Public Comment Summaries and Responses
Aquifer Exemption Proposal
Arroyo Grande Oil Field
Dollie Sands of the Pismo Formation

Introduction

On December 8, 2017, with preliminary concurrence from the State Water Resources Control Board (State Water Board), the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (Division) opened a 15-day supplemental comment period to receive public input regarding new information added to the proposal to expand the current aquifer exemption designation for the Dollie sands of the Pismo formation in the Arroyo Grande Oil Field in unincorporated San Luis Obispo County (the "Arroyo Grande Aquifer Exemption Proposal"). The new information made available for public comment consisted of additional data supporting the proposal, and related modifications to the originally-proposed aquifer exemption boundary.

This supplemental public comment period followed two previous invitations for public comment regarding the Arroyo Grande Aquifer Exemption Proposal: (1) a 30-day comment period beginning August 20, 2015, regarding the proposal as originally developed, and (2) a 15-day supplemental comment period beginning December 2, 2015, regarding a first batch of additional information prepared in support of the proposal. With concurrence from the State Water Board, on February 8, 2016, the Division submitted the Arroyo Grande Aquifer Exemption Proposal to the United States Environmental Protection Agency ("US EPA") for review and approval. After reviewing the proposal, the US EPA requested additional supporting data on certain issues. In response, the Division developed the information referenced above. Subject to approval by the US EPA, the Arroyo Grande Aquifer Exemption Proposal would allow the Division and the State Water Board, in compliance with the federal Safe Drinking Water Act, to approve Class II injection into the identified area, either for enhanced oil recovery or for injection disposal of fluids associated with oil and gas production.

Over the course of the public comment period, the Division received comments via email and mail. To facilitate the process of reviewing and responding to comments, the Division assigned to each comment a unique numerical signifier. This signifier consists of three components: first, a unique code number assigned to each commenter; second, a separating hyphen; third, a sequential number assigned to each comment from the identified commenter.

This document summarizes all comments received and presents responses to those comments from the Division and the State Water Board. Comment summaries are arranged in groups under one or more corresponding numerical signifiers. Responses to comments appear below the respective comment summaries, in italicized text.

COMMENTERS:

Number	Name and/or Entity
0001	Terre Dunivant
0002	Cindy Hansen
0003	Rebecca August
0004	Jeanne Blackwell
0005	Linda Chimenti
0006	Teresa Lees
0007	Alice Butterick
0008	Barry Winholtz
0009	Julie Stein
0010	Heather Dine
0011	Jaclynn Nusbett
0012	Holly Padove
0013	Doug Timewell
0014	Jeremy Barnes
0015	Nell Wade
0016	Deb Thorlakson
0017	Beverly Harben
0018	Chris Anderson
0019	Susan Pyburn
0020	Tracy Del Rio
0021	Piper Hunter
0022	Dani Nicholson
0023	Bill Jenkins
0024	Cheryl Jenkins
0025	Sandi Heller
0026	Janet Glenn
0027	Kim Chaffee
0028	P.F. Ready
0029	Valerie Monge
0030	Kerry Cirone
0031	Jim Neville
0032	Christine Zurbach
0033	Kelly Reed Daulton
0034	Center for Biological Diversity
0035	David Blakely
0036	Elizabeth Warner
0037	Nancy Mauter
0038	Shannon and Fred Bond
0039	Coalition to Protect SLO County
0040	Larry Bishop

0041	Judy Burch
0042	Natalie Beller
0043	Jonathan Beller
0044	Margaret Neville
0045	Sentinel Peak Resources
0046	Carol Mortensen
0047	Janis and John Sexton
0048	Gail Comer
0049	Michael and Leslie Hannon
0050	Charles Varni

COMMENT SUMMARIES AND RESPONSES:

COMMENTS IN SUPPORT

0045-1
The change in the exemption boundary is responsive to comments received during the comment period in 2015. A small change has been proposed in the northeast corner of the boundary due to the proximity of two private water wells. The change affects approximately 6.3 acres from the originally proposed 805 acres, or an adjustment of just 0.8%. This change was proposed by US EPA with the agreement of the Central Coast Water Quality Control Board, the State Water Board, and the Division. All agencies acknowledged that the private wells were noted in the original 2015 aquifer exemption application and in other submissions supporting that application. US EPA requested, with concurrence from other regulatory authorities, that the boundary be modified to provide an extra measure of separation or "buffer" between the exemption boundary and the water wells in question. While there is ample evidence to indicate the absence of influence on these private water wells after more than a century of oil field operations, including testimonials by the property owners themselves, the boundary adjustment was proposed out of an abundance of caution.

