UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 95105-3901

JUL 17 2014

OFFICE OF THE
REGIONAL ADMINISTRATOR

Matt Rodriquez
Secretary for Environmental Protection
California Environmental Protection Agency
1001 I Street
P.O. Box 2815
Sacramento, CA 95812-2815

John Laird
Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Dear Secretaries Rodriquez and Laird:

The Safe Drinking Water Act was passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supplies. The SDWA authorizes the United States Environmental Protection Agency to protect underground sources of drinking water. This role is of particular importance at this time of drought and diminished water supplies.

Since 1983, California's Division of Oil, Gas and Geothermal Resources has been granted primary responsibility from EPA to implement the requirements of the Safe Drinking Water Act's Underground Injection Control Program. The State's authority covers certain types of injection wells, used primarily to inject steam or water for enhanced oil/gas recovery, or to inject waste water (such as brines) from oil and gas production (Class II). EPA approves the locations where injection into groundwater aquifers may be allowed. These aquifers are generally those that are not used and have no use as potential sources of drinking water. Aquifers with high quality water are protected and should not receive Class II oil and gas related injection fluids.

EPA requires DOGGR to administer the State Program in accordance with approved statutes and regulations, including the requirements and procedures described in a Memorandum of Agreement between the EPA and DOGGR. In 2011, EPA conducted an audit of the State Program that highlighted specific deficiencies. Additionally, in 2012, EPA performed a preliminary review focused on aquifer exemptions, the results of which were shared with DOGGR (copy enclosed). The review raised questions about the alignment of Class II injection wells with approved aquifer exemption boundaries. DOGGR then initiated a broad review of Class II injection in the State to ensure that wells have been appropriately authorized to inject within the aquifer exemption boundaries approved by the EPA. After reviewing files for existing Class II well permits and GIS mapping of the wells in question, DOGGR determined that it had authorized some injection of oil and gas-related disposal fluids such as brines into non-exempt

aquifers containing high quality water. Additionally, DOGGR identified the presence of water supply wells in the vicinity of some of the injection wells. On July 1, 2014, the State issued orders requiring the affected operators to cease injection in non-exempt, fresh water aquifers and to submit data needed to assess the potential threat to human health and potential impacts to water quality.

Exercising our authority under 40 C.F.R. § 145.32, EPA requests that DOGGR take the following actions and provide the following information to the EPA:

1. **Drinking Water Source Evaluation**

EPA requests that the State provide, within 60 days of receipt of this letter, its initial assessment of whether any existing and potential sources of drinking water are at risk of contamination from improper Class II injection, including the following:

a. The location of private and public water system wells that may be at risk due to permitted Class II injection activities.

b. A plan to ensure protection of human health from actual or potential exposure to drinking water affected by any injection wells.

c. In coordination with the State Water Resources Control Board, Regional Water Quality Control Boards and the California Department of Public Health, a plan to communicate this information to the public and to address subsequent questions and concerns.

2. **Documentation of Aquifer Exemptions**

When EPA approved State primacy in 1983, EPA also approved a number of aquifer exemptions. Following up on our 2012 preliminary review, we are working to evaluate the historical records on aquifer exemptions. To facilitate our evaluation, EPA asks that DOGGR provide all documents that pertain to the State's requests for aquifer exemptions, EPA's approval or denial of such requests, and any post-primacy appeals by the State regarding aquifer exemptions. Please provide any information within 30 days of receipt of this letter.

3. **Tiered Review of Class II Wells**

Any injection from Class II wells into an aquifer that meets the definition of an underground source of drinking water (less than 10,000 mg/L total dissolved solids), absent an EPA-approved aquifer exemption, is inconsistent with UIC regulations and State Program primacy requirements. EPA understands the State is currently evaluating all potential Class II wells that may be injecting into underground sources of drinking water. EPA supports the State's plans to complete the review of all affected wells within the next several months, and to take responsive action to protect underground sources of drinking water, with priorities for review based on proximity to water supply wells and the potential that receiving formations may be in current use as sources of drinking water. Please provide the following:

a. Within 30 days of receipt of this letter, the number and location of all Class II wells, by DOGGR district, permitted to inject in non-hydrocarbon-producing formations with water quality below 10,000 mg/L total dissolved solids, other than the 25 formations listed in Attachment A to this letter. For each identified well, please include the operator's name, well type, depth, field and formation names, date injection commenced, the water quality (TDS) of both the injection formation and the injection fluid, and any other pertinent details. In addition, please provide any associated orders or actions to cease injection in such formations (excluding the seven orders dated July 1, 2014) and plans to ensure future protection of underground sources of drinking water.

