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San Antonio Creek Valley Groundwater Basin Groundwater Sustainability Plan

June 7, 2021



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Abbreviations and Acronyms

| | |
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| Basin Plan | Water Quality Control Plan for the Central Coastal Basin |
| CASGEM | California Statewide Groundwater Elevation Monitoring |
| CGPS | continuous global positioning system |
| COGG | California Oil, Gas, and Groundwater |
| DDW | SWRCB Division of Drinking Water |
| DMS | Data Management System |
| DQO | data quality objective |
| DTSC | Department of Toxic Substances Control |
| DWR | California Department of Water Resources |
| EPA | U.S. Environmental Protection Agency |
| GAMA | Groundwater Ambient Monitoring and Assessment Program |
| GDE | groundwater dependent ecosystems |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| HCM | hydrogeologic conceptual model |
| ILRP | Irrigated Lands Regulatory Program |
| InSAR | interferometric synthetic-aperture radar |
| LACSD | City of Los Alamos Community Services District |
| NAVD 88 | North American Vertical Datum of 1988 |
| NCCAG | natural communities commonly associated with groundwater |
| NHD | USGS National Hydrography Data Set |
| NWIS | National Water Information System |
| OSWCR | Online System for Well Completion Reports |
| QA/QC | quality assurance and quality control |
| RMS | representative monitoring site |
| RP | reference point |
| RWQCB | Central Coast Regional Water Quality Control Board |
| SCADA | supervisory control and data acquisition |
| SGMA | Sustainable Groundwater Management Act |
| SWRCB | State Water Resources Control Board |
| UNAVCO | University NAVSTAR Consortium |
| USGS | U.S. Geological Survey |
| WCR | well completion reports |
| WQO | water quality objective |

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SECTION 5: Monitoring Networks [Article 5, SubArticle 4]

5.1 Introduction to Monitoring Networks [§354.32]

§354.32 Introduction to Monitoring Networks. This Subarticle describes the monitoring network that shall be developed for each basin, including monitoring objectives, monitoring protocols, and data reporting requirements. The monitoring network shall promote the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.

This section describes existing monitoring networks and improvements to the monitoring networks that will be developed for the Basin. This section is prepared in accordance with the Sustainable Groundwater Management Act (SGMA) regulations §354.32, §354.34, §354.36, §354.38, and §354.40 and includes monitoring objectives, monitoring protocols, assessment and improvement of monitoring networks, representative monitoring, and data reporting requirements.

The monitoring networks presented in this section are based on existing monitoring sites. During the 20-year GSP implementation period, it may be necessary to expand the existing monitoring networks and identify or install more monitoring sites to fully demonstrate sustainability and improve the GSP model. Monitoring networks and data gaps are described for each of the five applicable sustainability indicators. Identified data gaps will be addressed during GSP implementation to improve GSAs ability to track progress and demonstrate sustainability.

The groundwater monitoring network section of this GSP is largely based on historical groundwater data compiled by the United States Geological Survey (USGS) National Water Information System (NWIS) program, the USGS Groundwater Ambient Monitoring and Assessment (GAMA) Program, the California Statewide Groundwater Elevation Monitoring (CASGEM),¹ and quarterly groundwater monitoring completed by the San Antonio Basin Groundwater Sustainability Agency (GSA) beginning the fourth quarter of 2019 to present.

¹ Available at NWIS <https://maps.waterdata.usgs.gov/mapper/index.html>; GAMA, <https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/>; and CASGEM, <https://water.ca.gov/Programs/Groundwater-Management/Groundwater-Elevation-Monitoring-CASGEM>, respectively (Accessed May 18, 2021.)

5.2 Monitoring Network Objectives and Design Criteria

[§354.34(a),(b)(1),(b)(2),(b)(3),(b)(4),(d),(f)(1),(f)(2),(f)(3), and (f)(4)]

§354.34 Monitoring Network.

(a) Each Agency shall develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation.

(b) Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation. The monitoring network objectives shall be implemented to accomplish the following:

- (1) Demonstrate progress toward achieving measurable objectives described in the Plan.
- (2) Monitor impacts to the beneficial uses or users of groundwater.
- (3) Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.
- (4) Quantify annual changes in water budget components.

(d) The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.

(f) The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:

- (1) Amount of current and projected groundwater use.
- (2) Aquifer characteristics, including confined or unconfined aquifer conditions, or other physical characteristics that affect groundwater flow.
- (3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.
- (4) Whether the Agency has adequate long-term existing monitoring results or other technical information to demonstrate an understanding of aquifer response.

The SGMA regulations require monitoring networks be developed to promote the collection of data of sufficient quality, frequency, and spatial distribution to characterize groundwater and related surface water

conditions in the basin and to evaluate changing conditions that occur through implementation of the GSP. The monitoring network should accomplish the following:

- Demonstrate progress toward achieving measurable objectives described in the GSP
- Monitor impacts to the beneficial uses and users of groundwater
- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds
- Quantify annual changes in water budget components

The minimum thresholds and measurable objectives monitored by the networks are described in Section 4 - Sustainable Management Criteria.

5.2.1 Monitoring Networks

Monitoring networks have been developed for each of the five sustainability indicators that are applicable to the Basin. These indicators are described in SGMA as conditions to be avoided:

- Chronic lowering of groundwater levels
- Reduction in groundwater storage
- Degraded water quality
- Land subsidence
- Depletion of interconnected surface water

A sixth sustainability indicator, seawater intrusion is not applicable in the Basin. The Basin is isolated from the Pacific Ocean and is not threatened by seawater intrusion; therefore, this GSP does not provide monitoring for the seawater intrusion sustainability indicator.

The SGMA regulations allow the GSA to use existing monitoring sites for the monitoring network; however, some monitoring sites do not presently meet all SGMA requirements that include unique well identification number, well location, ground surface elevation, well depth, and perforated intervals. Currently, some wells in the groundwater level monitoring network do not have perforated interval information. Perforated interval and other monitoring well information will be obtained during GSP implementation.

The approach for establishing the monitoring networks for the Basin is to leverage historical or existing monitoring programs and incorporate, as needed, additional monitoring locations that have been made available by cooperating entities. The monitoring networks are limited to locations with data that are publicly available and not collected under confidentiality agreements. This section identifies data gaps in each monitoring network and proposes locations and methods for filling those data gaps.

5.2.2 Management Areas

At this time, management areas have not been defined for the Basin. If management areas are developed in the future, the monitoring networks will be reevaluated to ensure that there is sufficient monitoring to evaluate conditions in each management area.

5.3 Groundwater Level Monitoring Network [§354.34(e),(g)(1)(2)(3),(h), and (j)]

23 Cal. Code Regs. §354.34 Monitoring Network.

- (e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.
- (g) Each Plan shall describe the following information about the monitoring network:
- (1) Scientific rationale for the monitoring site selection process.
 - (2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.
 - (3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.
- (h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.
- (j) An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.

The minimum thresholds and measurable objectives for the chronic lowering of groundwater levels sustainability indicator are evaluated by monitoring groundwater levels at groundwater wells identified as representative monitoring sites. The SGMA regulations require a network of monitoring wells sufficient to demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features.

Groundwater well construction information and water level data were obtained from the following public sources:

- USGS NWIS
- DWR CASGEM
- DWR Online System for Well Completion Reports (OSWCR)
- The City of Los Alamos Community Services District (LACSD)

These data sources resulted in a data set of more than 200 wells, each analyzed using the following steps to assess whether they would be included in the groundwater level monitoring network:

- **Include only currently measured wells:** To reduce the possibility of selecting a well that has not been monitored in many years or that may no longer be accessible, wells were excluded that did not have

at least one groundwater level measurement from 2015 or later. All the groundwater level monitoring data available for the Basin that met this criterion were provided by the USGS, DWR CASGEM, LACSD, or the GSA for a total of 64 wells.

- **Remove wells for which access agreements were denied by well owners:** The GSA was not able to obtain access agreements for five of the wells included in USGS-led groundwater level monitoring program for the Basin. These wells are excluded from the existing groundwater level monitoring network. An effort is ongoing to reach out to well owners with pending well access agreements to discuss participation in the groundwater level monitoring network.² The groundwater level data that met this criterion resulted in a total of 50 wells, including wells with pending well access agreements.

The wells included in the groundwater level monitoring network are listed in Table 5-1 and shown on Figure 5-1. A subset of wells from the monitoring network has been selected as representative monitoring sites (RMS). RMS are defined in the SGMA regulations as a subset of monitoring sites that are representative of conditions in the Basin. These RMS wells are evaluated in terms of sustainable management criteria in Section 4. The groundwater level RMS network is summarized in Table 5-1 and shown on Figure 5-1. RMSs with pending access agreements are noted in Table 5-1. Further rationale for selection of RMSs is provided in Section 4.4.

All but six wells in the groundwater level monitoring network are monitored by the GSA. Four of the six wells are monitored by the LACSD using pressure transducers coupled to a supervisory control and data acquisition (SCADA) system. Static water levels are provided to the GSA on a quarterly basis in association with the GSA's quarterly monitoring events. The remaining two wells are monitored by Santa Barbara County semiannually, in March and October, as part of the DWR CASGEM program. The most recent available measurements for all wells included in the groundwater level monitoring network were collected in 2019, 2020, or 2021.

Pressure transducers are installed in 10 wells in the groundwater level monitoring network. Each transducer is programmed to measure groundwater elevation once every 4 hours and is calibrated quarterly. Wells equipped with transducers are shown in Figure 5-2.

² To date, this outreach has resulted in the addition of several wells to the groundwater level monitoring network.

Table 5-1. Groundwater Level Monitoring Network

| Well ID | Well Type | Well Depth (ft) | Screen Interval(s) (ft bgs) | Ground Elevation (ft NAVD 88) | Elevation Reference Point Description (ft NAVD 88) | First Date Measured | Last Date Measured | Years Measured | Total Number of Measurements | Screened Aquifer | RMS Well (Y/N) |
|---------------------------|--------------|-----------------|-----------------------------|-------------------------------|--|---------------------|--------------------|----------------|------------------------------|-----------------------|----------------|
| 13C1 | Agricultural | 1,070 | -- | 776.8 | 777.3 | 2/25/2004 | 2/25/2021 | 17 | 30 | Careaga Sand | Y |
| 13Q1 ² | Agricultural | 295 | 47-295 | 662.3 | 663.3 | 11/7/1957 | 10/5/2020 | 63 | 37 | Paso Robles Formation | N |
| 14L1 | Monitoring | 593 | 500-560 | 328.7 | 330.2 | 6/20/1980 | 2/25/2021 | 41 | 1958 | Careaga Sand | N |
| 16C2 ¹ | Monitoring | 169 | -- | 328.6 | 330.2 | 2/5/1970 | 2/26/2021 | 51 | 299 | Careaga Sand | N |
| 16C4 ¹ | Monitoring | 560 | -- | 328.6 | 330.0 | 2/5/1970 | 2/26/2021 | 51 | 298 | Careaga Sand | N |
| 16F1 | Monitoring | 57.8 | -- | 276.4 | 280.8 | 8/1/1978 | 2/26/2021 | 43 | 149 | Careaga Sand | N |
| 16G3 | Monitoring | 55.5 | -- | 294.5 | 297.3 | 2/25/1976 | 2/26/2021 | 45 | 179 | Careaga Sand | Y |
| 17E1 ³ | Monitoring | 89 | -- | 243.0 | -- | 2/25/1976 | 2/25/2021 | 45 | 180 | Careaga Sand | N |
| 17H1 ³ | Monitoring | 61 | -- | 260.0 | 264.4 | 3/26/1976 | 2/26/2021 | 45 | 139 | Careaga Sand | N |
| 17K2 ³ | Monitoring | 60 | -- | 260.0 | 260.0 | 9/26/1978 | 2/25/2021 | 42 | 148 | Careaga Sand | N |
| 17Q1 ³ | Monitoring | 48 | -- | 270.0 | 274.9 | 9/26/1978 | 2/25/2021 | 42 | 121 | Careaga Sand | N |
| 20Q2 ² | Agricultural | -- | -- | 406.4 | -- | 1/16/1958 | 6/25/2019 | 61 | 130 | Paso Robles Formation | Y |
| 21A1 | Monitoring | 271 | -- | 301.0 | 304.0 | 12/16/1977 | 2/25/2021 | 43 | 1056 | Careaga Sand | N |
| 22J1 ^{2,3} | Agricultural | -- | -- | 1,435.0 | -- | 3/22/1990 | 6/26/2019 | 29 | 33 | Careaga Sand | N |
| 22K3 ² | Agricultural | 250 | -- | 463.0 | 463.15 | 11/5/1971 | 10/5/2020 | 49 | 44 | Paso Robles Formation | Y |
| 22M1 ^{2,3} | Agricultural | -- | -- | 1,268.0 | -- | 1/19/2018 | 6/26/2019 | 1 | 5 | Careaga Sand | N |
| 22N1 ^{2,3} | Agricultural | 175 | -- | 1,201.0 | -- | 1/5/2017 | 6/26/2019 | 2 | 5 | Paso Robles Formation | N |
| 24 E1 ^{2,3} | Agricultural | 580 | 310-570 | 350.0 | -- | 6/3/1977 | 6/25/2019 | 42 | 99 | Careaga Sand | Y |
| 25D1 ² | Agricultural | 700 | 268-700 | 764.9 | -- | 4/22/1977 | 6/26/2019 | 42 | 102 | Careaga Sand | Y |
| 2M1 | Agricultural | 750 | 240-500 | 419.4 | 420.0 | 6/15/1977 | 2/25/2021 | 44 | 105 | Paso Robles Formation | Y |
| 2N1 ³ | Agricultural | 980 | 290-960 | 827.0 | 827.0 | 3/14/2017 | 2/25/2021 | 4 | 8 | Careaga Sand | N |
| 2R1 ³ | Agricultural | 370 | 220-320 | 776.0 | 778.0 | 11/5/2019 | 2/25/2021 | 1 | 5 | Careaga Sand | N |
| 30D1 ^{2,3} | Agricultural | 895 | 265-895 | 540.0 | -- | 6/16/1977 | 6/26/2019 | 42 | 869 | Paso Robles Formation | Y |
| 34P1 | Monitoring | 222.5 | -- | 452.5 | 455.0 | 8/9/1979 | 2/25/2021 | 42 | 97 | Careaga Sand | Y |
| 4-Deer Field ³ | Agricultural | 490 | -- | 639.0 | 639.8 | 1/25/2018 | 2/25/2021 | 3 | 11 | Careaga Sand | N |
| 4-Deer Highway | Agricultural | 349 | -- | 689.2 | 690.3 | 12/1/1955 | 2/25/2021 | 65 | 13 | Careaga Sand | N |
| LACSD 3a | Municipal | 521 | 180-510 | 589.0 | 589.9 | 11/17/2010 | 6/25/2020 | 10 | 214 | Paso Robles Formation | N |
| LACSD 4 | Municipal | 535 | 230-530 | 604.0 | 605.0 | 3/28/1994 | 6/25/2020 | 26 | 467 | Paso Robles Formation | Y |
| LACSD 5 | Municipal | 1,010 | 502-952 | 560.2 | 561.9 | 1/31/2007 | 6/25/2020 | 13 | 266 | Paso Robles Formation | N |
| LACSD 6 | Municipal | 1,005 | 190-950 | 566.0 | 568.1 | 12/18/2019 | 6/25/2020 | 1 | 10 | Paso Robles Formation | N |
| Mesa Vineyard | Agricultural | -- | -- | 805.0 | 805.5 | 11/5/2019 | 2/25/2021 | 1 | 6 | Careaga Sand | N |
| SACC 1 | Monitoring | 980 | 920-940 | 586.1 | 585.0 | 9/8/2016 | 2/25/2021 | 4 | 26 | Paso Robles Formation | Y |
| SACC 2 | Monitoring | 720 | 700-720 | 586.1 | 585.0 | 9/23/2016 | 2/25/2021 | 4 | 25 | Paso Robles Formation | N |
| SACC 3 | Monitoring | 530 | 510-530 | 586.1 | 585.0 | 9/8/2016 | 2/25/2021 | 4 | 27 | Paso Robles Formation | N |

| Well ID | Well Type | Well Depth (ft) | Screen Interval(s) (ft bgs) | Ground Elevation (ft NAVD 88) | Elevation Reference Point Description (ft NAVD 88) | First Date Measured | Last Date Measured | Years Measured | Total Number of Measurements | Screened Aquifer | RMS Well (Y/N) |
|---------------------------|--------------|-----------------|-----------------------------|-------------------------------|--|---------------------|--------------------|----------------|------------------------------|-----------------------|----------------|
| SACC 4 | Monitoring | 325 | 305-325 | 586.1 | 585.0 | 9/8/2016 | 2/25/2021 | 4 | 27 | Paso Robles Formation | N |
| SACC 5 ¹ | Monitoring | 120 | 100-120 | 586.2 | 586.0 | 3/13/2017 | 2/26/2021 | 4 | 384 | Paso Robles Formation | N |
| SACR 1 | Monitoring | 690 | 670-690 | 363.0 | 361.3 | 9/21/2016 | 2/25/2021 | 4 | 25 | Careaga Sand | Y |
| SACR 2 | Monitoring | 540 | 520-540 | 363.0 | 361.3 | 9/21/2016 | 2/25/2021 | 4 | 25 | Paso Robles Formation | N |
| SACR 3 | Monitoring | 350 | 330-350 | 363.0 | 361.3 | 9/21/2016 | 2/25/2021 | 4 | 25 | Paso Robles Formation | Y |
| SACR 4 | Monitoring | 220 | 200-220 | 363.0 | 361.3 | 9/21/2016 | 2/25/2021 | 4 | 25 | Paso Robles Formation | N |
| SACR 5 ¹ | Monitoring | 110 | 90-110 | 362.5 | 365.2 | 1/4/2017 | 2/26/2021 | 4 | 386 | Paso Robles Formation | N |
| SAGR ¹ | Monitoring | 90 | 70-90 | 329.6 | 329.4 | 3/8/2016 | 2/26/2021 | 5 | 387 | Paso Robles Formation | N |
| SAHC ¹ | Monitoring | 90 | 70-90 | 453.2 | 455.3 | 3/8/2016 | 2/26/2021 | 5 | 185 | Careaga Sand | Y |
| SAHG ¹ | Monitoring | 75 | 55-75 | 320.6 | 323.5 | 3/13/2017 | 2/26/2021 | 4 | 387 | Paso Robles Formation | N |
| SALA ¹ | Monitoring | 90 | 70-90 | 596.5 | 596.4 | 3/13/2017 | 2/26/2021 | 4 | 276 | Paso Robles Formation | N |
| SALS ¹ | Monitoring | 70 | 50-70 | 459.5 | 459.1 | 3/13/2017 | 2/26/2021 | 4 | 383 | Paso Robles Formation | Y |
| SASA ¹ | Monitoring | 65 | 45-65 | 309.7 | 311.9 | 3/8/2016 | 2/26/2021 | 5 | 390 | Careaga Sand | N |
| Schaff Well | Agricultural | 669 | -- | 598.0 | 599.1 | 3/10/2017 | 2/25/2021 | 4 | 13 | Careaga Sand | N |
| White Hawk 1 | Agricultural | 559.5 | -- | 800.6 | 801.2 | 11/5/2019 | 2/25/2021 | 1 | 5 | Careaga Sand | N |
| White Hawk 4 ³ | Agricultural | 820 | 180-800 | 781.0 | 783.3 | 3/15/2018 | 2/25/2021 | 3 | 8 | Careaga Sand | N |

Notes

¹ Pressure transducer installed in well.

² Pending access agreement.

³ Ground surface elevation and reference point elevation exceeding 0.5 ft accuracy

bgs = below ground surface

ft = foot or feet

NAVD 88 = North American Vertical Datum of 1988

RMS = representative monitoring site

Y = Yes

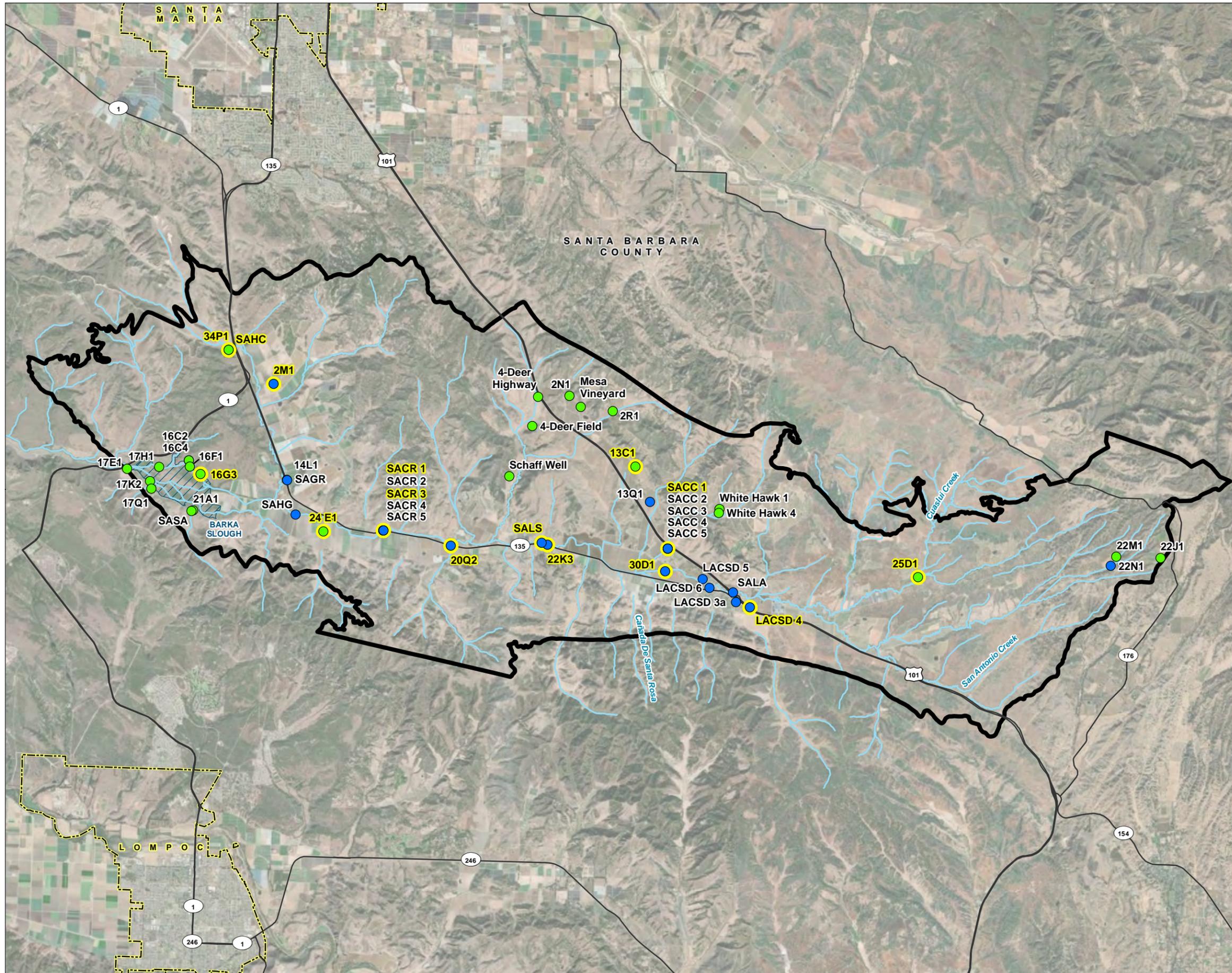
N = No

-- = No data available

FIGURE 5-1

Groundwater Level Monitoring Network

Groundwater Sustainability Plan
San Antonio Creek Valley
Groundwater Basin

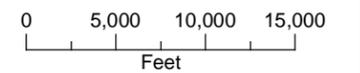


LEGEND

- Representative Well
- Wells (by screened aquifer)**
- Paso Robles Formation
- Careaga Sand
- All Other Features**
- ~ San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- ~ Barka Slough
- City Boundary

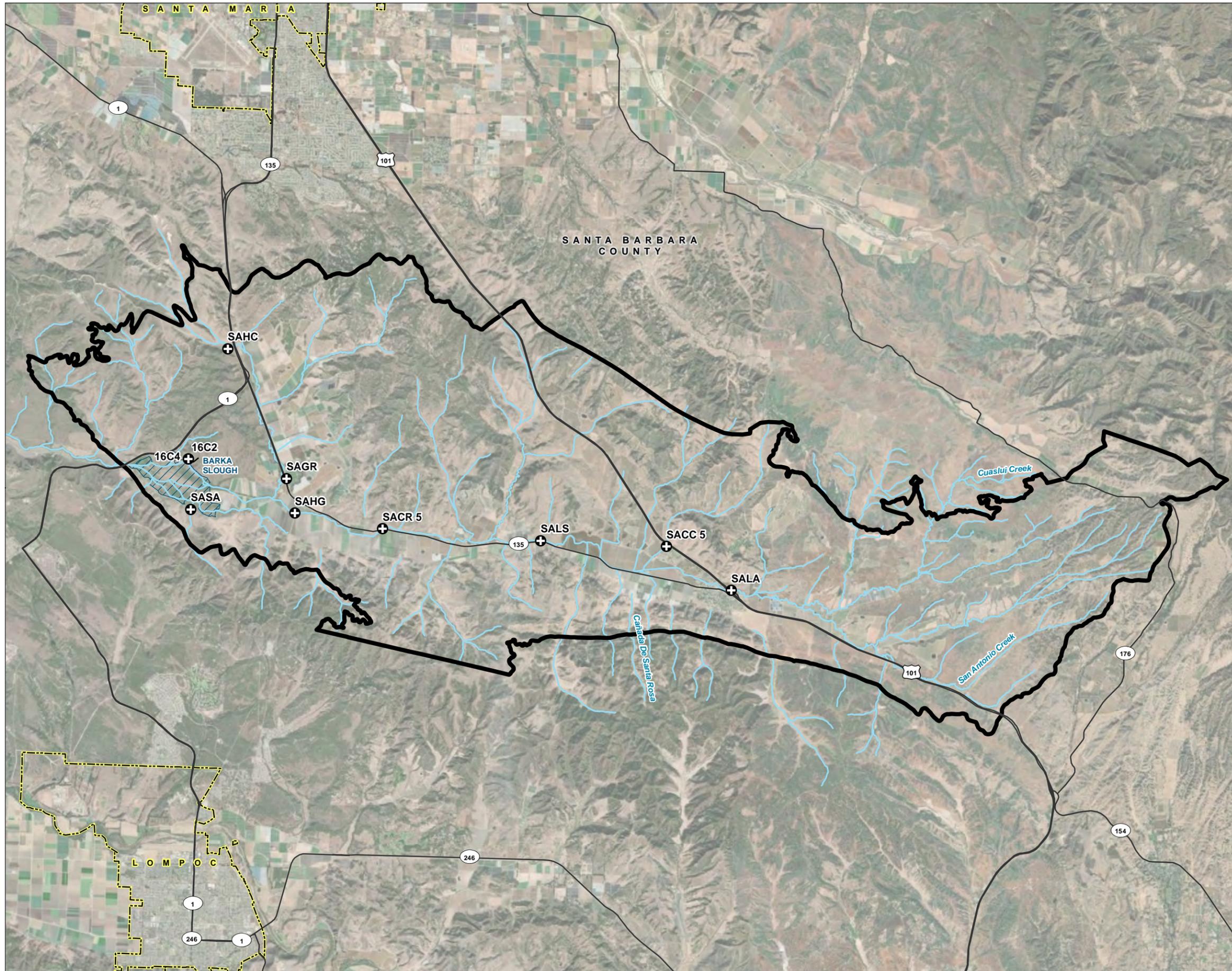
NOTES

*SACR 1 and 14L1 are screened in the Careaga Sand.
San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.



Date: May 21, 2021
Data Sources: USGS, ESRI, CADWR

FIGURE 5-2
Wells with Transducers
 Groundwater Sustainability Plan
 San Antonio Creek Valley
 Groundwater Basin

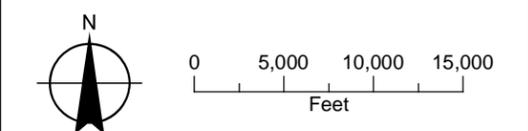


LEGEND

- Well with Transducer
- All Other Features**
- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

*SACR 1 and 14L1 are screened in the Careaga Sand.
 San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.



Date: May 21, 2021
 Data Sources: USGS, ESRI, CADWR

5.3.1 Monitoring Protocols [§354.34(i)]

§354.34 Monitoring Network.

- (i) **The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.**

The GSA adopted monitoring protocols using guidelines in the SGMA regulations and *Best Management Practices for the Sustainable Management of Groundwater – Monitoring Protocols, Standards, and Sites* (BMPs) published by DWR on monitoring protocols (DWR, 2016a). The following information or procedure is collected and documented for each monitoring site:

- Long-term access agreements. Access agreements include year-round site access to allow for increased monitoring frequency.
- A unique well identifier that includes a general written description of the site location, date established, access instructions and point of contact, type of information to be collected, latitude, longitude, and elevation. The written description for each monitoring location also tracks all modifications to the site in a modification log.

The following considerations for groundwater level measuring protocols are considered:

- Groundwater level data are taken from the correct location, well ID, and screen interval depth
- Groundwater level data are accurate and reproducible
- Groundwater level data collection protocols are completed in accordance with the data quality objectives (DQOs) process defined by the U.S. Environmental Protection Agency (EPA) *Guidance on Systematic Planning Using the Data Quality Objective Process* (EPA, 2006)
- All important information is recorded to correct, if necessary, and compare data
- A data collection and management quality assurance/quality control (QA/QC) program is implemented to ensure data integrity

Groundwater level data are collected under the following conditions:

- Quarterly groundwater levels are collected within as short a time as possible, preferably within a 1-to-2 day period.
- Depth to groundwater is measured relative to an established reference point (RP) on the well casing. The RP is usually identified with a permanent marker, paint spot, or a notch in the lip of the well casing. By convention, in open casing monitoring wells, the RP is located on the north side of the well casing. If no mark is apparent, the person performing the measurement measures the depth to groundwater from the north side of the top of the well casing.
- The elevation of the RP of each well is surveyed to the North American Vertical Datum of 1988 (NAVD 88). The elevation of the RP is accurate to within 0.5 foot.
- The sampler removes the appropriate cap, lid, or plug that covers the monitoring access point listening for pressure release. If a release is observed, the measurement is taken after a period of time to allow the water level to equilibrate.
- Depth to groundwater is measured to an accuracy of 0.01 foot below the RP.

- The water level meter is decontaminated prior to initial use and after measuring each well.
- Transducer data are:
 - Downloaded on a quarterly basis
 - Calibrated on a quarterly basis using a depth-to-water measurement
 - Compensated using a barometric pressure sensor

Protocols for the manual collection of groundwater levels are included in Appendix D. Protocols for the collection of groundwater levels obtained by pressure transducers are included in Appendix D.

5.3.2 Assessment and Improvement of Monitoring Network

[§354.38(a),(b),(c)(1)(A)(B),(c)(2),(d),(e)(1)(2)(3)(4), and §354.34(c)(1)(A)(B)]

§354.38 Assessment and Improvement of Monitoring Network.

(a) Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.

(b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.

(c) If the monitoring network contains data gaps, the Plan shall include a description of the following:

(1) The location and reason for data gaps in the monitoring network.

(2) Local issues and circumstances that limit or prevent monitoring.

(d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.

(e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:

(1) Minimum threshold exceedances.

(2) Highly variable spatial or temporal conditions.

(3) Adverse impacts to beneficial uses and users of groundwater.

(4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

§354.34 Monitoring Network.

(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:

(1) **Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:**

(A) **A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table or potentiometric surface for each principal aquifer.**

(B) **Static groundwater elevation measurements shall be collected at least two times per year, to represent seasonal low and seasonal high groundwater conditions.**

The GSA identified data gaps using guidelines in the SGMA regulations and BMPs published by DWR on monitoring networks (DWR, 2016b) and §354.38 of the regulations. Table 5-2 compares the suggested attributes of a groundwater level monitoring network from the BMPs to the attributes of the current network and identifies data gaps.

The SGMA regulations require a sufficient density of monitoring wells to characterize the groundwater table or potentiometric surface for each principal aquifer. Professional judgment is also used to determine an adequate level of monitoring density.

While there is no definitive rule on well density, the BMP (DWR, 2016b) cites a range of 0.2 to 10 wells per 100 square miles, with a median of 5 wells per 100 square miles from various cited studies. The Basin is approximately 105 square miles, and the groundwater level monitoring network consists of 23 wells in the Paso Robles Formation Aquifer and 27 wells in the Careaga Sand; which equates to approximately 22 wells and 26 wells per 100 square miles for well density in the Paso Robles Formation and Careaga Sand, respectively.

Although the existing groundwater level monitoring network satisfies the well density guidance cited in the BMP, there are areas identified within the Basin (see Figure 5-3) where the addition of monitoring wells would improve the hydrogeologic conceptual model (HCM) discussed in Section 3.2. Two low density areas in both principal aquifers were identified in the Basin: the eastern uplands and the central to northwestern uplands. Based on the State Water Resources Control Board (SWRCB) Irrigated Lands Regulatory Program (ILRP), private agricultural supply wells have been identified in the eastern uplands area. An effort will be made during GSP implementation to contact well owners of wells in the eastern uplands area to determine if they can be included in the monitoring program. Including these additional wells in the groundwater level monitoring network would minimize the uncertainty of groundwater elevation trends and benefit sustainable management of the Basin. Two wells in the central to northwestern uplands area, completed in the Careaga Sand, was previously monitored by the USGS or GSA. However, well access has been denied by the well owners. An effort will be made by the GSA to negotiate access to these wells.

Although well completion reports (WCRs) are available online via DWR's OSWCR database, the WCR identification numbers are unknown for many of the wells in the groundwater level monitoring network and therefore it is not possible to always identify the associated WCRs. The known WCRs, with redacted ownership information, are provided in Appendix D. In lieu of WCRs, well depth and well coordinate information provided by USGS NWIS were used in conjunction with the USGS Geohydrologic Framework

Model (USGS, 2020) to determine an aquifer of completion. Well construction information will be incorporated into the database as available. Alternatively, if well construction information cannot be found for a particular well, specifically an RMS well, then another well in the monitoring network with well construction information and representative of groundwater conditions in that area will be selected to replace the well in the RMS monitoring network. If funding is available, the GSA is also considering conducting video surveys of certain representative wells in order to document well construction.

Ground surface elevations and reference point elevations accurate to within 0.5 feet (ft) are not available for six wells with pending access agreements, four wells recently added to the monitoring network, four wells recently cleared of vegetation in Barka Slough, and four LACSD wells. The GSA will continue to pursue access agreements. When access agreements are obtained, ground surface elevations and RP elevations will be surveyed and incorporated into the database. A survey of wells with access agreements and an RP elevation accuracy of greater than 0.5 ft will be conducted in 2022.

There may be opportunities to optimize the groundwater level monitoring network in the Basin. The number of wells included in the groundwater level monitoring network will be evaluated during each 5-year GSP interim period. Hydrograph signatures from wells included in the groundwater level monitoring network will be compared for redundancy.

Table 5-2. Summary of Best Management Practices, Groundwater Level Monitoring Well Network, and Data Gaps

| Best Management Practice (DWR, 2016b) | Current Monitoring Network | Data Gap |
|---|--|--|
| Groundwater level data will be collected from each principal aquifer in the basin. | Groundwater level data are collected from 23 wells in the Paso Robles Formation and 27 wells in the Careaga Sand as part of the groundwater level monitoring network. | There is a low density of monitoring points identified in two areas in the Paso Robles Formation and two areas in the Careaga Sand shown on Figure 5-3. The GSA has been contacting well owners in these areas to determine if wells can be added to the groundwater level monitoring network. |
| Groundwater level data must be sufficient to produce seasonal maps of groundwater elevations throughout the basin that clearly identify changes in groundwater flow direction and gradient (Spatial Density). | The groundwater level monitoring network is sufficiently distributed to identify changes in groundwater flow direction and gradient throughout the Basin. | Some wells used to prepare groundwater elevation contour maps (see Section 3.2) lack WCRs. For wells without available WCRs, well depth information, well coordinates, and the USGS Geohydrologic Framework Model (USGS, 2020) were used to determine an aquifer of completion. well construction information will be obtained from video surveys as funding allows. |
| Groundwater levels will be collected during the middle of October and March for comparative reporting purposes, although more frequent monitoring may be required (Frequency). | All wells in the groundwater level monitoring network with executed well access agreements are monitored on a quarterly basis. Ten of the wells are measured once every 4 hours by pressure transducers. | None identified. |

| Best Management Practice (DWR, 2016b) | Current Monitoring Network | Data Gap |
|---|---|---|
| Data must be sufficient for mapping groundwater depressions, recharge areas, and along margins of basins where groundwater flow is known to enter or leave a basin. | The groundwater level monitoring network is sufficiently distributed to map groundwater depressions, recharge areas, and along margins of the Basin where groundwater flow is known to enter or leave a Basin (i.e., Barka Slough). | None identified. |
| Well density must be adequate to determine changes in storage. | The groundwater level monitoring network is sufficiently distributed and meets DWR well density requirements to determine changes of groundwater in storage. | None identified. |
| The elevation of the RP of each well is surveyed to NAVD 88. The elevation of the RP is accurate to within 0.5 ft. | 33 wells in the groundwater level monitoring network have RP elevations surveyed to within 0.5 ft accuracy. | 17 wells in the groundwater level monitoring network have RP elevations exceeding 0.5 ft accuracy. Wells with access agreements will be surveyed in 2022. |

Notes

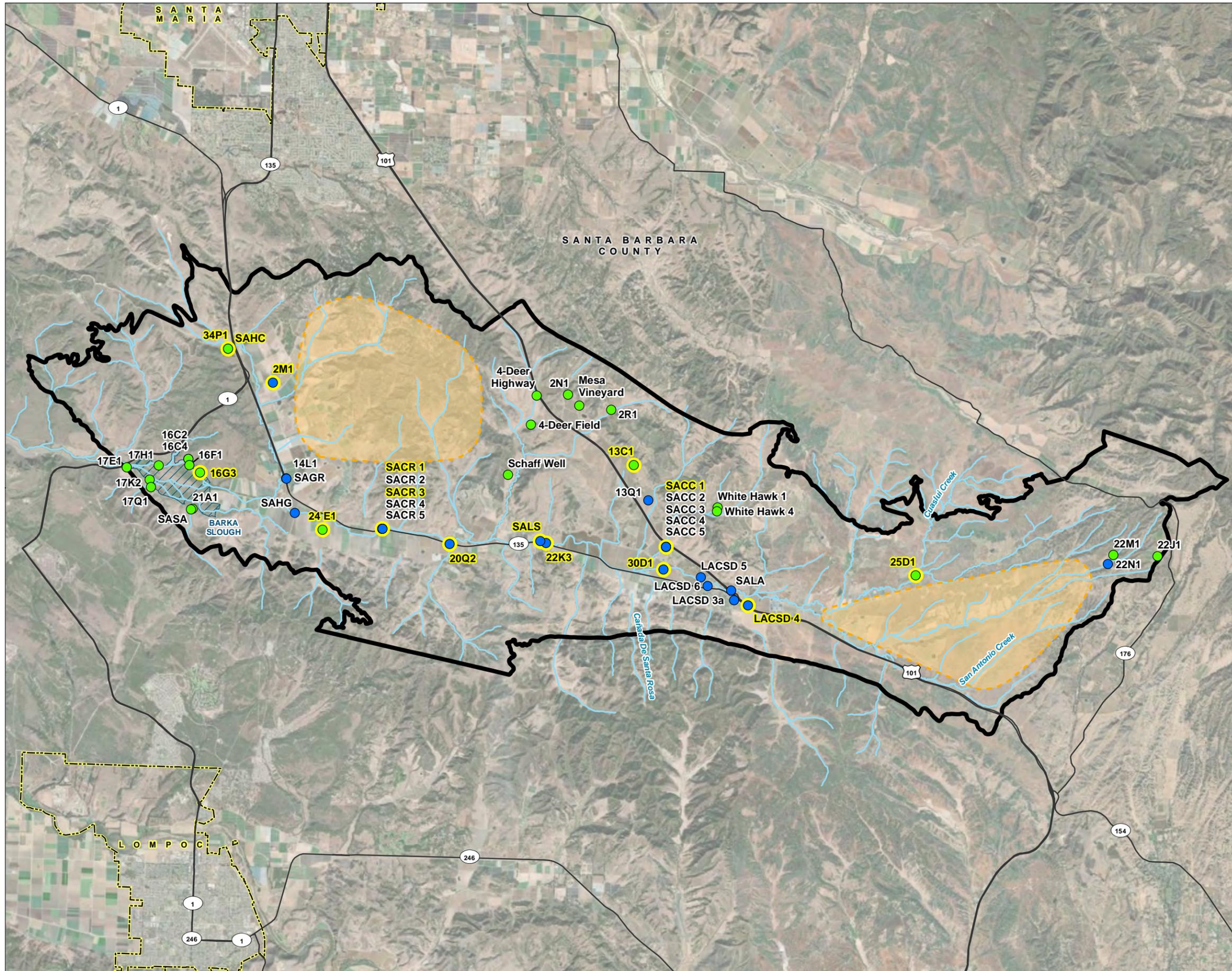
ft = foot or feet

NAVD 88 = North American Vertical Datum of 1988

RP = reference point

USGS = U.S. Geological Survey

FIGURE 5-3
Groundwater Level Monitoring Network - Low Density Areas
 Groundwater Sustainability Plan
 San Antonio Creek Valley
 Groundwater Basin

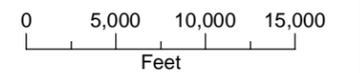


LEGEND

- Data Gap Area
- Representative Well
- Wells (by screened aquifer)**
 - Paso Robles Formation
 - Careaga Sand
- All Other Features**
 - San Antonio Creek or Tributary
 - Major Road
 - San Antonio Creek Valley Groundwater Basin
 - Barka Slough
 - City Boundary

NOTES

*SACR 1 and 14L1 are screened in the Careaga Sand.
 San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.



Date: May 26, 2021
 Data Sources: USGS, ESRI, CADWR

5.4 Groundwater Storage Monitoring Network [§354.34(e),(g)(1)(2)(3),(h), and (j)]

§354.34 Monitoring Network.

- (e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.
- (g) Each Plan shall describe the following information about the monitoring network:
- (1) Scientific rationale for the monitoring site selection process.
 - (2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.
 - (3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.
- (h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.
- (j) An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.

This GSP adopts groundwater levels as a proxy for assessing change in groundwater storage (see Section 4). The groundwater level monitoring network described in Section 5.3 was used to create historical groundwater elevation contour maps and calculate change of groundwater in storage for each principal aquifer (see Section 3.2). A total of approximately 50 wells were used for these groundwater elevation analyses. The locations of these wells are shown on Figure 5-1 and are listed in Table 5-1.

5.4.1 Monitoring Protocols [§354.34(i)]

§354.34 Monitoring Network.

- (i) The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.

The groundwater level monitoring network will be used as a proxy for the groundwater storage monitoring network. Therefore, the protocols described in Section 5.3.1 for the groundwater level monitoring network

are representative of protocols for the groundwater storage monitoring network. Protocols for the manual collection of groundwater levels are included in Appendix D. Protocols for the collection of groundwater levels obtained by pressure transducers are included in Appendix D.

5.4.2 Assessment and Improvement of Monitoring Network [§354.38(a),(b),(c)(1)(2),(d),(e)(1)(2)(3)(4), §354.34(c)(2)]

§354.38 Assessment and Improvement of Monitoring Network.

- (a) Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.
- (b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.
- (c) If the monitoring network contains data gaps, the Plan shall include a description of the following:
- (1) The location and reason for data gaps in the monitoring network.
 - (2) Local issues and circumstances that limit or prevent monitoring.
- (d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.
- (e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:
- (1) Minimum threshold exceedances.
 - (2) Highly variable spatial or temporal conditions.
 - (3) Adverse impacts to beneficial uses and users of groundwater.
 - (4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

§354.34 Monitoring Network.

- (c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:
- (2) **Reduction of Groundwater Storage.** Provide an estimate of the change in annual groundwater in storage.

The groundwater level monitoring network will be used as a proxy for the groundwater storage monitoring network. Therefore, the data gaps discussed in Section 5.3.2 for the groundwater level monitoring network are representative of data gaps in the groundwater storage monitoring network.

5.5 Seawater Intrusion Monitoring Network [§354.34(c) 3),(e),(g)(1)(2)(3),(h),(i),(j), and [§354.38(a),(b),(c)(1)(2),(d),(e)(1)(2)(3)(4)]]

§354.34 Monitoring Network.

(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:

(3) Seawater Intrusion. Monitor seawater intrusion using chloride concentrations, or other measurements convertible to chloride concentrations, so that the current and projected rate and extent of seawater intrusion for each applicable principal aquifer may be calculated.

(e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.

(g) Each Plan shall describe the following information about the monitoring network:

(1) Scientific rationale for the monitoring site selection process.

(2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.

(3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.

(h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.

(i) The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.

(j) An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.

§354.38 Assessment and Improvement of Monitoring Network.

- (a) Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.
- (b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.
- (c) If the monitoring network contains data gaps, the Plan shall include a description of the following:
 - (1) The location and reason for data gaps in the monitoring network.
 - (2) Local issues and circumstances that limit or prevent monitoring.
- (d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.
- (e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:
 - (1) Minimum threshold exceedances.
 - (2) Highly variable spatial or temporal conditions.
 - (3) Adverse impacts to beneficial uses and users of groundwater.
 - (4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

The Basin is isolated from the Pacific Ocean and is not threatened by seawater intrusion; therefore, this GSP does not provide monitoring for the seawater intrusion sustainability indicator.

5.6 Degraded Water Quality Monitoring Network [§354.34(e),(g)(1)(2)(3),(h), and (j)]

§354.34 Monitoring Network.

- (e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.
- (g) Each Plan shall describe the following information about the monitoring network:
- (1) Scientific rationale for the monitoring site selection process.
 - (2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.
 - (3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.
- (h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.
- (j) An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.

The sustainability indicator for degraded water quality is evaluated by monitoring groundwater quality at a network of existing supply wells. The SGMA regulations require sufficient spatial and temporal data in each principal aquifer to determine groundwater quality trends for water quality indicators to address known water quality issues.

There are no known contaminant plumes in the Basin (see Section 3.2.3), therefore only nonpoint source and naturally occurring constituents of concern are present in the Basin.

According to the California Department of Conservation, Geologic Energy Management Division online Well Finder, or WellSTAR, tool, nine named oil and gas fields are within or adjacent to the Basin: Cat Canyon, Zaca, Barham Ranch, Lompoc, Harris Canyon (abandoned), Careaga, Orcutt, and Four Deer (abandoned) (see Figure 3-38).³ The USGS, in cooperation with the SWRCB, initiated the California Oil, Gas, and Groundwater (COGG) Program in 2015.⁴ The objective of the COGG Program is to determine where and to what extent groundwater quality may be adversely impacted by proximal oil and gas development activities (Davis, et al., 2018). Results and interpretations from the COGG Program are not yet available for review, as of second quarter 2021. If results and interpretations become available during the implementation period of this GSP, the GSA will consider these findings during GSP 5-year interim periods.

³ Available at <https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx> . (Accessed May 3, 2021.)

⁴ Description available at <https://webapps.usgs.gov/cogg/>. (Accessed May 18, 2021.)

Existing groundwater quality monitoring programs in the Basin and groundwater quality distribution and trends are described in Section 3.2.3. Identified constituents of concern are based on state and federal regulatory standards (maximum contaminant levels [MCLs] and secondary MCLs [SMCLs]) for drinking water established by the SWRCB Division of Drinking Water (DDW) and the EPA, respectively.⁵ For agricultural uses, constituents of concern are based on Basin water quality objectives presented in the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan) (RWQCB, 2019). No minimum thresholds have been established for regulated contaminants because state regulatory agencies, including the Central Coast Regional Water Quality Control Board (RWQCB) and the Department of Toxic Substances Control (DTSC), have the responsibility and authority to regulate and direct actions that address contamination. Minimum thresholds and measurable objectives pertaining to salts and nutrients (total dissolved solids [TDS], chloride, sulfate, boron, sodium, and nitrate) have been established based upon water quality objectives (WQOs) established in the Basin Plan by the RWQCB.

Constituents of concern for drinking water will be assessed at public water supply wells as part of the SWRCB DDW public supply well water quality (DHS) program. Constituents of concern for agricultural and domestic use will be assessed as part of the state Irrigated Lands Regulatory Program (ILRP) and reported on the state GeoTracker website. According to the RWQCB proposed Ag Order 4.0, beginning in 2022, all ranches enrolled in the ILRP must conduct annual sampling of all on-farm domestic drinking water supply and irrigation wells between March 1 and May 31 of each year. All groundwater samples must be collected by a qualified third party using proper sample collecting and handling method. All groundwater monitoring data sampled to meet the minimum groundwater monitoring requirements of the Order will be submitted electronically to the State Water Board's GeoTracker database by the testing laboratory. (RWQCB, 2021).

Wells included in the groundwater quality monitoring network are listed in Table 5-1 and shown on Figure 5-4. All the wells from the GSP groundwater water quality monitoring network are RMS wells. The groundwater quality monitoring network includes seven municipal drinking water supply wells that were identified by reviewing data available from the SWRCB DDW in the SWRCB's GAMA database. Selected wells were sampled for at least one of the constituents of concern during 2015 or more recently. The seven wells are listed in Table 5-3 and shown on Figure 5-4. Three of the municipal drinking water supply wells are completed in the Paso Robles Formation, and four are completed in the Careaga Sand. The wells completed in the Paso Robles Formation are owned and operated by the LACSD and located near Los Alamos. The wells completed in the Careaga Sand are owned and operated by Vandenberg Air Force Base and located on the north side of Barka Slough (the Slough).

The agricultural supply wells and domestic supply wells included in the groundwater quality monitoring network were identified by reviewing data available from the ILRP located in the SWRCB's GAMA database. Selected wells were sampled in 2015 or more recently. There is a total of 81 ILRP wells in the groundwater quality monitoring network; 21 wells were determined to be domestic supply wells based on their GAMA ID, and 60 wells were determined to be agricultural supply wells. Well construction information is unknown for the majority ILRP wells. Some well construction information has been compiled for the domestic wells using OSWCR. The agricultural supply wells and associated domestic supply wells are listed in Table 5-3 and shown on Figure 5-4.

A groundwater quality monitoring event was completed by the USGS in 2017 as part of its Groundwater Supply Availability Study. For the purposes of this GSP, the 2017 monitoring event is considered a baseline survey of water quality in the Basin around the time SGMA was enacted. The wells included in the 2017 USGS monitoring event are observation wells constructed by the USGS with available well completion

⁵ The list of MCLs and SMCLs is available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chemicalcontaminants.html. (Accessed May 3, 2021.)

information and are not included in the SWRCB DDW DHS or ILRP; and therefore, are not included in the groundwater quality monitoring network. As previously discussed, well construction information for most wells included in the groundwater quality monitoring program is unknown (see Table 5-3). Until additional well construction information is developed, these wells do not provide adequate information to establish a baseline of groundwater quality in principal aquifers. Consequently, the groundwater quality analytical results reported from the 2017 USGS event will be compared to groundwater quality data collected from the groundwater quality monitoring networks to evaluate groundwater quality trends throughout the GSP implementation period. The information collected from the 2017 USGS monitoring event was used to determine groundwater quality trends for each principal aquifer and assess for potential water quality issues in the Basin during the GSP implementation period. Groundwater quality results from the 2017 USGS monitoring event are presented in Section 3.2.3. Well completion reports and geophysical logs are available for the USGS wells and are included as Appendix D.

