Preliminary Questions/Comments

Project: Cat Canyon Oil Field-Sisquoc and Monterey Formations

General Project and Aquifer Information

1. General Questions about the Application

    a. Section 8 of the application provides a response to the requirements at 40 CFR 146.4(b)(1)(2) and (3) and says that (b)(4) is "not applicable." The application also responds to 40 CFR 146.4(c) with a treatment feasibility study in Appendix 6-I. Please confirm that the aquifer exemption is requested pursuant to 40 CFR 146.4(a) and (b)(1).

    Although we provided responses to all the Safe Drinking Water Act requirements for exemption, this aquifer exemption is requested pursuant to 40 CFR 146.4(a) and (b)(1). The areas proposed for exemption are the hydrocarbon bearing areas in the Sisquoc and Monterey Formations as shown on Figures 1.2-1 and 1.2-2.

2. Areal Extent of the Aquifer Proposed for Exemption

    a. Are separate shape files available for each formation that show: the existing exempted area of the Sisquoc and Monterey Formations, and the area of the Sisquoc and Monterey Formations proposed to be exempted?

    These shape files are included in Appendix 7-I.

    b. Is information available to complete the following table for each formation (which EPA will need for the final decision document)?

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top Formation, Subsea Depth (feet)

This information is provided in the tables and maps located in the attachments at the end of this document.

3. General Project Information

   a. Do all eight operators identified on page 8 of the application have injection wells in the area proposed for exemption, or only the four that are listed on page 16?

      The following operators have injection wells in the area proposed for exemption: B.E. Conway Energy Inc., HVI Cat Canyon Inc., California Resources Production Corporation, ERG Operating Company LLC., and Vaquero Energy LLC. The four operators listed on page 16 actively participated in compiling the data and information for the current proposed aquifer exemption.

   b. How many Class II D and Class II R wells are in the area proposed for exemption?

      These numbers are subject to change as wells are abandoned and new wells are drilled. According to the Division's online map application, "Well Finder", there are 6 active Class II D wells and 113 active Class II R wells within the proposed exemption expansion area. In the existing exemption area, there are 18 active Class II D wells and 86 active Class II R wells.

4. Information about the Aquifer Proposed for Exemption

   a. The application states on page 120 that the sands of the Sisquoc Formation that comprise the producing intervals are named the S1b through S9 or S10, with the basal sands being locally named as the Brooks, the Thomas, and occasionally the Santa Margarita. Table 1.2-1 also mentions the Los Flores. Is this interval part of the previously exempted Sisquoc Formation?

      In 1954 the Los Flores Pool did include the basal Sisquoc sand (i.e., Brooks, Thomas and Santa Margarita sand equivalent) as well as the Monterey Formation. In 1973, the Los Flores only indicated the cherty zone in the Monterey Formation. To be consistent with the current exemption, Table 1.2-1 has been revised (attached) and correctly indicates that the Los Flores is part of the Monterey Formation.

   b. The application states on page 121 that in the West Area of the field, the Monterey Formation is sometimes named Los Flores. However, Table 1.2-1 indicates that Los Flores is part of the Sisquoc Formation. Please clarify.

      Table 1.2-1 has been revised (attached) and correctly indicates that the Los Flores is part of the Monterey Formation.

5. Depth and Thickness of the Aquifer Proposed for Exemption

   a. The application states on page 66 that the Sisquoc Formation ranges from 1,800 to 2,500 feet thick; however, on the north-south trending cross sections it appears to thin to about 800 feet to the north.

      i. Please clarify whether this depth range refers to the entire Sisquoc Formation, including the confining portion, or only the portion of the Sisquoc Formation that is proposed for exemption.

         This thickness range refers to the entire Sisquoc Formation. Page 66 has been revised to correctly reflect the thickness range. The revised page is attached to this document.

      ii. If it refers to the entire Sisquoc, what is the thickness of the portion of the Sisquoc Formation that is proposed for exemption?

         Please refer to the average thickness of the exemption interval described in Table 2 which is attached to this document.

   b. Why is the S1b interval not shown in cross sections D-D', E-E', or H-H'?

      The S1b interval is not shown on those cross sections because the focus of the aquifer exemption application is not on the individual sandstone members of the Sisquoc Formation. Instead, the application is focused on the entire Sisquoc and Monterey formations which are clearly specified on the cross sections.

   c. What is the average thickness of each formation that is proposed for exemption?

      Please refer to the average thickness of the exemption interval described in Table 2 which is attached to this document.

   d. Please provide the depth to the top of each formation proposed for exemption in depth below ground surface and relative to mean sea level (provide an average and a range, if possible).

      Please refer to Tables 2, 1a and 1b in the attachments.

6. Information on the TDS Content of the Aquifer

   a. Most of the TDS data are from the currently exempted areas. Are any additional TDS samples available from within the areas of the formations that are proposed for exemption?

All known TDS data are included in the aquifer exemption application in Appendix 5-IV Formation Water Analysis.

40 CFR 146.4(a) Criteria Support

7. Permeability and Porosity

   a. On page 120, the application states that the Sisquoc S1b-S10 sands have permeability as high as 3 Darcy. However, on the spreadsheet in Appendix 4-1, permeabilities based on conventional core data as high as 8 Darcy are shown. Please clarify.

      Page 120 was revised to show permeability as high as 8 Darcy. The revised page 120 is attached to this document.

      The application, on page 120, says that the Sisquoc S1b-S10 sands range in porosity from 25% to 63%; however, according to the spreadsheet provided in Appendix 4-1, porosity values based on conventional core data range from 2.3% to 48.8% in the Sisquoc Formation. Please clarify.

      The 25% to 63% porosity represents a combination of historical information from California Oil and Gas Fields, Volume II Publication No. TR12 and the core data found in the laboratory data sheets contained in Appendix 4-1. Well Tunnell S8 (API # 08322808) has porosity in the Sisquoc of 62.7%, which was rounded up to 63%. The lower porosity of 2.3% is not representative of a sand but of a portion of a calcified confining zone.

   b. Please clarify which sidewall core values in Appendix 4-1 are specific to the portion of the Sisquoc Formation that is proposed for exemption.

      In Appendix 4-I, there is a spreadsheet titled, “Summary of Core Data,” which contains all known core data in the possession of the four operators who participated in the study. The data is labelled and separated by specific geologic interval.

   c. The application on page 66 states that core data in the Monterey Formation is not considered representative of the total formation properties due to localized natural fracturing. If this is the case, what is the basis of the porosity/permeability values for the Monterey Formation cited on pages 66 and 121 of the application?

      The porosity and permeability values of the producing Monterey Formation were estimated by Hubbert & Willis based on initial production values and volumetric studies of naturally fractured reservoirs published in 1955. The Monterey Formation in Cat Canyon was extensively studied as one of the significant

naturally fractured producing reservoirs in the United States (Hubbert, M. K., & Willis, D. (1955). Important Fractured Reservoirs in the United States. 4th World Petroleum Congress, 6-15 June, Rome, Italy).

8. Upper Confinement
    a. What data were used to create the isochore map in Figure 6.1-2 and cross sections J-J' and I-I' that show confinement in the northern area proposed for exemption, and are they from throughout the area mapped?

        The data used to create the isochore maps and cross sections were the depths and geophysical signatures on well logs from wells throughout the mapped area. These data were used to map the Upper Sisquoc Confining Layer which is continuous throughout the proposed aquifer exemption area except where it pinches out in the far northeast part of the field. In that area, the overlying Foxen Claystone confines injection into the Sisquoc Formation. Well log data is kept by the Division and is publicly available via the free web map, “Well Finder” (https://www.conservation.ca.gov/dog/Pages/WellFinder.aspx).

    b. Please provide thickness information for the sub-units of the Sisquoc Formation, particularly the Upper Sisquoc Confining Layer.

        We did not gather thickness information for each of the sub-units of the Sisquoc Formation because they are not independently proposed for exemption. This application proposes to exempt the entire Sisquoc Formation (except the upper confining layer) and not just the sub-units. The thickness of the Upper Sisquoc Confining Layer thickness is provided in Figure 6.1-2.

9. Lower Confinement
    a. What is the thickness of the Lower Sisquoc siltstones and claystones that provide lower confinement?

        While there are low permeable strata that underlay the injection intervals, lower confinement is ultimately provided by connate fluid incompressibility and the reservoir’s pressure regime. Injected fluids are not expected to flow downwards because the pressures trend from high to low in an upward direction, and fluid incompressibility generally increases with depth. Pressure and confinement data are provided on Figure 5.1-19, Figure 5.1-20, in Appendix 5-V, and in Appendix 6-III. Thickness information is provided for the Upper Sisquoc Confining Layer on Figure 6.1-3.

    b. The application, on page 66 describes the basal sand contained within the Lower Sisquoc claystone.

i. Does this refer to the intermittent sands that DOGGR discussed with EPA in February 2018?

Yes.

ii. Do these sands contain water with a TDS content of less than 10,000 mg/L? If so, please describe the evidence for hydraulic isolation of these intermittent sands.

Within the standard deviation of the formation water data contained in Appendix 5-IV and analyzed in Appendix 6-I, the Sisquoc Formation in its present state contains waters bearing less than 10,000 mg/L TDS. Please refer to Table 1.1-1.

c. Figure 3.2-2 shows the Monterey Formation in contact with basement serpentinite in T8N R32W Sections 9 and 10. How does the serpentinite body affect lower confinement?

The lower confinement of the Monterey Formation is not affected by the serpentinite, and it is instead provided by an inward and upper pressure gradient toward the major producing areas. The serpentinite body is an ophiolite metamorphic sequence which existed prior to Monterey deposition. There is no active or historic fluid withdrawal from the serpentinite, so there is no accommodation space available for additional fluids. Therefore, the pressure regime does not facilitate the downward migration of fluids from the Monterey Formation into the serpentinite body.

10. Lateral Confinement

Is a map available that superimposes the sealing faults described throughout the application onto the area proposed for exemption? This would demonstrate how the faults provide confinement/relate to the AE boundaries.

The sealing faults described throughout the application are shown superimposed on the area proposed for exemption on Figure 1.2-1 and Figure 1.2-2. Figures 1-2-1b, 1-2-2b, and 4.2-2 to 4.2-4 show the sealing faults in relation to the current exempted areas.

11. Lateral Confinement to the East

a. The available pressure data across the normal fault in T8N R32W Sections 3 and 10 is from wells that are several miles from the southern portion of the eastern boundary of the area proposed for exemption. What evidence is there that the

fault's sealing properties are similar in the southern portion of the eastern boundary of the area proposed for exemption?

The sealing nature of the faults is documented on Figures 5.1-15 with differing groundwater gradients; 5.1-19 with different reservoir pressure data; and 5.1-20 with a variety of pressure data, tracer testing, and gas accumulations. In addition, published literature suggest the faults in this area are sealing (Sylvester, 1979) (DWR, 2004).

b. Please explain the mechanism for containment in the northeast corner of the area proposed for exemption (i.e., in the North Area Fault Block in T9N R32W Section 7, and T9N R33W Section 12).

The Sisquoc sands pinch out in the northeast portion of the area proposed for exemption in the North Area Fault Block (Figure 5.1-13, Cross section J-J'). The cross section demonstrates that the northern extent of the aquifer exemption boundary is defined by the last Sisquoc Sand to pinch out (S1b). The mechanism of containment is the lack of permeable reservoir in the area. Where the Sisquoc Sands are present, they are encapsulated by the Foxen Claystone, the Lower Sisquoc Confining layer, and the Upper Sisquoc Confining Layer where it exists. In addition, containment is provided by the inward pressure gradient caused by decades of fluid extraction from the producing formations in the field.

c. Please explain the mechanism of confinement along the southeastern boundary of the Monterey Formation AE in T9N R33W, Sections 20, 21, 28, 29, 33, and 34.

It appears the southeastern boundary of the Monterey Formation is in T9N R32W, Figure 5.1-20. The confinement is an unnamed sealing fault that is most clearly documented by Figure 5.1-15 Groundwater Gradient Map. In addition, published literature suggest the faults in this area are sealing (Sylvester, 1979) (DWR, 2004). Also, because the Monterey formation is primarily comprised of siliceous shale and cherts, it is only permeable where it is fractured (i.e. near some faults and along the crest of folds), so fluids are contained to the naturally fractured areas. In addition, containment is provided by the inward pressure gradient caused by decades of fluid extraction from the producing formations in the field.

d. For the Monterey Formation, the application states that the Garey Fault is sealing, but no supporting data are provided. Please provide evidence that this fault is sealing.

The confinement of the Garey Fault is most clearly documented by Figure 5.1-15, Groundwater Gradient Map. In addition, published literature suggest the faults in this area are sealing, including the Garey Fault (Sylvester, 1979) (DWR, 2004).

12. Lateral Confinement to the North
    a. Please describe where other productive sands of the Sisquoc Formation pinch out in the north relative to the S1b.
        i. Does the entire Upper Sisquoc pinch out?

        The northern Sisquoc boundary was chosen where the Sisquoc S1b pinches out. South of the Sisquoc S1b pinch out, all of the lower Sisquoc sands are already thinned and are no longer present, Figure 3.2-11a and 3.2-11b Cross Section J-J'. The S1b is the last productive sand to pinch out. The lower confining layer pinches out further to the north as shown by Hall (Hall, 1978).

        ii. What productive units in the Monterey Formation extend to the north of the area proposed for exemption, and do they pinch out at or before the northern boundary as well? What data/evidence are available to support this information?

        The Monterey Formation sub-crops north of the aquifer exemption boundary. The Monterey is the source rock as well as a producing zone in the Cat Canyon Oil Field. This means the Monterey Formation both generated the oil found in the Cat Canyon Oil Field and serves as a reservoir to store and produce oil. This is common for many of the oil fields found in the Santa Maria Basin. The proposed boundary in the northern area is based on northern most productive well in the Monterey(Figure 6.3-6).

13. Lateral Confinement to the West
    a. The application states that the Bradley Canyon Fault is sealing, but pressure data from only two wells on the eastern side of the Bradley Canyon Fault in the Monterey Formation are provided. Please provide additional evidence that the Bradley Canyon fault is sealing on the western boundary of the area proposed for exemption.

    The sealing nature of the Bradley Canyon Fault is documented on Figures 5.1-15 with differing groundwater gradients, 5.1-19 with multiple points of different reservoir pressure data and 5.1-20 with a variety of pressure, gas accumulations and wells pressured above hydrostatic. In addition, published literature suggest the faults in this area are sealing (Sylvester, 1979) (DWR, 2004).

b. Please clarify which productive units are encompassed by the western boundary of the AE and whether they are all confined by the pinch-outs described in the application.
    i. If they do not all pinch out within the AE boundary, what is the means of confinement along the western boundary of the Sisquoc Formation that is proposed for exemption?

    On the western boundary there are producible Sisquoc sands below the S1b pinchout that require exemption for future production Figure 3.2 -7a and 3.2 -11b Cross Section F-F'. The Sisquoc Sands that do not pinch out are confined by an inward fluid gradient, Figure 5.1-19. The Monterey does not pinch out in a western direction. It is confined by an inward fluid gradient that directs fluids towards naturally fractured production areas proximal to faults and anticlines, Figure 5.1-20.

c. Please clarify the mechanism for confinement along the western boundary of the area proposed for exemption in the North Bradley Canyon Fault Block (T9N R33W Sections 15 and 16)

    The Sisquoc Sands and Monterey Formation are confined by an inward fluid pressure gradient in the North Bradley Canyon Fault Block (see Figures 5.1-19 and 5.1-20).

14. Lateral Confinement to the South

a. What is the mechanism of confinement for each formation in the extreme southern tip of the area proposed for exemption? What lower units are contained in this boundary?

    The mechanism of confinement is an inward fluid gradient present in the Monterey Formation and the Sisquoc sands (see Figures 5.1-19 and 5.1-20).

15. Ground Water Movement

a. In Table 5.1-7, the "cumulative to 1977" numbers do not appear to total to the "balance number" shown. That is, (228,852,985+898,501,621) – (176,028,000+33,360,333 + 63,722,653) equals 854,243,620 not -805,407,026 as shown on the table. Please clarify the discrepancy.

    Please see the updated table for 2017, the last full data year. The updated table is attached to this document.

b. Are the “cumulative to 2016” numbers on Table 5.1-7 inclusive of the “cumulative to 1977” numbers?

Yes, but the new table has been updated to show up to 2017. The updated table is attached to this document.

c. Are the cumulative data up to 1977 in Table 5.1-7 considered to be unreliable/poor quality (and therefore not be used to support the evaluation of ground water flow), or is it simply incomplete?

The cumulative data up to 1977 is derived from the California Conservation Committee reports and are less reliable than the 1977 to 2017 data but are reasonably representative of production and injection data. Production and injection data was collected by the Division prior to 1977 in an analog format and has not been fully digitized by the State. The California Conservation Committee reports are an accurate characterization of the pre-1977 data.

d. Table 6.2-1 shows that the volume injected exceeded the volumes withdrawn for several years (e.g., 1979-1982 and 1987). What information is available to support a determination that this scenario will not recur?

Historically, most produced water was not reinjected but rather was sent out of the Study Area to the Santa Maria River, Pacific Ocean, or piped to the Battles Gas Plant where it was treated and then put into the outfall. Appendix 5-V, Fluid Levels and Material Balance, contains a map showing the historic gathering system. The calculated voidage for the field as a function of the cumulative production (based on material balance) is plotted on Figure 6.2-2. Although in several years injection was greater than production, this is an unusual event and uncommon. Aquifer Exemptions contain no conditions, and it is the responsibility of the Division to ensure all injection occurs within and stay within the approved boundaries of the exemptions. All Under Ground Injection Control projects, current and future, will be evaluated and have conditions added to ensure that the exempted aquifers will not be pressured up to a point that would allow flow of injection water out of the exempt areas and into non-exempt aquifers. With sufficient dewatering of a zone, injection volumes can exceed concurrent production as long as the zone pressure is low enough to contain the injection fluids.

e. How do the mass balance values in Tables 5.1-7 and 6.2-1 compare? The sum of oil and water produced in Table 6.2-1 does not match the values in Table 5.1-7, or the difference between the cumulative to 2016 minus the cumulative through 1977 values in Tables 5.1-7. Please clarify.

The tables have been updated to include data up to 2017, and they both match. The updated tables are attached to this document.

f. The text of the application says that Table 5.1-7 shows cumulative production and injection data up to 2016; however, the mass balance data in Table 6.2-1 contains 2017 data. Please clarify the discrepancy.

   The tables have been updated to include data up to 2017, and they both match. The updated tables are attached to this document.

g. In Appendix 5-V, the total amounts produced and injected on the tables "Production Assigned Zones" and "Injection Assigned Zones," respectively, do not match the information on Table 5.1-7. Please explain what those tables represent. Furthermore, the data presented as Table 6.2-2 in the file "DOGGR Injection & Production Data" in Appendix 5-V does not match Table 6.2-2 in the application. Please clarify the discrepancy.

   "Production Assigned Zones" and "Injection Assigned Zones" show which wells produced or injected into which zones, not cumulative production or injection. Appendix 5-V does not match Table 6.2-2 because they were created by different people using different datasets. There's no telling which is incorrect since the discrepancies are slight. The volumes reported in Table 6.2-2 were calculated by WZI, Inc. who used DOGGR's online injection and production data (available at ftp://ftp.consrv.ca.gov/pub/oil/online_data/production_injection_data/). DOGGR staff created the file, "DOGGR Injection & Production Data," in Appendix 5-V to check the various reported volumes and mass balance claims in the application, and they queried the data from DOGGR's internal database.