0045-2
A report entitled *Public Draft: San Luis Obispo Valley Basin Characterization and Monitoring Well Installation* substantiates the separation between the candidate area for exemption and the groundwater basin. The County of San Luis Obispo leads the Groundwater Sustainability Agency (GSA) overseeing the valley's groundwater basins in compliance with California's Sustainable Groundwater Management Act. The report was commissioned by the GSA and released on December 8, 2017. That impartial analysis of groundwater basin boundaries and groundwater flow in the area north of the oil field corroborates the observation that the Edna fault zone, of which the Arroyo Grande fault is a part, provides an impermeable barrier to the flow of groundwater in the area of Price Canyon. It further indicates that the general flow of groundwater in the basin is from south to north, toward the City of San Luis Obispo and San Luis Creek, not out through Price Canyon, again supporting the information in the aquifer exemption application.

Response to comments 0045-1 and 0045-2:
Noted. Thank you for your comments.

COMMENTS IN OPPOSITION

General Opposition

0001-1, 0002-1, 0002-2, 0005-3, 0007-1, 0009-1, 0010-1, 0013-2, 0015-4, 0016-1, 0017-1, 0018-1, 0020-1, 0023-1, 0024-4, 0024-5, 0025-1, 0026-1, 0027-1, 0027-4, 0028-3, 0029-1, 0030-2, 0032-1, 0035-1, 0036-1, 0038-1, 0040-4, 0041-4, 0042-1, 0044-4, 0044-5, 0046-1, 0047-1
Commenters expressed generalized opposition to approval of the aquifer exemption proposal, or to oil extraction activities.

Response to the above comments:
The purpose of the aquifer exemption process is to assess the characteristics of the aquifer at issue. The criteria for aquifer exemption are established in federal law under title 40, part 146.4, of the Code of Federal Regulations, and expanded upon in state law under Public Resources Code section 3131. Under these laws, before making a recommendation to the US EPA that it designate an aquifer or portion of an aquifer exempt, the Division and the State and Regional Water Boards must first evaluate the proposed exemption area to confirm that: (1) the proposed exemption area does not currently and will not in the future serve as a source of drinking water, (2) injection of fluids in the proposed exemption area will not affect the quality of water that is, or may reasonably be, used for any beneficial use, and (3) injected fluid will remain in the aquifer or portion of the aquifer that would be exempted.

Based on the information and analysis presented in the proposal materials, and after considering comments from the public, the Division determined, and the State Water Board concurred, that this aquifer exemption proposal satisfies the prerequisite criteria for submission of the proposal to the US EPA. Accordingly, on February 8, 2016, the Division submitted the aquifer exemption proposal to the US EPA for review and potential approval.

In response to feedback from the US EPA regarding the proposal, the Division has since made minor revisions to the aquifer exemption boundaries described in the materials that were submitted to the US EPA on February 8, 2016, and has prepared additional information and analysis supporting these revisions. As explained in the notice, the purpose of this comment period was to receive input from the public regarding these revisions and the additional information supporting the revisions.

For the reasons described in the supplemental aquifer exemption proposal materials, the Division has determined that, with these revisions, the aquifer exemption proposal continues to satisfy the prerequisite criteria for submission to the US EPA. The State Water Board has

reviewed the supplemental materials and concurred with the Division's determination on a preliminary basis, as reflected and more fully described in the State Water Board's letter of preliminary concurrence, dated November 28, 2017.

An aquifer exemption determination is not an approval or an entitlement to conduct injection operations. All injection projects must complete a separate approval process before operations may commence. Approved projects remain subject to ongoing regulatory oversight. The approval of an aquifer exemption proposal does not limit the discretion of the Division or the State and Regional Water Boards in the exercise of their respective regulatory authorities over injection operations.

