sue Brusenhan -- 10/27/2006  
Final Approval by Sue Brusenhan -- 10/27/2006  
Final Approval by JoAnn Cobb -- 10/27/2006



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : GS-1L  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131  
**Material Uses** : Special: Gel Stabilizer  
**Code** : 424590  
**Validation date** : 12/2/2011.  
**Print date** : 12/2/2011.  
**Version** : 1  
**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606  
**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid.  
**OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.  
**Emergency overview** : MAY CAUSE EYE AND SKIN IRRITATION.  
Avoid breathing vapor or mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

### Potential acute health effects

**Inhalation** : No known significant effects or critical hazards.  
**Ingestion** : No known significant effects or critical hazards.  
**Skin** : Slightly irritating to the skin.  
**Eyes** : Slightly irritating to the eyes.

### Potential chronic health effects

### Over-exposure signs/symptoms

**Inhalation** : None known.  
**Ingestion** : None known.  
**Skin** : irritation, redness  
**Eyes** : irritation, watering, redness

See toxicological information (Section 11)

## 3. Composition/information on ingredients

| <u>Name</u>        | <u>CAS number</u> | <u>%</u> |
|--------------------|-------------------|----------|
| Sodium thiosulfate | 7772-98-7         | 10 - 30  |

## 4. First aid measures

- Eye contact** : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

## 5. Fire-fighting measures

**Flammability of the product** : In a fire or if heated, a pressure increase will occur and the container may burst.

### Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : sulfur oxides, metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits   |           | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|--------------------------------|-----------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                   | List name | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| No exposure limit value known. |           |               |                   |       |                |                   |       |         |                   |       |           |

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

### Personal protection

- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

## 9. Physical and chemical properties

- Physical state** : Liquid.
- Flash point** : Closed cup: Not applicable.
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Not available.
- Odor** : Not available.
- pH** : 7 to 10

## 9 . Physical and chemical properties

|                                |                  |
|--------------------------------|------------------|
| Boiling/condensation point     | : Not available. |
| Initial Boiling Point          | : Not available. |
| Melting/freezing point         | : Not available. |
| Relative density               | : 1.26 to 1.31   |
| Density                        | : Not available. |
| Vapor density                  | : Not available. |
| Odor threshold                 | : Not available. |
| Evaporation rate               | : Not available. |
| VOC                            | : Not available. |
| Viscosity                      | : Not available. |
| Solubility (Water)             | : Soluble        |
| Vapor pressure                 | : Not available. |
| Pour Point                     | : Not available. |
| Partition coefficient (LogKow) | : Not available. |

## 10 . Stability and Reactivity

|                                    |  |
|------------------------------------|--|
| Chemical stability                 | : The product is stable.   |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur.                      |
| Hazardous polymerization           | : Under normal conditions of storage and use, hazardous polymerization will not occur.                 |
| Conditions to avoid                | : No specific data.  |
| Hazardous decomposition products   | : Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## 11 . Toxicological information

### Acute toxicity

| Product/ingredient name | Result    | Species | Dose        | Exposure |
|-------------------------|-----------|---------|-------------|----------|
| Sodium thiosulfate      | LD50 Oral | Rat     | >5000 mg/kg | -        |

### Chronic toxicity Remarks

1) Sodium thiosulfate

Not available.

## 12 . Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result                                  | Species   | Exposure |
|-------------------------|---|---|----------|
| Sodium thiosulfate      | Acute LC50 24000000 ug/L<br>Fresh water | Fish - Western mosquitofish -<br>Gambusia affinis - Adult | 96 hours |

Conclusion/Summary : Not available.

### Biodegradability

Conclusion/Summary : Not available.

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14. Transport information

| Regulatory information | UN number      | Proper shipping name | Classes | PG* | Label | Additional information |
|------------------------|----------------|----------------------|---------|-----|-------|------------------------|
| DOT Classification     | Not regulated. | -                    | -       | -   |       | -                      |
| TDG Classification     | Not regulated. | -                    | -       | -   |       | -                      |
| IMDG Class             | Not regulated. | -                    | -       | -   |       | -                      |
| IATA-DGR Class         | Not regulated. | -                    | -       | -   |       | -                      |

PG\* : Packing group

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not applicable.

**North-America NAERG** : Not available.

## 15. Regulatory information

**HCS Classification** : Not regulated.

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.

**SARA 302/304/311/312 extremely hazardous substances**: No products were found.

**SARA 302/304 emergency planning and notification**: No products were found.

**SARA 302/304/311/312 hazardous chemicals**: No products were found.

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**:

sodium thiosulphate: Immediate (acute) health hazard

**CERCLA: Hazardous substances.**: No products were found.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.

**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.

**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** :

Not listed

**United States inventory (TSCA 8b)** : All components are listed or exempted.

### Canada

**WHMIS (Canada)** : Not controlled under WHMIS (Canada).

## 15 . Regulatory information

Canada (CEPA DSL): : All components are listed or exempted.

## 16 . Other information

Label requirements : MAY CAUSE EYE AND SKIN IRRITATION.

Hazardous Material  
Information System (U.S.A.) :

|                     |   |
|---------------------|---|
| Health              | 0 |
| Flammability        | 0 |
| Physical hazards    | 0 |
| Personal protection | 9 |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection  
Association (U.S.A.) :



Date of printing : 12/2/2011.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : GBW-12CD  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Frac gel breaker  
**Code** : 424317  
**Validation date** : 9/22/2011.  
**Print date** : 9/22/2011.  
**Version** : 1.02  
**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606  
**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid.  
**Odor** : Fermentation.  
**Color** : Clear to dark brown  
**OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

**Emergency overview** : **MAY CAUSE EYE AND SKIN IRRITATION.**  
Avoid breathing vapor or mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

**Routes of entry** : Inhalation.

**Potential acute health effects**

**Inhalation** : No known significant effects or critical hazards.  
**Ingestion** : Ingestion may cause gastrointestinal irritation and diarrhea.  
**Skin** : Slightly irritating to the skin.  
**Eyes** : Slightly irritating to the eyes.

**Potential chronic health effects**

**Over-exposure signs/symptoms**

**Inhalation** : None known.  
**Ingestion** : None known.  
**Skin** : irritation, redness  
**Eyes** : irritation, watering, redness

See toxicological information (section 11)

### Additional information

May cause an allergic respiratory reaction in hypersensitive individuals

### 3. Composition/information on ingredients

| <u>Name</u>          | <u>CAS number</u> | <u>%</u> |
|----------------------|-------------------|----------|
| Hemicellulase enzyme | 9025-56-3         | 10 - 30  |

### 4. First aid measures

|                                   |  |
|-----------------------------------|--|
| <b>Eye contact</b>                | : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.  |
| <b>Skin contact</b>               | : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.                                      |
| <b>Inhalation</b>                 | : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately. |
| <b>Ingestion</b>                  | : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.   |
| <b>Protection of first-aiders</b> | : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.   |

### 5. Fire-fighting measures

|   |   |
|---|---|
| <b>Flammability of the product</b>                    | : In a fire or if heated, a pressure increase will occur and the container may burst.   |
| <b><u>Extinguishing media</u></b>                     |   |
| <b>Suitable</b>                                       | : Use an extinguishing agent suitable for the surrounding fire.   |
| <b>Not suitable</b>                                   | : None known.   |
| <b>Special exposure hazards</b>                       | : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| <b>Hazardous thermal decomposition products</b>       | : No specific data.   |
| <b>Special protective equipment for fire-fighters</b> | : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.                         |

### 6. Accidental release measures

|                                       |   |
|---------------------------------------|---|
| <b>Personal precautions</b>           | : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).  |
| <b>Environmental precautions</b>      | : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.   |
| <b><u>Methods for cleaning up</u></b> |   |
| <b>Small spill</b>                    | : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.   |
| <b>Large spill</b>                    | : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal. |

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits   |           | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|--------------------------------|-----------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                   | List name | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| No exposure limit value known. |           |               |                   |       |                |                   |       |         |                   |       |           |

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

### Personal protection

- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

## 9. Physical and chemical properties

- Physical state** : Liquid.
- Flash point** : Not available.
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Clear to dark brown
- Odor** : Fermentation.
- pH** : 3.8 to 9  
: 1% Aqueous Solution
- Boiling/condensation point** : 100 to 105 °C (212 to 221 °F)
- Initial Boiling Point** : Not available.

## 9. Physical and chemical properties

|                                   |                         |
|-----------------------------------|-------------------------|
| Melting/freezing point            | : Not available.        |
| Relative density                  | : 1.05 to 1.3           |
| Density                           | : 8.7 to 10.8 (lbs/gal) |
| Vapor density                     | : 0.62 [Air = 1]        |
| Volatility                        | : 0% (v/v)              |
| Odor threshold                    | : Not available.        |
| Evaporation rate                  | : Not available.        |
| VOC                               | : Not available.        |
| Viscosity                         | : Not available.        |
| Solubility (Water)                | : Completely miscible   |
| Vapor pressure                    | : Not available.        |
| Pour Point                        | : Not available.        |
| Partition coefficient<br>(LogKow) | : Not available.        |

## 10. Stability and Reactivity

|                                    |   |
|------------------------------------|---|
| Chemical stability                 | : The product is stable.  |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur.   |
| Hazardous polymerization           | : Under normal conditions of storage and use, hazardous polymerization will not occur.  |
| Conditions to avoid                | : No specific data.   |
| Hazardous decomposition products   | : Under normal conditions of storage and use, hazardous decomposition products should not be produced.                            |
| Conditions of reactivity           | : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. |

## 11. Toxicological information

No additional information.

### Chronic toxicity Remarks

1) Hemicellulase enzyme

Not available.

## 12. Ecological information

### Aquatic ecotoxicity

Conclusion/Summary : Not available.

### Biodegradability

Conclusion/Summary : Not available.

## 13. Disposal considerations

|                |   |
|----------------|---|
| Waste disposal | : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. |
|----------------|---|

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

| Regulatory information | UN number      | Proper shipping name | Classes | PG* | Label | Additional information |
|------------------------|----------------|----------------------|---------|-----|-------|------------------------|
| DOT Classification     | Not regulated. | -                    | -       | -   |       | -                      |
| TDG Classification     | Not regulated. | -                    | -       | -   |       | -                      |
| IMDG Class             | Not regulated. | -                    | -       | -   |       | -                      |
| IATA-DGR Class         | Not regulated. | -                    | -       | -   |       | -                      |

PG\* : Packing group

DOT Reportable Quantity : Not applicable.

Marine pollutant : Not applicable.

North-America NAERG : Not available.

## 15 . Regulatory information

HCS Classification : Not regulated.

U.S. Federal regulations : United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

CERCLA: Hazardous substances.: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :

Not listed

United States inventory (TSCA 8b) : All components are listed or exempted.

### Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canada (CEPA DSL): : Not determined.

## 16 . Other information

Label requirements : MAY CAUSE EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

|                     |   |
|---------------------|---|
| Health              | 1 |
| Flammability        | 1 |
| Physical hazards    | 0 |
| Personal protection | 9 |

## 16 . Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection :  
Association (U.S.A.)



Date of printing : 9/22/2011.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

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The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : Clay Master-5C  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Clay control  
**Code** : 499808  
**Validation date** : 1/21/2013.  
**Print date** : 1/21/2013.  
**Version** : 1.03  
**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606  
**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid.  
**Odor** : Sweet.  
**Color** : Clear. Amber.  
**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Emergency overview** : **WARNING!**  
CAUSES EYE IRRITATION. MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION.  
Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.  
**Routes of entry** : Dermal contact. Eye contact. Inhalation.  
**Potential acute health effects**  
**Inhalation** : Slightly irritating to the respiratory system.  
**Ingestion** : Ingestion may cause gastrointestinal irritation and diarrhea.  
**Skin** : Slightly irritating to the skin.  
**Eyes** : Irritating to eyes.  
**Potential chronic health effects**  
**Over-exposure signs/symptoms**  
**Inhalation** : respiratory tract irritation, coughing  
**Ingestion** : None known.  
**Skin** : irritation, redness  
**Eyes** : pain or irritation, watering, redness  
**See toxicological information (Section 11)**

### 3. Composition/information on ingredients

| <u>Name</u>                  | <u>CAS number</u> | <u>%</u> |
|------------------------------|-------------------|----------|
| Quaternary ammonium compound | 138879-94-4       | 30 - 60  |

#### Additional information

This product is a mixture. Chemical family : Quaternary ammonium compound.