16. Information on Drinking Water Wells

a. Do the Alluvium and Paso Robles Formation of the San Antonio Basin serve as the water supply for all drinking water uses in the area of the Cat Canyon Oil Field?

   The Alluvium, Paso Robles Formation, and the Careaga Formation provide drinking water for the area. The Paso Robles Formation is the main water bearing formation in the San Antonio Basin/ San Antonio Creek Valley (application page 121). For all water wells in and near the Cat Canyon Oil Field, Table 5.1-1 lists the designated use and the completed formation name. The intervals proposed for exemption are not a source of drinking water.

b. The application, on page 101, references a 2016 letter to B. Falkenhagen about the Los Alamos census designated place's (CDP's) well. Please provide a copy of this letter for inclusion in the record.

This letter is included in Appendix 6-1 Treatment Feasibility Study, Appendix III Water Purveyor Information, and the title of the Document is, "LACSD No Service Letter.pdf." This letter is the LACSD response to decline purchasing reverse osmosis water from the oilfields as part of the water treatment feasibility study. An email was provided by Kevin Barnard of the LACSD on April 20, 2017 with the wells used by LACSD for water production. That email is included in Appendix 6-1 Treatment Feasibility Study, Appendix III Water Purveyor information, and the title of the document is "LACSD Well Verification Contact Record.pdf."

c. What is the source of water for the community of Sisquoc if the Golden State Water Company's wells are currently inactive?

Golden State Water Company provides water to the community of Sisquoc through a variety of supplies, including the State Water Project, as stated in Appendix 6-I Treatment Feasibility Study Section 1.2.2.2.

i. Please include any active water supply wells for the Sisquoc Community on the inventory table.

There are no active water supply wells in the community of Sisquoc.

ii. Why are the Sisquoc Community CDP's two legacy wells (shown on Table 5.2-2) not included on Table 5.1-1? Please add them to the table for completeness and provide depth and screen/completion formation.

The two Sisquoc Community legacy wells are included on Table 5.1-1 as CC118 and CC119.

17. Water Well Table

a. Are the individual residential wells for the community of Garey on the inventory? If not, please add them to Table 5.1-1.

Yes, the individual residential wells for the community of Garey are included on Table 5.1-1 and Figure 5.1-3.

b. Do the wells identified as "domestic/irrigation" or "domestic/agricultural" on Table 5.1-1 have any potential use for human consumption? In particular, what

information is available about CC197, a domestic/irrigation well completed in the Careaga/Foxen/Sisquoc, to ensure that this well does not provide drinking water?

According to the USGS (https://water.usgs.gov/edu/wudo.html), domestic water use includes indoor and outdoor household purposes. Therefore, the wells identified as domestic/irrigation or domestic/agricultural could potentially be used to provide a house or farm with water including drinking water. Although CC197 is completed in the topmost portion of the Sisquoc Formation, it is not completed in the Sisquoc sands to be exempted. The well partially penetrates the Upper Sisquoc Confining Layer by approximately 40 feet. Approximately 500 vertical feet of fine-grained, low permeability siltstones and shales exists between the Sisquoc sands proposed for exemption and the base of the water well. This significant vertical separation, and the sealing properties of the Upper Sisquoc Confining Layer, will ensure that injected fluids are contained to the portion of Sisquoc sands to be exempted and will not affect the water well or any overlying aquifer.

c. Is depth/completion formation available for well CC066, a domestic well within the area proposed for exemption? If not, on what basis does DOGGR state that the well does not draw from the aquifers proposed for exemption?

   Well CC066 has a completed depth of 225' in the Paso Robles Formation.

d. There are several typos/misspellings on Table 5.1-1 (e.g., in the purpose column). Please correct these so that EPA can include the table in the record of decision document.

   Table 5.1-1 has been edited to fix these typos. The updated table is attached to this document.

e. Several wells on Table 5.1-1 are completed in the "Orcutt/Paso Robles/Careaga." Where is the Orcutt Formation relative to the formations that are proposed for exemption?

   The Orcutt Formation is stratigraphically younger than the Paso Robles Formation, located above the upper confining layer.

f. The application says on page 9 that there are agricultural water wells completed in the Careaga Formation and the Foxen Formation located stratigraphically above the Sisquoc oil sands. However, according to Table 5.1-1, two irrigation wells (CC140 and CC141) are completed in the Alluvium/Paso Robles/Monterey.

Please clarify why the text does not mention that wells are completed in the Monterey Formation.

CC140 and CC141 are east of the Santa Maria River Fault which hydraulically isolates these wells from the proposed exemption area and the Cat Canyon Oil Field.

g. Well CC225 appears to be an irrigation well shown on Cross Section K-K' as completed in the Alluvium/Upper Sisquoc at 60 feet bgs. However, according to Table 5.1-1, this well is completed at 50 feet. Please clarify.

Table 5.1-1 shows a total depth of 60 feet bgs as does Cross Section K-K'. Although the well is screened to 50' for production purposes, the hydraulic continuity is based on 60' bgs.

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18. Logs and Core Data

a. According to the summary spreadsheet in Appendix 4-1, oil saturation values for the Monterey Formation range from 0 to 22.3%. On what basis is this formation considered to be oil productive; that is, what data indicate that the Monterey Formation is a producing zone, as the application notes on page 137?

The Monterey core data is included in Appendix 4-I (Core Data and Well Histories). Please note that the core data may not be representative of the total formation's properties due to natural fracturing (Nelson, 2001). The upper Miocene Monterey Formation of the Cat Canyon Oil Field was identified as one of the most important naturally fractured oil and gas producing reservoirs in the United States, (Hubbert & Willis, 1955). The large volumes of oil produced both historically and currently throughout the Cat Canyon Oil Field demonstrate that the Monterey Formation is a commercial source of hydrocarbons. It should be noted that the Monterey Formation is the petroleum source rock, not only for the entire Cat Canyon Oil Field, but all oil fields in the Santa Maria Basin. It contains hydrocarbons throughout its entirety, and where it is naturally fractured it is a commercially producible oil reservoir.

19. Production Data

a. What is the start date of the "cumulative to 1977" numbers on Table 5.1-7?

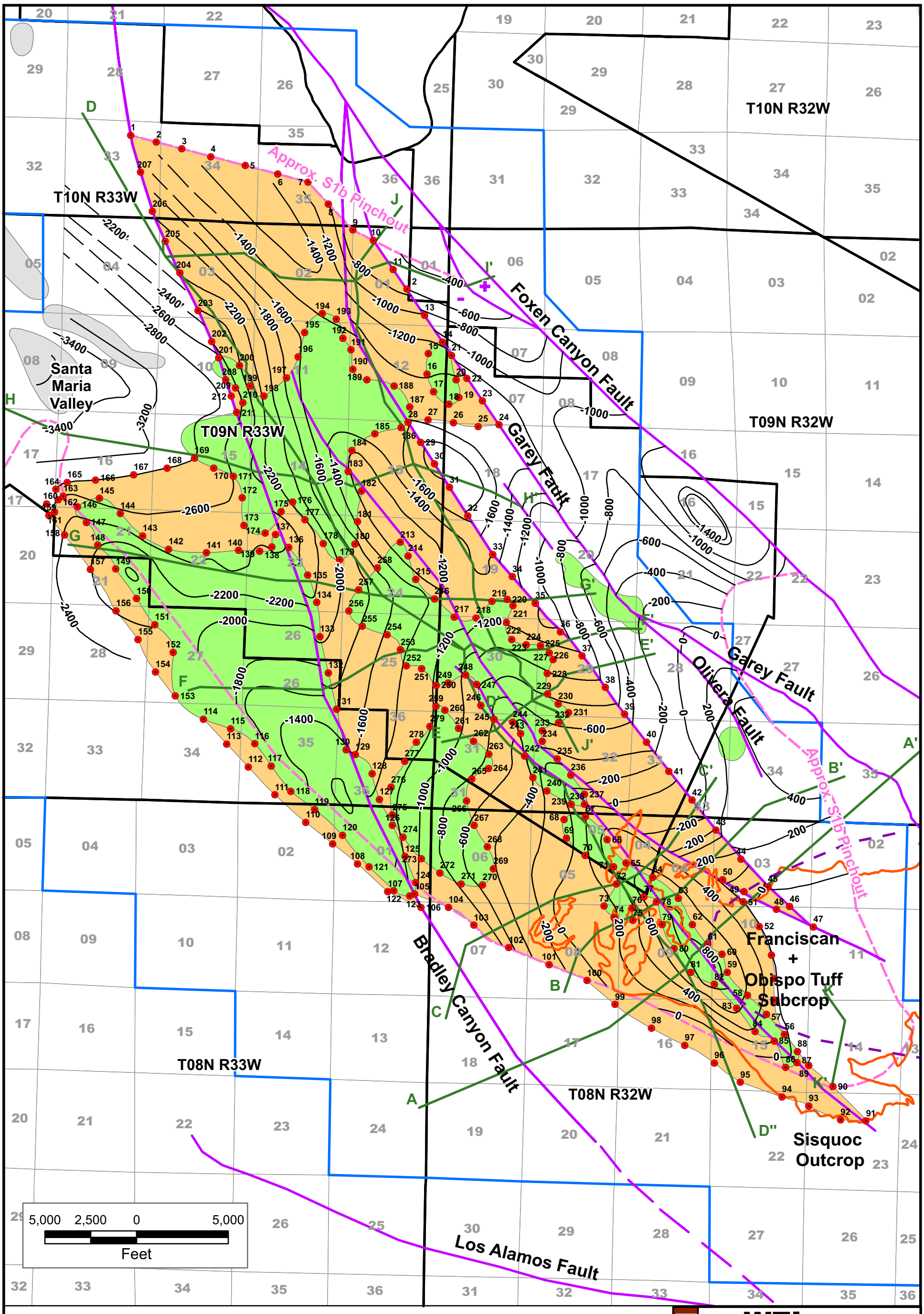
The Conservation Committee of California Oil and Gas Producers (CCCOGP) has historically collected production data from all oil and gas operators in the State of California since their inception in 1929, which is likely the start year for

Table 5.1-7. The cumulative data provided is the best available for the early years of the Cat Canyon Oil Field.

Attachments (15)

These attachments are revised components of the aquifer exemption application and may or may not be specifically referenced in the above correspondence. For electronic viewers, this list is hyperlinked (press Alt + Left Arrow to return to previous page view).

- Sisquoc AE Boundary Points Map
- Sisquoc AE Boundary Points
- Monterey AE Boundary Points Map
- Monterey AE Boundary Points
- Table 2 (Monterey and Sisquoc Formation Characteristics)
- Revised Table 1.2-1
- Revised Table 5.1-1 Water Well Inventory
- Revised Figure 5.1-3
- Revised Table 5.1-3
- Revised Table 5.1-7
- Revised Table 6.2-1
- Revised Page 69 (previously page 66)
- Revised Page 126 (previously page 120)
- Revised Page 83 (previously page 80)
- Revised Page 24 (previously page 22)
- Revised Page 137 (previously page 133)


T10N R32W
T10N R33W
T09N R32W
T09N R33W
T08N R33W
T08N R32W
Santa Maria Valley
Foxen Canyon Fault
Garey Fault
Olivera Fault
Bradley Canyon Fault
Los Alamos Fault
Approx. S1b Pinchout
Franciscan + Obispo Tuff Subcrop
Sisquoc Outcrop
5,000 2,500 0 5,000
Feet
Legend
Sisquoc Sands AE Expansion Boundary Points
Fault Throw
Down
Up
Volcanic Subcrop
Cross Sections
Sisquoc Outcrop
Elev. Contour (200f)
Approx. Elev. Contour (200f)
S1b Faults
Approx. S1b Pinchout
Study Area
Other Oilfield
1973-1974 Productive Boundary
Proposed Expanded Sisquoc Aquifer Exemption Boundary
N
W
E
S
WZI INC.
BAKERSFIELD, CALIFORNIA
CAT CANYON AQUIFER EXEMPTION EXPANSION
SISQUOC SANDS AQUIFER EXEMPTION EXPANSION BOUNDARY POINTS MAP
DATE: 12/18
FIGURE: X.X-X