Table 5-3. Groundwater Quality Monitoring Network

| Well ID | Type of Well | Well Depth (ft bgs) | Screen Interval(s) (ft bgs) | First Sampling Event Date | Last Sampling Event Date | Number of Sampling Events | Principal Aquifer |
|----------------------------|--------------|---------------------|-----------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| 4210002-004 | Municipal | 535 | 230-530 | 11/21/1988 | 6/5/2019 | 79 | Paso Robles |
| 4210002-007 | Municipal | 962 | 502-952 | 11/9/2006 | 6/5/2019 | 33 | Paso Robles |
| 4210002-009 | Municipal | 510 | 180-510 | 9/21/2010 | 6/5/2019 | 24 | Paso Robles |
| 4210700-001 | Municipal | -- | 162- | 6/27/1989 | 11/12/2019 | 103 | Careaga |
| 4210700-002 | Municipal | -- | 160- | 4/10/1984 | 10/14/2019 | 96 | Careaga |
| 4210700-003 | Municipal | -- | 220- | 3/6/1984 | 10/14/2019 | 103 | Careaga |
| 4210700-016 | Municipal | -- | 200- | 6/3/1996 | 10/14/2019 | 84 | Careaga |
| AGC100000001-CCGC_0581 | Agricultural | -- | -- | 6/23/2015 | 6/23/2015 | 1 | Unknown |
| AGL020000787-OFFICE_D | Domestic | -- | -- | 8/24/2015 | 11/29/2017 | 4 | Unknown |
| AGL020000787-WELL2_WH | Agricultural | -- | -- | 5/23/2017 | 11/29/2017 | 2 | Unknown |
| AGL020000788-#1 OLD | Agricultural | -- | -- | 12/26/2012 | 10/30/2017 | 4 | Unknown |
| AGL020000788-#2 NEW | Agricultural | -- | -- | 12/26/2012 | 10/30/2017 | 4 | Unknown |
| AGL020000976-DW1 | Domestic | 370 | 220-320 | 11/29/2012 | 11/15/2017 | 4 | Unknown |
| AGL020000976-IW3 | Agricultural | -- | -- | 11/29/2012 | 11/15/2017 | 4 | Unknown |
| AGL020000990-AG WELL | Agricultural | -- | -- | 11/29/2012 | 4/25/2017 | 3 | Unknown |
| AGL020000990-DOMESTIC WELL | Domestic | -- | -- | 11/29/2012 | 4/25/2017 | 3 | Unknown |
| AGL020001186-CARRARI | Agricultural | -- | -- | 7/28/2014 | 4/5/2018 | 3 | Unknown |
| AGL020001186-DANS HOUSE | Domestic | -- | -- | 7/28/2014 | 4/5/2018 | 3 | Unknown |
| AGL020001194-LOS ALAMOS | Agricultural | -- | -- | 7/28/2014 | 4/5/2018 | 3 | Unknown |

| Well ID | Type of Well | Well Depth (ft bgs) | Screen Interval(s) (ft bgs) | First Sampling Event Date | Last Sampling Event Date | Number of Sampling Events | Principal Aquifer |
|----------------------------|--------------|---------------------|-----------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| AGL020001197-DON MIGUEL | Agricultural | -- | -- | 7/28/2014 | 4/5/2018 | 3 | Unknown |
| AGL020001199-RONS HOUSE | Domestic | -- | -- | 7/28/2014 | 4/5/2018 | 3 | Unknown |
| AGL020001230-DOMESTIC WELL | Domestic | -- | -- | 2/7/2013 | 11/29/2017 | 4 | Unknown |
| AGL020001230-WELL #6 | Agricultural | -- | -- | 2/7/2013 | 11/29/2017 | 4 | Unknown |
| AGL020003431-DOM/IRR | Domestic | -- | -- | 12/2/2013 | 8/3/2017 | 3 | Unknown |
| AGL020003506-RANCH11_IR | Agricultural | -- | -- | 12/2/2013 | 11/13/2017 | 3 | Unknown |
| AGL020003593-WELL 1 | Agricultural | -- | -- | 12/12/2012 | 1/4/2018 | 3 | Unknown |
| AGL020003826-BEVENS WELL | Agricultural | -- | -- | 1/31/2013 | 11/15/2017 | 4 | Unknown |
| AGL020003826-BEVENS WELL 2 | Agricultural | -- | -- | 1/31/2013 | 11/15/2017 | 4 | Unknown |
| AGL020003826-MONIGHETTI | Agricultural | -- | -- | 1/31/2013 | 11/15/2017 | 4 | Unknown |
| AGL020004324-GEOFFREY_D | Domestic | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004324-GEOFFREY_I | Agricultural | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004328-MISSIONP_I | Agricultural | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004330-MISSIONT_D | Domestic | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004330-MISSIONT_I | Agricultural | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |

| Well ID | Type of Well | Well Depth (ft bgs) | Screen Interval(s) (ft bgs) | First Sampling Event Date | Last Sampling Event Date | Number of Sampling Events | Principal Aquifer |
|------------------------------|--------------|---------------------|-----------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| AGL020004333-JFWNEELY_I | Agricultural | -- | -- | 7/23/2018 | 7/23/2018 | 1 | Unknown |
| AGL020004334-SAINZ_DOM | Domestic | -- | -- | 7/23/2014 | 11/27/2017 | 2 | Unknown |
| AGL020004336-BARHAMV_D | Domestic | 370 | 260-360 | 7/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004336-BARHAMV_I | Agricultural | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004336-BARHAMV2_D | Domestic | -- | -- | 1/23/2014 | 11/27/2017 | 3 | Unknown |
| AGL020004388-DW | Domestic | -- | -- | 12/12/2012 | 10/2/2018 | 3 | Unknown |
| AGL020004388-WELL 1 | Agricultural | -- | -- | 7/9/2013 | 10/16/2018 | 2 | Unknown |
| AGL020004388-WELL 3 | Agricultural | -- | -- | 7/9/2013 | 10/2/2018 | 2 | Unknown |
| AGL020004388-WELL 4 | Agricultural | -- | -- | 7/9/2013 | 10/2/2018 | 2 | Unknown |
| AGL020004396-DW | Domestic | 525 | 345-445 | 12/12/2012 | 10/2/2018 | 4 | Unknown |
| AGL020004507-3207_I | Agricultural | -- | -- | 1/23/2014 | 8/28/2017 | 3 | Unknown |
| AGL020004507-3507_I | Agricultural | -- | -- | 1/23/2014 | 8/28/2017 | 3 | Unknown |
| AGL020004512-LOS ALAMOS #1 | Agricultural | -- | -- | 12/21/2012 | 11/13/2017 | 4 | Unknown |
| AGL020004512-LOS ALAMOS #5 | Agricultural | -- | -- | 12/21/2012 | 11/7/2017 | 4 | Unknown |
| AGL020004520-LOMA VERDE #1 | Agricultural | -- | -- | 12/21/2012 | 11/7/2017 | 4 | Unknown |
| AGL020004541-EL CAMINO #1 | Agricultural | -- | -- | 12/21/2012 | 11/7/2017 | 4 | Unknown |
| AGL020004541-EL CAMINO DW #1 | Domestic | -- | -- | 12/21/2012 | 11/7/2017 | 4 | Unknown |

| Well ID | Type of Well | Well Depth (ft bgs) | Screen Interval(s) (ft bgs) | First Sampling Event Date | Last Sampling Event Date | Number of Sampling Events | Principal Aquifer |
|-------------------------|--------------|---------------------|-----------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| AGL020004845-RANCH1_IRR | Agricultural | -- | -- | 12/4/2013 | 6/26/2017 | 3 | Unknown |
| AGL020004945-WELL 1 | Agricultural | -- | -- | 11/25/2012 | 2/22/2019 | 5 | Unknown |
| AGL020004945-WELL 2 | Agricultural | -- | -- | 11/5/2018 | 11/5/2018 | 1 | Unknown |
| AGL020004975-RANCH7_IRR | Agricultural | -- | -- | 12/4/2013 | 6/26/2017 | 4 | Unknown |
| AGL020007205-DOMESTIC | Domestic | -- | -- | 6/29/2017 | 6/29/2017 | 1 | Unknown |
| AGL020007472-MAIN WELL | Agricultural | -- | -- | 7/1/2015 | 7/1/2015 | 1 | Unknown |
| AGL020007578-DOMESTIC | Domestic | -- | -- | 9/19/2012 | 12/4/2017 | 4 | Unknown |
| AGL020007578-PRIMARY AG | Agricultural | -- | -- | 9/19/2012 | 12/4/2017 | 4 | Unknown |
| AGL020008902-DOMESTIC | Domestic | -- | -- | 9/5/2012 | 11/28/2017 | 5 | Unknown |
| AGL020008902-WELL 4 | Agricultural | -- | -- | 5/28/2013 | 6/29/2017 | 3 | Unknown |
| AGL020008902-WELL 5 | Agricultural | -- | -- | 11/28/2017 | 11/28/2017 | 1 | Unknown |
| AGL020010504-WELL 1 | Agricultural | -- | -- | 12/21/2012 | 12/28/2017 | 4 | Unknown |
| AGL020010504-WELL 2 | Agricultural | -- | -- | 12/21/2012 | 12/28/2017 | 5 | Unknown |
| AGL020011702-DOMESTIC | Domestic | -- | -- | 12/11/2013 | 11/28/2017 | 4 | Unknown |
| AGL020012002-WELL 13 | Agricultural | 250 | 160-240- | 9/5/2012 | 5/23/2017 | 3 | Unknown |
| AGL020014928-IRRIGATION | Agricultural | -- | -- | 12/2/2013 | 8/3/2017 | 3 | Unknown |
| AGL020020322-ALISOS_IRR | Agricultural | -- | -- | 12/4/2013 | 3/19/2019 | 4 | Unknown |

| Well ID | Type of Well | Well Depth (ft bgs) | Screen Interval(s) (ft bgs) | First Sampling Event Date | Last Sampling Event Date | Number of Sampling Events | Principal Aquifer |
|---------------------------|--------------|---------------------|-----------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| AGL020022802-RANCH9_IRR | Agricultural | -- | -- | 6/21/2017 | 11/29/2017 | 2 | Unknown |
| AGL020026466-WELL6_IRR | Agricultural | -- | -- | 5/22/2017 | 5/22/2017 | 1 | Unknown |
| AGL020026804-R4-W-1 | Agricultural | -- | -- | 6/6/2017 | 6/6/2017 | 1 | Unknown |
| AGL020027576-AW GLAD | Agricultural | -- | -- | 6/21/2017 | 11/29/2017 | 2 | Unknown |
| AGL020027596-PH #1 | Agricultural | -- | -- | 6/15/2017 | 12/1/2017 | 2 | Unknown |
| AGL020027597-WELL 1 | Agricultural | -- | -- | 10/30/2015 | 12/1/2017 | 3 | Unknown |
| AGL020027908-R2 W1 MONIG | Agricultural | -- | -- | 12/21/2017 | 12/21/2017 | 1 | Unknown |
| AGL020027908-R2 W2 MONIG | Agricultural | -- | -- | 12/21/2017 | 12/21/2017 | 1 | Unknown |
| AGL020027910-GLAD_WELL_3 | Agricultural | -- | -- | 5/23/2017 | 1/4/2018 | 2 | Unknown |
| AGL020027955-RANCH36_D | Domestic | -- | -- | 4/27/2016 | 8/28/2017 | 3 | Unknown |
| AGL020028062-3RAN2701_I | Agricultural | -- | -- | 8/2/2017 | 8/2/2017 | 1 | Unknown |
| AGL020028148-WHITE48 | Agricultural | -- | -- | 5/24/2017 | 12/28/2017 | 4 | Unknown |
| AGL020028151-HARRIS51 | Agricultural | -- | -- | 5/24/2017 | 5/24/2017 | 1 | Unknown |
| AGL020028275-SHOKV DOM | Domestic | -- | -- | 5/11/2018 | 9/25/2018 | 2 | Unknown |
| AGL020028275-SHOKV IRR | Agricultural | -- | -- | 5/11/2018 | 9/25/2018 | 2 | Unknown |
| AGL020028322-GLAD_WELL_11 | Agricultural | -- | -- | 5/23/2017 | 1/4/2018 | 2 | Unknown |

| Well ID | Type of Well | Well Depth (ft bgs) | Screen Interval(s) (ft bgs) | First Sampling Event Date | Last Sampling Event Date | Number of Sampling Events | Principal Aquifer |
|----------------------------|--------------|---------------------|-----------------------------|---------------------------|--------------------------|---------------------------|-------------------|
| AGLO20029934-WELL 1 IRR | Agricultural | -- | -- | 11/7/2017 | 11/7/2017 | 1 | Unknown |
| AGLO20033821-NOLANAG#1_IRR | Agricultural | -- | -- | 7/11/2018 | 10/26/2018 | 2 | Unknown |
| AGLO20033821-NOLANAG#5_IRR | Agricultural | -- | -- | 12/20/2018 | 12/20/2018 | 1 | Unknown |
| AGLO20033821-NOLANAG#6_IRR | Agricultural | -- | -- | 12/20/2018 | 12/20/2018 | 1 | Unknown |

Notes

Source: Data are available from the Groundwater Ambient Monitoring and Assessment (GAMA) Program: <https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/>

Refer to Figure 5-4 for well locations.

bgs = below ground surface

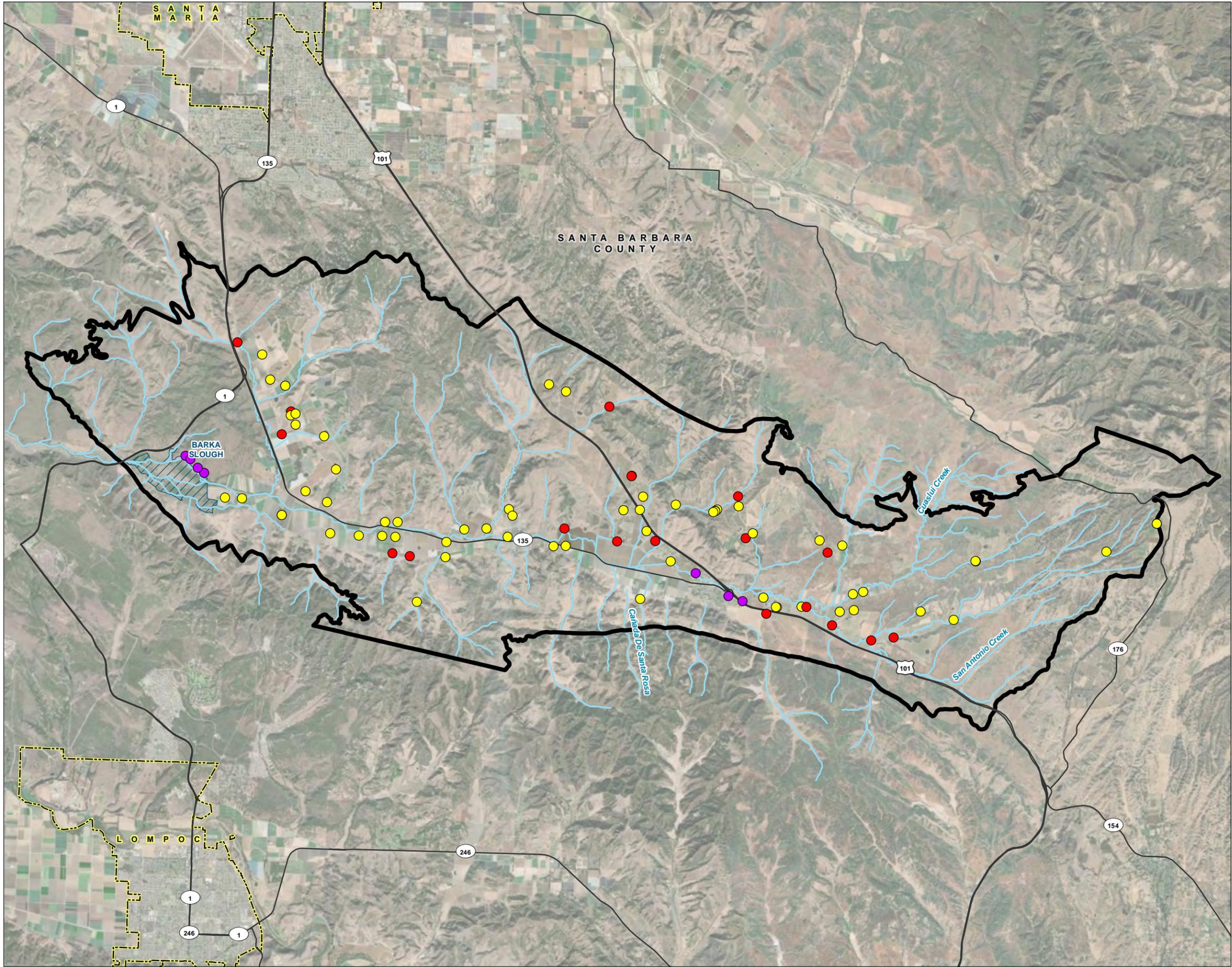


FIGURE 5-4
Groundwater Quality
Monitoring Network
 Groundwater Sustainability Plan
 San Antonio Creek Valley
 Groundwater Basin

LEGEND

Well Type

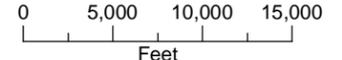
- Agricultural
- Domestic
- Municipal

All Other Features

- San Antonio Creek or Tributary
- Major Road
- San Antonio Creek Valley Groundwater Basin
- Barka Slough
- City Boundary

NOTES

San Antonio Creek Valley Groundwater Basin Boundary as defined in the California Department of Water Resources Bulletin 118.



Date: May 21, 2021
 Data Source:
 The Groundwater Ambient Monitoring and Assessment (GAMA) Program: <https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/>



5.6.1 Monitoring Protocols [§354.34(i)]

23 Cal. Code Regs. §354.34 Monitoring Network.

(i) The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.

Water quality samples are currently being collected in accordance with the SWRCB DDW for municipal drinking water supply wells and ILRP requirements for agricultural and domestic wells. ILRP data are currently collected under Central Coast RWQCB Ag Order 3.0. ILRP samples are collected under the Tier 1, Tier 2, or Tier 3 monitoring and reporting programs. Copies of these monitoring and reporting programs are included in Appendix D and incorporated herein as monitoring protocols. These protocols will continue to be followed during GSP implementation for the groundwater quality monitoring.

5.6.2 Assessment and Improvement of Monitoring Network [§354.38(a),(b),(c)(1)(2),(d),(e)(1)(2)(3)(4) and §354.34(c)(4)]

§354.38 Assessment and Improvement of Monitoring Network.

(a) Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.

(b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.

(c) If the monitoring network contains data gaps, the Plan shall include a description of the following:

(1) The location and reason for data gaps in the monitoring network.

(2) Local issues and circumstances that limit or prevent monitoring.

(d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.

(e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:

- (1) Minimum threshold exceedances.
- (2) Highly variable spatial or temporal conditions.
- (3) Adverse impacts to beneficial uses and users of groundwater.
- (4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

§354.34 Monitoring Network.

(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:

- (4) **Degraded Water Quality.** Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.

Groundwater quality data do not indicate a need for additional monitoring locations. Current programs provide adequate spatial and temporal coverage for the purposes for the GSP. There is adequate spatial coverage in the groundwater quality monitoring network to assess impacts, if any, to beneficial uses and users. Table 5-4 summarizes the recommendations for groundwater quality monitoring from DWR BMPs, the current groundwater quality monitoring network, and data gaps. Well construction information for 77 of 88 wells in the groundwater quality monitoring network is unknown. This is a data gap that will be addressed during GSP implementation by using OSWCR and by continued outreach by the GSA to groundwater users in the Basin to discuss participation in the groundwater level monitoring network.

Table 5-4. Summary of Best Management Practices, Groundwater Quality Monitoring Well Network, and Data Gaps

| Best Management Practice (DWR, 2016a) | Current Monitoring Network | Data Gap |
|--|--|--|
| <p>Monitor groundwater quality data from each principal aquifer in the basin that is currently, or may be in the future, impacted by degraded water quality. The spatial distribution must be adequate to map or supplement mapping of known contaminants. Monitoring should occur based upon professional opinion, but generally correlate to the seasonal high and low groundwater level, or more frequent as appropriate.</p> | <p>Public databases provide adequate spatial and temporal water quality data to identify and evaluate water quality trends in principal aquifers in the Basin.</p> | <p>The current monitoring network contains adequate spatial distribution to map or supplement mapping of any known contaminants. Well construction information for 77 of 88 wells in the monitoring network is unknown. Well construction information will be developed as funding allows.</p> |
| <p>Collect groundwater quality data from each principal aquifer in the basin that is currently, or may be in the future, impacted by degraded water quality. Agencies should use existing water quality monitoring data to the greatest degree possible. For example, these could include ILRP, GAMA, existing RWQCB monitoring and remediation programs, and drinking water source assessment programs.</p> | <p>The water quality monitoring network includes seven municipal wells (monitored by the SWRCB DDW program) and 81 IRLP wells within the Basin that have been regularly sampled for groundwater quality since at least 2015. Three of the municipal wells are completed in the Paso Robles Formation and four municipal wells are completed in the Careaga Sand. Well construction information for the majority of wells in the IRLP is unknown.</p> | <p>The current monitoring network utilizes existing water quality monitoring data from the SWRCB DDW program and ILRP. Wells included in these programs provide adequate spatial distribution to map water quality in principal aquifers in the Basin. Well construction information for 77 of 88 wells in the groundwater quality monitoring network is unknown. Well construction information will be developed as funding allows.</p> |
| <p>Define the three-dimensional extent of any existing degraded water quality impact.</p> | <p>Historical water quality data provides adequate spatial distribution and coverage of principal aquifers (including multiple-zone completion wells) to define the three-dimensional extent of existing degraded water quality impacts.</p> | <p>Well construction information for 77 of 88 wells in the GSP water quality monitoring network is unknown. Well construction information will be developed as funding allows.</p> |

| Best Management Practice (DWR, 2016a) | Current Monitoring Network | Data Gap |
|---|---|--|
| <p>Data should be sufficient to assess groundwater quality impacts to beneficial uses and users.</p> | <p>The water quality monitoring network provides sufficient water quality data, spatial distribution, and coverage of principal aquifers to assess potential impacts to beneficial uses and users of groundwater in the Basin.</p> | <p>Well construction information for 77 of 88 wells in the current water quality monitoring network is unknown. Well construction information will be developed as funding allows.</p> |
| <p>Data should be adequate to evaluate whether management activities are contributing to water quality degradation.</p> | <p>Projects and management actions proposed for implementation by the GSA will be evaluated for potential impacts to all five sustainability indicators applicable to the Basin. Existing groundwater quality monitoring programs (SWRCB DDW and ILRP), spatial distribution of monitored wells, and coverage of principal aquifers will provide adequate data to evaluate whether management activities are contributing to water quality degradation throughout the GSP implementation period. Additionally, select projects and management actions (e.g., recharge of treated wastewater) may be subject to further regulatory review, such as the California Environmental Quality Act.</p> | <p>None identified.</p> |

Notes

CGPS = continuous global positioning system
 DDW = SWRCB Division of Drinking Water
 GSA = Groundwater Sustainability Agency
 GSP = Groundwater Sustainability Plan

ILRP = Irrigated Lands Regulatory Program
 InSAR = interferometric synthetic-aperture radar
 SWRCB = State Water Resources Control Board
 UNAVCO = University NAVSTAR Consortium

5.7 Land Subsidence Monitoring Network [§354.34(c)(5),(e),(g)(1)(3),(h), and (j)]

23 Cal. Code Regs. §354.34 Monitoring Network.

(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:

(5) **Land Subsidence.** Identify the rate and extent of land subsidence, which may be measured by extensometers, surveying, remote sensing technology, or other appropriate method.

(e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.

(g) Each Plan shall describe the following information about the monitoring network:

(1) **Scientific rationale for the monitoring site selection process.**

(3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.

(h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.

(j) An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.

Locally defined significant and unreasonable conditions for land subsidence are (1) land subsidence rates exceeding rates observed from 2000- through 2020 at the University NAVSTAR Consortium (UNAVCO) continuous global positioning system (CGPS) Station ORES in the town of Los Alamos, near Los Alamos Park; and (2) land subsidence that causes damage to groundwater supply, land uses, infrastructure, and property interests. Currently, ground surface elevation is being monitored at one CGPS site (ORES) in the Basin as reported by UNAVCO from its Data Archive Interface.⁶ Since the beginning of data collection in 2000, the net vertical displacement is negative (-0.82 ft). This means that the land surface elevation has decreased (negative displacement) 0.82 ft in the last 20 years. The Basin is located near the intersection of the Coastal Ranges and Transverse Ranges California Geomorphic Provinces. Consequently, the Basin is in a very tectonically active region. The 0.82 ft of vertical displacement measured at the UNAVCO station could be due to tectonic activity, groundwater extraction, oil and gas extraction, or a combination of the three. In addition, interferometric synthetic-aperture radar (InSAR) data provided by DWR shows that significant land subsidence did not occur during the period between June 2015 and June 2019 (available InSAR data period of record) in the Basin (see Section 3.2.4).

⁶ The UNAVCO Data Archive Interface is available at <http://www.unavco.org/data/data.html>.

5.7.1 Monitoring Protocols [§354.34(g)(2), (i)]

23 Cal. Code Regs. §354.34 Monitoring Network.

(g) Each Plan shall describe the following information about the monitoring network:

(2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.

(i) The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.

The DWR BMP notes that no standard operating procedures exist for collecting land subsidence data. UNAVCO CGPS and DWR InSAR data will continue to be monitored annually throughout the GSP implementation period. If additional relevant data sets become available, they will be evaluated and incorporated into the monitoring program. Should potential land subsidence be observed at rates exceeding the minimum threshold (see Section 4.9.2), the GSA will first assess whether the subsidence may be due to (1) groundwater pumping or (2) elastic processes (subsidence that will recover with rising groundwater). If subsidence is observed, approaches the minimum threshold, causes undesirable results, and appears to be related to pumping, the GSA will undertake a program to install land surface elevation benchmarks at critical infrastructure locations, and monitor subsidence with measured land surface elevations on an annual basis.

5.7.2 Assessment and Improvement of Monitoring Network [§354.38(a),(b),(c)(1)(2),(d), and (e)(1)(2)(3)(4)]

§354.38 Assessment and Improvement of Monitoring Network.

- (a) Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.
- (b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.
- (c) If the monitoring network contains data gaps, the Plan shall include a description of the following:
- (1) The location and reason for data gaps in the monitoring network.
 - (2) Local issues and circumstances that limit or prevent monitoring.
- (d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.
- (e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:
- (1) Minimum threshold exceedances.
 - (2) Highly variable spatial or temporal conditions.
 - (3) Adverse impacts to beneficial uses and users of groundwater.
 - (4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

The subsidence minimum thresholds are set to avoid subsidence that could harm groundwater supply, land uses, infrastructure, and property interests. Available data indicate that there is currently little subsidence occurring in the Basin that affects groundwater supply, land uses, infrastructure, and property interests. If an undesirable result occurs, the land subsidence monitoring network may be expanded to include additional monitoring stations near areas identified as having critical infrastructure, oil and gas extraction, or significant groundwater pumping.

5.8 Depletion of Interconnected Surface Water Monitoring Network [§354.34(c)(6)(A,B,C,D),(e),(g)(1)(2)(3),(h), and (j)]

§354.34 Monitoring Network.

- (c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:
- (6) **Depletions of Interconnected Surface Water.** Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following:
 - (A) Flow conditions including surface water discharge, surface water head, and baseflow contribution.
 - (B) Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable.
 - (C) Temporal change in conditions due to variations in stream discharge and regional groundwater extraction.
 - (D) Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.
- (e) A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.
- (g) Each Plan shall describe the following information about the monitoring network:
- (3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.
 - (h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.

§354.34 Monitoring Network.

(g) Each Plan shall describe the following information about the monitoring network:

- (1) Scientific rationale for the monitoring site selection process.**
- (2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.**

(j) An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.

Based on the USGS National Hydrography Data Set (NHD), all the streams in the Basin are classified as intermittent and suspected to be losing streams, except for stream channels located in the Barka Slough, which are classified as perennial and suspected to be gaining streams (see Figure 3-44). Ephemeral surface water flows in the Basin make it difficult to assess the interconnectivity of surface water and groundwater and to quantify the degree to which surface water depletion has occurred. There are no available data that establish whether the groundwater and surface water are connected through a continuous saturated zone in any aquifer. The USGS NDH data set and groundwater elevation contour maps of the Paso Robles Formation wells (see Figures 3-13 and 3-14) suggest that a continuous saturated zone between the surface water and the Paso Robles Formation does not exist. Interconnected surface water and groundwater within the Careaga Sand is indicated by discharge of groundwater into Barka Slough and by the perennial classification of streams in that area. See Figure 3-28 for a conceptual model of groundwater flow as it reaches Barka Slough.

Avoiding adverse impacts on beneficial uses of interconnected surface water in the Basin and preserving existing habitat are the focus of the depletion of interconnected surface water sustainability management criterion (see Section 4.10). Direct uses of surface water (for recreation, irrigation, or municipal purposes) are not present nor are expected as a future significant beneficial use in the Basin; therefore, the sustainability criterion for depletion of interconnected surface water is focused on avoiding impacts to groundwater dependent ecosystems (GDEs) and sensitive species. There is no intention at this time, nor is there a regulatory requirement, to create new habitat or restore habitat that existed prior to the enactment of SGMA in January 2015. In conjunction with the natural communities commonly associated with groundwater (NCCAG) data set available from DWR (see Figure 3-11), measured groundwater elevation data were used to identify locations within the Basin where groundwater levels were within 30 ft of ground surface. The Nature Conservancy Guidelines suggests that areas overlying groundwater by more than 30 ft may be removed from the GDE category, as that depth is too great to support habitat (The Nature Conservancy, 2019). The evaluation mapped GDEs in the watershed that include both aquatic and riparian habitat types located in Barka Slough (see Figure 3-46).

An Enhanced Vegetation Index (EVI) analysis was completed using Landsat data processed in Climate Engine⁷ as a first step towards determining whether this tool could be used to assess the historical and future condition of the vegetation within Barka Slough. EVI data provides an indicator of healthy, well-

⁷ Climate Engine (Huntington et al., 2017) is an online tool for cloud computing of climate and remote sensing data powered by Google Earth Engine (Gorelick et al., 2017) (<https://app.climateengine.org/climateEngine>)

watered vegetation. It is calculated from the proportions of visible and near-infrared sunlight reflected by vegetation. EVI values typically range from zero to over 0.7. Healthy, or well-watered, vegetation absorbs most of the visible light that hits it and reflects a large portion of near-infrared light, resulting in a high EVI value. Unhealthy, dry, or dormant vegetation reflects more visible light and less near-infrared light, leading to a lower EVI value. The results of EVI analyses for Barka Slough and a subset area, referred to as West Barka Slough, are shown on Figure 3-46. Notable observations from the EVI analysis are discussed in Section 3.2. Based on this analysis, it was determined that this method could provide a reliable and cost-effective means for monitoring vegetative health in the Slough.

Groundwater levels measured in wells located near Barka Slough indicate that groundwater levels have fallen below the Slough elevation in a number of locations since about 1983. In addition, upward vertical gradients within the Careaga Sand near the Slough (see Figure 3-57) have decreased; indicating groundwater flow into the Slough has likely declined. Surface water also discharges into the Slough. It is unknown whether surface water flow into the Slough has been decreasing due to the lack of a stream gage at the east end of the Slough. This is a data gap that will be addressed in the projects and management actions section of the GSP. Regardless, the existing condition supports significant habitat values. As a result, significant and unreasonable effects to GDEs at the Slough include the following:

- Permanent loss or significant degradation of existing native riparian or aquatic habitat due to lowered groundwater levels and reduced surface water flow into Barka Slough caused by groundwater pumping.

The surface water component of flow into the Slough is equally as important as groundwater discharge into the Slough. Currently no stream gage exists where surface water flow enters or exits the Slough. The Casmalia stream gage is located more than 2.5 miles west of the Slough and there appears to be groundwater use within this area. Due to a lack of stream gage data, the presence or absence of surface water flow entering and exiting the Slough will be visually monitored during quarterly groundwater monitoring (detailed below). Surface water entering the Slough may not be observable during periods of reduced precipitation. Periods of cessation of observable surface water flow entering Barka Slough may not cause adverse impacts to the Slough unless groundwater levels near the Slough indicate that groundwater discharge to the Slough is also reduced as a result of lowered groundwater levels. If groundwater levels are not within the root zone for plants living in the Slough, then there is a potential for an impact to the Slough GDE.

The interconnected surface water monitoring network is summarized below, and monitoring locations are shown on Figure 4-1:

- Surface water flow entering Barka Slough will be monitored on a quarterly basis during groundwater monitoring events by visual observation at the overpass on San Antonio Road (Surface Flow OP1)
- Surface water exiting Barka Slough will be monitored on a quarterly basis during groundwater monitoring events by visual observation at the California State Highway 1 overpass (Surface Flow OP2)
- Surface water exiting Barka Slough will also be measured using the Casmalia stream gage
- Groundwater elevation at the Slough will be measured using well 16G3 on a quarterly basis as part of the groundwater level monitoring network
- Groundwater vertical flux will be measured using nested well set 16C2 and 16C4 on a quarterly basis during groundwater monitoring events
- If observations and data collected as part of the interconnected surface water monitoring network (preceding bulleted statements) indicate the minimum thresholds for the interconnected surface water sustainability indicator (see Section 4) are being approached or reached, an EVI analysis (consistent with

the EVI analysis discussed in Section 3.2) will be completed to assess the condition of the vegetation in Barka Slough to determine if GDE's may be impacted.

5.8.1 Monitoring Protocols [§354.34(i)]

23 Cal. Code Regs. §354.34 Monitoring Network.

(i) The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.

Groundwater level measurements from well 16G3 will be used for the interconnected surface water monitoring network. Therefore, the protocols described in Section 5.3.1 for the groundwater level monitoring network are representative of protocols for the interconnected surface water network. Protocols for the manual collection of groundwater levels are included in Appendix D.

Visual observation of the presence of surface water will occur during quarterly monitoring events. A log of visual observation of the presence of surface water and whether it is observed to be flowing will be kept.

5.8.2 Assessment and Improvement of Monitoring Network [§354.38(a),(b),(c)(1),(c)(2),(d),(e)(1),(e)(2),(e)(3), and(e)(4)]

§354.38 Assessment and Improvement of Monitoring Network.

- (a) Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.
- (b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.
- (c) If the monitoring network contains data gaps, the Plan shall include a description of the following:
- (1) The location and reason for data gaps in the monitoring network.
 - (2) Local issues and circumstances that limit or prevent monitoring.
- (d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.
- (e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:
- (1) Minimum threshold exceedances.
 - (2) Highly variable spatial or temporal conditions.
 - (3) Adverse impacts to beneficial uses and users of groundwater.
 - (4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

There are currently no stream gages immediately east or west of Barka Slough. As discussed in Section 3.3, estimated volumes of surface water flow entering and exiting the Slough are based on the USGS Basin Characterization Model (BCM) and surface water flow volumes recorded at the Casmalia stream gage. Likewise, groundwater discharging to surface water in the Slough was calculated using the USGS BCM, surface water flow volumes recorded at the Casmalia stream gage, and Darcian flux calculations. Two locations have been identified for installation of a stream gage to supplement characterization of spatial and temporal exchanges between surface water and groundwater relative to Barka Slough. A stream gage downstream of the confluence of San Antonio Creek and Harris Canyon Creek and upstream of the Slough would enable direct quantification of surface water entering the Slough. The addition of a stream gage at this location would supplement the water budget and the ability to assess the interconnected surface water sustainable management criteria described in Section 4.10. DWR has evaluated locations downstream of the confluence of Harris Canyon Creek and San Antonio Creek and did not find any of the sites suitable for gaging. Cross sections of the two of the locations have been collected by Santa Barbara County and included

in Appendix D. A stream gage at the west end of Barka Slough (where surface water discharges from the Basin) near California State Highway 1 would provide a more direct quantification of surface water discharge exiting the Slough than using the Casmalia stream gage. The addition of a stream gage at this location would supplement the water budget and the ability to assess the interconnected surface water sustainable management criteria described in Section 4.10. The GSA is in the process of identifying willing land owners who will provide access to the gauge(s) and is working with the USGS for assistance.

5.9 Representative Monitoring Sites [§354.36(a),(b)(1),(b)(2), and (c)]

§354.36 Representative Monitoring. Each Agency may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin, as follows:

(a) Representative monitoring sites may be designated by the Agency as the point at which sustainability indicators are monitored, and for which quantitative values for minimum thresholds, measurable objectives, and interim milestones are defined.

(b) Groundwater elevations may be used as a proxy for monitoring other sustainability indicators if the Agency demonstrates the following:

(1) Significant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy.

(2) Measurable objectives established for groundwater elevation shall include a reasonable margin of operational flexibility taking into consideration the basin setting to avoid undesirable results for the sustainability indicators for which groundwater elevation measurements serve as a proxy.

(c) The designation of a representative monitoring site shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area.

Minimum thresholds and measurable objectives are established at RMSs (also referred to as representative wells) that are deemed to be representative of local and basinwide groundwater conditions in each principal aquifer. Representative wells for the groundwater level monitoring network were selected from a subset of the wells that have been monitored over time in the Basin and have the following characteristics:

- They have known well construction information and are screened exclusively within either the Paso Robles Formation or the Careaga Sand.
- They are spatially distributed to provide information across most of the Basin.
- They have recent monitoring data and a reasonably long record of data (period of record) so that trends can be determined.
- They have hydrograph signatures that are representative of wells in the surrounding area.

The RMS network for groundwater level monitoring consists of 15 wells (8 wells in the Paso Robles Formation and 7 wells in the Careaga Sand) that will be used to help identify chronic reductions in groundwater levels and storage. The representative well located adjacent to Barka Slough, an area designated as a GDE, will be used to monitor potential changes in groundwater levels that may indicate a reduction in groundwater flow into the Slough resulting in potential impacts to GDEs. One representative well is a municipal drinking water supply well operated by the LACSD. Five representative wells are

production wells used for agricultural irrigation. While not ideal for use as a monitoring wells, these five production wells are currently included as RMSs because of their location in the Basin, available well construction information, and long period of record (see Table 5-1). These five wells have been matched individually with nearby observation wells (non-pumping wells) that provide comparable spatial coverage of the Basin, have known well construction and aquifer completion data, but do not have a long period of record. Therefore, the five sets of paired wells will continue to be monitored until the period of record for the observation wells is adequate to identify trends in groundwater elevations and confirm that the observation wells are representative of the pumping well that will be eventually replaced in the monitoring program.

Minimum thresholds and measurable objectives for chronic lowering of groundwater levels are presented in Section 4.5, and minimum thresholds and measurable objectives for reduction of groundwater in storage are presented in Section 4.6. The potential for impacts to GDEs for the chronic lowering of groundwater levels sustainability indicator are discussed in Section 4.5 and for the depletion of interconnected surface water sustainability indicator in Section 4.10.

RMS wells are included in the broader GSP groundwater quality monitoring program that includes municipal wells monitored for DDW compliance and agricultural and domestic wells that are sampled as part of the ILRP. Data from RMS wells are evaluated in terms of sustainable management criteria presented in Section 4. The groundwater quality network is indicated in Table 5-3 and shown in Figure 5-4. Minimum thresholds and measurable objectives for degraded groundwater quality are discussed in Section 4.8.

5.10 Reporting Monitoring Data to the Department (Data Management System) [§354.40]

§354.40 Reporting Monitoring Data to the Department. Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.

The SGMA regulations state that a GSP must adhere to the following guidelines for a data management system (DMS):

- Article 3, Section 352.6: Each Agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the GSP and monitoring of the Basin.
- Article 5, Section 354.40: Monitoring data shall be stored in the DMS developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.

SGMA-related data for the Basin is being incorporated into the DMS (currently under development). The GSA and entities that collect and report data within the Basin will have access to the DMS and authorization to upload data into the DMS. The data and information stored in the DMS will be checked for quality. The DMS will manage and present the data in a centralized environment to enable utilization of the data by the SABGSA Board and GSP consultant. The data will be used to support GSP development, demonstrate progress towards Basin sustainability, and will be used to communicate with basin stakeholders and the state. The data that will be housed in the DMS are listed in Table 5-5.

Data sources used to populate the DMS are listed in Table 5-6. Categories marked with an X indicate data sets that are publicly accessible. Data are compiled and reviewed to comply with the DQO process defined by EPA guidance (EPA, 2006). The review includes the following:

- Identifying data that is inconsistent with preceding data collected over the period of record or not representative of area conditions based on adjacent measurements collected during the same event.
- Removing or flagging inconsistent data. This applies to historical water level data, water quality data, and water level over time data.

Table 5-5. Overview of Data Management System

| Data | Description |
|------------------------------|---|
| Groundwater Levels | Water level data and well construction information |
| Groundwater Storage | Groundwater storage monitoring network sites |
| Water Quality | Water quality well and station data as reported by the SWRCB DDW and ILRP |
| Land Subsidence | Land subsidence data from the UNAVCO CGPS ORES and InSAR data |
| Interconnected Surface Water | Data related to the interconnected surface water sustainability indicator such as groundwater levels, stream gages, visual streamflow observations, and precipitation stations. |
| Water use data | Irrigation, municipal, and domestic water use estimates |

Notes

CGPS = continuous global positioning system

DDW = SWRCB Division of Drinking Water

GSA = Groundwater Sustainability Agency

GSP = Groundwater Sustainability Plan

NCCAG = Natural Communities Commonly Associated with Groundwater

ILRP = Irrigated Lands Regulatory Program

InSAR = interferometric synthetic-aperture radar

SWRCB = State Water Resources Control Board

UNAVCO = University NAVSTAR Consortium

Table 5-6. Summary of Data Management System Data Sources

| Data Sets | Well and Site Info | Well Construction | Aquifer Properties and Lithology | Water Level | Pumping | Recharge | Water Quality |
|---|--------------------|-------------------|----------------------------------|-------------|---------|----------|---------------|
| DWR (CASGEM) | X | X | -- | X | -- | -- | -- |
| DWR Well Completion Report Map Application | X | X | X | -- | X | -- | -- |
| USGS NWIS | X | X | -- | X | -- | -- | -- |
| USGS SAB Study | X | X | X | -- | -- | -- | -- |
| Los Alamos CSD | X | X | X | X | X | -- | -- |
| SRWCB GeoTracker ¹ | X | X | -- | -- | -- | -- | X |
| GeoTracker GAMA ² | X | X | -- | -- | -- | -- | X |

Notes

¹ Available at: <https://geotracker.waterboards.ca.gov/>

² Available at: <https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/>

CASGEM = California Statewide Groundwater Elevation Monitoring

CSD = Community Services District

DWR = California Department of Water Resources

GAMA = Groundwater Ambient Monitoring and Assessment Program

NWIS = National Water Information System

SAB = San Antonio Basin

SRWCB = State Water Resources Control Board

USGS = U.S. Geological Survey

5.11 References and Technical Studies [§354.4(b)]

§354.4 General Information.

(b) Each Plan shall include the following general information: A list of references and technical studies relied upon by the Agency in developing the Plan. Each Agency shall provide to the Department electronic copies of reports and other documents and materials cited as references that are not generally available to the public.

- Davis, T.A, M.K Landon, and G.L Bennett. 2018. Prioritization of Oil and Gas Fields for Regional Groundwater Monitoring Based on Preliminary Assessment of Petroleum Resource Development and Proximity to California's Groundwater Resources. Scientific Investigation Report 2018-5065.
- DWR. 2016a. Best Management Practices for the Sustainable Management of Groundwater – Monitoring Protocols, Standards, and Sites
- DWR. 2016b. Best Management Practices for the Sustainable Management of Groundwater – Monitoring Networks and Identification of Data Gaps
- DWR. 2018. San Antonio Creek Valley Groundwater Basin Bulletin 118 Update 2016. Prepared by the California Department of Water Resources.
- EPA. 2006. Guidance on Systematic Planning Using the Data Quality Objective Process. Prepared by the U.S. Environmental Protection Agency.
- RWQCB. 2019. Water Quality Control Plan for the Central Coastal Basin. June.
- RWQCB. 2021. Proposed General Waste Discharge Requirements for Discharges from Irrigated Lands. April
- The Nature Conservancy, 2019. Identifying GDEs Under SGMA, Best Practices for using the TNC Dataset.
- USGS. 2020. Geohydrologic Framework Model: Section Locations and Sections.

APPENDIX D

D-5: Standard Operating Procedures

D-6: Well Completion Reports

D-7: SWRCB DDW and ILRP Monitoring and Reporting

D-8: Stream Channel Cross-Sections

APPENDIX D-5

Standard Operating Procedures



California Department of Water Resources
Sustainable Groundwater Management Program

December 2016

Best Management Practices for the
Sustainable Management of Groundwater

Monitoring Protocols,
Standards, and Sites

BMP

State of California
Edmund G. Brown Jr., Governor
California Natural Resources Agency
John Laird, Secretary for Natural Resources
Department of Water Resources
Mark W. Cowin, Director

Carl A. Torgersen, Chief Deputy Director

Office of the Chief Counsel
Spencer Kenner

Public Affairs Office
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Office of Workforce Equality
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Kasey Schimke, Ass't Dir.

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Groundwater Monitoring Protocols, Standards, and Sites Best Management Practice

1. OBJECTIVE

The objective of this *Best Management Practice* (BMP) is to assist in the development of Monitoring Protocols. The California Department of Water Resources (the Department or DWR) has developed this document as part of the obligation in the Technical Assistance chapter (Chapter 7) of the Sustainable Groundwater Management Act (SGMA) to support the long-term sustainability of California's groundwater *basins*. Information provided in this BMP provides technical assistance to Groundwater Sustainability Agencies (GSAs) and other stakeholders to aid in the establishment of consistent data collection processes and procedures. In addition, this BMP can be used by GSAs to adopt a set of sampling and measuring procedures that will yield similar data regardless of the monitoring personnel. Finally, this BMP identifies available resources to support the development of monitoring protocols.

This BMP includes the following sections:

1. Objective. A brief description of how and where monitoring protocols are required under SGMA and the overall objective of this BMP.
2. Use and Limitations. A brief description of the use and limitations of this BMP.
3. Monitoring Protocol Fundamentals. A description of the general approach and background of groundwater monitoring protocols.
4. Relationship of Monitoring Protocols to other BMPs. A description of how this BMP is connected with other BMPs.
5. Technical Assistance. Technical content providing guidance for regulatory sections.
6. Key Definitions. Descriptions of definitions identified in the GSP Regulations or SGMA.
7. Related Materials. References and other materials that provide supporting information related to the development of Groundwater Monitoring Protocols.

2. USE AND LIMITATIONS

BMPs developed by the Department provide technical guidance to GSAs and other stakeholders. Practices described in these BMPs do not replace the GSP Regulations, nor do they create new requirements or obligations for GSAs or other stakeholders. In addition, using this BMP to develop a GSP does not equate to an approval determination by the Department. All references to GSP Regulations relate to Title 23 of the California Code of Regulations (CCR), Division 2, Chapter 1.5, and Subchapter 2. All references to SGMA relate to California Water Code sections in Division 6, Part 2.74.

3. MONITORING PROTOCOL FUNDAMENTALS

Establishing data collection protocols that are based on best available scientific methods is essential. Protocols that can be applied consistently across all basins will likely yield comparable data. Consistency of data collection methods reduces uncertainty in the comparison of data and facilitates more accurate communication within basins as well as between basins.

Basic minimum technical standards of accuracy lead to quality data that will better support implementation of GSPs.

4. RELATIONSHIP OF MONITORING PROTOCOL TO OTHER BMPs

Groundwater monitoring is a fundamental component of SGMA, as each GSP must include a sufficient network of data that demonstrates measured progress toward the achievement of the sustainability goal for each basin. For this reason, a standard set of protocols need to be developed and utilized.

It is important that data is developed in a manner consistent with the basin setting, planning, and projects/management actions steps identified on **Figure 1** and the GSP Regulations. The inclusion of monitoring protocols in the GSP Regulations also emphasizes the importance of quality empirical data to support GSPs and provide comparable information from basin to basin.

Figure 1 provides a logical progression for the development of a GSP and illustrates how monitoring protocols are linked to other related BMPs. This figure also shows the context of the BMPs as they relate to various steps to sustainability as outlined in the GSP Regulations. The monitoring protocol BMP is part of the Monitoring step identified in **Figure 1**.

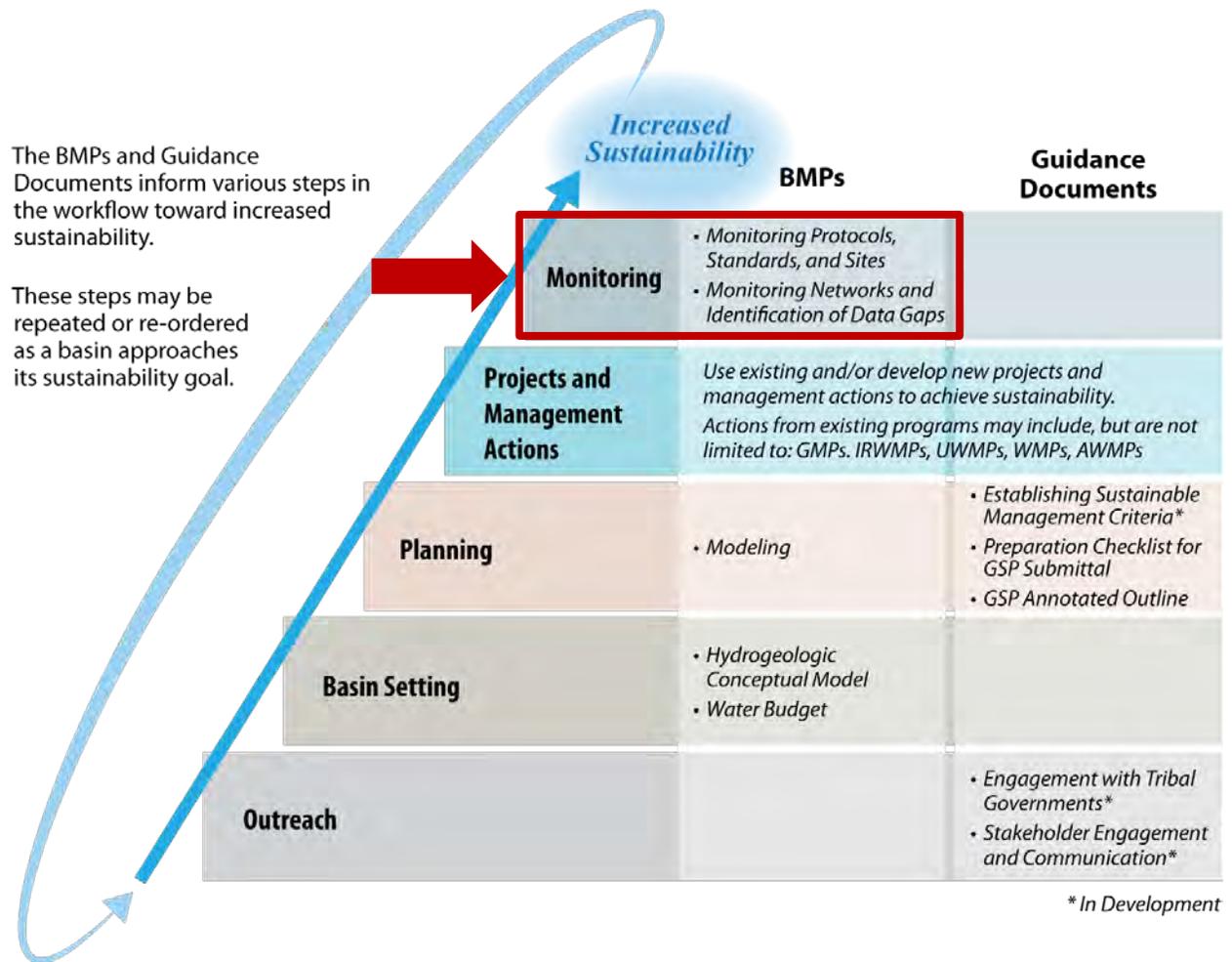


Figure 1 – Logical Progression of Basin Activities Needed to Increase Basin Sustainability

5. TECHNICAL ASSISTANCE

23 CCR §352.2. *Monitoring Protocols. Each Plan shall include monitoring protocols adopted by the Agency for data collection and management, as follows:*

(a) Monitoring protocols shall be developed according to best management practices.

(b) The Agency may rely on monitoring protocols included as part of the best management practices developed by the Department, or may adopt similar monitoring protocols that will yield comparable data.

(c) Monitoring protocols shall be reviewed at least every five years as part of the periodic evaluation of the Plan, and modified as necessary.

The GSP Regulations specifically call out the need to utilize protocols identified in this BMP, or develop similar protocols. The following technical protocols provide guidance based upon existing professional standards and are commonly adopted in various groundwater-related programs. They provide clear techniques that yield quality data for use in the various components of the GSP. They can be further elaborated on by individual GSAs in the form of standard operating procedures which reflect specific local requirements and conditions. While many methodologies are suggested in this BMP, it should be understood that qualified professional judgment should be used to meet the specific monitoring needs.

The following BMPs may be incorporated into a GSP's monitoring protocols section for collecting groundwater elevation data. A GSP that adopts protocols that deviate from these BMPs must demonstrate that they will yield comparable data.

PROTOCOLS FOR ESTABLISHING A MONITORING PROGRAM

The protocol for establishment of a monitoring program should be evaluated in conjunction with the *Monitoring Network and Identification of Data Gaps* BMP and other BMPs. Monitoring protocols must take into consideration the *Hydrogeologic Conceptual Model, Water Budget, and Modeling* BMPs when considering the data needs to meet GSP objectives and the sustainability goal.

It is suggested that each GSP incorporate the Data Quality Objective (DQO) process following the U.S. EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA, 2006). Although strict adherence to this method is not required, it does provide a robust approach to consider and assures that data is collected with a specific purpose in mind, and efforts for monitoring are as efficient as possible to achieve the objectives of the GSP and compliance with the GSP Regulations.

The DQO process presents a method that can be applied directly to the sustainability criteria quantitative requirements through the following steps.

1. State the problem – Define sustainability indicators and planning considerations of the GSP and sustainability goal.
2. Identify the goal – Describe the quantitative measurable objectives and minimum thresholds for each of the sustainability indicators.
3. Identify the inputs – Describe the data necessary to evaluate the sustainability indicators and other GSP requirements (i.e. water budget).
4. Define the boundaries of the study – This is commonly the extent of the Bulletin 118 groundwater basin or subbasin, unless multiple GSPs are prepared for a given basin. In that case, evaluation of the coordination plan and specifically how the monitoring will be comparable and meet the sustainability goals for the entire basin.
5. Develop an analytical approach – Determine how the quantitative sustainability indicators will be evaluated (i.e. are special analytical methods required that have specific data needs).
6. Specify performance or acceptance criteria – Determine what quality the data must have to achieve the objective and provide some assurance that the analysis is accurate and reliable.
7. Develop a plan for obtaining data – Once the objectives are known determine how these data should be collected. Existing data sources should be used to the greatest extent possible.

These steps of the DQO process should be used to guide GSAs to develop the most efficient monitoring process to meet the measurable objectives of the GSP and the sustainability goal. The DQO process is an iterative process and should be evaluated regularly to improve monitoring efficiencies and meet changing planning and project needs. Following the DQO process, GSAs should also include a data quality control and quality assurance plan to guide the collection of data.

Many monitoring programs already exist as part of ongoing groundwater management or other programs. To the extent possible, the use of existing monitoring data and programs should be utilized to meet the needs for characterization, historical record documentation, and continued monitoring for the SGMA program. However, an evaluation of the existing monitoring data should be performed to assure the data being collected meets the DQOs, regulatory requirements, and data collection protocol described in this BMP. While this BMP provides guidance for collection of various

regulatory based requirements, there is flexibility among the various methodologies available to meet the DQOs based upon professional judgment (local conditions or project needs).

At a minimum, for each monitoring site, the following information or procedure should be collected and documented:

- Long-term access agreements. Access agreements should include year-round site access to allow for increased monitoring frequency.
- A unique identifier that includes a general written description of the site location, date established, access instructions and point of contact (if necessary), type of information to be collected, latitude, longitude, and elevation. Each monitoring location should also track all modifications to the site in a modification log.

PROTOCOLS FOR MEASURING GROUNDWATER LEVELS

This section presents considerations for the methodology of collection of groundwater level data such that it meets the requirements of the GSP Regulations and the DQOs of the specific GSP. Groundwater levels are a fundamental measure of the status of groundwater conditions within a basin. In many cases, relationships of the sustainability indicators may be able to be correlated with groundwater levels. The quality of this data must consider the specific aquifer being monitored and the methodology for collecting these levels.

The following considerations for groundwater level measuring protocols should ensure the following:

- Groundwater level data are taken from the correct location, well ID, and screen interval depth
- Groundwater level data are accurate and reproducible
- Groundwater level data represent conditions that inform appropriate basin management DQOs
- All salient information is recorded to correct, if necessary, and compare data
- Data are handled in a way that ensures data integrity

General Well Monitoring Information

The following presents considerations for collection of water level data that include regulatory required components as well as those which are recommended.

- Groundwater elevation data will form the basis of basin-wide water-table and piezometric maps, and should approximate conditions at a discrete period in time. Therefore, all groundwater levels in a basin should be collected within as short a time as possible, preferably within a 1 to 2 week period.
- Depth to groundwater must be measured relative to an established Reference Point (RP) on the well casing. The RP is usually identified with a permanent marker, paint spot, or a notch in the lip of the well casing. By convention in open casing monitoring wells, the RP reference point is located on the north side of the well casing. If no mark is apparent, the person performing the measurement should measure the depth to groundwater from the north side of the top of the well casing.
- The elevation of the RP of each well must be surveyed to the North American Vertical Datum of 1988 (NAVD88), or a local datum that can be converted to NAVD88. The elevation of the RP must be accurate to within 0.5 foot. It is preferable for the RP elevation to be accurate to 0.1 foot or less. Survey grade global navigation satellite system (GNSS) global positioning system (GPS) equipment can achieve similar vertical accuracy when corrected. Guidance for use of GPS can be found at USGS <http://water.usgs.gov/osw/gps/>. Hand-held GPS units likely will not produce reliable vertical elevation measurement accurate enough for the casing elevation consistent with the DQOs and regulatory requirements.
- The sampler should remove the appropriate cap, lid, or plug that covers the monitoring access point listening for pressure release. If a release is observed, the measurement should follow a period of time to allow the water level to equilibrate.
- Depth to groundwater must be measured to an accuracy of 0.1 foot below the RP. It is preferable to measure depth to groundwater to an accuracy of 0.01 foot. Air lines and acoustic sounders may not provide the required accuracy of 0.1 foot.
- The water level meter should be decontaminated after measuring each well.

Where existing wells do not meet the base standard as described in the GSP Regulations or the considerations provided above, new monitoring wells may need to be constructed to meet the DQOs of the GSP. The design, installation, and documentation of new monitoring wells must consider the following:

- Construction consistent with California Well Standards as described in Bulletins 74-81 and 74-90, and local permitting agency standards of practice.
- Logging of borehole cuttings under the supervision of a California Professional Geologist and described consistent with the Unified Soil Classification System methods according to ASTM standard D2487-11.
- Written criteria for logging of borehole cuttings for comparison to known geologic formations, principal aquifers and aquitards/aquicludes, or specific marker beds to aid in consistent stratigraphic correlation within and across basins.
- Geophysical surveys of boreholes to aid in consistency of logging practices. Methodologies should include resistivity, spontaneous potential, spectral gamma, or other methods as appropriate for the conditions. Selection of geophysical methods should be based upon the opinion of a professional geologist or professional engineer, and address the DQOs for the specific borehole and characterization needs.
- Prepare and submit State well completion reports according to the requirements of §13752. Well completion report documentation should include geophysical logs, detailed geologic log, and formation identification as attachments. An example well completion as-built log is illustrated in **Figure 2**. DWR well completion reports can be filed directly at the Online System for Well Completion Reports (OSWCR) <http://water.ca.gov/oswcr/index.cfm>.

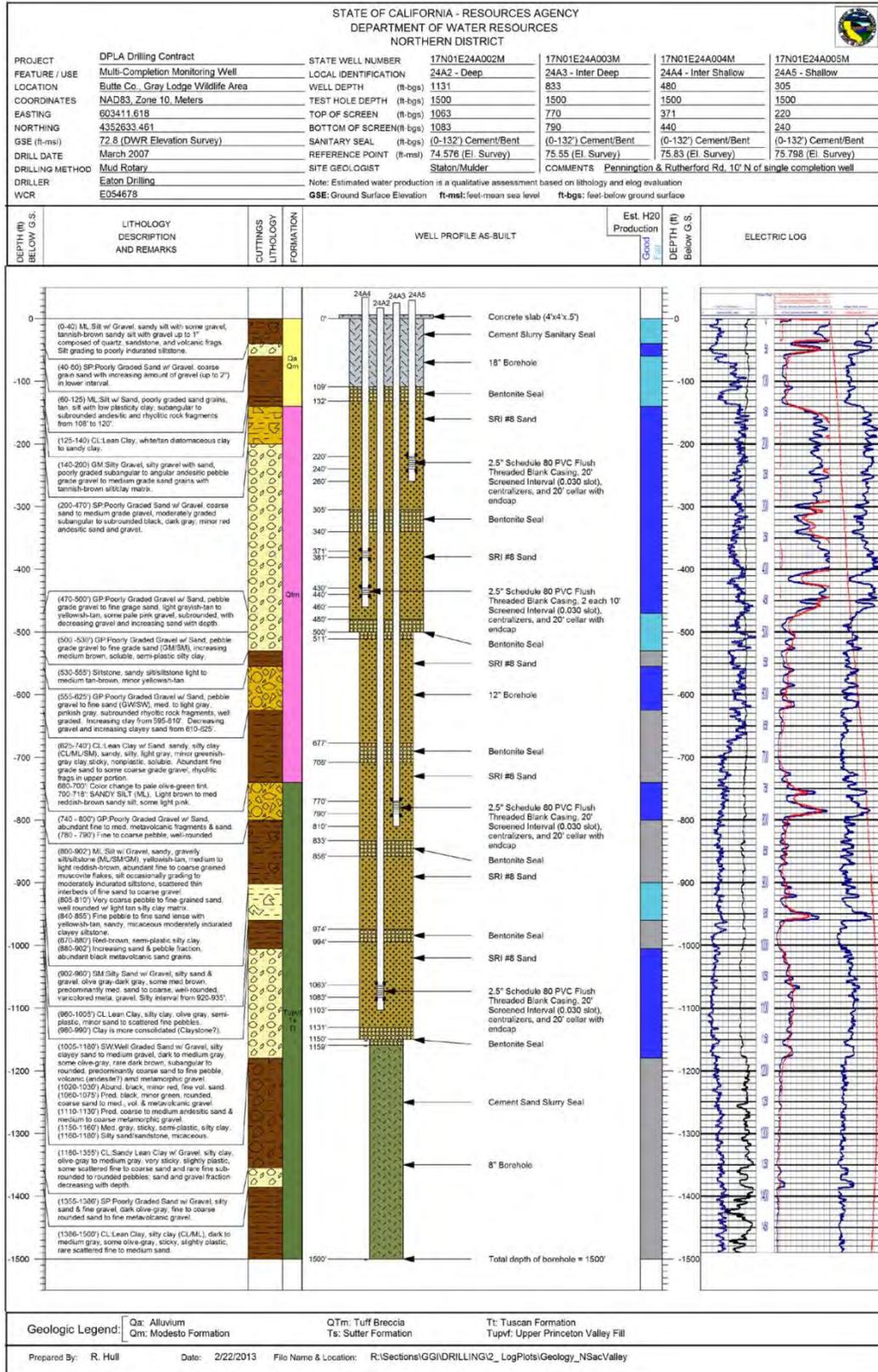


Figure 2 – Example As-Built Multi-Completion Monitoring Well Log

Measuring Groundwater Levels

Well construction, anticipated groundwater level, groundwater level measuring equipment, field conditions, and well operations should be considered prior collection of the groundwater level measurement. The USGS *Groundwater Technical Procedures* (Cunningham and Schalk, 2011) provide a thorough set of procedures which can be used to establish specific Standard Operating Procedures (SOPs) for a local agency. **Figure 3** illustrates a typical groundwater level measuring event and simultaneous pressure transducer download.

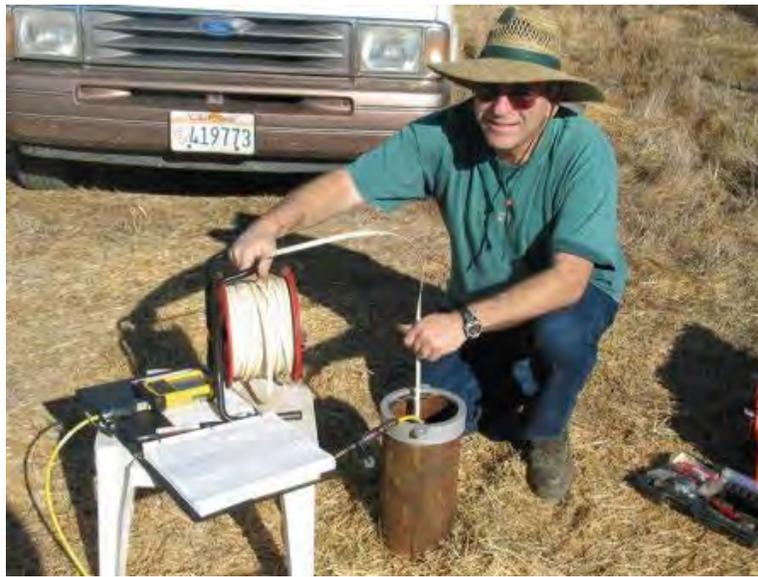


Figure 3 – Collection of Water Level Measurement and Pressure Transducer Download

The following points provide a general approach for collecting groundwater level measurements:

- Measure depth to water in the well using procedures appropriate for the measuring device. Equipment must be operated and maintained in accordance with manufacturer's instructions. Groundwater levels should be measured to the nearest 0.01 foot relative to the RP.
- For measuring wells that are under pressure, allow a period of time for the groundwater levels to stabilize. In these cases, multiple measurements should be collected to ensure the well has reached equilibrium such that no significant changes in water level are observed. Every effort should be made to ensure that a representative stable depth to groundwater is recorded. If a well does not stabilize, the quality of the value should be appropriately qualified as a

questionable measurement. In the event that a well is artesian, site specific procedures should be developed to collect accurate information and be protective of safety conditions associated with a pressurized well. In many cases, an extension pipe may be adequate to stabilize head in the well. Record the dimension of the extension and document measurements and configuration.

