



**Michael J. Rubio**  
Manager, CA/OR/WA Government Affairs

February 11, 2016

Sara Nichols  
California Air Resources Board  
P.O. Box 2815  
Sacramento, CA 95812

Dear Ms. Nichols,

Chevron appreciates the opportunity to respond to the questions raised in the Air Resources Board whitepaper *Staff's Preliminary Assessment of the Need for Clarification for the Reporting of Covered Product Data for Petroleum and Natural Gas* dated December 11, 2015. The white paper introduces a number of questions regarding reporting covered product data and ARB's assessment that variability exists in the reporting and metering methods used for thermal enhanced oil recovery (EOR) and non-thermal EOR covered product data under its Mandatory Reporting Regulation as required by the California Global Warming Solutions Act.

Chevron believes that ARB's descriptions of industry reporting in the white paper are directionally correct. However, we would be remiss not to point out the oversimplification of thermal enhanced oil recovery principles currently illustrated and described in *Section 3 – Hypothetical Examples of Reporting of Thermal EOR and Non-Thermal EOR Covered Product Data and Associated Monitoring Methods*. The scenarios presented do not fully capture the benefits of heat transfer for thermal EOR, depicting only that of heat convection and not the recognized additional GHG emissions reducing benefit of heat transfer by conduction.

Also, while the ARB whitepaper indicates there are some slight variations between operations and reporting approaches between reporting entities, we believe that these variations are not likely to result in material or significant differences. Variations between operation and reporting approaches are to be expected given the variability between size, operations and company practices for all reporters within the Petroleum and Natural Gas sector. Because companies' data and size vary, we advise against changes in the current protocol. Maintaining current flexibility also allows for improvements over time. Reporting entities may have different data collection systems in the future through changing operations, improved technology and monitoring tool development. Flexibility does no harm because the accuracy standard protects against improper reporting.

Chevron uses a combination of lease and field method for its reporting, measuring on the lease basis and reporting at the field level. We suggest that the lease/field method is potentially the most common approach in the industry as it follows standard industry financial accounting reporting principles. We also suggest that if ARB finds it necessary to specify a method, that this method be used.

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Our detailed comments on the ARB staff assessment upstream product reporting white paper are attached. Due to the complexity of operations and reporting, we suggest that ARB host company or stakeholder consultations prior to moving forward on any changes to the product reporting protocol. We look forward to working with you on this important issue.

Chevron also supports the comments provided by the Western States Petroleum Association.

Sincerely,

*(original signed by)*

Michael J. Rubio

Enclosure

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**Attachment 1: Detailed Comments on the ARB Upstream Reporting White Paper**

**Section 4, Question 1 - Definition of “thermal enhanced oil recovery” or “thermal EOR”:** ARB is looking for the best way to clarify the definition of “thermal EOR.” What is an appropriate way to clarify what is meant by “thermal EOR” as it pertains to covered product data? What additional and/or more specific information should ARB provide regarding the definition?

While Chevron supports continued use of ARB’s current definition of “thermal enhanced oil recovery” as the process of using injected steam to increase oil recovery, guidance can be further clarified by recognizing the injected steam’s function and purpose, which is to introduce heat. The added heat reduces the viscosity of the crude, making it easier to bring it to the surface.

**OIL VISCOSITY VS TEMPERATURE**

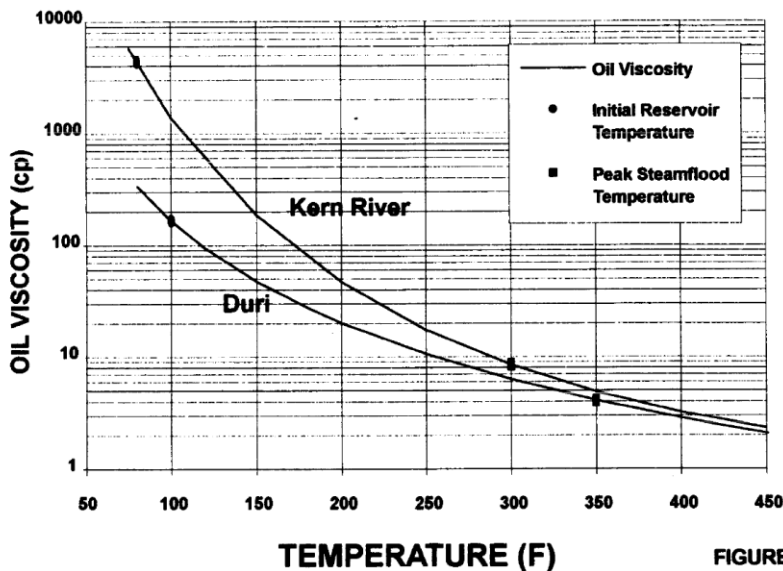


FIGURE 8

SPE/DOE 27764

**Reservoir Management in the Duri Steamflood**

B.T. Gael,\* E.S. Putro, Akmal Masykur, and L.J. Lederhos, P.T. Caltex Pacific Indonesia