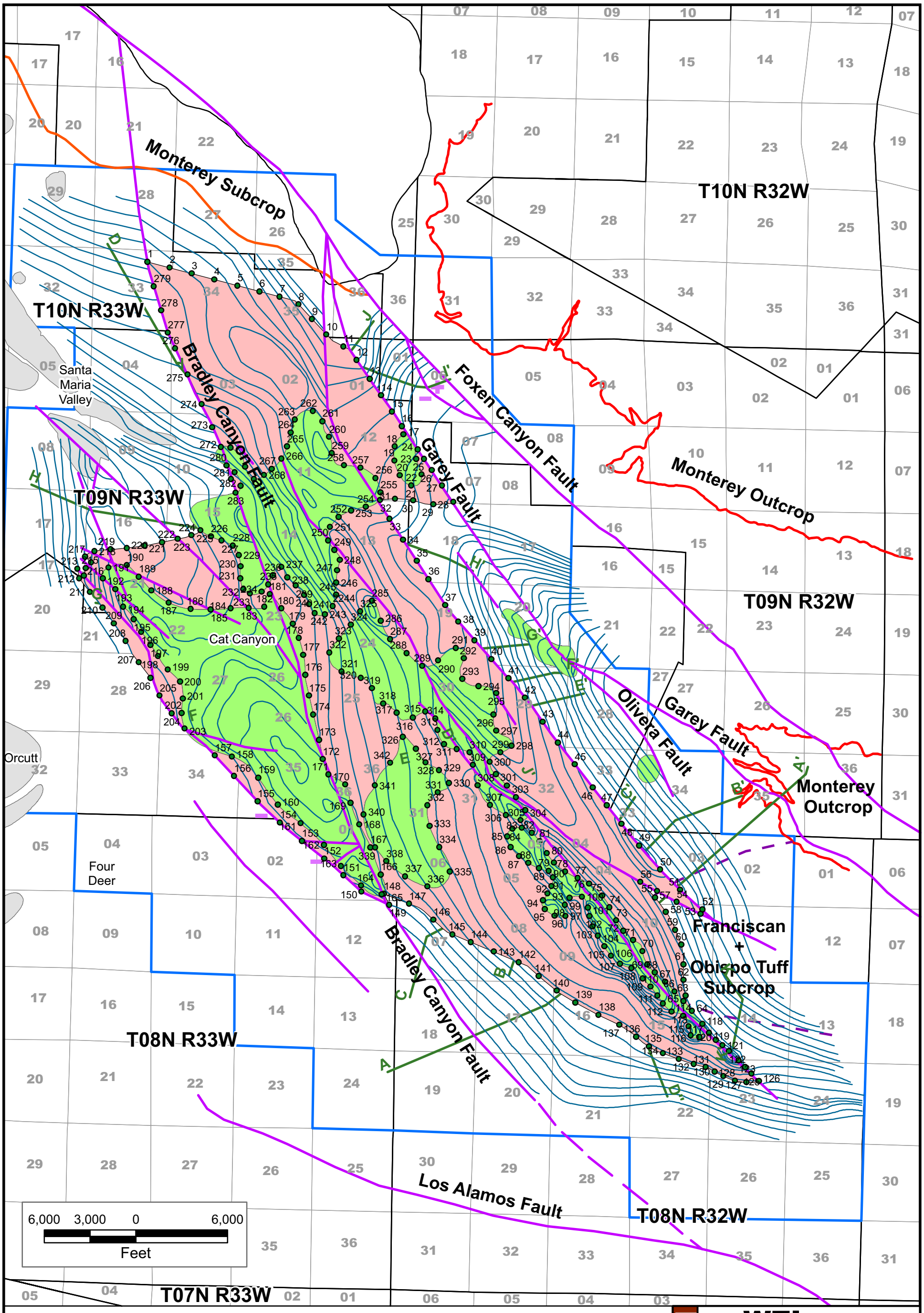
AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top Sisquoc Sands Below the Upper Confining Layer Subsea Depth (Feet)
1	10N	33W	33	34.90656834	-120.3532943	-1480'
2	10N	33W	33	34.90563723	-120.3485675	-1450'
3	10N	33W	34	34.90472909	-120.3439584	-1460'
4	10N	33W	34	34.90367591	-120.3386143	-1450'
5	10N	33W	34	34.90243597	-120.3323242	-1475'
6	10N	33W	35	34.90126773	-120.3263996	-1310'
7	10N	33W	35	34.90017369	-120.3208528	-1135'
8	10N	33W	35	34.89695421	-120.3170301	-1010'
9	09N	33W	2	34.89314002	-120.3125019	-550'
10	09N	33W	1	34.8916776	-120.3087332	-350'
11	09N	33W	1	34.88734459	-120.3049774	-580'
12	09N	33W	1	34.8844561	-120.3023796	-750'
13	09N	33W	1	34.88058905	-120.2990443	-1020'
14	09N	33W	12	34.87667367	-120.2956922	-1175'
15	09N	33W	12	34.87486123	-120.2982136	-1265'
16	09N	33W	12	34.87183866	-120.2983742	-1380'
17	09N	33W	12	34.86920043	-120.2971211	-1460'
18	09N	32W	7	34.86738342	-120.2943033	-1500'
19	09N	32W	7	34.86844387	-120.2924873	-1460'
20	09N	32W	7	34.87102947	-120.2930776	-1415'
21	09N	32W	7	34.8746767	-120.2939956	-1260'
22	09N	32W	7	34.87134342	-120.291111	-1415'
23	09N	32W	7	34.86799568	-120.2882107	-1470'
24	09N	32W	18	34.86444298	-120.2851333	-1470'
25	09N	32W	18	34.86415	-120.2888814	-1515'
26	09N	32W	7	34.86461375	-120.2934168	-1560'
27	09N	33W	12	34.86496377	-120.298037	-1580'
28	09N	33W	13	34.86452434	-120.3016424	-1565'
29	09N	33W	13	34.86156921	-120.2992447	-1750'
30	09N	33W	13	34.85840087	-120.2966808	-1730'
31	09N	32W	18	34.85493459	-120.2938761	-1750'
32	09N	32W	18	34.85074234	-120.2904175	-1630'
33	09N	32W	19	34.84499103	-120.2856735	-1410'
34	09N	32W	19	34.84172425	-120.2820422	-1335'
35	09N	32W	19	34.83787167	-120.2777616	-1225'
36	09N	32W	29	34.83367265	-120.2730941	-1245'
37	09N	32W	29	34.8301006	-120.2690545	-1170'
38	09N	32W	29	34.82546635	-120.2647082	-930'
39	09N	32W	29	34.8215372	-120.2610701	-685'
40	09N	32W	33	34.81739452	-120.2569919	-450'
41	09N	32W	33	34.81314828	-120.2527939	-100'
42	09N	32W	33	34.80886595	-120.2484834	-110'
43	08N	32W	3	34.80448343	-120.2440288	-175'
44	08N	32W	3	34.80021305	-120.2393342	300'
45	08N	32W	3	34.7961305	-120.2343526	-35'
46	08N	32W	3	34.79326809	-120.2303197	-220'
47	08N	32W	11	34.79029148	-120.2259377	-400'
48	08N	32W	10	34.79280216	-120.2327098	-165'
49	08N	32W	3	34.79535731	-120.2386873	100'
50	08N	32W	3	34.79704206	-120.2426291	235'
51	08N	32W	3	34.79379146	-120.2387817	200'
52	08N	32W	10	34.79019692	-120.2357493	220'
53	08N	32W	10	34.78594521	-120.2334225	220'
54	08N	32W	10	34.78240116	-120.2328354	250'
55	08N	32W	10	34.77922129	-120.2327203	255'
56	08N	32W	15	34.77407109	-120.2307409	240'
57	08N	32W	15	34.77703999	-120.2341251	345'
58	08N	32W	10	34.77983257	-120.2376388	565'
59	08N	32W	10	34.78320155	-120.2414141	700'
60	08N	32W	10	34.78587041	-120.2423965	715'
61	08N	32W	9	34.78729306	-120.245075	750'
62	08N	32W	9	34.7902707	-120.2478896	715'
63	08N	32W	4	34.79409438	-120.2505754	690'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top Sisquoc Sands Below the Upper Confining Layer Subsea Depth (Feet)
64	08N	32W	4	34.79717961	-120.2553016	645'
65	08N	32W	5	34.79922622	-120.260226	540'
66	08N	32W	5	34.80268432	-120.263756	425'
67	08N	32W	5	34.80605075	-120.2677907	190'
68	08N	32W	5	34.80554895	-120.2716689	-60'
69	08N	32W	5	34.80277606	-120.2711152	-50'
70	08N	32W	5	34.80023269	-120.2676971	150'
71	08N	32W	5	34.79859575	-120.2624895	430'
72	08N	32W	5	34.79605093	-120.261927	360'
73	08N	32W	8	34.79267923	-120.2640307	160'
74	08N	32W	8	34.79104858	-120.2621618	180'
75	08N	32W	9	34.79062955	-120.2587484	340'
76	08N	32W	9	34.79251321	-120.2589427	375'
77	08N	32W	4	34.79425538	-120.2568594	615'
78	08N	32W	4	34.79350936	-120.2545057	685'
79	08N	32W	9	34.79011978	-120.2533937	695'
80	08N	32W	9	34.78661202	-120.251139	705'
81	08N	32W	9	34.78305463	-120.2480203	720'
82	08N	32W	10	34.78133877	-120.2436652	835'
83	08N	32W	15	34.77786811	-120.239545	625'
84	08N	32W	15	34.77441085	-120.2361064	350'
85	08N	32W	15	34.77308159	-120.2325942	195'
86	08N	32W	15	34.76920025	-120.2304372	-130'
87	08N	32W	15	34.7699153	-120.2283848	400.00
88	08N	32W	15	34.7715546	-120.2282986	240.00
89	08N	32W	14	34.76951659	-120.2262247	65'
90	08N	32W	14	34.7664429	-120.2217142	760.00
91	08N	32W	23	34.76137494	-120.2155852	980.00
92	08N	32W	23	34.76146836	-120.2202111	-390.00
93	08N	32W	23	34.76344489	-120.2260315	-590.00
94	08N	32W	22	34.7646784	-120.2309822	-790.00
95	08N	32W	15	34.76677263	-120.2385496	-700.00
96	08N	32W	15	34.76958966	-120.2433788	-640.00
97	08N	32W	16	34.77210946	-120.2487901	-620.00
98	08N	32W	16	34.77456895	-120.2549402	-600.00
99	08N	32W	17	34.77797693	-120.2616313	-400.00
100	08N	32W	8	34.78150669	-120.266836	-200.00
101	08N	32W	8	34.78374213	-120.2737632	-300'
102	08N	32W	7	34.78613367	-120.2811759	-700'
103	08N	32W	7	34.7894037	-120.287602	-850'
104	08N	32W	7	34.79198648	-120.2922871	-920'
105	08N	33W	1	34.79384733	-120.2985006	-1183.00
106	08N	33W	12	34.79191077	-120.2972461	-1378.00
107	08N	33W	1	34.79413557	-120.3033756	-1417.00
108	08N	33W	1	34.79819889	-120.3090109	-1906.00
109	08N	33W	2	34.80112533	-120.3135727	-1950.00
110	08N	33W	2	34.80423438	-120.3185224	-2050.00
111	09N	33W	35	34.80827623	-120.324263	-2150.00
112	09N	33W	35	34.81231099	-120.3292404	-2100.00
113	09N	33W	34	34.81571755	-120.333272	-2200.00
114	09N	33W	34	34.81932821	-120.3375598	-2230.00
115	09N	33W	34	34.81800456	-120.3325949	-2000.00
116	09N	33W	35	34.8158516	-120.3281741	-1795.00
117	09N	33W	35	34.81259507	-120.3250606	-1790.00
118	09N	33W	35	34.80886402	-120.321382	-1814.00
119	08N	33W	2	34.80619497	-120.3170079	-1836.00
120	08N	33W	1	34.80242711	-120.3118408	-1800.00
121	08N	33W	1	34.7977847	-120.3068775	-1776.00
122	08N	33W	1	34.79431898	-120.3022854	-1375.00
123	08N	33W	1	34.79359032	-120.2993822	-1200.00
124	08N	33W	1	34.79556256	-120.2983853	-1050'
125	08N	33W	1	34.79947091	-120.3003876	-1185'
126	08N	33W	1	34.80407005	-120.3028428	-1250'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top Sisquoc Sands Below the Upper Confining Layer Subsea Depth (Feet)
127	09N	33W	36	34.80793547	-120.3052755	-1340'
128	09N	33W	36	34.81173611	-120.3066805	-1450'
129	09N	33W	36	34.81456807	-120.3098141	-1585'
130	09N	33W	36	34.81525857	-120.311527	-1380'
131	09N	33W	35	34.82128688	-120.3134245	-1735'
132	09N	33W	26	34.8267042	-120.3150874	-1855'
133	09N	33W	26	34.83211378	-120.3167485	-2025'
134	09N	33W	23	34.8372078	-120.3174717	-2165'
135	09N	33W	23	34.8413049	-120.3192542	-2300'
136	09N	33W	23	34.84537335	-120.3228222	-2500'
137	09N	33W	23	34.84724347	-120.3252356	-2435'
138	09N	33W	23	34.84539816	-120.3258611	-2415'
139	09N	33W	23	34.84465821	-120.3280746	-2380'
140	09N	33W	22	34.84471878	-120.331921	-2450'
141	09N	33W	22	34.84429291	-120.3377104	-2440'
142	09N	33W	22	34.84467523	-120.344622	-2425'
143	09N	33W	21	34.84660232	-120.3494144	-2440'
144	09N	33W	21	34.84987796	-120.35354	-2560'
145	09N	33W	16	34.85206099	-120.3573991	-2645'
146	09N	33W	16	34.8507432	-120.3613709	-2500'
147	09N	33W	21	34.84843585	-120.359707	-2450.00
148	09N	33W	21	34.84506024	-120.3575305	-2320.00
149	09N	33W	21	34.84154905	-120.3541274	-2133.00
150	09N	33W	21	34.83717852	-120.350222	-2179.00
151	09N	33W	27	34.83331677	-120.3467829	-2260.00
152	09N	33W	27	34.82923643	-120.3433445	-2290.00
153	09N	33W	27	34.8227427	-120.3427721	-2400.00
154	09N	33W	27	34.82628942	-120.3464851	-2370.00
155	09N	33W	28	34.8310688	-120.3498076	-2390.00
156	09N	33W	28	34.83527404	-120.3539199	-2300.00
157	09N	33W	21	34.84138095	-120.3587544	-2400.00
158	09N	33W	21	34.84640358	-120.3635776	-2750.00
159	09N	33W	20	34.84934827	-120.3665351	-2850.00
160	09N	33W	17	34.85102819	-120.366964	-2850.00
161	09N	33W	20	34.84980783	-120.3655084	-2790.00
162	09N	33W	16	34.85169998	-120.3649115	-3087.00
163	09N	33W	16	34.85224056	-120.3640123	-3000.00
164	09N	33W	16	34.85325582	-120.3653976	-3200.00
165	09N	33W	16	34.85430898	-120.3633524	-2800'
166	09N	33W	16	34.8548183	-120.3581768	-2800'
167	09N	33W	16	34.85568529	-120.3512914	-2800'
168	09N	33W	15	34.85683459	-120.345254	-2800'
169	09N	33W	15	34.858475	-120.3403165	-2800'
170	09N	33W	15	34.85703797	-120.3367412	-2700'
171	09N	33W	15	34.85585009	-120.3331871	-2585'
172	09N	33W	15	34.85261406	-120.3314499	-2565'
173	09N	33W	22	34.84852585	-120.3309886	-2500'
174	09N	33W	23	34.84744939	-120.3271628	-2450'
175	09N	33W	14	34.85071554	-120.3243409	-2350'
176	09N	33W	14	34.85215696	-120.3222888	-2170'
177	09N	33W	23	34.84953052	-120.3200042	-2210'
178	09N	33W	23	34.84610419	-120.3165648	-2100'
179	09N	33W	23	34.84367567	-120.3134577	-1965'
180	09N	33W	24	34.84610958	-120.3107638	-1650'
181	09N	33W	24	34.84944319	-120.3104483	-1365'
182	09N	33W	13	34.85404553	-120.3098426	-1140'
183	09N	33W	13	34.85695141	-120.3122911	-1210'
184	09N	33W	13	34.86013015	-120.3117064	-1235'
185	09N	33W	13	34.86268015	-120.3076458	-1450'
186	09N	33W	13	34.86374287	-120.3028786	-1565'
187	09N	33W	12	34.86678647	-120.3014202	-1550'
188	09N	33W	12	34.86996977	-120.3043342	-1490'
189	09N	33W	12	34.8707816	-120.3093161	-1475'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top Sisquoc Sands Below the Upper Confining Layer Subsea Depth (Feet)
190	09N	33W	12	34.87228864	-120.3119113	-1475'
191	09N	33W	12	34.87519231	-120.3123156	-1435'
192	09N	33W	11	34.87692965	-120.3138557	-1425'
193	09N	33W	2	34.87973037	-120.3150779	-1370'
194	09N	33W	2	34.88053728	-120.3177079	-1385'
195	09N	33W	11	34.87765789	-120.3208196	-1535'
196	09N	33W	11	34.87395069	-120.3218804	-1635'
197	09N	33W	11	34.87079146	-120.3238903	-1765'
198	09N	33W	11	34.86801125	-120.327921	-2150'
199	09N	33W	10	34.8694124	-120.3305464	-2350'
200	09N	33W	10	34.87246731	-120.3325169	-2410'
201	09N	33W	10	34.87355008	-120.3363033	-2635'
202	09N	33W	10	34.87594002	-120.3376476	-2595'
203	09N	33W	3	34.88052129	-120.3403265	-2415'
204	09N	33W	3	34.88610358	-120.3437277	-2190'
205	09N	33W	3	34.89076247	-120.3465666	-2075'
206	10N	33W	33	34.89524326	-120.3490059	-1950'
207	10N	33W	33	34.90105916	-120.3513177	-1700'
208	09N	33W	10	34.87023503	-120.3349569	-2710'
209	09N	33W	10	34.8690679	-120.3331414	-2610'
210	09N	33W	10	34.86693069	-120.33176	-2565'
211	09N	33W	10	34.86541922	-120.3328129	-2685'
212	09N	33W	10	34.86782389	-120.3338834	-2740'
213	09N	33W	24	34.8465217	-120.3025698	-1265'
214	09N	33W	24	34.84450512	-120.3010584	-1250.00
215	09N	33W	24	34.84102007	-120.2995818	-1290'
216	09N	33W	24	34.8381871	-120.2961301	-1320'
217	09N	32W	30	34.835519	-120.2924173	-1250'
218	09N	32W	30	34.8354535	-120.2884767	-1225'
219	09N	32W	19	34.83797022	-120.2856758	-1275'
220	09N	32W	19	34.83829714	-120.2828645	-1320'
221	09N	32W	19	34.83742968	-120.2818297	-1320'
222	09N	32W	30	34.83485699	-120.2829798	-1215'
223	09N	32W	30	34.83234457	-120.2818907	-1100'
224	09N	32W	30	34.83161914	-120.2792482	-1120'
225	09N	32W	29	34.83148746	-120.2766562	-1155'
226	09N	32W	29	34.8304466	-120.2750163	-1140'
227	09N	32W	29	34.829472	-120.2743184	-1100'
228	09N	32W	29	34.82734086	-120.2753171	-980'
229	09N	32W	29	34.82428521	-120.2751764	-820'
230	09N	32W	29	34.82280283	-120.2731623	-775'
231	09N	32W	29	34.82160532	-120.271252	-715'
232	09N	32W	32	34.82002832	-120.2730578	-625'
233	09N	32W	32	34.81879199	-120.275954	-535'
234	09N	32W	32	34.81715634	-120.2759147	-450'
235	09N	32W	32	34.81460929	-120.2731524	-345'
236	09N	32W	32	34.81222819	-120.2706031	-160'
237	09N	32W	32	34.80943214	-120.2680448	55'
238	09N	32W	32	34.80794095	-120.2680051	170'
239	09N	32W	32	34.80789426	-120.2704374	40'
240	09N	32W	32	34.80976541	-120.2749041	-160'
241	09N	32W	31	34.81171544	-120.2774899	-375'
242	09N	32W	31	34.81490245	-120.2790513	-440'
243	09N	32W	31	34.8182935	-120.279883	-390'
244	09N	32W	31	34.8199577	-120.2813596	-440'
245	09N	32W	31	34.82034216	-120.2848052	-790'
246	09N	32W	30	34.82237126	-120.287229	-870'
247	09N	32W	30	34.82545242	-120.2880713	-825'
248	09N	32W	30	34.82688769	-120.2901481	-950'
249	09N	32W	30	34.82559668	-120.2932505	-1100'
250	09N	33W	25	34.82524455	-120.2954131	-1275'
251	09N	33W	25	34.82763829	-120.2981429	-1280'
252	09N	33W	25	34.82802892	-120.3009282	-1375'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top Sisquoc Sands Below the Upper Confining Layer Subsea Depth (Feet)
253	09N	33W	25	34.83041934	-120.302083	-1445'
254	09N	33W	25	34.83262357	-120.3045383	-1575'
255	09N	33W	25	34.83379582	-120.3090822	-1785.00
256	09N	33W	24	34.83604565	-120.3116106	-1920'
257	09N	33W	24	34.83926634	-120.3099069	-1880'
258	09N	33W	24	34.84262158	-120.3066229	-1560'
259	09N	33W	25	34.82208691	-120.2953939	-1185'
260	09N	32W	30	34.82151535	-120.2937295	-1125'
261	09N	32W	31	34.81884157	-120.2912035	-1025'
262	09N	32W	31	34.81699858	-120.2884267	-900'
263	09N	32W	31	34.81507113	-120.2855702	-780'
264	09N	32W	31	34.81297697	-120.2855999	-750'
265	09N	32W	31	34.81133909	-120.2885979	-775'
266	09N	32W	31	34.80804186	-120.2894552	-700'
267	08N	32W	6	34.80437815	-120.2879519	-560'
268	08N	32W	6	34.80117421	-120.2854718	-450'
269	08N	32W	6	34.79790838	-120.2842615	-425'
270	08N	32W	6	34.79550565	-120.2862032	-565'
271	08N	32W	6	34.79557566	-120.2900731	-750'
272	08N	32W	6	34.79709806	-120.2939502	-860'
273	08N	33W	1	34.79915589	-120.2973894	-980'
274	08N	33W	1	34.80238539	-120.3008433	-1170'
275	08N	33W	1	34.8056598	-120.3028853	-1335'
276	09N	33W	36	34.80982016	-120.3031868	-1275'
277	09N	33W	36	34.81372071	-120.3008421	-1250'
278	09N	33W	36	34.81659775	-120.2987973	-1240'
279	09N	33W	36	34.81902417	-120.296416	-1210'


T10N R33W
T10N R32W
T09N R33W
T09N R32W
T08N R33W
T08N R32W
T07N R33W
Monterey Subcrop
Monterey Outcrop
Bradley Canyon Fault
Foxen Canyon Fault
Garey Fault
Olivera Fault
Los Alamos Fault
Santa Maria Valley
Cat Canyon
Orcutt
Four Deer
Franciscan + Obispo Tuff Subcrop
6,000 3,000 0 6,000
Feet
Legend
Monterey AE Expansion Boundary Points
Monterey Faults
Monterey Structure Contour (7-13-17)
Outside Oilfield
Cat Canyon
Proposed Expanded Monterey Aquifer Exemption Boundary
Cross Sections
Monterey Pinchout
Volcanic Subcrop
Monterey Outcrop
Fault Throw
Down
Up
Study Area
N
W
E
S
WZI INC.
BAKERSFIELD, CALIFORNIA
CAT CANYON AQUIFER EXEMPTION EXPANSION
MONTEREY AQUIFER EXEMPTION EXPANSION BOUNDARY POINTS MAP
DATE: 12/18
FIGURE: X.X-X