- The sampler should calculate the groundwater elevation as:

$$GWE = RPE - DTW$$

Where:

GWE = Groundwater Elevation

RPE = Reference Point Elevation

DTW = Depth to Water

The sampler must ensure that all measurements are in consistent units of feet, tenths of feet, and hundredths of feet. Measurements and RPEs should not be recorded in feet and inches.

Recording Groundwater Levels

- The sampler should record the well identifier, date, time (24-hour format), RPE, height of RP above or below ground surface, DTW, GWE, and comments regarding any factors that may influence the depth to water readings such as weather, nearby irrigation, flooding, potential for tidal influence, or well condition. If there is a questionable measurement or the measurement cannot be obtained, it should be noted. An example of a field sheet with the required information is shown in **Figure 4**. It includes questionable measurement and no measurement codes that should be noted. This field sheet is provided as an example. Standardized field forms should be used for all data collection. The aforementioned USGS *Groundwater Technical Procedures* offers a number of example forms.
- The sampler should replace any well caps or plugs, and lock any well buildings or covers.
- All data should be entered into the GSA data management system (DMS) as soon as possible. Care should be taken to avoid data entry mistakes and the entries should be checked by a second person for compliance with the DQOs.

Pressure Transducers

Groundwater levels and/or calculated groundwater elevations may be recorded using pressure transducers equipped with data loggers installed in monitoring wells. When installing pressure transducers, care must be exercised to ensure that the data recorded by the transducers is confirmed with hand measurements.

The following general protocols must be followed when installing a pressure transducer in a monitoring well:

- The sampler must use an electronic sounder or chalked steel tape and follow the protocols listed above to measure the groundwater level and calculate the groundwater elevation in the monitoring well to properly program and reference the installation. It is recommended that transducers record measured groundwater level to conserve data capacity; groundwater elevations can be calculated at a later time after downloading.
- The sampler must note the well identifier, the associated transducer serial number, transducer range, transducer accuracy, and cable serial number.
- Transducers must be able to record groundwater levels with an accuracy of at least 0.1 foot. Professional judgment should be exercised to ensure that the data being collected is meeting the DQO and that the instrument is capable. Consideration of the battery life, data storage capacity, range of groundwater level fluctuations, and natural pressure drift of the transducers should be included in the evaluation.
- The sampler must note whether the pressure transducer uses a vented or non-vented cable for barometric compensation. Vented cables are preferred, but non-vented units provide accurate data if properly corrected for natural barometric pressure changes. This requires the consistent logging of barometric pressures to coincide with measurement intervals.
- Follow manufacturer specifications for installation, calibration, data logging intervals, battery life, correction procedure (if non-vented cables used), and anticipated life expectancy to assure that DQOs are being met for the GSP.
- Secure the cable to the well head with a well dock or another reliable method. Mark the cable at the elevation of the reference point with tape or an indelible marker. This will allow estimates of future cable slippage.
- The transducer data should periodically be checked against hand measured groundwater levels to monitor electronic drift or cable movement. This should happen during routine site visits, at least annually or as necessary to maintain data integrity.

- The data should be downloaded as necessary to ensure no data is lost and entered into the basin's DMS following the QA/QC program established for the GSP. Data collected with non-vented data logger cables should be corrected for atmospheric barometric pressure changes, as appropriate. After the sampler is confident that the transducer data have been safely downloaded and stored, the data should be deleted from the data logger to ensure that adequate data logger memory remains.

PROTOCOLS FOR SAMPLING GROUNDWATER QUALITY

The following protocols can be incorporated into a GSP's monitoring protocols for collecting groundwater quality data. More detailed sampling procedures and protocols are included in the standards and guidance documents listed at the end of this BMP. A GSP that adopts protocols that deviate from these BMPs must demonstrate that the adopted protocols will yield comparable data.

In general, the use of existing water quality data within the basin should be done to the greatest extent possible if it achieves the DQOs for the GSP. In some cases it may be necessary to collect additional water quality data to support monitoring programs or evaluate specific projects. The USGS *National Field Manual for the Collection of Water Quality Data* (Wilde, 2005) should be used to guide the collection of reliable data. **Figure 5** illustrates a typical groundwater quality sampling setup.



Figure 5 – Typical Groundwater Quality Sampling Event



1 Introduction

1.1 About this Manual

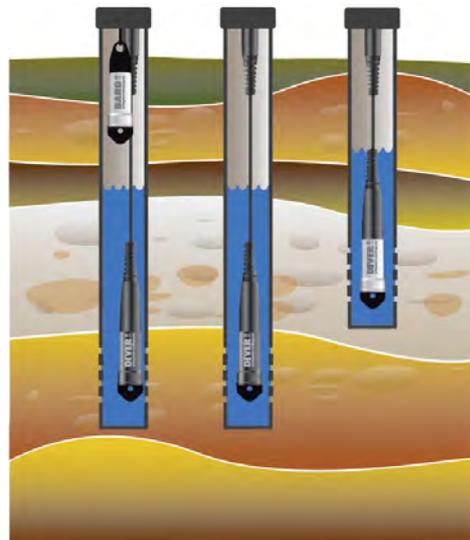
This manual contains information about Van Essen Instruments' Divers®. It contains a description of the Mini-Diver (DI5xx), Micro-Diver (DI6xx), Cera-Diver (DI7xx), Baro-Diver (DI500) and the CTD-Diver (DI27x). The number in brackets designates the Diver part number.

This section contains a brief introduction to the Diver's measurement principles, an instrument designed to measure groundwater levels and temperatures. Furthermore, a brief description of the software that can be used in combination with the Divers is provided. The next section contains the technical specifications for each type of Diver. The following section covers the installation of Divers in monitoring wells and in surface waters. This is followed by a description of how to maintain a Diver. The next section discusses conductivity measurements using the CTD-Diver and conductivity calibration. The last section includes the answers to frequently asked questions.

1.2 Operating Principle

The Diver is a datalogger designed to measure water pressure and temperature. Measurements are subsequently stored in the Diver's internal memory. The Diver consists of a pressure sensor designed to measure water pressure, a temperature sensor, memory for storing measurements and a battery. The Diver is an autonomous datalogger that can be programmed by the user. The Diver has a completely sealed enclosure. The communication between Divers and Laptops/field devices is based on optical communication.

The Divers measures the absolute pressure. This means that the pressure sensor not only measures the water pressure, but also the air pressure pushing on the water surface. If the air pressure varies, the measured water pressure will thus also vary, without having to vary the water level.



1.3 Measuring Water Levels

All Divers establish the height of a water column by measuring the water pressure using the built-in pressure sensor. As long as the Diver is not submerged in water it measures atmospheric pressure, just like a barometer. Once the Diver is submerged this is supplemented by the water's pressure: the higher the water column the higher the measured pressure. The height of the water column above the Diver's pressure sensor is determined on the basis of the measured pressure.

To measure these variations in atmospheric pressure a Baro-Diver is installed for each site being measured. The barometric compensation for these variations in atmospheric pressure can be done using the Diver-Office software. It is also possible to use alternative barometric data such as data made available online.



The compensated values can be related to a reference point such as the top of the monitoring well or a vertical reference datum, for example Mean Sea Level (MSL).

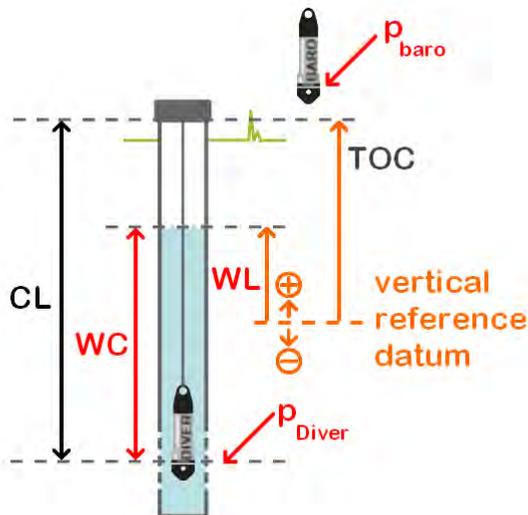
Theory

This section explains how to calculate the water level in relation to a vertical reference datum using the Diver and Baro-Diver's measurements.

The figure below represents an example of a monitoring well in which a Diver has been installed. In this case we are therefore interested in the height of the water level (WL) in relation to the vertical reference datum. If the water level is situated above the reference datum it has a positive value and a negative value if it is situated below the reference datum.

The top of casing (TOC) is measured in relation to the vertical reference datum and is denoted in the diagram below as TOC cm. The Diver is suspended with a cable with a length equal to CL cm.

The Baro-Diver measures the atmospheric pressure (p_{baro}) and the Diver measures the pressure exerted by the water column (WC) and the atmospheric pressure (p_{Diver}).



The water column (WC) above the Diver can be expressed as:

$$WC = 9806.65 \frac{p_{\text{Diver}} - p_{\text{baro}}}{\rho \cdot g} \quad (1)$$

where p is the pressure in cmH_2O , g is the acceleration due to gravity (9.81 m/s^2) and ρ is the density of the water ($1,000 \text{ kg/m}^3$).

The water level (WL) in relation to the vertical reference datum can be calculated as follows:

$$WL = \text{TOC} - \text{CL} + \text{WC} \quad (2)$$

By substituting WC from equation (1) in equation (2) we obtain:

$$WL = \text{TOC} - \text{CL} + 9806.65 \frac{p_{\text{Diver}} - p_{\text{baro}}}{\rho \cdot g} \quad (3)$$

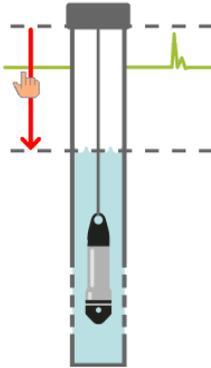
If the cable length is not exactly known, it can be determined using a manual measurement. From the figure below it is clear that the manual measurement (MM) is taken from the top of casing to the water level. The value of the water level is positive unless, in exceptional circumstances, the water level is situated above the top of casing.



The cable length can now be calculated as follows:

$$CL = MM + WC \tag{4}$$

where the water column (WC) is calculated on the basis of the measurements taken by the Diver and the Baro-Diver.



Comments:

- If the pressure measured by the Diver and the Baro-Diver is measured at different points in time, it is necessary to interpolate. The software automatically performs this interpolation.
- It is possible to enter manual measurements into the software. The software subsequently automatically calculates the cable length.

Example:

The top of casing is measured to be 150 cm above the Mean Seal Level (MSL). $TOC = 150$ cm. The cable length is not exactly known and is therefore measured manually. It turns out to be 120 cm: $MM = 120$ cm.

The Diver measures a pressure of 1,170 cmH₂O and the Baro-Diver measures a pressure of 1,030 cmH₂O. Substituting these values into equation (1), results in a water column of 140 cm above the Diver: $WC = 140$ cm.

Substituting the values of the manual measurement and the water column in equation (4) results in the following cable length: $CL = 120 + 140 = 260$ cm.

The water level in relation to MSL can now be easily calculated using equation (2): $WL = 150 - 260 + 140 = 30$ cm above MSL.

1.4 Measuring Temperature

All Divers measure the groundwater temperature. This can, for example, provide information about groundwater flows. This also makes it possible to determine the diffusion of (polluted) water.

The temperature is measured using a semiconductor sensor. This sensor not only measures the temperature, but also uses the value of the temperature to at the same time compensate the pressure sensor and electronics (incl. the crystal clock) for the effects of temperature.



Quick Reference Guide

Barometric Compensation

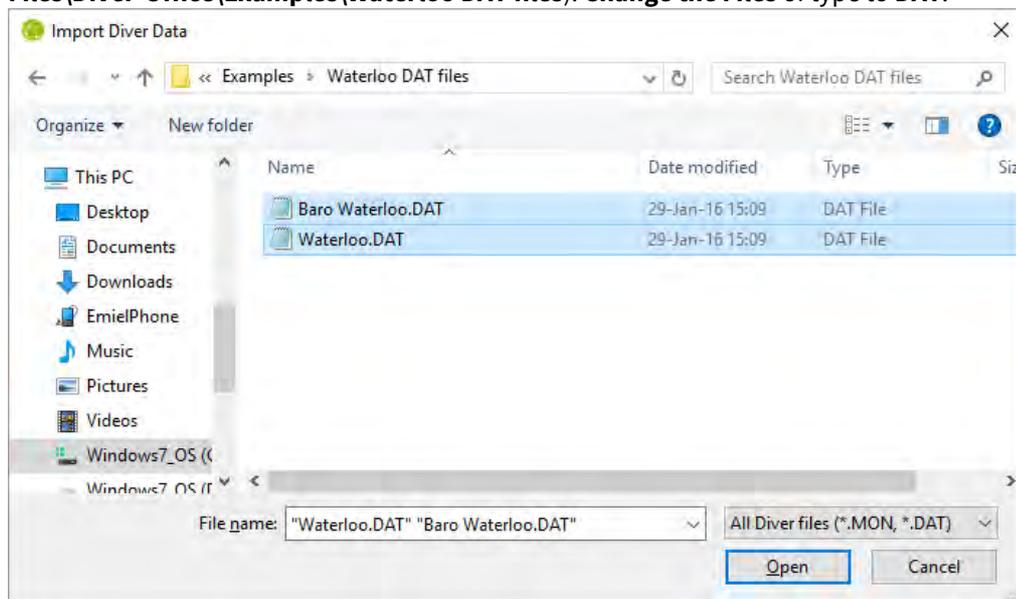
Introduction

This document outlines the basics to perform the barometric compensation. Please refer to the Diver-Office help for more details.

Importing Sample Data

Diver-Office comes with example data. The default folder is **C:\Program Files\Diver-Office\Examples**.

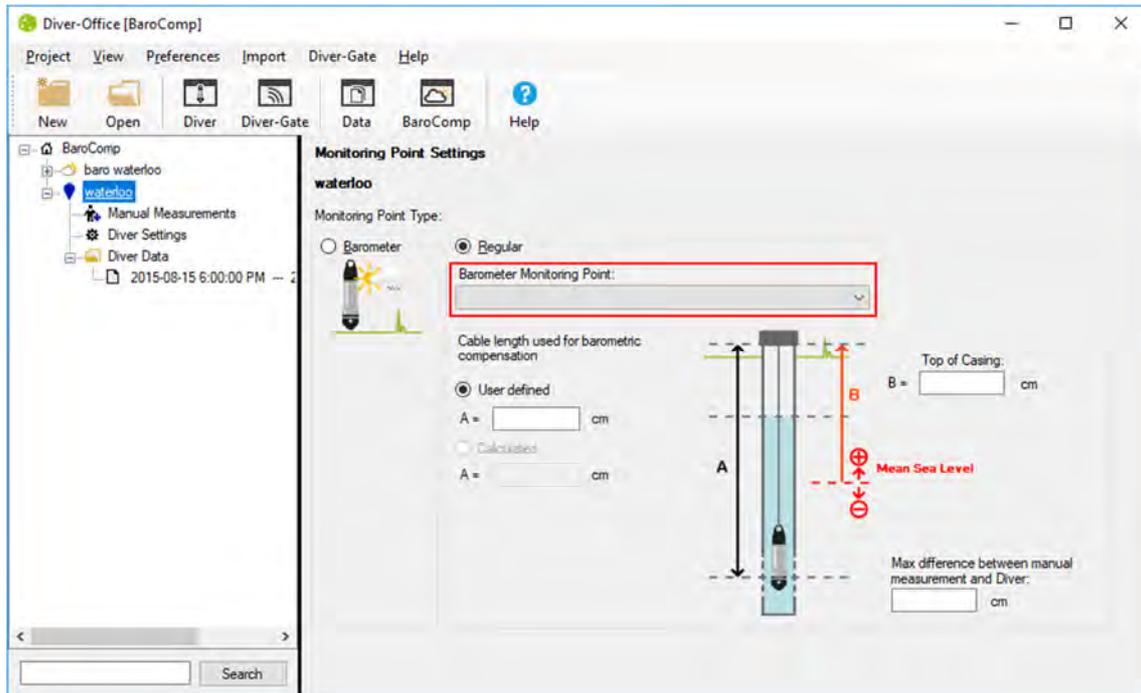
1. In Diver-Office click on the menu bar item **Import > Diver Data...** (CTRL+E). In the dialog that opens navigate to the **Waterloo DAT files** folder in the **Examples** folder (**C:\Program Files\Diver-Office\Examples\Waterloo DAT files**). **Change the Files** of type to **DAT**.



2. Select the two files and click **[Open]**.

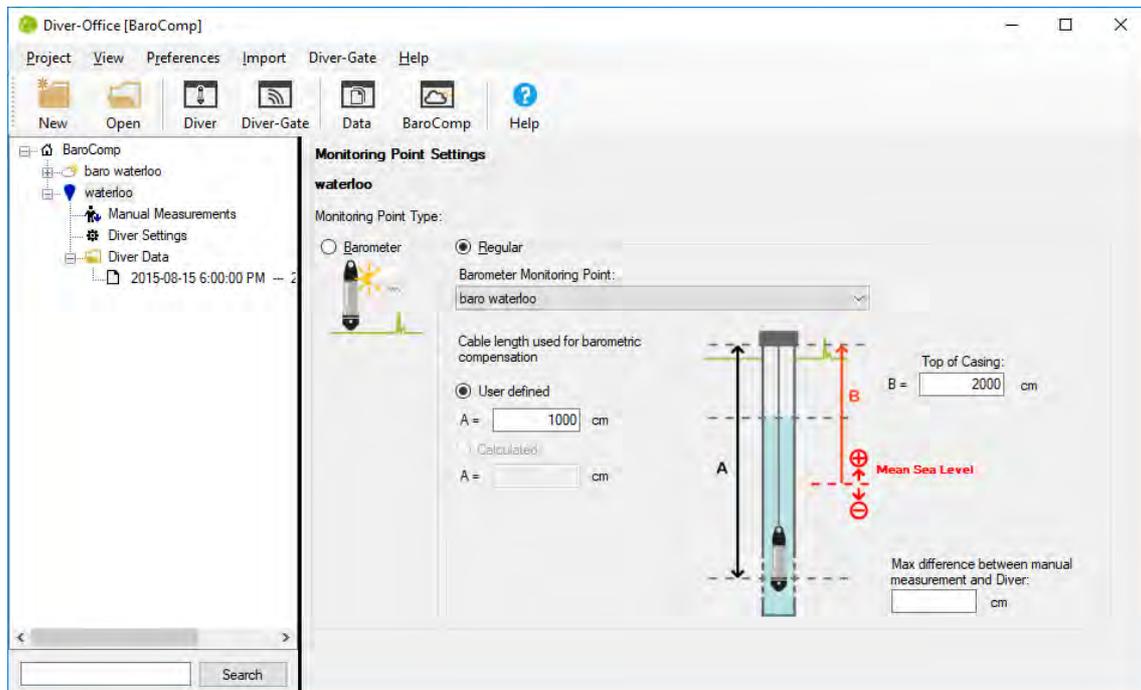
Setting the barometer

One of the imported data series is now shown. Click on **Waterloo** in the tree view on the left. The screen should now look something like the window shown below. Note that the **Barometer Monitoring Point** field is blank. To perform the barometric compensation this field must contain a value.



1. From the **Barometer Monitoring Point** dropdown list select **baro waterloo**.
2. Enter a value for the cable length (**A**) if the barometric compensation should calculate the depth to water
3. Enter a value both (**A**) and for the top of casing (**B**) if the barometric compensation should calculate the water level with respect to Mean Sea Level.

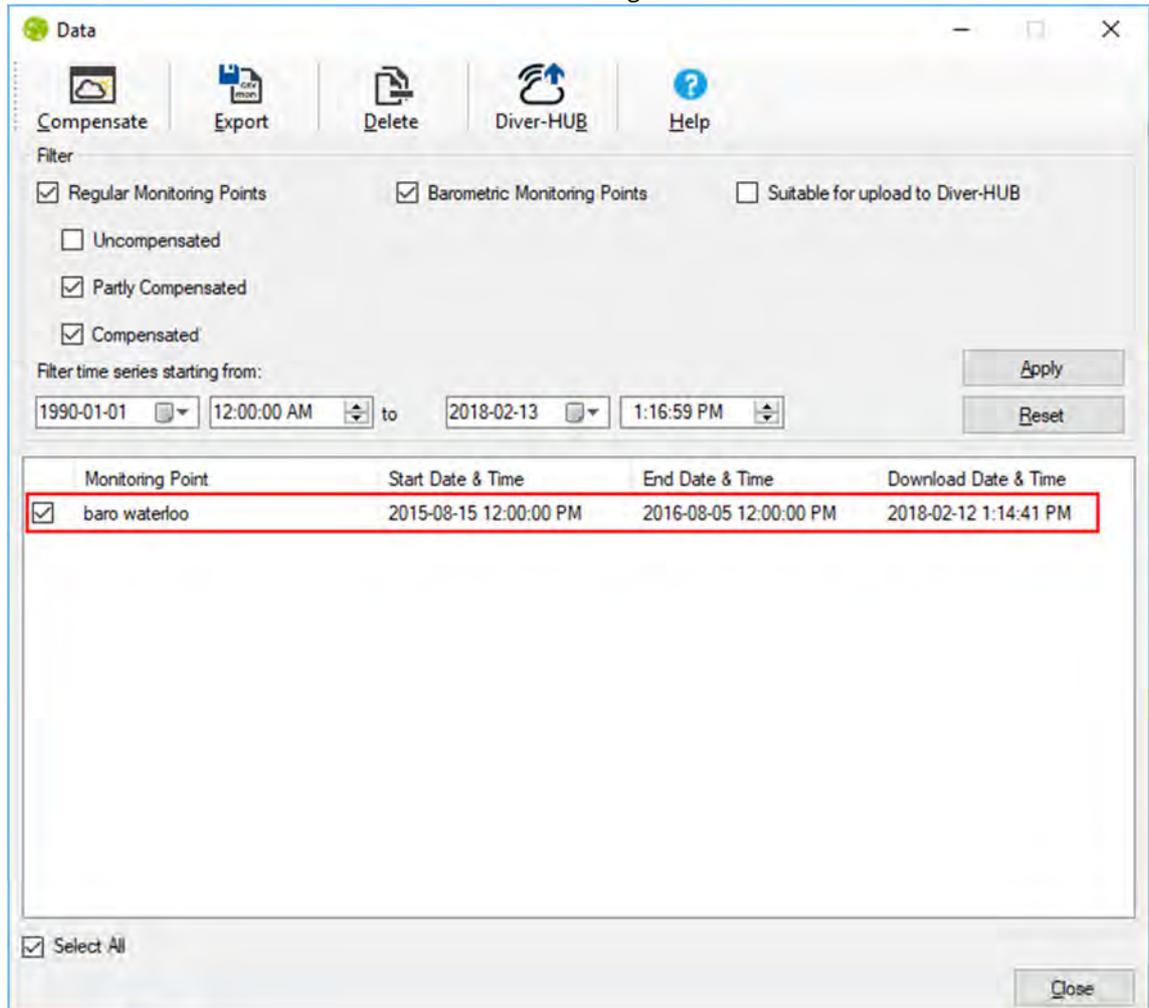
The window should now be similar to the window shown below:





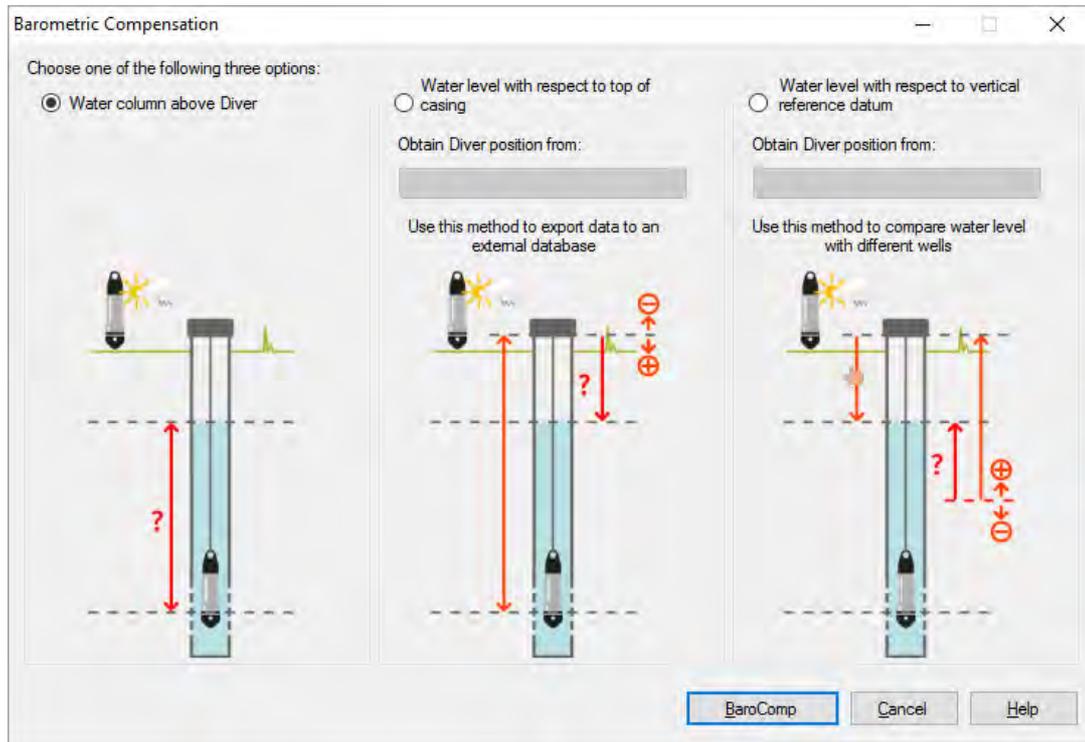
Compensating Diver Data

1. Click the  **BaroComp** button from the main toolbar.
*You may also right click on the data set in the project tree to go directly to the BaroCompensation dialog.
2. Select one or more time-series data from the Data dialog.



3. Select the  **BaroComp** button from the Data dialog toolbar.
4. Select the desired barometric compensation method from the **BaroComp** dialog (shown on following page). You may choose from five barometric compensation methods:
 - a. Water Column above Diver
 - b. Water level with respect to Top of Casing *using Cable Length*
 - c. Water level with respect to Top of Casing *using Manual Measurement*
 - d. Water Level with respect to VRD *using Cable Length*
 - e. Water Level with respect to VRD *using Manual Measurement*

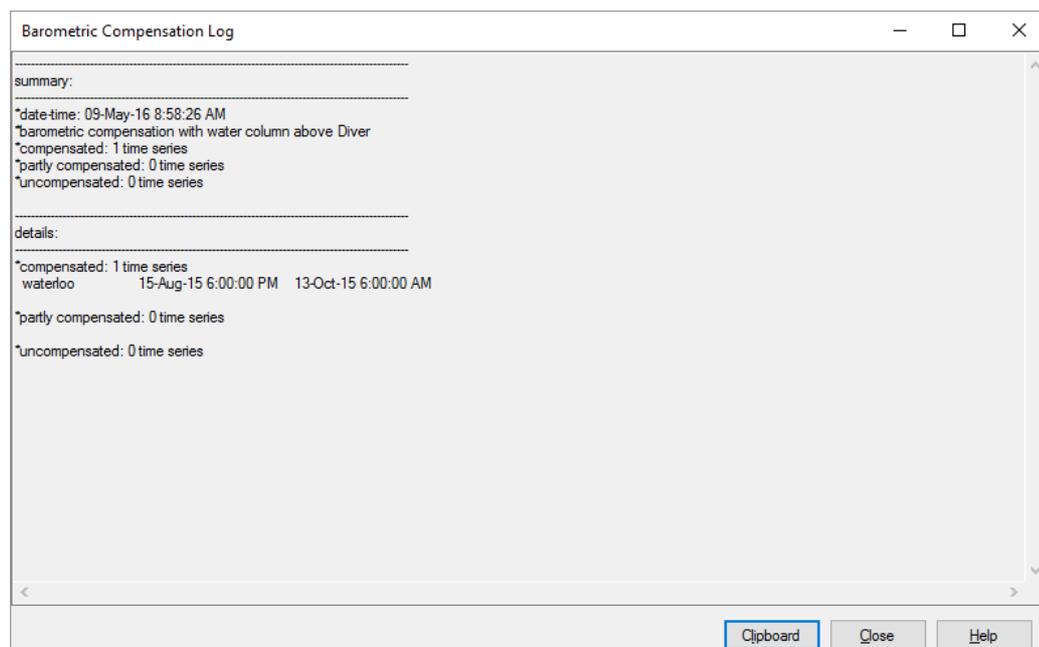
Note: Each barometric compensation method requires that certain data be entered before the compensation can be performed. Please refer to the Diver-Office user's manual for more information on the data requirements for each compensation method.



- Once the method is chosen, select the **[BaroComp]** button to perform the barometric compensation.

Note: If the compensation fails, the type of missing information will be indicated in the log dialog.

- When the compensation is complete, the barometric compensation log will show, displaying a summary with details.





7. Click the [**Close**] button to finish. You can now view the compensated data in the time series table and plot. You will notice that the time series symbol in the **Project Tree** will change once compensation has been performed:

-  means that the data was Partially Compensated
-  means that all the data in the time series was Compensated
-  means that the data is Uncompensated.

APPENDIX D-6

Well Completion Reports

ORIGINAL File with DWR

Page 1 of 2

Owner's Well No. #3

Date Work Began 9/16/98, Ended 9/23/98

Local Permit Agency S.B. County Environmental Health

Permit No. SR100017 Permit Date 8/17/98

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 521842

DWR USE ONLY - DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

WELL OWNER

| ORIENTATION (°) | | VERTICAL | HORIZONTAL | ANGLE | (SPECIFY) |
|--|--|-------------------------------------|--------------------------|-------|-----------|
| | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | |
| DEPTH TO FIRST WATER | | 186 (Ft.) BELOW SURFACE | | | |
| DEPTH FROM SURFACE | DESCRIPTION | | | | |
| Ft. to Ft. | Describe material, grain size, color, etc. | | | | |
| 0 to 75 | Sand And Gravel | | | | |
| 75 to 85 | White Clay | | | | |
| 85 to 140 | Gravel And Brown Sand | | | | |
| 140 to 160 | Brown Clay Some Sand | | | | |
| 160 to 190 | Very Coarse Brown Sand | | | | |
| 190 to 270 | Brown Clay, Sand With Streaks Of Gravel | | | | |
| 270 to 480 | Grey Clay, xxx Fine Sand | | | | |
| 480 to 650 | Brown Clay Some Sand | | | | |
| 650 to 740 | Brown Sand Some Clay | | | | |
| 740 to 800 | Grey Sand And Clay | | | | |
| 800 to 980 | Careaga Sand With Clay | | | | |
| 980 to 1100 | Shale | | | | |
| TOTAL DEPTH OF BORING 1100 (Feet) | | | | | |
| TOTAL DEPTH OF COMPLETED WELL 980 (Feet) | | | | | |

WELL LOCATION

Address Palmer Road and US 101

City Santa Barbara County

County Santa Barbara County

APN Book 137 Page 36 Parcel 101-060-45

Township 8N Range 33W Section 2

Latitude Longitude

DEG. MIN. SEC. NORTH Longitude DEG. MIN. SEC. WEST

LOCATION SKETCH

ACTIVITY (°)

NEW WELL

MODIFICATION/REPAIR

Deepen

Other (Specify)

DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (°)

MONITORING

WATER SUPPLY

Domestic

Public

Irrigation

Industrial

"TEST WELL"

CATHODIC PROTECTION

OTHER (Specify)

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

DRILLING METHOD Mud Rotary FLUID Bentonite

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 186 (Ft.) & DATE MEASURED 10/21/98

ESTIMATED YIELD 1400 (GPM) & TEST TYPE 12HR Continuous

TEST LENGTH 12 (Hrs.) TOTAL DRAWDOWN 264 (Ft.)

* May not be representative of a well's long-term yield.

| DEPTH FROM SURFACE | BORE-HOLE DIA. (Inches) | CASING(S) | | | | | | | |
|--------------------|-------------------------|-----------|-----------|-----------|--|------------------|----------------------------|-------------------------|---------------------------|
| | | TYPE (°) | | | | MATERIAL / GRADE | INTERNAL DIAMETER (Inches) | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (Inches) |
| Ft. to Ft. | BLANK | SCREEN | CONDUCTOR | FILL PIPE | | | | | |
| "SEE ATTACHED" | | | | | | | | | |

| DEPTH FROM SURFACE | ANNULAR MATERIAL | | | |
|--------------------|------------------|----------------|----------|-------------------------|
| | TYPE | | | |
| Ft. to Ft. | CE-MENT (°) | BEN-TONITE (°) | FILL (°) | FILTER PACK (TYPE/SIZE) |
| 0 to 55 | x | | | 6 Sack Slurry |
| 55 to 980 | | | x | Lapis #2 |

ATTACHMENTS (°)

Geologic Log

Well Construction Diagram

Geophysical Log(s)

Soil/Water Chemical Analyses

Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Floyd V. Wells, Inc.

(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 1337 W. Betteravia Road Santa Maria CA 93455

CITY STATE ZIP

Signed: *Chuck Wells* DATE SIGNED 10-29-98 C57-229570

WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

521842

| DEPTH FROM SURFACE | | BORE- HOLE DIA. (INCHES) | CASING (S) | | | | MATERIAL / GRADE | INTERNAL DIAMETER (INCHES) | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (INCHES) |
|-----------------------|--------|-----------------------------------|------------|--------|----------------|-----------|---------------------|----------------------------------|-------------------------------|---------------------------------|
| | | | TYPE (X) | | | | | | | |
| Ft. | to Ft. | | BLANK | SCREEN | CON- DUCTOR | FILL PIPE | | | | |
| 0 | 55 | 38 | | | X | | Carbon Steel | 30 | 0.250 | |
| 55 | 290 | 28 | X | | | | Carbon Steel | 16 | 0.312 | |
| 290 | 490 | 28 | | X | | | Carbon Steel | 16 | xxx-Hvy | 0.040 |
| 490 | 550 | 28 | X | | | | Carbon Steel | 16 | 0.312 | |
| 550 | 620 | 28 | | X | | | Carbon Steel | 16 | xxx-Hvy | 0.040 |
| 620 | 650 | 28 | X | | | | Carbon Steel | 16 | 0.312 | |
| 650 | 960 | 28 | | X | | | Carbon Steel | 16 | xxx-Hvy | 0.040 |
| 960 | 980 | 28 | X | | | | Carbon Steel | 16 | 0.312 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Premiere Partners III Production Well Number 3

ORIGINAL
File with DWR

MAR 31 1977

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do Not Fill In

No 105190

State Well No. BN/34W-24E1

Other Well No. _____

(1) OWNER:

Name _____
Address _____

(11) WELL LOG:

Total depth _____ ft. Depth of completed well _____ ft.
Formation: Describe by color, character, size of material, and structure
ft. to _____ ft.

(2) LOCATION OF WELL:

County Santa Barbara Owner's number, if any OK
Township, Range, and Section T8N, R34W, Rancho Los Alamos
Distance from cities, roads, railroads, etc. 1/4 mi S of Harris Road or Hwy 1, 3/10 mi W of San Antonio Creek and Hwy 135, North side of Ranch reservoir

SEE ATTACHED LOG

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Destroying
If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) EQUIPMENT:

Rotary
Cable
Other

(6) CASING INSTALLED:

STEEL: OTHER: _____
SINGLE DOUBLE

If gravel packed

| From ft. | To ft. | Diam. | Gage or Wall | Diameter of Bore | From ft. | To ft. |
|----------|--------|--------|--------------|------------------|----------|--------|
| 0 | 580 | 16" od | .312 | 28" | 35 | 580 |

Size of shoe or well ring: _____ Size of gravel: 1/4 x 1/8

Describe joint butt

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Vertical slot

| From ft. | To ft. | Perf. per row | Rows per ft. | Size in. x in. |
|----------|--------|---------------|--------------|----------------|
| 310 | 570 | | 32 | .060 x 2 1/2 |

CONFIDENTIAL - NOT FOR PUBLIC RELEASE

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes No To what depth 35 ft.

Were any strata sealed against pollution? Yes No If yes, note depth of strata

From _____ ft. to _____ ft.

From _____ ft. to _____ ft.

Method of sealing 35' of 30" surface pipe cemented in

Work started 2/28 19 77, Completed 3/06 19 77

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

(9) WATER LEVELS:

Depth at which water was first found, if known _____ ft.

Standing level before perforating, if known _____ ft.

Standing level after perforating and developing _____ ft.

NAME Floyd V. Wells, Inc

(Person, firm, or corporation) (Typed or printed)

(10) WELL TESTS:

Was pump test made? Yes No If yes, by whom?

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Temperature of water _____ Was a chemical analysis made? Yes No

Was electric log made of well? Yes No If yes, attach copy

Address P. O. Box 1007
Santa Maria, Ca 93454

[SIGNED] Floyd V. Wells
(Well Driller)

License No. C57-229570 Dated March 14, 19 77

SKETCH LOCATION OF WELL ON REVERSE SIDE

SANTA MARIA, CALIFORNIA

FLOYD V. WELLS, INC.

GOLETA, CALIFORNIA

105190

MAR 31 1977

WATER WELL DRILLING LOG

Owner: [REDACTED] Company: _____

Well No.: #5 Rig: #5

Location of Well: 1/4 mi S. of Harris Rd or Hwy 1, 3/10 mi W of San Antonio Creek and Hwy 135
T8N, R34W, Rancho Los Alamos, North side of Ranch reservoir

| | | | | | | | | |
|---|-----------------|----------------------|-----------------------|--------|---------|------------|------|--|
| Surface Pipe or Seal: | 35' cemented in | Size: | 30" | Depth: | 35' | Gauge: | .250 | |
| Well Bore Diameter: | 28" | Depth of Casing Set: | 580' | | | | | |
| Casing Size: | 16" OD | Gauge: | .312 | Type: | steel | | | |
| Perforations: | Size: .060 | Type: | 2 1/2" vertical slots | | Number: | 32 rows | | |
| Perforation Location from Ground Level: | | From: | G.L. 0' | | To: | 310' blank | | |
| | | | 310' | | | 570' perf | | |
| | | | 570' | | | 580' blank | | |
| | | | Bull nose on bottom | | | | | |

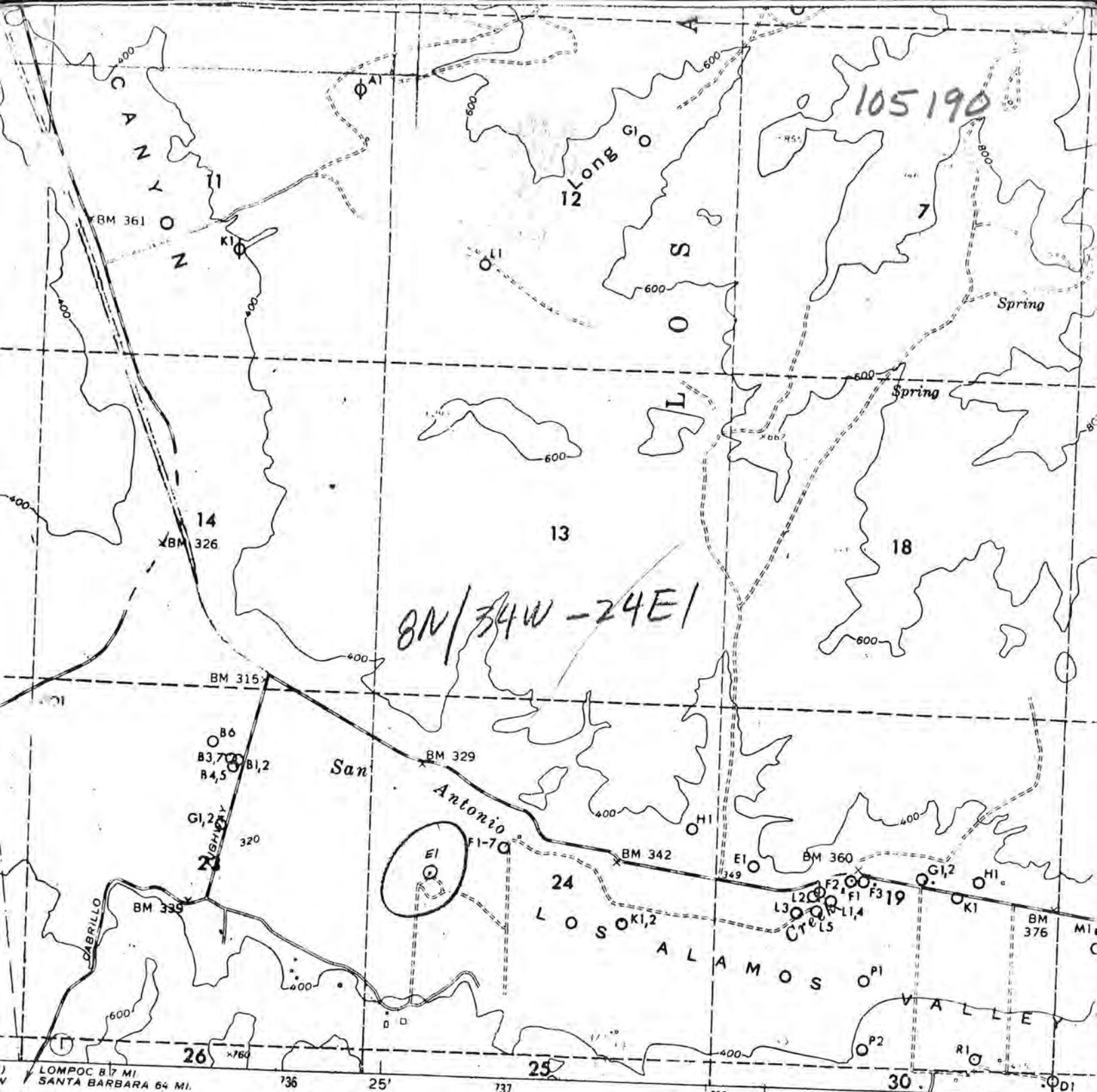
| | | | | | | | |
|------------------|-----------------|-----------------|---------------------------------------|-----------|------------|------------------|--|
| Gravel Pack: | Type: Pumped in | Size: | 1/4 x 1/8 | Quantity: | 128.84 ton | | |
| Bits: | No. Used: 4 | Size: | (1) 9 7/8"; (1) 20"; (1) 28"; (1) 36" | | | | |
| Drilling Method: | Air: | Foam: | | | Mud: | X | |
| Material Used: | Gel: 350 gel | P-95: | 50 clay | | Foam: | | |
| Well Started: | 2/28/77 | Well Completed: | 3/06/77 | | Driller: | Frank & Clarence | |

CONFIDENTIAL - NOT FOR PUBLIC RELEASE

TEST PUMPING INFORMATION:

| | |
|-----------------------|----------------|
| Production Test: | |
| Standing Water Level: | Pumping Level: |
| G.P.M.: | Pumping Level: |

REMARKS:



BN/34W-24E1

105190

ORCUTT QUAD

MAP SYMBOLS

- \circ^{R1} WELL
- ϕ^{D1} DRY, DESTROYED, OR FILLED WELL
- ϕ^{Q1} SPRING, DRY

- ROAD CLASSIFICATION
- Heavy-duty
 - Medium-duty
 - Light-duty
 - Unimproved
 - U. S. Route
 - State

MAP ACCURACY STANDARDS
 LORADO 80225, OR WASHINGTON, D. C. 20242
 SYMBOLS IS AVAILABLE ON REQUEST

DATA COMPILED BY USGS WRD
 GARDEN GROVE, CALIF. 2-74

ORCUTT, CALIF.
 SW/4 SANTA MARIA 15
 N3445-W120.

1959

AMS 1953 IV SW-

STATE OF CALIFORNIA
 THE RESOURCES AGENCY
 DEPARTMENT OF WATER RESOURCES
 WATER WELL DRILLERS REPORT

08N 33W 25B 0045

Do not fill in

No. 068870

State Well No. _____
 Other Well No. _____

Permit No. _____
 Permit No. or Date _____

(12) WELL LOG: Total depth 100 ft. Depth of completed well 100 ft.
 from ft. to ft. Formation (Describe by color, character, size or material)

0 - 20 top soil
 20 - 40 coarse gravel (caving)
 40 - 100 clay + gravel

LOCATION OF WELL (See instructions):
 County Santa Barbara Owner's Well Number _____
 Address if different from above Hy 125 Los Alamos
 Township _____ Range _____ Section _____
 Distance from cities, roads, railroads, fences, etc. Parcel 101-090-18-00

(3) TYPE OF WORK:

- New Well Deepening
- Reconstruction
- Reconditioning
- Horizontal Well
- Destruction (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

- Domestic
- Irrigation
- Industrial
- Test Well
- Stock
- Municipal
- Other

WELL LOCATION SKETCH

EQUIPMENT:
 Rotary
 Air
 Bucket

(6) GRAVEL PACK:
 Yes No
 Size 10
 Diameter of bore _____
 Packed from 30 to 100 ft.

CASING INSTALLED:
 Plastic Concrete

(8) PERFORATIONS:
Saw cut 1/16 x 4
 Type of perforation or size of screen _____

| From ft. | To ft. | Dia. in. | Gage or Wall | From ft. | To ft. | Slot size |
|----------|--------|----------|--------------|----------|--------|-----------|
| | 60 | 6 | 200 | 60 | 100 | 1/16 |

WELL SEAL:
 Surface sanitary seal provided? Yes No If yes, to depth 30 ft.
 Strata sealed against pollution? Yes No Interval 5-30 ft.
 Method of sealing concrete (pumped in)

WATER LEVELS:
 Depth of first water, if known 5ft. ft.
 Standing level after well completion 5ft. ft.

WELL TESTS:
 Well test made? Yes No If yes, by whom? _____
 Method of test Pump Bailer Air lift
 Depth to water at start of test _____ ft. At end of test _____ ft.
 Discharge _____ gal/min after _____ hours Water temperature _____
 Chemical analysis made? Yes No If yes, by whom? _____
 Electric log made? Yes No If yes, attach copy to this report

Work started May 13, 1983 Completed 20 19 83
 WELL DRILLER'S STATEMENT:
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
 SIGNED [Signature]
 (Well Driller)
 NAME Enloe Well Drilling
 (Person, firm, or corporation) (Typed or printed)
 Address Rt. 1 Box 199 B
 City Santa Maria Zip 93455
 License No. 318877 Date of this report June 9 83

068870



8N/33W-25B (4?)

068870

ENLOE WELL DRILLING

Rotary or Cable Tool

DOUG ENLOE

RT. 3
MESA ROAD
NIPOMO, CA 93444

805-929-1063

Att. Carl Abeloe

April 11, 1983

As we discussed we intend to drill a one hundred foot gravel packed well on your property in Los Alamos,

~~This well will have class 200 P.V.C. casing and a 20ft. cement seal conforming to county codes.~~

We will also instale a submersiable pump, Goulds 1 hp. modle 25EL this pump will deliver 30 gallons per minute into a 5000 gal. storage tank . A Goulds modle XSH10 boster pump will deliver 30 gallons per minute into a presure tank , Well-X-Trol 252, .

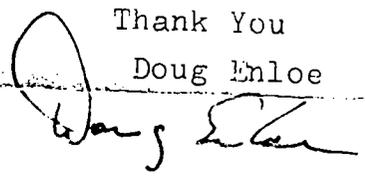
This will give you 50 PSI. water presure and will be plumbed into the existing water line.

The above ground electrial hook up will be the responsibility of the owner

Thank You

Doug Enloe

Cal. Licence #
312277



Ph 343 1698
Cell 448 5365

Denner
Just a reminder. Carl Abeloe is our brother who lives in SLO. The well is actually on his section of this property. But the well ^{is} serves the house (Laura Abeloe) and the farming field (Litch Abeloe)

(TEPUSQUET PEAK)
162500

068870

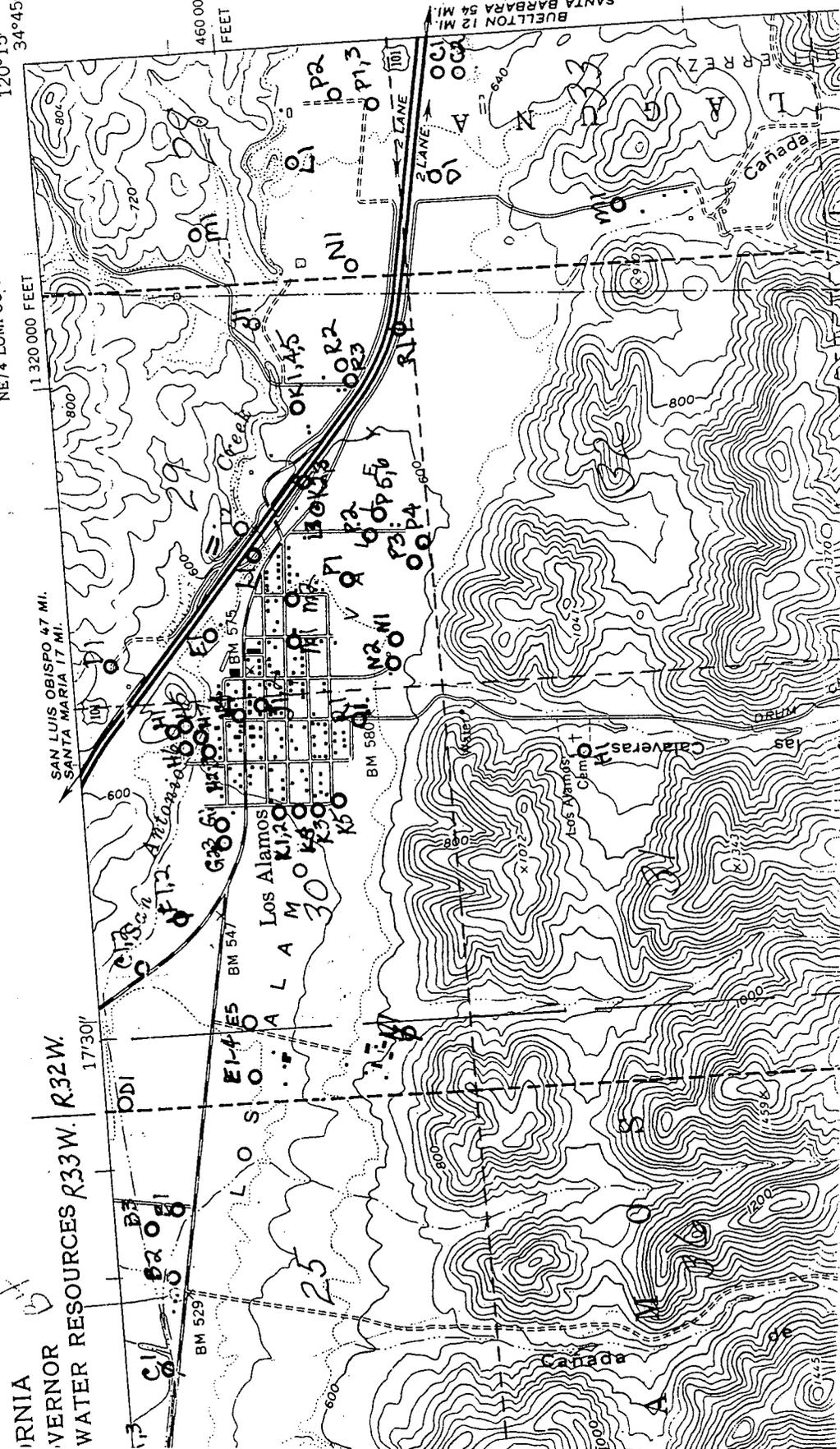
7.7N
7.8N

LOS ALAMOS QUADRANGLE
CALIFORNIA—SANTA BARBARA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE 1/4 LOMPOC, 15' QUADRANGLE

120°15'
34°45'

1,320,000 FEET

460,000 FEET



SAN LUIS OBISPO 47 MI.
SANTA MARIA 17 MI.

ERNIA
VERNON
WATER RESOURCES R33W. R32W.
1730'

BM 529

BM 547

BM 575

BM 580

Los Alamos

Los Alamos
Cf. m.

Canada

Canavas

Canada

BUELLTON 12 MI.
SANTA BARBARA 54 MI.

2 LANE

</

WELL SCHEDULE
GEOLOGICAL SURVEY, WRD

Lat 34 44 54 Long 120 118 112 Seq. No. 01
B&M

County: Santa Barbara Well No. 8N/33W-25B4 S
Area: Los Alamos Drill Log No. 068870
Date: June 24, 2003 Other No.
Recorded by: Chuck Lamb / Dennis G. bbs
Source of data: drill log / owner / personal inspection

Location map: Los Alamos Scale: 1:24000
Altitude of LSD: _____ ft. How obtained:
Topography at well: flat / floor plan
Owner: Lark/Butch/Laura Abeloe Phone No. (805) 344-2815
Address: 3899 Hwy 135, Los Alamos, CA
Permission to measure/sample given by: Laura Abeloe
Contact before? Yes No

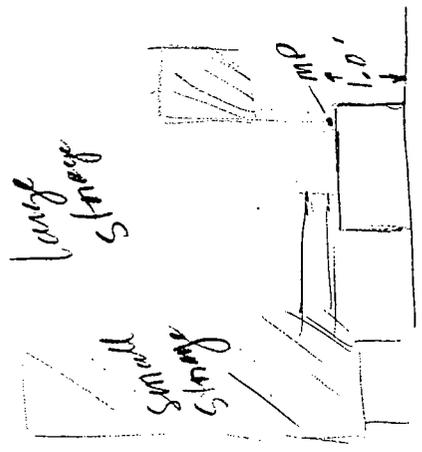
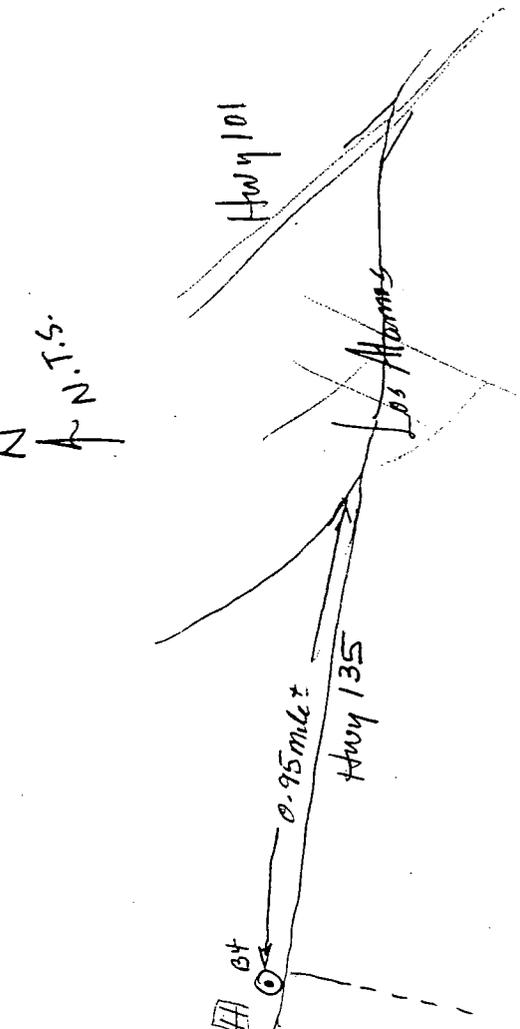
Driller: Enloe Well Drilling
Address: Santa Maria
Date drilled: May 20, 1983 Drill depth: 100ft.
Method drilled: Rotary Well finish:
Perforations: 60-100ft.
Type log data: Drillers
Use of well: withdrawal Use of water: domestic
Pump type: Submersible Serial No.:
Motor: _____ Serial No.:
Power type: electric HP _____ Meter No.:

Well Meas. _____
Depth _____ ft. From MP _____ Rept. _____ Date _____
Casing diam. 8 inch Casing type: PVC
Water level 10.79 ft. Pmpg. Rept. 6/26/2003
above (Stdg.) Meas. (above)
below 1 inch hole, T.O.C. NW which is 1.0 ft. below LSD
Water level abv/btw LSD = 9.79 - 1.00 = 8.79

23-12.21 = 9.79 steel tape

Location: Well is about 200 ft north of Hwy 135 and
10 ft north of large metal storage tank
Erix GPS NAD83
34 44 54.1 ± 16 ft.
120 18 12.3
4/2/03 23.00
- 14.41
8.59

SKETCH OF LOCATION AND M.P.



