THE NEXT FRONTIER:

OFFSHORE HYDRAULIC FRACTURING

Environmental Law Institute, Washington, DC

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SEMINAR SUMMARY

Land-based hydraulic fracturing has been the subject of extensive discussion and debate in recent years. But offshore hydraulic fracturing has received relatively little attention, despite having been used in practice for many years to stimulate wells where production has declined and where there are offshore shale plays.

Emerging awareness of offshore hydraulic fracturing has spurred questions about the nature of the practice, how it has been employed, and the framework for managing it. The webinar convened representatives from various sectors to address these and other questions surrounding the science, law, and policy of offshore hydraulic fracturing. The goal of the webinar was to provide perspective on the growing, yet rarely discussed, practice of using hydraulic fracturing in the ocean setting.

MODERATOR:

- **David Roche**, Staff Attorney, Ocean Program, Environmental Law Institute

PANELISTS:

- **Jayni Foley Hein**, Policy Director, Institute for Policy Integrity at NYU School of Law
- **Brian Segee**, Senior Attorney, Environmental Defense Center
- **Rock Zierman**, Chief Executive Officer, California Independent Petroleum Association

Ms. Jayni Foley Hein focused her remarks on what is known about offshore hydraulic fracturing, uncertainties about the practice, and the regulatory framework for managing it. Ms. Hein began with a brief overview of the practice. Offshore hydraulic fracturing is an extraction technique used primarily in well completion, involving the injection of water, sand, and certain chemicals at high pressures to fracture oil- and gas-bearing rock, and is often combined with gravel completion in "frac packs." Ms. Hein noted that it is practiced off the California coast, in the Gulf of Mexico, and internationally in areas such as the North Sea, West Africa, and Brazil.

Ms. Hein then described the prevalence of offshore hydraulic fracturing, noting that sources indicate that 12% of all wells in the Gulf of Mexico use the practice, a number that is expected to grow 10% by 2015. Risks are associated with technical and practical challenges, and they include disposal of wastewater, wildlife impacts, the potential for blowouts and well failures, air pollution, and seismicity.

Ms. Hein then discussed the regulatory framework governing hydraulic fracturing. The Outer Continental Shelf Lands Act (OCSLA) implements a four-stage process for offshore management through lease plans, sales, and exploration/development plans—a process that is administered by the Department of Interior (DOI) through the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE). After wells begin commercially producing, the leases have no effective termination date, leading to drilling under older plans. Before drilling takes place under plans, agencies must approve site-specific applications for permits to drill (APD) or modify (APM), which could include a proposal to use hydraulic fracturing. BOEM has approved at least 15 such permits off the coast of California alone. Notably, the plans and applications are usually approved without additional review under the National Environmental Policy Act (NEPA).

She next highlighted the role of NEPA in offshore hydraulic fracturing. Three stages require environmental review, including lease planning, lease sales, and development plan approval. One criticism is that Categorical Exclusions (CEs) are often used for exploration plans and a process known as "tiering" limits more thorough review of site-specific plans. In addition, Environmental Impact Statements (EISs) are not normally prepared for APDs or APMs, and the federal government has not prepared a programmatic EIS for offshore hydraulic fracturing generally. The Clean Water Act makes it unlawful to discharge pollutants into U.S. waters without a permit—offshore hydraulic fracturing discharges are covered by National Pollutant Discharge Elimination System (NPDES) permits issued by the Environmental Protection Agency (EPA). Ms. Hein also discussed other relevant statutes, including the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), and the Coastal Zone Management Act (CZMA).

Ms. Hein concluded by highlighting emerging questions and issues. First, there is no robust analysis of the risks associated with offshore hydraulic fracturing, and no programmatic EIS has been completed. Second, it is unclear how the technology will develop, and whether the corresponding regulatory regime will be adequate. Third, there is uncertainty related to how the regulatory framework should optimally govern the growing practice of offshore hydraulic fracturing.

Following Ms. Foley Hein's presentation, Mr. Brian Segee provided an overview of offshore hydraulic fracturing and the Environmental Defense Center's (EDC's) ongoing work on the subject. Mr. Segee noted that EDC formed in the wake of the 1969 Santa Barbara Channel oil spill. Between 1969 and 1984, lease sales were completed in the Channel, and EDC discovered in 2012 that hydraulic fracturing and other forms of well stimulation (e.g., acidization) were being used at some of those wells. The practice was approved primarily by BSEE during the APD stage, and CEs were applied to NEPA review. EDC's report, "Dirty Water," provided a number of recommendations regarding offshore hydraulic fracturing and well stimulation in California. A primary EDC finding was that myriad uncertainties surround

offshore hydraulic fracturing, including within agencies permitting the practice. In addition, EDC called for a moratorium to align available science with industry practices, analogizing the current application of regulatory processes to what occurred prior to the *Deepwater Horizon* oil spill.