Aquifer Exemption Criteria are Outdated

0034-4
The Division and US EPA should stop granting aquifer exemptions due to the fact that the criteria for granting such exemptions are wholly outdated. They fail to account for technologies developed in the last few decades, or for the fact that the State's need for water will only rise due to anthropogenic climate change. California does not have complete or current data on its groundwater resources and additional studies are needed for evaluating subsurface activities that could contaminate these resources. A U.S. Government Accounting Office (GAO) audit report noted that increasing growth in the production of oil and gas and the corresponding increase in wastewater has raised concern about potential effects to human health and the environment, including the contamination of underground sources of drinking water (USDW) from injecting wastewater. At minimum, these potential impacts indicate US EPA's responsibility to conduct environmental review under the National Environmental Policy Act (NEPA) or an equivalent prior to approving any exemptions. The GAO report also found that US EPA has failed to completely and consistently oversee and enforce the nation's underground injection control (UIC) programs. The report indicated that until US EPA has a complete aquifer exemption database and a way to update it periodically, it does not have sufficient information on exemptions to assess whether programs are protecting USDWs. Unless and until US EPA can effectively protect the nation's groundwater by, at a minimum, meeting all the recommendations outlined in the GAO report, US EPA should not approve any further exemptions.

Response to Comments 0034-4:
The criteria for aquifer exemption are established in federal law under title 40, part 146.4, of the Code of Federal Regulations, and expanded upon in state law under Public Resources Code section 3131. Amendment of these federal and state laws is outside the scope of the determination to be made by the Division and the State Water Board within the context of this aquifer exemption proposal. The applicability of NEPA to the US EPA's exemption determination is not a matter to be addressed by the State within the context of this aquifer exemption proposal. Nonetheless, the Division and the State Water Board do appreciate the role technology and climate conditions play in the wise use of natural resources.

Conditions on Injection Approvals

0050-3
If this ill-conceived exemption is approved, then ALL the conditions of sentry wells, monitoring wells, and buffer zones MUST be required.

Response to Comment 0050-3:
Monitoring of formation pressure and groundwater elevations in the proposed exemption area, the use of sentry groundwater monitoring wells, and the creation of buffer zones near the boundaries of the proposed exemption area are among the conditions that Division and State and Regional Water Boards staff will consider incorporating as potential requirements for Class II injection project approvals.

Compliance with Other Laws

0027-3
Commenter asserts that the "human rights to water bill," AB 685, codified in Water Code section 106.3, requires state agencies to improve the access of marginalized communities to water supplies, and that recommendation of this aquifer exemption proposal to the US EPA would be contrary to the policy interests of California as identified in this statute.

Response to Comment 0027-3:
The Division and the State and Regional Water Boards have considered, and will continue to consider, California state policy regarding the right to safe, clean, affordable, and accessible water supplies when evaluating aquifer exemption proposals for potential recommendation to the US EPA. As discussed in the proposal materials, based on the data and analysis presented therein, the Division has determined, and the State Water Board has concurred, that: (1) the proposed exemption area does not currently and will not in the future serve as a source of drinking water, (2) injection of fluids in the proposed exemption area will not affect the quality of water that is, or may reasonably be, used for any beneficial use, and (3) injected fluid will remain in the aquifer or portion of the aquifer that would be exempted. For these reasons, the Division and the State Water Board believe recommendation of this aquifer exemption proposal to the US EPA is appropriate.

0004-1, 0006-1, 0007-2, 0012-1, 0014-1, 0015-1, 0018-2, 0019-1, 0033-1, 0048-1
Commenters assert that the Hazardous and Solid Waste Amendments to the Resource Conservation Recovery Act prohibit waste disposal injection via Class I wells unless the waste is first treated to become nonhazardous. Commenters assert that wells located in the Arroyo Grande Oil Field have been used to inject hydrogen sulfide and radioactive isotopes without such treatment. Commenters believe this allegation must be investigated and the findings analyzed in order to properly assess the aquifer exemption proposal.

0004-2, 0006-2, 0007-3, 0008-1, 0012-2, 0014-2, 0015-2, 0018-3, 0019-2, 0022-1, 0033-2, 0048-2
Commenters urge denial of the aquifer exemption proposal based on assertions that injection operations in the Arroyo Grande Oil Field are, or would be, in violation of specific provisions pertaining to authorization for injection under EPA regulations for the Safe Drinking Water Act (40 C.F.R. § 144.11) or to management of hazardous waste under the Resource Conservation and Recovery Act (42 U.S.C. § 6921 and 40 C.F.R. § 264.11).

0004-4, 0006-3, 0007-6
Commenters assert that safety records for the operators of wells in the Arroyo Grande Oil Field need to be provided before an aquifer exemption is granted. Commenters want to see records for any spills, accidents, explosions, worker complaints, OSHA visits, worker safety records, and safety or health citations or violations.