068870

ORIGINAL
File with-DWR

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

DWR USE ONLY - DO NOT FILL IN

018N32W28P004S
STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Page 1 of 1
Owner's Well No. 04-01
Date Work Began 7/09/04, Ended 7/23/04
Local Permit Agency Santa Barbara Co. Environmental Health
Permit No. SR0103311 Permit Date 7/07/04
No. **0907621**

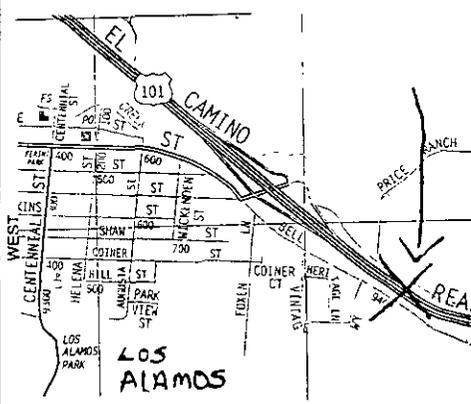
GEOLOGIC LOG

ORIENTATION () VERTICAL HORIZONTAL ANGLE (SPECIFY) _____
DRILLING METHOD Mud Rotary FLUID Bentonite

| DEPTH FROM SURFACE | | DESCRIPTION |
|--------------------|--------|-----------------------------------|
| Ft. | to Ft. | |
| | | Please See Attached Formation Log |

WELL OWNER

WELL LOCATION
Address Bell Street
City Los Alamos
County Santa Barbara
APN Book 133 Page 130 Parcel 009
Township 8N Range 32W Section 28
Lat _____ Deg. _____ Min. _____ Sec. _____ N Long _____ Deg. _____ Min. _____ Sec. _____ W

LOCATION SKETCH
NORTH SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY ()
 NEW WELL
 MODIFICATION/REPAIR
 ___ Deepen
 ___ Other (Specify) _____
 DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG") _____

USES ()
WATER SUPPLY
 Domestic ___ Public
 Irrigation ___ Industrial

MONITORING
 TEST WELL
 CATHODIC PROTECTION
 HEAT EXCHANGE
 DIRECT PUSH
 INJECTION
 VAPOR SPARGING
 REMEDIATION
 OTHER (SPECIFY) _____

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER 133 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 133 (Ft.) & DATE MEASURED 7/23/04
ESTIMATED YIELD 385 (GPM) & TEST TYPE Continuous
TEST LENGTH 12 (Hrs.) TOTAL DRAWDOWN 210 (Ft.)
* May not be representative of a well's long-term yield.

| DEPTH FROM SURFACE Ft. to Ft. | BORE-HOLE DIA. (Inches) | CASING (S) | | | | | | DEPTH FROM SURFACE Ft. to Ft. | ANNULAR MATERIAL TYPE | | | | | | | | | | |
|----------------------------------|----------------------------|------------|-------------------------------------|-------------------------------------|--|------------------|----------------------------|----------------------------------|--------------------------|---------------------------|-------------|----------------|----------|-------------------------|---------|----|------|--|--|
| | | TYPE () | | | | MATERIAL / GRADE | INTERNAL DIAMETER (Inches) | | GAUGE OR WALL THICKNESS | SLOT SIZE IF ANY (Inches) | CE-MENT () | BEN-TONITE () | FILL () | FILTER PACK (TYPE/SIZE) | | | | | |
| 0 | 310 | 17 | <input checked="" type="checkbox"/> | | | | | | | | | | | | F480PVC | 10 | .512 | | |
| 310 | 514 | 17 | | <input checked="" type="checkbox"/> | | | F480PVC | 10 | .512 | .040 | | | | | | | | | |
| 514 | 524 | 17 | <input checked="" type="checkbox"/> | | | | F480PVC | 10 | .512 | | | | | | | | | | |

ATTACHMENTS ()

Geologic Log
 Well Construction Diagram
 Geophysical Log(s)
 Soil/Water Chemical Analyses
 Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Floyd V. Wells, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 1337 W. Betteravia Road, Santa Maria, CA 93455
CITY STATE ZIP

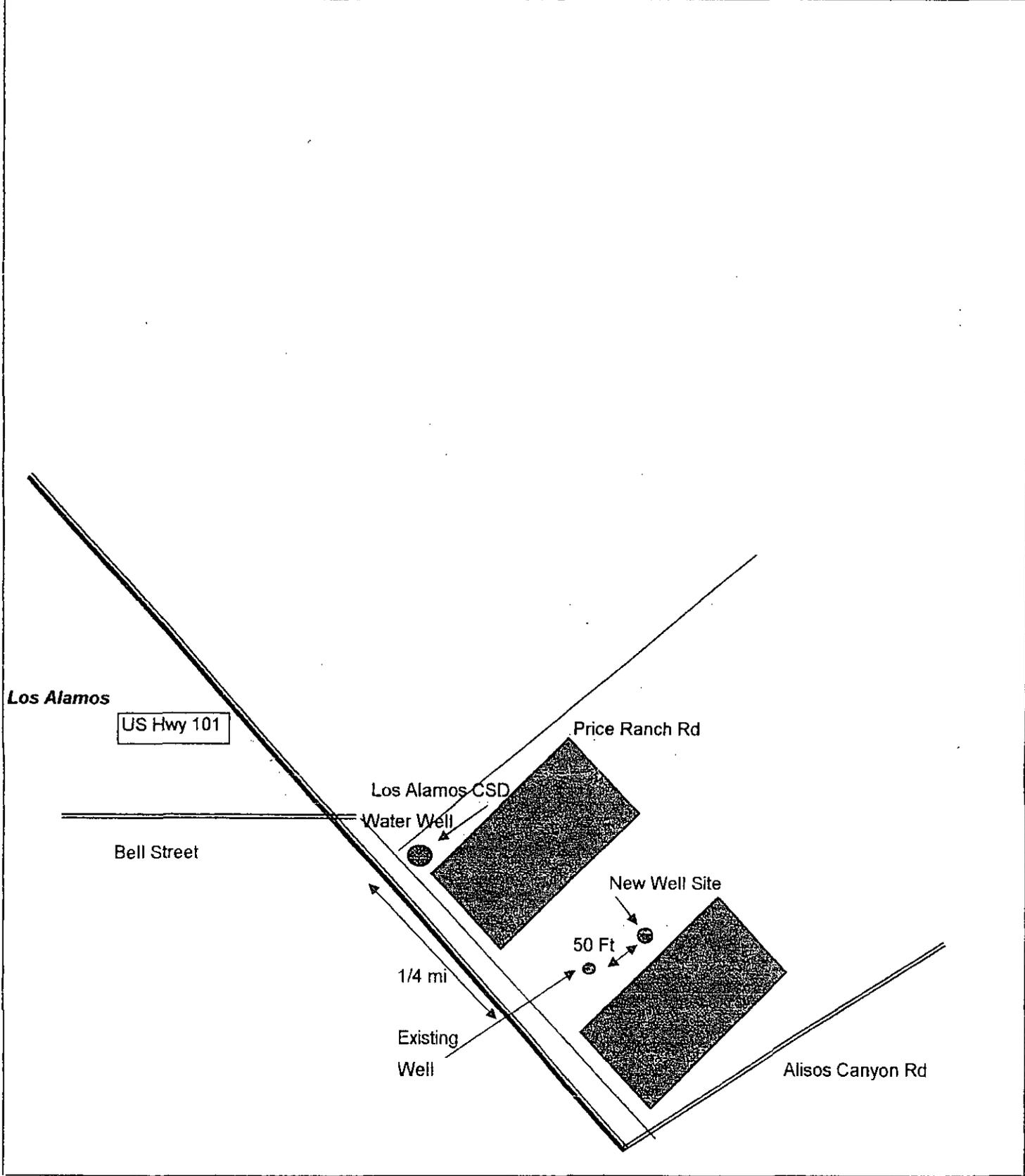
Signature [Signature] DATE SIGNED 09/24/09 57-229570
C-57 LICENSED WATER WELL CONTRACTOR C-57 LICENSE NUMBER

0907621

| Formation Log | | |
|---------------|-------|---|
| Depth | Depth | Formation Description |
| 0 | 12 | Dark brown clay fine sand |
| 12 | 21 | 1/8 - 1/4 Gravels, small gravels fine sand some dark brown clay 1/2 gravels |
| 21 | 29 | 1/8 to 3/4 Gravels, small gravel |
| 29 | 61 | 1/4 - 1" Gravels course sand, fine sand, brown clay |
| 61 | 79 | 1/8 - 1 1/2 Gravels course gravels fine sands, some brown clay |
| 79 | 98 | Course gravels, 1/8 to 1 3/4 gravel |
| 98 | 110 | Brown clay fine sand 1" to 1 1/2" gravels |
| 110 | 148 | Mostly brown clay some fine sand |
| 148 | 153 | Some brown clay course sands, fine sands, 1/4 gravels |
| 153 | 171 | Mostly brown clay some fine sands, little course gravel |
| 171 | 187 | Light brown clay very little course gravel |
| 187 | 192 | Light green clay with some tan sand very little course gravels grayish clay |
| 192 | 200 | Brown clay |
| 200 | 217 | Redish brown clay some course sand |
| 217 | 238 | Course gravels, 1/4 to 1/2 gravels, no clay, with some slay |
| 264 | 286 | Light brown clay, small gravel, course gravel, fine sand |
| 286 | 330 | Sticky brown clay |
| 330 | 386 | Brown clay, course sand, fine sand some small gravel |
| 386 | 474 | Course gravel, fine sand, some clay |
| 474 | 542 | Mostly brown clay some fine, sand little course gravel |
| 542 | 552 | 1/2 gravels brown clay fine sands |
| 552 | 562 | Grayish blue clay, some fine sands |

Plot Plan (1/4" = 20')

Indicate below the exact location of the proposed well with respect to the following items: Property lines, sewer lines and sewage disposal systems, animal enclosures, watercourses, flood plain, drainage pattern, existing wells, access roads, easements, and well site elevation. Include dimensions.



ORIGINAL
File with DWR

OCT 31 1974

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do Not Fill In

No 115694

State Well No. 8N/32W-30D1

Other Well No. _____

(1) OWNER:

Name [Redacted]
Address [Redacted]

(11) WELL LOG:

Total depth 899 ft. Depth of completed well 895 ft.

Formation: Describe by color, character, size of material, and structure
ft. to ft.

(2) LOCATION OF WELL:

County Santa Barbara Owner's number, if any
Township, Range, and Section 1/4 mile N. Hwy 135 & 1/3 mile W.
Distance from cities, roads, railroads, etc. Bell Street, 33' S. of
San Antonio Creek.

0 - 20 top soil
20 - 30 hard clay
30 - 83 blue sticky clay
83 - 90 coarse sand & pea gravel & large rocks

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Destroying
If destruction, describe material and procedure in Item 11.

90 - 101 coarse sand, gravel & rock
101 - 117 coarse sand w/ gravel
117 - 142 sandy gray clay

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) EQUIPMENT:

Rotary Rev.
Cable
Other

142 - 144 gravel & small rock
144 - 179 sandy gray clay
179 - 186 brown sticky clay
186 - 191 coarse sand & gravel (loose)

(6) CASING INSTALLED:

STEEL: OTHER:
SINGLE DOUBLE

If gravel packed

| From ft. | To ft. | Diam. | Gage or Wall | Diameter of Bore | From ft. | To ft. |
|----------|--------|-------|--------------|------------------|----------|--------|
| +1 | 20 | 30" | 14ga | 36" | | |
| +1 | 895 | 16" | 1/4" | 26" | 0 | 899 |

191 - 198 soft brown clay
198 - 201 coarse sand and gravel
201 - 227 brown clay rock
227 - 230 coarse sand, gravel & small /
230 - 250 soft brown clay
250 - 296 sticky gray clay
296 - 300 shale and gravel
300 - 308 coarse sand & gravel 1/4 - 1/2
308 - 318 sandy brown clay

Size of shoe or well ring:

Size of gravel: Sandy 5

Describe joint welded

318 - 339 sticky gray clay
339 - 341 gravel & shale (loose)

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen

| From ft. | To ft. | Perf. per row | Rows per ft. | Size in. x in. |
|----------|--------|---------------|--------------|----------------|
| 265 | 355 | | | 1/8" std. |
| 378 | 409 | | | 1/8" std. |
| 463 | 523 | | | 1/8" std. |
| 667 | 895 | | | 1/8" std. |

341 - 343 sticky gray clay rock
343 - 347 coarse sand, gravel & small /
347 - 363 sticky gray clay
363 - 366 coarse sand gravel & small rock
366 - 403 sandy brown clay (tight)
403 - 412 coarse sand, gravel w/small rock
412 - 419 gray clay
419 - 425 sticky gray clay clay
425 - 428 coarse sand & gravel w/some /
428 - 469 brown sticky clay'
469 - 476 fine sand & gravel
476 - 492 brown sticky clay
492 - 498 silt, fine sand & gravel
498 - 502 sticky gray clay

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes No To what depth 50 ft.

Were any strata sealed against pollution? Yes No If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing conductor and concrete

Work started 7-10 1974 Completed 7-30 1974 "OVER"

(9) WATER LEVELS:

Depth at which water was first found, if known ft.

Standing level before perforating, if known ft.

Standing level after perforating and developing ft.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Ben Barrow Company, Inc.
(Person, firm, or corporation) (Typed or printed)

(10) WELL TESTS:

Was pump test made? Yes No If yes, by whom?

ld: gal./min. with ft. drawdown after hrs.

Temperature of water Was a chemical analysis made? Yes No

Was electric log made of well? Yes No If yes, attach copy

Address P.O. Box 888
Woodland, California 95695

[SIGNED] (Well Driller)

License No. 283326 Dated August 2, 1974

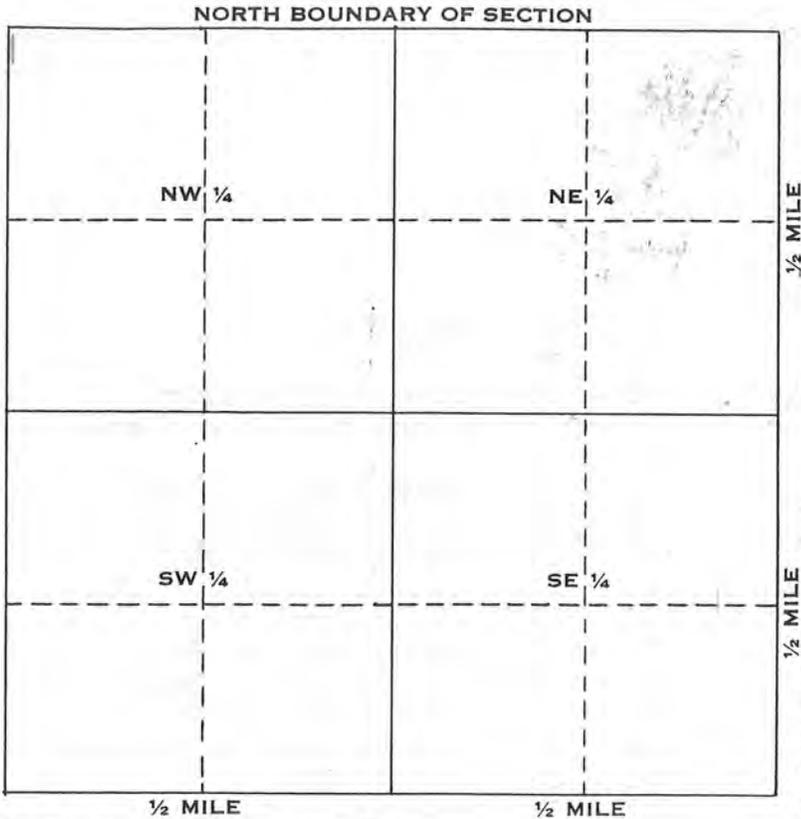
SKETCH LOCATION OF WELL ON REVERSE SIDE

Log continued on back page

WELL LOCATION SKETCH

76

RECEIVED
AUG 23 1974
SAN JOAQUIN DISTRICT



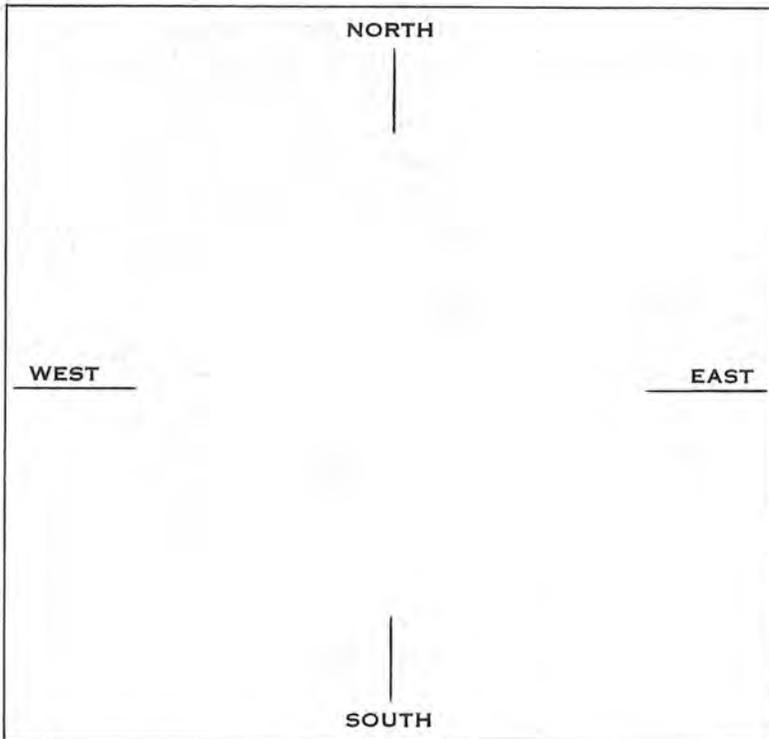
Township _____ N/S

Range _____ E/W

Section No. _____

- 502 - 510 silt, fine sand & gravel
- 510 - 517 sandy gray clay w/some gravel
- 517 - 541 sticky gray clay
- 541 - 567 blue sticky clay
- 567 - 570 hard brown clay
- 570 - 572 sand & gravel
- 572 - 608 blue sticky clay
- 608 - 609 hard clay
- 609 - 626 blue clay
- 626 - 654 hard gray clay
- 654 - 656 coarse sand & gravel w/some clay
- 656 - 662 coarse sand and grave^l
- 662 - 664 gray sticky clay
- 664 - 676 blue clay
- 676 - 709 hard sandy brown clay
- 709 - 721 hard brown clay w/some shale
- 721 - 728 sticky yellow clay
- 728 - 732 coarse sand and gravel
- 732 - 733 yellow clay
- 733 - 751 coarse sand and gravel
- 751 - 753 yellow sticky clay
- 753 - 755 coarse sand and gravel
- 755 - 767 yellow clay
- 767 - 773 sandy clay & gravel
- 773 - 791 yellow clay
- 791 - 793 blue clay
- 793 - 795 gray clay & shale
- 795 - 854 yellow clay
- 854 - 861 coarse sand and gravel
- 861 - 865 clay and shale
- 865 - 874 soft yellow clay
- 874 - 875 sandy clay w/some gravel
- 875 - 879 coarse sand and gravel
- 879 - 881 shale and clay
- 881 - 895 clay and gravel
- 895 - 899 ~~xxxx~~ coarse sand & gravel

A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.



B. Location of well in areas not sectionized.
Sketch roads, railroads, streams, or other features as necessary.
Indicate distances.

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STATE OF CALIFORNIA
THE RESOURCES AGENCY

Do Not Fill In

ORIGINAL
File with DWR

SEP 30 1973

DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

No 78802

State Well No. SN/33W
Other Well No. _____

SN 33W-0

(1) OWNER:

Name _____
Address _____

(11) WELL LOG:

Total depth 1001 ft. Depth of completed well 1001 ft.
Formation: Describe by color, character, size of material, and structure
ft. to _____ ft.

(2) LOCATION OF WELL:

County Santa Barbara Owner's number, if any 6
Township, Range, and Section 3/10 mile West of Bell St. on
Distance from cities, roads, railroads, etc. HWY. 135 1/10 mile south
of Hwy. 135

SEE ATTACHED LOG

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Destroying
If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) EQUIPMENT:

Rotary
Cable
Other

(6) CASING INSTALLED:

STEEL: _____ OTHER: _____
SINGLE DOUBLE

If gravel packed

| From ft. | To ft. | Diam. | Gage or Wall | Diameter of Bore | From ft. | To ft. |
|----------|--------|-------|--------------|------------------|----------|--------|
| 0 | 100 | 14" | .375 | 24" | 0 | 1001 |
| 150 | 680 | " | .312 | | | |
| 680 | 1001 | " | .375 | | | |

Size of shoe or well ring: _____

Size of gravel: _____

Describe joint Butt welded

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen

| From ft. | To ft. | Perf. per row | Rows per ft. | Size in. x in. |
|----------|--------|---------------|--------------|----------------|
| 150 | 1001 | 14 rows | of 125 mesh | |

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes No To what depth _____ ft.

Were any strata sealed against pollution? Yes No If yes, note depth of strata

From _____ ft. to _____ ft.

From _____ ft. to _____ ft.

Method of sealing _____

(9) WATER LEVELS:

Depth at which water was first found, if known _____ ft.

Standing level before perforating, if known _____ ft.

Standing level after perforating and developing _____ ft.

(10) WELL TESTS:

Was pump test made? Yes No If yes, by whom F.V. Wells, Inc.

Yield: 1250 gal./min. with 400 ft. drawdown after 4 hrs.

Temperature of water _____ Was a chemical analysis made? Yes No

Was electric log made of well? Yes No If yes, attach copy

Work started 3-18-73 Completed 3-24-73

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Floyd V. Wells, Inc.
(Person, firm, or corporation) (Typed or printed)

Address P. O. Box 1007, Santa Maria, Calif.

[SIGNED] F.V. Wells
(Well Driller)

License No. C57-229570 Dated Sept. 10, 19 73

SKETCH LOCATION OF WELL ON REVERSE SIDE

OVER

CONFIDENTIAL - NOT FOR PUBLIC RELEASE

FLOYD V. WELLS, INC.

116 North Blosser Road • Phone Walnut 5-8626
SANTA MARIA, CALIFORNIA 93454

Mailing Address:
Post Office Box 1007
Santa Maria, California

Goleta Office:
5798 Dawson Ave.
Phone 967-4124
Santa Maria
Phone Zenith 2-7726

Log of well drilled for :
Well number : #6
Location : 3/10 mile west of Bell St. on Hwy. 135,
1/10 mile south of Hwy. 135, Los Alamos
Well bore : 24"
Casing : 1001 ft. of 14" wall pipe, .375 wall from 680 ft.
to 1001 ft., .312 wall from 150 ft. to 680 ft.,
.375 wall from 0 to 150 ft.
Perforations : 1001 ft. to 150 ft. of 14 rows, 125 mesh
Well completed : 24 March 1972
Formation

| From | 0 | to | 10 | feet | |
|------|-----|----|-----|------|--|
| " | 0 | " | 10 | " | Adobe |
| " | 10 | " | 31 | " | Adobe and gravel |
| " | 31 | " | 45 | " | Black clay and gravel, loose |
| " | 45 | " | 70 | " | Dark brown clay and gravel |
| " | 70 | " | 87 | " | Light brown clay and coarse sand and gravel |
| " | 87 | " | 97 | " | Dark brown clay and gravel |
| " | 97 | " | 112 | " | Light brown clay and gravel |
| " | 112 | " | 155 | " | Dark brown clay with small amount of gravel |
| " | 155 | " | 190 | " | Light brown sandy clay with coarse sand and gravel, loose |
| " | 190 | " | 220 | " | Dark brown clay with small amount gravel |
| " | 220 | " | 260 | " | Light brown clay with coarse sand and gravel strips |
| " | 260 | " | 290 | " | Dark brown sandy clay with coarse sand strips |
| " | 290 | " | 320 | " | Light gray clay |
| " | 320 | " | 330 | " | Dark brown clay |
| " | 330 | " | 345 | " | Light brown clay with thin gravel strips |
| " | 345 | " | 368 | " | Dark brown clay |
| " | 368 | " | 423 | " | Brown sandy clay with coarse sand and gravel strips |
| " | 423 | " | 450 | " | Dark brown clay with thin gravel strips |
| " | 450 | " | 460 | " | Green clay |
| " | 460 | " | 515 | " | Brown clay with gravel strips |
| " | 515 | " | 555 | " | Dark brown clay with gravel |

SEP 30 1973

CONFIDENTIAL - NOT
FOR PUBLIC RELEASE

Log of well drilled for

Page 2

| | | | | | |
|------|-----|----|------|------|--|
| From | 555 | to | 615 | feet | Blue clay |
| " | 615 | " | 625 | " | Brown clay |
| " | 625 | " | 665 | " | Dark gray clay |
| " | 665 | " | 685 | " | Brown clay |
| " | 685 | " | 702 | " | Dark gray clay with light brown clay |
| " | 702 | " | 745 | " | Brown clay with coarse sand and gravel |
| " | 745 | " | 779 | " | Brown clay |
| " | 779 | " | 800 | " | Gray clay |
| " | 800 | " | 830 | " | Brown clay |
| " | 830 | " | 860 | " | Sandy brown clay |
| " | 860 | " | 1001 | " | Brown sandy clay with coarse sand |

8N 33W-0

78802

Schlumberger

INDUCTION ELECTRICAL LOG

| | |
|---|--|
| COUNTY FIELD or LOCATION WELL COMPANY | COMPANY _____ |
| | WELL <u>FERRERS # 6</u> |
| | FIELD <u>Los Alamos</u> |
| | COUNTY <u>SANTA BARBARA</u> STATE <u>CALIF</u> |
| | LOCATION _____ Sec. _____ Twp. _____ Rge. _____ |

Other Services:

| | |
|---|-------------------|
| Permanent Datum: <u>G.L.</u> , Elev. _____ | Elev.: K.B. _____ |
| Log Measured From <u>G.L.</u> , _____ Ft. Above Perm. Datum | D.F. _____ |
| Drilling Measured From <u>G.L.</u> | G.L. _____ |

| | | | | | | |
|-------------------------------|----------------------------|-----------------|-------------|----|----|----|
| Date | <u>3-17-72</u> | | | | | |
| Run No. | <u>- 1 -</u> | | | | | |
| Depth—Driller | <u>993</u> | | | | | |
| Depth—Logger | <u>992</u> | | | | | |
| Btm. Log Interval | <u>991</u> | | | | | |
| Top Log Interval | <u>06</u> | | | | | |
| Casing—Driller | <u>- @ -</u> | @ | @ | @ | @ | @ |
| Casing—Logger | <u>—</u> | | | | | |
| Bit Size | <u>1 7/8 x 9 7/8 @ 700</u> | | | | | |
| Type Fluid in Hole | <u>NATURAL</u> | | | | | |
| Dens. | Visc. | <u>- N.A. -</u> | | | | |
| pH | Fluid Loss | <u>7</u> | <u>-</u> ml | ml | ml | |
| Source of Sample | <u>PIT</u> | | | | | |
| R _m @ Meas. Temp. | <u>7.5 @ 60</u> | °F | @ | °F | @ | °F |
| R _{mf} @ Meas. Temp. | <u>9.6 @ 60</u> | °F | @ | °F | @ | °F |
| R _{mc} @ Meas. Temp. | <u>@</u> | °F | @ | °F | @ | °F |
| Source: R _{mf} | R _{mc} | <u>m</u> | <u>c</u> | | | |
| R _m @ BHT | <u>53 @ 76</u> | °F | @ | °F | @ | °F |
| Time Since Circ. | <u>1 HR</u> | | | | | |
| Max. Rec. Temp. | <u>18</u> | °F | | °F | | °F |
| Equip. | Location | <u>7516</u> | <u>IT</u> | | | |
| Recorded By | <u>BARBARA</u> | | | | | |
| Witnessed By | <u>F.L.S.H.</u> | | | | | |

State of California
Well Completion Report
 Form DWR 188 Complete 12/15/2017
 WCR2017-005628

Owner's Well Number WELL #6 Date Work Began 10/23/2017 Date Work Ended 11/08/2017
 Local Permit Agency Santa Barbara County Environmental Health Services
 Secondary Permit Agency _____ Permit Number 0002481 Permit Date 10/23/2017

Well Owner (must remain confidential pursuant to Water Code 13752)

Name XXXXXXXXXXXXXXXXXXXX
 Mailing Address XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
 City XXXXXXXXXXXXXXXXXXXX State XX Zip XXXXX

Planned Use and Activity

Activity New Well
 Planned Use Water Supply Public

Well Location

Address 175 BELL ST APN 101-152-008
 City LOS ALAMOS Zip 93440 County Santa Barbara Township 08 N
 Latitude 34 44 40.95 N Longitude -120 16 47.23 W Range 32 W
 Deg. Min. Sec. Deg. Min. Sec. Section 30
 Dec. Lat. 34.7447083 Dec. Long. -120.2797861 Baseline Meridian San Bernardino
 Vertical Datum _____ Horizontal Datum WGS84 Ground Surface Elevation _____
 Location Accuracy _____ Location Determination Method _____ Elevation Accuracy _____
 Elevation Determination Method _____

Borehole Information

Orientation Vertical Specify _____
 Drilling Method Direct Rotary Drilling Fluid Bentonite
 Total Depth of Boring 1005 Feet
 Total Depth of Completed Well 960 Feet

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)
 Depth to Static _____
 Water Level 140 (Feet) Date Measured 11/08/2017
 Estimated Yield* 600 (GPM) Test Type Air Lift
 Test Length 12 (Hours) Total Drawdown _____ (feet)
 *May not be representative of a well's long term yield.

Geologic Log - Free Form

| Depth from Surface Feet to Feet | Description | |
|------------------------------------|-------------|----------------------------|
| 0 | 42 | DARK BROWN CLAY |
| 42 | 54 | SAND & GRAVEL |
| 54 | 71 | BROWN SANDY CLAY |
| 71 | 126 | SAND & GRAVEL |
| 126 | 143 | BROWN CLAY |
| 143 | 152 | SAND & GRAVEL |
| 152 | 157 | BROWN CLAY |
| 157 | 173 | SAND & GRAVEL |
| 173 | 179 | BROWN CLAY & GRAVEL LAYERS |
| 179 | 267 | SAND & GRAVEL |
| 267 | 272 | BROWN CLAY |
| 272 | 281 | SAND & GRAVEL |
| 281 | 293 | BROWN CLAY |
| 293 | 303 | SAND & GRAVEL |
| 303 | 308 | BROWN CLAY & HARD LAYERS |

| | | |
|-----|------|----------------------------|
| 308 | 317 | SAND & GRAVEL |
| 317 | 321 | BROWN CLAY |
| 321 | 348 | SAND & GRAVEL |
| 348 | 364 | SAND W/ CLAY LAYERS |
| 364 | 428 | BROWN CLAY |
| 428 | 437 | SAND |
| 437 | 463 | GREY / BROWN CLAY |
| 463 | 478 | GRAVEL LAYERS |
| 478 | 564 | BROWN CLAY |
| 564 | 570 | SAND & GRAVEL |
| 570 | 637 | BROWN CLAY W/ SAND LAYERS |
| 637 | 648 | SAND & THIN GRAVEL ZONES |
| 648 | 654 | BROWN CLAY |
| 654 | 665 | SAND & THIN GRAVEL ZONES |
| 665 | 677 | BROWN CLAY |
| 677 | 685 | SAND & GRAVEL |
| 685 | 732 | BLUE CLAY W/ GRAVEL LAYERS |
| 732 | 743 | SAND & GRAVEL |
| 743 | 757 | BLUE CLAY |
| 757 | 763 | SAND & GRAVEL |
| 763 | 768 | BLUE CLAY |
| 768 | 782 | SAND & GRAVEL |
| 782 | 836 | BLUE CLAY |
| 836 | 864 | SAND |
| 864 | 902 | BLUE CLAY & SAND |
| 902 | 935 | SAND & GRAVEL |
| 935 | 951 | CLAY |
| 951 | 958 | SAND & GRAVEL |
| 958 | 1005 | BROWN CLAY |

USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SACOC PROJECT: GC16ZG00FUVS300 PROJECT CHIEF: David O'Leary
 ELEV: 583' LOCATION: 8300 Cat Canyon Rd., Los Alamos, CA 93440; N34°45'20" W120°17'40" LOGGED BY: Anthony Brown Adam King
 DRILLED BY: USGS RDP RIG TYPE: Mud Rotary- TH60 LAG METHOD: Rice (mud)

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones | Graphic | Description and other observations | Bit size, & Rice time |
|-------------|------------|----------------------------|------------------------|---------|-------------------------------------|---|---------------------------|
| 0 | 1511 | | | | | | |
| 7/19 20 | 1540 | 11' | 2.57 4/2 | V HV7 | | Gravelly (gran) SAND (vf-vc) | 20" Hole OPENER |
| | 1730 | | 2.54 5/8 | 3908 | | SANDY (vf-vc) gravel (gran-sm-pcb) | |
| 7/20 40 | 1000 | 23' chatter | 2.57 6/4 | V HV7 M | | SAND (vf-vc) | 9 7/8" Long tooth Tricone |
| | 1011 | 32' | | 9890 | | SANDY (vf-vc) gravel (gran-md-pcb) | |
| 60 | 1417 | | 104K 4/4 | V HV7 M | | Gravelly (gran-sm-pcb) SAND (vf-vc) | |
| | 1424 | | 2.54 5/4 | 4340 | | Gravelly (gran-sm-pcb) SAND (vf-vc) | |
| 80 | 1520 | 32' | | V HV7 M | | Gravelly (gran-sm-pcb) SAND (vf-vc) | |
| | 1532 | | 3780 | | SANDY (vf-vc) gravel (gran-lg-pcb) | | |
| 100 | 1614 | 35' | 2.57 4/5 | HV7 | | SAND (vf-m) | |
| | 1620 | 45' | | 3670 | | SANDY (vf-vc) gravel (gran-lg-pcb) | |
| 120 | 1646 | | | HV7 | | SANDY (vf-vc) gravel (gran-lg-pcb) | |
| | 1652 | | | 3590 | | SANDY (vf-vc) gravel (gran-lg-pcb) | |
| 140 | 1713 | | 104K 5/4 | HV7 M | | SANDY (vf-vc) gravel (gran-md-pcb) | Rice TIME 1 1/2 MIN |
| | 1721 | | | 3400 | | SANDY (vf-vc) gravel (gran-md-pcb) | |
| 7/20 160 | 1735 | 144' | 104K 6/4 | HV7 | | Silty sand (vf-m) | |
| | 1750 | 155' | | 2070 | | Silty sand (vf-m) | |
| 7/21 180 | 0855 | 126' colon | | It | | SAND (vf-vc) w/ minor gravel (gran-sm-pcb) ? | |
| | 0901 | | | 2910 | | 1 in. tabbed clay | |
| 200 | 0932 | | 104K 5/4 | It | | Silty sand (vf-c) | |
| | 0945 | | | 2810 | | Silty sand (vf-c) | |
| 220 | 1025 | 212' last 218' | 2.57 6/4 | Mod | | SANDY (vf-c) silty clay | Rice TIME 1.5 min |
| | 1036 | | 104K 6/4 | 2800 | | SANDY (mv-c) gravel (gran-lg-pcb) | |
| 240 | 1103 | 235' | | V HV7 | | Silty sand (vf-m) | |
| | 1111 | | 2740 | | SAND (vf-m) | | |
| 260 | 1132 | 237' | | V HV7 M | | Gravelly (gran-md-pcb) sand (vf-vc) mostly vf-m | |
| | 1152 | 248' | | 2830 | | SAND (vf-m) | |
| 280 | 1322 | 254' | | HV7 | | SANDY (vf-vc) silty clay | |
| | 1336 | | 2790 | | clay | | |
| 300 | 1354 | 261' | | HV7 | | SANDY (vf-vc) silty clay | |
| | 1408 | | 275' | 2790 | | SANDY (vf-vc) silty clay | |
| 320 | 1428 | 306' | | HV7 M | | SANDY (vf-vc) silty clay | |
| | 1435 | | 2760 | | SANDY (vf-vc) silty clay | | |
| 340 | 1522 | 333' | 104K 6/4 | HV7 | | SAND (vf-vc) w/ minor gravel (gran) | Rice Time 2.5 min |
| | 1531 | | 2620 | | SAND (vf-vc) w/ minor gravel (gran) | | |
| 360 | 1552 | 333' | | V HV7 | | SANDY (vf-vc) silt | |
| | 1558 | | 2590 | | SANDY (vf-vc) silt | | |
| 380 | 1630 | 362' 364' banded 374' fast | | Mod | | SANDY (vf-vc) silt | |
| | 1636 | | 2570 | | SANDY (vf-vc) silt | | |
| 400 | 1715 | 382' | 104K 6/4 | It | | SAND (vf-vc) clayey silt | |
| | 1750 | | 3470 | | SAND (vf-vc) clayey silt | | |
| 400 | 1810 | 395' colon | 104K 5/4 | It | | SAND (vf-m) | |
| | 1817 | | 2540 | | SANDY (vf-m) silt | | |

USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SAC C PROJECT: GC16ZG00FUVS300 PROJECT CHIEF: David O'Leary
 ELEV: 583' LOCATION: 8300 Cat Canyon Rd., Los Alamos, CA 93440; N34°45'20" W120°17'40" LOGGED BY: Anthony Brown Adam Lyons
 DRILLED BY: USGS RDP RIG TYPE: Mud Rotary- TH60 LAG METHOD: Rice (mud)

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones | Graphic | Description and other observations | Bit size, & Rice time |
|----------|------------------------------|---------------------------|------------------------|--------------------|---------|---|------------------------------------|
| 400 | | | | EC | | | |
| 7/22 420 | 1024 1033 1043 | 416' | 10YR 6/4 | V HV7 M 2220 | | clayey silt | 9 7/8" long tooth rice time |
| 440 | 1100 1111 1121 | | 10YR 4/3 10YR 5/4 | V HV4 2140 | | clayey sandy (uf-c) silt | Rice Time 3 1/2 min |
| 460 | 1138 1142 1156 | | | V HV4 2180 | | clayey sandy (uf-c) silt | |
| 480 | 1232 1246 1257 | | | V HV7 2240 | | clay (bentonitic) | |
| 500 | 1325 1335 1346 | | 10YR 5/3 | HV7 M 2090 | | clayey silty SAND (uf-c) | |
| 520 | 1356 1403 1410 | 505' | 10YR 6/4 | V HV7 2250 | | SAND (uf-c) | |
| 540 | 1538 1543 1548 | | | V HV7 M 2560 | | Gravelly (gran-sm pe6) SAND (uf-vc) | |
| 560 | 1603 1608 1616 | 557' alt | 7.5Y 5/2 | V HV7 2440 | | Gravelly (gran-sm pe6) SAND (uf-vc) | |
| 580 | 1632 1638 1647 | | | V HV7 2410 | | Gravelly (gran-sm pe6) SAND (uf-vc) | RICE TIME 5 1/2 MIN |
| 600 | 1702 1709 1716 | | | V HV4 2380 | | Gravelly (gran-sm pe6) SAND (uf-vc) | |
| 620 | 1730 1736 1748 | chatter 628' | 2.5Y 5/2 2.5Y 4/1 | V HV4 2340 | | SANDY (uf-c) silt | |
| 7/22 640 | 1758 1833 1846 1855 | chatter 628' 635' | 2.5Y 5/2 | MOD 2250 | | SANDY (uf-m) silt w/ clay (salt n pepper) | 7 7/8" long tooth rice time |
| 7/23 660 | 0900 0905 0922 | 652' slow | | HV7 2020 | | SAND (uf-vc) | long tooth rice time w/ jets |
| 680 | 0943 0958 1030 | 669' chatter | 2.5Y 4/1 | HV7 1942 | | clayey silty SAND (uf-vc) s&p | RICE TIME 9 MIN |
| 700 | 1044 1119 1153 | | 2.5Y 5/2 | mod 1916 | | clayey silty SAND (uf-vc) | |
| 720 | 1233 1240 1331 | 737' w/ packing 716' | | mod 2110 | | silty SAND (uf-vc) | |
| 740 | 1345 1406 1431 | 717' | 2.5Y 5/3 | mod 2190 | | SAND (uf-vc) | |
| 760 | 1448 1621 1724 | | | mod 1847 | | clayey silty SAND (uf-m) mostly SAND (G-F) but drilling like baklop stinky | RICE TIME 9 min |
| 780 | 1733 1809 1825 1835 | 768' chatter 775' slow | 2.5Y 6/4 2.5Y 6/5 | IT 2160 | | silty sand (uf-vc) | stopped @ 776' @ 1825 |
| 7/23 780 | 1835 1845 | | | IT 2160 | | clay | |
| 7/24 800 | 0755 0918 0929 | 796' | 2.5Y 5/3 | IT M 1943 | | clayey SAND (uf-c) | |

USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SACDC PROJECT: GC16ZG00FUVS300 PROJECT CHIEF: David O'Leary
 ELEV: 583' LOCATION: 8300 Cat Canyon Rd., Los Alamos, CA 93440, N34°45'20" W120°17'40" LOGGED BY: Anthony Brown, ~~Anthony Brown~~
 DRILLED BY: USGS RDP RIG TYPE: Mud Rotary- TH60 LAG METHOD: Rice (mud)

7/24

7/24

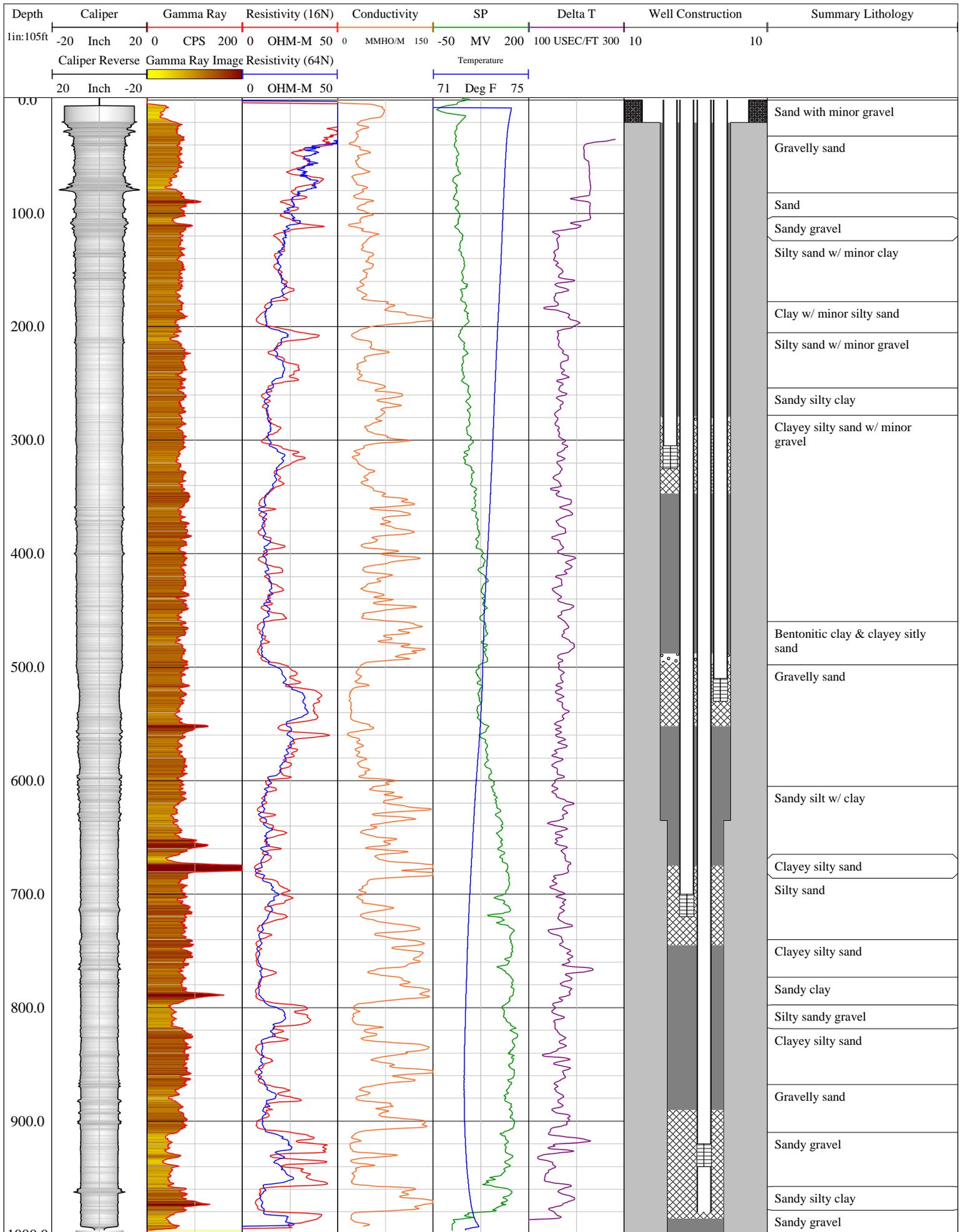
7/24

7/24

7/25

7/25

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones | Graphic | Description and other observations | Bit size, & Rice time |
|-------|------------|----------------|------------------------|-------|---------|------------------------------------|-----------------------|
| 800 | | | | EC | | | |
| | 0946 | 803' chatter | 2.5, 5/3 | HV7 | | clayey sand (uf-c) | 7 7/8" |
| | 0950 | | | | | SAND (uf-vc) w/ some silt | long tooth |
| 820 | 0955 | 816' | | 1939 | | SANDY (uf-vc) GRAVEL (gran-md peb) | 7 1/2" |
| | 1014 | | | Mod | | SANDY (uf-vc) GRAVEL (gran-md peb) | Rice |
| | 1019 | | | | | | Time |
| 840 | 1120 | 852' slow | | 1974 | | clay | 10 min |
| | 1144 | | | Mod | | clay | |
| | 1209 | 850' chatter | | | | | |
| | 1307 | 852' slow | | 1924 | | clayey silty SAND (uf-vc) | |
| | 1326 | | 2.5, 6/3 | | | | |
| | 1430 | 868' chatter | | HV7 | | | |
| 880 | 1437 | | | 1920 | | Gravelly (gran) SAND (uf-vc) | |
| | 1456 | 886' slower | | VHV4 | | | |
| | 1512 | | | | | | |
| 900 | 1537 | | | 1906 | | Gravelly (gran) SAND (uf-vc) | |
| | 1556 | | | | | | |
| | 1614 | 910' chatter | | VHV4 | | | |
| | 1618 | | | | | | |
| | 1638 | | | | | | |
| | 1649 | | | VHV7 | | | |
| 940 | 1704 | 937' slow (1') | | 1995 | | SANDY (uf-vc) GRAVEL (gran-md peb) | |
| | 1724 | | | VHV4 | | | |
| | 1729 | | | | | | |
| 960 | 1748 | slow 958' | | 1858 | | SANDY (uf-vc) gravel (gran-md peb) | Rice Time 11 min |
| | 1024 | | | 1+ | | | |
| | 1053 | | | | | | |
| 980 | 1122 | 978' chatter | | 2020 | | sandy (uf-vc) silty clay | |
| | 1143 | | | | | | |
| | 1148 | | | HV7 | | | |
| 1000 | 1155 | | | 2000 | | SANDY (uf-vc) gravel (gran-md peb) | |



USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SACC #3 PROJECT: PROJECT CHIEF: David O'Leary
 ELEV: LOCATION: LOGGED BY:
 DRILLED BY: USGS RDP RIG TYPE: Auger LAG METHOD: N/A

| Depth | Time (min) <i>Start End</i> | Rig noise etc. | Color (Munsell- soil) | Cones mud EC | Graphic | Description and other observations <i>± No lith symbol i.e. (grs S) No sorting, can use field Surv. hand.</i> | Bit size, & Rice time |
|-----------|------------------------------------|-------------------|-----------------------------|------------------------|---------|--|-----------------------------|
| | | | | | | | |
| 1/21/2016 | 16:24 | Harsh | | | | | |
| 5' | 16:1 16:1 | | 10YR 5/4 | | | Sand (S); v.f. med sand (minor coarse sand) w/ minor silt <i>well sorted</i> | 8.5" |
| 10' | 16:1 16:1 | | | | | Clayey silty sand (MS); v.f. medium sand (minor coarse sand) w/ silt and clay | |
| 15' | 16:4 17:03 | | | | | (grs S); v.f. coarse sand w/ silt, clay and granule - lg peb; <i>color change</i> <i>v. poorly sorted</i> | |
| 20' | 17:05 17:11 | | | | | (grs S); v.f. coarse sand w/ silt, clay and granule - lg pebb <i>v. poorly sorted</i> | |
| 25' | 17:14 17:20 | | | | | (grs S); v.f. coarse sand w/ silt, clay and granule - v. lg pebb | |
| 30' | 17:22 17:29 | | | | | Sandy clayey silt; silt w/ clay and v.f. - medium sand <i>color change</i> <i>(minor crs - v. crs sand)</i> | |
| 35' | 17:32 17:57 | | | | | gravely sandy clayey silt; silt w/ clay, v.f. - v. crs sand and gran - med peb <i>(minor clay)</i> | |
| 40' | 17:34 17:44 | | | | | Slightly starchy clayey silty sand; v.f. - v. crs sand (down v. med sand) w/ silt, clay and gran - med peb | |
| 45' | 17:47 17:54 | | | | | Sandy silt; silt w/ v.f. - med sand (minor crs - v. crs sand) w/ minor clay and trace gran - sm pebb | |
| 50' | 17:56 18:01 | | | | | Sandy silt; silt w/ v.f. - med sand (minor crs - v. crs sand) w/ minor clay and trace gran - lg peb | |
| 55' | 18:03 07:27 | | 7.5YR 4/6 | | | Sandy silt; silt w/ v.f. - med sand (minor crs - v. crs sand) w/ minor clay and trace - minor gran - med peb | |
| 60' | 07:30 07:37 | | 7.5YR 4/6 | | | Sandy silt; silt w/ v.f. - med sand (minor crs - v. crs sand) w/ trace - minor clay and trace granules | |
| 65' | 07:39 07:49 | Soft | 10YR 5/4 | | | Silty sand; v.f. - crs sand (minor v. crs sand) w/ silt and trace gran <i>More sand; (loosian clay component)</i> | |
| 70' | 07:51 08:00 | | 10YR 5/4 | | | Silty sand; v.f. - v. crs sand w/ silt, trace minor clay and trace gran med peb | |
| 75' | 08:04 08:12 | | 10YR 5/6 | | | Silty sand; v.f. - v. crs sand w/ silt, trace clay and trace gran - sm peb | |
| 80' | 08:15 08:31 | | 10YR 5/6 | | | Silty sand; v.f. - v. crs sand w/ silt, trace clay and trace gran lg peb | |
| 85' | 08:33 08:47 | really soft | 10YR 5/3 | | | Slightly silty sand; v.f. - v. crs sand (down v.f. - med sand) w/ silt and gran - lg peb | |
| 90' | 08:49 08:56 | | 10YR 5/3 | | | Sil. gray silty sand; v.f. - v. crs sand (down v.f. - med sand) w/ silt and gran - lg peb | |
| 95' | 08:57 09:04 | | 10YR 5/3 | | | Slightly silty sand; v.f. - v. crs sand w/ silt, minor clay, and gran - med peb | |
| 100' | 09:06 | | 10YR 5/3 | | | | |

SITE ID: 344520120174005

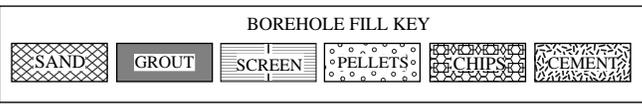
STATION NAME: 008N032W19M005S

TOTAL DEPTH: 120'

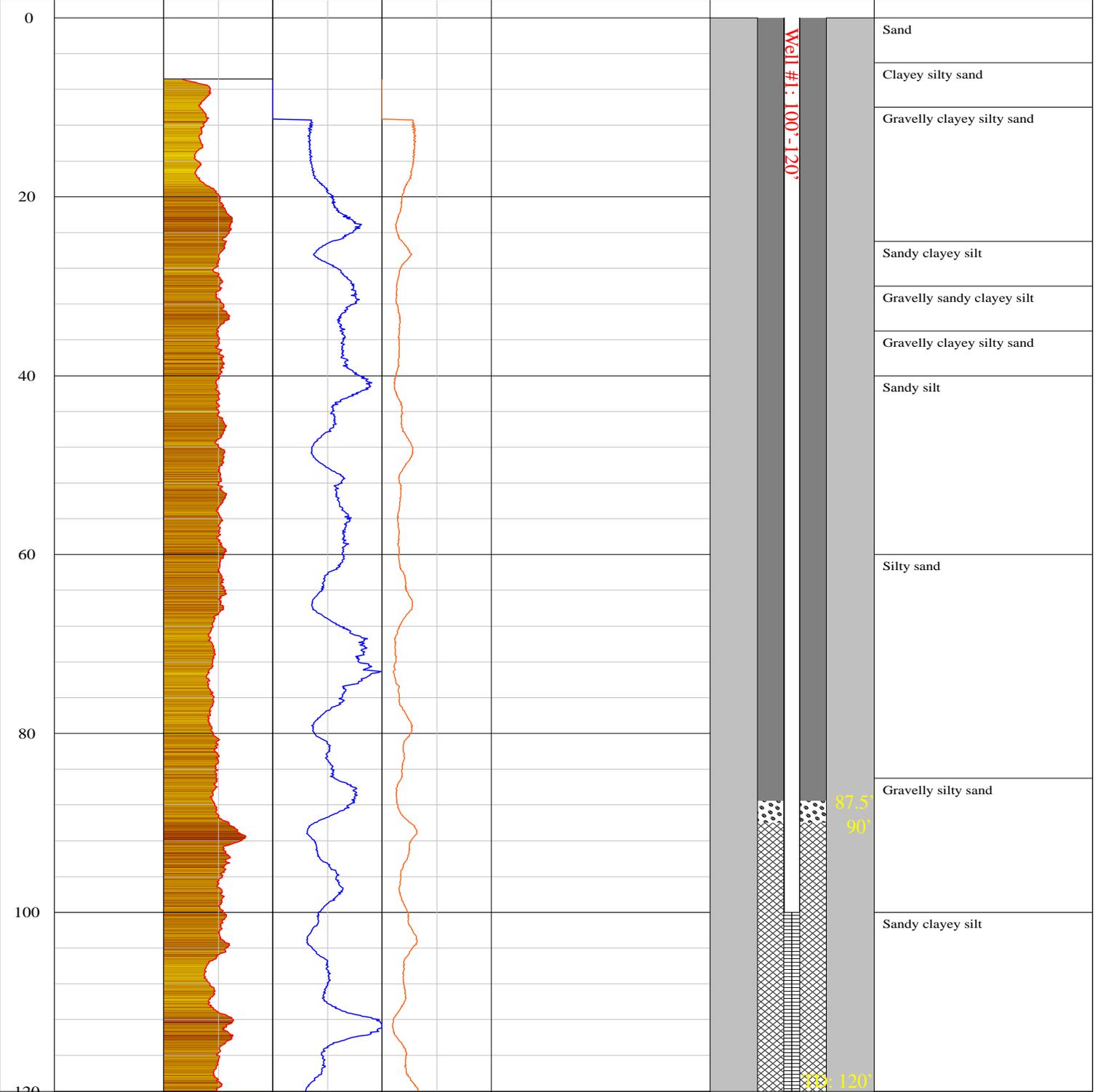
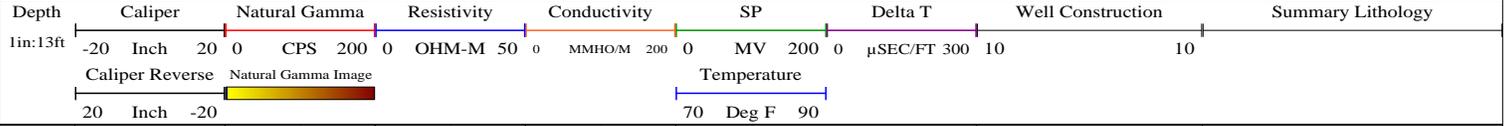
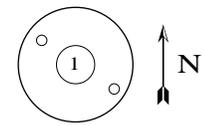
USGS SITE NAME: SACC #5 San Antonio Creek Cat Canyon Road-5

COMPLETION DATE: 11/22/2016

WELL OWNER: County of Santa Barbara



Water Level (10/20/2015)
#1: 66.49' b/s



| | | |
|---|--|---|
| DRILLER: USGS Research Drilling Program | DRILL TYPE: Auger | WELL FINISH: 8" Monitoring Well Manhole |
| CASING TYPE: 2" Schedule 80 PVC, 20' Sections | SCREEN TYPE: 2" Schedule 80 PVC →1.30" X 0.020" Slot | |
| BOREHOLE DIA.: 8.5": 0'-120' | FILTER PACK: CEMEX #3 Monterey Sand | |
| SEALS: Baroid Quik-Grout 0'-87.5', Pel-Plug 1/4" TR30 Pellets 87.5'-90' | | |

USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SACR 825 PROJECT: GC16ZG00FUVS300 PROJECT CHIEF: David O'Leary
 ELEV: 361' LOCATION: CA-135, Los Alamos, CA 93455, N34°45'32" W120°23'39" LOGGED BY: Anthony Brown Adam Kjos
 DRILLED BY: USGS RDP RIG TYPE: Mud Rotary- TH60 LAG METHOD: Rice (mud)

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones | Graphic | Description and other observations | Bit size, & Rice time |
|-------|---------------------|--------------------------|------------------------|---------|-------------------------------------|--|-------------------------------|
| 0 | | | | 4780 EC | | | |
| 7/30 | 1514 | | 2.57 3/4 | VH07 | X X X X | 0-1 - wood | 20" HOLE |
| | 1543 | | 2.57 5/3 | | A A A A | 2-2 - RDR - cement / asphalt | 14-16 silty sand (gr-m) |
| | 1614 | | | 3950 | A A A A | 2-3 soil - silty clay | 16-17 clayey |
| 7/31 | 0944 | | | VH07 | A A A A | 3-4 silty clay (gr-m) | 17-20 = 14-16 |
| | 0949 | 33' | | M | A A A A | SANDY (uf-vc) gravel (gran-mid peb) | 9 7/8" long tooth |
| | 0959 | | 2.57 8/3 | 3080 | A A A A | Gravelly (gran-mid peb) sand (uf-vc) | tailored |
| | 1132 | | | VH07 | A A A A | | |
| | 1137 | | 2.54 6/3 | 3050 | A A A A | slightly gravelly (gran-smp peb) sand (uf-vc) | |
| | 1142 | | | | | | |
| | 1153 | 68' slow | | H07 | A A A A | 64-65' soil hole | |
| | 1209 | 71' fast | 2.57 7/2 | 3010 | A A A A | 65-66' silty sand (uf-vc) w/ gravel (gran-mid peb) | |
| | 1219 | | 2.57 5/3 | | | 68-71' clayey silt w/ med peb | 71-80' sandy (uf-m) w/ gravel |
| | 1229 | 81' | | Mod | A A A A | | |
| 1232 | | 2.57 5/3 | 2920 | A A A A | SANDY (uf-vc) gravel (gran-mid peb) | | |
| 100 | 1236 | | | | | | |
| 7/31 | 1332 | 110' | 2.57 6/3 | VH07 | A A A A | Gravelly (mid peb) sand (uf-m) | last cone |
| | 1337 | | | M | A A A A | | |
| | 1347 | 113' | 2.57 4/3 | 3310 | A A A A | clayey silt | |
| | 1427 | 128' | | VH07 | A A A A | clayey silt | |
| | 1443 | | | M | A A A A | sandy (uf-vc) gravel (gran-ly peb) | |
| | 140 | 1455 | 128' | 3240 | A A A A | sand (uf-m) | |
| | 1504 | | | VH07 | A A A A | SAND (uf-m) | Rice Time |
| | 1510 | 152' | | M | A A A A | SAND (uf-vc) | 2 min |
| | 1519 | 158' | | 3330 | A A A A | SAND (uf-vc) abundant wood + pent | |
| | 1549 | 161' | | VH07 | A A A A | gray sand (uf-m) | |
| 1552 | 168' color | | M | A A A A | green sand (uf-m) | | |
| 180 | 1622 | 172' 173' 174' 175' 176' | | 3160 | A A A A | clay sand (uf-m) clay (6:14) | |
| 1637 | 172' | | VH07 | A A A A | | | |
| 1659 | 178' | | M | A A A A | sand (uf-m) | | |
| 200 | 1727 | 195' | 2960 | A A A A | silty clay | | |
| 1736 | | | H07 | A A A A | | | |
| 1739 | | | M | A A A A | SAND (uf-m) | | |
| 1752 | 216' slow | | 2950 | A A A A | sand (uf-vc) | | |
| 1801 | 225' slow | | VH07 | A A A A | | | |
| 1843 | 230' | | M | A A A A | silty clay | Rice Time | |
| 240 | 0844 0848 0900 0908 | 241' | 2830 | A A A A | sand (uf-vc) | 3 min | |
| 8/1 | 0949 | 241' | | Mod | A A A A | | |
| | 0949 | 257' slow | | M | A A A A | SANDY (uf-m) silt | |
| | 1208 | | | It | A A A A | clay | |
| | 1326 | 274' fast | | M | A A A A | | |
| | 1402 | | | 2950 | A A A A | | |
| | 1419 | 288' fast | | Mod | A A A A | | |
| | 1439 | | | M | A A A A | silt | |
| | 1447 | | | 2640 | A A A A | | |
| | 1500 | | | VH07 | A A A A | SAND (uf-vc) upper - sandy | Rice Time |
| | 1506 | | | M | A A A A | mid - gravel | 3 min |
| 320 | 1511 | | 2630 | A A A A | bottom - brown | | |
| 1530 | | | VH07 | A A A A | | | |
| 1536 | | | M | A A A A | SAND (uf-m) | | |
| 340 | 1543 | | 2640 | A A A A | | | |
| 1602 | | | VH07 | A A A A | | | |
| 1611 | | | M | A A A A | | | |
| 360 | 1619 | | 2690 | A A A A | | | |
| 1629 | | | VH07 | A A A A | | | |
| 1634 | | | M | A A A A | | | |
| 380 | 1656 | 274' slow | 2820 | A A A A | | | |
| 1755 | | 283' slow | It | A A A A | clay | | |
| 1845 | | | M | A A A A | | | |
| 8/2 | 0856 0908 | | 2540 | A A A A | | 7 7/8 turns | |