### 4. First aid measures

- Eye contact** : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

### 5. Fire-fighting measures

**Flammability of the product** : In a fire or if heated, a pressure increase will occur and the container may burst.

#### Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide, nitrogen oxides, halogenated compounds
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

### 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 6. Accidental release measures

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits   |           | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|--------------------------------|-----------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                   | List name | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| No exposure limit value known. |           |               |                   |       |                |                   |       |         |                   |       |           |

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.
- Personal protection**
- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves: Rubber gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

## 9. Physical and chemical properties

- Physical state** : Liquid.
- Flash point** : Closed cup: >93 °C (>199.4 °F) [PMCC]
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Clear. Amber.
- Odor** : Sweet.
- pH** : 6 to 9

## 9. Physical and chemical properties

|                                |                                 |
|--------------------------------|---------------------------------|
| Boiling/condensation point     | : Not available.                |
| Initial Boiling Point          | : Not available.                |
| Melting/freezing point         | : -40°C (-40°F)                 |
| Relative density               | : 1.14 to 1.18 (16°C)           |
| Density                        | : 9.49 to 9.74 (lbs/gal)        |
| Vapor density                  | : Not available.                |
| Odor threshold                 | : Not available.                |
| Evaporation rate               | : Not available.                |
| VOC                            | : Not available.                |
| Viscosity                      | : Dynamic (23.9°C): 10 to 30 cP |
| Solubility (Water)             | : Soluble                       |
| Vapor pressure                 | : Not available.                |
| Pour Point                     | : -40°C (-40°F)                 |
| Partition coefficient (LogKow) | : Not available.                |

## 10. Stability and Reactivity

|                                    |  |
|------------------------------------|--|
| Chemical stability                 | : The product is stable.   |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur.  |
| Hazardous polymerization           | : Under normal conditions of storage and use, hazardous polymerization will not occur.                                       |
| Conditions to avoid                | : No specific data.  |
| Hazardous decomposition products   | : Under normal conditions of storage and use, hazardous decomposition products should not be produced.                       |
| Conditions of reactivity           | : Non-flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. |

## 11. Toxicological information

### Acute toxicity

| Product/ingredient name | Result    | Species | Dose       | Exposure |
|-------------------------|-----------|---------|------------|----------|
| Clay Master-5C          | LD50 Oral | Rabbit  | 5050 mg/kg | -        |

### Chronic toxicity Remarks

1) Quaternary ammonium compound

Not available.

## 12. Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result           | Species                           | Exposure  |
|-------------------------|------------------|-----------------------------------|-----------|
| Clay Master-5C          | EC50 4671.5 mg/l | Algae - Skeletonema costatum      | 72 hours  |
|                         | LC50 30.38 mg/l  | Crustaceans - Acartia tonsa       | 48 hours  |
|                         | LC50 1349.6 mg/l | Crustaceans - Corophium volutator | 240 hours |
|                         | LC50 42.33 mg/l  | Fish - Scopthalmus maximus        | 96 hours  |

**Conclusion/Summary** : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### Biodegradability

**Conclusion/Summary** : Not available.

### 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

### 14. Transport information

| Regulatory information    | UN number | Proper shipping name  | Classes | PG* | Label | Additional information                       |
|---------------------------|-----------|---|---------|-----|-------|--|
| <b>DOT Classification</b> | UN3082    | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(Contains: Quaternary ammonium compound) | 9       | III |       | <u>Remarks</u>                               |
| <b>TDG Classification</b> | UN3082    | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(Contains: Quaternary ammonium compound) | 9       | III |       |  |
| <b>IMDG Class</b>         | UN3082    | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(Contains: Quaternary ammonium compound) | 9       | III |       | <u>Emergency schedules (EmS)</u><br>F-A, S-F |
| <b>IATA-DGR Class</b>     | UN3082    | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(Contains: Quaternary ammonium compound) | 9       | III |       |  |

PG\* : Packing group

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Quaternary ammonium compound.



## 15 . Regulatory information

- HCS Classification** : Irritating material
- U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances**: No products were found.  
**SARA 302/304 emergency planning and notification**: No products were found.  
**SARA 302/304/311/312 hazardous chemicals**: No products were found.  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**:  
 CLAY MASTER-5C: Immediate (acute) health hazard  
 CERCLA: Hazardous substances.: No products were found.  
**Clean Water Act (CWA) 307**: No products were found.  
**Clean Water Act (CWA) 311**: No products were found.  
**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.  
**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.  
**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** :  
 Not listed
- United States inventory (TSCA 8b)** : All components are listed or exempted.

### Canada

- WHMIS (Canada)** : Class D-2B: Material causing other toxic effects (Toxic).  
**Canada (CEPA DSL)**: : All components are listed or exempted.

## 16 . Other information

- Label requirements** : CAUSES EYE IRRITATION. MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION.
- Hazardous Material Information System (U.S.A.)** :

|                     |   |
|---------------------|---|
| Health              | 1 |
| Flammability        | 1 |
| Physical hazards    | 0 |
| Personal protection | d |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

- National Fire Protection Association (U.S.A.)** :



- Date of printing** : 1/21/2013.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

**NOTE:** The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or

## **16 . Other information**

disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : BC-3  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Breaker catalyst  
**Code** : 488187  
**Validation date** : 1/6/2012.  
**Print date** : 1/6/2012.  
**Version** : 1

**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid. [Oily liquid.]  
**Odor** : None.  
**Color** : Clear.

**OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

**Emergency overview** : **MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.**  
Avoid breathing vapor or mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

**Routes of entry** : Dermal contact. Eye contact. Inhalation.

**Potential acute health effects**

**Inhalation** : Slightly irritating to the respiratory system.  
**Ingestion** : No known significant effects or critical hazards.  
**Skin** : Slightly irritating to the skin.  
**Eyes** : Slightly irritating to the eyes.

**Potential chronic health effects**

**Over-exposure signs/symptoms**

**Inhalation** : respiratory tract irritation, coughing  
**Ingestion** : None known.  
**Skin** : irritation, redness  
**Eyes** : irritation, watering, redness

See toxicological information (Section 11)

### 3. Composition/information on ingredients

| <u>Name</u>             | <u>CAS number</u> | <u>%</u> |
|-------------------------|-------------------|----------|
| No hazardous ingredient |                   |          |

### 4. First aid measures

|                                   |  |
|-----------------------------------|--|
| <b>Eye contact</b>                | : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.  |
| <b>Skin contact</b>               | : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.                                      |
| <b>Inhalation</b>                 | : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately. |
| <b>Ingestion</b>                  | : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.   |
| <b>Protection of first-aiders</b> | : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.   |

### 5. Fire-fighting measures

**Flammability of the product** : In a fire or if heated, a pressure increase will occur and the container may burst.

#### Extinguishing media

|   |   |
|---|---|
| <b>Suitable</b>                                       | : Use an extinguishing agent suitable for the surrounding fire.   |
| <b>Not suitable</b>                                   | : None known.   |
| <b>Special exposure hazards</b>                       | : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| <b>Hazardous thermal decomposition products</b>       | : carbon dioxide, carbon monoxide   |
| <b>Special protective equipment for fire-fighters</b> | : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.                         |

### 6. Accidental release measures

|                                       |   |
|---------------------------------------|---|
| <b>Personal precautions</b>           | : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).  |
| <b>Environmental precautions</b>      | : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.   |
| <b><u>Methods for cleaning up</u></b> |   |
| <b>Small spill</b>                    | : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.   |
| <b>Large spill</b>                    | : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal. |

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits   |           | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|--------------------------------|-----------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                   | List name | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| No exposure limit value known. |           |               |                   |       |                |                   |       |         |                   |       |           |

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

### Personal protection

- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves: neoprene, Rubber gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

## 9. Physical and chemical properties

- Physical state** : Liquid. [Oily liquid.]
- Flash point** : Closed cup: 153 °C (307.4 °F)
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Clear.
- Odor** : None.
- pH** : Not available.
- Boiling/condensation point** : 297 °C (566.6 °F)
- Initial Boiling Point** : Not available.

## 9. Physical and chemical properties

|                                |                          |
|--------------------------------|--------------------------|
| Melting/freezing point         | : -42°C (-43.6°F)        |
| Relative density               | : 1.135                  |
| Density                        | : 9.45 (lbs/gal)         |
| Vapor density                  | : 11.1 [Air = 1]         |
| Odor threshold                 | : Not available.         |
| Evaporation rate               | : <1 (butyl acetate = 1) |
| VOC                            | : Not available.         |
| Viscosity                      | : Not available.         |
| Solubility (Water)             | : 0.72% at °C:25         |
| Vapor pressure                 | : Not available.         |
| Pour Point                     | : Not available.         |
| Partition coefficient (LogKow) | : Not available.         |

## 10. Stability and Reactivity

|                                    |  |
|------------------------------------|--|
| Chemical stability                 | : The product is stable.   |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur.                      |
| Hazardous polymerization           | : Under normal conditions of storage and use, hazardous polymerization will not occur.                 |
| Conditions to avoid                | : No specific data.  |
| Materials to avoid                 | : Reactive or incompatible with the following materials: oxidizing materials.                          |
| Hazardous decomposition products   | : Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## 11. Toxicological information

### Acute toxicity

| Product/ingredient name | Result    | Species | Dose       | Exposure |
|-------------------------|-----------|---------|------------|----------|
| BC-3                    | LD50 Oral | Rat     | 7000 mg/kg | -        |

## 12. Ecological information

### Aquatic ecotoxicity

Conclusion/Summary : Not available.

### Biodegradability

Conclusion/Summary : Not available.

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

| Regulatory information | UN number      | Proper shipping name | Classes | PG* | Label | Additional information |
|------------------------|----------------|----------------------|---------|-----|-------|------------------------|
| DOT Classification     | Not regulated. | -                    | -       | -   |       | -                      |
| TDG Classification     | Not regulated. | -                    | -       | -   |       | -                      |
| IMDG Class             | Not regulated. | -                    | -       | -   |       | -                      |
| IATA-DGR Class         | Not regulated. | -                    | -       | -   |       | -                      |

PG\* : Packing group

DOT Reportable Quantity : Not applicable.

Marine pollutant : Not applicable.

North-America NAERG : Not available.

## 15 . Regulatory information

HCS Classification : Not regulated.

U.S. Federal regulations : United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

CERCLA: Hazardous substances.: No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :

Not listed

United States inventory (TSCA 8b) : All components are listed or exempted.

### Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canada (CEPA DSL): : All components are listed or exempted.

## 16 . Other information

Label requirements : MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

|                     |   |
|---------------------|---|
| Health              | 1 |
| Flammability        | 1 |
| Physical hazards    | 0 |
| Personal protection | g |

## 16 . Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection :  
Association (U.S.A.)



Date of printing : 1/6/2012.

☑ Indicates information that has changed from previously issued version.