0004-4, 0006-3, 0007-6, 0008-2, 0018-5, 0022-2
Commenters assert that the US EPA must issue Material Safety Data Sheets for chemicals present in injected waste water, to explain how those chemicals interact when injected into the ground.

0027-2
Commenter requests that a comprehensive evaluation of an alleged cancer cluster area near the Arroyo Grande Oil Field be conducted by a third-party. Commenter believes that this aquifer exemption proposal should be denied due to inadequate information in the proposal materials concerning the alleged cancer cluster area.

0030-1, 0044-3
Commenters assert that, over a span of many years, some wells in the Arroyo Grande Oil Field have been used to inject fluids into areas that meet the regulatory definition of an “underground source of drinking water” and that have not been designated “exempt” by the US EPA through the aquifer exemption process. In consequence, commenters argue, the aquifer exemption proposal should be denied.

Response to Comments 0004-1, 0004-2, 0004-4, 0006-1, 0006-2, 0006-3, 0007-2, 0007-3, 0007-6, 0008-1, 0008-2, 0012-1, 0012-2, 0014-1, 0014-2, 0015-1, 0015-2, 0018-2, 0018-3, 0018-5, 0019-1, 0019-2, 0022-1, 0022-2, 0027-2, 0030-1, 0033-1, 0033-2, 0044-3, 0048-1, 0048-2:
An aquifer exemption determination is not an approval or an entitlement to conduct injection operations, or any other activities. The purpose of the aquifer exemption process is to assess the characteristics of the aquifer at issue. The criteria for aquifer exemption are established in federal law under title 40, part 146.4, of the Code of Federal Regulations, and expanded upon in state law under Public Resources Code section 3131. Under these laws, before making a recommendation to the US EPA that it designate an aquifer or portion of an aquifer exempt, the Division and the State and Regional Water Boards must first evaluate the proposed exemption area to confirm that: (1) the proposed exemption area does not currently and will not in the

future serve as a source of drinking water, (2) injection of fluids in the proposed exemption area will not affect the quality of water that is, or may reasonably be, used for any beneficial use, and (3) injected fluid will remain in the aquifer or portion of the aquifer that would be exempted. The various problems alleged in these comments do not address the specific evaluation criteria at issue in this aquifer exemption proposal. If approved, the proposed aquifer exemption would not excuse injection operations in the proposed exemption area from compliance with other applicable requirements.

0004-5, 0006-4, 0007-5, 0008-3, 0012-4, 0014-3, 0015-3, 0018-4, 0019-3, 0022-3, 0033-3, 0037-1, 0048-3
California Code of Regulations, title 14, section 1779.1 established regulatory deadlines for injection projects previously approved by the Division for injection into aquifers with certain characteristics either to obtain an aquifer exemption or to cease injection. Commenters urge the Division to compel full and immediate compliance with the February 15, 2017 regulatory deadlines described in section 1779.1, and to impose the maximum civil penalty of $25,000 per day, per well, for any injection that may have occurred in conflict with those regulatory deadlines. Commenters assert that the total civil penalty liability incurred by operators for these alleged violations amounts to more than 12 billion dollars.

Response to Comments 0004-5, 0006-4, 0007-5, 0008-3, 0012-4, 0014-3, 0015-3, 0018-4, 0019-3, 0022-3, 0033-3, 0037-1, 0048-3:
The policy of the Division and the State Water Board regarding enforcement of the February 15, 2017 regulatory deadlines was addressed in their joint letter to the US EPA, dated January 17, 2017, and in the US EPA's response letter, dated January 25, 2017. Subsequent correspondence between the state agencies and the US EPA provided further elaboration. Those letters, along with other materials relevant to this issue, can be found on the Division's website at:
http://www.conservation.ca.gov/dog/general_information/Pages/UndergroundInjectionControl%28UIC%29.aspx.

Data and Analysis

0028-2, 0031-1
Commenters question the sufficiency of the research and analysis done to evaluate this aquifer exemption proposal. Commenters suggest that the Division should not rely solely on the opinions provided in the application but should conduct independent research and analysis to make their determinations.