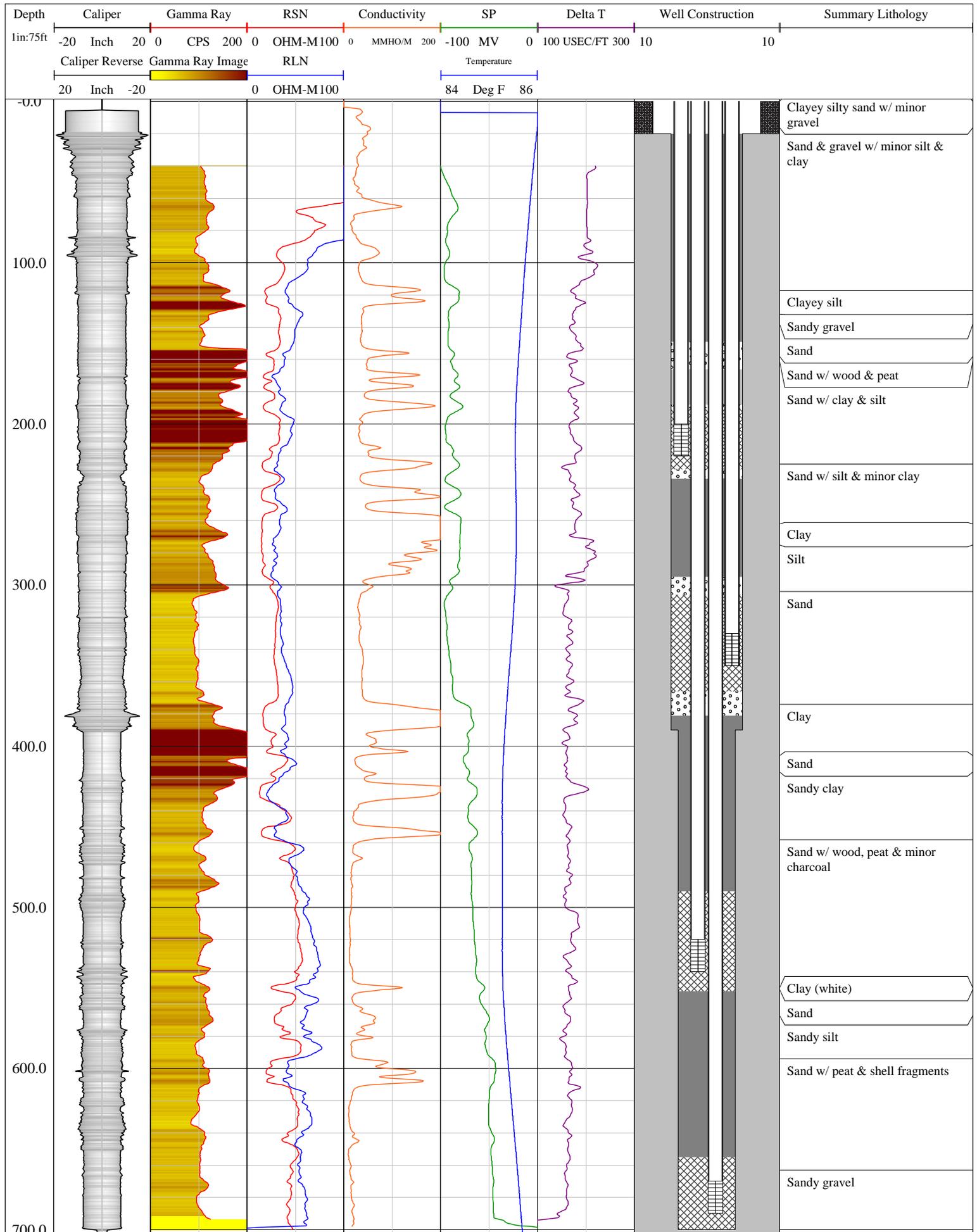
USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SACR PROJECT: GCI6ZG00FUVS300 PROJECT CHIEF: David O'Leary
 ELEV: 361' LOCATION: 1098 CA-135, Los Alamos, CA 93455, N34°45'32" W120°23'39" LOGGED BY: Anthony Brown Adam Kjos
 DRILLED BY: USGS RDP RIG TYPE: Mud Rotary- TH60 LAG METHOD: Rice (mud)

8/2

8/2

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones | Graphic | Description and other observations | Bit size, & Rice time |
|-------|----------------------|--|------------------------|-------------------|---------|--|------------------------|
| 400 | 0919 0928 | 409' | | HV4 M 2600 | | clay SAND(vf-m) w/ SAND(e-vc) w/ shells | Rice Time 4 1/2 min |
| 420 | 0934 1003 | 425' slow | | lt 2420 | | SANDY (vf-m) clay | |
| 440 | 1038 1101 | 434' Fast | | mid 2440 | | SAND (vf-m) w/ small wood chips | |
| 460 | 1114 1119 1141 | 443' Fast 454' slow 457' Fast | | VHV4 2470 | | SAND(vf-m) w/ small wood chips | |
| 480 | 1155 1158 1202 | | | VHV4 2470 | | SAND(vf-m) w/ small wood chips | |
| 500 | 1215 1218 1220 | | | VHV4 2390 | | SAND (vf-m) w/ v sm wood chips | |
| 520 | 1258 1301 1303 | | | VHV4 2470 | | SAND (vf-m) w/ v sm wood chips | Rice Time 5 min |
| 540 | 1319 1321 1323 | 539' | | VHV4 2270 | | SAND (vf-m) w/ v sm wood chips some charcoal SAND (vf-m) w/ Peat and wood chips | |
| 560 | 1340 1343 1346 | 550' | | HV4 2170 | | SAND (vf-m) | |
| 580 | 1400 1407 1409 | 567' slow - Fast | | VHV4 M 2260 | | SANDY (vf-m) silt | |
| 600 | 1422 1423 1438 | 574' slow/fast | | lt 2310 | | Peat SAND (vf-vc) w/ shell fragments | |
| 620 | 1451 1516 1518 | 601' slow 604' Fast 607' slow/Fast | | Mod 2290 | | SAND (vf-m) w/ peat + shells @ 631-640 | Rice Time 6 min |
| 640 | 1531 1532 1533 | | | HV4 2300 | | SAND (vf-m) w/ peat + shells | |
| 660 | 1555 1558 1601 | | | Mod 2370 | | SANDY (vf-vc) gravel (gran-smpeb) rounded | |
| 680 | 1613 1616 1620 | 663' chatter | | VHV4 M 2360 | | SANDY (vf-vc) gravel (gran-smpeb) | |
| 700 | 1633 1637 1643 | | | VHV4 2370 | | SANDY (vf-vc) gravel (gran-smpeb) | |



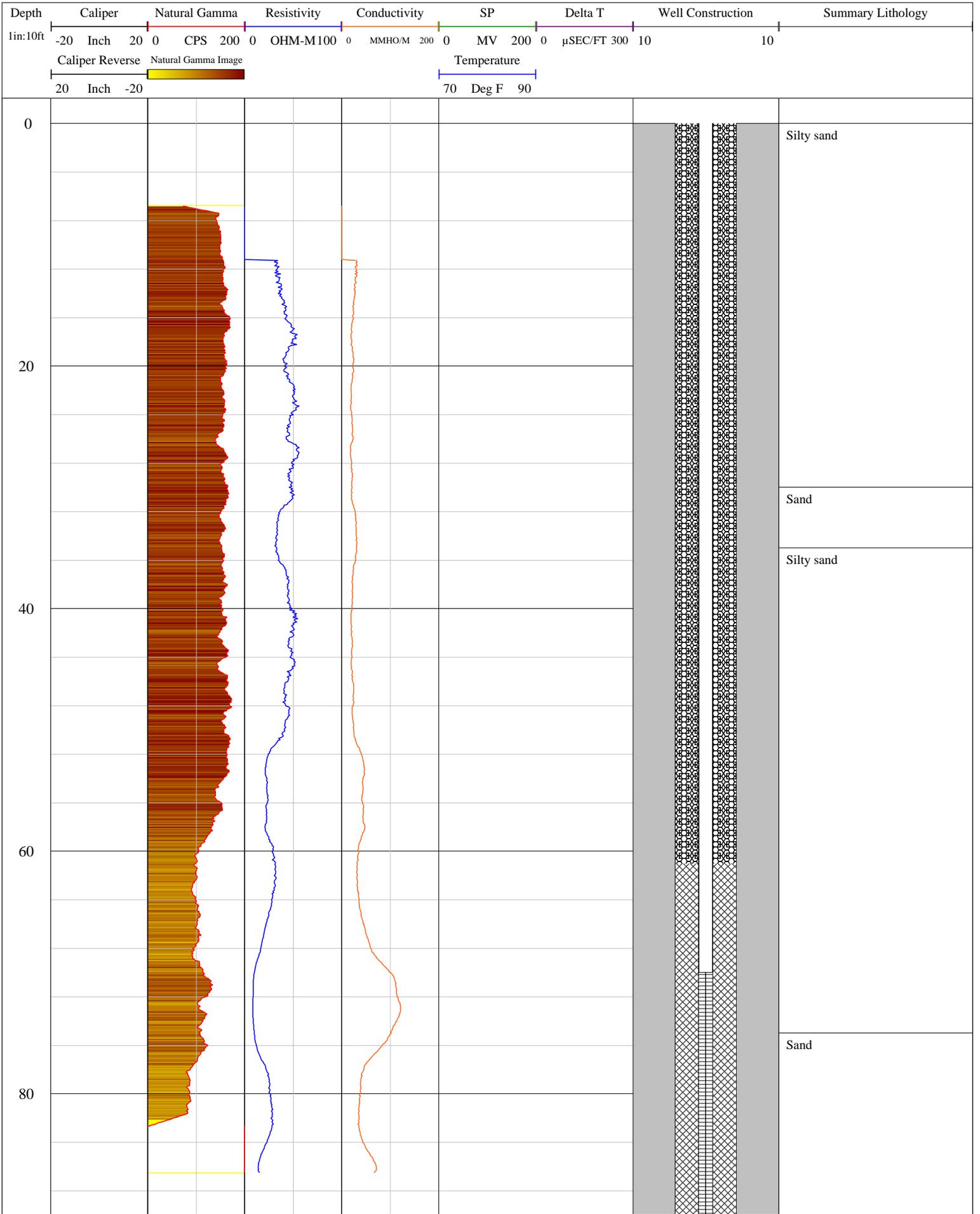
USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SAGR PROJECT: GC16ZG00FUVS200 PROJECT CHIEF: David O'Leary
 ELEV: ~322' LOCATION: Graciosa Road, Santa Maria, CA; N34°46'24" W120°25'39" LOGGED BY: Adam Kjos
 DRILLED BY: USGS RDP RIG TYPE: Auger- CME750 LAG METHOD: N/A

10/17/
2015

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones | | Graphic | Description and other observations | Bit size, & Rice time |
|-------|------------|----------------|------------------------|-------|----|---------|---|-----------------------|
| | | | | | EC | | | |
| | 0948 | | | | | | | |
| 5 | 0950 | | | | | | ~ 2' silty sand (v-f-m) | 8.5" |
| | 1001 | | | | | | moist sand (f-c) w/ trace gravel (g-s.p.) | |
| 10 | 1003 | | | | | | | |
| | 1010 | | | | | | | |
| 15 | 1012 | | | | | | slightly darker | |
| | 1018 | | | | | | | |
| 20 | 1020 | | | | | | | |
| | 1026 | | | | | | | |
| 25 | 1028 | | | | | | | |
| | 1035 | | | | | | | |
| 30 | 1037 | | | | | | | |
| | 1044 | | | | | | | |
| 35 | 1046 | | | | | | | |
| | 1055 | | | | | | | |
| 40 | 1057 | | | | | | | |
| | 1109 | | | | | | | |
| 45 | 1111 | | | | | | | |
| | 1122 | | | | | | | |
| 50 | 1124 | | | | | | | |
| | 1134 | -52 Tongue up | | | | | | |
| 55 | 1136 | | | | | | | |
| | 1207 | | | | | | | |
| 60 | 1209 | | | | | | | |
| | 1214 | | | | | | | |
| 65 | 1216 | | | | | | | |
| | 1221 | | | | | | | |
| 70 | 1223 | | | | | | | |
| | 1228 | | | | | | | |
| 75 | 1230 | | | | | | | |
| | 1236 | | | | | | | |
| 80 | 1238 | | | | | | | |
| | 1607 | | | | | | | |
| 85 | 1609 | | | | | | | |
| | 1614 | | | | | | | |
| 90 | 1616 | | | | | | | |
| TD | | | | | | | | |

Nearby Well
62.34 @ MP (~2' a1=0)
@ 0930 10/17



SITE ID: 344836120270001

STATION NAME: 009N034W34N002S

TOTAL DEPTH: 90'

USGS SITE NAME: SAHC San Antonio Creek Harris Canyon

COMPLETION DATE: 10/15/2015

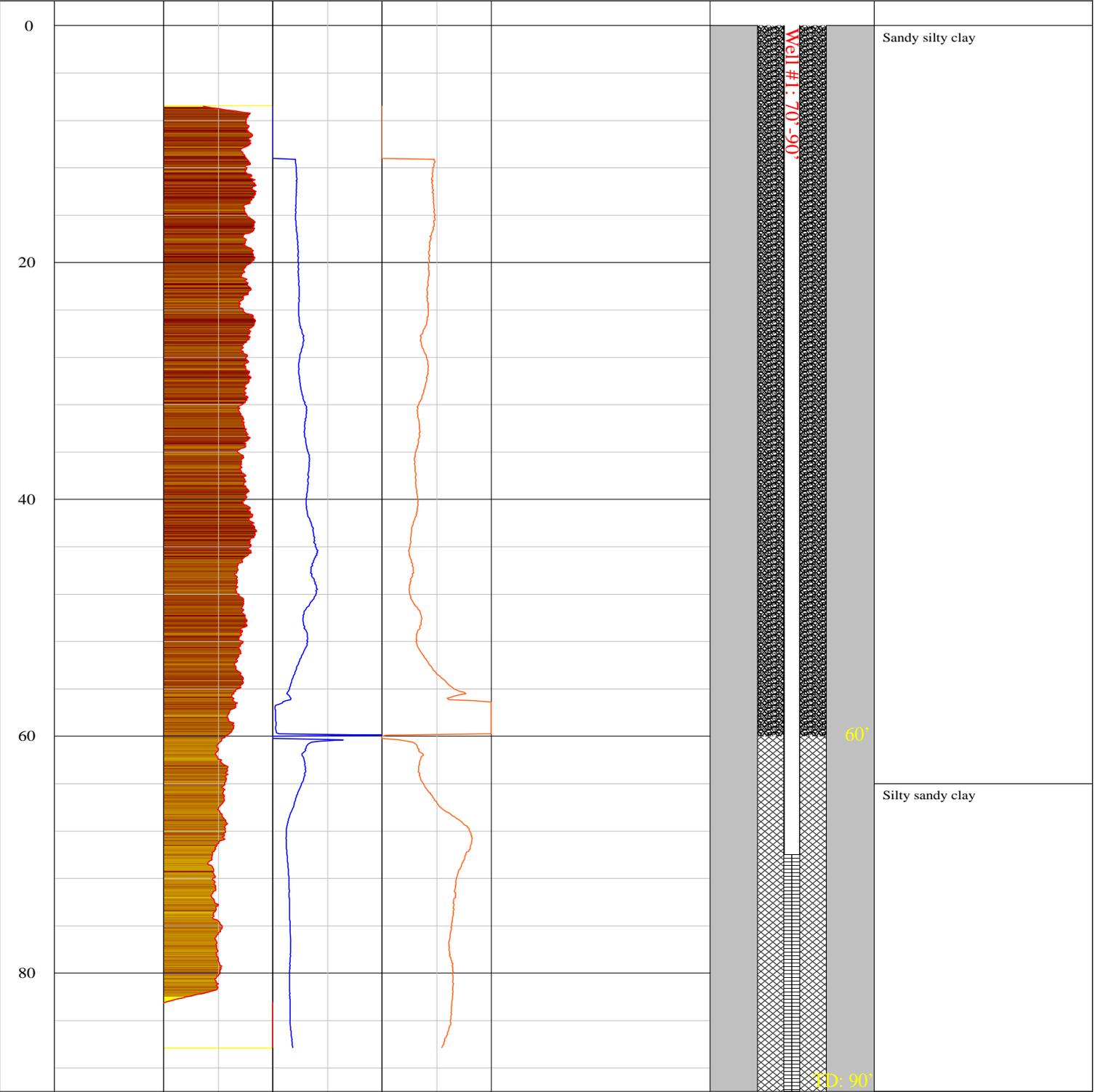
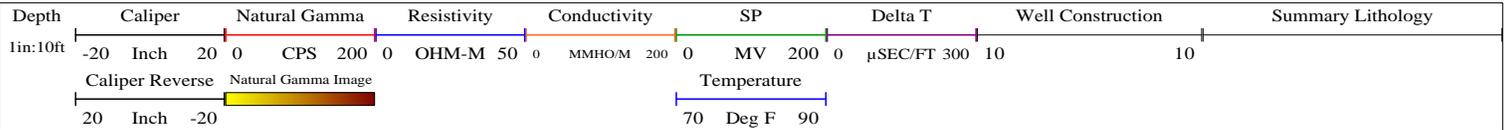
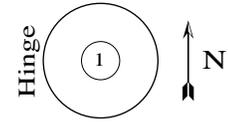
WELL OWNER: County of Santa Barbara

BOREHOLE FILL KEY

SAND GROUT SCREEN PELLETS CHIPS CEMENT

Water Level (01/04/2018)

#1: 69.82' b/s



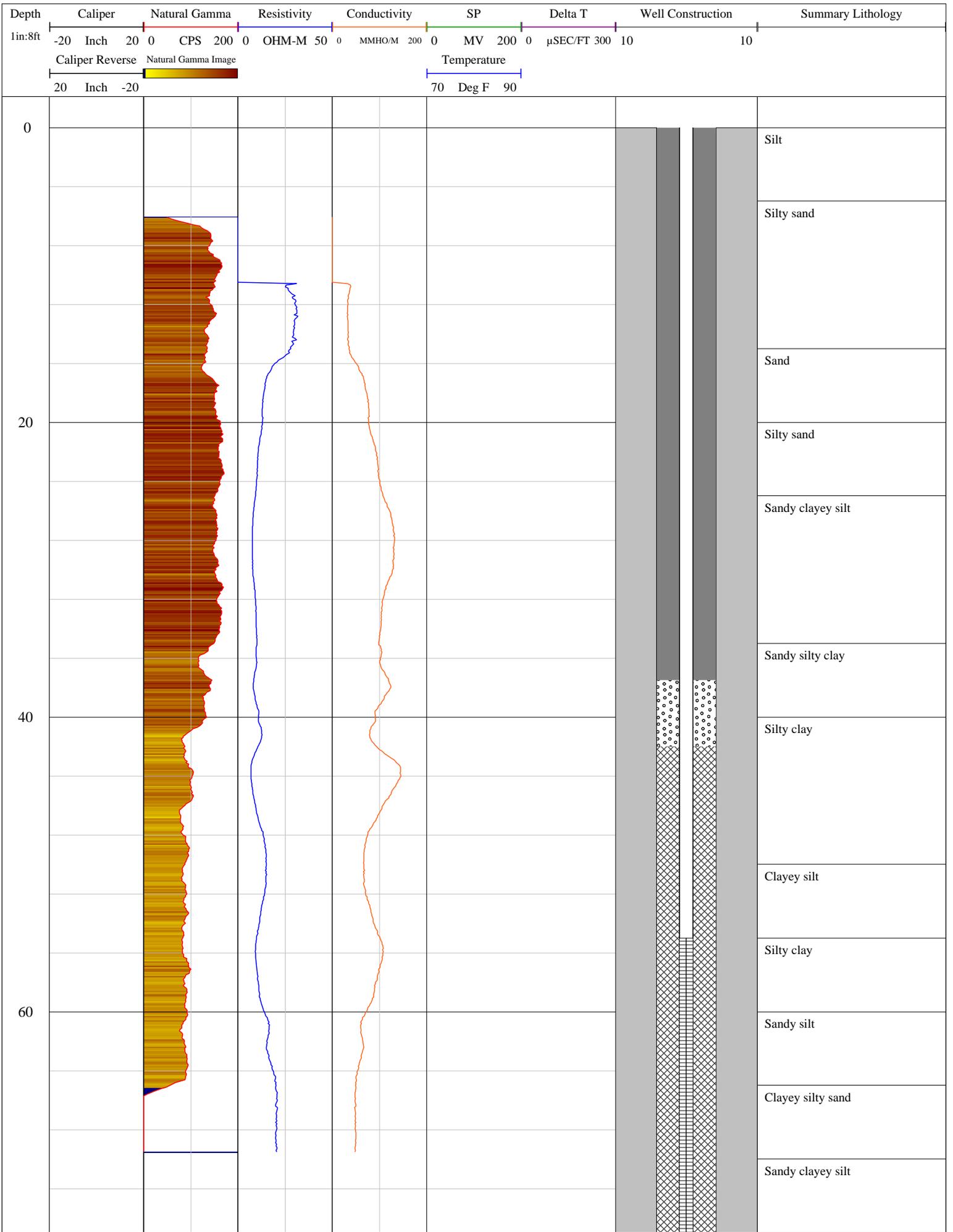
| | | |
|---|--|---------------------------------|
| DRILLER: USGS Research Drilling Program | DRILL TYPE: Auger | WELL FINISH: 10" Steel Monument |
| CASING TYPE: 2" Schedule 80 PVC, 20' Sections | SCREEN TYPE: 2" Schedule 80 PVC →1.30" X 0.020" Slot | |
| BOREHOLE DIA.: 8.5": 0'-90' | FILTER PACK: CEMEX #3 Monterey Sand | |
| SEALS: Baroid EZ-SEAL (granular) 50'-60', Baroid HOLEPLUG (3/8" grade) 0'-50' | | |

Table ____. Lithologic AUGER log for multiple well monitoring site SAHG

| Depth (ft) | Description |
|-------------------|---|
| 5 | Silt (z); silt with trace fine to coarse sand and clay; well sorted; black (2.5Y 2.5/1) |
| 10 | Silty sand (zS); fine to coarse sand with silt and trace clay and granules to very large pebbles; moderately sorted; sub-angular to sub-rounded; very dark gray (2.5Y 3/1) |
| 15 | Silty sand (zS); fine to medium sand with silt and trace clay and coarse sand and granules; moderately to well sorted; sub-angular to sub-rounded; very dark grayish brown (10YR 3/2) |
| 20 | Sand (S); medium sand with trace coarse sand and granules; well sorted; sub-angular to sub-rounded; grayish brown (2.5Y 5/2) |
| 25 | Silty sand (zS); fine to medium sand and silt with trace coarse sand, clay and granules; moderately sorted; sub-angular to sub-rounded; dark grayish brown (2.5Y 4/2) |
| 30 | Sandy clayey silt (sM); silt and clay with fine to medium sand; moderately sorted; very dark gray (2.5Y 3/1) |
| 35 | Sandy clayey silt (sM); silt and clay with very fine to medium sand; moderately to poorly sorted; very dark grayish brown (2.5Y 3/2) |
| 40 | Sandy silty clay (sM); clay and silt with very fine to medium sand; moderately to poorly sorted; very dark grayish brown (2.5Y 3/2) |
| 45 | Silty clay (M); clay and silt with trace fine to medium sand; moderately sorted; very dark grayish brown (2.5Y 3/2) |
| 50 | Silty clay (M); clay and silt with trace fine to medium sand and granules; moderately sorted; very dark grayish brown (2.5Y 3/2) |
| 55 | Clayey silt (M); silt and clay with trace fine to medium sand; moderately to well sorted; very dark grayish brown (2.5Y 3/2) |
| 60 | Silty clay (M); clay and silt with trace very fine to fine sand and granules; well sorted; very dark grayish brown (2.5Y 3/2) |
| 65 | Sandy silt (sZ); silt with fine to medium sand and trace clay; moderately to well sorted; dark grayish brown (2.5Y 4/2) |
| 70 | Clayey silty sand (mS); fine to medium sand with silt and minor clay; moderately to well sorted; sub-angular to sub-rounded; dark grayish brown (2.5Y 4/2) |

Table ____. Lithologic AUGER log for multiple well monitoring site SAHG

| Depth (ft) | Description |
|-------------------|---|
| 75 | Sandy clayey silt (sM); silt with clay and fine to medium sand; moderately sorted; olive brown (2.5Y 4/3) |



USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SALA

PROJECT:

PROJECT CHIEF: David O'Leary

ELEV: 607'

LOCATION: N34°44'37" W120°16'17"

LOGGED BY: David O'Leary, Adam Kjos, Chris Kohel

DRILLED BY: USGS RDP

RIG TYPE: Auger

LAG METHOD: N/A

| Depth | Time (min) | Rig noise etc. | Color (Munsell soil) | Cones mud EC | Graphic | Description and other observations | Bit size, & Rice time |
|-------|-------------------------|----------------|----------------------|--------------|---------|--|-----------------------|
| | | | | | | | |
| 5' | 10:03 10:04 10:13 | | 10YR 3/3 | | | Gravelly Sandy silt, v.f. - v. crs sand (dom v.f. - med sand) w/ gran. - v. lg Peb. | 8.5" |
| 10' | 10:18 10:26 | | 10YR 4/2 | | | Silty Sand grave. Coars. rg Peb. v.f. - v. crs Sand and s. t. | |
| 15' | 10:30 10:38 | | 10YR 4/2 | | | Sand - clay. Clay w/ silt v.f. - v. crs Sand and trace gran. - silt Peb.; v. firm | |
| 20' | 10:43 10:47 | | 10YR 4/3 | | | Sandy clay. Clay w/ silt, v.f. - v. crs Sand and trace gran. - silt; v. firm clay | |
| 25' | 10:50 10:53 | | 10YR 5/3 | | | Sandy silt; silt - v. crs Sand (dom v.f. - med sand), sh. clay and tr. gran. - silt Peb. | |
| 30' | 10:56 10:59 | Soft | 10YR 5/3 | | | Gravel and clay silt. Clay, v.f. - v. crs Sand and gran. - rg Peb. | |
| 35' | 11:02 11:11 | | 10YR 5/3 | | | Light gray sand and gravel. Clay w/ silt, v.f. - v. crs Sand and trace clay. | |
| 40' | 11:13 11:16 | | 10YR 5/3 | | | Sand s. t. Clay. Clay w/ silt, v.f. - v. crs Sand and trace gran. - rg Peb. clay | |
| 45' | 11:18 11:21 | | 10YR 5/3 | | | Silt and clay. Clay w/ silt, v.f. - v. crs Sand and gran. - lg Peb. | |
| 50' | 11:22 11:29 | | 10YR 5/3 | | | Slightly gray sand and gravel. Clay w/ silt, v.f. - v. crs Sand and trace clay. | |
| 55' | 11:31 11:35 | | 10YR 5/3 | | | Slightly gray sand and gravel. Clay w/ silt, v.f. - v. crs Sand and trace clay. | |
| 60' | 11:39 11:46 | | 10YR 4/3 | | | Slightly gray sandy silt. Clay w/ silt, v.f. - v. crs Sand and trace clay. | |
| 65' | 11:48 11:49 | Full | 10YR 4/3 | | | Silty Clay; clay w/ silt, v.f. - v. crs Sand and trace gran. - med Peb.; s. t. | |
| 70' | 11:48 11:53 | | 10YR 4/3 | | | Silty Clay; clay w/ silt, v.f. - v. crs Sand and trace gran. - med Peb.; s. t. | |
| 75' | 11:55 12:37 | | 10YR 4/3 | | | Silty Clay; clay w/ silt, v.f. - v. crs Sand and trace gran. - med Peb.; s. t. | |
| 80' | 12:39 12:42 | | 10YR 5/3 | | | Silty Clay; clay w/ silt, v.f. - v. crs Sand and trace gran. - med Peb.; s. t. | |
| 85' | 12:44 12:47 | | 10YR 5/3 | | | Silty Clay; clay w/ silt, v.f. - v. crs Sand and trace gran. - med Peb.; s. t. | |
| 90' | 12:50 | | 10YR 5/3 | | | Silty Clay; clay w/ silt, v.f. - v. crs Sand and trace gran. - med Peb.; s. t. | TD - 91' |

9/02/22/11

USGS MONITORING WELL DRILLING AND LITHOLOGIC LOG

COMMON WELL NAME: SALS PROJECT: GC.17.ZG00.FUVS2.00 PROJECT CHIEF: David O'Leary
 ELEV: LOCATION: San Antonio Creek CA LOGGED BY: C. Kohel A. Kjos D. O'Leary
 DRILLED BY: USGS RDP RIG TYPE: Luger LAG METHOD: N/A (augers)

11/20/
2016

| Depth | Time (min) | Rig noise etc. | Color (Munsell - soil) | Cones EC | Graphic | Description and other observations | Bit size, & Rice time |
|-------|------------|----------------|------------------------|-------------|---------|--|-----------------------|
| | 11:00 | | | | | | |
| 5' | 11:20 | None | 7.5YR 2.5/1 | | | (SM); Clay w/ silt, v.f. sand and trace granule - small pebbles Organic rich black clay; Cohesive clay | 8.5" |
| 10' | 11:30 | None | 7.5YR 3/1 | | | (SM); Clay w/ silt, v.f. sand, and trace granule - small pebbles Organic rich dark gray clay; Cohesive clay | |
| 15' | 11:37 | None | 7.5YR 3/1 | | | (SM); Clay w/ silt and v. fine - coarse sand; Organic rich clay; Cohesive clay | |
| 20' | 11:47 | None | 10YR 3/2 | | | (ZC); Clay w/ silt and trace - minor v.f. - medium sand; v. Cohesive clay | |
| 25' | 11:57 | None | 10YR 4/2 | | | (ZC); Clay w/ silt, trace - minor v.f. - coarse sand and trace granules; v. Cohesive clay | |
| 30' | 12:05 | None | 7.5YR 4/1 | | | (SM); Clay w/ silt, v.f. - v. coarse sand and trace granules - small pebbles; v. Cohesive clay | |
| 35' | 12:12 | None | 10YR 3/2 | | | (SM); Clay w/ silt, v.f. - coarse sand and trace granules, v. Cohesive clay | |
| 40' | 12:18 | None | 2.5Y 3/1 | | | (ZC); Clay w/ silt, minor v. fine - coarse sand and trace granules; Adhesive clay | |
| 45' | 12:24 | None | 5Y 3/1 | | | (ZC); Clay w/ silt and minor v.f. - coarse sand; Adhesive clay | |
| 50' | 12:30 | None | 5Y 3/1 | | | (ZC); Clay w/ silt and minor v.f. - medium sand; Adhesive clay | |
| 55' | 12:35 | None | 5Y 3/1 | | | (ZC); Clay w/ silt and minor v.f. - medium sand; Adhesive clay | |
| 60' | 12:40 | None | 5Y 3/1 | | | (ZC); Clay w/ silt and minor v.f. - medium sand; Adhesive clay | |

Brown clay ↑
gray clay ↓

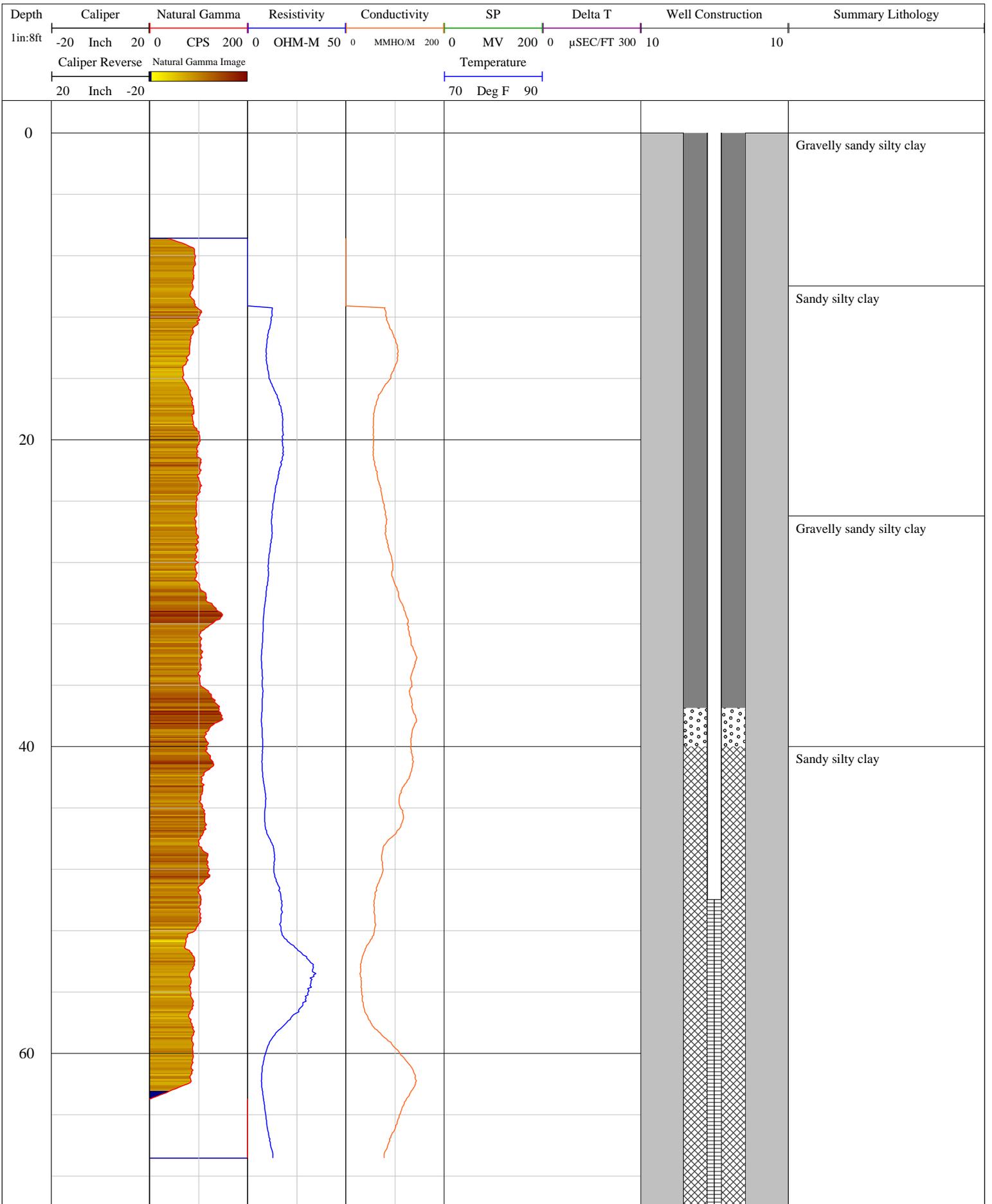
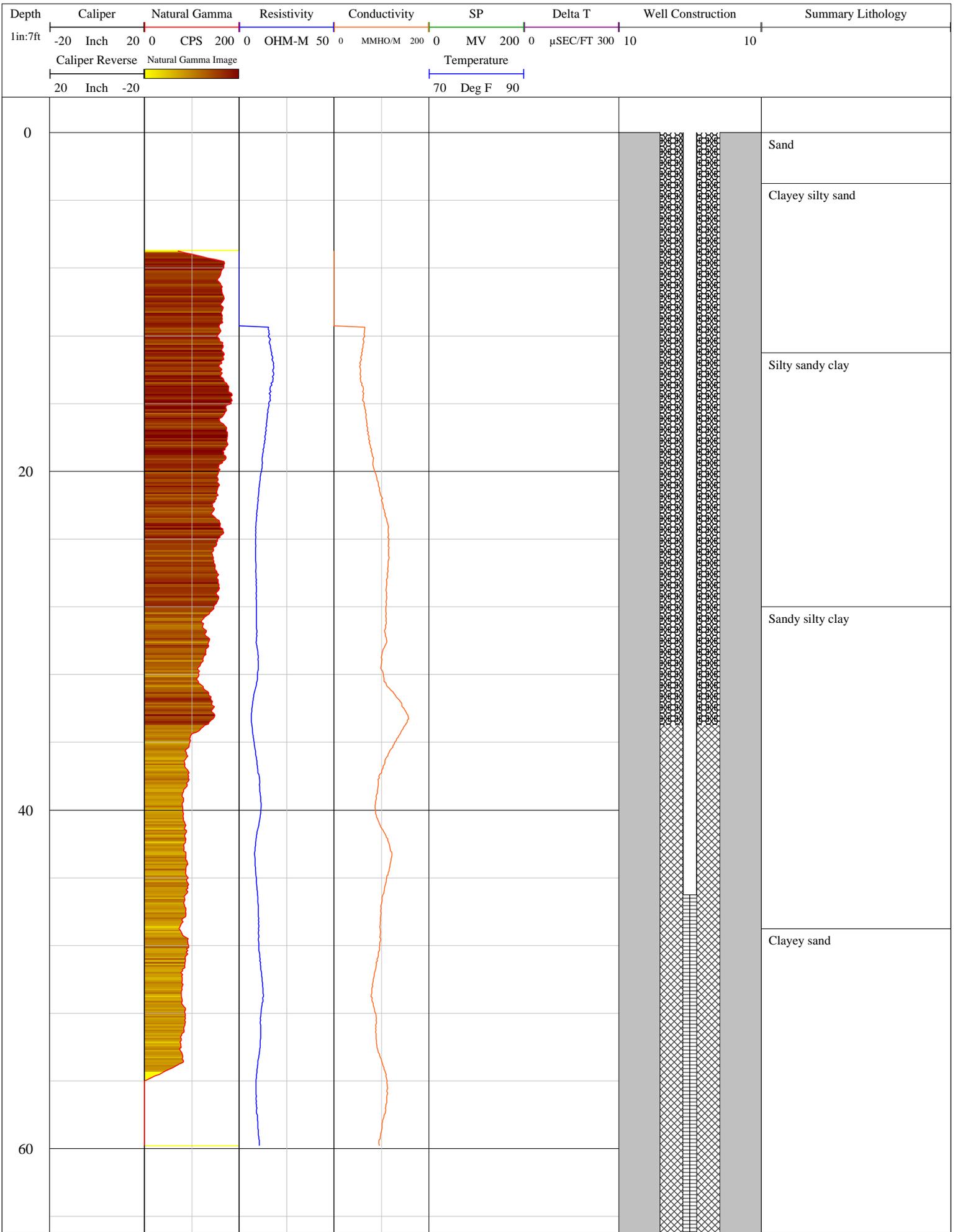


Table ____. Lithologic AUGER log for multiple well monitoring site SASA

| Depth (ft) | Description |
|------------|---|
| 5 | Sandy clayey silt (sM); clay and silt with very fine to medium sand and trace gravel; moderately sorted; very dark gray (2.5Y 3/1) |
| 10 | Sandy silty clay (sM); clay and silt with minor very fine to fine sand and trace coarse sand and gravel; moderately sorted; black (2.5Y 2.5/1) |
| 15 | Sandy silty clay (sM); clay and silt with minor very fine to fine sand; moderately sorted; black (2.5Y 2.5/1) |
| 20 | Sandy silty clay (sM); clay and silt with minor very fine to fine sand; moderately sorted; black (2.5Y 2.5/1) |
| 25 | Sandy silty clay (sM); clay and silt with minor very fine sand and trace gravel; well sorted; black (2.5Y 2.5/1) |
| 30 | Clayey silt (M); silt and clay with trace very fine sand; well sorted; very dark grayish brown (2.5Y 3/2) |
| 35 | Clayey silt (M); silt and clay with trace very fine to coarse sand; well sorted; very dark grayish brown (2.5Y 3/2) |
| 40 | Clayey silt (M); silt and clay with trace very fine to medium sand; well sorted; black (2.5Y 2.5/1) |
| 45 | Sandy clayey silt (sM); silt and clay with minor very fine to fine sand; moderately sorted; dark grayish brown (2.5Y 4/2) |
| 50 | Sandy silt (sZ); silt with very fine sand; well sorted; olive brown (2.5Y 4/3) |
| 55 | Sandy silt (sZ); silt with minor very fine sand; well sorted; dark olive brown (2.5Y 3/3); slightly calcareous |
| 60 | Silt (Z); silt with trace very fine sand; well sorted; olive brown (2.5Y 4/3); slightly to moderately calcareous |
| 65 | Sandy silt (sZ); silt with very fine to fine sand and trace coarse sand; moderately to well sorted; light olive brown (2.5Y 5/3); slight to moderately calcareous; poor returns |
| 65 bit | Sandy silt (sZ); silt with very fine to fine sand and trace coarse sand and gravel; moderately to well sorted; dark grayish brown (2.5Y 4/2); slightly to moderately calcareous |



APPENDIX D-7

SWRCB DDW and ILRP Monitoring and Reporting

Management Practice Implementation and Assessment

8. Dischargers must implement management practices and assessment, as necessary, to improve and protect water quality, protect beneficial uses, achieve compliance with applicable water quality objectives, achieve the numeric targets, numeric interim quantifiable milestones, and numeric limits established in this Order. Management practices implementation and assessment must be documented in the appropriate section of the Farm Plan (e.g., irrigation and nutrient management practices and assessment must be documented in the INMP section of the Farm Plan). Dischargers must report on management practice implementation and assessment in the ACF, as described in the MRP.

CEQA Mitigation Measure Implementation, Monitoring, and Reporting

9. Impacts and mitigation measures identified in CEQA Mitigation Monitoring and Reporting Program are set forth in the Final Environmental Impact Report (FEIR) at Appendix D, which is incorporated by reference. Mitigation measures identified in the FEIR for this Order and required to be implemented as described in Appendix D, will substantially reduce environmental effects of the project. The mitigation measures included in this Order have eliminated or substantially lessened all significant effects on the environment, where feasible. Where noted, some of the mitigation measures are within the responsibility and jurisdiction of other public agencies. Such mitigation measures can and should be adopted, as applicable, by those other agencies.
10. Dischargers must report on mitigation measure implementation electronically in the Annual Compliance Form (ACF), as described in the MRP. Draft mitigation monitoring and reporting is available for review in the FEIR.

Part 2, Section C.1. Groundwater Protection

1. Dischargers may not be subject to all provisions of **Part 2, Section C.1** if they are members in good standing with the third-party alternative compliance pathway program included within **Part 2, Section C.2**.

Phasing

2. Ranches are assigned the Groundwater Phase Area of the groundwater basin where the ranch is located based on the relative level of water quality and beneficial use impairment and risk to water quality. All ranches are assigned a Groundwater Phase Area of 1, 2, or 3. Groundwater Phase 1 areas represent greater water quality impairment and higher risk to water quality relative to Groundwater Phase 2 and 3 areas.

3. The requirements and implementation schedules for groundwater protection are based on the groundwater phase areas, listed in [Table C.1-1](#) and shown on the maps in [Figure C.1-1](#).
4. In the event that a ranch spans multiple Groundwater Phase areas, the ranch will be assigned the earlier phase. For example, a ranch that spans both Groundwater Phase 1 and Groundwater Phase 2 areas will be assigned to Groundwater Phase 1.
5. The Groundwater Phase Area assigned to each ranch will be displayed on the ranch eNOI in GeoTracker.

Irrigation and Nutrient Management Plan

6. Dischargers must develop and implement an Irrigation and Nutrient Management Plan (INMP) that addresses both groundwater and surface water. This section applies to the groundwater related INMP requirements and the surface water related INMP requirements are contained within [Part 2, Section C.3](#) of this Order. The INMP is a section of the Farm Plan and must be maintained in the Farm Plan and submitted to the Central Coast Water Board upon request. Summary information from the INMP must be submitted in the INMP Summary report. At a minimum, the elements of the INMP related to groundwater protection must include:
 - a. Monitoring and recordkeeping necessary to submit complete and accurate reports, including the ACF, Total Nitrogen Applied (TNA) report, and INMP Summary report.
 - b. Planning and management practice implementation and assessment that results in compliance with the fertilizer nitrogen application limits in [Table C.1-2](#) and the nitrogen discharge targets and limits in [Table C.1-3](#).
 - c. Descriptions of all irrigation, nutrient, and salinity management practices implemented and assessed on the ranch.
 - d. When INMP certification is required, e.g., as a follow-up action or as a consequence for not meeting the quantifiable milestones and time schedules below, the INMP certification shall include the following:

The person signing this Irrigation and Nitrogen Management Plan (INMP) certifies, under penalty of law, that the INMP was prepared under his/her direction and supervision, that the information and data reported is to the best of his/her knowledge and belief, true, accurate, and complete, and that he/she is aware that there are penalties for knowingly submitting false information. The qualified professional signing the INMP may rely on the

information and data provided by the Discharger and is not required to independently verify the information and data.

The qualified professional signing the INMP below further certifies that he/she used sound irrigation and nitrogen management planning practices to develop irrigation and nitrogen application recommendations and that the recommendations are informed by applicable training to minimize nitrogen loss to surface water and groundwater. The qualified professional signing the INMP is not responsible for any damages, loss, or liability arising from subsequent implementation of the INMP by the Discharger in a manner that is inconsistent with the INMP's recommendations for nitrogen application. This certification does not create any liability or claims for environmental violations.

Qualified professional certification:

"I, _____, certify this INMP in accordance with the statement above."

_____ (Signature)

The discharger additionally agrees as follows:

"I, _____, Discharger, have provided information and data to the certifier above that is, to the best of my knowledge and belief, true, accurate, and complete, that I understand that the certifier may rely on the information and data provided by me and is not required to independently verify the information and data, and that I further understand that the certifier is not responsible for any damages, loss, or liability arising from subsequent implementation of the INMP by me in a manner that is inconsistent with the INMP's recommendations for nitrogen application. I further understand that the certification does not create any liability for claims for environmental violations."

Quantifiable Milestones and Time Schedules

7. As shown in **Table C.1-2**, the fertilizer nitrogen application limits go into effect during the second year of the this Order (December 31, 2023).
8. As shown in **Table C.1-3**, the nitrogen discharge targets go in to effect during the second year of this Order (December 31, 2023) and nitrogen discharge limits go in to effect during the fifth year of this Order (December 31, 2027).

Fertilizer Nitrogen Application Limits

9. Dischargers must not apply fertilizer nitrogen (A_{FER}) at rates greater than the limits in **Table C.1-2**. Compliance with fertilizer nitrogen application limits is assessed for each specific crop reported in the TNA report or INMP Summary report.

Nitrogen Discharge Targets and Limits

10. This Order requires Dischargers to submit information on nitrogen applied (A) and nitrogen removed (R). This Order also establishes nitrogen discharge targets and limits based on the calculation of nitrogen applied minus nitrogen removed ($A-R$) using the formulas below. Nitrogen must not be discharged at rates greater than the targets and limits in **Table C.1-3**. Compliance with nitrogen discharge targets and limits is assessed annually for the entire ranch in the INMP Summary report through one of the **three compliance pathways** shown below. Compliance with all pathways is not required.

Compliance Pathway 1:

$$A_{FER} + (C \times A_{COMP}) + (O \times A_{ORG}) + A_{IRR} - R = \text{Nitrogen Discharge}$$

OR

Compliance Pathway 2:

$$A_{FER} + (C \times A_{COMP}) + (O \times A_{ORG}) = R$$

OR

Compliance Pathway 3:

$$A_{FER} + (C \times A_{COMP}) + (O \times A_{ORG}) - R = \text{Nitrogen Discharge}$$

In all formulas, $R = R_{HARV} + R_{SEQ} + R_{SCAVENGE} + R_{TREAT} + R_{OTHER}$

- a. A_{FER} is the amount of fertilizer nitrogen applied in pounds per acre.
- b. C is the compost discount factor used to represent the amount of compost nitrogen mineralized during the year that the compost was applied.
- c. A_{COMP} is the total amount of compost nitrogen applied in pounds per acre.
- d. O is the organic fertilizer discount factor used to represent the amount of nitrogen mineralized during the first 12 weeks in the year it was applied.
- e. A_{ORG} is the total amount of organic fertilizer or amendment nitrogen applied in pounds per acre.

- f. **A_{IRR}** is the amount of nitrogen applied in the irrigation water estimated from the volume required for crop evapotranspiration (ET) in pounds per acre.
 - g. **R** is the amount of nitrogen removed from the field through harvest, sequestration, or other removal methods, in pounds per acre.
 - h. **R_{HARV}** is the amount of nitrogen removed from the field through harvest or other removal of crop material.
 - i. **R_{SEQ}** is the amount of nitrogen removed from the field through sequestration in woody materials of permanent or semi-permanent crops.
 - j. **R_{SCAVENGE}** is the amount of nitrogen removed from the field through nitrogen scavenging cover crops and/or nitrogen scavenging high carbon amendments during the wet/rainy season.
 - k. **R_{TREAT}** is the amount of nitrogen removed from the ranch through a quantifiable treatment method (e.g., bioreactor).
 - l. **R_{OTHER}** is the amount of nitrogen removed from the ranch through other methods not previously quantified.
11. The Central Coast Water Board encourages the use of irrigation water nitrogen as a method of reducing the amount of fertilizer nitrogen applied to crops. The use of irrigation water nitrogen is typically referred to as “pump and fertilize” and is incentivized through compliance pathway 2 and 3 in [Table C.1-3](#). The amount of irrigation water nitrogen is not used in the compliance calculation in these compliance pathways. The amount of irrigation water nitrogen must be reported regardless of the compliance pathway.
12. The Central Coast Water Board encourages the use of compost to improve soil health, nutrient and carbon sequestration, and water holding capacity consistent with the state’s Healthy Soils Initiative. All compost nitrogen (**A_{COMP}**) applied to the ranch must be reported in the TNA report or INMP Summary report; however, the use of compost is incentivized through the option for Dischargers to use a compost “discount” factor (**C**). Dischargers may use the compost discount factor provided by the Central Coast Water Board in the MRP or may determine their own discount factor. The discounted compost nitrogen must, at a minimum, represent the amount of compost mineralized during the year the compost was applied to the ranch. If the Discharger uses their own compost discount factor, they must maintain records of the method used to determine the compost discount factor in the Farm Plan, and these records must be submitted to the Central Coast Water Board upon request.
13. The Central Coast Water Board encourages the use of organic fertilizers and amendments to improve soil health, nutrient and carbon sequestration, and water holding capacity consistent with the state’s Healthy Soils Initiative. All organic fertilizer and amendment nitrogen (**A_{ORG}**) applied to the ranch must be reported in the TNA report or INMP Summary report; however, the use of organic fertilizers and amendments is incentivized through the option for Dischargers to

use an organic fertilizer “discount” factor (**O**). Dischargers may use the organic fertilizer discount factor associated with the products C:N ratio, provided by the Central Coast Water Board in the MRP. The discounted organic fertilizer nitrogen must, at a minimum, represent the amount of organic fertilizer mineralized during the first 12 weeks the organic fertilizer was applied to the ranch. The Discharger must maintain records of the organic products used and their associated C:N ratios in the Farm Plan, and these records must be submitted to the Central Coast Water Board upon request. The following products are not eligible to receive an organic fertilizer discount: a) products with no organic compounds (long chain carbon) molecules, such as conventional fertilizer, slow release fertilizers, b) products that do not depend on microbial mineralization to release nitrogen to mineral form to make it available for crop uptake, c) products without C:N ratio information available, and d) organic liquid fertilizers that are in the liquid and/or emulsified form.

14. The amount of **crop material** removed through harvest or other methods (**R_{HARV}**) must be calculated using the formula described below. Dischargers must either use the crop-specific conversion coefficient values found in the MRP or develop their own conversion coefficient values following the approved method in the MRP. If Dischargers develop their own conversion coefficient, they must maintain information on the method used in the Farm Plan, and these records must be submitted to the Central Coast Water Board upon request.

R_{HARV} = Conversion Coefficient x Material Removed

- a. The **Conversion Coefficient** is a crop-specific coefficient used to convert from units of material removed per acre to units of nitrogen removed per acre.
 - b. **Material Removed** is the amount of nitrogen-containing material removed from the field, in units of pounds per acre.
15. The amount of nitrogen removed through **sequestration** in woody material of permanent or semi-permanent crops (**R_{SEQ}**) must be estimated by the Discharger. Dischargers must maintain records detailing how they estimated the amount of nitrogen sequestered in their permanent crops. These records must be maintained in the Farm Plan and submitted to the Central Coast Water Board upon request.
16. The Central Coast Water Board encourages Dischargers to implement best management practices that reduce nitrogen leaching in the wet/rainy season. Dischargers may claim a nitrogen scavenging credit (**R_{SCAVENGE}**) provided by the Central Coast Water Board in the MRP, one time per year for each ranch acre where nitrogen scavenging cover crops or nitrogen scavenging high carbon amendments are utilized during the wet/rainy season. The total acres receiving

the nitrogen scavenging credit may not exceed the ranch acres. Dischargers electing to claim the nitrogen scavenging credit must ensure that their cover crop and/or high carbon amendment best management practice meets the definitions of a nitrogen scavenging cover crop and/or nitrogen scavenging high carbon amendment, as noted in the MRP and Definitions. Substantiating records for this credit must be maintained in the Farm Plan and submitted to the Central Coast Water Board upon request.

17. The Central Coast Water Board encourages Dischargers to develop and implement innovative methods for removing nitrogen from the environment to improve water quality. Dischargers may use treatment methods (e.g., bioreactors) to remove nitrogen from groundwater or surface water and may count this towards their nitrogen removal (**R**) value if they are able to quantify the amount of nitrogen removed from ranch discharge to groundwater or surface water. This quantified removal through treatment or other innovative methods must be reported as **R_{TREAT}**. Dischargers electing to account for this nitrogen removal must monitor the volume and concentration of water entering and exiting their treatment system and calculate the amount of nitrogen removed. These records must be maintained in the Farm Plan and submitted to the Central Coast Water Board upon request.
18. If Dischargers remove additional nitrogen through means other than removing crop material (**R_{HARV}**), sequestration (**R_{SEQ}**), scavenging credit (**R_{SCAVENGE}**), or treatment methods (**R_{TREAT}**), they must quantify and report this additional removal as **R_{OTHER}**. Dischargers must maintain records detailing how they calculated **R_{OTHER}**. These records must be maintained in the Farm Plan and submitted to the Central Coast Water Board upon request.
19. The discharge of nitrogen in excess of the nitrogen discharge **targets** in [Table C.1-3](#) may result in additional requirements, including obtaining additional education, INMP certification by a qualified professional, implementing additional or improved management practices, and increased monitoring and/or reporting.
20. The discharge of nitrogen in excess of the nitrogen discharge **limits** in [Table C.1-3](#) may result in additional requirements, including obtaining additional education, INMP certification by a qualified professional, implementing additional or improved management practices, increased monitoring and reporting, and/or progressive enforcement actions.
21. Dischargers who apply more fertilizer nitrogen (**A_{FER}**) than the fertilizer nitrogen application limits in [Table C.1-2](#) to any specific crop **and** who are able to demonstrate compliance with the **final** nitrogen discharge limits, as shown in [Table C.1-3](#), are exempt from the fertilizer nitrogen application limit.