\*SPE Member

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**Section 4, Question 2 - Hypothetical Examples and Other Considerations:** In Section 3 above, staff presents hypothetical examples of the variation that might exist among entities that report thermal EOR and non-thermal EOR covered product data and the associated metering methods. Staff is seeking

*input on the following questions related to the reporting of upstream oil and associated gas covered product data:*

- a. How does your facility define and quantify thermal EOR and non-thermal EOR production? What criteria are used, and what assumptions are made? If applicable, use the examples presented in Section 3 (above) to assist you in describing definitions and quantification.*

Chevron defines and reports thermal and non-thermal EOR production separately. If significant heat has been introduced into a lease for a period of time, lease production is considered as thermal. Field lease production is then consolidated and reported at the facility level. We have continued to use this reporting methodology which was previously approved by CARB staff.

- b. Does your facility define and report covered product data at the reservoir, field, lease, or well-head level? If applicable, use the examples presented in Section 3 (above) to assist you in this description.*

Covered product data is defined at the lease level and then consolidated and reported at the field level (aligns with Reporter C methodology in ARB's Section 3 - Hypothetical Examples of Reporting of Thermal EOR and Non-Thermal EOR Covered Product Data and Associated Metering Methods).

- c. If ARB were to define thermal EOR as the production of oil from a reservoir that has had steam injected into it, would that cause any issues in the reporting of covered product data at your facility?*

Yes, this would raise several issues. The reservoir definition is too broad in scope and unclear. Thermal EOR production must acknowledge that the prime purpose for injecting steam is to add heat to increase oil recovery and not be limited to only that portion of heat added to a producing zone by thermal convection, but must also account for heat added by thermal conduction. Thermal oil production associated with the continued heat benefit from a previously built-up injected steam thermal transfer into the producing zone should not be excluded.

- d. What subsurface monitoring and surface metering technologies does your facility have in place and how do they relate to the quantification of covered product data?*

Subsurface data is not required to directly quantify product data given the availability of LACT meters. Heat management is facilitated by direct measurement in the reservoir. Data obtained from Temperature Observation wells gives heating and drainage information by flow unit and the use of earth models help to understand the spatial characteristics of each sand body over time. Please see our responses to parts e and g of this Section 4.2.

- e. *What evidence does your facility provide to verifiers to demonstrate conformance to the MRR definitions of thermal EOR and non-thermal EOR covered product data?*

The overwhelming majority of all steam produced onsite and purchased from third parties is used in thermal enhanced oil recovery. All data associated with thermal energy whether this thermal energy is produced onsite, purchased from third parties or sold to other entities is reported on an annual basis to ARB pursuant to the Mandatory Reporting Regulation. To report our thermal and non-thermal EOR covered product data Chevron uses steam injection data, and financial transaction data from LACT meters.

- f. *What additional guidance should ARB provide to verifiers when verifying the reporting of covered product data for the sector?*

If ARB determines additional guidance is needed to be given to the verifiers based upon the clarifications we provided above and others that it may receive, Chevron requests that ARB work with Chevron and industry to create this guidance.

- g. *Do you use calibrated meters to determine the split between thermal EOR and non-thermal EOR covered product data, if applicable? If not, what methods do you use? If applicable, please refer to the hypothetical metering scenarios presented in Section 3 (above) for Reporters C and D.*

Chevron uses calibrated LACT meters, which meet the requirements of MRR Section 95103(k)(7), for financial and royalty accounting and to report total field covered product data with production allocated to the lease level based upon industry accepted practice of individual well test data, similar to that described in the metering scenario for Reporter C in the ARB whitepaper. Measurement follows industry recognized standard practices and guidelines established by the American Petroleum Institute in its *API Manual of Petroleum Measurement Standards*.

- h. *Did you report voluntary survey data as part of the most recent oil and gas benchmarking data collection process? Emails containing the survey spreadsheets and instructions were sent to existing covered entities on December 21, 2012. If you did report benchmark survey data, are you currently using the same approach for MRR reporting as you did for the benchmark survey data? If not, please explain any differences in reporting methods.*

Yes, Chevron provided benchmarking data in response to the December 21, 2012 ARB survey. Covered product reported was determined using the same methodology that Chevron has used to report its covered product data for MRR reporting.