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This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : BF-7L  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Buffer  
**Code** : 411109  
**Validation date** : 2/25/2013.  
**Print date** : 2/25/2013.  
**Version** : 1.02  
**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606  
**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid. [Clear to hazy.]  
**Odor** : Mild.  
**Color** : Colorless.  
**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Emergency overview** : DANGER!  
CAUSES EYE AND SKIN BURNS. CAUSES RESPIRATORY TRACT IRRITATION. MAY BE HARMFUL IF SWALLOWED.  
Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

**Routes of entry** : Dermal contact. Inhalation.

**Potential acute health effects**

**Inhalation** : Irritating to respiratory system.  
**Ingestion** : Harmful if swallowed. May cause burns to mouth, throat and stomach.  
**Skin** : Corrosive to the skin. Causes burns.  
**Eyes** : Corrosive to eyes. Causes burns.

**Potential chronic health effects**

**Over-exposure signs/symptoms**

**Inhalation** : respiratory tract irritation, coughing  
**Ingestion** : stomach pains  
**Skin** : pain or irritation, redness, blistering may occur  
**Eyes** : pain, watering, redness

**See toxicological information (Section 11)**

### 3. Composition/information on ingredients

| <u>Name</u>         | <u>CAS number</u> | <u>%</u> |
|---------------------|-------------------|----------|
| Potassium carbonate | 584-08-7          | 30 - 60  |

#### Additional information

This product is a mixture. Chemical family : Inorganic salt.

### 4. First aid measures

- Eye contact** : Get medical attention immediately. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open.
- Skin contact** : Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

### 5. Fire-fighting measures

**Flammability of the product** : In a fire or if heated, a pressure increase will occur and the container may burst.

#### Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide, metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

### 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.

## 6. Accidental release measures

- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits   |           | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|--------------------------------|-----------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                   | List name | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| No exposure limit value known. |           |               |                   |       |                |                   |       |         |                   |       |           |

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.
- Personal protection**
- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

## 9 . Physical and chemical properties

|                                |                            |
|--------------------------------|----------------------------|
| Physical state                 | : Liquid. [Clear to hazy.] |
| Flash point                    | : Not available.           |
| Auto-ignition temperature      | : Not available.           |
| Flammable limits               | : Not available.           |
| Color                          | : Colorless.               |
| Odor                           | : Mild.                    |
| pH                             | : 12 to 13                 |
|                                | : Neat - without dilution. |
| Boiling/condensation point     | : Not available.           |
| Initial Boiling Point          | : Not available.           |
| Melting/freezing point         | : Not available.           |
| Relative density               | : 1.47 (15.6°C)            |
| Density                        | : 12.25 (lbs/gal)          |
| Vapor density                  | : Not available.           |
| Odor threshold                 | : Not available.           |
| Evaporation rate               | : Not available.           |
| VOC                            | : Not available.           |
| Viscosity                      | : Not available.           |
| Solubility (Water)             | : Not available.           |
| Vapor pressure                 | : Not available.           |
| Pour Point                     | : Not available.           |
| Partition coefficient (LogKow) | : Not available.           |

## 10 . Stability and Reactivity

|                                    |   |
|------------------------------------|---|
| Chemical stability                 | : The product is stable.  |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur.   |
| Hazardous polymerization           | : Under normal conditions of storage and use, hazardous polymerization will not occur.  |
| Conditions to avoid                | : No specific data.   |
| Materials to avoid                 | : Reactive or incompatible with the following materials: oxidizing materials and reducing materials.                              |
| Hazardous decomposition products   | : Under normal conditions of storage and use, hazardous decomposition products should not be produced.                            |
| Conditions of reactivity           | : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. |

## 11 . Toxicological information

### Acute toxicity

| Product/ingredient name | Result    | Species | Dose       | Exposure |
|-------------------------|-----------|---------|------------|----------|
| Potassium carbonate     | LD50 Oral | Rat     | 1870 mg/kg | -        |

### Chronic toxicity Remarks

1) Potassium carbonate

Potash miners exposed to potassium carbonate during work exhibited symptoms of productive cough and slight breathlessness, but no significant impairment of lung function (Markham et al, 1981). Iron miners who inhaled 4 to 3 mg/m<sup>3</sup> of potassium carbonate before and after their shift for 10 years were protected to some extent from silicosis (Beleckij et al, 1982).

## 12. Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result                                       | Species   | Exposure |
|-------------------------|--|---|----------|
| Potassium carbonate     | Acute LC50 630000 to 670000 ug/L Fresh water | Crustaceans - Water flea - Ceriodaphnia dubia - <24 hours | 48 hours |
|                         | Acute LC50 650000 to 820000 ug/L Fresh water | Daphnia - Water flea - Daphnia magna - <24 hours          | 48 hours |

Conclusion/Summary : Not available.

### Biodegradability

Conclusion/Summary : Not available.

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14. Transport information

| Regulatory information | UN number | Proper shipping name                                     | Classes | PG* | Label   | Additional information                      |
|------------------------|-----------|--|---------|-----|---|---|
| DOT Classification     | UN1760    | CORROSIVE LIQUID, N.O.S. (Contains: Potassium carbonate) | 8       | II  |  | -   |
| TDG Classification     | UN1760    | CORROSIVE LIQUID, N.O.S. (Contains: Potassium carbonate) | 8       | II  |  | -   |
| IMDG Class             | UN1760    | CORROSIVE LIQUID, N.O.S. (Contains: Potassium carbonate) | 8       | II  |  | <b>Emergency schedules (EmS)</b><br>F-E S-C |
| IATA-DGR Class         | UN1760    | CORROSIVE LIQUID, N.O.S. (Contains: Potassium carbonate) | 8       | II  |  | -   |

PG\* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : 154

## 15 . Regulatory information

- HCS Classification** : Corrosive material
- U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances**: No products were found.  
**SARA 302/304 emergency planning and notification**: No products were found.  
**SARA 302/304/311/312 hazardous chemicals**: Potassium carbonate  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: BF-7L: Immediate (acute) health hazard  
**CERCLA**: Hazardous substances.: No products were found.  
**Clean Water Act (CWA) 307**: No products were found.  
**Clean Water Act (CWA) 311**: No products were found.  
**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.  
**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.  
**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** :  
 Not listed
- United States inventory (TSCA 8b)** : All components are listed or exempted.
- Canada**
- WHMIS (Canada)** : Class E: Corrosive material
- Canada (CEPA DSL)**: : All components are listed or exempted.

## 16 . Other information

**Label requirements** : CAUSES EYE AND SKIN BURNS. CAUSES RESPIRATORY TRACT IRRITATION. MAY BE HARMFUL IF SWALLOWED.

**Hazardous Material Information System (U.S.A.)** :

|                     |   |
|---------------------|---|
| Health              | 2 |
| Flammability        | 0 |
| Physical hazards    | 0 |
| Personal protection | i |

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection Association (U.S.A.)** :



**Date of printing** : 2/25/2013.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

**NOTE:** The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or

## 16 . Other information

disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : MA-844W  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Surfactant.  
**Code** : 411252  
**Validation date** : 12/14/2011.  
**Print date** : 12/14/2011.  
**Version** : 1

**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid. [Clear to opaque]  
**Odor** : Citrus-like.  
**Color** : Colorless to milky white

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Emergency overview** : **WARNING!**  
FLAMMABLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.  
Keep away from heat, sparks and flame. Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. Vapors may form explosive mixtures with air. Vapors can travel to a source of ignition and flashback. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

**Routes of entry** : Dermal contact. Inhalation.

**Potential acute health effects**

**Inhalation** : Irritating to respiratory system.  
**Ingestion** : Ingestion may cause gastrointestinal irritation and diarrhea.  
**Skin** : Irritating to skin.  
**Eyes** : Irritating to eyes.

**Potential chronic health effects**

**Chronic effects** : Contains material that may cause target organ damage, based on animal data. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

**Target organs** : Contains material which may cause damage to the following organs: upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

**Over-exposure signs/symptoms**

**Inhalation** : respiratory tract irritation, coughing  
**Ingestion** : None known.  
**Skin** : irritation, redness, dryness, cracking

## 2. Hazards identification

- Eyes** : pain or irritation, watering, redness
- Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

## 3. Composition/information on ingredients

| <u>Name</u>     | <u>CAS number</u> | <u>%</u> |
|-----------------|-------------------|----------|
| Citrus Terpenes | 94266-47-4        | 30 - 60  |
| Isopropanol     | 67-63-0           | 30 - 60  |

## 4. First aid measures

- Eye contact** : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

## 5. Fire-fighting measures

- Flammability of the product** : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

### Extinguishing media

- Suitable** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## 6. Accidental release measures

### Methods for cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits |               | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       | Notations |
|------------------------------|---------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                 | List name     | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other |           |
| Isopropanol                  | US ACGIH      | 200           | -                 | -     | 400            | -                 | -     | -       | -                 | -     |           |
|                              | OSHA PEL      | 400           | 980               | -     | -              | -                 | -     | -       | -                 | -     |           |
|                              | OSHA PEL 1989 | 400           | 980               | -     | 500            | 1225              | -     | -       | -                 | -     |           |

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Use explosion-proof ventilation equipment.

## 8 . Exposure controls/personal protection

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

### Personal protection

**Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Hands** : Chemical-resistant gloves.

**Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.

**Skin** : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

## 9 . Physical and chemical properties

**Physical state** : Liquid. [Clear to opaque]

**Flash point** : Closed cup: 25 °C (77 °F)

**Auto-ignition temperature** : Not available.

**Flammable limits** : Lower: 0.7%  
Upper: 6.1%

**Color** : Colorless to milky white

**Odor** : Citrus-like.

**pH** : Not available.

**Boiling/condensation point** : 154.44 °C (310 °F)

**Initial Boiling Point** : Not available.

**Melting/freezing point** : <-41.11 °C (<-42 °F)

**Relative density** : 0.94

**Density** : 7.9 (lbs/gal)

**Vapor density** : Not available.

**Volatility** : 55 to 75% (w/w)

**Odor threshold** : Not available.

**Evaporation rate** : Not available.

**VOC** : Not available.

**Viscosity** : Not available.

**Solubility (Water)** : 69-79%

**Vapor pressure** : Not available.

**Pour Point** : Not available.

**Partition coefficient (LogKow)** : Not available.

## 10 . Stability and Reactivity

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

**Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

**Materials to avoid** : Reactive or incompatible with the following materials: oxidizing materials.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## 10 . Stability and Reactivity

**Conditions of reactivity** : Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

## 11 . Toxicological information

### Acute toxicity

| Product/ingredient name | Result               | Species | Dose       | Exposure |
|-------------------------|----------------------|---------|------------|----------|
| Isopropanol             | LD50 Oral            | Rat     | 5045 mg/kg | -        |
|                         | LC50 Inhalation Gas. | Rat     | 16000 ppm  | 8 hours  |

### Carcinogenicity

#### Classification

| Product/ingredient name | ACGIH | IARC | EPA | NIOSH | NTP | OSHA |
|-------------------------|-------|------|-----|-------|-----|------|
| Isopropanol             | A4    | 3    | -   | -     | -   | -    |

### Chronic toxicity Remarks

1) Citrus Terpenes

Not available.

2) Isopropanol

Not available.