22. Dischargers who can quantifiably demonstrate that their ranches pose no threat to surface water quality or groundwater quality may submit a technical report to the Executive Officer for review. If approved, the Discharger is not required to conduct the nitrogen application (**A**) or removal (**R**) monitoring and reporting or to submit the INMP Summary report, regardless of what Groundwater Phase area the ranch is in. The technical report must demonstrate that nitrogen applied at the ranch does not percolate below the root zone in an amount that could degrade groundwater and does not migrate to surface water through discharges, including drainage, runoff, or sediment erosion. Dischargers must provide the Executive Officer with annual updates to confirm that the exemption is still applicable. Failure to provide sufficient annual updates confirming that the exemption is still applicable will result in an immediate reinstatement of the requirement to submit the INMP Summary report for applicable Dischargers. Dischargers electing to use this approach are still eligible to participate in the third-party alternative compliance pathway for groundwater protection.
23. Dischargers who can quantifiably demonstrate that their ranch is achieving the **final** nitrogen discharge limits, as shown in **Table C.1-3**, are not required to submit the nitrogen removal (**R**) reporting in the INMP Summary report, regardless of what Groundwater Phase area the ranch is in. Example situations where this may apply include participation in an approved third-party program that certifies that the Discharger is meeting the final discharge limit and will continue to do so for the duration of the Discharger's participation in the approved third-party program, or by submitting a technical report, subject to Executive Officer review, that quantifies the amount of nitrogen discharge based on the volume and nitrogen concentration of all discharges from the ranch. In these situations, confirmation of membership in the approved third-party program or Executive Officer approval of a submitted technical report constitute compliance with the nitrogen removed (**R**) reporting requirement in the INMP Summary report. This exemption only applies to removal (**R**) in the INMP Summary report; all other requirements, including the TNA report, still apply as described in this Order. Dischargers must provide the Executive Officer with annual updates to confirm that the exemption is still applicable. Failure to provide sufficient annual updates confirming that the exemption is still applicable will result in an immediate reinstatement of the requirement to submit the nitrogen removal (**R**) reporting information in the INMP Summary report for applicable Dischargers. Dischargers electing to use this approach are still eligible to participate in the third-party alternative compliance pathway for groundwater protection.
24. Dischargers, groups of dischargers or commodity groups who can quantify the amount of nitrogen discharged from their ranch or for specific crops or via specific management practices by directly monitoring it at the points of discharge can propose an alternative monitoring methodology to comply with the nitrogen

discharge targets and limits, in lieu of using the A-R compliance formulas. Example situations where this may apply includes greenhouse, nursery, container production or intensive crop production where irrigation and drain water is captured and allows for direct monitoring of discharges. For these types of situations, it may be easier to monitor nitrogen discharge than to calculate the amount of nitrogen removed at harvest for each one of the many different crops and plants being grown. Dischargers must submit a request to the Executive Officer with a technical report of the methodology proposed to quantify nitrogen discharges. The methodology must include enough information to quantify the amount of nitrogen discharged and confirm compliance with the nitrogen discharge targets and limits, as shown in [Table C.1-3](#) or [Table C.2-2](#) (for Dischargers participating in the Third-Party Alternative Compliance Pathway Program for Groundwater Protection described in [Part 2, Section C.2](#)). Acceptable methodologies must include direct measurements of the volume and nitrogen concentration of the water discharged from each ranch per acre and year. Executive Officer approval of the method(s) must be granted before the discharger begins reporting nitrogen discharge based on the proposed methodology. Dischargers who obtain Executive Officer approval to directly monitor their nitrogen discharge from their ranches will not be required to submit nitrogen removal (R) reporting in the INMP Summary report. Dischargers electing to use this approach are still eligible to participate in the third-party alternative compliance pathway program for groundwater protection.

25. The initial 2027 nitrogen discharge limits, as shown in [Table C.1-3](#) will be re-evaluated based on Discharger reported nitrogen applied and removed data, new science, and management practice implementation and assessment before becoming effective.

Monitoring and Reporting

26. Dischargers must report on management practice implementation and assessment electronically in the **ACF**, as described in the MRP.
27. Dischargers must record and report total nitrogen applied to all crops grown on the ranch, electronically in the TNA report form, as described in the MRP.
28. Dischargers must track and record the following elements of the INMP Summary report that are not included in the TNA report: total nitrogen removed from the ranch and information on irrigation water application and discharge volumes. Dischargers must submit this information electronically in the INMP Summary report form as described in the MRP.
29. The INMP Summary report contains the same nitrogen application information as the TNA report, plus additional information related to nitrogen removed and irrigation management. **Therefore, the INMP Summary report satisfies the**

TNA report requirement and an additional TNA report is not required to be submitted when the INMP Summary report is submitted to the Central Coast Water Board.

30. Dischargers must conduct **irrigation well monitoring and reporting prior to the start of groundwater quality trend monitoring and reporting**, either individually or as part of a third-party effort, as described in the MRP.
31. Dischargers must conduct **on-farm domestic well monitoring and reporting**, either individually or as part of a third-party effort, as described in the MRP.
32. Dischargers must conduct **groundwater quality trend monitoring and reporting**, either individually or as part of a third-party effort, as described in the MRP. This requirement applies to all Dischargers enrolled in this Order, regardless of how many wells are currently present on their ranch.
 - a. Dischargers who elect to perform groundwater quality trend monitoring and reporting as part of a **third-party** effort must form or join a third-party. The third-party must submit a work plan for Executive Officer review by the dates and covering the areas specified in the MRP unless it is associated with the Third-Party Alternative Compliance Pathway for Groundwater Protection described in **Part 2, Section C.2**. The work plan must be approved by the Executive Officer prior to implementation. Once approved by the Executive Officer, the work plan must be implemented.
 - b. Dischargers who elect to perform groundwater quality trend monitoring and reporting individually must submit a work plan for Executive Officer review, by the date specified in the MRP, based on their ranch location. The work plan must be approved by the Executive Office prior to implementation. The work plan must describe how the ranch-level groundwater quality trend monitoring program will evaluate groundwater quality trends over time and assess the impacts of agricultural discharges on groundwater quality. Once approved by the Executive Officer, the work plan must be implemented. Dischargers without a well on their property may comply with individual ranch-level groundwater quality trend monitoring and reporting requirements by implementing one of the options specified in the MRP.
33. When required by the Executive Officer based on groundwater quality data or significant and repeated exceedance of the nitrogen discharge targets or limits, Dischargers must complete **ranch-level groundwater discharge monitoring and reporting**, either individually or as part of a third-party effort as described in the MRP. Water Board staff will coordinate with Dischargers prior to the Executive Officer invoking this requirement to determine if non-compliance is the result of unforeseen or uncontrollable circumstances and to provide the Discharger with 90-day advanced notice of the forthcoming requirement. When ranch-level groundwater discharge monitoring and reporting is required, a work

plan, including a SAP and QAPP, must be submitted for Executive Officer review prior to implementation. Once approved by the Executive Officer, the work plan must be implemented. Ranch-level groundwater discharge monitoring may be discontinued with the approval of the Executive Officer when the Discharger comes into compliance with the nitrogen discharge targets or limits, or the discharge has otherwise ceased.

Part 2, Section C.2. Third-Party Alternative Compliance Pathway for Groundwater Protection

1. Dischargers that are members in good standing in the third-party alternative compliance pathway program are subject to the provisions of this **Part 2, Section C.2**, unless otherwise stated. For purposes of this section, such Dischargers are referred to as “participating Dischargers.”

Participating dischargers:

- a. Are not subject to fertilizer nitrogen application limits in **Table C.1-2**, which are enforceable by the Central Coast Water Board.
 - b. Are not subject to nitrogen discharge limits in **Table C.1-3**, which are enforceable by the Central Coast Water Board.
 - c. Are subject to targets, which if exceeded result in consequences outlined in this **Part 2, Section C.2**.
 - d. Are not subject to ranch-level groundwater discharge monitoring and reporting.
 - e. Are generally provided more time to achieve fertilizer nitrogen application targets and nitrogen discharge targets, relative to non-participating dischargers.
2. Prior to the initiation of the work plan process outlined below and in the MRP for this third-party alternative compliance pathway program, entities wishing to implement the third-party alternative compliance pathway program described in this **Part 2, Section C.2** must submit a third-party alternative compliance pathway program proposal consistent with the third-party program requirements outlined in **Part 2, Section A** of this Order, as well as the request for proposal process and associated third-party program expectations document forthcoming after Order adoption. For purposes of this section, the entity approved to implement the third-party alternative compliance pathway is referred to as the approved third-party alternative compliance pathway program administrator.
 3. Participating Dischargers must develop and implement an Irrigation and Nutrient Management Plan (INMP) that addresses groundwater. The INMP is a section of the Farm Plan and must be maintained in the Farm Plan and submitted to the Central Coast Water Board upon request. Summary information from the INMP must be submitted in the INMP Summary report. At a minimum, the elements of

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§64310. Reduction of Fees for Public Water Systems Serving Disadvantaged Community.

(a) A public water system must pay the full amount of the annual fee unless it requests and receives from the State Board a determination that its annual fees are reduced because it is a community water system that serves a disadvantaged community in which case the fee to be paid is the amount for a disadvantaged community as shown in Table 64305-A.

(b) To qualify for the reduction provided for in subsection (a), a public water system must certify, and provide documentation to the State Board upon request, that it serves a disadvantaged community.

§64315. Payment of Fees

(a) Each fee required by this chapter shall be paid to the State Board within forty five (45) calendar days of the date of the invoice, except that this date may be extended by the State Board for good cause, which shall be determined at the State Board's sole discretion.

CHAPTER 15. DOMESTIC WATER QUALITY AND MONITORING REGULATIONS

Article 1. Definitions

§64400. Acute Risk.

"Acute risk" means the potential for a contaminant or disinfectant residual to cause acute health effects, i.e., death, damage or illness, as a result of a single period of exposure of a duration measured in seconds, minutes, hours, or days.

§64400.05. Combined Distribution System.

"Combined distribution system" means the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

§64400.10. Community Water System.

"Community water system" means a public water system which serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents.

§64400.20. Compliance Cycle.

"Compliance cycle" means the nine-year calendar year cycle during which public water systems shall monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar year cycle began January 1, 1993 and ends December 31, 2001; the second begins January 1, 2002 and ends December 31, 2010; the third begins January 1, 2011 and ends December 31, 2019.

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§64400.25. Compliance Period.

“Compliance period” means a three-year calendar year period within a compliance cycle. Within the first compliance cycle, the first compliance period runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999 to December 31, 2001.

§64400.28. Confluent Growth.

“Confluent growth” means a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

§64400.29. Consecutive System.

“Consecutive system” means a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

§64400.30. Customer.

“Customer” means a service connection to which water is delivered by a community water system or a person that receives water from a nontransient-noncommunity water system for more than six months of the year.

§64400.32. Detected.

“Detected” means at or above the detection limit for purposes of reporting (DLR).

§64400.34. Detection Limit for Purposes of Reporting (DLR).

“Detection limit for purposes of reporting (DLR)” means the designated minimum level at or above which any analytical finding of a contaminant in drinking water resulting from monitoring required under this chapter shall be reported to the State Board.

§64400.36. Dual Sample Set.

“Dual sample set” means a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5.

§64400.38. Enhanced Coagulation.

“Enhanced coagulation” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

§64400.40. Enhanced Softening.

“Enhanced softening” means the improved removal of disinfection byproduct precursors by precipitative softening.

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§64400.41. Finished Water.

“Finished water” means the water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as treatment necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

§64400.42. Fluoridation.

“Fluoridation” means the addition of fluoride to drinking water to achieve an optimal level, pursuant to Section 64433.2, that protects and maintains dental health.

§64400.45. GAC10.

“GAC10” means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of once every 180 days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with the TTHM and HAA5 MCLs monitored pursuant to section 64534.2(d) shall be once every 120 days.

§64400.46. GAC20.

“GAC20” means granular activated carbon filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of once every 240 days.

§64400.47. Haloacetic Acids (Five) or HAA5.

“Haloacetic acids (five)” or “HAA5” means the sum of the concentrations in milligrams per liter (mg/L) of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

§64400.50. Initial Compliance Period.

“Initial compliance period” means the first full three-year compliance period which began January 1, 1993, for existing systems. For new systems, the “initial compliance period” means the period in which the State Board grants the permit.

§64400.60. Initial Finding.

“Initial finding” means the first laboratory result from a water source showing the presence of an organic chemical listed in §64444, Table 64444-A.

§64400.65. IOC.

“IOC” means inorganic chemical.

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§64400.66. Locational Running Annual Average or LRAA.

“Locational running annual average” or “LRAA” means the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

§64400.67. Maximum Residual Disinfectant Level or MRDL.

“Maximum residual disinfectant level” or “MRDL” means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

§64400.70. MCL.

“MCL” means maximum contaminant level.

§64400.80. Nontransient-noncommunity Water System.

“Nontransient-noncommunity water system” means a public water system that is not a community water system and that regularly serves at least the same 25 persons over 6 months per year.

§64400.90. Operational Evaluation Levels or OEL.

“Operational evaluation level” or “OEL” means the sum of the two previous quarters’ TTHM results plus twice the current quarter’s TTHM result, divided by 4 to determine an average; or the sum of the two previous quarters’ HAA5 results plus twice the current quarter’s HAA5 result, divided by 4 to determine an average.

§64401. Repeat Compliance Period.

“Repeat compliance period” means any subsequent compliance period after the initial compliance period.

§64401.10. Repeat Sample.

“Repeat sample” means a required sample collected following a total coliform-positive sample.

§64401.20. Replacement Sample.

“Replacement sample” means a sample collected to replace an invalidated sample.

§64401.30. Routine Sample.

“Routine sample” means a bacteriological sample the water supplier is required to collect on a regular basis, or one which the supplier is required to collect for a system not in compliance with Sections 64650 through 64666 when treated water turbidity exceeds 1 nephelometric turbidity unit (NTU), pursuant to §64423(b).

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§64401.40. Sanitary Survey.

“Sanitary survey” means an on-site review of a public water system for the purpose of evaluating the adequacy of the water source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

§64401.50. Significant Rise in Bacterial Count.

“Significant rise in bacterial count” means an increase in coliform bacteria, as determined in §64426, when associated with a suspected waterborne illness or disruption of physical works or operating procedures.

§64401.55. SOC.

“SOC” means synthetic organic chemical.

§64401.60. Standby Source.

“Standby source” means a source which is used only for emergency purposes pursuant to §64414.

§64401.65. SUVA.

“SUVA” means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of a water. It is calculated by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

§64401.70. System with a Single Service Connection.

“System with a single service connection” means a system which supplies drinking water to consumers via a single service line.

§64401.71. Tier 1 Public Notice.

“Tier 1 public notice” means a public notice issued in response to the events listed in subsection 64463.1(a) and in the manner specified in subsections 64463.1(b) and (c).

§64401.72. Tier 2 Public Notice.

“Tier 2 public notice” means a public notice issued in response to the events listed in section 64463.4(a) and in the manner specified in subsections 64463.4(b) and (c).

§64401.73. Tier 3 Public Notice.

“Tier 3 public notice” means a public notice issued in response to the events listed in section 64463.7(a) and in the manner specified in subsections 64463.7(b), and (c) or (d).

§64401.75. Too Numerous to Count.

“Too numerous to count” means that the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

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§64401.80. Total Coliform-positive.

“Total coliform-positive” means a sample result in which the presence of total coliforms has been demonstrated.

§64401.82. Total Organic Carbon or TOC.

“Total organic carbon” or “TOC” means total organic carbon reported in units of milligrams per liter (mg/L), as measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

§64401.85. Transient-noncommunity Water System.

“Transient-noncommunity water system” means a public water system that is not a community water system or a nontransient-noncommunity water system.

§64401.90. Treatment.

“Treatment” means physical, biological, or chemical processes, including blending, designed to affect water quality parameters to render the water acceptable for domestic use.

§64401.92. Total Trihalomethanes or TTHM.

“Total Trihalomethanes” or “TTHM” means the sum of the concentrations in milligrams per liter (mg/L) of the trihalomethane compounds (bromodichloromethane, bromoform, chloroform, and dibromochloromethane), rounded to two significant figures after addition.

§64401.95. VOC.

“VOC” means volatile organic chemical.

§64402. Vulnerable System.

“Vulnerable system” means a water system which has any water source which in the judgment of the State Board, has a risk of containing an organic contaminant, based on an assessment as set forth in §64445(d)(1).

§64402.10. Water Source.

“Water source” means an individual groundwater source or an individual surface water intake. Sources which have not been designated as standby sources shall be deemed to be water sources.

§64402.20. Water Supplier.

“Water supplier”, “person operating a public water system” or “supplier of water” means any person who owns or operates a public water system. These terms will be used interchangeably in this chapter.

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(a) “Wholesale water supplier,” or “wholesaler” means any person who treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

(b) “Retail water supplier,” or “retailer” means

(1) Any person who owns or operates any distribution facilities and any related collection, treatment, or storage facilities under the control of the operator of the public water system which are used primarily in connection with the public water system; or

(2) Any person who owns or operates any collection or pretreatment storage facilities not under the control of the operator of the public water system which are used primarily in connection with the public water system.

§64402.30. Wholesale System.

“Wholesale system” means a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

Article 2. General Requirements

§64412. Determination of Persons Served.

(a) The number of persons served by a community water system shall be determined by the water system using one of the following methods:

(1) Utilizing the most recent United States census data, or more recent special census data certified by the California Department of Finance, for the service area served by the water system;

(2) Multiplying the number of service connections served by the water system by 3.3 to determine the total population served;

(3) Determining the total number of dwelling units or efficiency dwelling units as defined in the Uniform Building Code (Title 24, California Code of Regulations), the number of mobile home park spaces and the number of individual business, commercial, industrial and institutional billing units served by the water system and multiplying this total by 2.8 to arrive at the total population served by the system.

(b) Each community water system shall report to the State Board annually the number of persons and the number of service connections served by the system using the procedures set forth in subsection (a).

§64413.1. Classification of Water Treatment Facilities.

(a) Each water treatment facility shall be classified pursuant to Table 64413.1-A based on the calculation of total points for the facility using the factors specified in subsection (b).

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**Table 64413.1-A.
Water Treatment Facility Class Designations**

| <i>Total Points</i> | <i>Class</i> |
|---------------------|--------------|
| Less than 20 | T1 |
| 20 through 39 | T2 |
| 40 through 59 | T3 |
| 60 through 79 | T4 |
| 80 or more | T5 |

(b) The calculation of total points for each water treatment facility shall be the sum of the points derived in each of paragraphs (1) through (13). If a treatment facility treats more than one source, the source with the highest average concentration of each contaminant shall be used to determine the point value in paragraphs (2) through (5).

(1) For water source, the points are determined pursuant to Table 64413.1-B.

**Table 64413.1-B.
Points for Source Water Used by the Facility**

| <i>Type of source water used by the facility</i> | <i>Points</i> |
|---|---------------|
| Groundwater and/or purchased treated water meeting primary and secondary drinking water standards, as defined in § 116275 of the Health and Safety Code | 2 |
| Water that includes any surface water or groundwater under the direct influence of surface water | 5 |

(2) For influent microbiological water quality, points shall be determined by using the median of all total coliform analyses completed in the previous 24 months pursuant to Table 64413.1-C:

**Table 64413.1-C.
Influent Water Microbiological Quality Points**

| <i>Median Coliform Density Most Probable Number Index (MPN)</i> | <i>Points</i> |
|---|---------------|
| less than 1 per 100 mL | 0 |
| 1 through 100 per 100 mL | 2 |
| greater than 100 through 1,000 per 100 mL | 4 |
| greater than 1,000 through 10,000 per 100 mL | 6 |
| greater than 10,000 per 100 mL | 8 |

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(3) For facilities treating surface water or groundwater under the direct influence of surface water, points for influent water turbidity shall be determined pursuant to Table 64413.1-D on the basis of the previous 24 months of data, except that if turbidity data is missing for one or more of the months, the points given for turbidity shall be 5. The maximum influent turbidity sustained for at least one hour according to an on-line turbidimeter shall be used unless such data is not available, in which case, the maximum influent turbidity identified by grab sample shall be used. For facilities that have not been in operation for 24 months, the available data shall be used. For facilities whose permit specifies measures to ensure that influent turbidity will not exceed a specified level, the points corresponding to that level shall be assigned.

**Table 64413.1-D.
Influent Water Turbidity Points**

| <i>Maximum Influent Turbidity Level Nephelometric Turbidity Units (NTU)</i> | <i>Points</i> |
|---|---------------|
| Less than 15 | 0 |
| 15 through 100 | 2 |
| Greater than 100 | 5 |

(4) The points for influent water perchlorate, nitrate, or nitrite levels shall be determined by an average of the three most recent sample results, pursuant to Table 64413.1-E.

**Table 64413.1-E.
Influent Water Perchlorate, Nitrate, and Nitrite Points**

| <i>Perchlorate, Nitrate, and Nitrite Data Average</i> | <i>Points</i> |
|--|---------------|
| Less than or equal to the maximum contaminant level (MCL), as specified in Table 64431-A | 0 |
| For each contaminant greater than its MCL | 5 |

(5) The points for other influent water contaminants with primary MCLs shall be a sum of the points for each of the inorganic contaminants (Table 64431-A), organic contaminants (Table 64444-A) and radionuclides (Tables 64442 and 64443). The points for each contaminant shall be based on an average of the three most recent sample results, pursuant to Table 64413.1-F. If monitoring for a contaminant has been waived pursuant to sections 64432(m) or (n), 64432.2(c), or 64445(d), the points shall be zero for that contaminant.

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**Table 64413.1-F.
Influent Water Chemical and Radiological Contaminant Points**

| <i>Contaminant Data Average</i> | <i>Points</i> |
|---------------------------------|---------------|
| Less than or equal to the MCL | 0 |
| Greater than the MCL | 2 |
| 5 Times the MCL or greater | 5 |

(6) The total points for surface water filtration treatment shall be the sum of the points of those treatment processes utilized by the facility for compliance with section 64652, pursuant to Table 64413.1-G.

**Table 64413.1-G.
Points for Surface Water Filtration Treatment**

| <i>Treatment</i> | <i>Points</i> |
|---|---------------|
| Conventional, direct, or inline | 15 |
| Diatomaceous earth | 12 |
| Slow sand, membrane, cartridge, or bag filter | 8 |
| Backwash recycled as part of process | 5 |

(7) The points for each treatment process utilized by the facility and not included in paragraph (6) that is used to reduce the concentration of one or more contaminants for which a primary MCL exists, pursuant to Table 64431-A, Table 64444-A, and Tables 64442 and 64443, shall be 10. Blending shall only be counted as a treatment process if one of the blended sources exceeds a primary MCL.

(8) The points for each treatment process not included in paragraphs (6), or (7) that is used to reduce the concentration of one or more contaminants for which a secondary MCL exists, pursuant to Tables 64449-A and 64449-B, shall be 3. Blending shall only be counted as a treatment process if one of the blended sources exceeds a secondary MCL.

(9) The points for each treatment process not included in paragraphs (6), (7), or (8) that is used for corrosion control or fluoridation shall be 3.

(10) The total points for disinfection treatment shall be the sum of the points for those treatment processes utilized by the facility for compliance with section 64654(a), pursuant to Table 64413.1-H.

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**Table 64413.1-H.
Points for Disinfection Treatment**

| <i>Treatment Process</i> | <i>Points</i> |
|----------------------------|---------------|
| Ozone | 10 |
| Chlorine and/or chloramine | 10 |
| Chlorine dioxide | 10 |
| Ultraviolet (UV) | 7 |

(11) The points for disinfection/oxidation treatment not included in paragraphs (6), (7), (8), or (10) shall be a sum of the points for all the treatment processes used at the facility pursuant to Table 64413.1-I.

**Table 64413.1-I.
Points for Disinfection/Oxidation Treatment without Inactivation Credit**

| <i>Treatment Process</i> | <i>Points</i> |
|----------------------------|---------------|
| Ozone | 5 |
| Chlorine and/or chloramine | 5 |
| Chlorine dioxide | 5 |
| Ultraviolet (UV) | 3 |
| Other oxidants | 5 |

(12) The points for any other treatment process that alters the physical or chemical characteristics of the drinking water and that was not included in paragraphs (6), (7), (8), (9), (10), or (11) shall be 3.

(13) The points for facility flow shall be 2 per million gallons per day or fraction thereof of maximum permitted treatment facility capacity, up to a maximum of 50 points; except that for facilities utilizing only blending, the points shall be based on the flow from the contaminated source and the dilution flow required to meet the MCL(s) specified in Tables 64431-A, 64444-A, 64449-A, 64449-B, and Tables 64442 and 64443.

§64413.3. Classification of Distribution Systems.

(a) The distribution system for each community and nontransient- noncommunity water system shall be classified pursuant to Table 64413.3-A unless modified pursuant to subsection(b). For a wholesaler, the population served shall include the customers served by its retailers.

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**Table 64413.3-A.
Distribution System Classifications**

| <i>Population Served</i> | <i>Class</i> |
|--------------------------|--------------|
| 1,000 or less | D1 |
| 1,001 through 10,000 | D2 |
| 10,001 through 50,000 | D3 |
| 50,001 through 5 million | D4 |
| Greater than 5 million | D5 |

(b) The class determined pursuant to (a) shall be upgraded by one level if the population served is 5 million or less and the sum of all the points from paragraphs (1) through (6) exceeds 20.

(1) The points for pressure zones shall be zero for up to three zones, 4 for four to ten zones, or 6 for more than ten zones.

(2) The points for disinfectants used shall be zero if no disinfectant is applied in the distribution system and no more than one type of disinfectant residual is entering the distribution system. The points shall be 5 if a single disinfectant or ammonia is applied in the distribution system. The points shall be 8 if there are multiple disinfectants in the system.

(3) The points based on the largest single pump in the system for which the distribution operator is responsible shall be 4 for up to fifty horsepower, or 6 for fifty or more horsepower.

(4) The points for distribution storage reservoirs in the system shall be 4 for one to five reservoirs, or 6 for greater than five.

(5) The points for one or more existing uncovered distribution reservoirs shall be 10.

(6) The points to be added if any of the distribution system customers are also served by a non-potable water distribution system shall be 6. This does not apply to wholesalers if the only customers receiving non-potable water are served by its retailers.

§64413.5. Treatment Facility Staff Certification Requirements.

(a) Each water supplier shall designate at least one chief operator that meets the requirements specified in §63765 for each water treatment facility utilized by the water system.

(b) Each water supplier shall designate at least one shift operator that meets the requirements specified in §63765 for each water treatment facility utilized by the water system for each operating shift.

(c) Except as provided in (d), a chief operator or shift operator shall be on-site at all times that the facility is operating.

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(d) If the water supplier's operations plan, submitted and approved pursuant to §64661, demonstrates an equal degree of operational oversight and reliability with either unmanned operation or operation under reduced operator certification requirements, the chief operator or shift operator is not required to be on-site, but shall be able to be contacted within one hour.

(e) If there is no change in the treatment facility and the employed shift and/or chief operators, the water supplier shall be in compliance until January 1, 2003 with the shift and operator certification requirements that were in effect on December 31, 2000. If the water system employs a new shift and/or chief operator, that operator shall meet the certification requirements pursuant to §63765(a).

§64413.7. Distribution System Staff Certification Requirements.

(a) Each water supplier shall designate at least one chief operator that meets the requirements specified in §63770 for each distribution system utilized by the water system.

(b) Each water supplier shall designate at least one shift operator that meets the requirements specified in §63770 for each distribution system utilized by the water system for each operating shift.

(c) The chief operator or shift operator shall be on-site or able to be contacted within one hour.

§64414. Standby Sources.

(a) A source which has been designated "standby" shall be monitored a minimum of once every compliance cycle for all inorganic, organic, and radiological MCLs, unless a waiver has been granted by the State Board pursuant to Section 64432(m) or (n) for inorganics, Section 64432.2(c) for asbestos, or Section 64445(d) for organics.

(b) A standby source which has previous monitoring results indicating nitrate or nitrite levels equal to or greater than 50 percent of the MCL shall collect and analyze a sample for nitrate and nitrite annually. In addition, upon activation of such a source, a sample shall be collected, analyzed for these chemicals and the analytical results reported to the State Board within 24 hours of activation.

(c) A standby source shall be used only for short-term emergencies of five consecutive days or less, and for less than a total of fifteen calendar days a year.

(d) Within 3 days after the short-term emergency use of a standby source, the water supplier shall notify the State Board. The notification shall include information on the reason for and duration of the use.

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(e) The status of a designated standby source shall not be changed to that of a regular source of drinking water supply, unless the source meets all existing drinking water standards and approval is obtained from the State Board in advance.

(f) A standby source for which perchlorate has been previously detected shall have a sample collected and analyzed for perchlorate annually. Additionally, upon activation of such a source, a sample shall be collected and analyzed for perchlorate, and the analytical result shall be reported to the State Board within 48 hours of activation.

§64415. Laboratory and Personnel.

(a) Except as provided in subsection (b), required analyses shall be performed by laboratories certified by the State Board to perform such analyses pursuant to Article 3, commencing with section 100825, of Chapter 4 of Part 1 of Division 101, Health and Safety Code. Unless directed otherwise by the State Board, analyses shall be made in accordance with U.S. EPA approved methods as prescribed at 40 Code of Federal Regulations parts 141.21 through 141.42, 141.66, and 141.89.

(b) Sample collection, and field tests including color, odor, turbidity, pH, temperature, and disinfectant residual shall be performed by personnel trained to perform such sample collections and/or tests by:

- (1) The State Board;
- (2) A laboratory certified pursuant to subsection (a); or
- (3) An operator, certified by the State Board pursuant to section 106875(a) or (b) of the Health and Safety Code and trained by an entity in paragraph (1) or (2) to perform such sample collections and/or tests.

§64416. Sampling Plan for all Monitoring Except Bacteriological.

(a) Each public water system serving contiguous areas totaling more than 10,000 service connections shall submit a plan to the State Board for monitoring the quality of water.

(1) This plan shall be supported by analytical, hydrological and geological data, and may be developed in cooperation with other agencies or water suppliers.

(2) Constituents to be addressed in the plan shall include inorganic chemicals, organic chemicals, trihalomethanes, radioactivity, general minerals and general physical parameters.

(3) Sampling of certain wells on a rotating basis may be included in the plan if the water supplier is able to demonstrate with analytical, hydrological and geological data that those wells are producing similar quality water from the same aquifer.

(4) The water supplier shall submit an updated plan to the State Board at least once every ten years or at any time the plan no longer ensures representative monitoring of the system.

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Article 2.5. Point-of-Use Treatment

§64417. Definitions.

“Point-of-use treatment device” or “POU” means a treatment device applied to a single tap for the purpose of reducing contaminant levels in drinking water at that tap.

§64418. General Provisions.

(a) Except for a proposed new community water system that does not have a domestic water supply permit, a public water system that meets the requirements of Health and Safety Code section 116380(a) may be permitted to use POUs in lieu of centralized treatment for the purpose of complying with one or more maximum contaminant levels or action levels in this Title, other than for microbial contaminants, volatile organic chemicals, organic chemicals that pose an inhalation risk, or radon, and as allowed under the state and federal Safe Drinking Water Acts, if:

(1) the public water system meets the requirements of this Article and any applicable statutory requirements;

(2) the public water system has:

(A) applied for funding from any federal, state, or local agency to correct the system's violations, and

(B) demonstrated to the State Board that centralized treatment for achieving compliance is not immediately economically feasible, as defined in section 64418.1;

(3) the public water system has applied for a permit or permit amendment to use POUs. The duration of the permit or permit amendment issued will be in accordance with Health and Safety Code section 116552;

(4) for a community water system, following a public hearing, the State Board determines pursuant to section 64418.6 that there is no substantial community opposition;

(5) the public water system has a State Board-approved:

(A) POU Treatment Strategy, as defined in section 64418.3,

(B) POU Operations and Maintenance Program, as defined in section 64418.4,

and

(C) POU Monitoring Program, as defined in section 64418.5; and

(6) the public water system ensures that each building and each dwelling unit connected to the public water system has a POU installed pursuant to this Article.

(b) With State Board approval and without having to meet the requirement of paragraph (a)(6), a public water system may utilize POUs in lieu of centralized treatment for the purpose of reducing contaminant levels, other than microbial contaminants, volatile organic chemicals, or radon, to levels at or below one or more of the maximum contaminant levels or action levels in this Title, in the water it supplies to some or all of the persons it serves, but the public water system will not be deemed in compliance without meeting the requirement of paragraph (a)(6). A public water system's application for a permit to utilize POUs pursuant to this subsection may include a request that one or more of the requirements of this article be amended or eliminated to address

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the public water system's specific utilization, and such request may be granted or denied by the State Board.

(c) Funding for centralized treatment is available when funding for centralized treatment, from any source, is received by, or otherwise placed under control of, the public water system.

(d) As used in this article, the estimated cost for both centralized treatment and POU treatment shall be the complete life cycle cost for a similar period of time.

§64418.1. Immediate Economic Feasibility of Centralized Treatment.

(a) To specifically meet the requirements of subparagraph 64418(a)(2)(B), a community water system, when comparing the costs of centralized treatment to the use of POU treatment, shall submit to the State Board information demonstrating that the:

(1) estimated annual cost of centralized treatment, per household, is more than one percent (1%) of the median household income (MHI) of the customers served by the community water system; and

(2) (A) if the community's annual MHI is equal to or less than the statewide annual MHI, the estimated annual cost of centralized treatment, per household, plus the median annual water bill from the most recent 12 months per household is more than 1.5 percent (1.5%) of the annual MHI of the customers served by the community water system, or

(B) if the community's annual MHI is greater than the statewide annual MHI, the estimated annual cost of centralized treatment, per household, plus the median annual water bill from the most recent 12 months per household is more than two percent (2%) of the annual MHI of the customers served by the community water system.

(b) A noncommunity water system shall submit to the State Board documents that demonstrate that centralized treatment is not immediately economically feasible.

§64418.2. POU Requirements.

(a) Each POU must:

(1) be independently certified in accordance with an American National Standard Institute (ANSI) standard that is applicable to the specific type of proposed POU and that adequately addresses a California drinking water standard; or

(2) be approved by the State Board upon determination that the proposed POU unit design, construction, treatment performance, and field or pilot test results can reliably produce water in compliance with California drinking water standards under local expected influent water quality and flow conditions;

(3) be owned, controlled, operated, and maintained by the public water system and/or a person(s) under contract with the public water system, to ensure proper operation, maintenance, monitoring, and compliance with this Article and applicable drinking water standards;

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(4) be equipped with a mechanical warning (e.g. alarm, light, etc.) that alerts users when a unit needs maintenance or is no longer operating in a manner that assures the unit is producing effluent meeting state and federal drinking water standards, unless the device is equipped with an automatic shut-off mechanism that prevents the flow of water under such circumstances; and

(5) be equipped with a totalizing flow meter if:

(A) the POU's treatment efficiency or capacity is volume limited; or

(B) if requested by the State Board following a determination that information about the quantity of water treated by the POU is necessary to assess POU efficiency.

(b) Except as provided in subsection (c), pilot testing shall be performed by the public water system, and/or a person(s) under contract with the public water system, on each proposed type of POU to establish its use limitations and operations and maintenance criteria, as well as verification that it will produce effluent that meets drinking water standards under local expected influent water quality and flow conditions. Pilot testing shall include the following steps:

(1) Prior to performing pilot testing, a pilot testing protocol shall be submitted to the State Board for review. The pilot testing protocol must be adequate to demonstrate that water treated by the POU will meet drinking water standards;

(2) Pilot testing for a POU shall be conducted in the manner and for the time period specified by the most current pilot testing protocol for that POU approved under section 64418.2(b)(1), and shall be conducted for no less than two months; and

(3) After completion of the pilot testing, the public water system shall submit a report to the State Board describing the results and findings of the pilot testing.

(c) The State Board may exempt a public water system from the pilot testing requirements in section 64418.2(b), or permit a reduced level of pilot testing required pursuant to subsection (b), if:

(1) the public water system demonstrates to the State Board that the POU's proposed for use have been tested, by the public water system or another person, under equivalent water quality and flow conditions; and

(2) the limitations, criteria, and effluent verification in subsection (b) can be ascertained and have been reported to the State Board.

§64418.3. POU Treatment Strategy.

(a) Prior to installing POU's, and as part of its permit application to use POU in lieu of centralized treatment, a public water system shall submit to the State Board a POU Treatment Strategy sufficient to reliably reduce levels of the contaminants listed in section 64418(a) and comply with drinking water standards. The POU Treatment Strategy shall include the following:

(1) A description of the compliance issues for which POU's are being proposed to address and how the use of POU's will achieve compliance;

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(2) A description of how the public water system will determine the type, number, and location of POU's to ensure a sufficient number of devices are installed for human consumption at each building and each dwelling unit connected to the public water system;

(3) The public water system's authority to require customers to accept POU's in lieu of centralized treatment and to take an action, such as discontinuing service, if a customer fails to accept POU's;

(4) The basis for the POU selection(s);

(5) The qualifications and identification of the person(s) responsible for POU installation, operation, maintenance, and water quality sampling and analyses;

(6) A Customer Education Program that includes information about the POU, how the devices work, required maintenance and monitoring, and the need for the person(s) responsible for the POU, as defined in paragraph (a)(5) of this section, to have access to the device to perform required maintenance and monitoring. The Customer Education Program shall be designed to reach all customers and shall be implemented prior to and following installation of POU's;

(7) The authority, ordinances, and/or access agreements adequate to allow the public water system's representatives access to customers' premises for POU installation, maintenance, and water quality monitoring, as well as the surveys necessary to meet paragraph (a)(2);

(8) Identification of applicable local regulatory requirements;

(9) A Consumer Notification Protocol designed to timely inform consumers, in the appropriate language(s), in the event that an installed POU fails to produce water that meets drinking water standards. The Consumer Notification Protocol shall include:

(A) an example of a notice that includes the requirements of Article 18 of this Title, and

(B) a plan for providing an alternative water supply that meets drinking water standards, consistent with section 64551.100 of this Title, in a quantity sufficient for daily household ingestion needs, to customers served by each installed POU not meeting drinking water standards. An alternative water supply shall be provided according to the following timeline;

1. as soon as possible, but no later than 24 hours following the receipt of results of confirmation samples indicating an MCL exceedance for nitrate, nitrite, nitrate plus nitrite, or perchlorate, or

2. as soon as possible, but no later than 7 days following the receipt of results of confirmation samples indicating an MCL exceedance for contaminants other than nitrate, nitrite, nitrate plus nitrite, or perchlorate;

(10) A Customer Notification Protocol for routine notifications that includes examples of notices, to be provided no less frequently than quarterly, in the appropriate language(s) to inform each customer and consumer:

(A) that only the taps for which POU's are installed provide water meeting drinking water standards, and

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(B) regarding the mechanical warning or shut-off mechanism required pursuant to paragraph 64418.2(a)(5), including a telephone number that connects the customer or consumer to water system personnel or recording system that shall be accessible by water system personnel 24 hours a day, seven days a week, for the purpose of providing the customer or consumer a reliable means of notifying personnel when the mechanical warning or shut-off mechanism is activated;

(11) The proposed schedules for:

(A) the distribution of public hearing information pursuant to section 64418.6,

(B) the public hearing required pursuant to section 64418.6,

(C) the distribution to customers of POU acceptance surveys pursuant to section 64418.6,

(D) POU installation, and

(E) the construction of centralized treatment; and

(12) An estimate of the percent of all customers within the public water system's service area who are expected to voluntarily allow installation of POU devices, as well as a description of how the public water system will address customers who do not.

(b) A public water system shall comply with the most current State Board-approved version of its POU Treatment Strategy at all times.

§64418.4. POU Operations and Maintenance (O&M) Program.

(a) Prior to installing POU's, and as part of its permit application to use POU in lieu of centralized treatment, a public water system shall submit to the State Board a POU Operations and Maintenance Program (O&M Program) sufficient to reliably reduce levels of the contaminants listed in section 64418(a) and comply with drinking water standards. The O&M Program shall include the following:

(1) An installation protocol that, at a minimum, describes locations and assurances that POU's will be accessible for operation and maintenance;

(2) The type and frequency of maintenance, at intervals specified by the manufacturer and determined by pilot testing, whichever is shorter, that ensures POU's produce effluent that meets drinking water standards;

(3) The number and type of auxiliary POU's and parts necessary to ensure continuous effective treatment;

(4) Replacement schedules for critical components and POU's necessary to ensure continuous effective treatment;

(5) The qualifications and identification of the person(s) responsible for POU installation, operation, and maintenance; and

(6) POU waste-handling and disposal procedures sufficient to ensure that wastes generated by the POU and the POU itself are properly and safely disposed of in accordance with federal, state and local requirements.

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(b) To ensure a POU is properly operating and has not been bypassed, POUs shall be inspected by the public water system no less often than every twelve months and when a POU's effluent is monitored pursuant to section 64418.5.

(c) Based on the on-going operation and maintenance of installed POUs, a public water system shall revise its POU O&M Program as necessary to ensure continuous effective treatment and that POUs produce effluent that meets drinking water standards. Revised POU O&M Programs shall be submitted to the State Board for review and may not be implemented without State Board approval, confirming that the revised POU O&M Program meets the requirements of this section.

(d) A public water system shall maintain a copy of, and at all times implement the most current State Board-approved version of its POU O&M Program.

§64418.5. POU Monitoring Program.

(a) Prior to installing POUs, and as part of its permit application to use POU in lieu of centralized treatment, a public water system shall submit to the State Board a POU Monitoring Program sufficient to ensure that water treated by the proposed POU consistently meet drinking water standards. The POU Monitoring Program shall include the following:

(1) source water monitoring – quarterly, with samples collected during the same month (first, second, or third) of each calendar quarter;

(2) POU effluent – initially, with samples collected as soon as possible but no later than 72 hours after a device is installed; and

(3) POU effluent – on-going following the monitoring in paragraph (a)(2), annually, with one twelfth of all units sampled monthly on a rotating basis. After completion of one year of monitoring, a public water system may alternatively monitor one quarter of all units each calendar quarter provided that monitoring results do not exceed 75 percent (75%) of a contaminant's MCL, and the water system submits a revised monitoring plan to the State Board. Water systems shall resume monthly monitoring if results exceed 75 percent (75%) of a contaminant's MCL.

(b) For a contaminant other than nitrate, nitrite, nitrate plus nitrite, or perchlorate, after no less than one year of monitoring conducted pursuant to subsection (a), a public water system may reduce the number of POU units monitored to no less than one third of all installed units per year such that all installed units are monitored no less frequently than once every three years, if all the results of the on-going monitoring conducted pursuant to paragraph (a)(3) do not exceed 75 percent (75%) of a contaminant's MCL, and the public water system submits a revised monitoring plan to the State Board.

(c) In accordance with subsections 64432.8(b) and 64445.2(b) of this Title, the State Board may require additional monitoring for the contaminant of concern or other contaminants, including microbial contaminants, if monitoring results indicate a potential

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health risk associated with the contaminant, POU technology, or a public water system's compliance with this Article.

(d) The public water system shall revise its POU Monitoring Program as necessary to ensure continuous effective treatment based on the on-going operation and maintenance of installed POU's or additional monitoring required pursuant to subsection (c). Revised POU Monitoring Programs shall be submitted to the State Board for review and may not be implemented without State Board approval confirming that the revised POU Monitoring Program meets the requirements of this section.

(e) The public water system shall maintain a copy of and implement the most current State Board-approved version of its POU Monitoring Program prepared pursuant to this section.

(f) If a POU effluent sample result exceeds an MCL for a contaminant other than nitrate, nitrite, nitrate plus nitrite, or perchlorate, the public water system shall:

(1) implement the public notification and alternative water procedures identified in its most recent State Board-approved POU Treatment Strategy; and

(2) collect a confirmation sample within seven days of notification of the exceedance. If the confirmation sample, or the average of the original and confirmation sample, exceeds the MCL, notify the State Board within 48 hours of the result, complete corrective actions as soon as possible but within one month of receipt of the result, and increase the monitoring frequency, as requested by the State Board to assess the effectiveness of the corrective actions.

(g) If a POU effluent sample result exceeds an MCL for nitrate, nitrite, nitrate plus nitrite, or perchlorate:

(1) implement the public notification and alternative water procedures identified in its most recent State Board-approved POU Treatment Strategy; and

(2) collect a confirmation sample within 72 hours of notification of the exceedance. If the confirmation sample, or the average of the original and confirmation sample, exceeds the MCL, notify the State Board within 24 hours of the result, continue to provide alternative water until the corrective actions have been confirmed to be effective, complete corrective actions as soon as possible but within one month of receipt of the result, and increase the monitoring frequency, as requested by the State Board to assess the effectiveness of the corrective actions.

§64418.6. Public Hearing and Acceptance.

(a) A community water system shall conduct a customer survey and participate in, and provide information for, a public hearing held by the State Board. At least 30 days prior to placing information into a public repository per paragraph (a)(2), the public water system shall submit a Public Acceptance Protocol to the State Board for review. The

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Public Acceptance Protocol must satisfy the following requirements in order to receive State Board approval:

- (1) Prior to conducting a customer survey, a community water system shall participate in and provide information for a public hearing that, at a minimum, disseminates the following to those in its service area:
 - (A) a description of the public water system's POU Treatment Strategy,
 - (B) a description of the adverse health effects, as specified in the appendices to section 64465, associated with the contaminant(s) of concern,
 - (C) a copy of those portions of the POU Operation and Maintenance Program and Monitoring Program that necessitates customer involvement,
 - (D) the estimate of any anticipated increase in water bills that may result from utilization of POU's, and
 - (E) the supporting documentation, assumptions, and calculations used to determine any anticipated increase in water bills proposed to be presented at the public hearing.
- (2) At least 30 days prior to the public hearing, the community water system shall place the information to be presented at the public hearing into a publicly accessible repository and notify the State Board and those in its service area of the date, time, and location of the public hearing, as well as the location and hours of operation of the repository. If the public water system serves multi-unit residential dwellings including, but not limited to, apartments and residential institutions, whether sub-metered or not, the public water system shall provide notice to each resident of such residential dwellings.
- (3) Following the public hearing, the community water system shall deliver a survey to each of its customers. The survey shall be delivered in a manner designed to reach each customer and in the language appropriate for communication with the customers. The survey shall consist of the following two choices:
 - (A) "I vote FOR the use of Point-of-Use treatment devices.", and
 - (B) "I vote AGAINST the use of Point-of-Use treatment devices."

(b) The community water system shall at all times comply with the most recent Public Acceptance Protocol approved by the State Board pursuant to this section.

(c) Use of POU treatment devices in lieu of centralized treatment shall be considered to have no substantial community opposition if:

- (1) the sum of the number of non-voting customers and the number of customers voting against POU's, is less than half of the total customers; and
- (2) no more than 25 percent of the total number of customers voted against POU's.

§64418.7. Recordkeeping and Reporting.

- (a) A public water system shall maintain the following records for at least ten years and provide the records to the State Board, as specified in subsection (b) or upon request:
 - (1) results of all water quality monitoring conducted pursuant to this Article;
 - (2) the location and type of each installed POU;

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(3) the date and type of maintenance and repairs performed; and
(4) verbal and written customer complaints received and the resulting corrective actions and/or responses.

(b) A public water system shall report to the State Board, at the frequency noted, the following:

(1) monthly – treated water quality monitoring results;
(2) quarterly – source water monitoring results and any investigations and/or corrective action(s) taken to ensure POU's meet the requirements of this Article including, but not limited to, POU maintenance, customer complaints, inspection results, and manufacturer notices pertaining to proper operation of devices.

(c) The reports required pursuant to subsection (b) shall be submitted to the State Board within ten days following the end of the applicable reporting period.

§64418.8. Compliance.

(a) A public water system using POU's in lieu of centralized treatment shall be in violation of an MCL if:

(1) for all POU's combined, during a 12-month interval, more than five percent (5%) of the results of the effluent monitoring conducted pursuant to section 64418.5 exceed an MCL;

(2) for a POU, the effluent fails to meet the MCL, which is determined in accordance with the applicable compliance determination requirements in this Title. Depending on the contaminant and concentration detected, compliance determination may be based on the result of a single sample, an initial sample averaged with one or two confirmation sample(s), or an average of four quarterly or six monthly samples; or

(3) a building or dwelling unit served by the water system does not have a POU installed pursuant to this Article.

Article 2.7. Point-of-Entry Treatment

§64419. Definitions.

“Point-of-entry treatment device” or “POE” means a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminant levels in the drinking water distributed throughout the house or building.

Notwithstanding the foregoing, where all the water supplied by a public water system for human consumption is treated by the public water system via a single device or facility, regardless of location of the device or facility, the public water system shall be considered to have centralized treatment.

§64420. General Provisions.

(a) Except for a proposed new community water system that does not have a domestic water supply permit, a public water systems that meets the requirements of Health and Safety Code section 116380(a) may be permitted to use POEs in lieu of centralized

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treatment for the purpose of complying with one or more maximum contaminant levels, action levels, or treatment techniques in this Title and as allowed under the state and federal State Drinking Water Acts, if:

(1) the public water system meets the requirements of this Article and any applicable statutory requirements;

(2) the public water system has:

(A) applied for funding from any federal, state, or local agency to correct the system's violations, and

(B) demonstrated to the State Board that centralized treatment for achieving compliance is not immediately economically feasible, as defined in section 64420.1;

(3) the public water system has applied for a permit or permit amendment to use POEs. The duration of the permit or permit amendment issued will be in accordance with Health and Safety Code section 116552;

(4) for a community water system, following a public hearing, the State Board determines pursuant to section 64420.6 that there is no substantial community opposition;

(5) the public water system has a State Board-approved:

(A) POE Treatment Strategy, as defined in section 64420.3,

(B) POE Operations and Maintenance Program, as defined in section 64420.4,

and

(C) POE Monitoring Program, as defined in section 64420.5; and

(6) the public water system ensures that each building connected to the public water system has a POE installed pursuant to this Article.

(b) With State Board approval and without having to meet the requirement of paragraph (a)(6), a public water system may utilize POEs in lieu of centralized treatment for the purpose of reducing contaminant levels to levels at or below one or more of the maximum contaminant levels, action levels, or treatment techniques in this Title, in the water it supplies to some or all of the persons it serves, but the public water system will not be deemed in compliance without meeting the requirement of paragraph (a)(6). A public water system's application for a permit to utilize POEs pursuant to this subsection may include a request that one or more of the requirements of this article be amended or eliminated to address the public water system's specific utilization, and such request may be granted or denied by the State Board.

(c) Funding for centralized treatment is available when funding for centralized treatment, from any source, is received by, or otherwise placed under control of, the public water system.

(d) As used in this article, the estimated cost for both centralized treatment and POE treatment shall be the complete life cycle cost for a similar period of time.

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§64420.1. Immediate Economic Feasibility of Centralized Treatment.

(a) To specifically meet the requirements of subparagraph 64420 (a)(2)(B), a community water system, when comparing the costs of centralized treatment to the use of POE treatment, shall submit to the State Board information demonstrating that the:

(1) estimated annual cost of centralized treatment, per household, is more than one percent (1%) of the median household income (MHI) of the customers served by the community water system; and

(2) (A) if the community's annual MHI is equal to or less than the statewide annual MHI, the estimated annual cost of centralized treatment, per household, plus the median annual water bill from the most recent 12 months per household is more than 1.5 percent (1.5%) of the annual MHI of the customers served by the community water system, or

(B) if the community's annual MHI is greater than the statewide annual MHI, the estimated annual cost of centralized treatment, per household, plus the median annual water bill from the most recent 12 months per household is more than two percent (2%) of the annual MHI of the customers served by the community water system.

(b) A noncommunity water system shall submit to the State Board documents that demonstrate that centralized treatment is not immediately economically feasible.

§64420.2. POE Requirements.

(a) Each POE must:

(1) be independently certified in accordance with an American National Standard Institute (ANSI) standard that is applicable to the specific type of proposed POE and that adequately addresses a California drinking water standard; or

(2) be approved by the State Board upon determination that the proposed POE unit design, construction, treatment performance, and available field or pilot test results can reliably produce water in compliance with California drinking water standards under local expected influent water quality and flow conditions;

(3) be owned, controlled, operated, and maintained by the public water system and/or a person(s) under contract with the public water system, to ensure proper operation, maintenance, monitoring, and compliance with this Article and applicable drinking water standards;

(4) be equipped with a mechanical warning (e.g. alarm, light, etc.) that alerts users when a unit needs maintenance or is no longer operating in a manner that assures the unit is producing effluent meeting state and federal drinking water standards, unless the device is equipped with an automatic shut-off mechanism that prevents the flow of water under such circumstances; and

(5) be equipped with a totalizing flow meter.

(b) Except as provided in subsection (c), pilot testing shall be performed by the public water system, and/or a person(s) under contract with the public water system, on each proposed type of POE to establish its use limitations and operations and maintenance

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criteria, as well as verification that it will produce effluent that meets drinking water standards under local expected influent water quality and flow conditions. [Pilot testing shall include the following steps:

(1) Prior to performing pilot testing, a pilot testing protocol shall be submitted to the State Board for review. The pilot testing protocol must be adequate to demonstrate that water treated by the POE will meet drinking water standards;

(2) Pilot testing for a POE shall be conducted in the manner and for the time period specified by the most current pilot testing protocol for that POE approved under section 64420.2(b)(1), and shall be conducted for no less than two months; and

(3) After completion of the pilot testing, the public water system shall submit a report to the State Board describing the results and findings of the pilot testing.

(c) The State Board may exempt a public water system from the pilot testing requirements in section 64420.2(b), or permit a reduced level of pilot testing required pursuant to subsection (b), if:

(1) the public water system demonstrates to the State Board that the POEs proposed for use have been tested, by the public water system or another person, under equivalent water quality and flow conditions; and

(2) the limitations, criteria, and effluent verification in subsection (b) can be ascertained and have been reported to the State Board.

§64420.3. POE Treatment Strategy.

(a) Prior to installing POEs, and as part of its permit application to use POE in lieu of centralized treatment, a public water system shall submit to the State Board a POE Treatment Strategy sufficient to reliably reduce levels of contaminants and comply with drinking water standards. The POE Treatment Strategy shall include each of the following:

(1) A description of the compliance issues for which POEs are being proposed to address and how the use of POEs will achieve compliance;

(2) A description of how the public water system will determine the type, number, and location of POEs to ensure POEs serve, in their entirety, each building connected to the public water system;

(3) The public water system's authority to require customers to accept POEs in lieu of centralized treatment and to take an action, such as discontinuing service, if a customer fails to accept POEs, or disconnects or modifies a POE installed pursuant to this Article;

(4) The basis for the POE selection(s);

(5) The qualifications and identification of the person(s) responsible for POE installation, operation, maintenance, and water quality sampling and analyses;

(6) A Customer Education Program that includes information about the POE, how the devices work, required maintenance and monitoring, and the need for the person(s) responsible for the POE, as defined in paragraph (a)(5) of this section, to have access to the device to perform required maintenance and monitoring. The Customer Education

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Program shall be designed to reach all customers and shall be implemented prior to and following installation of POEs;

(7) The authority, ordinances, and/or access agreements adequate to allow the public water system's representatives access to customers' premises for POE installation, maintenance, and water quality monitoring, as well as the surveys necessary to meet paragraph (a)(2);

(8) Identification of applicable local regulatory requirements;

(9) A Consumer Notification Protocol designed to timely inform consumers, in the appropriate language(s), in the event that an installed POE fails to produce water that meets drinking water standards. The Consumer Notification Protocol shall include:

(A) an example of a notice that includes the requirements of Article 18 of this Title, and

(B) a plan for providing an alternative water supply that meets drinking water standards, consistent with section 64551.100 of this Title, in a quantity sufficient for daily household ingestion needs, to customers served by each installed POE not meeting drinking water standards. An alternative water supply shall be provided according to the following timeline;

1. as soon as possible, but no later than 24 hours following the receipt of results of confirmation samples indicating an MCL exceedance for nitrate, nitrite, nitrate plus nitrite, or perchlorate, or

2. as soon as possible, but no later than 7 days following the receipt of results of confirmation samples indicating an MCL exceedance for contaminants other than nitrate, nitrite, nitrate plus nitrite, or perchlorate;

(10) A Customer Notification Protocol for routine notifications that includes examples of notices, to be provided no less frequently than quarterly, in the appropriate language(s) to inform each customer:

(A) which water supplies are not treated by the POEs, and

(B) regarding the mechanical warning or shut-off mechanism required pursuant to paragraph 64420.2(a)(5), including a telephone number that connects the customer to water system personnel or recording system that shall be accessible by water system personnel 24 hours a day, seven days a week, for the purpose of providing the customer a reliable means of notifying personnel when the mechanical warning or shut-off mechanism is activated;

(11) The proposed schedules for:

(A) the distribution of public hearing information pursuant to section 64420.6,

(B) the public hearing required pursuant to section 64420.6,

(C) the distribution to customers of POE acceptance surveys pursuant to section 64420.6,

(D) POE installation, and

(E) the construction of centralized treatment;

(12) An estimate of the percent of all customers within the public water system's service area who are expected to voluntarily allow installation of POE devices, as well as a description of how the public water system will address customers who do not; and

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(13) The means for ensuring that the rights and responsibilities of the customer, with respect to an installed POE, convey with title upon the sale or transfer of property to which the POE is attached.

(b) A public water system shall comply with the most current State Board-approved version of its POE Treatment Strategy at all times.

§64420.4. POE Operations and Maintenance (O&M) Program.

(a) Prior to installing POEs, and as part of its permit application to use POE in lieu of centralized treatment, a public water system shall submit to the State Board a POE Operations and Maintenance (O&M) Program sufficient to reliably reduce levels of contaminants and comply with drinking water standards. The POE O&M Program shall include the following:

(1) An installation protocol that, at a minimum, describes locations and assurances that POEs will be accessible for operation and maintenance;

(2) The type and frequency of maintenance, at intervals specified by the manufacturer and determined by pilot testing, whichever is shorter, that ensures POEs produce effluent that meets drinking water standards;

(3) The number and type of auxiliary POEs and parts necessary to ensure continuous effective treatment;

(4) Replacement schedules for critical components and POEs necessary to ensure continuous effective treatment;

(5) The qualifications and identification of the person(s) responsible for POE installation, operation, and maintenance; and

(6) POE waste-handling and disposal procedures sufficient to ensure that wastes generated by the POE and the POE itself are properly and safely disposed of in accordance with federal, state and local requirements.

(b) To ensure a POE is properly operating and has not been bypassed, POEs shall be inspected by the public water system no less often than every twelve months and when a POE's effluent is monitored pursuant to section 64420.5.

(c) Based on the on-going operation and maintenance of installed POEs, a public water system shall revise its POE O&M Program as necessary to ensure continuous effective treatment and that POEs produce effluent that meets drinking water standards. Revised POE O&M Programs shall be submitted to the State Board for review and may not be implemented without State Board approval confirming that the revised POE O&M Program meets the requirements of this section.

(d) A public water system shall maintain a copy of and implement the most current State Board-approved version of its POE O&M Program.

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§64420.5. POE Monitoring Program.

(a) Prior to installing POEs, and as part of its permit application to use POE in lieu of centralized treatment, a public water system shall submit to the State Board a POE Monitoring Program sufficient to ensure that water treated by the proposed POE consistently meet drinking water standards. The POE Monitoring Program shall include the following:

(1) source water monitoring – quarterly, with samples collected during the same month (first, second, or third) of each calendar quarter;

(2) POE effluent – initially, with samples collected as soon as possible but no later than 72 hours after a device is installed; and

(3) POE effluent, on-going following the monitoring in paragraph (a)(2), annually, with one twelfth of all units sampled monthly on a rotating basis. After completion of one year of monitoring, a public water system may alternatively monitor one quarter of all units each calendar quarter provided that monitoring results do not exceed 75 percent (75%) of a contaminant's MCL, and the water system submits a revised monitoring plan to the State Board. Water systems shall resume monthly monitoring if results exceed 75 percent (75%) of a contaminant's MCL.

(b) For a contaminant other than nitrate, nitrite, nitrate plus nitrite, or perchlorate, after no less than one year of monitoring conducted pursuant to subsection (a), a public water system may reduce the number of POE units monitored to no fewer than one third of all installed units per year such that all installed devices are sampled no less frequently than once every three years, if all the results of the on-going monitoring conducted pursuant to paragraph (a)(3) do not exceed 75 percent (75%) of a contaminant's MCL, and the public water system submits a revised monitoring plan to the State Board.