0039-1
Commenter asserts that the data and analysis presented in the proposal materials have been, and remain, of inadequate professional rigor to support a finding that the applicable criteria for exemption are satisfied. Commenter believes the proposal should not be approved until the December 2008 Ground Water Resources Study prepared by Cleath & Associates, included as

Appendix A to the December 2017 Aquifer Exemption Supplement Information package, has been finalized and stamped by a certified engineer or geologist. Additionally, commenter believes that certain findings in the December 2008 Cleath & Associates study indicate further investigation of regional groundwater and subsurface conditions is necessary to confirm hydraulic isolation of the Dollie Sands. Commenter requests that the proposal materials be supplemented with a regional and local groundwater model prepared by a third-party California-licensed professional engineer or geologist. Commenter also wants state agencies to require ongoing monitoring of all drinking water sources within a half mile of the proposed exemption area.

Response to Comments 0028-2, 0031-1, 0039-1:
In preparing this aquifer exemption proposal, the Division utilized a combination of information supplied by third parties and its own independent analysis. Based on the data presented in the proposal materials, it is the Division's determination that the revised aquifer exemption proposal satisfies the prerequisite criteria for submission to the US EPA, as set forth in Public Resources Code section 3131, subdivision (a). The State Water Board has reviewed the proposal materials and concurred with the Division's determinations on a preliminary basis, as more fully described in the State Water Board's Preliminary Concurrence on the Revised Aquifer Exemption Proposal, dated November 28, 2017. The US EPA is responsible for final review and approval of the aquifer exemption proposal. As discussed in the aquifer exemption proposal, observation methods to ensure confinement will be considered on the injection projects for the Arroyo Grande oil field.

0039-2
Commenters are dissatisfied with the response provided to comments submitted during earlier public comment periods for this aquifer exemption proposal. Commenters request that the US EPA review the comments and responses carefully to ensure that the applicable criteria for exemption are satisfied.

Response to Comment 0039-2:
The Division and the State Water Board have determined that this aquifer exemption proposal meets the criteria for submission to the US EPA. All materials prepared for this aquifer exemption proposal, including the full text of the public comments received and the responses thereto, will be transmitted to the US EPA for its consideration as it decides whether to approve the aquifer exemption proposal.

0042-2
The sentry monitoring wells used for data in the proposal materials are 200 feet deep, yet the injection is occurring 400-1000 feet. The sentry wells are not able to accurately monitor the injection activity because they are so far from where injection would occur.

Response to Comment 0042-2:
The shallow sentry monitoring wells are required by the County of San Luis Obispo. The Application provides data from other, deeper, observation wells. The UIC projects use the

temperature observation wells to monitor injection activity within the Arroyo Grande oil field. These observation wells, referenced in Appendix E, range in depths from 700 feet deep to nearly 1,500 feet deep. They are used to monitor the temperature gradient of the subsurface from surface to the bottom of the well. If US EPA approves the proposed aquifer exemption area, the Division and the State Water Board will review the UIC projects for an update to the conditions of approval. During that time, all options will be reviewed for ensuring all injection will remain within the approved injection interval. Some of those options may include additional observation wells strategically placed around the oil field.

Modifications to the Proposed Aquifer Exemption Boundary

0005-1, 0013-1, 0017-2, 0023-2, 0024-1, 0034-1, 0039-3, 0039-4, 0042-3
The Division redrew the aquifer exemption boundaries because new analysis found that two drinking water wells were included within the original proposed boundary. The redrawing of the aquifer exemption boundary demonstrates that the Division recognizes that the possibility of ground water contamination is high. The fact that the Division missed this danger in its original proposal reveals that their assessment methods are inadequate to ensure safety. This new boundary remains too close to surrounding wells that neighbors rely on for drinking water.

0005-2, 0021-1, 0034-2, 0050-1
Commenters question the research and analysis that lead to a determination that tar seals are sufficient to contain injected fluids within the proposed exemption area. Commenters assert by redrawing the exemption boundary around a well capture zone, the Division is tacitly agreeing that the tar seal will not provide a barrier to fluids in that region. Commenters urge that the aquifer exemption proposal be denied due to this alleged lack of confidence in the underlying data and analysis.

0040-1, 0041-1
DOGGR has reduced the area of the proposed wells even though it declared the aquifer completely hydrologically isolated from the surrounding usable aquifer. What then is the rationale for area reduction if the entire aquifer is hydrologically isolated? Should it not hold, leak free, the entire quantity of dumped toxic waste water in to perpetuity?

