

CALIFORNIA ENERGY COMMISSION

1516 Ninth Street
 Sacramento, California 95814

Main website: www.energy.ca.gov



March 16, 2012

Marisa Mascaro
 SCS Energy
 30 Monument Square, Suite 235
 Concord, MA 01742

Dear Ms. Mascaro:

| DOCKET | |
|---------------|-------------|
| 08-AFC-8 | |
| DATE | MAR 16 2012 |
| RECD. | MAR 16 2012 |

On September 2, 2011, SCS Energy California LLC acquired 100% ownership of Hydrogen Energy California LLC from BP Alternative Energy North America Inc. and Rio Tinto Hydrogen Energy LLC. Upon acquiring the project you notified the Energy Commission that several changes would be made to the project proposal, including the addition of a 4-mile long rail spur, a urea facility, and a change in the ratio of coal and petroleum coke that would be used (Status Report #9). You have indicated that you would provide additional detail on these changes and responses to outstanding issues previously identified by staff by April 2012 and propose a project schedule that results in a Commission decision by March 2013.

As proposed, HECA would capture carbon from the raw syngas produced by its integrated gasification combined cycle at steady-state operation, and sell it to Occidental Petroleum whereby it would be transported to the Elk Hills Oil Field via pipeline for CO₂ enhanced oil recovery (EOR) and sequestration.

The Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) is responsible for issuing Class II Permits in California under the Safe Drinking Water Act, a federal statute requiring review of any activity involving the injection of materials underground that has the potential to negatively impact groundwater resources. The CO₂ EOR proposal will require Class II permits for every proposed injection well. Because the viability of HECA is dependent upon the viability of Occidental Petroleum's CO₂ EOR proposal, Occidental Petroleum must file a Class II permit application with DOGGR for these proposed EOR activities in a timeframe that provides the Energy Commission with sufficient information to reach a decision on the HECA application for certification within the applicant's proposed schedule.

Energy Commission staff recommends that these Class II injection well permit applications be submitted as soon as possible and requests that SCS Energy provide the Energy Commission with a copy of these applications when submitted, as well as any additional information that may be required by DOGGR during their review. In addition to the information normally required for a Class II permit, and that specified in section 1724.7, title 14, California Code of Regulations, DOGGR will need the information requested in the attached data requests in order to evaluate the procedures and the potential impacts involved with use of CO₂ in Occidental Petroleum's EOR activities.

PROOF OF SERVICE (REVISED 3/16/12) FILED WITH
 ORIGINAL MAILED FROM SACRAMENTO ON 3/16/12
EKS

If you have any questions please call me at (916)651-8853, or by email at
rworl@energy.ca.gov.

Sincerely,

Original signed by
Robert Worr
Project Manager

Attachments: Data Request
Cc: Proof of Service List

Technical Areas: DOGGR Requests; Energy Commission Soil and Water, Geology

BACKGROUND:

The Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) is responsible for issuing Class II Permits in California under the Safe Drinking Water Act, a federal statute requiring review of any activity involving the injection of materials underground that has the potential to negatively impact groundwater resources. The CO₂ EOR proposal will require Class II permits for every proposed injection well. In addition to the information normally required for a Class II permit, and that specified in section 1724.7, title 14, California Code of Regulations, DOGGR will need the information requested below in order to evaluate the permutations involved with use of CO₂ in EOR activities. In order to evaluate the potential impacts from this project the baseline conditions of the project site and intended project actions need to be understood. The following data requests are intended to insure that the staff has the necessary information that will allow timely analysis of the revised project.

DATA REQUESTS

1. Please submit a permit application to the Department of Conservation, the Division of Oil, Gas, and Geothermal Resources, with a copy to the California Energy Commission for a Class II permit for every injection well Occidental Petroleum intends to drill for purposes of utilizing carbon dioxide procured from HECA.
2. Please provide an engineering study to the Department of Conservation, the Division of Oil, Gas, and Geothermal Resources with a copy to the California Energy Commission. The study should include:
 - a. Statement of the primary purpose of the project.
 - b. The total amount of CO₂ that is planned to be injected over the life of the project; reservoir characteristics of each injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient; original, if available, and present temperature; pressure and distribution, present and original, if available; and residual oil, gas, and water saturations.
 - c. Reservoir fluid data for each injection zone, such as oil gravity and viscosity, water quality, and specific gravity of gas.
 - d. Casing diagrams, include cement plugs, and actual or calculated cement fill behind casing, of all wells within the area affected by the project, and evidence that wells in the area will not have an adverse effect on the project or cause damage to life, health, property, or natural resources.
 - e. A list of wells that may need to be remediated based upon a possible conduit for the CO₂ to migrate outside of the intended zone of injection.