Another recommendation, based on the finding that the California Coastal Commission (CCC) was not aware of the process, was that BSEE and BOEM go through the consistency review process under the CZMA during the APD and APM stages. EDC also recommended MMPA and ESA review, along with the revision of the NPDES general permit to address offshore hydraulic fracturing. Since the publication of the report, the EPA revised the NPDES general permit, adding a chemical inventory requirement for wells that discharge waste into the ocean.

Mr. Segee next discussed the role of NEPA review. The Council on Environmental Quality has made policy statements in regards to the *Deepwater Horizon* spill that new and risky practices should not be approved using CEs, which are now being applied to offshore hydraulic fracturing and well stimulation. In the Santa Barbara Channel, EDC found that many CEs were tiered to older NEPA documents, including an EIS from 1974. Under OCSLA, APDs are an opportunity to conduct fuller NEPA review. Mr. Segee noted that there is little transparency regarding the documents and rationale for decisions being made. DOI could alter its policies regarding document availability and NEPA compliance during the APD and APM processes.

Following Mr. Segee's remarks, Mr. Rock Zierman gave an overview of offshore hydraulic fracturing as it relates to the broader oil and gas regulatory framework. Mr. Zierman began by providing context for his remarks, noting that hydraulic fracturing has reshaped domestic oil and gas production, with the U.S. decreasing imports to 33% of consumption, energy prices decreasing, and manufacturing increasing. In addition, hydraulic fracturing is a completion technique that is used once in the life of a well, and it is one of the more studied energy recovery practices, which has proven to be safe and environmentally friendly in most instances.

Mr. Zierman highlighted several studies regarding hydraulic fracturing. Among other analyses, the Bureau of Land Management found that onshore hydraulic fracturing can be safe, although there are data gaps that may require more site-specific analysis. In California specifically, Senate Bill 4 calls for increased data for onshore and offshore practices and the Council on Science and Technology is working on a robust study; the state is completing environmental impact review on both onshore and offshore well completion; and Kern County is completing a similar study. These studies and others are continuing to fill data gaps and ensure that there is even more information available. California's Senate Bill 4 is a comprehensive regulatory scheme for permitting, requiring pre-notice, chemical disclosure, seismic reviews, and many more things.

Mr. Zierman stated that he did not think offshore hydraulic fracturing was "The Next Frontier" as implied in the webinar title, at least in California. Mr. Zierman highlighted that the practice had been used for decades in some capacity and its use has been infrequent. He said that most of California's offshore hydraulic fracturing results in no discharge—waste is transported to shore and disposed in a close-loop system. He noted that the practice has not been used in several years in California due to

sufficient reservoirs and relatively limited ability to increase production. If it were to happen, producers would need to comply with the provisions of Senate Bill 4, including pre-notice and disclosure of chemicals used on FracFocus.org and the Division of Oil and Gas website.

In federal waters off of California's coast, offshore drilling discharges are subject to EPA Region 9's NPDES general permit, revised in December 2013. Mr. Zierman stated that the permit considers the nature of offshore hydraulic fracturing and the best available science regarding effluent discharges and their impact on coastal ecosystems. He stated that earlier suggestions that discharges are poorly characterized are not true—the EPA development documents included summaries of numerous studies, testing protocols, and chemical analyses to arrive at the best available technologies for controlling effluent discharges. The 2013 permit revision builds on previous requirements and increases the frequency of produced water testing and monitoring—operators must conduct effluent toxicity tests on a quarterly basis. In addition, there are new chemical inventory reporting requirements, similar to Senate Bill 4 on the state side. Finally, EPA and BSEE both have the authority to inspect at any time and have used that authority in the past.

Regarding jurisdictional issues, Mr. Zierman stated that in state waters offshore hydraulic fracturing does not constitute "development" under California's Coastal Act. *Development* does not apply to down-hole oil and gas operations which occur below the seabed, thus excluding the practice. In federal waters, he stated that consistency review is precluded for offshore well completions that are adequately described in the Outer Continental Shelf plan. He concluded by agreeing that transparency and disclosure are important issues that could allay concerns about offshore hydraulic fracturing.