## 12 . Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result                        | Species  | Exposure |
|-------------------------|-------------------------------|--|----------|
| Isopropanol             | Acute LC50 1400000 ug/L water | Crustaceans - Common shrimp, sand shrimp - Crangon crangon   | 48 hours |
|                         | Acute LC50 >1400000 ug/L      | Fish - Western mosquitofish - Gambusia affinis - 20 to 30 mm | 96 hours |

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

| Regulatory information | UN number | Proper shipping name  | Classes | PG* | Label   | Additional information |
|------------------------|-----------|---|---------|-----|---|------------------------|
| DOT Classification     | UN1993    | FLAMMABLE LIQUID, N.O.S. (Contains: Isopropanol, Citrus Terpenes) | 3       | III |  | -                      |
| TDG Classification     | UN1993    | FLAMMABLE LIQUID, N.O.S. (Contains: Isopropanol, Citrus Terpenes) | 3       | III |  | -                      |
| IMDG Class             | UN1993    | FLAMMABLE LIQUID, N.O.S. (Contains: Isopropanol, Citrus Terpenes) | 3       | III |  | -                      |
| IATA-DGR Class         | UN1993    | FLAMMABLE LIQUID, N.O.S. (Contains: Isopropanol, Citrus Terpenes) | 3       | III |  | -                      |

PG\* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : 128

## 15 . Regulatory information

HCS Classification : Flammable liquid  
Irritating material  
Target organ effects

U.S. Federal regulations : **United States inventory (TSCA 8b):** All components are listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances:** No products were found.  
**SARA 302/304 emergency planning and notification:** No products were found.  
**SARA 302/304/311/312 hazardous chemicals:** Isopropanol  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** MA-844W: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard  
 CERCLA: Hazardous substances.: No products were found.  
**Clean Water Act (CWA) 307:** No products were found.  
**Clean Water Act (CWA) 311:** No products were found.  
**Clean Air Act (CAA) 112 regulated flammable substances:** No products were found.  
**Clean Air Act (CAA) 112 regulated toxic substances:** No products were found.  
**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :**  
 Not listed

### SARA 313

|                       | <u>Product name</u> | <u>CAS number</u> | <u>Concentration</u> |
|-----------------------|---------------------|-------------------|----------------------|
| Supplier notification | : Isopropanol       | 67-63-0           | 30 - 60              |

United States inventory (TSCA 8b) : All components are listed or exempted.

### Canada

WHMIS (Canada) : Class B-2: Flammable liquid  
Class D-2B: Material causing other toxic effects (Toxic).

## 15 . Regulatory information

Canada (CEPA DSL): : At least one component is not listed.

## 16 . Other information

**Label requirements** : FLAMMABLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

**Hazardous Material Information System (U.S.A.)** :

|                     |   |
|---------------------|---|
| Health              | 2 |
| Flammability        | 3 |
| Physical hazards    | 0 |
| Personal protection | 9 |

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection Association (U.S.A.)** :



**Date of printing** : 12/14/2011.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

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This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

## 1. Product and company identification

**Product name** : XLW-56  
**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Cross-linking agent.  
**Code** : 424356  
**Validation date** : 12/13/2011.  
**Print date** : 12/13/2011.  
**Version** : 1

**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Liquid. [Clear.]  
**Odor** : Mild. Sweet.  
**Color** : Amber. [Light]

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Emergency overview** : **WARNING!**  
HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.  
Do not breathe vapor or mist. Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

**Routes of entry** : Dermal contact. Eye contact. Inhalation.

**Potential acute health effects**

**Inhalation** : Irritating to respiratory system.  
**Ingestion** : Toxic if swallowed.  
**Skin** : Moderately irritating to the skin. May cause sensitization by skin contact.  
**Eyes** : Moderately irritating to eyes.

**Potential chronic health effects**

**Chronic effects** : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Target organs** : Contains material which may cause damage to the following organs: kidneys, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, skin, eyes, nose/sinuses.

**Over-exposure signs/symptoms**

**Inhalation** : respiratory tract irritation, coughing  
**Ingestion** : None known.  
**Skin** : irritation, redness

## 2. Hazards identification

- Eyes** : irritation, watering, redness
- Medical conditions aggravated by over-exposure** : Pre-existing skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.
- See toxicological information (Section 11)

## 3. Composition/information on ingredients

| <u>Name</u>        | <u>CAS number</u> | <u>%</u> |
|--------------------|-------------------|----------|
| Glyoxal            | 107-22-2          | 10 - 30  |
| Sodium tetraborate | 1330-43-4         | 5 - 10   |
| Sodium glycolate   | 2836-32-0         | 1 - 5    |

## 4. First aid measures

- Eye contact** : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

## 5. Fire-fighting measures

- Flammability of the product** : In a fire or if heated, a pressure increase will occur and the container may burst.

### Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide, metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## 6. Accidental release measures

### Methods for cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits  |               | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|-------------------------------|---------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:                  | List name     | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| Glyoxal<br>Sodium tetraborate | US ACGIH      | -             | 0.1               | -     | -              | -                 | -     | -       | -                 | -     | [3] [a]   |
|                               | US ACGIH      | -             | 2                 | -     | -              | 6                 | -     | -       | -                 | -     | [a]       |
|                               | OSHA PEL 1989 | -             | 10                | -     | -              | -                 | -     | -       | -                 | -     |           |

[3]Skin sensitization

**Form:** [a]Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM-TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract.

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

## 8. Exposure controls/personal protection

### Personal protection

- Respiratory** : If a risk assessment indicates it is necessary, use a properly fitted, air purifying or supplied air respirator complying with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves: Nitrile or Neoprene gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and other protective clothing to prevent repeated or prolonged skin contact.

## 9. Physical and chemical properties

- Physical state** : Liquid. [Clear.]
- Flash point** : Closed cup: >93.4°C (>200.1°F) [TCC]
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Amber. [Light]
- Odor** : Mild. Sweet.
- pH** : 6 to 7
- : 5% in water
- Boiling/condensation point** : Not available.
- Initial Boiling Point** : Not available.
- Melting/freezing point** : Not available.
- Relative density** : 1.297 (15.6°C)
- Density** : 10.8 (lbs/gal)
- Vapor density** : >1 [Air = 1]
- Odor threshold** : Not available.
- Evaporation rate** : Not available.
- VOC** : Not available.
- Viscosity** : Not available.
- Solubility (Water)** : Soluble
- Vapor pressure** : 2.1 kPa (16 mm Hg) at 21.1°C (Calculated Value for all Components.)
- Pour Point** : Not available.
- Partition coefficient (LogKow)** : Not available.

## 10. Stability and Reactivity

- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : No specific data.
- Materials to avoid** : Reactive or incompatible with the following materials: oxidizing materials, metals, acids, alkalis and moisture.  
Sodium tetraborate is incompatible with alkaloid salts, mercuric chloride, zinc sulfate, and other metallic salts.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Conditions of reactivity** : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.

## 10 . Stability and Reactivity

## 11 . Toxicological information

### Acute toxicity

| Product/ingredient name | Result      | Species | Dose        | Exposure |
|-------------------------|-------------|---------|-------------|----------|
| Glyoxal                 | LD50 Dermal | Rabbit  | 11400 mg/kg | -        |
|                         | LD50 Oral   | Mouse   | 400 mg/kg   | -        |
|                         | LD50 Oral   | Rat     | 200 mg/kg   | -        |
| Sodium tetraborate      | LD50 Oral   | Rat     | 1200 mg/kg  | -        |
| Sodium glycolate        | LD50 Oral   | Rat     | 7110 mg/kg  | -        |

### Carcinogenicity

#### Classification

| Product/ingredient name | ACGIH | IARC | EPA | NIOSH | NTP | OSHA |
|-------------------------|-------|------|-----|-------|-----|------|
| Glyoxal                 | A4    | -    | -   | -     | -   | -    |
| Sodium tetraborate      | A4    | -    | -   | -     | -   | -    |

### Chronic toxicity Remarks

#### 1) Glyoxal

Glyoxal is a component of this product. There were no established effects associated with chronic exposures at the time of review, but mutagenic effects have occurred.

Glyoxal has shown mutagenic activity in Salmonella typhimurium assay. DNA damage occurred in rats at an oral dose of 500 mg/kg, and unscheduled DNA synthesis in rats occurred at an oral dose of 300 mg/Kg. Sister chromatid exchanges occurred in human lymphocyte cells at a dose of 400 umol/L. (RTECS)

#### 2) Sodium tetraborate

Sodium borate is a component of this product. Systemic toxicity is more likely to occur following chronic or multiple exposures. The principal effects of exposure include gastrointestinal symptoms (nausea, vomiting, diarrhea) and dermal effects (erythema, desquamation). These effects may occur following any route of exposure. Central nervous system (CNS) effects (excitement or depression, lethargy, headache, coma, seizures), dehydration, acute kidney failure, arrhythmias, shock and/or metabolic acidosis have been reported in extreme adult and pediatric cases. (Meditext)

Adverse testicular effects and infertility have been reported in animals. There have been limited animal studies which suggest decreased ovulation, fetotoxicity, and developmental defects may occur with very high exposure levels. Maternal toxicity was present in some studies. (Meditext)

#### 3) Sodium glycolate

Not available.

### Additional information

A 29.2% solution of glyoxal has a rat oral LD50 of 4,290 mg/kg (RTECS).  
May contain traces of formaldehyde, which has been proven to be a carcinogen.

## 12 . Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result                                       | Species  | Exposure |
|-------------------------|--|--|----------|
| Glyoxal                 | Acute LC50 215000 ug/L Fresh water           | Fish - Fathead minnow -                                | 96 hours |
|                         |  | Pimephales promelas                                    |          |
| Sodium tetraborate      | Acute LC50 141000 to 159000 ug/L Fresh water | Daphnia - Water flea - Daphnia magna - Neonate         | 48 hours |
|                         |  | Fish - Western mosquitofish - Gambusia affinis - Adult |          |

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

## 12. Ecological information

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14. Transport information

| Regulatory information | UN number      | Proper shipping name | Classes        | PG* | Label | Additional information |
|------------------------|----------------|----------------------|----------------|-----|-------|------------------------|
| DOT Classification     | Not regulated. | -                    | -              | -   |       | -                      |
| TDG Classification     | Not regulated. | -                    | -              | -   |       | -                      |
| IMDG Class             | Not regulated. | -                    | -              | -   |       | -                      |
| IATA-DGR Class         | Not available. | Not available.       | Not available. | -   |       | -                      |

PG\* : Packing group

**DOT Reportable Quantity** Not applicable.

**Marine pollutant** Not applicable.

**North-America NAERG** : Not available.

## 15. Regulatory information

**HCS Classification** : Toxic material  
Irritating material  
Sensitizing material  
Target organ effects

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.

**SARA 302/304/311/312 extremely hazardous substances**: No products were found.

**SARA 302/304 emergency planning and notification**: No products were found.

**SARA 302/304/311/312 hazardous chemicals**: Boric acid, disodium salt; D-glucitol; Glyoxal

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**:

XLW-56: Immediate (acute) health hazard

**CERCLA: Hazardous substances.**: No products were found.

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.

**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.

## 15. Regulatory information

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :

Not listed

United States inventory (TSCA 8b) : All components are listed or exempted.

### Canada

WHMIS (Canada) : Class D-1B: Material causing immediate and serious toxic effects (Toxic).  
Class D-2B: Material causing other toxic effects (Toxic).

Canada (CEPA DSL): : All components are listed or exempted.

## 16. Other information

Label requirements : HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

|                     |   |
|---------------------|---|
| Health              | 2 |
| Flammability        | 1 |
| Physical hazards    | 0 |
| Personal protection | c |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of printing : 12/13/2011.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



# Material Safety Data Sheet

## 1. Product and company identification

**Product name** : X-CIDE™ 207 INDUSTRIAL MICROBIOCIDE  
™ a trademark of Baker Hughes, Inc.

**Supplier** : Baker Hughes, Inc.  
12645 W. Airport Blvd.  
Sugar Land, TX 77478  
For Product Information/MSDSs Call: 281-351-8131

**Material Uses** : Special: Microbiocide

**Code** : 100486

**Validation date** : 1/11/2012.

**Print date** : 1/11/2012.

**Version** : 1

**Responsible name** : Global Regulatory Affairs - Telephone 281-276-5400 or 800-231-3606

**In case of emergency** : CHEMTREC 800-424-9300 (U.S. 24 hour)  
(001)281-276-5400  
CANUTEC 613-996-6666 (Canada 24 hours)CHEMTREC Int'l 01-703-527-3887 (International 24 hour)

## 2. Hazards identification

**Physical state** : Solid. [Granular.]

**Odor** : Mild.

**Color** : Tan. Red.

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Emergency overview** : DANGER!