- f. The planned well-drilling and abandonment program to complete the project, including a flood-pattern map showing all injection, and abandoned wells, and unit boundaries.
 - g. The engineering study data must include calculations for the amount of remaining oil reserves, as well as the estimated reservoir volume for the proposed CO₂ injection project, by zone. In addition, the anticipated reservoir pressure increase, as a result of the proposed injection.
 - h. An estimated amount of CO₂ that needs to be injected to produce an incremental barrel of oil.
- 3. Please provide a geologic study to the Department of Conservation, the Division of Oil, Gas, and Geothermal Resources, with a copy to the California Energy Commission. The study should include:
 - a. Structural contour map drawn on a geologic marker at or near the top of each injection zone in the project area.
 - b. Isopachous maps of each injection zone or subzone in the project area.
 - c. At least one geologic cross section through at least one injection well in the project area.
 - d. Representative electric log to a depth below the deepest producing zone (if not already shown on the cross section), identifying all geologic units, formations, freshwater aquifers, and oil and gas zones.
 - e. Detailed study of the injection zone cap rock/confining layer. This should include a seismic study and an analysis of the possibility of micro-fractures in the cap rock that could allow the CO₂ to migrate outside of the zone.
 - f. Seismic study related to the injection of the large volumes of CO₂ and the effects on local faulting.
- 4. Please provide an injection plan, to the Department of Conservation, the Division of Oil, Gas, and Geothermal Resources, with a copy to the California Energy Commission. The plan should include:
 - a. A map showing injection facilities, including the anticipated total number of wells to complete the project and all pipelines.
 - b. Maximum anticipated surface injection pressure (pump pressure) and daily rate of injection, by well.
 - c. Monitoring system or method to be utilized to ensure that the injection CO₂ is confined to the intended zone or zones of injection.
 - d. Design details of the type of injection project such as:

- Water-alternating-gas (WAG) design
 - If a WAG pattern is used, what will happen to the delivered CO₂?
 - Will it have to be vented to the atmosphere?
 - Miscible CO₂ Flood
 - Immiscible CO₂ Flood
- e. List of proposed cathodic protection measures for plant, lines, and wells, if such measures are warranted.
- f. If the project type is WAG, the source and treatment of water to be injected.
- g. Source and analysis of the CO₂.
- h. Location and depth of each water-source well that will be used in conjunction with the project.
- i. Amount of CO₂ that will be produced back and reinjected, and how this will affect the rate of injection over time.
- j. Change of formation pressure with time as a result of the injection and the impact on the rate of injection.
- k. Corrosion testing methods for the wells and facilities and schedule.
- l. Pre-injection testing such as:
 - Step rate testing
 - Pressure falloff testing

NOTE: All maps, diagrams and exhibits required should be clearly labeled as to scale and purpose and shall clearly identify wells, boundaries, zones, contacts, and other relevant data.



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV**

**APPLICATION FOR CERTIFICATION
FOR THE HYDROGEN ENERGY
CALIFORNIA, LLC PROJECT**

Docket No. 08-AFC-8

**PROOF OF SERVICE
(Revised 3/16/12)**

APPLICANT

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DECLARATION OF SERVICE

I, Elizabeth Stewart, declare that on March 16, 2012, I served and filed a copy of the attached DOGGR DATA REQUESTS #1-4 letter dated March 16,2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/hydrogen_energy/index.html].

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(Check all that Apply)

For service to all other parties:

- Served electronically to all e-mail addresses on the Proof of Service list;
- Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

- by sending an original paper copy and one electronic copy, mailed with the U.S. Postal Service with first class postage thereon fully prepaid and e-mailed respectively, to the address below (preferred method); **OR**
- by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 08-AFC-8
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

- Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original signed by
Elizabeth Stewart
Project Assistant