Response to Comments 0005-1, 0005-2, 0013-1, 0017-2, 0021-1, 0023-2, 0024-1, 0034-1, 0034-2, 0039-3, 0039-4, 0040-1, 0041-1, 0042-3, 0050-1:
On February 8, 2016, with concurrence from the State Water Board, the Division submitted this aquifer exemption proposal to the US EPA for review and potential approval. In response to feedback from the US EPA regarding the proposal, the Division has since made minor revisions to the aquifer exemption boundaries described in those previously-submitted materials. Specifically, an approximately 500 foot by 800 foot area has been removed from the northeast corner of the area originally proposed for exemption, based in part on a capture zone analysis surrounding a domestic supply well located outside of, but near to, that portion of the proposed exemption area. Although the Division and the State Water Board remain confident that the

boundaries identified in the February 8, 2016 proposal materials adequately and accurately reflect the relevant characteristics of the aquifer at issue, this revision to the proposed aquifer exemption boundaries provides an additional precaution supporting the conclusion that injected fluids will not affect groundwater that may be accessed by this nearby domestic water supply well. The supplemental materials prepared in support of this aquifer exemption proposal discuss in more detail the data and analysis upon which this boundary revision is based.

Potential Future Beneficial Use

0003-1, 0028-1, 0044-1
Commenters assert that future demands on the water supply and the advancement of technology could make it reasonable to use the proposed exemption area as a source for drinking water or beneficial use water.

Response to Comments 0003-1, 0028-1, 0044-1:
Information presented in the proposal materials indicates that the identified portion of the Dollie Sands of the Pismo Formation does not currently serve as source of drinking water, and will not in the future serve as a source of drinking water, or be used for other expected beneficial use, because the groundwater in that area contains commercially producible petroleum hydrocarbons. This determination is consistent with the criteria for aquifer exemption, as established in federal law under title 40, part 146.4, of the Code of Federal Regulations, and expanded upon in state law under Public Resources Code section 3131.

Seismic Activity

0011-1, 0040-2, 0041-2, 0049-1
The application does not adequately address the risk of natural seismicity. Seismic activity has the potential to destabilize well infrastructure and could create new conduits for fluid migration. This proposal cannot rule out the dangers of seismic activity in the region as a threat to the zonal isolation of injected fluids.

0024-3, 0043-1
Injection into an aquifer that relies on faults for containment has the potential to induce seismic activity as seen in other parts of the country, such as in Oklahoma.

0004-3, 0007-4, 0012-3,
Commenters express concern that a large earthquake near the Arroyo Grande Oil Field sometime in the near future is a likely occurrence. Commenters worry that such an earthquake could alter the subsurface conditions in the Arroyo Grande Oil Field in a way that would allow injected fluids to migrate into other areas and contaminate nearby water sources. For this reason, commenters believe the aquifer exemption proposal should be rejected.

Response to Comments 0004-3, 0007-4, 0011-1, 0012-3, 0024-3, 0040-2, 0041-2, 0043-1, 0049-1:
The criteria for aquifer exemption do not contemplate speculative evaluation of seismic activity. The Division and the State Water Board have determined that hydrologic and geologic conditions in the area are such that injected fluid will remain in the proposed exemption area and will not affect the quality of water that is used, or may reasonably be used, for any beneficial use. The basis for this determination is set forth in the proposal materials.

An aquifer exemption determination is not an approval or an entitlement to conduct injection operations. All injection projects must complete a separate approval process before operations may commence. Approved projects remain subject to ongoing regulatory oversight. This system of approval and ongoing regulatory oversight considers, among other things, limitations on injection pressures and volumes as necessary to ensure injected fluids remain isolated from higher quality groundwater. A seismic monitoring program may be a component of future approvals for injection operations.

Zonal Isolation

0023-3, 0024-2, 0044-2
Commenters are concerned that the analysis of nearby drinking water wells is insufficient. Commenters claim to personally possess, or to know of, water wells located approximately half a mile or less from the Arroyo Grande Oil Field. Commenters are concerned that injection activities could affect these wells, and that not enough effort has been made to test for possible contamination. One commenter asserts that water produced from a well at the Holland Ranch contains oil, and suggests that this indicates further research is needed to confirm zonal isolation.

Response to Comments 0023-3, 0024-2, 0044-2:
The Division and the State Water Board have done a comprehensive study to find all nearby water wells using all available agency databases and data submissions by the public. Appendix P, in the supplemental application, is a letter signed by Ron Holland confirming there is no evidence of oil in his water wells. The Division received no evidence of any missed water wells within the quarter mile boundary outside of the proposed aquifer exemption area during any of the public comment periods.