(c) The State Board may require additional monitoring for the contaminant of concern or other contaminants, including microbial contaminants, if monitoring results indicate a potential health risk associated with the contaminant, POE technology, or a public water system's compliance with this Article.

(d) The public water system shall revise its POE Monitoring Program as necessary to ensure continuous effective treatment based on the on-going operation and maintenance of installed POEs or additional monitoring required pursuant to subsection (c). Revised POE Monitoring Programs shall be submitted to the State Board for review and may not be implemented without State Board approval confirming that the revised POE Monitoring Program meets the requirements of this section.

(e) The public water system shall maintain a copy of and implement the most current State Board-approved version of its POE Monitoring Program prepared pursuant to this section.

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(f) If a POE effluent sample result exceeds an MCL for a contaminant other than nitrate, nitrite, nitrate plus nitrite, or perchlorate, the public water system shall:

- (1) implement the public notification and alternative water procedures identified in its most current State Board-approved POE Treatment Strategy; and
- (2) collect a confirmation sample within seven days of notification of the exceedance. If the confirmation sample, or the average of the original and confirmation sample, exceeds the MCL, notify the State Board within 48 hours of the result, complete corrective actions as soon as possible but within one month of receipt of the result, and increase the monitoring frequency, as requested by the State Board to assess the effectiveness of the corrective actions.

(g) If a POE effluent sample result exceeds an MCL for nitrate, nitrite, nitrate plus nitrite, or perchlorate:

- (1) implement the public notification and alternative water procedures identified in its most current State Board-approved POE Treatment Strategy; and
- (2) collect a confirmation sample within 72 hours of notification of the exceedance. If the confirmation sample, or the average of the original and confirmation sample, exceeds the MCL, notify the State Board within 24 hours of the result, continue to provide alternative water until the corrective actions have been confirmed to be effective, complete corrective actions as soon as possible but within one month of receipt of the result, and increase the monitoring frequency as requested by the State Board to assess the effectiveness of the corrective actions.

§64420.6. Public Hearing and Acceptance.

(a) A community water system shall conduct a customer survey and participate in, and provide information for, a public hearing held by the State Board. At least 30 days prior to placing information into a public repository per subsection (a)(2), the public water system shall submit a Public Acceptance Protocol, to the State Board for review. The Public Acceptance Protocol must satisfy the following requirements in order to receive State Board approval:

- (1) Prior to conducting a customer survey, a community water system shall participate in and provide information for a public hearing that, at a minimum, disseminates the following to those in its service area:
 - (A) a description of the public water system's POE Treatment Strategy,
 - (B) the adverse health effects, as specified in the appendices to section 64465, associated with the contaminant(s) of concern,
 - (C) POE Operation and Maintenance Program and Monitoring Program information that necessitates customer involvement,
 - (D) the estimate of any anticipated increase in water bills that may result from utilization of POEs, and
 - (E) the supporting documentation, assumptions, and calculations used to determine any anticipated increase in water bills proposed to be presented at the public hearing.

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(2) At least 30 days prior to the public hearing, the community water system shall place the information to be presented at the public hearing into a publicly accessible repository and notify the State Board and those in its service area of the date, time, and location of the public hearing, as well as the location and hours of operation of the repository. If the public water system serves multi-unit residential dwellings including, but not limited to, apartments and residential institutions, whether sub-metered or not, the public water system shall provide notice to each resident of such residential dwellings.

(3) Following the public hearing, the community water system shall deliver a survey to each of its customers. The survey shall be delivered in a manner designed to reach each customer and in the language appropriate for communication with the customers. The survey shall consist of the following two choices:

- (A) "I vote FOR the use of Point-of-Entry treatment devices.", and
- (B) "I vote AGAINST the use of Point-of-Entry treatment devices."

(b) The community water system shall at all times comply with the most recent Public Acceptance Protocol approved by the State Board pursuant to this section.

(c) Use of POE treatment devices in lieu of centralized treatment shall be considered to have no substantial community opposition if:

(1) the sum of the number of non-voting customers and the number of customers voting against POEs, is less than half of the total customers; and

(2) no more than 25 percent of the total number of customers voted against POEs.

§64420.7. Recordkeeping and Reporting.

(a) A public water system shall maintain the following records for at least ten years and provide the records to the State Board, as specified in subsection (b) or upon request:

- (1) results of all water quality monitoring conducted pursuant to this Article;
- (2) the location and type of each installed POE;
- (3) the date and type of maintenance and repairs performed; and
- (4) verbal and written customer complaints received and the resulting corrective actions and/or responses.

(b) A public water system shall report to the State Board, at the frequency noted, the following:

- (1) monthly – treated water quality monitoring results;
- (2) quarterly – source water monitoring results and any investigations and/or corrective action(s) taken to ensure POEs meet the requirements of this Article including, but not limited to, POE maintenance, customer complaints, inspection results, and manufacturer notices pertaining to proper operation of devices.

(c) The reports required pursuant to subsection (b) shall be submitted to the State Board within ten days following the applicable reporting period.

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§64420.8. Compliance.

(a) A public water system using POEs in lieu of centralized treatment shall be in violation of an MCL if:

(1) for all POEs combined, during a 12-month interval, more than five percent (5%) of the results of the effluent monitoring conducted pursuant to section 64420.5 exceed an MCL;

(2) for a POE, the effluent fails to meet the MCL, which is determined in accordance with the applicable compliance determination requirements in this Title. Depending on the contaminant and concentration detected, compliance determination may be based on the result of a single sample, an initial sample averaged with one or two confirmation sample(s), or an average of four quarterly or six monthly samples; or

(3) a building or dwelling unit served by the water system does not have a POE installed pursuant to this Article.

Article 3. Primary Standards--Bacteriological Quality

§64421. General Requirements.

(a) Each water supplier shall:

(1) Develop a routine sample siting plan as required in section 64422;

(2) Collect routine, repeat and replacement samples as required in Sections 64423, 64424, and 64425;

(3) Have all samples analyzed by laboratories approved to perform those analyses by the State Board and report results as required in section 64423.1;

(4) Notify the State Board when there is an increase in coliform bacteria in bacteriological samples as required in section 64426; and

(5) Comply with the Maximum Contaminant Level as required in section 64426.1.

(b) Water suppliers shall perform additional bacteriological monitoring as follows:

(1) After construction or repair of wells;

(2) After main installation or repair;

(3) After construction, repair, or maintenance of storage facilities; and

(4) After any system pressure loss to less than five psi. Samples collected shall represent the water quality in the affected portions of the system.

§64422. Routine Sample Siting Plan.

(a) By September 1, 1992, each water supplier shall develop and submit to the State Board a siting plan for the routine collection of samples for total coliform analysis, subject to the following:

(1) The sample sites chosen shall be representative of water throughout the distribution system including all pressure zones, and areas supplied by each water source and distribution reservoir.

(2) The water supplier may rotate sampling among the sample sites if the total number of sites needed to comply with (a)(1) above exceeds the number of samples

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required according to Table 64423-A. The rotation plan shall be described in the sample siting plan.

(b) If personnel other than certified operators will be performing field tests and/or collecting samples, the sample siting plan shall include a declaration that such personnel have been trained, pursuant to Section 64415 (b).

(c) The supplier shall submit an updated plan to the State Board at least once every ten years and at any time the plan no longer ensures representative monitoring of the system.

§64423. Routine Sampling.

(a) Each water supplier shall collect routine bacteriological water samples as follows:

(1) The minimum number of samples for community water systems shall be based on the known population served or the total number of service connections, whichever results in the greater number of samples, as shown in Table 64423-A. A community water system using groundwater which serves 25-1000 persons may request from the State Board a reduction in monitoring frequency. The minimum reduced frequency shall not be less than one sample per quarter.

(2) The minimum number of samples for nontransient-noncommunity water systems shall be based on the known population served as shown in Table 64423-A during those months when the system is operating. A nontransient-noncommunity water system using groundwater which serves 25-1000 persons may request from the State Board a reduction in monitoring frequency if it has not violated the requirements in this article during the past twelve months. The minimum reduced frequency shall not be less than one sample per quarter.

(3) The minimum number of samples for transient-noncommunity water systems using groundwater and serving 1000 or fewer persons a month shall be one in each calendar quarter during which the system provides water to the public.

(4) The minimum number of samples for transient-noncommunity water systems using groundwater and serving more than 1000 persons during any month shall be based on the known population served as shown in Table 64423-A, except that the water supplier may request from the State Board a reduction in monitoring for any month the system serves 1000 persons or fewer. The minimum reduced frequency shall not be less than one sample in each calendar quarter during which the system provides water to the public.

(5) The minimum number of samples for transient-noncommunity water systems using approved surface water shall be based on the population served as shown in Table 64423-A. A system using groundwater under the direct influence of surface water shall begin monitoring at this frequency by the end of the sixth month after the State Board has designated the source to be approved surface water.

(6) A public water system shall collect samples at regular time intervals throughout the month, except that a system using groundwater which serves 4,900

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persons or fewer may collect all required samples on a single day if they are taken from different sites.

(b) In addition to the minimum sampling requirements, all water suppliers using approved surface water which do not practice treatment in compliance with Sections 64650 through 64666, shall collect a minimum of one sample before or at the first service connection each day during which the turbidity level of the water delivered to the system exceeds 1 NTU. The sample shall be collected within 24 hours of the exceedance and shall be analyzed for total coliforms. If the water supplier is unable to collect and/or analyze the sample within the 24-hour time period because of extenuating circumstances beyond its control, the supplier shall notify the State Board within the 24-hour time period and may request an extension. Sample results shall be included in determining compliance with the MCL for total coliforms in Section 64426.1.

(c) If any routine, repeat, or replacement sample is total coliform-positive, then the water supplier shall collect repeat samples in accordance with Section 64424 and comply with the reporting requirements specified in Sections 64426 and 64426.1.

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**Table 64423-A
Minimum Number of Routine Total Coliform Samples**

| <i>Monthly Population Served</i> | <i>Service Connections</i> | <i>Minimum Number of Samples</i> |
|----------------------------------|----------------------------|----------------------------------|
| 25 to 1000 | 15 to 400 | 1 per month |
| 1,001 to 2,500 | 401 to 890 | 2 per month |
| 2,501 to 3,300 | 891 to 1,180 | 3 per month |
| 3,301 to 4,100 | 1,181 to 1,460 | 4 per month |
| 4,101 to 4,900 | 1,461 to 1,750 | 5 per month |
| 4,901 to 5,800 | 1,751 to 2,100 | 6 per month |
| 5,801 to 6,700 | 2,101 to 2,400 | 7 per month |
| 6,701 to 7,600 | 2,401 to 2,700 | 2 per week |
| 7,601 to 12,900 | 2,701 to 4,600 | 3 per week |
| 12,901 to 17,200 | 4,601 to 6,100 | 4 per week |
| 17,201 to 21,500 | 6,101 to 7,700 | 5 per week |
| 21,501 to 25,000 | 7,701 to 8,900 | 6 per week |
| 25,001 to 33,000 | 8,901 to 11,800 | 8 per week |
| 33,001 to 41,000 | 11,801 to 14,600 | 10 per week |
| 41,001 to 50,000 | 14,601 to 17,900 | 12 per week |
| 50,001 to 59,000 | 17,901 to 21,100 | 15 per week |
| 59,001 to 70,000 | 21,101 to 25,000 | 18 per week |
| 70,001 to 83,000 | 25,001 to 29,600 | 20 per week |
| 83,001 to 96,000 | 29,601 to 34,300 | 23 per week |
| 96,001 to 130,000 | 34,301 to 46,400 | 25 per week |
| 130,001 to 220,000 | 46,401 to 78,600 | 30 per week |
| 220,001 to 320,000 | 78,601 to 114,300 | 38 per week |
| 320,001 to 450,000 | 114,301 to 160,700 | 50 per week |
| 450,001 to 600,000 | 160,701 to 214,300 | 55 per week |
| 600,001 to 780,000 | 214,301 to 278,600 | 60 per week |
| 780,001 to 970,000 | 278,601 to 346,400 | 70 per week |
| 970,001 to 1,230,000 | 346,401 to 439,300 | 75 per week |
| 1,230,001 to 1,520,000 | 439,301 to 542,900 | 85 per week |
| 1,520,001 to 1,850,000 | 542,901 to 660,700 | 90 per week |
| 1,850,001 to 2,270,000 | 660,701 to 810,700 | 98 per week |
| 2,270,001 to 3,020,000 | 810,701 to 1,078,600 | 105 per week |
| 3,020,001 to 3,960,000 | 1,078,601 to 1,414,300 | 110 per week |
| 3,960,001 or more | 1,414,301 or more | 120 per week |

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§64423.1. Sample Analysis and Reporting of Results.

(a) The water supplier shall designate (label) each sample as routine, repeat, replacement, or “other” pursuant to Section 64421(b), and have each sample analyzed for total coliforms. The supplier also shall require the laboratory to analyze the same sample for fecal coliforms or *Escherichia coli* (*E. coli*) whenever the presence of total coliforms is indicated. As a minimum, the analytical results shall be reported in terms of the presence or absence of total or fecal coliforms, or *E. coli* in the sample, whichever is appropriate.

(b) The water supplier shall require the laboratory to notify the supplier within 24 hours, whenever the presence of total coliforms, fecal coliforms or *E. coli* is demonstrated in a sample or a sample is invalidated due to interference problems, pursuant to Section 64425(b), and shall ensure that a contact person is available to receive these analytical results 24-hours a day. The water supplier shall also require the laboratory to immediately notify the State Board of any positive bacteriological results if the laboratory cannot make direct contact with the designated contact person within 24 hours.

(c) Analytical results of all required samples collected for a system in a calendar month shall be reported to the State Board not later than the tenth day of the following month, as follows:

(1) The water supplier shall submit a monthly summary of the bacteriological monitoring results to the State Board.

(2) For systems serving fewer than 10,000 service connections or 33,000 persons, the water supplier shall require the laboratory to submit copies of all required bacteriological monitoring results directly to the State Board.

(3) For systems serving more than 10,000 service connections, or 33,000 persons, the water supplier shall require the laboratory to submit copies of bacteriological monitoring results for all positive routine samples and all repeat samples directly to the State Board.

(d) Laboratory reports shall be retained by the water supplier for a period of at least five years and shall be made available to the State Board upon request.

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§64424. Repeat Sampling.

(a) If a routine sample is total coliform-positive, the water supplier shall collect a repeat sample set as described in paragraph (1) within 24 hours of being notified of the positive result. The repeat samples shall all be collected within the same 24 hour time period. A single service connection system may request that the State Board allow the collection of the repeat sample set over a four-day period.

(1) For a water supplier that normally collects more than one routine sample a month, a repeat sample set shall be at least three samples for each total coliform-positive sample. For a water supplier that normally collects one or fewer samples per month, a repeat sample set shall be at least four samples for each total coliform-positive sample.

(2) If the water supplier is unable to collect the samples within the 24-hour time period specified in subsection (a) or deliver the samples to the laboratory within 24 hours after collection because of circumstances beyond its control, the water supplier shall notify the State Board within 24 hours. The State Board will then determine how much time the supplier will have to collect the repeat samples.

(b) When collecting the repeat sample set, the water supplier shall collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken. Other repeat samples shall be collected within five service connections upstream or downstream of the original site. At least one sample shall be from upstream and one from downstream unless there is no upstream and/or downstream service connection.

(c) If one or more samples in the repeat sample set is total coliform-positive, the water supplier shall collect and have analyzed an additional set of repeat samples as specified in subsections (a) and (b). The supplier shall repeat this process until either no coliforms are detected in one complete repeat sample set or the supplier determines that the MCL for total coliforms specified in Section 64426.1 has been exceeded and notifies the State Board.

(d) If a public water system for which fewer than five routine samples/month are collected has one or more total coliform-positive samples, the water supplier shall collect at least five routine samples the following month. If the supplier stops supplying water during the month after the total coliform-positive(s), at least five samples shall be collected during the first month the system resumes operation. A water supplier may request the State Board waive the requirement to collect at least five routine samples the following month, but a waiver will not be granted solely on the basis that all repeat samples are total coliform-negative. To request a waiver, one of the following conditions shall be met:

(1) The State Board conducts a site visit before the end of the next month the system provides water to the public to determine whether additional monitoring and/or corrective action is necessary to protect public health.

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(2) The State Board determines why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. If a waiver is granted, a system shall collect at least one routine sample before the end of the next month it serves water to the public and use it to determine compliance with Section 64426.1.

§64425. Sample Invalidation.

(a) A water supplier may request the State Board to invalidate a sample for which a total coliform-positive result has been reported if the supplier demonstrates:

(1) All repeat sample(s) collected at the same tap as the original total coliform-positive sample also are total coliform-positive and all repeat samples collected within five service connections of the original tap are not total coliform-positive; or

(2) The laboratory did not follow the prescribed analytical methods pursuant to Section 64415(a), based on a review of laboratory documentation by the State Board. The supplier shall submit to the State Board a written request for invalidation along with the laboratory documentation, the supplier's sample collection records and any observations noted during sample collection and delivery. The water supplier shall require the laboratory to provide the supplier with documentation which shall include, but not be limited to:

(A) A letter from the director of the laboratory having generated the data, confirming the invalidation request by reason of laboratory accident or error;

(B) Complete sample identification, laboratory sample log number (if used), date and time of collection, date and time of receipt by the laboratory, date and time of analysis for the sample(s) in question;

(C) Complete description of the accident or error alleged to have invalidated the result(s);

(D) Copies of all analytical, operating, and quality assurance records pertaining to the incident in question; and

(E) Any observations noted by laboratory personnel when receiving and analyzing the sample(s) in question.

(b) Whenever any total coliform sample result indicative of the absence of total coliforms has been declared invalid by the laboratory due to interference problems as specified at 40 Code Federal Regulations, Section 141.21(c)(2), the supplier shall collect a replacement sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The supplier shall continue to re-sample at the original site within 24 hours and have the samples analyzed until a valid result is obtained.

§64426. Significant Rise in Bacterial Count.

(a) Any of the following criteria shall indicate a possible significant rise in bacterial count:

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- (1) A system collecting at least 40 samples per month has a total coliform-positive routine sample followed by two total coliform-positive repeat samples in the repeat sample set;
- (2) A system has a sample which is positive for fecal coliform or *E. coli*; or
- (3) A system fails the total coliform Maximum Contaminant Level (MCL) as defined in Section 64426.1.

(b) When the coliform levels specified in subsection (a) are reached or exceeded, the water supplier shall:

(1) Contact the State Board by the end of the day on which the system is notified of the test result or the system determines that it has exceeded the MCL, unless the notification or determination occurs after the State Board office is closed, in which case the supplier shall notify the State Board within 24 hours; and

(2) Submit to the State Board information on the current status of physical works and operating procedures which may have caused the elevated bacteriological findings, or any information on community illness suspected of being waterborne. This shall include, but not be limited to:

(A) Current operating procedures that are or could potentially be related to the increase in bacterial count;

(B) Any interruptions in the treatment process;

(C) System pressure loss to less than 5 psi;

(D) Vandalism and/or unauthorized access to facilities;

(E) Physical evidence indicating bacteriological contamination of facilities;

(F) Analytical results of any additional samples collected, including source samples;

(G) Community illness suspected of being waterborne; and

(H) Records of the investigation and any action taken.

(c) Upon receiving notification from the State Board of a significant rise in bacterial count, the water supplier shall implement the emergency notification plan required by Section 116460, Health and Safety Code.

§64426.1. Total Coliform Maximum Contaminant Level (MCL).

(a) Results of all samples collected in a calendar month pursuant to Sections 64423, 64424, and 64425 that are not invalidated by the State Board or the laboratory shall be included in determining compliance with the total coliform MCL. Special purpose samples such as those listed in section 64421(b) and samples collected by the water supplier during special investigations shall not be used to determine compliance with the total coliform MCL.

(b) A public water system is in violation of the total coliform MCL when any of the following occurs:

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- (1) For a public water system which collects at least 40 samples per month, more than 5.0 percent of the samples collected during any month are total coliform-positive; or
- (2) For a public water system which collects fewer than 40 samples per month, more than one sample collected during any month is total coliform-positive; or
- (3) Any repeat sample is fecal coliform-positive or E. coli-positive; or
- (4) Any repeat sample following a fecal coliform-positive or E. coli-positive routine sample is total coliform-positive.

(c) If a public water system is not in compliance with paragraphs (b)(1) through (4), during any month in which it supplies water to the public, the water supplier shall notify the State Board by the end of the business day on which this is determined, unless the determination occurs after the State Board office is closed, in which case the supplier shall notify the State Board within 24 hours of the determination. The water supplier shall also notify the consumers served by the water system. A Tier 2 Public Notice shall be given for violations of paragraph (b)(1) or (2), pursuant to section 64463.4. A Tier 1 Public Notice shall be given for violations of paragraph (b)(3) or (4), pursuant to section 64463.1.

§64426.5. Variance from Total Coliform Maximum Contaminant Level.

A water system may apply to the State Board for a variance from the total coliform MCL in section 64426.1(b)(1) or (2). To be eligible for a variance, the water system shall demonstrate that it meets the following criteria:

- (a) During the thirty days prior to application for a variance, water entering the distribution system has:
 - (1) Been free from fecal coliform or E. coli occurrence based on at least daily sampling;
 - (2) Contained less than one total coliform per hundred milliliters of water in at least ninety-five percent of all samples based on at least daily sampling;
 - (3) Complied with the turbidity requirements of section 64653, if approved surface water; and
 - (4) Maintained a continuous disinfection residual of at least 0.2 mg/L at the entry point(s) to the distribution system;
- (b) The system has had no waterborne microbial disease outbreak, pursuant to section 64651.91, while operated in its present configuration;
- (c) The system maintains contact at least twice a week with the State Board and local health departments to assess illness possibly attributable to microbial occurrence in the public drinking water system;
- (d) The system has analyzed, on a monthly basis, at least the number of samples required pursuant to the approved sample siting plan and has not had an E. coli-positive

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compliance sample within the last six months, unless the system demonstrates to the State Board that the occurrence is not due to contamination entering the distribution system;

(e) The system has undergone a sanitary survey conducted by the State Board within the past twelve months;

(f) The system maintains a cross-connection control program in accordance with sections 7583 through 7605, title 17 of the California Code of Regulations;

(g) The system agrees to submit a biofilm control plan to the State Board within twelve months of the granting of the first request for a variance;

(h) The system monitors general distribution system bacterial quality by conducting heterotrophic bacteria plate counts on at least a weekly basis at a minimum of ten percent of the number of total coliform sites specified in the approved sample siting plan (preferably using the methods in section 9215(a), 18th edition of Standard Methods for the Examination of Water and Wastewater, 1992, American Public Health Association, et. al); and

(i) The system conducts daily monitoring at distribution system total coliform monitoring sites approved by the State Board and maintains a detectable disinfectant residual at a minimum of ninety-five percent of those points and a heterotrophic plate count of less than 500 colonies per mL at sites without a disinfectant residual.

(j) No water system shall be eligible for a variance or exemption from the MCL for total coliforms unless it demonstrates that the violation of the total coliform MCL is due to a persistent growth of total coliforms in the distribution system pursuant to section 64426.5, rather than to fecal or pathogenic contamination, a treatment lapse or deficiency, or a problem in the operation or maintenance of the distribution system.

§64427. Sanitary Survey.

Systems which collect less than five routine samples per month shall be subject to an initial sanitary survey by the Department by June 29, 1994 for community water systems and June 29, 1999 for nontransient-noncommunity and transient-noncommunity water systems. Sanitary surveys shall be repeated every five years.

Article 3.5. Ground Water Rule

§64430. Requirements.

A public water system that uses ground water shall comply with the following provisions of 40 Code of Federal Regulations as they appear in the Ground Water Rule published in 71 Federal Register 65574 (November 8, 2006) and amended in 71 Federal Register 67427 (November 21, 2006) and 74 Federal Register 30953 (June 29, 2009), which are hereby incorporated by reference: Sections 141.21(d)(3), 141.28(a), 141.153(h)(6),

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Appendix A to Subpart O (Consumer Confidence Reports), 141.202(a)(8), 141.203(a)(4), Appendices A and B to Subpart Q (Public Notification), and 141.400 through 141.405, except that in:

(a) sections 141.402(a)(1)(ii), (a)(2), (a)(2)(ii), (a)(4), (a)(4)(ii)(A), (a)(5)(i), and (a)(5)(ii), the phrase “§141.21(a)” is replaced by “22 California Code of Regulations sections 64422 and 64423”,

(b) sections 141.402(a)(1)(ii) and 141.405(b)(4), the phrase “§141.21(c)” is replaced by “22 California Code of Regulations section 64425”, and

(c) section 141.402(a)(2)(iii), the phrase “§141.21(b)” is replaced by “22 California Code of Regulations section 64424”.

[Note: The text reflecting the above section is provided in Addendum A of this book.]

Article 4. Primary Standards--Inorganic Chemicals

§64431. Maximum Contaminant Levels--Inorganic Chemicals.

Public water systems shall comply with the primary MCLs in table 64431-A as specified in this article.

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**Table 64431-A
Maximum Contaminant Levels
Inorganic Chemicals**

| <i>Chemical</i> | <i>Maximum Contaminant Level, mg/L</i> |
|-----------------------------------|--|
| Aluminum | 1. |
| Antimony | 0.006 |
| Arsenic | 0.010 |
| Asbestos | 7 MFL* |
| Barium | 1. |
| Beryllium | 0.004 |
| Cadmium | 0.005 |
| Chromium | 0.05 |
| Cyanide | 0.15 |
| Fluoride | 2.0 |
| Mercury | 0.002 |
| Nickel | 0.1 |
| Nitrate (as nitrogen) | 10. |
| Nitrate+Nitrite (sum as nitrogen) | 10. |
| Nitrite (as nitrogen) | 1. |
| Perchlorate | 0.006 |
| Selenium | 0.05 |
| Thallium | 0.002 |

* MFL=million fibers per liter; MCL for fibers exceeding 10 µm in length.

§64432. Monitoring and Compliance--Inorganic Chemicals.

(a) All public water systems shall monitor to determine compliance with the nitrate and nitrite MCLs in table 64431-A, pursuant to subsections (d) through (f) and Section 64432.1. All community and nontransient-noncommunity water systems shall monitor to determine compliance with the perchlorate MCL, pursuant to subsections (d), (e), and (l), and section 64432.3. All community and nontransient-noncommunity water systems shall also monitor to determine compliance with the other MCLs in table 64431-A, pursuant to subsections (b) through (n) and, for asbestos, section 64432.2. Monitoring shall be conducted in the year designated by the State Board of each compliance period beginning with the compliance period starting January 1, 1993.

(b) Unless directed otherwise by the State Board, each community and nontransient-noncommunity water system shall initiate monitoring for an inorganic chemical within six months following the effective date of the regulation establishing the MCL for the chemical and the addition of the chemical to table 64431-A. If otherwise performed in accordance with this section, groundwater monitoring for an inorganic chemical performed no more than two years prior to the effective date of the regulation

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establishing the MCL may be used to satisfy the requirement for initiating monitoring within six months following such effective date.

(c) Unless more frequent monitoring is required pursuant to this Chapter, the frequency of monitoring for the inorganic chemicals listed in table 64431-A, except for asbestos, nitrate/nitrite, and perchlorate, shall be as follows:

(1) Each compliance period, all community and nontransient-noncommunity systems using groundwater shall monitor once during the year designated by the State Board. The State Board will designate the year based on historical monitoring frequency and laboratory capacity. All community and nontransient-noncommunity systems using approved surface water shall monitor annually. All systems monitoring at distribution entry points which have combined surface and groundwater sources shall monitor annually.

(2) Quarterly samples shall be collected and analyzed for any chemical if analyses of such samples indicate a continuous or persistent trend toward higher levels of that chemical, based on an evaluation of previous data.

(d) For the purposes of sections 64432, 64432.1, 64432.2, and 64432.3, detection shall be defined by the detection limits for purposes of reporting (DLRs) in table 64432-A.

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Table 64432-A

Detection Limits for Purposes of Reporting (DLRs) for Regulated Inorganic Chemicals

| <i>Chemical</i> | <i>Detection Limit for Purposes of Reporting (DLR) (mg/L)</i> |
|-----------------------|---|
| Aluminum | 0.05 |
| Antimony | 0.006 |
| Arsenic | 0.002 |
| Asbestos | 0.2 MFL>10um* |
| Barium | 0.1 |
| Beryllium | 0.001 |
| Cadmium | 0.001 |
| Chromium | 0.01 |
| Cyanide | 0.1 |
| Fluoride | 0.1 |
| Mercury | 0.001 |
| Nickel | 0.01 |
| Nitrate (as nitrogen) | 0.4 |
| Nitrite (as nitrogen) | 0.4 |
| Perchlorate | 0.004 |
| Selenium | 0.005 |
| Thallium | 0.001 |

* MFL=million fibers per liter; DLR for fibers exceeding 10 um in length.

(e) Samples shall be collected from each water source or a supplier may collect a minimum of one sample at every entry point to the distribution system which is representative of each source after treatment. The system shall collect each sample at the same sampling site, unless a change is approved by the State Board.

(f) A water system may request approval from the State Board to composite samples from up to five sampling sites, provided that the number of sites to be composited is less than the ratio of the MCL to the DLR. Approval will be based on a review of three years of historical data, well construction and aquifer information for groundwater, and intake location, similarity of sources, and watershed characteristics for surface water. Compositing shall be done in the laboratory.

(1) Systems serving more than 3,300 persons shall composite only from sampling sites within a single system. Systems serving 3,300 persons or less may composite among different systems up to the 5-sample limit.

(2) If any inorganic chemical is detected in the composite sample at a level equal to or greater than one fifth of the MCL, a follow-up sample shall be analyzed within 14 days from each sampling site included in the composite for the contaminants

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which exceeded the one-fifth-MCL level. If available, duplicates of the original sample taken from each sampling site used in the composite may be used instead of resampling; the analytical results shall be reported within 14 days. The water supplier may collect up to two additional samples each from one or more of the sources to confirm the result(s).

(3) Compliance for each site shall be determined on the basis of the individual follow-up samples, or on the average of the follow-up and confirmation sample(s) if the supplier collects confirmation sample(s) for each detection.

(g) If the level of any inorganic chemical, except for nitrate, nitrite, nitrate plus nitrite, or perchlorate, exceeds the MCL, the water supplier shall do one of the following:

(1) Inform the State Board within 48 hours and monitor quarterly beginning in the next quarter after the exceedance occurred; or

(2) Inform the State Board within seven days from the receipt of the analysis and, as confirmation, collect one additional sample within 14 days from receipt of the analysis. If the average of the two samples collected exceeds the MCL, this information shall be reported to the State Board within 48 hours and the water supplier shall monitor quarterly beginning in the next quarter after the exceedance occurred.

(h) If the concentration of an inorganic chemical exceeds ten times the MCL, within 48 hours of receipt of the result the water supplier shall notify the State Board and resample as confirmation. The water supplier shall notify the State Board of the result(s) of the confirmation sample(s) within 24 hours of receipt of the confirmation result(s).

(1) If the average concentration of the original and confirmation sample(s) is less than or equal to ten times the MCL, the water supplier shall monitor quarterly beginning in the quarter following the quarter in which the exceedance occurred.

(2) If the average concentration of the original and confirmation sample(s) exceeds ten times the MCL, the water supplier shall, if directed by the State Board;

(A) Immediately discontinue use of the contaminated water source; and

(B) Not return the source to service without written approval from the

State Board.

(i) Compliance with the MCLs shall be determined by a running annual average; if any one sample would cause the annual average to exceed the MCL, the system is immediately in violation. If a system takes more than one sample in a quarter, the average of all the results for that quarter shall be used when calculating the running annual average. If a system fails to complete four consecutive quarters of monitoring, the running annual average shall be based on an average of the available data.

(j) If a system using groundwater has collected a minimum of two quarterly samples or a system using approved surface water has collected a minimum of four quarterly samples and the sample results have been below the MCL, the system may apply to the State Board for a reduction in monitoring frequency.

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(k) Water quality data collected prior to January 1, 1990, and/or data collected in a manner inconsistent with this section shall not be used in the determination of compliance with the monitoring requirements for inorganic chemicals.

(l) Water quality data collected in compliance with the monitoring requirements of this section by a wholesaler providing water to a public water system shall be acceptable for use by that system for compliance with the monitoring requirements of this section.

(m) A water system may apply to the State Board for a waiver from the monitoring frequencies specified in subsection (c)(1), if the system has conducted at least three rounds of monitoring (three periods for groundwater sources or three years for approved surface water sources) and all previous analytical results are less than the MCL. The water system shall specify the basis for its request. If granted a waiver, a system shall collect a minimum of one sample per source while the waiver is in effect and the term of the waiver shall not exceed one compliance cycle (i.e., nine years).

(n) A water system may be eligible for a waiver from the monitoring frequencies for cyanide specified in subsection (c)(1) without any prior monitoring if it is able to document that it is not vulnerable to cyanide contamination pursuant to the requirements in §64445(d)(1) or (d)(2).

(o) Transient-noncommunity water systems shall monitor for the inorganic chemicals in table 64431-A as follows:

- (1) All sources shall be monitored at least once for fluoride; and
- (2) Surface water sources for parks and other facilities with an average daily population use of more than 1,000 people and/or which are determined to be subject to potential contamination based on a sanitary survey shall be monitored at the same frequency as community water systems.

§64432.1. Monitoring and Compliance--Nitrate and Nitrite.

(a) To determine compliance with the MCL for nitrate in Table 64431-A, all public water systems using groundwater and transient-noncommunity systems using approved surface water shall monitor annually, and all community and nontransient-noncommunity systems using approved surface water shall monitor quarterly.

(1) The water supplier shall require the laboratory to notify the supplier within 24 hours whenever the level of nitrate in a single sample exceeds the MCL, and shall ensure that a contact person is available to receive such analytical results 24-hours a day. The water supplier shall also require the laboratory to immediately notify the State Board of any acute nitrate MCL exceedance if the laboratory cannot make direct contact with the designated contact person within 24 hours. Within 24 hours of notification, the water supplier shall:

- (A) Collect another sample, and

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(B) Analyze the new sample; if the average of the two nitrate sample results exceeds the MCL, report the result to the State Board within 24 hours. If the average does not exceed the MCL, inform the State Board of the results within seven days from the receipt of the original analysis.

(C) If a system is unable to resample within 24 hours, it shall notify the consumers by issuing a Tier 1 Public Notice pursuant to section 64463.1 and shall collect and analyze a confirmation sample within two weeks of notification of the results of the first sample.

(2) For public water systems using groundwater, the repeat monitoring frequency shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 50 percent of the MCL. After four consecutive quarterly samples are less than the MCL, a system may request that the State Board reduce monitoring frequency to annual sampling.

(3) For public water systems using approved surface water, the repeat monitoring frequency shall be quarterly following any one sample in which the concentration is greater than or equal to 50 percent of the MCL. After four consecutive quarterly samples are less than 50 percent of the MCL, a system may request that the State Board reduce monitoring frequency to annual sampling. A system using approved surface water shall return to quarterly monitoring if any one sample is greater than or equal to 50 percent of the MCL.

(4) After any round of quarterly sampling is completed, each community and nontransient-noncommunity system which initiates annual monitoring shall take subsequent samples during the quarter which previously resulted in the highest analytical results.

(b) All public water systems shall monitor to determine compliance with the MCL for nitrite in Table 64431-A, by taking one sample at each sampling site during the compliance period beginning January 1, 1993.

(1) If the level of nitrite in a single sample is greater than the MCL, the water supplier shall proceed as for nitrate in accordance with paragraph (a)(1) of this section.

(2) The repeat monitoring frequency for systems with an analytical result for nitrite that is greater than or equal to 50 percent of the MCL shall be quarterly monitoring for at least one year. After four consecutive quarterly samples are less than the MCL, a system may request that the State Board reduce monitoring frequency to annual sampling, collecting subsequent samples during the quarter which previously resulted in the highest analytical results.

(3) The repeat monitoring frequency for systems with an analytical result for nitrite that is less than 50 percent of the MCL shall be one sample during each compliance period (every three years).

(c) All public water systems shall determine compliance with the MCL for nitrate plus nitrite in Table 64431-A. If the level exceeds the MCL, the water supplier shall proceed as for nitrate in accordance with paragraphs (a)(1) through (a)(4) of this section.

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§64432.2. Monitoring and Compliance - Asbestos.

(a) All community and nontransient-noncommunity water systems are required to monitor to determine compliance with the MCL for asbestos in Table 64431-A during the year designated by the State Board of the first compliance period of each nine-year compliance cycle, beginning in the compliance period starting January 1, 1993. The State Board will designate the year based on historical monitoring frequency and laboratory capacity.

(1) If a groundwater system is vulnerable to asbestos contamination solely in its source water, it shall collect one sample at every entry point to the distribution system which is representative of each water source after treatment and proceed in accordance with Subsections 64432(c)(2) through (e) and Subsections 64432(g) through (i).

(2) All approved surface water systems shall be designated vulnerable to asbestos contamination in their source waters. If a surface water system is vulnerable solely in its source water, it shall proceed as in paragraph (1) above.

(3) If a system is vulnerable to asbestos contamination due to leaching of asbestos-cement pipe, with or without vulnerability to asbestos contamination in its source water, it shall take one sample at a tap served by asbestos-cement pipe under conditions where asbestos contamination is most likely to occur.

(b) If the level of asbestos exceeds the MCL in Table 64431-A, the supplier shall report to the State Board within 48 hours and monitor quarterly beginning in the next quarter after the violation occurred. A system may request that the State Board reduce monitoring frequency to one sample every compliance cycle, pursuant to §64432(j).

(c) If a system is not vulnerable either to asbestos contamination in its source water or due to leaching of asbestos-cement pipe, it may apply to the State Board for a waiver of the monitoring requirements in paragraphs (a)(1) through (3) of this section. The State Board will determine the vulnerability of groundwater sources on the basis of historical monitoring data and possible influence of serpentine formations. Vulnerability due to leaching of asbestos-cement pipe will be determined by the State Board on the basis of the presence of such pipe in the distribution system and evaluation of the corrosivity of the water. The period of the waiver shall be three years.

§64432.3. Monitoring and Compliance - Perchlorate.

(a) For initial monitoring for the perchlorate MCL, each community and nontransient-noncommunity water system shall collect two samples at each source in a year, five to seven months apart. At least one of the samples shall be collected during the period from May 1 through September 30 (vulnerable time), unless the State Board specifies a different vulnerable time for the water system due to seasonal conditions related to use, manufacture and/or weather.

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(b) Data collected since January 3, 2001, that is in conformance with subsection (a) may be used to comply with the initial monitoring requirement.

(c) After meeting the initial monitoring requirements in subsection (a) and if no perchlorate is detected, during each compliance period each water system:

- (1) Using groundwater, shall monitor once during the year designated by the State Board;
- (2) Using approved surface water, shall monitor annually; and
- (3) Monitoring at distribution entry points that have combined surface and groundwater sources, shall monitor annually; if perchlorate is detected in the water from the combined sources, the water system shall sample each source individually to determine which is contaminated.

(d) The water supplier shall require the laboratory to notify the supplier within 48 hours of the result whenever the level of perchlorate in a single sample exceeds the MCL, and shall ensure that a contact person is available to receive such analytical results 24-hours a day. The water supplier shall also require the laboratory to immediately notify the State Board of any perchlorate MCL exceedance if the laboratory cannot make direct contact with the designated contact person within 48 hours. Within 48 hours of notification of the result, the water supplier shall:

- (1) Collect and analyze a confirmation sample, and
- (2) If the average of the two perchlorate sample results exceeds the MCL, report the result to the State Board within 48 hours. If the average does not exceed the MCL, inform the State Board of the results within seven days from the receipt of the original analytical result.
- (3) If a system is unable to resample within 48 hours, it shall issue a Tier 1 notice to the consumers in accordance with sections 64463 and 64463.1 and shall collect and analyze a confirmation sample within two weeks of notification of the results of the first sample.

(e) A water system shall monitor quarterly any source in which perchlorate has been detected. After four consecutive quarterly samples indicate that perchlorate is not present at or above the DLR, a system may request that the State Board reduce monitoring to the frequencies specified in paragraphs (c)(1) through (3).

(f) A water system serving less than 10,000 persons may apply to the State Board for a variance from the perchlorate MCL if it can demonstrate that the estimated annualized cost per household for treatment to comply with the MCL exceeds 1% of the median household income in the community within which the customers served by the water system reside.

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§64432.8. Sampling of Treated Water Sources.

(a) Each water supplier utilizing treatment to comply with one or more MCL(s) in Table 64431-A shall collect monthly samples of the treated water at a site prior to the distribution system and analyze for the chemical(s) for which treatment is being applied. If the treated water exceeds an MCL, other than a nitrate, nitrite, nitrate plus nitrite, or perchlorate MCL, within 48 hours of receipt of the result the water supplier shall resample the treated water to confirm the result and report the initial result to the State Board. The result of the analysis of the confirmation sample shall be reported to the State Board within 24 hours of receipt of the confirmation result. For nitrate, nitrite, nitrate plus nitrite, or perchlorate treated water monitoring, the water supplier shall comply with the requirements of section 64432.1(a)(1) for nitrate, section 64432.1(b)(1) for nitrite, section 64432.1(c) for nitrate plus nitrite, and section 64432.3(d) for perchlorate.

(b) The State Board may require more frequent monitoring based on an evaluation of the treatment process used, the treatment effectiveness and efficiency, and the concentration of the inorganic chemical in the water source.

Article 4.1. Fluoridation

§64433. System Requirements and Exemptions.

(a) Any public water system with 10,000 service connections or more that does not have a fluoridation system shall install such a system pursuant to the requirements in this article if the State Board identifies a source of sufficient funds not excluded by Health and Safety Code section 116415 to cover capital and any associated costs necessary to install such a system. Installation shall be completed within two years of the date the funds are received by the water system; the water system may apply to the State Board for an extension of the deadline. Following installation, if the State Board identifies a source of sufficient funds not excluded by Health and Safety Code section 116415 to cover the noncapital operations and maintenance costs for the period of a year or more, the system shall fluoridate within three months of receiving the funds and shall continue fluoridating so long as such funds are received.

(b) Any public water system with 10,000 service connections or more that has a fluoridation system but ceased fluoridating prior to December 31, 1995 shall fluoridate the drinking water if its fluoridation system is determined to be capable of fluoridating the drinking water in compliance with §64433.2, based on a State Board review, and the State Board identifies a source of sufficient funds not excluded by Health and Safety Code section 116415 to cover the noncapital operations and maintenance costs for the period of a year or more. Such a system shall fluoridate within one month of receiving the funds and shall continue fluoridating so long as such funds are received.

(c) Any public water system required to install a fluoridation system pursuant to subsection (a) or required to fluoridate pursuant to subsection (b) shall annually submit an estimate of anticipated fluoridation operations and maintenance costs for the next

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fiscal year (July 1 through June 30) to the State Board by the January 1 preceding that fiscal year.

(d) Any public water system with 10,000 service connections or more that has naturally-occurring fluoride and cannot demonstrate that it maintains an average annual fluoride level that is equal to or greater than the low level specified in the temperature-appropriate “control range” in Table 64433.2-A shall be subject to subsections (a) and (b).

(e) Any public water system which achieves 10,000 service connections or more subsequent to July 1, 1996, that does not have a fluoridation system, or that has naturally-occurring fluoride and meets the criteria in subsection (d) shall provide an estimate to the State Board of capital and any associated costs necessary to install a fluoridation system within one year of achieving at least 10,000 service connections:

(f) Any public water system with 10,000 service connections or more shall be exempted from fluoridation in either of the following cases:

(1) The water system does not receive sufficient funds from a source identified by the State Board and not excluded by Health and Safety Code section 116415 to cover the capital and associated costs needed to install a fluoridation system; or

(2) The water system received sufficient capital funds from a source identified by the State Board and not excluded by Health and Safety Code section 116415 and subsequently installed a fluoridation system or the water system meets the criteria in subsection (b), and the water system did not receive sufficient funds from a source identified by the State Board and not excluded by Health and Safety Code section 116415 to cover the noncapital operation and maintenance costs to fluoridate. The water system shall be exempted for any fiscal year (July 1 through June 30) for which it does not receive the funds for noncapital operation and maintenance costs.

§64433.2. Optimal Fluoride Levels.

Any public water system that is fluoridating shall comply with the temperature-appropriate fluoride levels in Table 64433.2-A. The system shall determine, and submit to the State Board, its annual average of maximum daily air temperatures based on the five calendar years immediately preceding the current calendar year.

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**Table 64433.2-A
Optimal Fluoride Levels**

| <i>Annual average of maximum daily air temperatures, degrees</i> | | <i>Optimal fluoride level, mg/L</i> | <i>Control Range, mg/L</i> | |
|--|----------------|---|----------------------------|-------------|
| Fahrenheit | Celsius | | Low | High |
| 50.0 to 53.7 | 10.0 to 12.0 | 1.2 | 1.1 | 1.7 |
| 53.8 to 58.3 | 12.1 to 14.6 | 1.1 | 1.0 | 1.6 |
| 58.4 to 63.8 | 14.7 to 17.7 | 1.0 | 0.9 | 1.5 |
| 63.9 to 70.6 | 17.8 to 21.4 | 0.9 | 0.8 | 1.4 |
| 70.7 to 79.2 | 21.5 to 26.2 | 0.8 | 0.7 | 1.3 |
| 79.3 to 90.5 | 26.3 to 32.5 | 0.7 | 0.6 | 1.2 |

§64433.3. Monitoring and Compliance--Fluoride Levels.

(a) If a water system has a single fluoridation system which treats all the water distributed to consumers, the supplier shall collect a daily sample for fluoride analysis, pursuant to §64415(b), either in the distribution system or at the entry point. If a water system does not fluoridate all its water and/or has more than one fluoridation system, the supplier shall collect one sample daily in the distribution system and rotate the sample sites in order to be representative of the water throughout the distribution system according to a monitoring plan the State Board has determined to be representative. For water systems fluoridating as of January 1, 1997, the plan shall be submitted by July 1, 1998. For all others, the plan shall be submitted prior to initiating fluoridation treatment. A water system shall monitor only when it is operating its fluoridation system.

(b) If more than 20 percent of the daily fluoride samples collected in a month by a water system pursuant to subsection (a) fall outside the control range of optimal levels as determined by temperature for that system pursuant to §64433.2, the system shall be out of compliance with §64433.2.

(c) At least once a month, any water supplier with an operating fluoridation system shall divide one sample and have one portion analyzed for fluoride by water system personnel and the other portion analyzed pursuant to §64415(a).

(d) Any water system with an operating fluoridation system shall sample the raw source waters annually and analyze for fluoride pursuant to §64415(a); samples collected pursuant to §64432(c)(1) may be used toward satisfying this requirement. All raw source water samples collected under this subsection are subject to compliance with the fluoride MCL in Table 64431-A.

(e) If any sample result obtained pursuant to subsection (a) does not fall within the temperature-appropriate fluoride level control range in Table 64433.2-A, the water

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supplier shall take action as detailed in the water system's approved fluoridation system operations contingency plan as specified in §64433.8.

§64433.5. Fluoridation System.

Each fluoridation system installed or modified after January 1, 1997, shall meet the following criteria, as a minimum:

- (a) Operate only when a flow of water is detected. If the water system serves less than 200 service connections, a secondary flow-based control device shall be provided as back-up protection;
- (b) Provide flow measuring and recording equipment for the fluoride addition;
- (c) Provide design and reliability features to maintain the level of fluoride within the temperature-appropriate control range 95 per cent of the time;
- (d) Provide for containment of spills; and
- (e) Provide alarm features for fluoride chemical feed and fluoride spills.

§64433.7. Recordkeeping, Reporting, and Notification for Water Systems Fluoridating.

(a) By the tenth day of each month following the month being reported, each water supplier fluoridating its water supply shall send operational reports to the State Board which include the following:

- (1) The fluoride compounds used and the calculated fluoride dose in mg/L;
- (2) Information on any interruptions in the fluoridation treatment which may have occurred during the month including the duration of the interruptions, an explanation of causes, and what corrective actions were taken to insure that fluoridation treatment was resumed in a timely manner;
- (3) The results of the daily monitoring for fluoride in the water distribution system, reported in terms of daily results, and ranges and the number of samples collected; and
- (4) The results of monthly split sample(s) analyzed pursuant to §64433.3(c).

(b) For water systems that fluoridated the previous fiscal year (July 1 through June 30), the water supplier shall report the operations and maintenance costs for that year to the State Board by August 1.

(c) Whenever a water system initiates fluoridation, suspends fluoridation for more than ninety days, or reinitiates fluoridation after a suspension of more than ninety days, the water supplier shall notify the consumers, local health departments, pharmacists, dentists, and physicians in the area served by the water system, regarding the status of the fluoridation treatment. If a water system with more than one fluoridation system suspends

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the use of one or more of its fluoridation systems, but the level of fluoride being served to the consumers is in conformance with Table 64433.2-A, no notification shall be required.

(d) If a fluoride overfeed exceeding 10.0 mg/L occurs, the water system shall notify the State Board by the end of the business day of the occurrence or within 24 hours if the State Board office is closed.

(e) If the level of fluoride in the distribution system is found to be less than the control range in Table 64433.2-A in two or more samples in a month, the water system shall notify the State Board within three business days of the second occurrence. If the level of fluoride in the distribution system is found to be 0.1 mg/L or more above the control range up to 10.0 mg/L, the water supplier shall notify the State Board within three business days of the occurrence.

§64433.8. Fluoridation System Operations Contingency Plan.

(a) Water systems fluoridating as of July 1, 1996 shall submit a fluoridation system operations contingency plan by July 1, 1998. All other water systems shall submit the plan at least three months before initiating fluoridation treatment. All fluoridating water systems shall operate in accordance with a fluoridation system operations contingency plan determined by the State Board to include the elements in subsection (b).

(b) A fluoridation system operation contingency plan shall include, but not be limited to, the following elements:

(1) Actions to be implemented by the water supplier in the event that the fluoride level in a distribution system sample is found to be less than the control range in Table 64433.2-A, 0.1 mg/L above the control range up to a fluoride level of 2.0 mg/L, from 2.1 to a level of 4.0 mg/L, from 4.1 to a level of 10.0 mg/L, or above a level of 10.0 mg/L.

(2) The procedure for shutting down the fluoridation equipment if there is a fluoride overfeed and the need to do so is identified by the State Board and/or the water supplier;

(3) The procedure for investigating the cause of an underfeed or overfeed;

(4) A list of water system, county health department, and State Board personnel with day and evening phone numbers to be notified by the end of the business day of the occurrence or within 24 hours if the State Board office is closed in the event of an overfeed exceeding 10.0 mg/L; and

(5) The procedure for notifying the public if instructed to do so by the State Board in the event of a fluoride underfeed extending for more than three months or a fluoride overfeed exceeding 10.0 mg/L.

§64434. Water System Priority Funding Schedule.

Public water systems with 10,000 service connections or more that are not fluoridating as of July 1, 1996, shall install fluoridation systems and initiate fluoridation according to the

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order established in Table 64434-A, as the water systems receive funds from sources identified by the State Board, pursuant to Health and Safety Code section 116415.

**Table 64434-A
Water System Priority Funding Schedule**

| <i>System No.</i> | <i>System Name</i> | <i>Priority</i> |
|-------------------|--|-----------------|
| 3710010 | Helix Water District | 1 |
| 5610017 | Ventura, City of | 2 |
| 4110013 | Daly City, City of | 3 |
| 3710006 | Escondido, City of | 4 |
| 4210011 | Santa Maria, City of | 5 |
| 3410009 | Fair Oaks Water District | 6 |
| 1910083 | Manhattan Beach, City of | 7 |
| 3710025 | Sweetwater Authority | 8 |
| 4210010 | Santa Barbara, City of | 9 |
| 0910001 | El Dorado Irrigation District | 10 |
| 3410006 | Citrus Heights Water District | 11 |
| 4410010 | Santa Cruz, City of | 12 |
| 3610039 | San Bernardino, City of | 13 |
| 3310009 | Eastern Municipal Water District | 14 |
| 3710037 | Padre Dam Municipal Water District | 15 |
| 1910067 | Los Angeles, City of | 16 |
| 2810003 | Napa, City of | 17 |
| 3710020 | San Diego, City of | 18 |
| 3710034 | Otay Water District | 19 |
| 3310031 | Riverside, City of | 20 |
| 1910173 | Whittier, City of | 21 |
| 3410020 | Sacramento, City of | 22 |
| 1910139 | California American Water Company - San Marino | 23 |
| 3710021 | San Dieguito Water District | 24 |
| 3610024 | Hesperia Water District | 25 |
| 1910179 | Burbank, City of | 26 |
| 2710004 | California American Water Company - Monterey | 27 |
| 3310049 | Western Municipal Water District | 28 |
| 3010073 | Moulton Niguel Water District | 29 |
| 3010101 | Santa Margarita Water District | 30 |
| 1910239 | Lakewood, City of | 31 |
| 2110003 | North Marin Water District | 32 |
| 3010037 | Yorba Linda Water District | 33 |
| 3710015 | Poway, City of | 34 |
| 3110025 | Placer County Water Agency | 35 |

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| <i>System No.</i> | <i>System Name</i> | <i>Priority</i> |
|-------------------|---|-----------------|
| 5010010 | Modesto, City of | 36 |
| 1910126 | Pomona, City of | 37 |
| 3410004 | Carmichael Water District | 38 |
| 1910043 | Glendale, City of | 39 |
| 3610018 | Cucamonga Community Water District | 40 |
| 3910011 | Tracy, City of | 41 |
| 1910234 | Walnut Valley Water District | 42 |
| 3910012 | Stockton, City of | 43 |
| 1910146 | Santa Monica, City of | 44 |
| 3710027 | Vista Irrigation District | 45 |
| 3010018 | La Habra, City of | 46 |
| 1910009 | Valley County Water District | 47 |
| 3310012 | Elsinore Valley Municipal Water District | 48 |
| 1910051 | Inglewood, City of | 49 |
| 3710005 | Carlsbad Municipal Water District | 50 |
| 4210004 | Goleta Water District | 51 |
| 1910213 | Torrance, City of | 52 |
| 1910152 | South Gate, City of | 53 |
| 1910155 | Southern California Water Company - Southwest | 54 |
| 1510017 | Indian Wells Valley Water District | 55 |
| 1910039 | San Gabriel Valley Water Company - El Monte | 56 |
| 1610003 | Hanford, City of | 57 |
| 3310037 | Corona, City of | 58 |
| 3010062 | Garden Grove, City of | 59 |
| 3610003 | Apple Valley Ranchos Water Community | 60 |
| 3610036 | Chino Hills, City of | 61 |
| 3010064 | Westminster, City of | 62 |
| 4310011 | San Jose Water Company | 63 |
| 3610012 | Chino, City of | 64 |
| 3910004 | Lodi, City of | 65 |
| 5610007 | Oxnard, City of | 66 |
| 1910019 | Cerritos, City of | 67 |
| 1910205 | Suburban Water Systems - San Jose Hills | 68 |
| 1910059 | Suburban Water Systems - La Mirada | 69 |
| 1910092 | Monterey Park, City of | 70 |
| 1910174 | Suburban Water Systems - Whittier | 71 |
| 1910026 | Compton, City of | 72 |
| 1910124 | Pasadena, City of | 73 |
| 3310022 | Lake Hemet Municipal Water District | 74 |
| 1910142 | Southern California Water Company - San Dimas | 75 |
| 4510005 | Redding, City of | 76 |

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| <i>System No.</i> | <i>System Name</i> | <i>Priority</i> |
|-------------------|--|-----------------|
| 3610037 | Redlands, City of | 77 |
| 3910005 | Manteca, City of | 78 |
| 3710014 | Oceanside, City of | 79 |
| 3610038 | Rialto, City of | 80 |
| 4310022 | Great Oaks Water Company | 81 |
| 4310014 | Sunnyvale, City of | 82 |
| 3310021 | Jurupa Community Services District | 83 |
| 3410001 | Arcade- Town & County | 84 |
| 3610052 | Victor Valley Water District | 85 |
| 3010023 | Newport Beach, City of | 86 |
| 3610064 | East Valley Water District | 87 |
| 1910225 | Las Virgenes Municipal Water District | 88 |
| 3710001 | California American Water Company - Coronado | 89 |
| 3610034 | Ontario, City of | 90 |
| 3910001 | California Water Service Company - Stockton | 91 |
| 1910033 | Dominguez Water Agency | 92 |
| 5410015 | Tulare, City of | 93 |
| 5710006 | Woodland, City of | 94 |
| 3710029 | Olivenhain Municipal Water District | 95 |
| 1910003 | Arcadia, City of | 96 |
| 1910008 | Azusa Valley Water Company | 97 |
| 4410011 | Watsonville, City of | 98 |
| 3010003 | Buena Park, City of | 99 |
| 4310005 | Milpitas, City of | 100 |
| 1910017 | Santa Clarita Water Company | 101 |
| 1910240 | Valencia Water Company | 102 |
| 3610004 | West San Bernardino Water District | 103 |
| 0910002 | South Tahoe Public Utilities District | 104 |
| 5610059 | Southern California Water Company - Simi Valley | 105 |
| 3010027 | Orange, City of | 106 |
| 5410010 | Porterville, City of | 107 |
| 4410017 | Soquel Creek Water District | 108 |
| 4110023 | San Bruno, City of | 109 |
| 1910001 | Alhambra, City of | 110 |
| 3010022 | Southern California Water Company-West Orange County | 111 |
| 3010091 | Los Alisos Water District | 112 |
| 3610050 | Upland, City of | 113 |
| 3410024 | Northridge Water District | 114 |
| 1010003 | Clovis, City of | 115 |
| 3010004 | Mesa Consolidated Water District | 116 |
| 3610041 | San Gabriel Valley Water Company - Fontana | 117 |

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| <i>System No.</i> | <i>System Name</i> | <i>Priority</i> |
|-------------------|---|-----------------|
| 3410010 | Citizens Utilities Company of California - Suburban | 118 |
| 3010038 | Santa Ana, City of | 119 |
| 3010092 | Irvine Ranch Water District | 120 |
| 1910211 | Park Water Company - Bellflower | 121 |
| 3010010 | Fullerton, City of | 122 |
| 4310007 | Mountain View, City of | 123 |
| 3010036 | San Clemente, City of | 124 |
| 3010079 | El Toro Water District | 125 |
| 5610020 | Thousand Oaks, City of | 126 |
| 3610029 | Monte Vista Water District | 127 |
| 1910004 | Southern California Water Company - Artesia | 128 |
| 4210016 | Southern California Water Company - Orcutt | 129 |
| 4110008 | California Water Service Company - San Mateo | 130 |
| 1310038 | Rancho California Water District | 131 |
| 3410017 | Citizens Utilities Company of California - Parkway | 132 |
| 1910024 | Southern California Water Company - Claremont | 133 |
| 1910044 | Glendora, City of | 134 |
| 3010001 | Anaheim, City of | 135 |
| 5710001 | Davis, City of | 136 |
| 1910134 | California Water Service Company-Hermosa/Redondo | 137 |
| 1010007 | Fresno, City of | 138 |
| 1910102 | Palmdale Water District | 139 |
| 4310012 | Santa Clara, City of | 140 |
| 2710010 | California Water Service Company - Salinas | 141 |
| 4910006 | Petaluma, City of | 142 |
| 1910036 | California Water Service Company - East Los Angeles | 143 |
| 3410013 | Citizens Utilities Company of California - Lincoln Oaks | 144 |
| 3310001 | Coachella Valley Water District | 145 |
| 5010019 | Turlock, City of | 146 |
| 5410016 | California Water Service Company - Visalia | 147 |
| 5610023 | Waterworks District 8-Simi Valley | 148 |
| 0410002 | California Water Service Company - Chico | 149 |
| 1910104 | California Water Service Company - Palos Verdes | 150 |
| 3410015 | Southern California Water Company - Corodva | 151 |
| 4910009 | Santa Rosa, City of | 152 |
| 1910194 | Rowland Water District | 153 |
| 1510003 | California Water Service Company - Bakersfield | 154 |
| 5610040 | California American Water Company - Village District | 155 |
| 3310005 | Desert Water Agency | 156 |
| 0110003 | California Water Service Company - Livermore | 157 |
| 3010046 | Tustin, City of | 158 |

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| <i>System No.</i> | <i>System Name</i> | <i>Priority</i> |
|-------------------|--|-----------------|
| 4310001 | California Water Service Company - Los Altos Suburban | 159 |
| 4110007 | California Water Service Company - San Carlos | 160 |
| 1910070 | Los Angeles, County Water Works District 4&34- Lancaster | 161 |
| 1510031 | Bakersfield, City of | 162 |
| 4110009 | California Water Service Company - South San Francisco | 163 |
| 3010053 | Huntington Beach, City of | 164 |
| 4110006 | California Water Service Company - Bear Gulch | 165 |
| 1910034 | Downey, City of | 166 |
| 4110022 | Redwood City | 167 |

Article 5. Radioactivity

§64442. MCLs and Monitoring - Gross Alpha Particle Activity, Radium-226, Radium-228, and Uranium

(a) Each community and nontransient-noncommunity water system (system) shall comply with the primary MCLs in Table 64442 in the drinking water supplied to the public and use the DLRs for reporting monitoring results:

**Table 64442
Radionuclide Maximum Contaminant Levels (MCLs)
and Detection Levels for Purposes of Reporting (DLRs)**

| <i>Radionuclide</i> | <i>MCL</i> | <i>DLR</i> |
|---|---------------------------------------|------------|
| Radium-226 | 5 pCi/L (combined radium-226 & - 228) | 1 pCi/L |
| Radium-228 | | 1 pCi/L |
| Gross Alpha particle activity (excluding radon and uranium) | 15 pCi/L | 3 pCi/L |
| Uranium | 20 pCi/L | 1 pCi/L |

(b) Each system shall monitor to determine compliance with the MCLs in table 64442, as follows:

(1) Monitor at each water source, or every entry point to the distribution system that is representative of all sources being used under normal operating conditions; conduct all monitoring at the same sample site(s) unless a change is approved by the State Board, based on a review of the system and its historical water quality data;

(2) For quarterly monitoring, monitor during the same month (first, second or third) of each quarter during each quarter monitored;

(3) By December 31, 2007, complete initial monitoring that consists of four consecutive quarterly samples at each sampling site for each radionuclide in table 64442, except that nontransient-noncommunity water systems shall not be required to monitor radium-228 as a separate analyte, but shall monitor for compliance with the combined

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radium MCL using the analytical method described in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, Section 6, Alpha-emitting Radium Isotopes in Drinking Water, Method 903.0 (EPA/600/4-80-032, August 1980):

(A) Data collected for a sampling site between January 1, 2001, and December 31, 2004, may be used to satisfy the initial monitoring requirement, subject to the State Board's approval based on whether the analytical methods, DLRs, sampling sites, and the frequency of monitoring used were consistent with this article.