CAUSES EYE AND SKIN BURNS. HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER.

Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

**Routes of entry** : Dermal contact. Eye contact. Inhalation.

### Potential acute health effects

**Inhalation** : Irritating to respiratory system.

**Ingestion** : Toxic if swallowed. May cause burns to mouth, throat and stomach.

**Skin** : Corrosive to the skin. Causes burns. May cause sensitization by skin contact.

**Eyes** : Corrosive to eyes. Causes burns.

### Potential chronic health effects

**Chronic effects** : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity** : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

**Target organs** : Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes.

### Over-exposure signs/symptoms

**Inhalation** : respiratory tract irritation, coughing

## 2. Hazards identification

- Ingestion** : stomach pains
- Skin** : pain or irritation, redness, blistering may occur
- Eyes** : pain, watering, redness
- Medical conditions aggravated by over-exposure** : Pre-existing skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

## 3. Composition/information on ingredients

| <u>Name</u>                                    | <u>CAS number</u> | <u>%</u> |
|--|-------------------|----------|
| Diatomaceous earth, calcined                   | 91053-39-3        | 30 - 60  |
| Magnesium nitrate                              | 10377-60-3        | 5 - 10   |
| 5-chloro-2-methyl-4-isothiazolin-3-one         | 26172-55-4        | 5 - 10   |
| 2-Methyl-4-isothiazolin-3-one                  | 2682-20-4         | 1 - 5    |
| Crystalline silica: cristobalite               | 14464-46-1        | 0.1 - 1  |
| Crystalline silica: Quartz (SiO <sub>2</sub> ) | 14808-60-7        | 0.1 - 1  |

## 4. First aid measures

- Eye contact** : Get medical attention immediately. Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open.
- Skin contact** : Wash affected area with soap and mild detergent for at least 20 - 60 minutes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing and gloves. Remove contaminated clothing and shoes.

## 5. Fire-fighting measures

**Flammability of the product** : No specific fire or explosion hazard.

### Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.

**Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, halogenated compounds, metal oxide/oxides

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## 5. Fire-fighting measures

**Special remarks on fire hazards** : Avoid temperature extremes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Hazardous combustion products may include hydrogen chloride, carbon monoxide, carbon dioxide and oxides of nitrogen and sulfur.

## 6. Accidental release measures

**Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

### Methods for cleaning up

**Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

**Large spill** : Move containers from spill area. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

**Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Empty containers retain product residue and can be hazardous. Do not reuse container.

**Storage** : Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

| Occupational exposure limits                              |               | TWA (8 hours) |                   |       | STEL (15 mins) |                   |       | Ceiling |                   |       |           |
|---|---------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredients:  | List name     | ppm           | mg/m <sup>3</sup> | Other | ppm            | mg/m <sup>3</sup> | Other | ppm     | mg/m <sup>3</sup> | Other | Notations |
| Crystalline silica: cristobalite                          | US ACGIH      | -             | 0.025             | -     | -              | -                 | -     | -       | -                 | -     | [a]       |
| Crystalline silica: cristobalite, as quartz               | OSHA PEL 1989 | -             | 0.05              | -     | -              | -                 | -     | -       | -                 | -     | [b][A]    |
| Crystalline silica: Quartz (SiO <sub>2</sub> )            | US ACGIH      | -             | 0.025             | -     | -              | -                 | -     | -       | -                 | -     | [a]       |
| Crystalline silica: Quartz (SiO <sub>2</sub> ), as quartz | OSHA PEL 1989 | -             | 0.1               | -     | -              | -                 | -     | -       | -                 | -     | [b][A]    |

**Form:** [a]Respirable fraction; see Appendix C [b]Respirable dust

**Notes:** [A]as quartz

**Consult local authorities for acceptable exposure limits.**

**Only components of this product with established exposure limits appear in the box above.**

**If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.**

## 8 . Exposure controls/personal protection

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Take off contaminated clothing and wash before reuse.

### Personal protection

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant gloves: Nitrile gloves. Butyl rubber gloves.
- Eyes** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Skin** : Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

### Additional information

Substance may be harmful if swallowed. In extreme cases (ingestion) may cause liver and/or kidney damage.

## 9 . Physical and chemical properties

- Physical state** : Solid. [Granular.]
- Flash point** : Closed cup: >93.4°C (>200.1°F) [SFCC]
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Tan. Red.
- Odor** : Mild.
- pH** : Not available.
- Boiling/condensation point** : Not available.
- Initial Boiling Point** : Not available.
- Melting/freezing point** : Not available.
- Relative density** : Not available.
- Density** : 6 (lbs/gal)
- Vapor density** : >1 [Air = 1]
- Odor threshold** : Not available.
- Evaporation rate** : Not available.
- VOC** : Not available.
- Viscosity** : Not available.
- Solubility (Water)** : Dispersible
- Vapor pressure** : 2.1 kPa (15.8 mm Hg) at 21°C (Calculated Value for all Components.)
- Pour Point** : -29°C (-20.2°F)
- Partition coefficient (LogKow)** : Not available.

## 10 . Stability and Reactivity

|   |  |
|---|--|
| <b>Chemical stability</b>                 | : The product is stable.   |
| <b>Possibility of hazardous reactions</b> | : Under normal conditions of storage and use, hazardous reactions will not occur.  |
| <b>Hazardous polymerization</b>           | : Under normal conditions of storage and use, hazardous polymerization will not occur.   |
| <b>Conditions to avoid</b>                | : No specific data.  |
| <b>Materials to avoid</b>                 | : Reactive or incompatible with the following materials: oxidizing materials.  |
| <b>Hazardous decomposition products</b>   | : Under normal conditions of storage and use, hazardous decomposition products should not be produced.   |
| <b>Conditions of reactivity</b>           | : Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.<br>Avoid temperature extremes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Hazardous combustion products may include hydrogen chloride, carbon monoxide, carbon dioxide and oxides of nitrogen and sulfur. |

## 11 . Toxicological information

### Acute toxicity

| Product/ingredient name                | Result          | Species | Dose        | Exposure |
|--|-----------------|---------|-------------|----------|
| Magnesium nitrate                      | LD50 Oral       | Rat     | 5440 mg/kg  | -        |
| 5-chloro-2-methyl-4-isothiazolin-3-one | LD50 Dermal     | Rabbit  | 660 mg/kg   | -        |
|  | LD50 Oral       | Rat     | 457 mg/kg   | -        |
|  | LC50 Inhalation | Rat     | 0.33 mg/l   | 4 hours  |
|  | Vapor           |         |             |          |
| X-CIDE™ 207 INDUSTRIAL MICROBIOCID     | LD50 Dermal     | Rabbit  | >5000 mg/kg | -        |

### Irritation/Corrosion

#### Conclusion/Summary

|             |   |
|-------------|---|
| <b>Skin</b> | : Skin Irritation Score = 4 (Extreme Irritant/Corrosive). |
| <b>Eyes</b> | : Eye Irritation Score = 4 (Extreme Irritant/Corrosive).  |

### Carcinogenicity

#### Classification

| Product/ingredient name                        | ACGIH | IARC | EPA | NIOSH | NTP     | OSHA  |
|--|-------|------|-----|-------|---------|-------|
| Magnesium nitrate                              | -     | 2A   | -   | -     | -       | -     |
| Crystalline silica: cristobalite               | A2    | 1    | -   | +     | Proven. | None. |
| Crystalline silica: Quartz (SiO <sub>2</sub> ) | A2    | 1    | -   | +     | Proven. | +     |

### Chronic toxicity Remarks

1) Diatomaceous earth, calcined

Not available.

2) Magnesium nitrate

Repeated small oral doses of nitrate may cause weakness, depression, headache and mental impairment. Magnesium nitrate is a methemoglobin-forming agent, chronic exposure may effect the ability of the blood carry oxygen causing the lips and skin to turn blue.

Generally, nitrates can be reduced to nitrites, under anaerobic conditions (without oxygen). Nitrosating agents that arise from nitrite under acidic gastric conditions react readily with nitrosatable compounds, especially secondary amines and alkyl amides, to generate N-nitroso compounds. Many N-nitroso compounds are carcinogenic. Ingested nitrate under conditions that result in endogenous (originating from within an organ) nitrosation has been classified IARC as probably carcinogenic to humans or Group 2A carcinogens (IARC monographs, vol. 94; 2006).

3) 5-chloro-2-methyl-4-isothiazolin-3-one

Not available.

## 11. Toxicological information

### 4) 2-Methyl-4-isothiazolin-3-one

Not available.

### 5) Crystalline silica: cristobalite

Silica crystalline as Cristobalite is a component of this product. Cristobalite is listed by NTP as a suspect carcinogen, by OSHA as a possible carcinogen, and by IARC as a possible carcinogen. Silica exists in several forms, but only the crystalline materials produce the chronic pulmonary condition termed specifically silicosis. Chronic inhalation of airborne crystalline silica dust may lead to fibrotic lung disease, silicosis or cancer (based on animal studies and limited evidence of carcinogenicity in humans).

An inhalation study in humans at a dose of 16 mppcf/8H/17.9Y intermittent produced toxic effects to the lungs, thorax, or respiration resulting in fibrosis, focal (pneumoconiosis), cough and dyspnea (RTECS).

An intratracheal (inside the airway tube between the voice box and chest cavity) dose of 200 mg/kg in rats produced lung, thorax, or respiration effects resulting in fibrosis, focal (pneumoconiosis). (RTECS) An intrapleural (inside the membrane lining of the lung cavity) dose of 90, and 100 mg/kg in rats produced tumors, and blood lymphomas (malignant but treatable cancer) including Hodgkin's disease (a type of lymphoma cancer). (RTECS)

### 3) Crystalline silica: Quartz (SiO<sub>2</sub>)

Crystalline silica as quartz is a component of this product. Prolonged inhalation of respirable crystalline quartz may cause delayed chronic lung injury - silicosis. Silicosis is a form of disabling pulmonary fibrosis which can be progressive and may lead to death. Silicosis may progress without further exposure to silica (Hathaway et al, 1991). Chronic inhalation of silica dust suppressed the immune response in mice (Scheuchenzuber et al, 1985), and a decreased immune response has also been shown in silicotics (Barlogova et al, 1981). The effect of silica on the immune mechanism may be mediated by its toxicity to pulmonary macrophages, a critical component of the immune response, and may have implications for the increased susceptibility of silicotics to respiratory infections, particularly tuberculosis. Inhaled crystalline silica particles produced several signs of pulmonary injury and inflammation in rats exposed to an airborne concentration of 50 mg/m<sup>3</sup> for 3 hours per day for 5 days (Driscoll et al, 1991).

ARC (International Agency for Research on Cancer) rates crystalline silica as "carcinogenic to humans" (Group 1). The JS NTP (National Toxicology Program) rates respirable crystalline silica as a "Proven Carcinogen".

Silica has been inactive for inducing DNA damage in the B. subtilis rec assay (Kanematsu et al, 1980), chromosome damage or sister chromatid exchanges in hamster cells (Price-Jones et al, 1980), chromosome damage in human cells (Oshimura et al, 1984), in vitro oncogenic transformation of hamster cells into cancer cells (Oshimura et al, 1984), and induction of micronuclei in mouse bone marrow (Vanchugova et al, 1985). Crystalline silica has caused DNA strand breaks in vitro; etching the surface with hydrofluoric acid reduced this activity.