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
1	10N	33W	33	34.90656834	-120.3532943	-2200'
2	10N	33W	33	34.90560282	-120.3483928	-2100'
3	10N	33W	34	34.90465347	-120.3435746	-1980'
4	10N	33W	34	34.90366548	-120.3385614	-1880'
5	10N	33W	34	34.90266654	-120.3334938	-1700'
6	10N	33W	35	34.90171318	-120.3286585	-1460'
7	10N	33W	35	34.90084405	-120.3242514	-1200'
8	10N	33W	35	34.89953047	-120.320089	-920'
9	10N	33W	35	34.89695421	-120.3170301	-860'
10	10N	33W	35	34.89424829	-120.3138453	-1300
11	09N	33W	1	34.89216299	-120.3100266	-1320
12	09N	33W	1	34.88979514	-120.3071016	-1350'
13	09N	33W	1	34.88644138	-120.3041807	-1650'
14	09N	33W	1	34.88354098	-120.30158	-1870'
15	09N	33W	1	34.88067413	-120.299117	-2000'
16	09N	33W	12	34.87807728	-120.2969372	-2110'
17	09N	33W	12	34.87656194	-120.2965804	-2150'
18	09N	33W	12	34.87451623	-120.298335	-2170'
19	09N	33W	12	34.87189674	-120.2983861	-2260'
20	09N	33W	12	34.8692805	-120.2971784	-2350'
21	09N	32W	7	34.86742237	-120.2945805	-2540'
22	09N	32W	7	34.86943063	-120.2923777	-2780'
23	09N	32W	7	34.87225066	-120.2936283	-2470'
24	09N	32W	7	34.87392323	-120.2933462	-2370'
25	09N	32W	7	34.87226662	-120.2919108	-2560'
26	09N	32W	7	34.87024872	-120.2901626	-2750'
27	09N	32W	7	34.86756743	-120.2878398	-2900'
28	09N	32W	7	34.86462238	-120.2852887	-3100'
29	09N	32W	18	34.86412262	-120.2896848	-2840'
30	09N	32W	7	34.86474831	-120.2940567	-2520'
31	09N	33W	12	34.86496377	-120.298037	-2340'
32	09N	33W	12	34.86468822	-120.3012719	-2250'
33	09N	33W	13	34.86138095	-120.2990924	-2550'
34	09N	33W	13	34.85763919	-120.2960645	-2780'
35	09N	32W	18	34.85386436	-120.2929931	-3100'
36	09N	32W	18	34.85066221	-120.2903514	-2950'
37	09N	32W	19	34.84605856	-120.286554	-2900'
38	09N	32W	19	34.84310745	-120.2835797	-2850'
39	09N	32W	19	34.83985192	-120.2799612	-2720'
40	09N	32W	20	34.83651001	-120.2762471	-2560'
41	09N	32W	29	34.83317996	-120.2724277	-2310'
42	09N	32W	29	34.82973209	-120.268678	-2000'
43	09N	32W	29	34.82546635	-120.2647082	-1770'
44	09N	32W	29	34.82177397	-120.2613029	-1600'
45	09N	32W	33	34.81792099	-120.2575111	-1450'
46	09N	32W	33	34.81381789	-120.253457	-1350'
47	09N	32W	33	34.81070281	-120.2503323	-1350'
48	09N	32W	33	34.80740685	-120.2470148	-1300'
49	08N	32W	3	34.80360675	-120.2430771	-1100'
50	08N	32W	3	34.79936923	-120.2383848	-1200'
51	08N	32W	3	34.79580263	-120.2339349	-1300'
52	08N	32W	10	34.79236014	-120.228983	-1350'
53	08N	32W	10	34.79151161	-120.2293533	-1350'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
54	08N	32W	3	34.79361779	-120.2346178	-1300'
55	08N	32W	3	34.79545841	-120.2389238	-1400'
56	08N	32W	3	34.79704206	-120.2426291	-1420'
57	08N	32W	3	34.79432609	-120.23936	-1380'
58	08N	32W	10	34.79175866	-120.2369246	-1330'
59	08N	32W	10	34.7885834	-120.2347986	-1310'
60	08N	32W	10	34.78594521	-120.2334225	-1330'
61	08N	32W	10	34.78240116	-120.2328354	-1500'
62	08N	32W	10	34.77958742	-120.2327501	-1430'
63	08N	32W	15	34.77677778	-120.2322085	-1400'
64	08N	32W	15	34.77406463	-120.2307341	-1400'
65	08N	32W	15	34.77580919	-120.2326607	-1280'
66	08N	32W	15	34.77746302	-120.2346284	-1000'
67	08N	32W	10	34.77919051	-120.2367414	-800'
68	08N	32W	10	34.78081915	-120.2390345	-570'
69	08N	32W	10	34.78222002	-120.2406659	-500'
70	08N	32W	10	34.784631	-120.2418754	-500'
71	08N	32W	10	34.78658047	-120.2439734	-450'
72	08N	32W	9	34.78822933	-120.2461231	-300'
73	08N	32W	9	34.7899978	-120.247691	-320'
74	08N	32W	9	34.79237253	-120.249252	-450'
75	08N	32W	4	34.79443206	-120.2509044	-480'
76	08N	32W	4	34.79650275	-120.2537911	-400'
77	08N	32W	4	34.79749258	-120.2562769	-200'
78	08N	32W	4	34.79858987	-120.259069	-570'
79	08N	32W	5	34.80013993	-120.2615606	-600'
80	08N	32W	5	34.80192653	-120.2632143	-740'
81	08N	32W	5	34.80397763	-120.264806	-1050'
82	08N	32W	5	34.8054452	-120.2665486	-900'
83	08N	32W	5	34.8062911	-120.2687272	-1200'
84	08N	32W	5	34.8061239	-120.2708271	-1400'
85	08N	32W	5	34.80470134	-120.2719154	-1550'
86	08N	32W	5	34.80279855	-120.2711371	-1610'
87	08N	32W	5	34.80114889	-120.2692	-1610'
88	08N	32W	5	34.7999679	-120.2671383	-1550'
89	08N	32W	5	34.79913968	-120.2648133	-1300'
90	08N	32W	5	34.79864844	-120.2626404	-930'
91	08N	32W	5	34.79755341	-120.2617251	-1000'
92	08N	32W	5	34.79591965	-120.2619891	-1400'
93	08N	32W	5	34.79457767	-120.2628083	-1620'
94	08N	32W	5	34.79338235	-120.2637962	-1750'
95	08N	32W	8	34.79176114	-120.2633381	-1730'
96	08N	32W	8	34.79062813	-120.2611702	-1730'
97	08N	32W	9	34.79060632	-120.2587844	-1800'
98	08N	32W	9	34.79262997	-120.2589753	-1500'
99	08N	32W	4	34.79391418	-120.2580132	-930'
100	08N	32W	4	34.79412	-120.2552761	-800'
101	08N	32W	9	34.79226516	-120.2539808	-500'
102	08N	32W	9	34.79067415	-120.2535706	-640'
103	08N	32W	9	34.78883438	-120.2528765	-850'
104	08N	32W	9	34.7871654	-120.2516156	-800'
105	08N	32W	9	34.78528654	-120.2502038	-840'
106	08N	32W	9	34.78363762	-120.2486894	-850'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
107	08N	32W	9	34.78224171	-120.2466888	-700'
108	08N	32W	9	34.78150168	-120.2441245	-680'
109	08N	32W	10	34.7796492	-120.2415747	-500'
110	08N	32W	15	34.7782403	-120.2399537	-520'
111	08N	32W	15	34.7766813	-120.2383475	-630'
112	08N	32W	15	34.77530485	-120.237127	-880'
113	08N	32W	15	34.77384874	-120.2351747	-1200'
114	08N	32W	15	34.77310953	-120.232624	-1400'
115	08N	32W	15	34.77124072	-120.2313966	-800'
116	08N	32W	15	34.76968936	-120.2308973	-1000'
117	08N	32W	15	34.76940208	-120.2290242	-1200'
118	08N	32W	15	34.77176652	-120.2284344	-1240'
119	08N	32W	15	34.77020079	-120.2269289	-1200'
120	08N	32W	14	34.7689352	-120.2253948	-1300'
121	08N	32W	14	34.76797384	-120.223895	-1280'
122	08N	32W	14	34.76698207	-120.2224822	-1100'
123	08N	32W	23	34.76533448	-120.2203312	-1200'
124	08N	32W	23	34.76418817	-120.218901	-1590'
125	08N	32W	23	34.76304005	-120.2174686	-1730'
126	08N	32W	23	34.76169934	-120.2158389	-1920'
127	08N	32W	23	34.76142742	-120.2185358	-2250'
128	08N	32W	23	34.76168119	-120.2210256	-2270'
129	08N	32W	23	34.76243883	-120.2235448	-2250'
130	08N	32W	23	34.76321199	-120.2255394	-2250'
131	08N	32W	22	34.76401042	-120.2274747	-2250
132	08N	32W	22	34.76449858	-120.2301122	-2250
133	08N	32W	22	34.76532893	-120.2334066	-2250'
134	08N	32W	15	34.76630862	-120.2368922	-2250'
135	08N	32W	15	34.7674773	-120.2399304	-2260'
136	08N	32W	15	34.76918963	-120.2427912	-2250'
137	08N	32W	16	34.77126431	-120.2464946	-2250'
138	08N	32W	16	34.77295457	-120.2510856	-2250'
139	08N	32W	16	34.77509318	-120.256192	-2260
140	08N	32W	16	34.77713517	-120.2603308	-2270'
141	08N	32W	8	34.77974025	-120.2643141	-2280'
142	08N	32W	8	34.78211967	-120.2687353	-2350'
143	08N	32W	8	34.78390971	-120.2742825	-2560'
144	08N	32W	7	34.78552317	-120.2792834	-2800'
145	08N	32W	7	34.78683092	-120.2833374	-3000'
146	08N	32W	7	34.7894037	-120.287602	-3110'
147	08N	32W	7	34.79218649	-120.2929549	-3200'
148	08N	33W	1	34.79384733	-120.2985006	-3250'
149	08N	33W	12	34.79191077	-120.2972461	-3400'
150	08N	33W	1	34.79413557	-120.3033756	-2900'
151	08N	33W	1	34.79703923	-120.3074025	-3100'
152	08N	33W	1	34.79996017	-120.3117051	-3500'
153	08N	33W	2	34.80304506	-120.3166458	-3630'
154	08N	33W	2	34.80623351	-120.3215002	-3640'
155	09N	33W	35	34.80998614	-120.3264893	-3740'
156	09N	33W	34	34.81443161	-120.3317501	-3900'
157	09N	33W	34	34.8180476	-120.336039	-3870'
158	09N	33W	34	34.81792363	-120.3323055	-3800'
159	09N	33W	35	34.8142374	-120.3264886	-3580'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
160	09N	33W	35	34.80947848	-120.3220863	-3500'
161	08N	33W	2	34.80617577	-120.3169785	-3440'
162	08N	33W	1	34.80242711	-120.3118408	-3380'
163	08N	33W	1	34.79869612	-120.3079689	-3100'
164	08N	33W	1	34.79525054	-120.3035007	-3000'
165	08N	33W	1	34.79374049	-120.2989987	-3200'
166	08N	33W	1	34.79729952	-120.2992843	-3200'
167	08N	33W	1	34.80215866	-120.301652	-3300'
168	08N	33W	1	34.80618489	-120.3041983	-3400'
169	09N	33W	36	34.81009467	-120.3062362	-3400'
170	09N	33W	36	34.81337355	-120.3074779	-3300'
171	09N	33W	36	34.8150935	-120.311134	-3200'
172	09N	33W	36	34.81778949	-120.3124808	-3220'
173	09N	33W	35	34.82128434	-120.3134238	-3600'
174	09N	33W	26	34.8258427	-120.3148229	-3640'
175	09N	33W	26	34.82921238	-120.3158575	-3650'
176	09N	33W	26	34.83294059	-120.3167719	-3670'
177	09N	33W	23	34.8365506	-120.3172937	-3690'
178	09N	33W	23	34.83955091	-120.3183586	-3720'
179	09N	33W	23	34.84202929	-120.3197025	-3800'
180	09N	33W	23	34.84480015	-120.322279	-3880'
181	09N	33W	23	34.84728606	-120.3248604	-3950'
182	09N	33W	23	34.8450034	-120.326032	-3950'
183	09N	33W	23	34.84474542	-120.3293849	-4100'
184	09N	33W	22	34.84462332	-120.3333399	-4190'
185	09N	33W	22	34.84429115	-120.3377541	-4350'
186	09N	33W	22	34.84430153	-120.3420797	-4300'
187	09N	33W	22	34.84534788	-120.3469175	-4350'
188	09N	33W	21	34.84747564	-120.3507367	-4310'
189	09N	33W	21	34.84989323	-120.3535575	-4270'
190	09N	33W	16	34.85189042	-120.3561725	-5000'
191	09N	33W	16	34.85141617	-120.3601957	-4600'
192	09N	33W	21	34.84941054	-120.3614043	-4600'
193	09N	33W	21	34.84752298	-120.3585729	-4200'
194	09N	33W	21	34.8444307	-120.3567888	-4000'
195	09N	33W	21	34.84224321	-120.3544507	-3840'
196	09N	33W	21	34.83996359	-120.352706	-3860'
197	09N	33W	21	34.83765915	-120.3506274	-3870'
198	09N	33W	28	34.83565807	-120.3489759	-3900'
199	09N	33W	27	34.83331677	-120.3467829	-4000'
200	09N	33W	27	34.83119465	-120.3440291	-4000'
201	09N	33W	27	34.82815863	-120.3433561	-4000'
202	09N	33W	27	34.82556436	-120.343538	-4050'
203	09N	33W	27	34.8227427	-120.3427721	-4050'
204	09N	33W	27	34.82544169	-120.345667	-4250'
205	09N	33W	28	34.82856663	-120.3484173	-4300'
206	09N	33W	28	34.83174743	-120.3504712	-5300'
207	09N	33W	28	34.83446452	-120.3531282	-5350'
208	09N	33W	21	34.83828835	-120.3560987	-5400'
209	09N	33W	21	34.84138095	-120.3587544	-5400'
210	09N	33W	21	34.84419587	-120.3613179	-5400'
211	09N	33W	21	34.84690197	-120.3641024	-5410'
212	09N	33W	20	34.84934827	-120.3665351	-5500'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
213	09N	33W	17	34.85102819	-120.366964	-5430'
214	09N	33W	20	34.84983262	-120.365538	-5310'
215	09N	33W	16	34.85121182	-120.365171	-5280'
216	09N	33W	16	34.85224056	-120.3640123	-5010'
217	09N	33W	16	34.85325582	-120.3653976	-5170'
218	09N	33W	16	34.85430898	-120.3633524	-5090'
219	09N	33W	16	34.85468105	-120.3598453	-5100'
220	09N	33W	16	34.85501232	-120.3563121	-5000'
221	09N	33W	16	34.85551382	-120.3524972	-4900'
222	09N	33W	16	34.85617974	-120.3486762	-4800'
223	09N	33W	15	34.85683459	-120.345254	-4700'
224	09N	33W	15	34.85754804	-120.3423084	-4600'
225	09N	33W	15	34.85847642	-120.3403144	-4400'
226	09N	33W	15	34.85741835	-120.3379773	-4310'
227	09N	33W	15	34.85674305	-120.3356829	-4240'
228	09N	33W	15	34.85582451	-120.333158	-4150'
229	09N	33W	15	34.85414441	-120.3318473	-4150'
230	09N	33W	15	34.85217985	-120.3314399	-4180'
231	09N	33W	22	34.8500512	-120.3314533	-4190'
232	09N	33W	22	34.8480796	-120.3306772	-4120'
233	09N	33W	23	34.84729545	-120.3291736	-4000'
234	09N	33W	23	34.84771265	-120.3266703	-3970'
235	09N	33W	23	34.84903734	-120.3252431	-3970'
236	09N	33W	14	34.8507331	-120.3243329	-3830'
237	09N	33W	14	34.85221705	-120.3224314	-3630'
238	09N	33W	23	34.85036057	-120.3211266	-3630'
239	09N	33W	23	34.84896516	-120.3192454	-3620'
240	09N	33W	23	34.84728755	-120.3174404	-3640'
241	09N	33W	23	34.84563934	-120.3163214	-3620'
242	09N	33W	23	34.84405859	-120.3149747	-3580'
243	09N	33W	24	34.84389366	-120.312735	-3340'
2244	09N	33W	24	34.84540653	-120.31111	-3000'
245	09N	33W	24	34.84746858	-120.3104256	-2640'
246	09N	33W	24	34.84963292	-120.3104574	-2200'
247	09N	33W	13	34.85185442	-120.3103121	-2120'
248	09N	33W	13	34.85370932	-120.3098161	-2060'
249	09N	33W	13	34.85553742	-120.3110106	-2120'
250	09N	33W	13	34.85721586	-120.3124442	-2240'
251	09N	33W	13	34.85966296	-120.3120378	-2070'
252	09N	33W	13	34.86147615	-120.3102615	-2380'
253	09N	33W	13	34.86271857	-120.3075251	-2440'
254	09N	33W	13	34.86338751	-120.3044106	-2320'
255	09N	33W	12	34.86610711	-120.301267	-2230'
256	09N	33W	12	34.8686473	-120.3024454	-2170'
257	09N	33W	12	34.87042424	-120.3058151	-2080'
258	09N	33W	12	34.87077866	-120.3093733	-2100'
259	09N	33W	12	34.8730204	-120.3120724	-2150'
260	09N	33W	11	34.87586597	-120.3128061	-2080'
261	09N	33W	11	34.87862533	-120.3142791	-2030'
262	09N	33W	2	34.88043004	-120.3164144	-2030'
263	09N	33W	11	34.87882002	-120.3202916	-1920'
264	09N	33W	11	34.87639697	-120.321162	-2040'
265	09N	33W	11	34.87391657	-120.3218924	-2130'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
266	09N	33W	11	34.87171498	-120.3230254	-2280'
267	09N	33W	11	34.86983773	-120.3250954	-2520'
268	09N	33W	11	34.86866711	-120.326724	-2800'
269	09N	33W	11	34.8679425	-120.3288937	-3200'
270	09N	33W	10	34.87012947	-120.3309166	-3140'
271	09N	33W	10	34.87349508	-120.3342234	-3110'
272	09N	33W	10	34.87354176	-120.3362986	-3200'
273	09N	33W	10	34.87706553	-120.3382807	-2920'
274	09N	33W	3	34.88117155	-120.3407227	-2800'
275	09N	33W	3	34.88643218	-120.3439279	-2420'
276	09N	33W	3	34.89109217	-120.3467675	-2350'
277	09N	33W	4	34.89386869	-120.3484596	-2340'
278	10N	33W	33	34.89784754	-120.3500411	-2300'
279	10N	33W	33	34.90217312	-120.3517606	-2270'
280	09N	33W	10	34.87023679	-120.3349583	-3500'
281	09N	33W	10	34.86908528	-120.3331612	-3520'
282	09N	33W	10	34.86664921	-120.3317927	-3640'
283	09N	33W	10	34.86541123	-120.3328093	-3660'
284	09N	33W	10	34.86782389	-120.3338834	-3640'
285	09N	33W	24	34.84652281	-120.3025892	-1900'
286	09N	33W	24	34.84299237	-120.3005351	-1900'
287	09N	33W	24	34.83971397	-120.2983715	-2250'
288	09N	32W	19	34.83726151	-120.2947461	-2300'
289	09N	32W	30	34.83501382	-120.291237	-2140'
290	09N	32W	19	34.83606691	-120.2878086	-2690'
291	09N	32W	19	34.83841691	-120.2840409	-2800'
292	09N	32W	19	34.83654597	-120.2822295	-2730'
293	09N	32W	30	34.83286364	-120.2824599	-2650'
294	09N	32W	30	34.83163059	-120.2789465	-2650'
295	09N	32W	29	34.83044737	-120.2750174	-2550'
296	09N	32W	29	34.82655731	-120.275517	-2600'
297	09N	32W	29	34.82365732	-120.2748165	-2480'
298	09N	32W	29	34.82104337	-120.2714043	-2410'
299	09N	32W	32	34.81978678	-120.2737964	-2200'
300	09N	32W	32	34.81806796	-120.2760948	-2000'
301	09N	32W	32	34.81585837	-120.2746926	-1950'
302	09N	32W	32	34.81380599	-120.2722165	-1910'
303	09N	32W	32	34.81177976	-120.2701753	-1300'
304	09N	32W	32	34.80949972	-120.2680953	-1000'
305	09N	32W	32	34.80764843	-120.2690228	-1000'
306	09N	32W	32	34.80856057	-120.2722372	-1400'
307	09N	32W	32	34.81027723	-120.2758048	-1800'
308	09N	32W	31	34.81376613	-120.2786159	-1800'
309	09N	32W	31	34.81739313	-120.2797049	-1650'
310	09N	32W	31	34.81963784	-120.2805072	-1670'
311	09N	32W	31	34.8202295	-120.2833089	-2100'
312	09N	32W	31	34.82103358	-120.2861456	-2170'
313	09N	32W	30	34.82353851	-120.2876326	-2170'
314	09N	32W	30	34.82562396	-120.2881584	-2160'
315	09N	32W	30	34.82686622	-120.2903825	-2200'
316	09N	32W	30	34.8256808	-120.2930391	-2400'
317	09N	33W	25	34.82643805	-120.296589	-2600'
318	09N	33W	25	34.82809636	-120.2996688	-2720'