b. Within 90 days of receipt of this letter, the number and location of all Class II wells, by DOGGR district, permitted to inject in hydrocarbon-producing formations with water quality below 10,000 mg/L TDS located in non-exempt aquifers. For each identified well, please include the operator's name, well type, depth, field and formation names, date injection commenced, the water quality (TDS) of both the injection formation and the injection fluid, and any other pertinent details.

c. Within 60 days of receipt of this letter, a plan and timeline for completion of a searchable database of all the Class II well information statewide (along with a GIS overlay of the injection wells, injection formations, and aquifer exemptions) and submission to EPA of any new or revised aquifer exemption requests, which the State determines are appropriate.

4. **State Program Consistency**

On November 16, 2012, DOGGR provided an action plan to the EPA in response to the EPA's 2011 audit of the State Program's consistency with federal regulations. The action plan addresses the identified deficiencies, including clarification of the regulatory definition of underground sources of drinking water and improved procedures for well testing and aquifer analysis. Please provide, within 30 days of receipt of this letter, a status report on DOGGR's progress on this action plan (copy enclosed), along with a schedule for any plan revisions and for completing implementation of the action plan.

In conducting the ongoing program evaluation, EPA's goal is to ensure that the State's Program complies with all necessary requirements, is implemented in accordance with the approved Program, and provides the transparency necessary for facilitating EPA's oversight of the Program.

Thank you for your prompt attention and continued cooperation as we pursue resolution of these issues.

Sincerely,

Jared Blumenfeld

Attachment and Enclosures

cc: Mark Nechodom, Director, California Department of Conservation
Jason Marshall, Deputy Director, California Department of Conservation
Bruce Reeves, Chief Counsel, California Department of Conservation
Tom Howard, Executive Director, State Water Resources Control Board
Jonathan Bishop, Chief Deputy Director, State Water Resources Control Board
Pamela Creedon, Executive Officer, Regional Water Quality Control Board
Clay Rodgers, Assistant Executive Officer, Regional Water Quality Control Board
Mark Starr, Deputy Director, California Department of Public Health
Steven Bohlen, Oil and Gas Supervisor, Division of Oil, Gas and Geothermal Resources
California Department of Conservation

## ATTACHMENT A

EPA Approved Aquifer Exemption formations for which no information is requested:

| Field | Formation /Zone |
|---|---|
| McCool Ranch | "D" Sand |
| Asphalto | Tulare |
| San Ardo | Continental |
| San Ardo | Aurignac |
| Ramona | Pico |
| Cat Mountain | Undifferentiated |
| Simi | Sespe |
| San Ardo | Santa Margarita |
| San Ardo | Monterey "D" Sand |
| San Ardo | Monterey "E" Sand |
| Monroe Swell | Santa Margarita |
| Buena Vista | Tulare |
| Kern Bluff | Vedder |
| Kern River | Vedder |
| Mountain View | Kern River |
| Pleito | Chanac |
| Pleito | Kern River |
| Poso Creek | Santa Margarita |
| Coalinga | Santa Margarita |
| Coalinga | Etchegoin-Jacalitos |
| Guijarral Hills | Etchegoin-Jacalitos* |
| Helm | Tulare-Kern River |
| Riverdale | Pliocene |
| Turk Anticline | San Joaquin |
| Sutter Buttes Gas | Kione* |

- Oil and/or gas producing

Enclosure

# Review of Aquifer Exemptions in California
# DRAFT Preliminary Findings

[Transmitted via email on May 11, 2012 from David Albright, Manager, Ground Water Office, USEPA Region 9 to Rob Habel, DOGGR with cc to Tim Kustic, DOGGR]

**Review of Aquifer Exemptions in California**

**DRAFT Preliminary Findings**

## Introduction

The California Division of Oil and Gas, in 1991 to also include Geothermal Resources (DOGGR) requested aquifer exemptions as part of the "Application for Primacy in the Regulation of Class II Injection Wells Under Section 1425 of the Safe Drinking Water Act" (the primacy application) dated April 1981. The specific exemptions requested are described in Appendix B of the primacy application.