At the time of this review, no reproductive studies were found for silica in humans. Few reproductive data are available for silica. As a component of welding fume, it caused infertility and fetal death in rats (Dabrowski et al, 1966). Intratracheal instillation of silica prolonged the estrus cycle in rats (Parsadian, 1967). So-called "soluble silica" was tested for reproductive effects in rats, but the results were not available at the time of this review (Smith et al, 1973).

## 12. Ecological information

### Aquatic ecotoxicity

| Product/ingredient name | Result | Species | Exposure |
|-------------------------|--------|---------|----------|
|-------------------------|--------|---------|----------|

## 12. Ecological information

|  |                               |   |          |
|--|-------------------------------|---|----------|
| 2-Methyl-4-isothiazolin-3-one          | Acute EC50 0.18 to 0.19 ppm   | Daphnia - Water flea - Daphnia magna - <24 hours            | 48 hours |
|  | Fresh water                   |   |          |
|  | Acute LC50 0.056 to 0.084 ppm | Crustaceans - Calanoid copepod - Acartia tonsa              | 48 hours |
|  | Marine water                  |   |          |
|  | Acute LC50 0.07 to 0.09 ppm   | Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss | 96 hours |
|  | Fresh water                   |   |          |
| 5-chloro-2-methyl-4-isothiazolin-3-one | Acute EC50 0.18 to 0.3 ppm    | Daphnia - Water flea - Daphnia magna - <24 hours            | 48 hours |
|  | Fresh water                   |   |          |
|  | Acute LC50 0.084 to 0.56 ppm  | Crustaceans - Calanoid copepod - Acartia tonsa              | 48 hours |
|  | Marine water                  |   |          |
|  | Acute LC50 0.19 to 0.31 ppm   | Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss | 96 hours |
|  | Fresh water                   |   |          |
| X-CIDE™ 207 INDUSTRIAL MICROBIOCIDE    | Acute LC50 9.2 mg/L           | Fish  | 96 hours |

**Conclusion/Summary** : Not available.

### Biodegradability

**Conclusion/Summary** : Not available.

## 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14. Transport information

| Regulatory information | UN number | Proper shipping name   | Classes | PG* | Label   | Additional information |
|------------------------|-----------|--|---------|-----|---|------------------------|
| DOT Classification     | UN3261    | CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Contains: 5-chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one) | 8       | II  |  | -                      |
| TDG Classification     | UN3261    | CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Contains: 5-chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one) | 8       | II  |  | -                      |
|                        |           |  |         |     |   |                        |

**14 . Transport information**

|                       |        |  |   |    |   |   |
|-----------------------|--------|--|---|----|---|---|
| <b>IMDG Class</b>     | UN3261 | CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Contains: 5-chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one) | 8 | II |  | <b>Emergency schedules (EmS)</b><br>F-A S-B |
| <b>IATA-DGR Class</b> | UN3261 | CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Contains: 5-chloro-2-methyl-4-isothiazolin-3-one, 2-Methyl-4-isothiazolin-3-one) | 8 | II |  | -   |

PG\* : Packing group

DOT Reportable Quantity Not applicable.

Marine pollutant Not applicable.

North-America NAERG : 154

**15 . Regulatory information**

**HCS Classification** : Toxic material  
Corrosive material  
Sensitizing material  
Carcinogen  
Target organ effects

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**SARA 302/304/311/312 extremely hazardous substances**: No products were found.  
**SARA 302/304 emergency planning and notification**: No products were found.  
**SARA 302/304/311/312 hazardous chemicals**: magnesium nitrate  
**SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: X-CIDE™ 207 INDUSTRIAL MICROBIOCIDE: Immediate (acute) health hazard, Delayed (chronic) health hazard  
CERCLA: Hazardous substances.: No products were found.  
**Clean Water Act (CWA) 307**: No products were found.  
**Clean Water Act (CWA) 311**: No products were found.  
**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.  
**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.  
**Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** :  
Not listed

**SARA 313**

|                              | <u>Product name</u> | <u>CAS number</u> | <u>Concentration</u> |
|------------------------------|---------------------|-------------------|----------------------|
| <b>Supplier notification</b> | : Magnesium nitrate | 10377-60-3        | 5 - 10               |

**United States inventory (TSCA 8b)** : All components are listed or exempted.

**Canada**

**WHMIS (Canada)** : Class D-2A: Material causing other toxic effects (Very toxic).  
Class D-2B: Material causing other toxic effects (Toxic).  
Class E: Corrosive material

**Canada (CEPA DSL)**: All components are listed or exempted.

## 15 . Regulatory information

### Additional information

This product is subject to regulation under the US Federal Insecticide, Fungicide and Rodenticide ACT (FIFRA) and is therefore exempt from US Toxic Substance Control Act (TSCA) Inventory listing requirements. EPA Registration No. 10707-44. Offshore Chemical Notification Scheme (OCNS) rating: Group A O-VII

## 16 . Other information

**Label requirements** : CAUSES EYE AND SKIN BURNS. HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER.

**Hazardous Material Information System (U.S.A.)** :

|                     |   |
|---------------------|---|
| Health              | 3 |
| Flammability        | 1 |
| Physical hazards    | 0 |
| Personal protection | h |

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection Association (U.S.A.)** :



**Date of printing** : 1/11/2012.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

**NOTE:** The information on this MSDS is based on data which is considered to be accurate. Baker Hughes, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.



Mayerson, Drew <drew.mayerson@bsee.gov>

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## Schlumberger Hydraulic Fracturing Presentation REMINDER

1 message

---

**Mayerson, Drew** <drew.mayerson@bsee.gov>

Thu, Apr 11, 2013 at 8:02 AM

To: BSEE PAC OPD <bseepacopd@bsee.gov>, BSEE PAC Managers/Supervisors <BSEEPACManagers\_Supervisors@boemre.gov>, Allan Shareghi <allan.shareghi@bsee.gov>, Chima Ojukwu <chima.ojukwu@boem.gov>

Today at 1pm in Conf. Room A Joe Lima from Schlumberger will be here to provide us a tutorial on hydraulic fracturing (fracking). He will also try to answer all of our questions regarding the technical aspects of fracking, onshore and offshore.

I've blocked the room from 1-5 just in case there are lots of questions.

Drew  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region



Mayerson, Drew <drew.mayerson@bsee.gov>

---

## Re: Schlumberger Presentation on Hydraulic Fracturing

1 message

---

**Drew Mayerson** <drew.mayerson@bsee.gov>  
To: "Seeley, Kenneth" <kenneth.seeley@bsee.gov>

Tue, Apr 2, 2013 at 6:03 PM

Can you come twice?

Sent from my iPad

On Apr 2, 2013, at 3:35 PM, "Seeley, Kenneth" <kenneth.seeley@bsee.gov> wrote:

you did include me the first time.

On Tue, Apr 2, 2013 at 3:30 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:

Sorry Ken, forgot you, but you'll probably want to attend.

Drew

Drew Mayerson

Regional Supervisor

Office of Production and Development

Pacific OCS Region

----- Forwarded message -----

From: **Mayerson, Drew** <drew.mayerson@bsee.gov>

Date: Tue, Apr 2, 2013 at 2:58 PM

Subject: Schlumberger Presentation on Hydraulic Fracturing

To: BSEE PAC OPD <bseepacopd@bsee.gov>, BSEE PAC Managers/Supervisors <BSEEPACManagers\_Supervisors@boemre.gov>, Richard Yarde <richard.yarde@boem.gov>, Joan Barminski <Joan.Barminski@boem.gov>, Allan Shareghi <allan.shareghi@bsee.gov>

Joe Lima, a representative from Schlumberger in Houston, has graciously agreed to teach us basic hydraulic fracturing methods on Thursday, April 11 in Training Room A. Joe will also answer our questions regarding hydraulic fracturing in the offshore. He will explain the basics of fracking and the differences in fracking (full frack vs frack pac vs mini frac, for example). He and I discussed that it would be best if I sent him a list of topics that we would like him to cover.

**Please provide me your list of topics by Thursday (4/4) at 2pm as well as the names of those that will be attending.**

This is a great time to get all of our technical questions out and hopefully answered. One question that keeps coming up is about how they dispose of the fluids. He answered that was up to the operator not Schlumberger, and although he knows the methods, I'm not sure he'll know the composition of the waste fluids after they're treated.

I'm still working with him to agree on a time of day, but it will probably be between 2-4 hours long. I'll let you know.

Drew Mayerson

Regional Supervisor

Office of Production and Development

Pacific OCS Region

—  
Kenneth R. Seeley, Ph.D.  
Regional Environmental Officer, Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
770 Paseo Camarillo  
Camarillo, CA 93010  
(P): 805-389-7799  
(F): 805-389-7592  
(C): 805-377-8618  
Kenneth.Seeley@BSEE.gov



Mayerson, Drew <drew.mayerson@bsee.gov>

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## Re: Hydraulic Fracturing 101 Presentation

1 message

---

Mayerson, Drew <drew.mayerson@bsee.gov>  
To: Joe Lima <lima1@slb.com>

Tue, Apr 2, 2013 at 5:03 PM

Joe,

Thanks for consenting to do this. It will be very helpful. In fact, we just received another FOIA (Freedom of Information Act) request today asking for all of our hydraulic fracturing records, emails, permits, etc.... We're doing our best to respond and the info you provide will help us provide more informed responses.

Thursday will be great. I don't know how long it will take. I've set aside 4 hours but I can go less or more depending on what you think. Afternoon will be best (1-5) but morning could work too.

I also requested respondents to my invitation to provide topics they want covered, such as how much water is used, frac fluid ingredients, proppants, what is a frac pack, etc... I'll try to get those in an email to you by Friday of this week.

Once again, Thanks,  
Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Tue, Apr 2, 2013 at 9:24 AM, Joe Lima <lima1@slb.com> wrote:

Drew,

As discussed yesterday, next week looks good for me. My thoughts are sometime on Thursday, Apr 11. How does that work for you? And if it is a good day, is there a time that is best?

Regards, Joe

Joe Lima

Schlumberger

lima1@slb.com

(O) 303-352-1261

(C) 720-281-8699





Mayerson, Drew <drew.mayerson@bsee.gov>

---

## Re: Schlumberger Presentation on Hydraulic Fracturing

1 message

---

Mayerson, Drew <drew.mayerson@bsee.gov>

Wed, Apr 10, 2013 at 9:26 AM

To: "Knowlson, Daniel" <daniel.knowlson@bsee.gov>

Cc: Roy Bobbitt <roy.bobbitt@bsee.gov>, John Kaiser <john.kaiser@bsee.gov>

I asked him to begin at 1 and go as long as needed.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

On Wed, Apr 10, 2013 at 9:24 AM, Knowlson, Daniel <daniel.knowlson@bsee.gov> wrote:

Drew, we have +/- 4 interested, not sure if all will attend but checking to see if we are limited. Also, any updates on time??

On Tue, Apr 2, 2013 at 2:58 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:

Joe Lima, a representative from Schlumberger in Houston, has graciously agreed to teach us basic hydraulic fracturing methods on Thursday, April 11 in Training Room A. Joe will also answer our questions regarding hydraulic fracturing in the offshore. He will explain the basics of fracking and the differences in fracking (full frack vs frack pac vs mini frac, for example). He and I discussed that it would be best if I sent him a list of topics that we would like him to cover. **Please provide me your list of topics by Thursday (4/4) at 2pm as well as the names of those that will be attending.**

This is a great time to get all of our technical questions out and hopefully answered. One question that keeps coming up is about how they dispose of the fluids. He answered that was up to the operator not Schlumberger, and although he knows the methods, I'm not sure he'll know the composition of the waste fluids after they're treated.