0040-3, 0041-3
Commenters assert that the Regional Water Quality Control Board has a longstanding policy of presuming continuity between all aquifers within a given basin. Commenters argue that the aquifer exemption proposal relies on determinations about zonal isolation that are in direct conflict with this Regional Water Quality Control Board policy.

Response to Comments 0040-3, 0041-3:
The Central Coast Regional Water Quality Control Board has no such policy. The Division and the State and Regional Water Boards recognize that groundwater basins can and often do contain discrete aquifers or zones that are hydrologically isolated from each other.

0003-2, 0050-2
Commenters express concern that the Division and State Water Board cannot be certain that injected fluids will remain in the proposed exemption area since the containment of fluids relies on operational controls. Such operational controls can slow or cease over time and thus cannot be maintained indefinitely.

0034-3
Perhaps hydrocarbons have not migrated updip across the Arroyo Grande Fault Zone simply because it is updip. Updip motion requires acting against the force of gravity and the current reservoir pressures may simply not be enough to overcome that force. It is important to note that the Operator's hydrologic analysis concludes that a spillover of injected fluid will not lead to a loss of containment. So the synclinal structure of the aquifer itself may be responsible for variable oil content across the fault rather than the fault itself, as it inferred from the hydrologic analysis. The possibility of spillover may change if injection and fluid extraction dynamics change however, and relying on the operator to maintain current dynamics is not an acceptable method of protection.

Response to Comment 0003-2, 0034-3, 0050-2:
Although the hydraulic gradient depends on the operator's own actions, approval of Class II injection projects (a regulatory process separate from aquifer exemption) involves a joint review by the Division and the State Water Board. The Division and the State Water Board will consider incorporating conditions into approvals of injection projects to verify that injected fluids remain in the proposed exemption area. Potential conditions include, but are not limited to, using sentry groundwater monitoring wells on the boundaries of the proposed exemption area where groundwater is currently or could potentially be of beneficial use; the creation of a buffer zone between the location of injection wells and the boundary of the proposed exemption area; and requiring monitoring and maintenance of formation pressure and monitoring of groundwater elevations in the proposed exemption area.

0034-3
Previous application materials claim that the Arroyo Grande Fault Zone serves as a barrier to fluid flow, yet the possibility of the fault zone halting some fluid flow while allowing some to continue is not considered. Analysis of the fault at various points along its extent is the only way to definitely prove its sealing status. The fault gouge identified on the "Silva" 1 well mud log is put forth as solid evidence of a fault sealing mechanism but is not discussed in terms of its composition. To confirm that this gouge is evidence of sealing requires information on the grain size of this gouge material and knowledge of its permeability. Furthermore, evidence of gouge appears to only be based on the one "Silva" 1 well mud long which is not enough to confirm the ubiquity of gouge material along the fault.

The proposal materials reprise the recurrent argument that if the fault were not sealing, then we would already see evidence of fluid migration across the fault. Yet, one concern with this argument is that the mechanisms of oil placement and movement are portrayed as equivalent to those for water; a lack of movement of oil does not necessarily preclude the possibility of water migration.

The supplemental information discusses a public comment which provided evidence of a surface breach on property north of the Arroyo Grande Fault Zone from injection operations to the south. This breach occurred in 1981 and is attributed to steam injection above the fracture gradient. Even considering that injection in this instance was in excess of the fracture gradient, the fact that activities south of the fault influenced property north of the fault calls into question the strength of the Arroyo Grande Fault Zone as a seal. It is clear that there are circumstances under which fluids can flow across the fault, and the Operator has not done enough to preclude pathways for fluid flow. With a drinking water well just north of the fault zone, the Operator and DOGGR have a responsibility to make absolutely certain the fault is a complete seal.

Response to Comment 0034-3:
Based upon the information reviewed by the Division and State Water Board staff, injected fluid will remain in the proposed aquifer exemption area through a combination of geologic (synclinal structure, stratigraphic and permeability conditions, fault barrier) and hydraulic controls (more water is removed from the proposed aquifer exemption area through oil field development than is re-injected as waste water). All of the data used for the review is available in the original aquifer exemption proposal application and the supplemental application. The breach in 1981 occurred as a result of injection pressures that were greater than twice the fracture gradient. Current regulations that require all injection activities to remain below the fracture gradient and operational controls required by the Division and the State Water Board will ensure that all injected fluids will remain within the proposed aquifer exemption boundary.