Following the completion of their presentations, Ms. Foley Hein, Mr. Segee, and Mr. Zierman each provided brief take-away statements. Ms. Foley Hein stated that offshore hydraulic fracturing is happening, but the full extent is not public knowledge. Regulators need to make sure that adequate information is available and that the current regulatory system is able to understand and control the risks. Mr. Segee expressed concern that the manner in which offshore hydraulic fracturing and well stimulation are being authorized is not heeding warnings from past experiences offshore, including the *Deepwater Horizon* oil spill, and that there should be a moratorium until detailed information is available. Finally, Mr. Zierman emphasized that offshore hydraulic fracturing is well-understood and well-regulated practice, though increased information and transparency would benefit all stakeholders and the public.

QUESTIONS AND ANSWERS

Does offshore hydraulic fracturing involve the same practice as onshore hydraulic fracturing?

Mr. Zierman stated that largely it is a similar practice wherever it occurs, though the footprint on the drilling rig be smaller. Ms. Hein observed that there are practical differences introduced by drilling in deep water. She noted that if there is any spill or leak, it will immediately contaminate the marine environment, leading to less margin of error. In addition, how the practice is growing and changing is

different than onshore, and there are few specific studies and limited regulatory oversight. Mr. Zierman noted that California does not utilize deep water drilling or drilling from floating platforms.

How does the discharge of produced water work in the offshore environment, and how do regulators and operators track the quantities discharged?

Mr. Zierman stated that off the California coast, operators must have an NPDES permit to discharge and must test the water quarterly (if any test results are elevated, then more frequent tests occur), leading to a good track record of characterizing discharges. Ms. Hein clarified that each EPA region has its own NPDES general permit, and more work is needed analyzing variances between Region 9 and Region 6 general permit requirements. Mr. Segee noted that discharge control is dependent upon-self reporting and monitoring. Ms. Hein followed up that given limited EPA, BOEM, and BSEE resources, reliance on self-reporting may result in imperfect compliance.

Is there a role for EPA to play in getting a better understanding of risks of offshore hydraulic fracturing?

In addition to more peer-reviewed scientific studies, Ms. Hein provided two other examples: (1) provide better oversight and enforcement, including unannounced tests and inspections; and (2) improve the process of understanding and characterizing discharges, ensuring that monitoring techniques keep up with the rapidly changing technology. Mr. Segee noted that the California Coastal Commission has asked EPA to go through the CZMA consistency review process. In addition, EPA could launch studies of the issue.

How are air emissions from offshore hydraulic fracturing operations regulated?

Mr. Zierman said that the practice is subject to the same requirements as onshore hydraulic fracturing under the Clean Air Act, emphasizing that emissions of methane have decreased 73% from hydraulic fracturing wells. Ms. Hein added that EPA is contemplating new air emission regulations for oil and gas operations, which should ideally account for offshore production.

What additional information on offshore hydraulic fracturing would be most helpful to evaluate and manage the practice?

Mr. Segee said that there needs to be some mechanism for the public to know when there is a new APD proposal, and that it is important to buttress NEPA review of such applications. Ms. Hein stated that there need to be more studies, both scientific and regulatory, regarding the practice. She raised the issue that under OCSLA, BOEM prepares NEPA documents related to offshore hydraulic fracturing, and it may be helpful to have more analysis independent of the leasing process. One possibility would be a programmatic EIS by region. Finally, DOI could develop more robust fact-sheets and other publically-facing documents on the practice.

What penalties do well operators face for non-compliance?

Mr. Zierman noted that there are significant fines and penalties for non-compliance. Ms. Hein noted that EPA can bring enforcement actions under statutes like the Clean Water Act and Clean Air Act. Other statutes, like NEPA, are procedural, and the goal is compliance with the process.

What is the geographical limit of state authority offshore California?

Mr. Segee responded that under the CZMA, the boundary line between federal and state jurisdiction in coastal waters is 3 miles offshore. However, it is important to note that beyond 3 miles, actions must be consistent with the state coastal plan and undergo consistency review. Mr. Segee stated that because consistency review and full NEPA review were not used, the public had no information regarding the practice and its use. Mr. Zierman responded that there are threshold questions of what initiates consistency review—if processes are adequately described in the planning documents and plan revisions, then consistency review is precluded.

What are priority actions to be taken moving forward, either by regulatory bodies or the regulated community?

Ms. Hein said that better studies are needed, possibly including a programmatic EIS. In addition, it is important to reexamine the process of granting CEs and exempting the practice from NEPA review. Mr. Segee emphasized the importance of a moratorium, and at the very least increasing transparency and information availability. Mr. Zierman agreed that more transparency and information availability would be helpful.

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