I'm still working with him to agree on a time of day, but it will probably be between 2-4 hours long. I'll let you know.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

---

Daniel R. Knowlson  
DO/BSEE/POCSR  
CA District Manager  
805-389-7746



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Sorry to bug you on vacation

2 messages

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Tue, Mar 26, 2013 at 9:47 AM

But i am writing a 1 page fracking briefing for the Coastal Commission and was wondering if u could send me the stuff u sent in to headquarters/PR, I have some of it, specifically the Nuevo/DCOR stuff. and I remember the venoco stuff, was there anymore?

thanks

Nathan

---

**Drew Mayerson** <drew.mayerson@bsee.gov>  
To: "Sinkula, Nathan" <nathan.sinkula@bsee.gov>

Tue, Mar 26, 2013 at 10:22 AM

No problem. I sent it a few minutes ago.

Sent from my iPad  
[Quoted text hidden]

February 21, 2013

To: Drew Mayerson  
*Regional Supervisor, Office of Production and Development*

From: Bobby Kurtz  
*Santa Clara Unit Geologist, Office of Production and Development*

Subject: Venoco, Inc. Annual Plan of Operations

**Non-Relevant**

[Redacted]

**Santa Clara Unit 2012 Review**

**Non-Relevant**

[Redacted]

Both horizontal completion wells are in the highly fractured opal CT-phase section of the Monterey. Venoco, Inc. mentioned that the majority of hydraulic fracking being performed onshore in the Monterey formation targets the less naturally-fractured quartz-phase sections of the formation.

**Other well activities:**

**Non-Relevant**

[Redacted]

Non-Relevant

[Redacted text block]

**Santa Clara Unit Plans for 2013**

Non-Relevant

[Redacted text block]



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Wastewater Injection and Earthquakes

3 messages

---

**Drew Mayerson** <drew.mayerson@bsee.gov>

Fri, Mar 29, 2013 at 7:36 AM

To: Nathan Sinkula <nathan.sinkula@bsee.gov>, Bobby Kurtz <Bobby.Kurtz@bsee.gov>, Robert Dame <Robert.Dame@bsee.gov>

Get ready... This is going to be an issue; just a feeling based on the press this ok research is getting and the recent onslaught of requests for hydro frac data. Bobby counted the number of injection wells at one point. If he still has the data we should put it in a table. Also, label those wells used for pressure maintenance since by definition those wells should not/could not contribute to seis events.

### Wastewater Injection and Earthquakes

<http://feedproxy.google.com/~r/Geologycom/~3/XWtkwcw5c0/wastewater-injection-and-earthquakes.shtml>

Shared via News360

Sent from my iPad

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Fri, Mar 29, 2013 at 8:45 AM

To: Drew Mayerson <drew.mayerson@bsee.gov>

Yea, I saw that. Mike had a geo membership so he printed me out a copy. I think we still have all that injection stuff from before. Ill look it over and see what else we may need to add.

Nathan

[Quoted text hidden]

---

**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Fri, Mar 29, 2013 at 8:50 AM

To: Drew Mayerson <drew.mayerson@bsee.gov>

i like how that article you linked to, acknowledges that hydrofracking itself is not linked to seismic events. too bad its buried near the bottom.

[Quoted text hidden]



Sinkula, Nathan <nathan.sinkula@bsee.gov>

---

## WATER USAGE ON GAIL IN 2010

1 message

---

**Mayerson, Drew** <drew.mayerson@bsee.gov>

Tue, Feb 26, 2013 at 4:23 PM

To: Nathan Sinkula <nathan.sinkula@bsee.gov>, Bobby Kurtz <geokurtz@gmail.com>

Cc: Daniel Knowlson <daniel.knowlson@bsee.gov>

CAN EITHER OF YOU FIND OUT THE AMOUNT OF WATER PRODUCED ON PLATFORM GAIL IN 2010 AND HOW MUCH WAS INJECTED FOR WATERFLOOD?  
EMAIL DAN WITH THE RESULTS AND COPY ME.  
THIS IS IN RESPONSE TO THAT FRACKING ARTICLE.

DREW

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region



Mayerson, Drew &lt;drew.mayerson@bsee.gov&gt;

## Platform Gail 2010 water handling

2 messages

Kurtz, Bobby &lt;bobby.kurtz@bsee.gov&gt;

Wed, Feb 27, 2013 at 7:17 AM

To: Daniel Knowlson &lt;daniel.knowlson@bsee.gov&gt;

Cc: Drew Mayerson &lt;drew.mayerson@bsee.gov&gt;, Nathan Sinkula &lt;nathan.sinkula@bsee.gov&gt;

Hi Dan,

The table below contains the water handling info for Platform Gail in 2010. Nearly all of their produced water was reinjected into Sockeye for the waterflood program. There was no water injection classified as disposal. Please let us know if we can help with anything else.

| Sockeye Field (Platform Gail) |                      |  |
|-------------------------------|----------------------|--|
| Date                          | Water Produced (bbl) | Water Injected for Reservoir Support (bbl) |
| Jan-2010                      | 1,044,262            | 1,044,262                                  |
| Feb-2010                      | 961,243              | 950,746                                    |
| Mar-2010                      | 1,007,144            | 1,006,941                                  |
| Apr-2010                      | 836,589              | 836,348                                    |
| May-2010                      | 1,077,646            | 1,077,646                                  |
| Jun-2010                      | 1,092,910            | 1,092,910                                  |
| Jul-2010                      | 1,143,570            | 1,143,570                                  |
| Aug-2010                      | 1,132,612            | 1,132,612                                  |
| Sep-2010                      | 1,100,679            | 1,100,679                                  |
| Oct-2010                      | 1,068,210            | 1,068,210                                  |
| Nov-2010                      | 1,082,729            | 1,082,729                                  |
| Dec-2010                      | 1,149,259            | 1,149,259                                  |
| <b>2010 Totals:</b>           | <b>12,696,853</b>    | <b>12,695,912</b>                          |

Thanks,

Bobby Kurtz

Geologist

Production and Development

Pacific OCS Region

Bureau of Safety and Environmental Enforcement

(805)389-7713

**Mayerson, Drew** <drew.mayerson@bsee.gov>

Wed, Feb 27, 2013 at 8:35 AM

To: "Kurtz, Bobby" <bobby.kurtz@bsee.gov>

Cc: Daniel Knowlson <daniel.knowlson@bsee.gov>, Nathan Sinkula <nathan.sinkula@bsee.gov>

THANKS FOR THE QUICK WORK. VERY HELPFUL.

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

[Quoted text hidden]



Mayerson, Drew <drew.mayerson@bsee.gov>

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## Re: We need to get some QA

1 message

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Sinkula, Nathan <nathan.sinkula@bsee.gov>  
To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Wed, Apr 10, 2013 at 1:22 PM

Is this the same procedure that occurs onshore?

- Many aspects of the actual fracking procedure are identical to those that occur onshore, however due to cost and logistical constraints that occur with offshore platforms, the size of jobs offshore is much smaller than some of the large Fracture jobs seen onshore in the Marcellus and Barnett shales. The other major difference is that offshore fracking fluids offshore may be composed of seawater rather than freshwater. Also typical operations in the POCS have been an order of magnitude smaller than those seen in onshore shale plays. typical proppant amounts used have been between 30,000# and 160,000#s while onshore shale developments can reach amounts of 5,000,000#s of proppant, and typical water usage is around 50,000-100,000 gals compared with the 1-3 million gals used in onshore shale fracturing jobs. Most of the frac jobs occurring offshore are of the Frac-Pack variety for sandstone formations, which are smaller than those seen in the onshore shales. Fracking has been tried in the offshore shales but with little success to date due to geologic properties of the Monterey Shale offshore California, and due to equipment and cost constraints working offshore.

Will any of the injected chemicals seep up into the ocean?

- highly unlikely. The fracking chemicals would need a conduit to the sea floor along a fault. Faults are avoided during fracking operations, losing fluids along the fault would compromise the effectiveness of the frac job. Fluid and pressure losses are closely monitored during fracking operations. Also the area where the fracking fluids are injected (near wellbore) will be the first areas drained during flowback and production. Leaks through casing are unlikely and are monitored and checked regularly. Even onshore it is highly unlikely to leak into any formations closer to the surface. In May 2011, EPA administrator Lisa Jackson told the U.S. Senate that she wasn't aware "of any proven case where the fracking process itself affected water.

Will this contribute to additional earthquakes in the area?

- The scientific community has not come to a consensus on the effect of fracking operations on seismic events. A recent article in the journal 'Geology' has indicated evidence to suggest that earthquakes in Oklahoma in November of 2011 were linked to fracking fluid disposal wells. However, the Oklahoma Geological Survey has indicated they believe the earthquakes to be of natural causes. The actual fracking of the reservoir rock has not been shown to increase seismic activity, rather it is the disposal of the fracking fluids post job that has been linked to increased seismic activity. Subsidence, the lowering of the ground-level due to voidage created by oil and gas production, has also been linked to seismic activity in California. Re-pressuring operations such as injection of water, or CO2, are used to mitigate subsidence events.

(5)

[REDACTED]

On Tue, Apr 9, 2013 at 2:14 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:

Nabil, Ken, and Nathan,

I've been asked to coordinate the response. I've placed names next to the question. Can I get the answer (where we can) by 1pm Thursday?

Thanks, Drew

Has BSEE approved a permit to conduct hydraulic fracturing? (Nabil)

Where is this taking place? (Nabil)

How long will operations occur? (Nabil)

Is this the same procedure as occurs onshore? (Nathan)

Have you conducted the necessary environmental reviews to ensure that the activities are safe? (Ken)

What reviews did you conduct? (Ken)

What will be discharged into the ocean, any chemicals? (Ken)

Will any of the chemicals injected seep up into the ocean? (Ken)

Will the discharges harm the environment? (Ken)

Will this contribute to additional earthquakes in the area? (Nathan)

Is it safe to fish in the same area as these operations are occurring? (Ken)

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

—— Forwarded message ——  
From: **Ming, Jaron** <jaron.ming@bsee.gov>  
Date: Tue, Apr 9, 2013 at 1:57 PM  
Subject: Fwd: We need to get some QA

To: Drew Mayerson <drew.mayerson@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

Drew, will you please coordinate responses to these questions? Thanks.

—— Forwarded message ——

From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>

Date: Tue, Apr 9, 2013 at 1:11 PM

Subject: We need to get some QA

To: Jaron Ming <Jaron.Ming@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>, Nabil Masri <Nabil.Masri@bsee.gov>

Cc: David Smith <David.Smith@bsee.gov>

Hi Jaron,

As discussed earlier, with one approval out the door and increased focus on the subject, we probably should have some QA on the recent approval in case we get calls should news get out. Is this info handy or available?

Has BSEE approved a permit to conduct hydraulic fracturing?

Where is this taking place?

How long will operations occur?

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Have you conducted the necessary environmental reviews to ensure that the activities are safe?

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Will any of the chemicals injected seep up into the ocean?

Will the discharges harm the environment?

Will this contribute to additional earthquakes in the area?

Is it safe to fish in the same area as these operations are occurring?

cheers,  
Nick



Mayerson, Drew <drew.mayerson@bsee.gov>

## Fwd: We need to get some QA

1 message

**Mayerson, Drew** <drew.mayerson@bsee.gov>  
To: Nathan Sinkula <nathan.sinkula@bsee.gov>

Wed, Apr 10, 2013 at 11:11 AM

Save to compile.  
Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

----- Forwarded message -----

From: **Knowlson, Daniel** <daniel.knowlson@bsee.gov>  
Date: Wed, Apr 10, 2013 at 11:08 AM  
Subject: Re: We need to get some QA  
To: Drew Mayerson <drew.mayerson@bsee.gov>  
Cc: Daniel Knowlson <daniel.knowlson@bsee.gov>, "Masri, Nabil" <Nabil.Masri@bsee.gov>, John Kaiser <john.kaiser@bsee.gov>

Drew, here is our response to the first three items re. hydraulic fracturing:

**Kaiser, John**

4:13 PM (18 hours ago)



to me

- 1) Has BSEE approved a permit to conduct hydraulic fracturing? (Nabil)- Yes, we approved the APM for the completion of S-05 on 3-7-13 and the APD on 3-7-13. The well has not been started yet and won't be until Gilda is back in operation.
- 2) Where is this taking place? (Nabil)- It's on platform Gilda well S-05. No others have been submitted OR approved.
- 3) How long will operations occur? (Nabil)- The mini-frac will take 2-3-days with lots of down time while changing intervals. I'll double check the timing with DCOR in the morning.

