

# State Poised To Advance Novel CCS Project Rules Seen As Key Model

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State regulators are moving closer to advancing novel permitting requirements for a groundbreaking carbon capture and sequestration (CCS) project that may inform how U.S. EPA eventually regulates similar sequestration projects around the country, with more elaborate monitoring and data verification requirements to certify sequestration is taking place and not threatening groundwater supplies, sources say. EPA Region IX officials are involved in multi-agency discussions over the proper state regulation of the Bakersfield-area project, which will use the sequestered carbon dioxide (CO<sub>2</sub>) for enhanced oil recovery (EOR).

The developments could affect EPA consideration of a proposal submitted recently by a coalition of industry representatives and environmentalists for first-time Safe Drinking Water Act (SDWA) rules governing underground injection control (UIC) for wells that can simultaneously produce oil and sequester CO<sub>2</sub>. The California project is also seen as especially significant because an increasing number of EOR projects around the country are expected to seek certification that they are sequestering CO<sub>2</sub> for the long term in part to generate carbon emission-reduction credits, according to sources.

At issue is the Hydrogen Energy California (HECA) project near Bakersfield, proposed by Hydrogen Energy International, LLC, which is a joint venture of BP Alternative Energy and Rio Tinto mining company. The proposal consists of a 250-megawatt integrated gasification combined cycle (IGCC) power plant that will take blends of coal and petroleum coke, combined with non-potable water, and convert them into hydrogen and CO<sub>2</sub>. The CO<sub>2</sub> will be separated from the hydrogen using the "methanol-based Rectisol process," according to the Department of Energy (DOE).

The hydrogen gas will be used to fuel the power plant, and the CO<sub>2</sub> will be transported by pipeline to the nearby Elk Hills Oil Field where it will be injected for storage and used for EOR. The project aims to sequester 90% of the CO<sub>2</sub> created by the plant, equaling more than 2 million tons per year. Occidental Petroleum (Oxy), which controls the oil field, will purchase the CO<sub>2</sub> for permanent sequestration. Occidental is required to obtain the local and state permits to sequester the CO<sub>2</sub>.

State agencies have struggled to determine the appropriate permit requirements for the HECA project, which must obtain approval by the California Energy Commission (CEC), the California Department of Conservation (DOC) and its division of oil, gas and geothermal resources (DOGGR), as well as the local air district. CEC and other officials are scheduled to hold a public meeting March 26 to discuss the status of the project.

DOC officials have told project developers and top officials in the Schwarzenegger Administration that they currently lack the authority and expertise to regulate a project that aims to sequester CO<sub>2</sub> for long periods of time, despite the fact that the department does have the authority to permit CO<sub>2</sub> sequestration used for EOR.

"Through primacy granted by EPA for class II wells, DOGGR currently has the authority to permit EOR using a variety of materials as injectants, including CO<sub>2</sub>," states a March 1 letter from the state's DOC director to a top Schwarzenegger Administration official. A copy of the letter is available at [InsideEPA.com](http://InsideEPA.com).

DOC is seeking state funding to establish a new CCS unit that can obtain this "needed technical regulatory expertise" to help it develop the regulatory provisions, the DOC letter states.

Over the past two months, state regulators have met with EPA officials and the project developers to "discuss the interesting and complicated issues presented," and to consider "myriad issues concerning the federal government's jurisdiction" regarding the HECA project, the letter adds. For example, DOC and DOGGR officials met last month with EPA Regions IX's groundwater office manager.

While EPA is working to finalize a draft regulation by early 2011 under the SDWA establishing a new Class VI UIC permit for CCS projects where CO<sub>2</sub> is injected for long-term storage into saline aquifers or other types of underground spaces, this permit is not expected to apply to the HECA project because it involves EOR.

Environmentalists and industry representatives recently submitted a proposal to EPA for a new Class II permit that would specifically lay out requirements for EOR projects aiming to sequester CO<sub>2</sub> for the long-term. But because EPA will promulgate its Class VI permit for CCS in saline formations and non-EOR projects by the end of this year or beginning of next, it is "doubtful that this permit would be done in time to inform" the stakeholders' Class II permit proposal, said an environmentalist closely following the issue.