AE Boundary Vertex Point Number	Township	Range	Section	Latitude	Longitude	Top of Monterey Subsea Depth (Feet)
319	09N	33W	25	34.83079984	-120.3021649	-2790'
320	09N	33W	25	34.83263164	-120.3045695	-2900'
321	09N	33W	25	34.83371179	-120.3088454	-3200'
322	09N	33W	24	34.83702316	-120.3115576	-3380'
323	09N	33W	24	34.83960669	-120.3095699	-3200'
324	09N	33W	24	34.84215258	-120.3070685	-2800'
325	09N	33W	24	34.84458898	-120.3050724	-2200'
326	09N	32W	30	34.82220707	-120.2951566	-2600'
327	09N	32W	31	34.82010388	-120.2922453	-2500'
328	09N	32W	31	34.81767699	-120.2900688	-2450'
329	09N	32W	31	34.81636885	-120.2870726	-2300'
330	09N	32W	31	34.81408395	-120.2848935	-2170'
331	09N	32W	31	34.81230846	-120.2872314	-2330'
332	09N	32W	31	34.80999988	-120.2894179	-2570'
333	08N	32W	6	34.80625484	-120.2888921	-2570'
334	08N	32W	6	34.80245454	-120.2866008	-2400'
335	08N	32W	6	34.79823102	-120.2842283	-2440'
336	08N	32W	6	34.7953427	-120.289011	-2800'
337	08N	32W	6	34.79710348	-120.2939607	-2950'
338	08N	32W	1	34.7997377	-120.2981511	-3100'
339	08N	32W	1	34.802153	-120.3006193	-3200'
340	08N	32W	36	34.80807395	-120.303294	-3200'
341	08N	32W	36	34.81334463	-120.3010001	-3000'
342	08N	32W	36	34.81744769	-120.2977473	-2750'

Table 2

Aquifer	Sisquoc
Lithology	Upper zone of silstone and diatomaceous claystone underlain by thick fine to course gained standstone and clay interbeds. Lower portion of the Sisquoc consists of diatomaceous claystone, silty claystone and sandy silstone
TDS (mg/L)	Sisquoc Area: 19,862 ppm Central Area: 10,745 ppm East Area: 7,668 ppm West Area: 22,007 ppm Gato Ridge Area: 21,000 ppm
Approx. Depth to Top from Ground Surface (feet)	320 to 4340 feet below ground surface
Approx. Depth to Top from Mean Sea Level (feet)	800 to -3600 feet from mean sea level (Average= -1104' from MSL)
Approx. Thickness (feet)	250 to 2200 feet thick (Average= 1330' thick)
Porosity and Permeability	Up to 8 Darcy, 25%-63% porosity

Aquifer	Monterey
Lithology	Upper platy siliceous shale member, middle fractured chert member, and lower buff and tan limy shale member
TDS (mg/L)	Sisquoc Area: 10,417 ppm Central Area: 12,314 ppm East Area: 10,417 ppm West Area: 12,314 ppm Gato Ridge: 9,118 ppm
Approx. Depth to Top from Ground Surface (feet)	540 to 7100 feet below ground surface
Approx. Depth to Top from Mean Sea Level (feet)	200 to -6200 feet from mean sea level (Average= -2359' from MSL)
Approx. Thickness (feet)	200 to 4200 feet thick (Average= 2065' thick)
Porosity and Permeability	10-15 Darcy (fractured) (8.4×10^{-3} cm/sec) effective porosity 6%

The Sisquoc Formation below the Upper Confining Layer and Monterey Formation are hydrocarbon bearing and producing with the assistance of steam injection, and water flood for enhanced recovery. Water is also injected into both zones for purposes of disposal. Water reinjection and gas reinjection into the exempt area is currently utilized as part of the current Maximum Efficient Rate (MER). **Figure 1.2-1, Proposed Aquifer Exemption Boundary for Sisquoc Formation below the Upper Confining Layer** and **Figure 1.2-2, Proposed Aquifer Exemption Boundary for Monterey Formation**, shows the location of Proposed Aquifer Exemption Expansion Areas in the Cat Canyon Oil Field. Historic exemption status was not consistent with the producing areas at the time of the original delegation by US Environmental Protection Agency (EPA). **Table 1.2-1** shows the historic status and the proposed exemptions by five (5) Areas within Cat Canyon Oil Field (Central, West, East, Sisquoc and Gato Ridge). The producing areas are shown on **Figure 1.2-3, Current Aquifer Exemption Boundary.**

Table 1.2-1: Summary of Historic Exemption and Proposed Expansion by Area

Current Exemption		**Proposed Expansion**		**Description of Expansion**
Formation	**Interval/Sand**	**Formation**	**Interval/Sand**	
Central Area:				
Sisquoc	Sisquoc[1]	Sisquoc	Sisquoc	Expand Area
		Monterey	Monterey	Add Monterey
East Area:				
Sisquoc	Sisquoc	Sisquoc	Sisquoc	Expand Area and consolidate Brooks with Sisquoc
Sisquoc	Brooks			
Monterey	Monterey	Monterey	Monterey	Expand Area
West Area:				
Sisquoc	S1b	Sisquoc	Sisquoc	Expand Area and include all Sisquoc Formation below the Upper Confining Layer
Sisquoc	Alexander (S9-S10)			
Monterey	Cherty Zone (Los Flores)	Monterey	Monterey	Expand Area and include all Monterey Formation
Sisquoc Area:				
Sisquoc	Sisquoc	Sisquoc	Sisquoc	Expand Area, consolidate Thomas and add Brooks in Sisquoc
Sisquoc	Thomas			
Monterey	Monterey	Monterey	Monterey	Expand Area
Gato Ridge:				
Sisquoc	Sisquoc	Sisquoc	Sisquoc	Expand Area
Monterey	Buff and Brown	Monterey	Monterey	Expand Area and include all Monterey formation
Olivera Area:				
Monterey	Cherty Bentonitic Buff and Brown	No Change	No Change	No Change
Tinaquaic Area:				
Monterey	Monterey	No Change	No Change	No Change

[1] In some interpretations of the 1973 Summary of Operation, only the basal Sisquoc Formation below the Upper Confining Layer may have been exempted, however, the table of producing formations in the volume does not discriminate or call out any portion of the Sisquoc Formation below the Upper Confining Layer. Since all of the Sisquoc Formation below the Upper Confining Layer were known in 1973 to be oil productive, that is the interpretation being made in this Aquifer Exemption Expansion proposal.

Table 5.1-1, Water Well Inventory

Map Number	APN	SB Co.Permit	DWR Ref.	Date Completed	TWN	RNGE	SEC	Total Depth (bgs feet)	Compl. Depth (bgs feet)	Depth of Static Water (bgs feet)	Screen Interval 1 (bgs feet)	Screen Interval 2 (bgs feet)	Screen Interval 3 (bgs feet)	Completed Formation	Formation TD	Purpose	Reference to Exemption Area
CC001	129-030-012	SR107627	1090201	1/13/2011	10N	33W	26P1	220	220	33				Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC002	129-030-012	SR0107674			10N	33W	26P2	205	194	54	34-194			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC003	128-101-07	604		11/6/1997	10N	33W	27D	260	260					Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC004	128-101-15	8817	316858	10/23/199	10N	33W	27N1	610	600	150				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC005	128-101-015	SR0107534	1082578	12/30/201	10N	33W	27N2	601	556	200				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC006	128-101-07	1482		8/22/2016	10N	33W	27R	120'?	120'?					Destroyed - No depth	Paso Robles	Destroyed	Outside Exemption Area
CC007	128-100-027	SR0102511	792430	8/29/2002	10N	33W	28R	473	450	195	220-440			Qoa/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC008	129-020-038	SR0105925		1/1/2009	10N	33W	33E	802	770		308-770			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC009			139063	6/4/1981	10N	33W	33Q1	485	478	265				Loess/Paso Robles	Paso Robles	Domestic/ Irrigation	Outside Exemption Area
CC010			38144	10/11/197	10N	33W	33Q2	476	476	287				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC011	129-020-027		1090206	11/12/201	10N	33W	33R	400	400	220				Loess/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC012	129-020-032	WP368		1/26/2015	10N	33W	34E1	650	650					Loess/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC013	129-020-032	WP1389		6/20/2016	10N	33W	34E2	700	700					Loess/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC014	129-020-005	WP1733		11/29/201	10N	33W	34G1	525	525					Alluvium/Paso Robles/Careaga	Careaga	N/A	Outside Exemption Area
CC015	129-020-05	9165	352724	5/7/1991	10N	33W	34G2	720	690					Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC016	129-020-31	116		8/4/1993	10N	33W	34K	670	670					Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC017	129-020-008	7646	316896	6/29/1989	10N	33W	34N1	575	575	220				Alluvium/Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC018	129-020-08	8847		6/10/1991	10N	33W	34N2	650	650					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC019	129-020-08	8851	316870	1/29/1991	10N	33W	34N3	410	410	253				Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC020	129-030-03	7536	335764	11/22/198	10N	33W	35A	504	470					Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC021	129-030-012	SR0107610	1090205	12/14/201	10N	33W	35B1	240	230	93				Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC022	129-030-012	SR107699		2/26/2011	10N	33W	35B2	200	200					Alluvium/Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC023	129-040-001	8036	441262	5/29/1996	10N	33W	35C	360	350	96				Alluvium/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC024	129-040-009	SR0103059	792452	11/25/200	10N	33W	35F	540	540					Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC025	129-040-009	SR0102972	792453	1/9/2004	10N	33W	35M	520	520					Paso Robles/ Careaga	Careaga	Irrigation	Inside Expansion Area
CC026	129-040-008	SR0109549		9/26/2014	10N	33W	35Q1	588	580					Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC027			61627	5/9/1973	10N	33W	35Q2	630	600					Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC028			39498	9/18/1968	10N	33W	35R1	275	275					Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC029	129-080-02	8646		2/24/1991	10N	33W	35R2	300	300					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC030				11/20/197	10N	33W	36G	122	122					Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC031	129-050-12	SR100375/527	521849	12/31/199	10N	33W	36H	109	105	12				Alluvium/Paso Robles	Paso Robles	Irrigation/Destroyed	Outside Exemption Area
CC032	Intentionally Blank																
CC033	129-040-010	WP1567		11/28/201	10N	33W	36Q1	600	650	86				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC034			61616	11/1/1972	10N	33W	36Q2	820	720					Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC035	129-050-12	5559	182650	3/11/1988	10N	33W	36Q3	560	540					Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC036	129-050-012	0000337/378	E0254985	2/4/2015	10N	33W	36Q05	460	460	101				Alluvium/Paso Robles/Careaga	Careaga	Domestic/Irrigation/Destro	Outside Exemption Area
CC037	129-110-02	8849	316867	4/22/1991	9N	33W	1B	160	160					Alluvium/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC038	129-110-01	5577	182663	5/17/1988	9N	33W	1G	474	470					Alluvium/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC039	129-110-002	WP0000381		6/5/2015	9N	33W	1H	650	640	139				Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC040	129-110-01	8879	352748	10/7/1991	9N	33W	1J	698	660					Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC041	129-100-11	7401	276939	8/25/1988	9N	33W	1L	225	223					Alluvium/Paso Robles	Paso Robles	Domestic/ Irrigation	Inside Expansion Area
CC042	129-100-23	SR0105118	1098073	9/27/2007	9N	33W	1M	440	440	140				Alluvium/Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC043	129-100-023	SR0107592	1082579	40502	9N	33W	1P		260					Alluvium/Paso Robles	Paso Robles	Destroyed	Inside Expansion Area
CC044		2021	64919	1/30/1979	9N	33W	1Q	195	195					Alluvium/Paso Robles	Paso Robles	Industrial Oil Field	Inside Expansion Area
CC045	101-020-013	0105164	E57344	39345	9N	33W	20D01	700						Alluvium/Paso Robles/Careaga	Careaga	Destroyed	Outside Exemption Area
CC046	101-020-013	SR0104928	E047439	39189	9N	33W	20D02	760						Alluvium/Paso Robles/Careaga	Careaga	Destroyed	Outside Exemption Area
CC047	101-060-069	105167	E057358		9N	33W	20D03	620						Alluvium/Paso Robles/Careaga	Careaga	Destroyed	Outside Exemption Area
CC048	101-020-013	105165		9/17/2007	9N	33W	20G	800	770	200				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC049	101-020-013	105215		10/12/200	9N	33W	20K	680	800	390				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC050	101-020-013	105166		9/29/2007	9N	33W	20Q	700	650	200				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC051	101-030-019	105088		8/3/2007	9N	33W	22B	760	740	400				Orcutt/Paso Robles/Careaga	Careaga	Domestic	Inside Expansion Area
CC052	101-030-019	9117		4/28/1992	9N	33W	22C	1000	1000					Orcutt/Paso Robles/Careaga	Careaga	Agricultural	Inside Expansion Area
CC053	129-170-11	1654		6/22/1979	9N	33W	22D01	700	700					Paso Robles/Careaga	Careaga	Domestic	Inside Expansion Area
CC054	101-030-04	100431	812773	7/14/2000	9N	33W	22D02	765	750	490				Paso Robles/Careaga	Careaga	Domestic/Irrigation	

Map Number	APN	SB Co.Permit	DWR Ref.	Date Completed	TWN	RNGE	SEC	Total Depth (bgs feet)	Compl. Depth (bgs feet)	Depth of Static Water (bgs feet)	Screen Interval 1 (bgs feet)	Screen Interval 2 (bgs feet)	Screen Interval 3 (bgs feet)	Completed Formation	Formation TD	Purpose	Reference to Exemption Area
CC054	101-030-04	100431	812773	7/14/2000	9N	33W	22D02	765	750	490				Paso Robles/Careaga	Careaga	Domestic/Irrigation	Inside Expansion Area
CC055	129-170-011	101693		6/15/2000	9N	33W	22D03	800	780					Paso Robles/Careaga	Careaga	N/A	Inside Expansion Area
CC056	101-030-007	101961		11/28/200	9N	33W	22H01	680	680					Orcutt/Paso Robles/Careaga	Careaga	Domestic/Agricultural	Inside Existing Exempt Area
CC057	101-030-007	104585	907276	11/15/200	9N	33W	22H02	905	905	447				Orcutt/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC058	101-030-10	101388	741645	10/15/200	9N	33W	22K	760	740	300				Orcutt/Paso Robles/Careaga	Careaga	Domestic	Inside Existing Exempt Area
CC059	101-030-009	SR0109093		11/30/201	9N	33W	23C	880	850	427				Orcutt/Paso Robles/Careaga	careaga	Irrigation	Inside Expansion Area
CC060	129-180-17	0103997		10/25/200	9N	33W	23D01	940	900	367				Orcutt/Paso Robles/Careaga	Careaga	Irrigation	Inside Existing Exempt Area
CC061	101-030-09	100343	521855	1/26/1999	9N	33W	23D02	1070	1070	432				Orcutt/Paso Robles/Careaga	Careaga	Irrigation	Inside Existing Exempt Area
CC062	101-030-08	8654	316890	2/28/1990	9N	33W	23E	613	553	250				Orcutt/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC063				10/15/197	9N	33W	25D01	758	758					Paso Robles/Careaga	Careaga	Industrial Oil Field	Inside Expansion Area
CC064			105178	10/29/197	9N	33W	25D02	515	515		380'-441'	441'-470'		Paso Robles/ Careaga	Careaga	Industrial Oil Field	Inside Expansion Area
CC065	129-080-06	300	82387	9/14/1976	9N	33W	2A1	329	329					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC066	129-080-002	SR0102354		37329	9N	33W	2A2	225						Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC067	129-090-003	8669	316885	6/28/1990	9N	33W	2A3	304	304					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC068	129-090-02	SR0103563		8/8/2005	9N	33W	2A4	310	305	83				Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC069	129-090-31	3362	139219	10/19/198	9N	33W	2H01	330	302					Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC070	129-090-035	9139	316880	7/29/1990	9N	33W	2H02	304	304					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC071	129-090-040	SR0105807		10/1/2008	9N	33W	2H03	290	290					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC072	129-090-27	8935		4/20/1992	9N	33W	2H04	318	318					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC073	129-090-037	SR0106942		1/29/2010	9N	33W	2H05	350	342	176				Paso Robles	Paso Robles	Domestic/Irrigation	Inside Expansion Area
CC074	129-100-017	SR0107629	1082582	2/1/2011	9N	33W	2K	665	650	304				Loess/Paso Robles	Paso Robles	Industrial Oil Field	Inside Expansion Area
CC075	129-100-32	101467	538842	4/4/2000	9N	33W	2N	1142	1090					Loess/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Inside Expansion Area
CC076			105180	1/28/1977	9N	33W	2Q	624	624					Loess/Paso Robles	Paso Robles	Industrial Oil Field	Inside Expansion Area
CC077	101-060-002	SR0101877	741641	9/7/2000	9N	33W	34E	440	420	100				Alluvium/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC078	129-02-30	8932	316871	11/25/199	9N	33W	3J	810	650					Loess/Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC079	129-020-12	9002	459941	10/3/1994	9N	33W	3N01	640	640	270				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC080	129-020-12	7513	256005	6/1/1989	9N	33W	3N02	750	740					Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC081	129-020-30	0103364		10/15/200	9N	33W	3R	860	850	320				Loess/Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC082	129-020-43	SR0109580	0962172		9N	33W	4A01	800	750					Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC083	129-020-048	SR0104840	1098076	3/30/2007	9N	33W	4A02	590	562	280				Loess/Paso Robles	Paso Robles	Irrigaton	Outside Exemption Area
CC084		SR15692		3/4/2013	9N	33W	4C	1018	1000	327				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC085	129-010-011	SR0108730		2/22/2013	9N	33W	4D	1000	1000					Loess/Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC086	129-020-053	SR0105857	1082623	11/15/200	9N	33W	4G	510	410	230				Loess/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC087	129-020-45	105836	1098063	10/26/200	9N	33W	4H	615	580	313				Loess/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC088	129-020-054	SR0105564	1082580	11/10/200	9N	33W	4J01	620	602	305				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC089	129-020-059	SR0106722	1082595	9/30/2009	9N	33W	4J02	620	601	352				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC090	129-020-066	SR0105468	1098059	6/15/2008	9N	33W	4K01	610	595	314				Loess/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC091	129-020-060		1098060	7/24/2008	9N	33W	4K02	610	600	341				Loess/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC092	129-020-067	0001188		5/27/2016	9N	33W	4L01	610	600	388				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC093	129-020-068	108023	1083182	10/4/2011	9N	33W	4L02	720	700	470				Loess/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC094	129-010-11	8934		7/25/1991	9N	33W	5D	800	800					Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC095		5269	153028	2/6/1986	9N	33W	8G	1040	1010					Loess/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC096	129-120-010	SR0107896	E0133185	40730	9N	33W	8K	1051						Loess/Paso Robles	Paso Robles	Destroyed	Outside Exemption Area
CC097	129-120-010	107707		6/1/2011	9N	33W	8L	1310	1150	595				Loess/Paso Robles/Careaga	Careaga	Public	Outside Exemption Area
CC098	129-146-012	SR0109484	E0240398	41843	9N	33W	8P2							Destroyed - No depth	Destroyed - No depth	Destroyed	Outside Exemption Area
CC099	129-120-016	105778	1098065	11/15/200	9N	33W	8Q01	930	900	608				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC100	129-120-16	SR0103306		8/2/2004	9N	33W	8Q02	1020	1020	600				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC101	129-120-026			12/9/2009	9N	33W	8R	1400	1380	528				Loess/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC102			154549	3/6/1985	9N	33W	9C	1180	1170					Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC103	129-170-002	SR108214	1083199	2/9/2012	9N	33W	9H01	700	700					Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC104	129-170-002	SR0102890		9/5/2003	9N	33W	9H02	603	603					Loess/Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC105		SR0108599		12/15/201	9N	33W	9N	1018	970	555				Loess/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC106	129-170-004	425		9/12/1995	9N	33W	9P	860	860					Loess/Paso Robles	Paso Robles	N/A	Outside Exemption Area