On Tue, Apr 9, 2013 at 2:41 PM, Masri, Nabil <nabil.masri@bsee.gov> wrote:

Dan,

Please draft a response to the first 3 questions in Nick's e-mail by noon tomorrow. Thanks

Nabil F. Masri  
Regional Supervisor, Office of Field Operations  
Pacific OCS Region  
Bureau of Safety and Environmental Enforcement  
805.389.7581  
nabil.masri@bsee.gov

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----- Forwarded message -----

From: **Mayerson, Drew** <drew.mayerson@bsee.gov>

Date: Tue, Apr 9, 2013 at 2:14 PM

Subject: Fwd: We need to get some QA

To: "Masri, Nabil" <Nabil.Masri@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>, Nathan Sinkula <nathan.sinkula@bsee.gov>

Cc: Nicholas Pardi <nicholas.pardi@bsee.gov>

Nabil, Ken, and Nathan,

I've been asked to coordinate the response. I've placed names next to the question. Can I get the answer (where we can) by 1pm Thursday?

Thanks, Drew

Has BSEE approved a permit to conduct hydraulic fracturing? (Nabil)

Where is this taking place? (Nabil)

How long will operations occur? (Nabil)

Is this the same procedure as occurs onshore? (Nathan)

Have you conducted the necessary environmental reviews to ensure that the activities are safe? (Ken)

What reviews did you conduct? (Ken)

What will be discharged into the ocean, any chemicals? (Ken)

Will any of the chemicals injected seep up into the ocean? (Ken)

Will the discharges harm the environment? (Ken)

Will this contribute to additional earthquakes in the area? (Nathan)

Is it safe to fish in the same area as these operations are occurring? (Ken)

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

----- Forwarded message -----

From: **Ming, Jaron** <jaron.ming@bsee.gov>  
Date: Tue, Apr 9, 2013 at 1:57 PM  
Subject: Fwd: We need to get some QA  
To: Drew Mayerson <drew.mayerson@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>

Drew, will you please coordinate responses to these questions? Thanks.

----- Forwarded message -----

From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>  
Date: Tue, Apr 9, 2013 at 1:11 PM  
Subject: We need to get some QA  
To: Jaron Ming <Jaron.Ming@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>, Nabil Masri <Nabil.Masri@bsee.gov>  
Cc: David Smith <David.Smith@bsee.gov>

Hi Jaron,

As discussed earlier, with one approval out the door and increased focus on the subject, we probably should have some QA on the recent approval in case we get calls should news get out. Is this info handy or available?

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Will this contribute to additional earthquakes in the area?

Is it safe to fish in the same area as these operations are occurring?

cheers,  
Nick

—  
Daniel R. Knowlson  
DOI/BSEE/POCSR  
CA District Manager  
805-389-7746



Mayerson, Drew <drew.mayerson@bsee.gov>

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## Re: We need to get some QA

1 message

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Ming, Jaron <jaron.ming@bsee.gov>

Fri, Apr 12, 2013 at 1:34 PM

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Cc: "Masri, Nabil" <Nabil.Masri@bsee.gov>, Kenneth Seeley <kenneth.seeley@bsee.gov>, Nathan Sinkula <nathan.sinkula@bsee.gov>, Daniel Knowlson <daniel.knowlson@bsee.gov>

Very nicely done. Thanks to all.

On Thu, Apr 11, 2013 at 5:10 PM, Mayerson, Drew <drew.mayerson@bsee.gov> wrote:

Jaron,

Attached are the answers to questions posed by OPA (Pardi). Please look them over and forward to Nick with any changes you may have.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

----- Forwarded message -----

From: **Pardi, Nicholas** <nicholas.pardi@bsee.gov>

Date: Tue, Apr 9, 2013 at 1:11 PM

Subject: We need to get some QA

To: Jaron Ming <Jaron.Ming@bsee.gov>, Drew Mayerson <drew.mayerson@bsee.gov>, Nabil Masri <Nabil.Masri@bsee.gov>

Cc: David Smith <David.Smith@bsee.gov>

Hi Jaron,

As discussed earlier, with one approval out the door and increased focus on the subject, we probably should have some QA on the recent approval in case we get calls should news get out. Is this info handy or available?

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Is it safe to fish in the same area as these operations are occurring?

cheers,  
Nick



Sinkula, Nathan <nathan.sinkula@bsee.gov>

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## Weekly

3 messages

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Thu, Feb 21, 2013 at 4:56 PM

To: Drew Mayerson <drew.mayerson@bsee.gov>

- continued, analyzing Santa Clara field (Gilda first) well files and inconsistencies in TIMS
- new, Venoco and PXP APOOs
- continued, looking at wells that DCOR had submitted as frac'd by Nuevo in SNTCLR field.
- started working on a 'Fracking' internal discussion paper

Nathan

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**Mayerson, Drew** <drew.mayerson@bsee.gov>

Thu, Feb 21, 2013 at 5:16 PM

To: "Sinkula, Nathan" <nathan.sinkula@bsee.gov>

Nathan,

I need your weekly before 2. It already went out....albeit just a few minutes before yours came in.

Drew

Drew Mayerson  
Regional Supervisor  
Office of Production and Development  
Pacific OCS Region

[Quoted text hidden]

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>

Thu, Feb 21, 2013 at 5:19 PM

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

yeah sorry, i just realized i didnt do it today. I will remember next week, big sticky note in front of my face.

Nathan

[Quoted text hidden]



Sinkula, Nathan &lt;nathan.sinkula@bsee.gov&gt;

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**weekly 3/21/2013**

1 message

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**Sinkula, Nathan** <nathan.sinkula@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Thu, Mar 21, 2013 at 2:58 PM

- continued adding SAWT to Tims, specifically 1st half 2012 for POO LLC
- continued well file to TIMS discrepancy check for P00215 and P00216 (Gilda, Santa Clara Field)
- new - WCD meeting DCOR
- new - response to Herdon on fracking statement
- continued research on fracking



Kurtz, Bobby <bobby.kurtz@bsee.gov>

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## Weekly Report: 12/17/12-12/21/12

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Kurtz, Bobby <bobby.kurtz@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Thu, Dec 20, 2012 at 12:31 PM

Weekly Report: 12/17/12-12/21/12

Non-relevant

A large black rectangular redaction box covers the majority of the email's body text.

PD is working with ONRR and the District Office to resolve a TIMS/OGOR well status discrepancy with PXP well: 043112064901. PXP has been instructed to continue reporting this well as "oil shut in" until such time that required filing procedures and approved well work are completed to move the well to temporarily abandoned status.

Non-relevant

A very large black rectangular redaction box covers the entire lower half of the email, obscuring all content below the paragraph above.

Non-relevant



**Bobby Kurtz**

*Geologist*

*Production and Development*

*Pacific OCS Region*

*Bureau of Safety and Environmental Enforcement*

*(805)389-7713*



Kurtz, Bobby <bobby.kurtz@bsee.gov>

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## Weekly Report: 1/7/13-1/11/13

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Kurtz, Bobby <bobby.kurtz@bsee.gov>  
To: Drew Mayerson <drew.mayerson@bsee.gov>

Thu, Jan 10, 2013 at 11:38 AM

Weekly Report: 1/7/13-1/11/13

Non-relevant

A large, solid black rectangular redaction box covers the majority of the page's content, starting below the 'Weekly Report' header and ending above the 'PD is drafting' paragraph. The text 'Non-relevant' is written in red at the top left corner of this redacted area.

PD is drafting a response to speculations and concerns brought to the Secretary by concerned citizens regarding fracking activities in the Pacific OCS region. Hydraulic fracturing is not a recovery technique utilized in the POCS region, but has been unsuccessfully attempted twice over 15 years ago by Chevron and Venoco under the review and approval of the MMS. Any future fracking activities would require the same assessment and approval by the BSEE.

Non-relevant

A second large, solid black rectangular redaction box covers the bottom half of the page, starting below the 'PD is drafting' paragraph and extending to the footer. The text 'Non-relevant' is written in red at the top left corner of this redacted area.

Non-relevant



—  
**Bobby Kurtz**

*Geologist*

*Production and Development*

*Pacific OCS Region*

*Bureau of Safety and Environmental Enforcement*

*(805)389-7713*



Mayerson, Drew <drew.mayerson@bsee.gov>

## Weekly Report: February 24-March 2, 2013

3 messages

Mayerson, Drew <drew.mayerson@bsee.gov>

Thu, Feb 28, 2013 at 2:35 PM

To: BSEE PAC OPD <bseepacopd@bsee.gov>, BSEE PAC Managers/Supervisors <BSEEPACManagers\_Supervisors@boemre.gov>, Armen Voskianian <armen.voskianian@bsee.gov>, Stephanie Rozek <stephanie.rozek@boem.gov>

## Weekly Report: February 24-March 2, 2013

### Items for the Director

New - PD is responding to a reporter's request for POCS injection/fracking data. Working with Public Affairs, PD staff as well as staff from FO and the District Offices are gathering information regarding past hydraulic fractures conducted in the Pacific Region as well as the timing and amount of ongoing water injection in the Region. The reporter is following up on a front page article written for a local weekly paper on the perceived dangers and lack of transparency in offshore hydraulic fracturing in the Pacific Region. We are also compiling a point by point response for OPA regarding the allegations made in the article.

**Non-Relevant**  
[Redacted]

### Conservation Related

**Non-Relevant**  
[Redacted]

**Non-Relevant** They have submitted APDs and will submit an APM for hydraulic fracturing of a Pliocene sandstone. If successful they plan to do more in the future. PD has conducted a geohazard review of their planned well and looked at the area surrounding the well for proximity to larger faults. No large faults were identified within 1500 feet of the planned fracks and the faults that were 1500 feet away did not reach the surface. DCOR estimates that their frack will penetrate about 100 to 200 feet into the formation.

**Non-Relevant**  
[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

**Regulatory**

**Safety**

Non-Relevant

[Redacted]

[Redacted]

[Redacted]

**Production Accounting**

Non-Relevant

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

**Strategic Plan**

**Other**

Non-Relevant

[Redacted]

Non-Relevant

[Redacted]

[Redacted]

Non-Relevant

[Redacted]

Annual Plan of Operations Meeting Schedule

Non-Relevant

Dame, Robert <robert.dame@bsee.gov>

Thu, Mar 7, 2013 at 2:27 PM

To: "Mayerson, Drew" <drew.mayerson@bsee.gov>

Cc: BSEE PAC OPD <bseepacopd@bsee.gov>, BSEE PAC Managers/Supervisors <BSEEPACManagers\_Supervisors@boemre.gov>, Armen Voskanian <armen.voskanian@bsee.gov>, Stephanie Rozek <stephanie.rozek@boem.gov>

**Weekly Report: March 4-8, 2013**

**Items for the Regional Director**

Non-Relevant

[Redacted content]

OPD staff are compiling a database on all historical and current injection and hydraulic fracture completions in the POCS and are preparing an internal BSEE memorandum and possible FAQ sheet to be posted on the public POCS BSEE website.

**Conservation Related**

Non-Relevant

[Redacted content]

Non-Relevant

Regulatory

Safety

Non-Relevant

Production Accounting

Non-Relevant

Strategic Plan

Other

Non-Relevant

Non-Relevant