As a result, California and other states currently face a permitting vacuum at the federal level for EOR projects that are seeking longer-term CO<sub>2</sub> sequestration recognition. While states have been approving EOR projects for decades, never before have they been asked to certify the long-term storage of CO<sub>2</sub> for purposes of showing that the projects can generate carbon-reduction credits, for example. This has led state regulators to determine that more elaborate measuring, monitoring, verification (MMV) and well-abandonment standards must be applied to ensure the permanence and safety of the sequestration.

In the HECA case, project developers must also carry out these enhanced permitting provisions because new power plants in California must meet an "environmental performance standard" in terms of efficiency and greenhouse gas emission limits.

"Technically, there is no difference between sequestration and EOR when you are injecting CO<sub>2</sub> into a producing oil and gas formation -- the only difference for HECA is that we want and need to prove sequestration a.k.a permanent storage by utilizing MMV procedures," said a HECA source.

Despite DOC's own perceived regulatory limitations, state officials are using the state's stringent environmental review law -- the California Environmental Quality Act (CEQA) -- and state resources statutes to craft adequate MMV and well-abandonment standards for the HECA project to attempt to satisfy EPA and other regulators' concerns.

"The MMV procedures will provide more formality -- for reporting purposes," said the project developer source. "The MMV procedures are still to be determined as part of the CEQA review process and are an element of discussion at [the March 26] meeting."

EPA's input "has (and will) confirm that the CO<sub>2</sub> injection for the HECA project can be permitted under UIC Class II, similar to other EOR/sequestration projects around the nation, and does not need to wait for final EPA Class VI rules, which are indeed for non-EOR 'pure sequestration' permits," the source added.

An EPA Region IX source said the HECA project is unique in part because it is a power plant pipelining CO<sub>2</sub> to the EOR location in a closed-loop system, in contrast to traditional EOR projects where developers sometimes use "natural sources" of CO<sub>2</sub> at the sites. Further, the main focus of the HECA project is to accurately track the CO<sub>2</sub> as part of a lifecycle assessment, whereas the primary focus of traditional EOR projects is to get as much oil out of the ground as possible, with less attention being paid to what happens to the CO<sub>2</sub>, the source said.

"The difference is that there is likely to be much greater monitoring and tracking" in the HECA project -- "knowing exactly how much CO<sub>2</sub> you put in the ground, and how much is being pulled back out when you recover the oil, and what's left in the ground. That quantification of the lifecycle of CO<sub>2</sub> in that kind of operation has not been a focus historically."

Regarding the plan for an enhanced Class II permit for EOR submitted recently to EPA headquarters officials by the industry and environmental coalition, the Region IX source said the proposal is essentially being treated as a comment on the pending Class VI permit regulations and will be reviewed in that context.

EPA officials have envisioned the potential for long-term CO<sub>2</sub>-sequestration projects in depleted oil and gas fields during the development of the pending SDWA Class VI permit regulations, the source said. But potential future regulations governing these types of project likely will require a broader assessment that goes beyond the SDWA UIC permitting system and involves other EPA offices, including air and climate change, according to the source.

EPA officials plan to "learn whatever we can about" how California permits the HECA project to help inform these future federal regulatory efforts, the source added.

The environmentalist believes permitting approval for the HECA project is only a matter of time. "From my standpoint it seems like the agencies are in agreement about how to proceed," the source said.

The source said the permitting of the HECA project will be influential around the country, because most EOR projects currently do not seek permitting to show long-term sequestration. However, given the expectation for widespread CO<sub>2</sub> regulations on a variety of emission sources, these projects going forward are being seen as significant generators of carbon-reduction credits that could be sold to entities needing to meet regulatory obligations.

"Some EOR operators have said, 'look, give us the regulations we need so we can certify projects, because we want to play in the carbon-constrained world,' " the environmentalist said. The HECA project developers, however, are saying "we don't need to wait for these new regs to come out," the source added.

The California approval and permitting requirements for the HECA project could easily be used as models for other state agencies around the country, and eventually as a template for how, and if, EPA intends to regulate EOR projects seeking special recognition of the sequestration benefits of their projects, the source said.