Map Number	APN	SB Co.Permit	DWR Ref.	Date Completed	TWN	RNGE	SEC	Total Depth (bgs feet)	Compl. Depth (bgs feet)	Depth of Static Water (bgs feet)	Screen Interval 1 (bgs feet)	Screen Interval 2 (bgs feet)	Screen Interval 3 (bgs feet)	Completed Formation	Formation TD	Purpose	Reference to Exemption Area
CC107	129-170-06	5276	222854	8/14/1986	9N	33W	10C	504	502					Alluvium/Paso Robles	Paso Robles	Domestic/ Irrigation	Outside Exemption Area
CC108	129-170-06	553	575188	9/25/1997	9N	33W	10D	800	750					Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC109	129-170-06	528	478064	5/10/1997	9N	33W	10M	890	880					Alluvium/Orcutt/Paso	Careaga	Domestic/Irrigation	Outside Exemption Area
CC110			106888	6/1/1976	9N	33W	11H	556	556					Older Gravels/Paso	Careaga	Industrial Oil Field	Inside Existing Exempt
CC111	129-180-010	SR107436	1082576	9/26/2010	9N	33W	12A	540	470	148				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC112	129-180-10	13360	171363	3/4/1985	9N	33W	12C01	520	500					Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC113	129-100-008	WP0000917		9/1/2016	9N	33W	12C02	659	620	208				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC114	129-180-009	SR107616	1082584	2/22/2011	9N	33W	12F	608	500	100				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC115	129-201-01	3193	139095	2/20/1982	9N	33W	12J01	520	486					Alluvium/Paso Robles	Paso Robles	Irrigation	Inside Existing Exempt
CC116	129-110-20	8608	337840	4/11/1990	9N	33W	12J02	281	275					Alluvium/Paso Robles	Paso Robles	Domestic/Irrigation	Inside Existing Exempt
CC117		1491		10/24/197	9N	33W	12N	600	600	410				Older Gravels/Paso	Careaga	Industrial Oil Field	Inside Existing Exempt
CC118	129-190-01	101202		12/24/199	9N	33W	12R01	900	900					Alluvium/Paso Robles/Careaga	Careaga	Domestic	Inside Expansion Area
CC119	129-190-007	SR0108572		1/25/2013	9N	33W	12R02	700	690	139				Alluvium/Paso Robles/Careaga	Careaga	Public	Outside Exemption Area
CC120	129-110-20	8590	337841	4/19/1990	9N	33W	12R03	663	640					Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC121				3/14/1973	9N	33W	14F	850	850					Orcutt/Paso Robles/Careaga	Careaga	Industrial Oil Field	Inside Existing Exempt
CC122	129-170-10	103648		5/5/2005	9N	33W	15D01	825	810	374				Orcutt/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC123	129-170-100	SR0109466		7/24/2014	9N	33W	15D02	810	810	470				Orcutt/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC124	129-170-13	5513/541458	194037	5/19/1987	9N	33W	16C01	1200	1195					Orcutt/Paso Robles/Careaga	Careaga	Irrigation/Destroyed	Outside Exemption Area
CC125	129-170-13	100583	521870	9/29/1999	9N	33W	16C02	1160	1156	493				Orcutt/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC126	129-170-13			4/28/1978	9N	33W	16C03	1245	1245					Orcutt/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC127		SR0102095	710821	5/16/2001	9N	33W	16C04	1002	1000	584				Orcutt/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC128	129-170-14	654	700833	4/30/1998	9N	33W	16D	1250	1200					Orcutt/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC129	129-150-43	525	478045	3/15/1997	9N	33W	17A01	1388	1370					Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC130	129-151-048	SR0106339	1090222	5/11/2009	9N	33W	17A02	1000	970	682				Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC131	129-170-014	0104043		11/17/200	9N	33W	17B	1220	1180	642				Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC132	129-151-056	SR0103140		4/12/2004	9N	33W	17E	690	690					Orcutt/Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC133	129-151-54	4086			9N	33W	17F	600	600					Orcutt/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC134	129-151-043	0103113		6/9/2004	9N	33W	17H	1000	830	701				Orcutt/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC135	129-151-036	SR0104221	1085537	3/14/2006	9N	33W	17M	1000	1000					Orcutt/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC136	129-160-030	SR0102397		3/18/2002	9N	33W	17N01	800	800					Orcutt/Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC137	129-160-030	100809	715630	3/16/2002	9N	33W	17N02	820	800	607				Orcutt/Paso Robles	Paso Robles	Public	Outside Exemption Area
CC138	129-160-003	SR0104333	1098086	5/13/2006	9N	33W	17N03	810	800	590				Orcutt/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC139	129-160-33	SR0102364		2/26/2002	9N	33W	17N04	700	700					Orcutt/Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC140	129-050-012	WP0000250		2/18/2015	9N	32W	5M	1100						Alluvium/Paso Robles/Monterey	Monterey	Irrigation	Outside Exemption Area
CC141			77813	2/2/1972	9N	32W	5R	816	600					Alluvium/Paso Robles/Monterey	Monterey	Irrigation	Outside Exemption Area
CC142	129-050-12	9001	352769		9N	32W	6D							Destroyed - No depth	Destroyed - No depth	Destroyed	Outside Exemption Area
CC143	129-050-12	WP0000249		42047	9N	32W	6F	1100						Alluvium/Paso Robles/Monterey	Monterey	Destroyed	Outside Exemption Area
CC144	129-003-05	8666	316888	4/25/1990	9N	32W	6P	550	550					Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC145	129-110-07	8594	351533	12/10/199	9N	32W	7G	758	530					Alluvium/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC146	129-201-034	SR0102887	757855	37841	9N	32W	7N01							Destroyed - No Depth	Destroyed - No Depth	Destroyed	Inside Expansion Area
CC147	129-201-033	SR0102888	757854	37841	9N	32W	7N02							Destroyed - No Depth	Destroyed - No Depth	Destroyed	Inside Expansion Area
CC148	129-110-19	8846	316868	2/18/1991	9N	32W	7P	505	505					Alluvium/Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC149	129-220-45	SR0101914	741647	10/25/200	9N	32W	9E	410	400	250				Alluvium/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC150	129-220-054	SR105595		5/24/2008	9N	32W	9N	580	550	141				Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC151	129-220-024	SR0107524	1082581	11/1/2010	9N	32W	16M	350	340	70				Alluvium/ Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC152	129-210-19	555		7/29/1977	9N	32W	17E	500	452					Alluvium/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC153	129-210-20	992	106367	12/6/1977	9N	32W	17K	361	360					Alluvium/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC154	129-210-001	568	478203	7/3/1997	9N	32W	18D	372	220					Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC155		511	82386	8/12/1976	9N	32W	18H1	385	385					Alluvium/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC156	129-210-005	103292	748800	7/9/2004	9N	32W	18H2	242	237	87				Alluvium/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC157	129-210-03	SR107901	E0135916	7/20/2011	9N	32W	18H3	410	410					Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC158	101-040-21	990		8/8/1977	9N	32W	19F1	696	601	268				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Inside Expansion Area
CC159	129-040-21	1001			9N	32W	19F2							Destroyed - No Depth	Destroyed - No Depth	Destroyed	Inside Expansion Area
CC162	101-040-022	0001111		6/9/2016	9N	32W	19H2	500	500	445				Paso Robles/Careaga	Careaga	Domestic	No

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CC160	101-040-021	1197		8/2/2016	9N	32W	19G	785	785	370	470'-600'	630'-785'		Paso Robles/Careaga	Careaga	Agricultural	Outside Exemption Area
CC161			39346	9/23/1966	9N	32W	19H1	505	500					Paso Robles/Careaga	Careaga	Industrial	Outside Exemption Area
CC162	101-040-022	0001111		6/9/2016	9N	32W	19H2	500	500	445				Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC163	101-050-003	465	105191	3/4/1977	9N	32W	20A	385	385					Paso Robles/ Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC164	101-050-040	SR0105814	1082558	4/13/2009	9N	32W	20B01	620	600	359				Alluvium/ Paso Robles/ Careaga	Careaga	Domestic	Outside Exemption Area
CC165	101-050-041	SR0105813	1082557	2/10/2009	9N	32W	20B02	620	600	457				Alluvium/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC166				27607	9N	32W	20D01	455						Paso Robles	Paso Robles	Destroyed	Outside Exemption Area
CC167				5/25/1976	9N	32W	20D02	700	700					Alluvium/Paso Robles/Careaga	Careaga	Industrial Oil Field	Outside Exemption Area
CC168	101-050-038	SR0104488		7/2/2006	9N	32W	20E	400	400	261				Paso Robles/ Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC169	Intentionally Blank																
CC170	101-050-032	1971		9/22/1978	9N	32W	20G	514	514					Alluvium/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC171				5/6/1905	9N	32W	20H	236		210	220'-236'			Paso Robles	Paso Robles	Stock	Outside Exemption Area
CC172	101-050-005		294579	4/19/1989	9N	32W	21A1	346	322	96				Alluvium/ Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC173	101-050-05	101398		3/1/2000	9N	32W	21A2	220	220		160-220			Alluvium/Paso Robles	Paso Robles	Domestic/Agricultural	Outside Exemption Area
CC174	101-050-004	2043	51604	1/12/1979	9N	32W	21D	420	420		216-405			Alluvium/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC175	101-050-11	SR0103245		6/10/2004	9N	32W	22N	205	205	75				Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC176			159021	12/4/1986	9N	32W	28F	295	275	70				Paso Robles	Paso Robles	Other	Outside Exemption Area
CC177	101-050-016	673	511158	7/6/1998	9N	32W	28R	500	430	250				Paso Robles/ Careaga	Careaga	Domestic	Outside Exemption Area
CC178	101-070-048	SR103688	0905313	5/10/2005	9N	32W	29G1	580'	550'	285	350'-550'			Careaga/Foxen	Foxen	Domestic	Outside Exemption Area
CC179	101-070-058	8970		12/13/199	9N	32W	29G2	400	400					Paso Robles/Careaga	Careaga	Domestic/Agricultural	Outside Exemption Area
CC180			106994	2/28/1975	9N	32W	29J	602	580		250'-280'	430'-580'		Paso Robles/ Careaga/Foxen	Foxen	Domestic	Outside Exemption Area
CC181	101-050-022	0104011	E031011	10/7/2005	9N	32W	29R1	640	550	500				Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC182	101-050-023	SR0105540		4/16/2008	9N	32W	29R2	600	600		300-600			Paso Robles/Careaga	Careaga	N/A	Outside Exemption Area
CC183	101-070-004	SR0105007		7/12/2007	9N	32W	31F	260	260	60	140'-260'			Careaga/Foxen	Foxen	Domestic	Inside Expansion Area
CC184	101-050-023	SR0103734		5/20/2005	9N	32W	32A01	550	522	110	322-522			Alluvium/Paso Robles/Careaga	Careaga	Domestic	Inside Expansion Area
CC185	101-070-050	104144		1/10/2006	9N	32W	32A02	500	450	325	300-340	340-440		Paso Robles/ Careaga	Careaga	Domestic	Inside Expansion Area
CC186	101-70-069	0104353	E039478	6/9/2006	9N	32W	32J1	140	140	45	60-140			Alluvium/ Careaga	Careaga	Domestic	Inside Expansion Area
CC187	101-70-069	0104136	E039477	6/7/2006	9N	32W	32J2	140	140'	45	60'-140'			Alluvium/ Careaga	Careaga	Domestic	Inside Expansion Area
CC188	100-070-066	101600	765360	4/28/2000	9N	32W	32J3	155	147'		23'-147'			Alluvium/ Careaga	Careaga	Domestic	Inside Expansion Area
CC189				7/26/1950	9N	32W	32L	210	210					Careaga	Careaga	Industrial Oil Field	Inside Expansion Area
CC190	101-070-060	SR107461		9/24/2010	9N	32W	32P	105	100	43	70'-90'			Alluvium/ Careaga	Careaga	Domestic/ Irrigation	Inside Existing Exempt Area
CC191	101-070-49	102151		6/19/2001	9N	32W	33C	265	265					Careaga	Careaga	Domestic	Outside Exemption Area
CC192	101-070-046	8958		9/6/1991	9N	32W	33D	440	400	370	240'-440'			Paso Robles/ Careaga	Careaga	Domestic	Inside Expansion Area
CC193	101-070-029	8852	316874	11/9/1990	9N	32W	33G	399	317	142				Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC194	101-070-53	460		3/21/1996	9N	32W	33K	100	100					Alluvium/Careaga	Careaga	Domestic	Inside Expansion Area
CC195	101-070-26	23		8/1/1993	9N	32W	33L	150	150					Alluvium/Careaga	Careaga	Domestic	Inside Expansion Area
CC196	101-070-71	104850		5/6/2008	9N	32W	33N04	114	114		54'-114'			Careaga	Careaga	N/A	Inside Expansion Area
CC197	101-070-071	SR106697		9/10/2009	9N	32W	33P1	420	420	40	80'-140'	240'-280'	380'-420'	Careaga/Foxen/ Upper Sisquoc	Upper Sisquoc	Domestic/ Irrigation	Inside Expansion Area
CC198	NA	NA		7/1/2005	9N	32W	33P2	100	97		57'-97'			Alluvium/ Careaga	Careaga	Domestic/ Irrigation	Inside Expansion Area
CC199	101-070-067	104346		6/1/2006	9N	32W	33R2	65	65		35'-65'			Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC200	101-070-067	104414		6/1/2006	9N	32W	33R3	60	60		30'-60'			Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC201	133-070-039	SR0105311		2/12/2008	9N	32W	34A	200	150	50				Alluvium/ Careaga	Careaga	Domestic	Outside Exemption Area
CC202	101-060-45	SR0100839	521865	8/9/1999	8N	33W	2D	970	820	166				Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC203	101-060-45	SR100016	700854	9/25/1998	8N	33W	2M	1080	1080	173				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC204	101-060-45	1003	700845	8/24/1998	8N	33W	2Q	600	340		220-320			Alluvium/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC205			715604	12/23/199	8N	33W	3P	462	460	57	240-460			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC206	101-060-066	SR0106424	1082560	7/20/2009	8N	33W	3Q	455	450	40	100-450			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC207	101-060-45	SR100017	521842	9/23/1998	8N	33W	3R	1100	980	186	290-490	550-620	650-960	Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC208	101-060-069	SR0105299		12/14/200	8N	33W	4G	430	395	175	205-305	325-385		Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC209	101-060-066	SR0106480		6/15/2009	8N	33W	4R	440	440		80-420			Paso Robles/Careaga	Careaga	N/A	Outside Exemption Area
CC210			812774	7/24/2000	8N	33W	9H	345	175		30-185			Paso Robles/Careaga	Careaga	N/A	Outside Exemption Area
CC211	101-060-066	SR0106635		8/4/2009	8N	33W	10C	490	490		100-480			Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC212	101-060-45	SR100015	700853	9/14/1998	8N	33W	11B	1020	970	102				Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC213		9143		8/16/1992	8N	33W	12F	810	800	400	0-400			Careaga	Careaga	Irrigation	Outside Exemption Area

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CC214	101-060-50	664	538318	7/2/1998	8N	33W	13D	540	525		345-425	445-525		Orcutt/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC215	101-060-23	552	700841	5/30/1998	8N	33W	13F	1080	1070					Alluvium/ Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC216	101-060-23	662	700842	6/9/1998	8N	33W	13Q	1150	1140					Orcutt/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC217	101-100-34	567	478206	7/21/1997	8N	33W	13R	1200	630		300-460	480-610		Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC218	101-090-022	SR0109452	962159	6/25/2014	8N	33W	24J1	350	305	87	100-300			Alluvium/ Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC219	101-100-02		561915	12/20/199	8N	33W	24J2	185	185	130	20'-160'			Alluvium/ Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC220	101-090-022	103478	907655	1/21/2005	8N	33W	24J3	850	820		370'-810'			Alluvium/Paso Robles	Paso Robles	Domestic/ Irrigation	Outside Exemption Area
CC221	101-090-022	SR0102991	757872	11/26/200	8N	33W	24K1	880	743	158	390'-490'	550'-590'	750'-850'	Paso Robles/ Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC222	101-090-021	104003		10/12/200	8N	33W	24M	950	880	190	240'-255'	310'-330'		Alluvium/ Paso Robles/ Careaga	Careaga	Irrigation	Outside Exemption Area
CC223	101-090-22	576	585025	9/6/1997	8N	33W	24Q2	987	980		250-980			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC224	101-090-22	7516	335768	12/4/1998	8N	33W	24Q1	700	670		400-510	550-660		Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC225	133-200-002	SR106820		11/2/2009	8N	32W	14F	60	50	10	20'-50'			Alluvium/Upper Sisquoc	Upper Sisquoc	Irrigation	Outside Exemption Area
CC226	101-300-008	SR0102315		1/7/2001	8N	32W	17G	440	390	200	130'-380'			Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC227	NA	8957		7/5/1991	8N	32W	17H	240	240	100	60'-240'			Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC228	101-060-032	10161		1/15/1992	8N	32W	17N	320	270		140'-260'			Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC229	101-100-035			2/1/1989	8N	32W	19A	500	500	180	260'-500'			Paso Robles/ Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC230	101-100-023	102856			8N	32W	19M	360'	360'		200'-360'			Paso Robles	Paso Robles	N/A	Outside Exemption Area
CC231	101-100-027	5565		4/4/1988	8N	32W	20G	503	473		205-465			Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC232	101-300-006	SR0102115	710824	6/25/2001	8N	32W	20H	500'	400'	47	160'-390'			Alluvium/ Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC233	101-100-033	SR 100525		3/11/1999	8N	32W	20K4	500	450	168	240'-440'			Careaga	Careaga	Irrigation	Outside Exemption Area
CC234	101-100-033		287807	4/29/1989	8N	32W	20K1	302	302	115	202-302			Paso Robles/ Careaga	Careaga	Domestic	Outside Exemption Area
CC235	101-100-033		287808	5/1/1989	8N	32W	20K2	280	280	105	180-280			Paso Robles/ Careaga	Careaga	Domestic	Outside Exemption Area
CC236	101-100-033		287832	6/21/1989	8N	32W	20K3	480	300	70	140-300			Alluvium/Careaga	Careaga	Domestic	Outside Exemption Area
CC237	133-100-053	8880		6/3/1991	8N	32W	21G	460	370		210'-365'			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC238	133-100-050	WP555	e0303828	3/10/2016	8N	32W	22K01	535'	460'	61	220'-440'			Paso Robles	Paso Robles	Domestic/ Irrigation	Outside Exemption Area
CC239	133-100-051	7494	276957	11/10/198	8N	32W	22K02	472'	460'		190'-450'			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC240	133-100-052	8881		5/22/1991	8N	32W	22L	500	345		155'-335'			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC241	133-100-35			1/21/1984	8N	32W	22R	613	613		203-603			Alluvium/ Paso Robles/ Careaga	Careaga	Domestic/ Irrigation	Outside Exemption Area
CC242	133-100-062	100444		5/20/1999	8N	32W	23P	640	640	134	440'-640'			Paso Robles	Paso Robles	Domestic/ Irrigation	Outside Exemption Area
CC243	129-146-012	Sr0108942	E0192179		9N	33W	8P1	1255	1185	694				Loess/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC244	101-060-23	663	700839		8N	33W	13P							Destroyed - No depth	Destroyed - No depth	Destroyed	Outside Exemption Area
CC245	101-090-22		757866		8N	33W	24K2	480						Alluvium/Paso Robles	Paso Robles	Destroyed	Outside Exemption Area
CC246	133-100-48	10059	335788	3/10/1990	8N	32W	24N1	560	560		230-550'			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC247	133-100-54	102331	782548	1/7/2002	8N	32W	24N2	560	540	70	180-200	370-530		Alluvium/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC248	133-100-23	SR0102230	763328	12/28/200	8N	32W	25F	656	605	127	155-455	555-595		Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC249			337739	010/20/19	8N	32W	25E1	325	309		180-306			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC250			67412	12/1/1980	8N	32W	25E2	410	390		130-150	180-280	300-380	Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC251	133-100-33	2821	221040	6/23/1983	8N	32W	25H	730	675		245-405	484-585	635-665	Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC252			50949	8/17/1981	8N	32W	25B	324	275		155-196			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC253	133-100-032	SR018879	e0214335	5/21/2014	8N	32W	25D	215	200	126	90-190			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC254	133-100-25	101954	710802	1/3/2001	8N	32W	26M	843	760	153	350-470	590-750		Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC255	133-130-026	SR0108709	e0185635	2/4/2013	8N	32W	26N	1000	979	125	500-950			Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC256	133-100-35	7492	276954	10/29/198	8N	32W	27G1	535	505		195-495			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC257	133-130-17	8611	335771	10/30/198	8N	32W	27G2	622	583		315-355	375-395	425-575	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC258	133-130-16	8586	335770	12/15/198	8N	32W	27F	610	610		340-400	420-460	560-600	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC259	133-130-13	7542	335752	10/19/198	8N	32W	27C	507	500		330-490			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC260	133-13-006	9148	337856	6/25/1990	8N	32W	27N	603	540		170-310	370-530		Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC261	133-130-015	288	446213	8/15/1995	8N	32W	27K	885	860		360-440	460-500	620-850	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC262	133-130-015	7540	335767	12/7/1989	8N	32W	27P	595	550		280-340	360-410	480-540	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC263	133-070-038	SR0104467	1098085	7/18/2006	8N	32W	27P2	125	120	78	60-120			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC264		SR108295	e0151331	4/1/2012	10N	33W	32H	660	650	240	370-400	410-430	440-460	Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC265	129-010-26	SR5015	153036	4/18/1986	10N	33W	32E	565	531		372-449	449-526		Loess/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC266	129-01-18	4198	172106	7/10/1985	10N	33W	32M	520	520	298	400-520			Loess/Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC267			322770	4/6/1990	10N	33W	32L	710	700		400-700			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC268			40806	4/6/1971	10N	33W	32P	470	470	311	442-462			Loess/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC269			38115	12/30/197	10N	33W	32G	392	392	225	385-390			Loess/Paso Robles/Careaga	Careaga	Domestic	Outside Exemption Area
CC270			64908	5/12/1978	10N	33W	29K	330	330	197	319-326			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC271	128-100-033	SR0104271	1098087	4/1/2006	10N	33W	29M	455	445	187	305-445			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC272	129-010-035	SR103574	905324	2/16/2005	10N	33W	29M2	510	390	195	230-390			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC273	129-010-070	SR0102909	786274	10/7/2003	10N	33W	29N	600	600	326	380-600			Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area