## Descriptions of the Exempt Aquifers

### The Primacy Application

The aquifer exemptions requested by DOGGR in the April 1981 primacy application fall into three categories. These categories were not specifically proposed by DOGGR; they are used in this paper for organizational clarity only. The three categories are as follows:

Category 1.

The hydrocarbon producing aquifers shown in Volumes I and II of "California Oil and Gas Fields" (the report), published by the California Division of Oil and Gas (dated 1973 and 1974, respectively) were included with the primacy application. The formations or portions thereof that were requested to be exempt are described and depicted as the shaded portions on the maps and cross sections of the report. The report's "Introduction" further describes these shaded areas as the producing zones.

Category 2.

For the oil and gas fields discovered after December 1973, a separate list of the thirty-seven (37) formations requested to be exempt were included in Appendix B, Table 2 of the primacy application. It should be noted that several of these formations/zones are named as "confidential". The primacy application did not include any maps of these 37 formations, only the location of the discovery well, and the range of depths of the producing intervals. However, some of these fields/formations (25 of the 37) are depicted in Volume III of the report, dated 1981. Volume III is an updated version of the Northern California portion of Volume I, and appears to have been published after DOGGR submitted their April 1981 primacy application, but prior to EPA's granting of primacy in 1982.

Category 3.

Non-hydrocarbon producing aquifers requested for exemption were listed in Appendix B, Table 1 of the primacy application. The list includes 87 formations/zones in various fields in Districts 1-6, and each of the field boundaries are depicted on the maps included in Appendix B, following Table 1.

Additional Comment

The current DOGGR website provides a hyperlink to the April 1981 primacy application. The website also contains a statement suggesting that the approved aquifer exemptions are those contained in the 1981 primacy application.

**The Memorandum of Agreement (MOA)**

Aquifer exemptions were formally approved by EPA as discussed in Section H and described in Attachment 2 of the "Underground Injection Control Program Memorandum of Agreement Between California Division of Oil and Gas and the United States Environmental Protection Agency Region 9" (the MOA) signed by DOGGR and EPA in September 1982, as part of the Class II UIC primacy approval process. This MOA is referenced in 40 CFR Part 147 as one of the official program documents associated with EPA's approval of the California Class II UIC program. The MOA documents which aquifers EPA exempted (refer to the copy of Attachment 2 of the MOA, attached).

**Analysis**

EPA has completed a review, based on the records we have, of the aquifer exemption determination process that was conducted, in order to clarify and confirm which aquifers were exempted.

Category 1.

The 1981 primacy application requested the exemption of all the oil and gas producing formations included in Volume I and II of the report. Volume I includes the oil and gas fields of North and East Central California, dated 1973. Volume I has been updated since 1973, the most current version is dated 1998. Volume II includes South, Central Coastal and Offshore California, dated 1974. Volume II has also been updated, the most current version is dated 1991.

Attachment 2 of the MOA states that "all oil and gas producing aquifers identified in Volumes 1, II and III" of the report are exempt (see attached). Section H. of the MOA formally incorporated Attachment 2 into the MOA. As noted, Volume III is an updated version of the Northern California portion of Volume I, and is dated 1981. Although the month in 1981 is not specified, it is presumed to have been issued post April 1981, the

date of the primacy application. Volume III has also been updated, the most current version is dated 1998.

For the Category 1 formations in the MOA, EPA exempted all oil and gas producing zones that were included in the report, as follows: 1) 1973 version of Volume I; 2) 1974 version of Volume II; and 3) 1981 version of Volume III. As requested by DOGGR, the exempt portions of the aquifer are described and depicted as the shaded portions on the maps and cross sections of the report.

Category 2.

The MOA does not specifically name the 37 formations/zones from the post 1973 oil/gas producing fields proposed for exemption by DOGGR in their 1981 application (on Table 2). However, our current review noted that 25 of the 37 formations are included in the 1981 version of Volume III, thus the designated portions of those 25 producing formations are exempt. The 12 remaining formations were not included in any of the three volumes of the report (as of 1982, when EPA granted primacy and approved aquifer exemptions), thus they are presumed non exempt. However, ten (10) of the fields and their associated formations are depicted in updated versions of the report; either the 1998 version of Volume 1, or the updated version of Volume II, dated 1991. The two (2) remaining formations are listed in the 1981 primacy application as "confidential" in the Harlan Ranch Gas and Howell's Pt. Gas fields, respectively, but are not included in any volumes of the report. The 12 formations are:

| Field | Formation |
|---|---|
| Yowlumne | Stevens |
| Rio Viejo | Stevens |
| Turk Anticline | Temblor |
| Carneros Creek | Wygal |
| Moorpark West | Sespe |
| Temblor Hills | Agua |
| Temblor Hills | Pt. of Rocks |
| Careaga Canyon | Monterey |
| Cal Canal | Stevens |
| Westhaven | Temblor |
| Harlan Ranch Gas | Confidential |
| Howell's Point Gas | Confidential |

Category 3.

Attachment 2 of the MOA (attached) lists 20 (of the 87 originally proposed non-hydrocarbon producing formations from Table 1 of the primacy application) formations/zones in various fields in Districts 2-6 as exempt. One additional non-hydrocarbon producing formation, not proposed for exemption in Table 1 of the primacy application (and presumed to have been proposed separately) is confirmed as exempt on Attachment 2 of the MOA. Thus, EPA approved a total of 21 aquifer exemptions for non-hydrocarbon producing formations - 20 of the 87 originally requested, plus one additional formation not identified in the primacy application. The additional exempt formation is the "Santa Margarita Formation, Poso Field, District 4. Attachment 3 of the MOA lists 11 of the 87 originally proposed non-hydrocarbon producing formations/zones as not exempt.

The remaining 56 formations (of the 87 proposed in Table 1 of the primacy application) were not exempted by EPA. Based on the information contained in EPA's administrative records, it appears that most, if not all of these formations were determined to be non-USDWs and thus did not require exemption. DOGGR submitted a letter, dated March 1982, which provided TDS values for all 87 of the non-hydrocarbon producing formations proposed for exemption in the primacy application. Fifty-three (53) of those formations are listed in the March 1982 letter as having TDS levels greater than 10,000 ppm.

It is unclear why the remaining three formations from Table 2 of the primacy application (that had TDS values below 10,000 ppm) were not exempted by EPA. However, those three formations (Etchegoin Fm, Strand Field, District 4; Mokulemne Fm, Union Island Gas Field, District 6; and Capay Fm, River Break Gas Field, District 6) are not included in Attachment 2 of the MOA, and are therefore not exempt.

Additional Findings

- Section H. of the MOA formally incorporated Attachments 2 and 3 into the MOA. Section H. also clarifies that the 11 aquifers in Attachment 3 "proposed for exemption in the 1425 demonstration and not exempted will be phased out within 18 months of the effective date of this Agreement (the MOA)". Since the MOA was signed in late September 1982, those 11 formations were not exempt as of April 1984.

- Section H. of the MOA also states the following: "Aquifers exempted by the Division and EPA under this Agreement shall only be applicable for the injection of fluids related to Class II activities defined in 40 CFR 146.05 (b).

**Summary**

Category 1.

All of the shaded portions of the oil and gas producing aquifers included in Volumes I, II and III of the report, dated 1973, 1974 and 1981 respectively, are exempt.

Category 2.

25 of the 37 formations within the post 1973 fields included on Table 2 of the primacy application and depicted in Volume III of the report dated 1981 are exempt.

12 of the formations within the post 1973 fields included on Table 2 of the primacy application and not depicted in versions of the report incorporated in the MOA, are not exempt. Ten (10) of these 12 fields are depicted in subsequent versions of the report. The two remaining fields with "confidential" formation designations are found on the DOGGR website as producing fields, even though they are not depicted in any subsequent versions of the report.

Category 3

21 non-hydrocarbon producing formations are exempt:

[20 of the 87 originally proposed non-hydrocarbon producing zones, and

1 additional non-hydrocarbon producing zone, the Santa Margarita Fm Poso Field]

All of the remaining non-hydrocarbon producing formations included in Table 1 of the primacy application were not exempted by EPA. Most (53) of these formations appear to have not been exempted because it was demonstrated that they are not USDWs (TDS levels > 10,000 ppm).

Suggested Next Steps:

- DOGGR to review and comment on this document and provide any other relevant documents/materials for EPA consideration.

- Recommend DOGGR consider modifying current website regarding aquifer exemptions.

- If warranted, DOGGR to identify any additional aquifers, or portions of aquifers that they request EPA consider for exemption.