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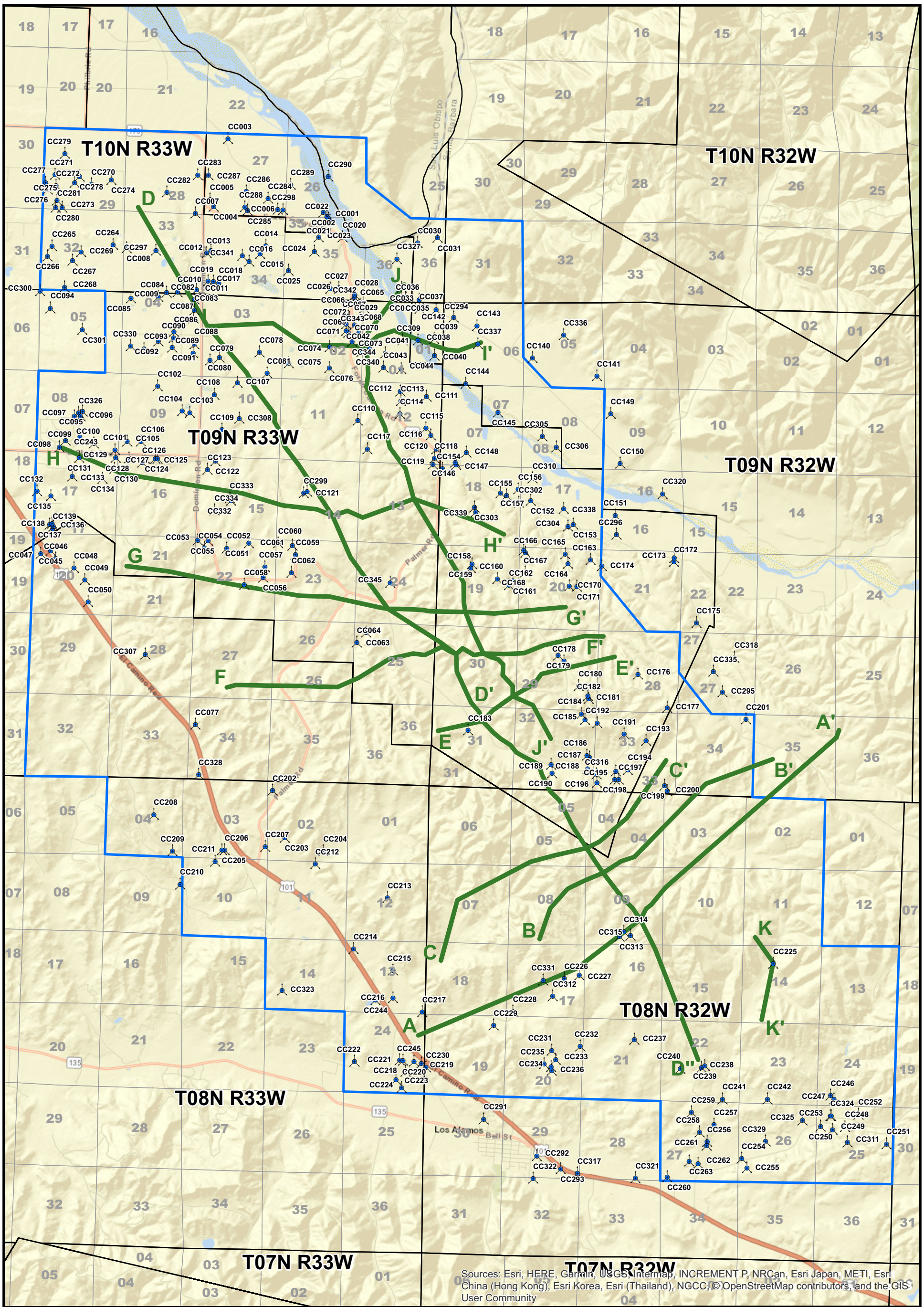
CC274	128-100-04	SR0109000	962151	10/15/201	10N	33W	29J	670	640	228	240-620			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC275	12-820-03		107376	3/3/1976	10N	33W	29N2	315	300		260-300			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC276	128-100-014	SR104312	1085518	4/4/2006	10N	33W	29M3	410	410	182	290-410			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC277	129-010-33	7393	276928	7/21/1988	10N	33W	29M4	660	660		250-410	430-650		Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC278			82377	12/30/197	10N	33W	29L	297	297	177	284-294			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC279			82379	3/15/1976	10N	33W	29F	286	286	171	260-275			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC280			961859	11/20/201	10N	33W	29N3	520	500	200	300-500			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC281			82378	1/30/1976	10N	33W	29L2	290	290	172	278-288			Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC282	128-100-27	SR0105231	1098058	12/18/200	10N	33W	28K	675	580	188	300-570			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC283		5020	153050	7/23/1986	10N	33W	28H	505	460					Paso Robles/Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC284			64921	2/12/1979	10N	33W	27R2	257	257	42	77-177			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC285	127-320-14	5556	182641	1/8/1988	10N	33W	27Q	405	400		155-395			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC286	127-320-14	3309	222807	4/12/1984	10N	33W	27L	404	400	43	100-285	335-390		Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC287	127-320-33	7530	335742	9/22/1989	10N	33W	27M	572	460		250-330	350-450		Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC288	127-320-31	7532	335756	11/2/1989	10N	33W	27P	469	400		270-390			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC289	129-030-012	SR0105187	907258	10/12/200	10N	33W	26M	205	200	68	60-200			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC290	129-30-1	2000-141	725024	7/8/2000	10N	33W	26G	127	120		20-100			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC291	101-110-035		E046752	11/18/200	8N	32W	30G	1010	962	89	217-352			Paso Robles	Paso Robles	Public	Outside Exemption Area
CC292	101-026-046	SR0107215	0907302	8/31/2010	8N	32W	29L	521	510	118	180-300	320-400	420-510	Paso Robles	Paso Robles	Public	Outside Exemption Area
CC293			4210002-	1/1/1988	8N	32W	29Q		500		180-240	320-400	420-500	Paso Robles	Paso Robles	Public	Outside Exemption Area
CC294	090-431-004	94-059	490913	5/16/1994	9N	33W	1A	80	80		45-75			Alluvium	Paso Robles	Irrigation	Outside Exemption Area
CC295	133-070-031	103926	0907671	9/26/2005	9N	32W	27K	140	130	36	80-120			Alluvium/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC296	129-220-015	105075	0907275	8/25/2007	9N	32W	16N	100	100	53	60-100			Alluvium/Paso Robles	Paso Robles	Public	Outside Exemption Area
CC297			61643		10N	33W	33F	965	550		350-550			Paso Robles/ Careaga	Careaga	Irrigation	Outside Exemption Area
CC298			105188	2/25/1977	10N	33W	27R	520	520		160-510			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC299			107040	11/4/1975	9N	33W	14F2	890	890		400-830			Paso Robles/Careaga	Careaga	Irrigation	Inside Existing Exempt Area
CC300			32186	4/18/1966	9N	33W	5D2	393	393	300	360-363	389-392		Loess/Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC301			78842	4/13/1973	9N	33W	5F	674	674		376-539	579-660		Loess/Paso Robles	Paso Robles	Industrial	Outside Exemption Area
CC302			104167	12/16/196	9N	32W	18H	508	454		147-454			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC303			106973	10/9/1974	9N	32W	18F	247	245		48-71	91-151	171-193	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC304			38156	12/18/196	9N	32W	17K2	202	202	63	132-138	148-151	180-194	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC305			67282	3/11/1971	9N	32W	8M	650	570		240-570			Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC306			67287	3/12/1971	9N	32W	8L	55	55					Alluvium	Alluvium	Irrigation	Outside Exemption Area
CC307	101-080-70	7504	256001	5/4/1989	9N	33W	28F	800	700		330-340			Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC308			051698	5/29/1980	9N	33W	10F				393-975			Paso Robles/ Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC309	129-100-07	5286	161612	11/26/198	9N	33W	1F	505	495		125-485			Alluvium/Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC310		2820	221034	5/2/1983	9N	32W	17D				97.6-	178-	258-389	Alluvium/Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC311			067412	12/1/1980	8N	32W	25F	410	390		130-150	180-220	260-280	Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC312			161097	8/7/1987	8N	32W	17K	400	370	92	130-170			Careaga	Careaga	Domestic/Irrigation	Outside Exemption Area
CC313		5548	194039	6/25/1987	8N	32W	9P2	300	0					N/A	Sisquoc	Test Hole	Inside Expansion Area
CC314	133-100-11	5544	194041	6/17/1987	8N	32W	9P1	450	0					N/A	Sisquoc	Test Hole	Inside Expansion Area
CC315	133-100-12	5548	194040	6/24/1987	8N	32W	9Q	350	0					N/A	Sisquoc	Test Hole	Inside Expansion Area
CC316	101-070-066	103830	1079306	6/27/2005	9N	32W	33N	145	140	52	40-140			Careaga	Careaga	Domestic/Irrigation	Inside Expansion Area
CC317	133-130-009	SR0103311	0907621	7/23/2004	8N	32W	28N	562	524	133	310-514			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC318		SR0106788	1090214	10/5/2009	9N	32W	27G	200	200	116	80-200			Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC319	129-010-01	SR0108981	0962150	11/30/201	10N	34W	36F	1000	950	326	400-940			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC320		107959	1082594	10/24/201	9N	32W	16G	460	455		135-435			Alluvium/Paso Robles	Paso Robles		Outside Exemption Area
CC321	133-013-10	8592	335786	3/2/1990	8N	32W	27N	601	530		250-520			Alluvium/Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC322	101-270-048	643	511245	10/22/199	8N	32W	32C	820	690	78	290-370	390-410	440-540	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC323	101-060-17	607	541450	11/30/199	8N	33W	14M	1009	960		320-540	600-950		Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC324			106875	3/27/1976	8N	32W	25D1				268-700			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area

Map Number	APN	SB Co.Permit	DWR Ref.	Date Completed	TWN	RNGE	SEC	Total Depth (bgs feet)	Compl. Depth (bgs feet)	Depth of Static Water (bgs feet)	Screen Interval 1 (bgs feet)	Screen Interval 2 (bgs feet)	Screen Interval 3 (bgs feet)	Completed Formation	Formation TD	Purpose	Reference to Exemption Area
CC325	133-100-078	631	0293013	12/1/2015	8N	32W	26B	745	735		305-600	640-720		Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC326	129-120-15	SR0103207	0907633	7/8/2004	9N	33W	8F	1200	1180	560	660-1160			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC327	90-431-04		051631	6/7/1979	10N	33W	36F	74	74		29-70			Paso Robles	Paso Robles	Domestic/Irrigation	Outside Exemption Area
CC328	101-060-069	SR0105299	E063593	12/14/200	9N	33W	34N	430	395	175	205-305	325--385		Paso Robles	Paso Robles	Domestic	Outside Exemption Area
CC329	133-151-059	SR0104584	E048794	9/28/2006	8N	32W	26F	900	675		500-900			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC330			1083200	1/20/2012	9N	33W	04M	620	600	415	200-220	400-600		Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC331		8906	080560	8/1/1992	8N	32W	17F	620	600					Careaga	Careaga	Irrigation	Outside Exemption Area
CC332	129-22-028	9174	351551	2/20/1991	9N	33W	15F1	461	460		250-460			Paso Robles	Paso Robles	Domestic/Irrigation	Inside Expansion Area
CC333	129-22-028	9197	337853	6/15/1990	9N	33W	15F2	560	525		230-320	360-515		Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC334	129-22-028	9198	351505	7/20/1990	9N	33W	15M	505	460		230-300	320-450		Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC335	133-080-33	518	469900	1/11/1996	9N	32W	27F	940	860	92	280-360	490-650		Paso Robles/Careaga	Careaga	Irrigation	Outside Exemption Area
CC336			067440		9N	32W	5F	370	370	90	80-370			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC337			109326	2/24/1966	9N	32W	6F2	318	312	153	160-170	218-252	282-294	Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC338			101215	2/2/1965	9N	32W	17F	600	600	169	168-600			Paso Robles	Paso Robles	Industrial	Outside Exemption Area
CC339			106871	3/5/1976	9N	32W	18L	231	231	110	135-231			Paso Robles	Paso Robles	Irrigation	Outside Exemption Area
CC340	129-100-16		106376	9/19/1978	9N	33W	2J	613	600	42	400-580			Paso Robles	Paso Robles	Domestic/Irrigation	Inside Expansion Area
CC341			78104	7/11/1978	10N	33W	34F	55	55	28	20-55			Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC342	129-080-003				9N	33W	2A3	220						Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC343					9N	33W	1D		200					Alluvium/Paso Robles	Paso Robles	Domestic	Inside Expansion Area
CC344	129-100-015	139223	1867	3/19/1985	9N	33W	2J2	410	390	80	31-390			Paso Robles	Paso Robles	Irrigation	Inside Expansion Area
CC345	101-040-027				9N	33W	24F		474					Paso Robles/Careaga	Careaga	Industrial	Inside Existing Exempt Area



Legend

- Water Well
- Cross Section
- Study Area

N W E S

6,000 3,000 0 6,000

Feet

WZI INC.

BAKERSFIELD, CALIFORNIA

CAT CANYON AQUIFER EXEMPTION EXPANSION

WATER WELL LOCATION MAP

DATE: 12/18		FIGURE: 5.1-3

on the water well inventory. As stated previously, the water wells are screened in various formations including the Alluvium, Orcutt, Paso Robles, Careaga and Foxen Formations. The higher values are found close to the ocean and farther away from the surface recharge areas.

Table 5.1-3 Water Well - Water Quality Information		
	TDS, mg/L	Boron, mg/L
Average	709.95	0.1665
Standard Deviation	245.68	0.1162

The upper Sisquoc clay and the Foxen Formation provide confinement between the water wells and the Sisquoc producing interval which are above the producing Sisquoc Formation below the Upper Confining Layer:

Figure 5.1-4 Cross Section A-A' with water wells and total proposed aquifer exemption areas;
Figure 5.1-5 Cross Section B-B' with water wells and total proposed aquifer exemption areas;
Figure 5.1-6 Cross Section C-C' with water wells and total proposed aquifer exemption areas;
Figure 5.1-7a Cross Section D-D' with water wells and total proposed aquifer exemption areas;
Figure 5.1-7b Cross Section D'-D" with water wells and total proposed aquifer exemption areas;
Figure 5.1-8 Cross Section E-E' with water wells and total proposed aquifer exemption areas;
Figure 5.1-9 Cross Section F-F' with water wells and total proposed aquifer exemption areas;
Figure 5.1-10 Cross Section G-G' with water wells and total proposed aquifer exemption areas;
Figure 5.1-11 Cross Section H-H' with water wells and total proposed aquifer exemption areas;
Figure 5.1-12 Cross Section I-I' with water wells and total proposed aquifer exemption areas;
Figure 5.1-13 Cross Section J-J' with water wells and total proposed aquifer exemption areas; and
Figure 5.1-14 Cross Section K-K' with water wells.

The unconfined groundwater gradient in the vicinity of the study area is to the northwest and southwest, is consistent with the surface topography in this area with flows to the ocean. Well data collected within the study area as well as groundwater reports were utilized to construct a regional gradient map for the study area, **Figure 5.1-15, Unconfined Groundwater Gradient Map**.

Table 5.1-7: Cumulative Material Balance Field Wide – Cat Canyon						
	Production		Injection			
Cumulative to:	Oil	Produced Water	WF	SF/SC	WD	Balance
1977	228,852,985	898,501,621	176,028,000	33,360,333	63,722,653	(854,243,620)
2017	312,039,990	1,459,770,807	875,689,821			(896,120,976)

Individual operators have provided information where possible delineating the inter-formation mass balance by the area and/or by their lease, **Appendix 5-V, Fluid Levels and Material Balance**. The long term net negative balance for the Study Area is supported by the injection and production data as well as the pressure gradients of the formations. A copy of the calculations and data are included in **Appendix 5-V, Fluid Level Data and Material Balance**.

Table 6.2-1, Cat Canyon Oil Field, Field Wide Balance shows the annual historic field wide mass balances based on DOGGR records back to 2005.

Table 6.2-1: Cat Canyon Oil Field Field Wide Balance since 1977				
Year	Oil (BBL)	Produced Water (BBL)	Injection (BBL)	Net (BBL)
2017	1,543,060	11,265,980	11,459,241	(1,349,799)
2016	1,185,347	8,063,539	9,349,369	100,483
2015	1,289,170	13,777,290	13,676,591	(1,389,869)
2014	1,579,585	17,664,106	17,914,396	(1,329,295)
2013	1,438,877	15,159,390	15,001,669	(1,596,598)
2012	839,883	12,607,366	12,223,548	(1,223,701)
2011	503,517	8,329,769	8,282,484	(550,802)
2010	336,451	4,415,922	4,445,305	(307,068)
2009	286,157	3,490,488	3,479,529	(297,116)
2008	230,676	3,129,773	3,122,441	(238,008)
2007	360,877	4,545,558	4,502,130	(404,305)
2006	354,202	4,322,425	4,255,820	(420,807)
2005	341,035	3,559,170	3,614,279	(285,926)
2004	386,543	5,156,080	4,771,291	(771,332)
2003	434,510	5,263,121	4,644,102	(1,053,529)
2002	412,539	5,484,397	5,533,211	(363,725)
2001	547,324	7,064,236	7,168,790	(442,770)
2000	550,114	6,492,561	6,657,787	(384,888)
1999	550,743	5,833,813	5,872,930	(511,626)
1998	843,920	7,336,727	7,472,720	(707,927)
1997	1,016,264	8,473,079	8,450,316	(1,039,027)
1996	866,969	8,898,763	7,145,223	(2,620,509)
1995	881,050	7,589,288	6,218,019	(2,252,319)
1994	1,070,524	9,269,593	6,664,442	(3,675,675)
1993	1,203,697	10,802,610	7,714,713	(4,291,594)
1992	1,054,829	10,326,382	7,998,858	(3,382,353)
1991	1,249,213	10,807,498	8,786,175	(3,270,536)
1990	1,309,702	11,962,574	10,087,094	(3,185,182)
1989	1,518,678	11,452,334	10,419,502	(2,551,510)
1988	2,436,009	14,750,859	16,269,230	(917,638)
1987	2,938,815	17,667,209	22,003,769	1,397,745
1986	3,528,739	18,972,508	19,333,982	(3,167,265)
1985	4,741,026	32,065,883	35,248,592	(1,558,317)
1984	4,986,256	31,090,336	34,046,819	(2,029,773)
1983	5,132,957	31,314,705	35,205,917	(1,241,745)
1982	5,127,121	29,468,777	36,205,222	1,609,324
1981	5,305,351	29,742,242	41,925,280	6,877,687
1980	5,760,918	31,322,564	37,866,547	783,065
1979	6,017,353	29,615,560	37,516,060	1,883,147
1978	6,315,995	26,692,968	30,383,521	(2,625,442)
1977	6,711,009	26,021,743	29,641,921	(3,090,831)

and below the basal Sisquoc Formation below the Upper Confining Layer provides the vertical confinement of the production intervals of the basal Sisquoc Formation below the Upper Confining Layer and the Monterey Formation below. The Sisquoc ranges from 800 to 2500 feet thick and outcrops where the Howard Canyon crosses Gato Ridge, **Figure 4.1-2, Dibblee Surface Geologic Map**. As shown on Cross Sections A-A', B-B' and D'-D" (Figures 4.1-3, 4.1-4 and 4.6b, respectively) the Upper Sisquoc Formation below the Upper Confining Layer do not outcrop and are overlain by the Upper Sisquoc claystone. The porosity of the Sisquoc claystone that comprises the Upper Sisquoc Confining Layer based on core data is varies from 27% to 42% with permeability ranging from less than 1 to 95 millidarcy, (8.4 X 10^{-7} to 8 X 10^{-5} cm/s), having an average permeability of 15 millidarcy, (1.26 X 10^{-5} cm/s) in the silts and clays that provide the confinement. The Lower Sisquoc confining clay has permeability with a range from 100 to 0.03 millidarcy, (8.4 X 10^{-5} to 2.5 X 10^{-8} cm/s) with the average being 11 millidarcy, (9.2 X 10^{-6} cm/s). The core data is contained in **Appendix 4-I, Core Data and Well Histories** along with the tabulated values by well and zone.

4.1.6 Monterey Formation

The Monterey Formation of upper Miocene age in the Gato Ridge Area of the Cat Canyon Oil Field was identified as one of the most important naturally fractured reservoirs in the United States, (Hubbert & Willis, 1955). The Monterey is a deep water marine deposit, consists of three distinct lithologic members: an upper platy siliceous shale member, a middle fractured chert/dolomitic member and the lower limy shale member, (the Buff and Tan). In the Gato Ridge Area all three members were completed with about 60% of the production coming from the chert member. In the West Area, the cherty zone is the primary completion interval. The Monterey Formation thickness ranges from zero, where it pinches out on the basement complex to the east of Gato Ridge, to over 2,500 feet over most of the study area. A maximum thickness of approximately 4,000 feet occurs in the Olivera Area. The Monterey chert zone has an estimated permeability of 10^{-15} darcy (8.4 x 10^{-3} to 1.26 x 10^{-2} cm/s) with a maximum of 35 darcy (2.94 x 10^{-2} cm/s) but an effective porosity of 6%, (Hubbert & Willis, 1955).[7] In the Cat Canyon Oil Field and surrounding oil fields, the Monterey Formation is both the source rock as well as the producing reservoir rock. While core data has been taken in the Monterey, it is not considered representative of the total formation properties due to the localized natural fracturing, (Nelson, 2001). The data is included in **Appendix 4-I, Core Data and Well Histories, Core Data Summary Table,** for completeness.

4.1.7 Point Sal Formation

The Point Sal Formation is marine deposit of middle Miocene age which conformably underlies the Monterey Formation. It consists of siltstone and diatomaceous siltstone with fine-grained sandstone and lenses of sandstone and conglomerate. The average thickness is 750 feet which provides the lower vertical confinement for the Monterey Formation**. Figure 4.1-1, Type Logs**, shows the Point Sal in its relationship to the Monterey. The permeability of the Point Sal is estimated as less than 1 millidarcy (8.4 X10-7 cm/s), (Freeze & Cherry, 1979).

[7] The high permeability accounts for the Monterey's ability to produce large volumes of heavy oil.

Table 6.1-1: Average Water TDS and Boron by Area and Formation(mg/L)				
Area	Formation		TDS	B
Sisquoc	All Sisquoc Data	Mean	9990	26
		Std Dev.	8028	9
		Count	38	28
	Sisquoc: Post Steaming Production	Mean	5862	26
		Std Dev.	2600	9
		Count	27	25
	Sisquoc: Native Formation	Mean	19862	34
		Std Dev.	7558	17
		Count	12	4
	Monterey	Mean	10417	7
		Std Dev.	6445	5
		Count	14	14
Central	Sisquoc	Mean	10745	28
		Std Dev.	3815	20
		Count	14	11
	Monterey	Mean	12314	19
		Std Dev.	6823	22
		Count	17	7
East	Monterey	Mean	10417	7
		Std Dev.	6445	5
		Count	14	14
	Sisquoc	Mean	7668	12
		Std Dev.	2547	12
		Count	17	9
West	Monterey	Mean	12314	19
		Std Dev.	6823	22
		Count	17	7
	Sisquoc	Mean	22007	42
		Std Dev.	5280	29
		Count	9	5
Gato Ridge	Monterey	Mean	9118	29
		Std Dev.	1151	14
		Count	55	40
	Sisquoc	Mean	21000	
		Std Dev.		
		Count	1	
	Sisquoc/ Monterey	Mean	6333	
		Std Dev.	153	
		Count	3	

6.1.1.5.2 Sisquoc S1b through basal Sisquoc Formation below the Upper Confining Layer

The Sisquoc producing intervals underlie the Upper Sisquoc Confining Layer. The sands are named the S1b through S9 or S10 with the basal sands being locally named throughout the field as the Brooks, the Thomas, and occasionally the Santa Margarita. They are Pliocene grading into Miocene in age and range in porosity from 25% to 63% with permeability as high as 8 darcy, (2.5 x 10^{-3} cm/s). The low gravity oil, 12.5°API to 9°API, and the high oil saturations up to over 70% create an unusual California producing area with relatively low water cuts. The core data is contained in **Appendix 4-I, Core Data and Well Histories** along with the tabulated values by well and zone. In the West Area where the Sisquoc Formation below the Upper Confining Layer are deeper some of the wells have reported higher API gravities.

The Sisquoc productive sands S1b-S10, are aerially extensive across the Cat Canyon Oil field, however these sands pinch out or grade into low permeability silts and marine clays to the north east and to the west and south east. The extent of the sands are shown on **Figure 4.1-7a, Cross Section D-D', Figure 4.1 -7b Cross Section D'-D",** and **Figure 4.2-2 Top Sisquoc Structure Map**, **Figure 4.2-3,** and **Top of Sisquoc S1b Structure Map.**

5.1.1 Water Wells/ Nearest Municipal Water Well

A search was conducted for water supply wells within at least one mile of the proposed Aquifer Exemption Expansion Area of the Cat Canyon Oil Field. The area of review extended beyond the specified Guidance Document 34 one mile buffer area to identify if any water supply wells were hydraulically connected with the potential exemption aquifers. Data on water supply wells were gathered from the Department of Water Resources, the County Of Santa Barbara and field inspection, **Table 5.1-1, Water Well Inventory**. Although total depth and screened intervals are reported on some of the well completion reports, the official aquifer information is not included. Where the completion interval was known, the formation of the water well completion was designated by the professional geologist and placed on the water well inventory. Field inspection was conducted within the study area by contract personnel on behalf of the applicant. Any reports of the field verification are included in **Appendix 5-I, Oil Field Water Well Verification Reports**. The redacted water well completion reports are included to conform with requirements of DWR and the county of Santa Barbara to protect confidential information in **Appendix 5-II, Water Well Completion Reports**.[8] Additional regional water well data were identified and plotted, these data are found in **Appendix 5-III, Geologic Survey Water-Supply Paper 1000**, and **Geologic Survey Water-Supply Paper 1664,** (Worts & Thomasson, 1951)**,** (Muir, 1964)**.**

[8] The owner information has been redacted.

3.2 History of the Cat Canyon Oil Field

The Cat Canyon Oil Field consists of five main producing areas: Sisquoc Area, West Area, Central Area, East Area and Gato Ridge Area. The first discovery of oil was in the West Area with the completion of Palmer No. 1 in 1908 for 600 to 10,000 barrels per day from the Sisquoc Formation below the Upper Confining Layer. Active prospecting of the well-defined Gato Ridge anticline was under way by 1911. Practically all the early wells encountered shows of heavy oil and a few produced a small amount. Barnsdall-Rio Grande Oil Co. Tognazzini No. 1 (now Barnsdall Oil Co. Tognazzini No. 1), completed in 1931 with a daily yield of 1,100 barrels of 13° (API) oil, was the first commercially successful well in the Monterey in Cat Canyon Oil Field. The oil in Cat Canyon Oil Field is heavy, 7° to a 13° API with occasional Monterey Formation production exceeding 20° API. By 1957, the Monterey Formation in the Gato Ridge Area was recognized as one of the important naturally fractured reservoirs in the United States and all of the five Producing Areas had been discovered and partially developed in both the Monterey Formation and the Sisquoc Formation below the Upper Confining Layer, (Bradley & al, 1943), (Hubbert & Willis, 1955). Reinjection of produced water and gas has taken place since the early 1960s, along with steaming and attempts at fire flooding due to the heavy oil gravity. **Figure 3.2-1, Cat Canyon Production History,** shows the production and injection history of Cat Canyon Oil Field since 1977. **Appendix 5-V, Fluid Level Data and Material Balance Calculations**, contains a list of wells by API number and the production and injection by well. Currently, the Cat Canyon Oil Field has produced approximately 311 million barrels of oil and 1.45 billion barrels of water with the recorded water injection of 868 million barrels as steam, water flood and reinjection. There are limited records of the gas injection due to lack of metering because of lack of gas sales.

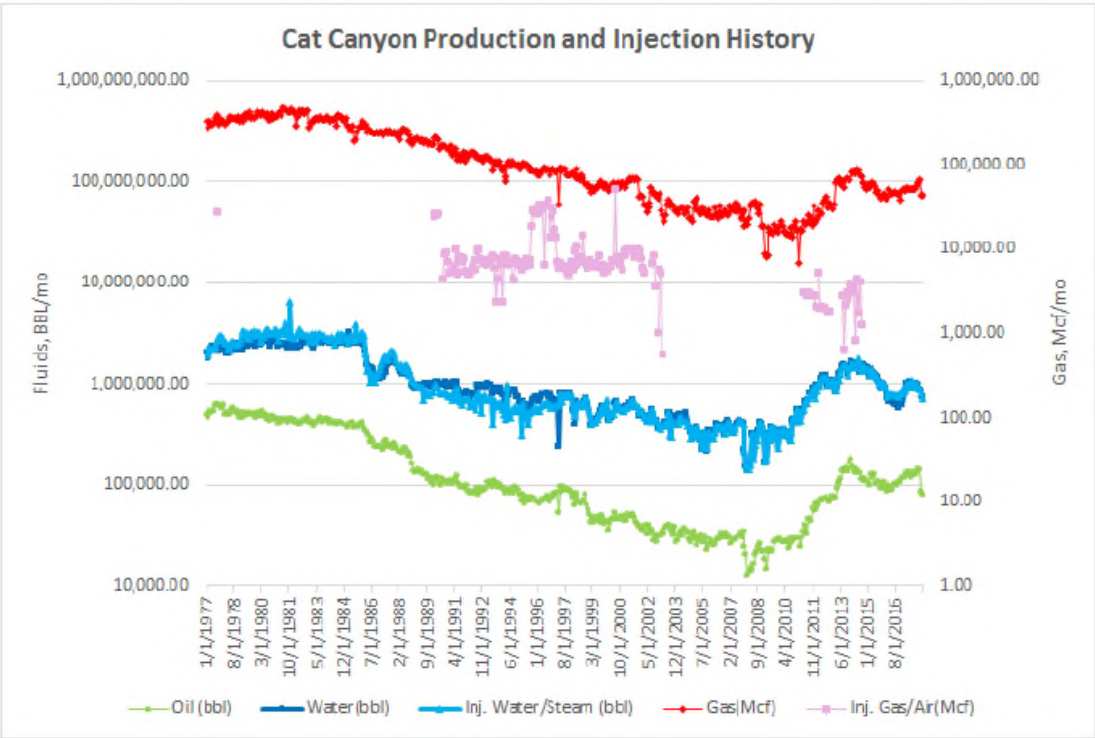


Figure 3.2-1

The current trend for utilization of produced water indicates that the total voidage created by historic fluid management activity will increase since oil is being sold and no water is being imported into Cat Canyon Oil Field. This material balance conservatively utilized fluid withdrawal only; the volume associated with the produced gas (which is significant) was discounted. The fluid level data and the production and injection data utilized in the analyses are included in **Appendix 5-V, Fluid Level and Material Balance.**

Presently, depending on the fault blocks in the designated areas, the Sisquoc Formation below the Upper Confining Layer are the primary production target and the deeper Monterey Formation is the target for reinjection of produced water not being used for steam or water flooding. The gradient will continue to be toward the production wells. When production ceases the gradient will continue in the same direction until the reservoir equalizes at which time the gradient will cease to exist.

6.3 Hydrocarbon Production/Potential

The Sisquoc, basal Sisquoc Formation below the Upper Confining Layer,(Brooks, Thomas, and Santa Margarita) and Monterey Formations are hydrocarbon bearing and commercial oil production is accomplished using primary and enhanced production (steam and water flood methods). The crude oil ranges from 8° API to over 20° API gravity; steam and water reinjection is an essential part of the commercial production process. **Figure 6.3-1, Cat Canyon Oil Field Oil Production and Injection History** shows the oil production history for the Cat Canyon Oil Field.

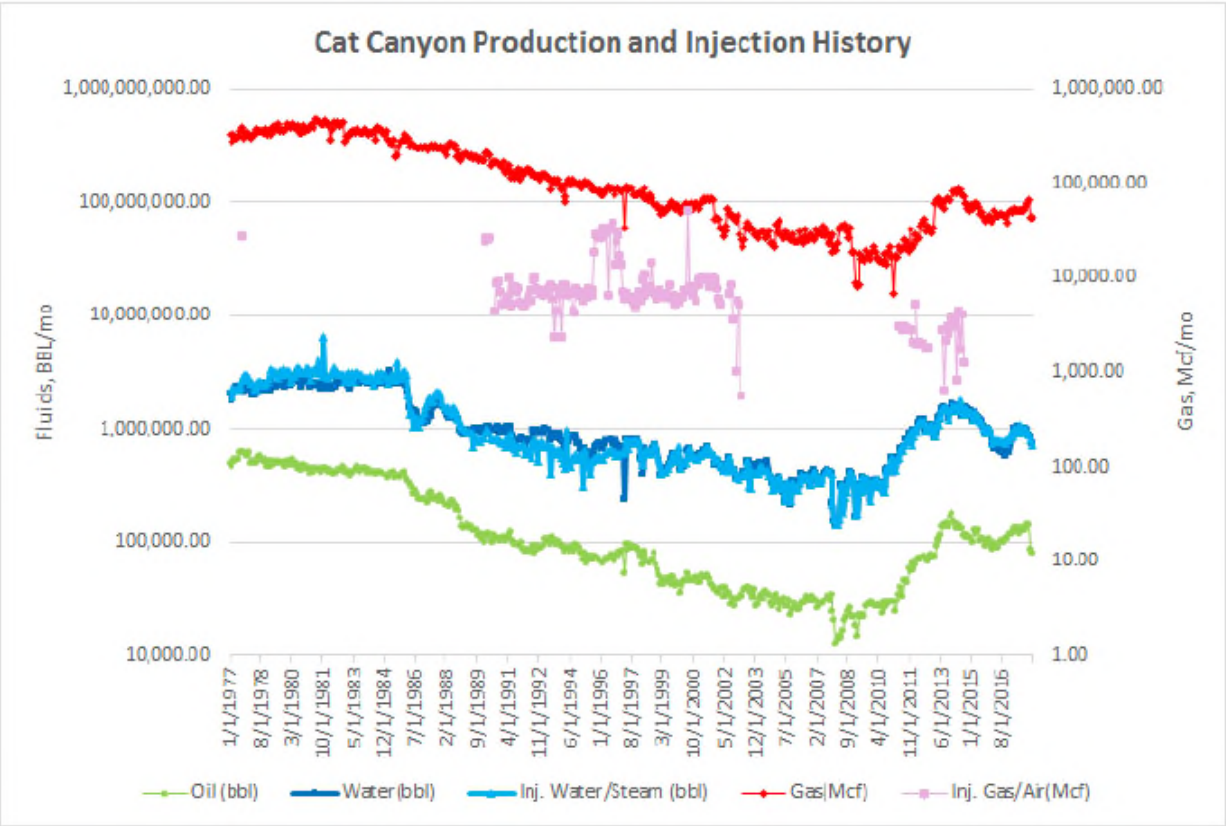


Figure 6.3-1