(B) For gross alpha particle activity, uranium, radium-226 and radium-228, the State Board may waive the final two quarters of initial monitoring at a sampling site if the results from the previous two quarters are below the DLR(s) and the sources are not known to be vulnerable to contamination.

(c) Any new system or new source for an existing system shall begin monitoring pursuant to Subsection (b) within the first quarter after initiating water service to the public.

(d) After initial monitoring, each system shall monitor for each radionuclide at each sampling site at a frequency determined by the monitoring result(s) [single sample result or average of sample results if more than one sample collected] from the most recent compliance period as follows:

(1) For nontransient-noncommunity water systems, the results for the total radium analyses shall be averaged.

(2) For community water systems, the results of radium-226 and radium-228 analyses shall be added and the average calculated.

(3) The values used for the radionuclide MCLs and DLRs shall be as specified in Table 64442.

(4) If the single sample result or average is:

A. Below the DLR, the system shall collect and analyze at least one sample every nine years (3 compliance periods).

B. At or above the DLR, but at or below $\frac{1}{2}$ the MCL, the system shall collect and analyze at least one sample every six years.

C. Above $\frac{1}{2}$ the MCL, but not above the MCL, the system shall collect and analyze at least one sample every three years.

(e) A system that monitors quarterly may composite up to four consecutive samples from a single sampling site if analysis is done within a year of the first sample's collection. If the result of the composited sample is greater than $\frac{1}{2}$ the MCL, at least one additional quarterly sample shall be analyzed to evaluate the range and trend of results over time before allowing the system to reduce the monitoring frequency.

(f) A gross alpha particle activity measurement may be substituted for other measurements by adding the 95% confidence interval (1.65σ , where σ is the standard deviation of the net counting rate of the sample) to it; and if,

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- (1) For uranium and radium measurements (after initial radium-228 monitoring has been completed), the gross alpha measurement does not exceed 5 pCi/L; or
- (2) For radium measurements (after initial radium-228 monitoring has been completed), the result obtained from subtracting the uranium measurement from the gross alpha measurement does not exceed 5 pCi/L.

(g) If any sample result is greater than an MCL:

- (1) For a system monitoring less than quarterly, quarterly samples shall be collected and analyzed to determine compliance, pursuant to subsection (h);
- (2) For a system that already has four consecutive quarterly results, compliance shall be determined pursuant to subsection (h).
- (3) The system shall monitor quarterly until the results of four consecutive quarterly sample results do not exceed the MCL.

(h) A system with one or more sample results greater than an MCL shall determine compliance with the MCL as follows:

- (1) At each sampling site, based on the analytical results for that site. Any confirmation sample result shall be averaged with the initial result.
- (2) Using all monitoring results collected under this section during the previous 12 months, even if more than the minimum required number of samples was collected.
- (3) By a running annual average of four consecutive quarters of sampling results. Averages shall be rounded to the same number of significant figures as the MCL for which compliance is being determined.

(A) If any sample result will cause the annual average at any sample site to exceed the MCL, the system shall be out of compliance immediately upon receiving the result;

(B) If a system has not analyzed the required number of samples, compliance shall be determined by the average of the samples collected at the site during the most recent 12 months; and

(C) If a sample result is less than the DLR in table 64442, zero shall be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226, total radium, and/or uranium. In that case, if the gross alpha particle activity result is less than the DLR, $\frac{1}{2}$ the DLR shall be used to calculate the annual average.

(4) If compositing is allowed at a sampling site, by the results of a composite of four consecutive quarterly samples.

(5) If the system can provide documentation that a sample was subject to sampling or analytical errors, the State Board may invalidate the result based on its review of the documentation, the sampling result, and the historical sampling data.

(6) Each system shall ensure that the laboratory analyzing its samples collected for compliance with this article calculates and reports the sample-specific Minimum Detectable Activity at the 95% confidence level (MDA_{95}) along with the sample results. The MDA_{95} shall not exceed the DLR and shall be calculated as described in ANSI

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N42.23 Measurement and Associated Instrumentation Quality Assurance for Radiobioassay Laboratories, Appendix A.7.6 (September 10, 1995).

§64443. MCLs and Monitoring - Beta Particle and Photon Radioactivity

(a) Each community and nontransient-noncommunity water system (system) shall comply with the primary MCLs in table 64443 and use the DLRs for reporting monitoring results:

**Table 64443
Radionuclide Maximum Contaminant Levels (MCLs)
and Detection Levels for Purposes of Reporting (DLRs)**

| <i>Radionuclide</i> | <i>MCL</i> | <i>DLR</i> |
|----------------------|--|---------------------------------------|
| Beta/photon emitters | 4 millirem/year annual dose equivalent to the total body or any internal organ | Gross Beta particle activity: 4 pCi/L |
| Strontium-90 | 8 pCi/L (= 4 millirem/yr dose to bone marrow) | 2 pCi/L |
| Tritium | 20,000 pCi/L (= 4 millirem/yr dose to total body) | 1,000 pCi/L |

(b) Each system designated by the State Board as vulnerable to contamination by nuclear facilities and/or a determination of vulnerability by a Source Water Assessment, as defined in section 63000.84, shall monitor to determine compliance with the MCLs in table 64443, as follows:

(1) Beginning within one quarter after being notified by the State Board that the system is vulnerable, quarterly for beta/photon emitters and annually for tritium and strontium-90 at each water source, or every entry point to the distribution system that is representative of all sources being used under normal operating conditions, and shall conduct all monitoring at the same sample site(s) unless a change is approved by the State Board, based on a review of the system and its historical water quality data;

(2) For quarterly monitoring, during the same month (first, second or third) of each quarter during each quarter monitored; and

(3) If the gross beta particle activity minus the naturally-occurring potassium-40 beta particle activity at a sampling site has a running annual average less than or equal to 50 pCi/L (screening level), reduce monitoring to a single sample for beta/photon emitters, tritium and strontium-90 once every three years (compliance monitoring period).

(c) Each system designated by the State Board as utilizing waters contaminated by effluents from nuclear facilities on the basis of analytical data and/or a Source Water Assessment, shall:

(1) Beginning within one quarter after being notified by the State Board of the above designation, monitor on an ongoing basis pursuant to subparagraphs (A) through (C) at each sampling site:

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(A) For beta/photon emitters, quarterly by analyzing three monthly samples and averaging the results or by analyzing a composite of three monthly samples;

(B) For iodine-131, quarterly by analyzing a composite of five consecutive daily samples, unless the State Board has directed the system to do more frequent monitoring based on a detection of iodine-131 in the sampled water; and

(C) For strontium-90 and tritium, annually by analyzing four quarterly samples and averaging the results or by analyzing a composite of four quarterly samples.

(2) If the gross beta particle activity minus the naturally-occurring potassium-40 beta particle activity at a sampling site has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), reduce the frequency of monitoring to a single sample for beta/photon emitters, iodine-131, strontium-90 and tritium once every three years (compliance monitoring period).

(d) If the gross beta particle activity minus the naturally-occurring potassium-40 beta particle activity exceeds a system's screening level pursuant to Subsection (b)(3) or (c)(2):

(1) The sample shall be analyzed to identify the primary radionuclides present and the doses shall be calculated and summed to determine compliance with the MCL for beta particle/photon radioactivity; and

(2) Except for strontium-90 and tritium for which the MCLs provide the average annual concentrations assumed to produce a total body or organ dose equivalent to 4 millirem/year, the concentration of manmade radionuclides shall be calculated using the 168 hour data list in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce. (See Title 40, Code of Federal Regulations, section 141.66(d)(2).)

(e) If a system analyzes for naturally-occurring potassium-40 beta particle activity from the same or equivalent samples used for the gross beta particle activity analysis, the potassium-40 beta particle activity shall be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82 pCi/mg.

(f) A system required to monitor under this section may use environmental surveillance data (collected by the nuclear facility to detect any radionuclide contamination) in lieu of monitoring, subject to the State Board's determination that the data is applicable to the system based on a review of the data and the hydrogeology of the area. In the event that there is a release of radioactivity or radioactive contaminants from the nuclear facility, a system using environmental surveillance data shall begin the monitoring in paragraph (b)(1) or (c)(1)(A) through (C), whichever is most applicable.

(g) If a sample result is greater than an MCL:

(1) Compliance shall be determined as follows:

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(A) At each sampling site, based on the analytical results for that site. Any confirmation sample result shall be averaged with the initial result.

(B) Using all monitoring results collected under this article during the previous 12 months, even if more than the minimum required number of samples was collected.

(C) By a running annual average of four consecutive quarters of sampling results where quarterly monitoring is required, or by an annual sample when applicable for tritium and strontium-90. Averages shall be rounded to the same number of significant figures as the MCL for which compliance is being determined.

1. If any sample result will cause the annual average at any sample site to exceed the MCL, the system shall be out of compliance immediately after being notified of the result;

2. If a system has not analyzed the required number of samples, compliance shall be determined by the average of the samples collected at the site during the most recent 12 months; and

3. If a sample result is less than the DLR in 64443, zero shall be used to calculate the annual average.

(D) If the system can provide documentation that a sample was subject to sampling or analytical errors, the State Board may invalidate the result based on its review of the documentation, the sampling result, and the historical sampling data.

(E) Each system shall ensure that the laboratory analyzing its samples collected for compliance with this article calculates and reports the sample-specific Minimum Detectable Activity at the 95% confidence level (MDA₉₅) along with the sample results. The MDA₉₅ shall not exceed the DLR and is calculated as described in ANSI N42.23 Measurement and Associated Instrumentation Quality Assurance for Radiobioassay Laboratories, Appendix A.7.6 (September 10, 1995). (See Title 40, Code of Federal Regulations, section 141.66(d)(2).)

(2) If a sample has a gross beta/photon radioactivity level greater than the MCL:

(A) A system shall monitor monthly beginning the month after receiving a result greater than the MCL and continue monthly monitoring until an average of three consecutive monthly sample results does not exceed the MCL ;

(B) The system shall then monitor quarterly until the average of four consecutive quarterly sample results does not exceed the MCL; and

(C) Subsequently, the system shall conduct the monitoring in paragraph (b)(1) or (c)(1)(A) through (C), whichever is most applicable.

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Article 5.5. Primary Standards -- Organic Chemicals

§64444. Maximum Contaminant Levels – Organic Chemicals.

The MCLs for the primary drinking water chemicals shown in table 64444-A shall not be exceeded in the water supplied to the public.

**Table 64444-A
Maximum Contaminant Levels
Organic Chemicals**

| <i>Chemical</i> | <i>Maximum Contaminant Level, mg/L</i> |
|--|--|
| (a) Volatile Organic Chemicals (VOCs) | |
| Benzene. | 0.001 |
| Carbon Tetrachloride | 0.0005 |
| 1,2-Dichlorobenzene. | 0.6 |
| 1,4-Dichlorobenzene. | 0.005 |
| 1,1-Dichloroethane | 0.005 |
| 1,2-Dichloroethane | 0.0005 |
| 1,1-Dichloroethylene | 0.006 |
| cis-1,2-Dichloroethylene | 0.006 |
| trans-1,2-Dichloroethylene | 0.01 |
| Dichloromethane. | 0.005 |
| 1,2-Dichloropropane. | 0.005 |
| 1,3-Dichloropropene. | 0.0005 |
| Ethylbenzene. | 0.3 |
| Methyl- <i>tert</i> -butyl ether | 0.013 |
| Monochlorobenzene. | 0.07 |
| Styrene. | 0.1 |
| 1,1,2,2-Tetrachloroethane. | 0.001 |
| Tetrachloroethylene. | 0.005 |
| Toluene. | 0.15 |
| 1,2,4-Trichlorobenzene | 0.005 |
| 1,1,1-Trichloroethane. | 0.200 |
| 1,1,2-Trichloroethane. | 0.005 |
| Trichloroethylene. | 0.005 |
| Trichlorofluoromethane. | 0.15 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane. | 1.2 |
| Vinyl Chloride. | 0.0005 |
| Xylenes. | 1.750* |

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Table 64444-A (continued)
Maximum Contaminant Levels
Organic Chemicals

| <i>Chemical</i> | <i>Maximum Contaminant Level, mg/L</i> |
|---|--|
| (b) Synthetic Organic Chemicals (SOCs) | |
| Alachlor. | 0.002 |
| Atrazine. | 0.001 |
| Bentazon. | 0.018 |
| Benzo(a)pyrene. | 0.0002 |
| Carbofuran. | 0.018 |
| Chlordane | 0.0001 |
| 2,4-D | 0.07 |
| Dalapon | 0.2 |
| Dibromochloropropane. | 0.0002 |
| Di(2-ethylhexyl)adipate | 0.4 |
| Di(2-ethylhexyl)phthalate | 0.004 |
| Dinoseb | 0.007 |
| Diquat | 0.02 |
| Endothall | 0.1 |
| Endrin. | 0.002 |
| Ethylene Dibromide | 0.00005 |
| Glyphosate. | 0.7 |
| Heptachlor. | 0.00001 |
| Heptachlor Epoxide. | 0.00001 |
| Hexachlorobenzene | 0.001 |
| Hexachlorocyclopentadiene | 0.05 |
| Lindane. | 0.0002 |
| Methoxychlor | 0.03 |
| Molinate | 0.02 |
| Oxamyl | 0.05 |
| Pentachlorophenol. | 0.001 |
| Picloram | 0.5 |
| Polychlorinated Biphenyls. | 0.0005 |
| Simazine | 0.004 |
| Thiobencarb. | 0.07 |
| Toxaphene. | 0.003 |
| 1,2,3-Trichloropropane | 0.000005 |
| 2,3,7,8-TCDD (Dioxin). | 3×10^{-8} |
| 2,4,5-TP (Silvex). | 0.05 |

*MCL is for either a single isomer or the sum of the isomers.

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§64445. Initial Sampling - Organic Chemicals.

(a) Each community and nontransient-noncommunity water system shall collect four quarterly samples during the year designated by the State Board of each compliance period beginning with the compliance period starting January 1, 1993, from each water source at a site prior to any treatment and test for all applicable organic chemicals listed in table 64444-A. The State Board will designate the year based on historical monitoring frequency and laboratory capacity. For surface sources, the samples shall be taken at each water intake. For groundwater sources, the samples shall be taken at each well head. Where multiple intakes or wells draw from the same water supply, the State Board will consider sampling of representative sources as a means of complying with this section. Selection of representative sources shall be based on evidence which includes a hydrogeological survey and sampling results. Wells shall be allowed to flow for a minimum of 15 minutes before sampling to insure that the samples reflect the water quality of the source. In place of water source samples, a supplier may collect samples at sites located at the entry points to the distribution system. The samples shall be representative of each source after treatment. The system shall collect each sample at the same sampling site, unless a change is approved by the State Board.

(b) For any organic chemical added to table 64444-A, the water system shall initiate the quarterly monitoring for that chemical in January of the calendar year after the effective date of the MCL.

(c) A water system may request approval from the State Board to composite samples from up to five sampling sites, provided that the number of the sites to be composited is less than the ratio of the MCL to the DLR in §64445.1. Approval will be based on a review of three years of historical data, well construction and aquifer information for groundwater, and intake location, similarity of sources, and watershed characteristics for surface water. Compositing shall be done in the laboratory and analyses shall be conducted within 14 days of sample collection.

(1) Systems serving more than 3,300 persons shall composite only from sampling sites within a single system. Systems serving 3,300 persons or less may composite among different systems up to the 5-sample limit.

(2) If any organic chemical is detected in the composite sample, a follow-up sample shall be analyzed within 14 days from each sampling site included in the composite for the contaminants which were detected. The water supplier shall report the results to the State Board within 14 days of the follow-up sample collection. If available, duplicates of the original sample taken from each sampling site used in the composite may be used instead of resampling.

(d) A water system may apply to the State Board for a monitoring waiver for one or more of the organic chemicals on table 64444-A in accordance with the following:

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(1) A source may be eligible for a waiver if it can be documented that the chemical has not been previously used, manufactured, transported, stored, or disposed of within the watershed or zone of influence and therefore, that the source can be designated nonvulnerable.

(2) If previous use of the chemical locally is unknown or the chemical is known to have been used previously and the source cannot be designated nonvulnerable pursuant to Paragraph (d)(1), it may still be eligible for a waiver based on a review related to susceptibility to contamination. The application to the State Board for a waiver based on susceptibility shall include the following:

- (A) previous monitoring results;
- (B) user population characteristics;
- (C) proximity to sources of contamination;
- (D) surrounding land uses;
- (E) degree of protection of the water source;
- (F) environmental persistence and transport of the chemical in water, soil and

air;

(G) elevated nitrate levels at the water supply source; and

(H) historical system operation and maintenance data including previous State Board inspection results.

(3) To apply for a monitoring waiver for VOCs, the water system shall have completed the initial four quarters of monitoring pursuant to subsection (a) or three consecutive years of monitoring with no VOCs detected. If granted a waiver for VOC monitoring, a system using groundwater shall collect a minimum of one sample from every sampling site every six years and a system using surface water shall not be required to monitor for the term of the waiver. The term of a VOC waiver shall not exceed three years.

(4) To obtain a monitoring waiver for one or more of the SOC(s), the water system may apply before doing the initial round of monitoring or shall have completed three consecutive years of annual monitoring with no detection of the SOC(s) listed. If the system is granted a waiver for monitoring for one or more SOC(s), no monitoring for the waived SOC(s) shall be required for the term of the waiver, which shall not exceed three years.

(e) For water sources designated by a water supplier as standby sources, the water supplier shall sample each source for any organic chemical added to table 64444-A once within the three-year period beginning in January of the calendar year after the effective date of the MCL.

(f) Water quality data collected prior to January 1, 1988, for VOCs, or January 1, 1990, for SOC(s), and/or data collected in a manner inconsistent with this section shall not be used in the determination of compliance with the monitoring requirements for organic chemicals.

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(g) MTBE data (i.e., a single sample) collected in a manner consistent with this section after January 1, 1998 in which no MTBE is detected, along with a designation of nonvulnerability pursuant to subsection (d), may be used to satisfy the initial monitoring requirements in subsection (a). If the requirements are satisfied in this way by a water system, the system shall begin annual monitoring pursuant to section 64445.1(b)(1).

(h) Water quality data collected in compliance with the monitoring requirements of this section by a wholesaler agency providing water to a public water system shall be acceptable for use by that system for compliance with the monitoring requirements of this section.

(i) Results obtained from groundwater monitoring performed for an organic chemical in accordance with this section and not more than two calendar years prior to the effective date of a regulation establishing the MCL for that organic chemical may be substituted to partially satisfy the initial monitoring requirements required by this section for that organic chemical. Requests to substitute groundwater monitoring results shall be made in accordance with the following:

1. Requests shall be made in writing by the water system to the State Board; and
2. If the State Board approves the request then results from a given calendar quarter will only be eligible to substitute for a single required initial monitoring result during that same quarter of initial monitoring. (e.g. the second quarter of 2016 may be substituted for the second quarter of 2018).
3. No more than three of the four quarterly samples as required by section 64445(a) or (b) may be substituted.

§64445.1. Repeat Monitoring and Compliance – Organic Chemicals.

(a) For the purposes of this article, detection shall be defined by the detection limits for purposes of reporting (DLRs) in table 64445.1-A:

**Table 64445.1-A
Detection Limits for Purposes of Reporting (DLRs)
for Regulated Organic Chemicals**

| <i>Chemical</i> | <i>Detection Limit for Purposes of Reporting (DLR)(mg/L)</i> |
|--|--|
| (a) All VOCs, except as listed. | 0.0005 |
| Methyl- <i>tert</i> -butyl ether | 0.003 |
| Trichlorofluoromethane | 0.005 |

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| <i>Chemical</i> | <i>Detection Limit for Purposes of Reporting (DLR)(mg/L)</i> |
|--|--|
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.01 |
| (b) SOCs | |
| Alachlor. | 0.001 |
| Atrazine. | 0.0005 |
| Bentazon. | 0.002 |
| Benzo(a)pyrene. | 0.0001 |
| Carbofuran. | 0.005 |
| Chlordane. | 0.0001 |
| 2,4-D. | 0.01 |
| Dalapon. | 0.01 |
| Dibromochloropropane (DBCP). | 0.00001 |
| Di(2-ethylhexyl)adipate. | 0.005 |
| Di(2-ethylhexyl)phthalate. | 0.003 |
| Dinoseb. | 0.002 |
| Diquat. | 0.004 |
| Endothall. | 0.045 |
| Endrin. | 0.0001 |
| Ethylene dibromide (EDB). | 0.00002 |
| Glyphosate. | 0.025 |
| Heptachlor. | 0.00001 |
| Heptachlor epoxide. | 0.00001 |
| Hexachlorobenzene. | 0.0005 |
| Hexachlorocyclopentadiene. | 0.001 |
| Lindane. | 0.0002 |
| Methoxychlor. | 0.01 |
| Molinate. | 0.002 |
| Oxamyl. | 0.02 |
| Pentachlorophenol. | 0.0002 |
| Picloram. | 0.001 |
| Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl). | 0.0005 |
| Simazine. | 0.001 |
| Thiobencarb. | 0.001 |
| Toxaphene. | 0.001 |
| 1,2,3-Trichloropropane | 0.000005 |
| 2,3,7,8-TCDD (Dioxin). | 5 x 10 ⁻⁹ |
| 2,4,5-TP (Silvex). | 0.001 |

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(b) When organic chemicals are not detected pursuant to table 64445.1-A.

(1) A water system which has not detected any of the VOCs on table 64444-A during the initial four quarters of monitoring, shall collect and analyze one sample annually. After a minimum of three years of annual sampling with no detection of a VOC in table 64444-A, a system using groundwater may reduce the monitoring frequency to one sample during each compliance period. A system using surface water shall continue monitoring annually.

(2) A system serving more than 3,300 persons which has not detected an SOC on table 64444-A during the initial four quarters of monitoring shall collect a minimum of two quarterly samples for that SOC in one year during the year designated by the State Board of each subsequent compliance period. The year will be designated on the basis of historical monitoring frequency and laboratory capacity.

(3) A system serving 3,300 persons or less which has not detected an SOC on table 64444-A during the initial four quarters of monitoring shall collect a minimum of one sample for that SOC during the year designated by the State Board of each subsequent compliance period. The year will be designated on the basis of historical monitoring frequency and laboratory capacity.

(c) When organic chemicals are detected pursuant to table 64445.1-A.

(1) Prior to proceeding with the requirements of paragraphs (2) through (7), the water supplier may first confirm the analytical result, as follows: Within seven days from the notification of an initial finding from a laboratory reporting the presence of one or more organic chemicals in a water sample, the water supplier shall collect one or two additional sample(s) to confirm the initial finding. Confirmation of the initial finding shall be shown by the presence of the organic chemical in either the first or second additional sample, and the detected level of the contaminant for compliance purposes shall be the average of the initial and confirmation sample(s). The initial finding shall be disregarded if two additional samples do not show the presence of the organic chemical.

(2) If one or both of the related organic chemicals heptachlor and heptachlor epoxide are detected, subsequent monitoring shall analyze for both chemicals until there has been no detection of either chemical for one compliance period.

(3) A groundwater sampling site at which one or more of the following chemicals has been detected shall be monitored quarterly for vinyl chloride: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene. If vinyl chloride is not detected in the first quarterly sample, the sampling site shall be monitored once for vinyl chloride during each compliance period.

(4) If the detected level of organic chemicals for any sampling site does not exceed any shown in table 64444-A, the water source shall be resampled every three months and the samples analyzed for the detected chemicals. After one year of sampling an approved surface water system or two quarters of sampling a groundwater system, the State Board will consider allowing the water supplier to reduce the sampling to once per

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year upon request, based on a review of previous sampling data. Systems shall monitor during the quarter(s) which previously yielded the highest analytical results.

(5) If the detected level of an organic chemical for any sampling site exceeds that listed in table 64444-A, the water supplier shall report this information to the State Board within 48 hours of receipt of the result. Unless use of the contaminated source is discontinued, the water supplier shall resample the contaminated source and compliance shall be determined as follows:

(A) Water systems serving more than 3,300 persons shall sample monthly for six months and shall submit the results to the State Board as specified in section 64469. If the average concentration of the initial finding, confirmation sample(s), and six subsequent monthly samples does not exceed the MCL shown in table 64444-A the water supplier may reduce the sampling frequency to once every three months. If the running annual average or the average concentration of the initial finding, confirmation sample(s), and six subsequent monthly samples exceeds the MCL shown in table 64444-A, the water system shall be deemed to be in violation of section 64444.

(B) Water systems serving 3,300 persons or less shall sample quarterly for a minimum of one year and shall submit the results to the State Board as specified in section 64469. If the running annual average concentration does not exceed the MCL in table 64444-A, the water supplier may reduce the sampling frequency to once every year during the quarter that previously yielded the highest analytical result. Quarterly monitoring shall resume if any reduced frequency sample result exceeds the MCL. If the running annual average concentration exceeds the MCL in table 64444-A, the water system shall be deemed to be in violation of section 64444.

(C) If any sample would cause the running annual average to exceed the MCL, the water system is immediately in violation. If a system takes more than one sample in a quarter, the average of all the results for that quarter shall be used when calculating the running annual average. If a system fails to complete four consecutive quarters of monitoring, the running annual average shall be based on an average of the available data.

(6) If any resample, other than those taken in accordance with paragraph (5), of a water sampling site shows that the concentration of any organic chemical exceeds a MCL shown in table 64444-A, the water supplier shall proceed in accordance with paragraphs (1) and (4), or paragraph (5).

(7) If an organic chemical is detected and the concentration exceeds ten times the MCL, the water supplier shall notify the State Board within 48 hours of the receipt of the results and the contaminated site shall be resampled within 48 hours to confirm the result. The water supplier shall notify the State Board of the result of the confirmation sample(s) within 24 hours of the receipt of the confirmation result(s).

(A) If the average concentration of the original and confirmation sample(s) is less than or equal to ten times the MCL, the water supplier shall proceed in accordance with paragraph (5).

(B) If the average concentration of the original and confirmation samples exceeds ten times the MCL, use of the contaminated water source shall immediately be

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discontinued, if directed by the State Board. Such a water source shall not be returned to service without written approval from the State Board.

§64445.2. Sampling of Treated Water Sources.

(a) Each water supplier utilizing treatment to comply with any MCL for an organic chemical listed in table 64444-A shall collect monthly samples of the treated water at a site prior to the distribution system. If the treated water exceeds the MCL, the water supplier shall resample the treated water to confirm the result and report the result to the State Board within 48 hours of the confirmation.

(b) The State Board will consider requiring more frequent monitoring based on an evaluation of (1) the treatment process used, (2) the treatment effectiveness and efficiency, and (3) the concentration of the organic chemical in the water source.

Article 12. Best available technologies (BAT)

§64447. Best Available Technologies (BAT) – Microbiological Contaminants.

The technologies identified by the State Board as the best available technology, treatment techniques, or other means available for achieving compliance with the total coliform MCL are as follows:

(a) Protection of wells from coliform contamination by appropriate placement and construction;

(b) Maintenance of a disinfectant residual throughout the distribution system;

(c) Proper maintenance of the distribution system; and

(d) Filtration and/or disinfection of approved surface water, in compliance with Section 64650, or disinfection of groundwater.

§64447.2. Best Available Technologies (BAT) - Inorganic chemicals.

The technologies listed in table 64447.2-A are the best available technology, treatment techniques, or other means available for achieving compliance with the MCLs in table 64431-A for inorganic chemicals.

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**Table 64447.2-A
Best Available Technologies (BAT)
Inorganic Chemicals**

| <i>Chemical</i> | <i>Best Available Technologies (BATs)</i> |
|-----------------|---|
| Aluminum | 10 |
| Antimony | 2, 7 |
| Arsenic | 1, 2, 5, 6, 7, 9, 13 |
| Asbestos | 2, 3, 8 |
| Barium | 5, 6, 7, 9 |
| Beryllium | 1, 2, 5, 6, 7 |
| Cadmium | 2, 5, 6, 7 |
| Chromium | 2, 5, 6 ^a , 7 |
| Cyanide | 5, 7, 11 |
| Fluoride | 1 |
| Mercury | 2 ^b , 4, 6 ^b , 7 ^b |
| Nickel | 5, 6, 7 |
| Nitrate | 5, 7, 9 |
| Nitrite | 5, 7 |
| Perchlorate | 5,12 |
| Selenium | 1, 2 ^c , 6, 7, 9 |
| Thallium | 1, 5 |

^aBAT for chromium III (trivalent chromium) only.

^bBAT only if influent mercury concentrations <10 µg/L.

^cBAT for selenium IV only.

Key to BATs in table 64447.2:

- 1 = Activated Alumina
- 2 = Coagulation/Filtration (not BAT for systems < 500 service connections)
- 3 = Direct and Diatomite Filtration
- 4 = Granular Activated Carbon
- 5 = Ion Exchange
- 6 = Lime Softening (not BAT for systems < 500 service connections)
- 7 = Reverse Osmosis
- 8 = Corrosion Control
- 9 = Electrodialysis
- 10 = Optimizing treatment and reducing aluminum added
- 11 = Chlorine oxidation
- 12 = Biological fluidized bed reactor
- 13 = Oxidation/Filtration

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§64447.3. Best Available Technologies (BAT) - Radionuclides.

The technologies listed in tables 64447.3-A, B and C are the best available technology, treatment technologies, or other means available for achieving compliance with the MCLs for radionuclides in tables 64442 and 64443.

**Table 64447.3-A
Best Available Technologies (BATs)
Radionuclides**

| <i>Radionuclide</i> | <i>Best Available Technology</i> |
|--|---|
| Combined radium-226 and radium-228 | Ion exchange, reverse osmosis, lime softening |
| Uranium | Ion exchange, reverse osmosis, lime softening, coagulation/filtration |
| Gross alpha particle activity | Reverse osmosis |
| Beta particle and photon radioactivity | Ion exchange, reverse osmosis |

**Table 64447.3-B
Best Available Technologies (BATs) and Limitations for Small Water Systems
Radionuclides**

| <i>Unit Technologies</i> | <i>Limitations (see footnotes)</i> | <i>Operator Skill Level Required</i> | <i>Raw Water Quality Range and Considerations</i> |
|----------------------------------|------------------------------------|--------------------------------------|---|
| 1. Ion exchange | (a) | Intermediate | All ground waters; competing anion concentrations may affect regeneration frequency |
| 2. Point of use, ion exchange | (b) | Basic | All ground waters; competing anion concentrations may affect regeneration frequency |
| 3. Reverse osmosis | (c) | Advanced | Surface waters usually require pre-filtration |
| 4. Point of use, reverse osmosis | (b) | Basic | Surface waters usually require pre-filtration |
| 5. Lime softening | (d) | Advanced | All waters |

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| | | | |
|--|----------|--------------------------|---|
| 6. Green sand filtration | (e) | Basic | All ground waters; competing anion concentrations may affect regeneration frequency |
| 7. Co-precipitation with barium sulfate | (f) | Intermediate to advanced | Ground waters with suitable quality |
| 8. Electrodialysis/electrodialysis reversal | (g) | Basic to intermediate | All ground waters |
| 9. Pre-formed hydrous manganese oxide filtration | (h) | Intermediate | All ground waters |
| 10. Activated alumina | (a), (i) | Advanced | All ground waters; competing anion concentrations may affect regeneration frequency |
| 11. Enhanced coagulation/filtration | (j) | Advanced | Can treat a wide range of water qualities |

Limitation Footnotes:

- ^a The regeneration solution contains high concentrations of the contaminant ions, which could result in disposal issues.
- ^b When point of use devices are used for compliance, programs for long-term operation, maintenance, and monitoring shall be provided by systems to ensure proper performance.
- ^c Reject water disposal may be an issue.
- ^d The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small systems.
- ^e Removal efficiencies can vary depending on water quality.
- ^f Since the process requires static mixing, detention basins, and filtration, this technology is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.
- ^g Applies to ionized radionuclides only.
- ^h This technology is most applicable to small systems with filtration already in place.
- ⁱ Chemical handling during regeneration and pH adjustment may be too difficult for small systems without an operator trained in these procedures.
- ^j This would involve modification to a coagulation/filtration process already in place.

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**Table 64447.3-C
Best Available Technologies (BATs) for Small Water Systems by System Size
Radionuclides**

| <i>Compliance Technologies for System Size Categories Based On Population Served</i> | | | |
|--|--|---------------------------|---------------------------|
| | <i>25-500</i> | <i>501-3,300</i> | <i>3,301 - 10,000</i> |
| <i>Contaminant</i> | <i>Unit Technologies (Numbers Correspond to Table 64447.3-B)</i> | | |
| Combined radium-226 and radium-228 | 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1, 2, 3, 4, 5, 6, 7, 8, 9 | 1, 2, 3, 4, 5, 6, 7, 8, 9 |
| Gross alpha particle activity | 3, 4 | 3, 4 | 3, 4 |
| Beta particle activity and photon radioactivity | 1, 2, 3, 4 | 1, 2, 3, 4 | 1, 2, 3, 4 |
| Uranium | 1, 2, 4, 10, 11 | 1, 2, 3, 4, 5, 10, 11 | 1, 2, 3, 4, 5, 10, 11 |

§64447.4. Best Available Technologies (BATs) - Organic Chemicals.

The technologies listed in table 64447.4-A are the best available technology, treatment technologies, or other means available for achieving compliance with the MCLs in table 64444-A for organic chemicals.

**Table 64447.4-A
Best Available Technologies (BATs)
Organic Chemicals**

| <i>Chemical</i> | <i>Best Available Technologies</i> | | |
|---------------------------------------|------------------------------------|------------------------------|------------------|
| | <i>Granular Activated Carbon</i> | <i>Packed Tower Aeration</i> | <i>Oxidation</i> |
| (a) Volatile Organic Chemicals (VOCs) | | | |
| Benzene | X | X | |
| Carbon Tetrachloride | X | X | |
| 1,2-Dichlorobenzene | X | X | |
| 1,4-Dichlorobenzene | X | X | |
| 1,1-Dichloroethane | X | X | |
| 1,2-Dichloroethane | X | X | |

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| <i>Chemical</i> | <i>Best Available Technologies</i> | | |
|--|--|--------------------------------------|------------------|
| | <i>Granular Activated Carbon</i> | <i>Packed Tower Aeration</i> | <i>Oxidation</i> |
| 1,1-Dichloroethylene | X | X | |
| cis-1,2-Dichloroethylene | X | X | |
| trans-1,2-Dichloroethylene | X | X | |
| Dichloromethane | | X | |
| 1,2-Dichloropropane | X | X | |
| 1,3-Dichloropropene | X | X | |
| Ethylbenzene | X | X | |
| Methyl- <i>tert</i> -butyl ether | | X | |
| Monochlorobenzene | X | X | |
| Styrene | X | X | |
| 1,1,2,2-Tetrachloroethane | X | X | |
| Tetrachloroethylene | X | X | |
| Toluene | X | X | |
| 1,2,4-Trichlorobenzene | X | X | |
| 1,1,1-Trichloroethane | X | X | |
| 1,1,2-Trichloroethane | X | X | |
| Trichlorofluoromethane | X | X | |
| Trichlorotrifluoroethane | X | X | |
| Trichloroethylene | X | X | |
| Vinyl Chloride | | X | |
| Xylenes | X | X | |
| (b) Synthetic Organic Chemicals (SOCs) | | | |
| Alachlor | X | X | |
| Atrazine | X | | |
| Bentazon | | X | |
| Benzo(a)pyrene | X | | |
| Carbofuran | X | | |
| Chlordane | X | | |
| 2,4-D | X | | |
| Dalapon | X | | |
| Di(2-ethylhexyl)adipate | X | X | |
| Dinoseb | X | | |
| Diquat | X | | |
| 1,2-Dibromo-3-chloropropane | X | X | |
| Di(2-ethylhexyl)phthalate | X | | |
| Endothall | X | | |
| Endrin | X | | |
| Ethylene Dibromide | X | X | |

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Chemical

Best Available Technologies

| | Granular Activated Carbon | Packed Tower Aeration | Oxidation |
|---------------------------|---------------------------------|-----------------------------|-----------|
| Glyphosate | | | X |
| Heptachlor | X | | |
| Heptachlor epoxide | X | | |
| Hexachlorobenzene | X | | |
| Hexachlorocyclopentadiene | X | X | |
| Lindane | X | | |
| Methoxychlor | X | | |
| Molinate | X | | |
| Oxamyl | X | | |
| Picloram | X | | |
| Pentachlorophenol | X | | |
| Polychlorinated Biphenyls | X | | |
| Simazine | X | | |
| Thiobencarb | X | | |
| Toxaphene | X | X | |
| 1,2,3-Trichloropropane | X | | |
| 2,3,7,8-TCDD (Dioxin) | X | | |
| 2,4,5-TP (Silvex) | X | | |

Article 14. Treatment Techniques

§64448. Treatment Technique Requirements.

(a) A public water system which uses acrylamide and/or epichlorohydrin in drinking water treatment shall certify annually in writing to the State Board that the combination of dose and monomer does not exceed the following levels:

(1) Acrylamide: 0.05% monomer in polyacrylamide dosed at 1 mg/L, or equivalent.

(2) Epichlorohydrin: 0.01% residual of epichlorohydrin dosed at 20 mg/L, or equivalent.

Article 16. Secondary Drinking Water Standards

§64449. Secondary Maximum Contaminant Levels and Compliance.

(a) The secondary MCLs shown in Tables 64449-A and 64449-B shall not be exceeded in the water supplied to the public by community water systems.

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Table 64449-A
Secondary Maximum Contaminant Levels
“Consumer Acceptance Contaminant Levels”

| <i>Constituents</i> | <i>Maximum Contaminant Levels/Units</i> |
|---|---|
| Aluminum | 0.2 mg/L |
| Color | 15 Units |
| Copper | 1.0 mg/L |
| Foaming Agents (MBAS) | 0.5 mg/L |
| Iron | 0.3 mg/L |
| Manganese | 0.05 mg/L |
| Methyl- <i>tert</i> -butyl ether (MTBE) | 0.005 mg/L |
| Odor—Threshold | 3 Units |
| Silver | 0.1 mg/L |
| Thiobencarb | 0.001 mg/L |
| Turbidity | 5 Units |
| Zinc | 5.0 mg/L |

Table 64449-B
Secondary Maximum Contaminant Levels
“Consumer Acceptance Contaminant Level Ranges”

| <i>Constituent, Units</i> | <i>Maximum Contaminant Level Ranges</i> | | |
|------------------------------------|---|--------------|-------------------|
| | <i>Recommended</i> | <i>Upper</i> | <i>Short Term</i> |
| Total Dissolved Solids, mg/L or | 500 | 1,000 | 1,500 |
| Specific Conductance, μ S/cm | 900 | 1,600 | 2,200 |
| Chloride, mg/L | 250 | 500 | 600 |
| Sulfate, mg/L | 250 | 500 | 600 |

(b) Each community water system shall monitor its groundwater sources or distribution system entry points representative of the effluent of source treatment every three years and its approved surface water sources or distribution system entry points representative of the effluent of source treatment annually for the following:

- (1) Secondary MCLs listed in Tables 64449-A and 64449-B; and
- (2) Bicarbonate, carbonate, and hydroxide alkalinity, calcium, magnesium, sodium, pH, and total hardness.

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(c) If the level of any constituent in Table 64449-A exceeds an MCL, the community water system shall proceed as follows:

(1) If monitoring quarterly, determine compliance by a running annual average of four quarterly samples;

(2) If monitoring less than quarterly, initiate quarterly monitoring and determine compliance on the basis of an average of the initial sample and the next three consecutive quarterly samples collected;

(3) If a violation has occurred (average of four consecutive quarterly samples exceeds an MCL), inform the State Board when reporting pursuant to Section 64469;

(4) After one year of quarterly monitoring during which all the results are below the MCL and the results do not indicate any trend toward exceeding the MCL, the system may request the State Board to allow a reduced monitoring frequency.

(d) For the constituents shown on Table 64449-B, no fixed consumer acceptance contaminant level has been established.

(1) Constituent concentrations lower than the Recommended contaminant level are desirable for a higher degree of consumer acceptance.

(2) Constituent concentrations ranging to the Upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable waters.

(3) Constituent concentrations ranging to the short term contaminant level are acceptable only for existing community water systems on a temporary basis pending construction of treatment facilities or development of acceptable new water sources.

(e) New services from community water systems serving water which carries constituent concentrations between the Upper and Short Term contaminant levels shall be approved only:

(1) If adequate progress is being demonstrated toward providing water of improved mineral quality.

(2) For other compelling reasons approved by the State Board.

(f) A community water system may apply to the State Board for a waiver from the monitoring frequencies specified in subsection (b), if the system has conducted at least three rounds of monitoring (three periods for groundwater sources or three years for approved surface water sources) and these analytical results are less than the MCLs. The water system shall specify the basis for its request. A system with a waiver shall collect a minimum of one sample per source while the waiver is in effect and the term of the waiver shall not exceed one compliance cycle (i.e., nine years).

(g) Nontransient-noncommunity and transient-noncommunity water systems shall monitor their sources or distribution system entry points representative of the effluent of source treatment for bicarbonate, carbonate, and hydroxide alkalinity, calcium, iron, magnesium, manganese, pH, specific conductance, sodium, and total hardness at least

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once. In addition, nontransient-noncommunity water systems shall monitor for the constituents in Tables 64449-A and B at least once.

§64449.2. Waivers for Secondary MCL Compliance.

(a) If the average of four consecutive quarters of sample results for a constituent that does not have a primary MCL is not greater than three times the secondary MCL or greater than the State Notification Level, an existing community water system is eligible to apply for a nine-year waiver of a secondary MCL in Table 64449-A, for the following:

- (1) An existing source; or
- (2) A new source that is being added to the existing water system, as long as:
 - (A) The source is not being added to expand system capacity for further development; and
 - (B) The concentration of the constituent of concern in the new source would not cause the average value of the constituent's concentration at any point in the water delivered by the system to increase by more than 20%.

(b) To apply for a waiver of a secondary MCL, the community water system shall conduct and submit a study to the State Board within one year of violating the MCL that includes the following:

- (1) The water system complaint log, maintained pursuant to section 64470(a), along with any other evidence of customer dissatisfaction, such as a log of calls to the county health department;
- (2) An engineering report, prepared by an engineer registered in California with experience in drinking water treatment, that evaluates all reasonable alternatives and costs for bringing the water system into MCL compliance and includes a recommendation for the most cost-effective and feasible approach;
- (3) The results of a customer survey distributed to all the water system's billed customers that has first been approved by the State Board based on whether it includes:
 - (A) Estimated costs to individual customers of the most cost-effective alternatives presented in the engineering report that are acceptable to the State Board based on its review of their effectiveness and feasibility;
 - (B) The query: "Are you willing to pay for (*identify constituent*) reduction treatment?";
 - (C) The query: "Do you prefer to avoid the cost of treatment and live with the current water quality situation?"
 - (D) The statement: "If you do not respond to this survey, (*insert system name*) will assume that you are in support of the reduction treatment recommended by the engineering report."
- (4) A brief report (agenda, list of attendees, and transcript) of a public meeting held by the water system to which customers were invited, and at which both the tabulated results of the customer survey and the engineering report were presented with a request for input from the public.

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(c) A community water system may apply for a waiver for iron and/or manganese if, in addition to meeting the requirements in Subsection (b), an average of four consecutive quarter results for the source has not exceeded a State Notification Level for iron and/or manganese. In addition, the system shall include sequestering, as follows:

- (1) As one of the alternatives evaluated in the Engineering Report;
- (2) In the customer survey as a query: “Are you willing to pay for iron and/or manganese sequestering treatment?”

(d) Unless 50% or more of the billed customers respond to the survey, the community water system shall conduct another survey pursuant to Subsections (b) or (c) within three months from the date of the survey by sending the survey out to either all the customers again, or only the customers that did not respond to the survey. The water system shall not be eligible for a waiver until it achieves at least a 50% response rate on the survey.

(e) If the customer survey indicates that the percentage of billed customers that voted for constituent reduction treatment and the number of billed customers that did not respond to the survey at all exceeds 50% of the total number of billed customers, the community water system shall install treatment, except as provided in Subsection (f), within three years from the date the system completed the customer survey, pursuant to a schedule established by the State Board.

(f) For iron and/or manganese MCL waiver applications, if the percentage of survey respondents that voted for constituent reduction treatment plus the percentage of survey respondents that voted for sequestering exceeds the percentage that voted to avoid the cost and maintain the current water quality situation, the community water system shall implement either constituent reduction treatment or sequestering, on the basis of which was associated with the higher percentage result. If the highest percentage result is for sequestering, the system shall submit a sequestering implementation and assessment plan to the State Board that includes:

- (1) A description of the pilot testing or other type of evaluation performed to determine the most effective sequestering agent for use in the system's water;
- (2) The sequestering agent feed rate and the equipment to be used to insure that the rate is maintained for each source;
- (3) An operations plan; and
- (4) The projected cost of sequestering including capital, operations and maintenance costs.

(g) To apply for renewal of a waiver for a subsequent nine years, the system shall request approval from the State Board at least six months prior to the end of the current waiver period. The renewal request shall include all monitoring and treatment operations data for the constituent for which the waiver had been granted and any related customer complaints submitted to the water system. Based on its review of the data and customer

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complaints, the State Board may require the water system to conduct another customer survey pursuant to this section before making a determination on the waiver renewal.

§64449.4. Use of Sources that Exceed a Secondary MCL and Do Not Have a Waiver.

A source that exceeds one or more of the secondary MCLs in Table 64449-A and does not have a waiver may be used only if the source meets the requirements in Section 64414, and the community water system:

(a) Meters the source's monthly production and submits the results to the State Board by the 10th day of the next month;

(b) Counts any part of a day as a full day for purposes of determining compliance with Section 64414(c);

(c) As a minimum, conducts public notification by including information on the source's use (dates, constituent levels, and reasons) in the Consumer Confidence Report (Sections 64480 through 64483);

(d) Provides public notice prior to use of the source by electronic media, publication in a local newspaper, and/or information in the customer billing, if the situation is such that the water system can anticipate the use of the source (e.g., to perform water system maintenance); and

(e) Takes corrective measures such as flushing after the source is used to minimize any residual levels of the constituent in the water distribution system.

§64449.5. Distribution System Physical Water Quality.

(a) The water supplier shall determine the physical water quality in the distribution system. This determination shall be based on one or more of the following:

(1) Main flushing operations and flushing records.

(2) Consumer complaint records showing location, nature and duration of the physical water quality problem.

(3) Other pertinent data relative to physical water quality in the distribution system.

(b) If the State Board determines that a water system does not have sufficient data on physical water quality in the distribution system to make the determination required in paragraph (a), the water supplier shall collect samples for the following general physical analyses: color, odor, and turbidity. Samples shall be collected from representative points in the distribution system:

(1) For community water systems with 200 to 1,000 service connections: one sample per month.

(2) For community water systems with greater than 1,000 service connections: one sample for every four bacteriological samples required per month.

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(3) For community water systems with less than 200 service connections: as established by the local health officer or the State Board.

(c) Odor samples required as a part of general physical analyses may be examined in the field as per Section 64415(b).

(d) The distribution system water of public water systems shall be free from significant amounts of particulate matter.

Article 18. Notification of Water Consumers and the State Board
§64463. General Public Notification Requirements.

(a) Each public (community, nontransient-noncommunity and transient-noncommunity) water system shall give public notice to persons served by the water system pursuant to this article.

(b) Each water system required to give public notice shall submit the notice to the State Board, in English, for approval prior to distribution or posting, unless otherwise directed by the State Board.

(c) Each wholesaler shall give public notice to the owner or operator of each of its retailer systems. A retailer is responsible for providing public notice to the persons it serves. If the retailer arranges for the wholesaler to provide the notification, the retailer shall notify the State Board prior to the notice being given.

(d) Each water system that has a violation of any of the regulatory requirements specified in section 64463.1(a), 64463.4(a), or 64463.7(a) in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system may limit distribution of the notice to only persons served by that portion of the system that is out of compliance, if the State Board has granted written approval on the basis of a review of the water system and the data leading to the violation or occurrence for which notice is being given.

(e) Each water system shall give new customers public notice of any acute violation as specified in section 64463.1(a) that occurred within the previous thirty days, any continuing violation, the existence of a variance or exemption, and/or any other ongoing occurrence that the State Board has determined poses a potential risk of adverse effects on human health [based on a review of estimated exposures and toxicological data associated with the contaminant(s)] and requires a public notice. Notice to new customers shall be given as follows:

(1) Community water systems shall give a copy of the most recent public notice prior to or at the time service begins; and

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(2) Noncommunity water systems shall post the most recent public notice in conspicuous locations for as long as the violation, variance, exemption, or other occurrence continues.

§64463.1. Tier 1 Public Notice.

(a) A water system shall give public notice pursuant to this section and section 64465 if any of the following occurs:

- (1) Violation of the total coliform MCL when:
 - (A) Fecal coliform or *E. coli* are present in the distribution system; or
 - (B) When any repeat sample tests positive for coliform and the water system fails to test for fecal coliforms or *E. coli* in the repeat sample;
- (2) Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, or when the water system fails to take a confirmation sample within 24 hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL;
- (3) Violation of a Chapter 17 treatment technique requirement resulting from a single exceedance of a maximum allowable turbidity level if:
 - (A) The State Board determines after consultation with the water system and a review of the data that a Tier 1 public notice is required; or
 - (B) The consultation between the State Board and the water system does not take place within 24 hours after the water system learns of the violation;
- (4) Occurrence of a waterborne microbial disease outbreak, as defined in section 64651.91, or other waterborne emergency, a failure or significant interruption in water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that has the potential for adverse effects on human health as a result of short-term exposure;
- (5) Other violation or occurrence that has the potential for adverse effects on human health as a result of short-term exposure, as determined by the State Board based on a review of all available toxicological and analytical data;
- (6) Violation of the MCL for perchlorate or when a system is unable to resample within 48 hours of the system's receipt of the first sample showing an exceedance of the perchlorate MCL as specified in section 64432.3(d)(3);
- (7) For chlorite:
 - (A) Violation of the MCL for chlorite;
 - (B) When a system fails to take the required sample(s) within the distribution system, on the day following an exceedance of the MCL at the entrance to the distribution system; or
 - (C) When a system fails to take a confirmation sample pursuant to section 64534.2(b)(4); or
- (8) Violation of the MRDL for chlorine dioxide; or when a system fails to take the required sample(s) within the distribution system, on the day following an exceedance of the MRDL at the entrance to the distribution system.

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(b) As soon as possible within 24 hours after learning of any of the violations in subsection (a) or being notified by the State Board that it has determined there is a potential for adverse effects on human health [pursuant to paragraph (a)(4), (5), or (6)], the water system shall:

- (1) Give public notice pursuant to this section;
- (2) Initiate consultation with the State Board within the same timeframe; and
- (3) Comply with any additional public notice requirements that are determined by the consultation to be necessary to protect public health.

(c) A water system shall deliver the public notice in a manner designed to reach residential, transient, and nontransient users of the water system and shall use, as a minimum, one of the following forms:

- (1) Radio or television;
- (2) Posting in conspicuous locations throughout the area served by the water system;
- (3) Hand delivery to persons served by the water system; or
- (4) Other method approved by the State Board, based on the method's ability to inform water system users.

§64463.4. Tier 2 Public Notice.

(a) A water system shall give public notice pursuant to this section if any of the following occurs:

- (1) Any violation of the MCL, MRDL, and treatment technique requirements, except:
 - (A) Where a Tier 1 public notice is required under section 64463.1; or
 - (B) Where the State Board determines that a Tier 1 public notice is required, based on potential health impacts and persistence of the violations;
- (2) All violations of the monitoring and testing procedure requirements in sections 64421 through 64426.1, article 3 (Primary Standards – Bacteriological Quality), for which the State Board determines that a Tier 2 rather than a Tier 3 public notice is required, based on potential health impacts and persistence of the violations;
- (3) Other violations of the monitoring and testing procedure requirements in this chapter, and chapters 15.5, 17 and 17.5, for which the State Board determines that a Tier 2 rather than a Tier 3 public notice is required, based on potential health impacts and persistence of the violations; or
- (4) Failure to comply with the terms and conditions of any variance or exemption in place.

(b) A water system shall give the notice as soon as possible within 30 days after it learns of a violation or occurrence specified in subsection (a), except that the water system may request an extension of up to 60 days for providing the notice. This extension would be subject to the State Board's written approval based on the violation or

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occurrence having been resolved and the State Board's determination that public health and welfare would in no way be adversely affected. In addition, the water system shall:

- (1) Maintain posted notices in place for as long as the violation or occurrence continues, but in no case less than seven days;
- (2) Repeat the notice every three months as long as the violation or occurrence continues. Subject to the State Board's written approval based on its determination that public health would in no way be adversely affected, the water system may be allowed to notice less frequently but in no case less than once per year. No allowance for reduced frequency of notice shall be given in the case of a total coliform MCL violation or violation of a Chapter 17 treatment technique requirement; and
- (3) For turbidity violations pursuant to sections 64652.5(c)(2) and 64653(c), (d) and (f), as applicable, a water system shall consult with the State Board as soon as possible within 24 hours after the water system learns of the violation to determine whether a Tier 1 public notice is required. If consultation does not take place within 24 hours, the water system shall give Tier 1 public notice within 48 hours after learning of the violation.

(c) A water system shall deliver the notice, in a manner designed to reach persons served, within the required time period as follows:

- (1) Unless otherwise directed by the State Board in writing based on its assessment of the violation or occurrence and the potential for adverse effects on public health and welfare, community water systems shall give public notice by:
 - (A) Mail or direct delivery to each customer receiving a bill including those that provide their drinking water to others (e.g., schools or school systems, apartment building owners, or large private employers), and other service connections to which water is delivered by the water system; and
 - (B) Use of one or more of the following methods to reach persons not likely to be reached by a mailing or direct delivery (renters, university students, nursing home patients, prison inmates, etc.):
 1. Publication in a local newspaper;
 2. Posting in conspicuous public places served by the water system, or on the Internet; or
 3. Delivery to community organizations.
- (2) Unless otherwise directed by the State Board in writing based on its assessment of the violation or occurrence and the potential for adverse effects on public health and welfare, noncommunity water systems shall give the public notice by:
 - (A) Posting in conspicuous locations throughout the area served by the water system; and
 - (B) Using one or more of the following methods to reach persons not likely to be reached by a public posting:
 1. Publication in a local newspaper or newsletter distributed to customers;
 2. E-mail message to employees or students;
 3. Posting on the Internet or intranet; or

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4. Direct delivery to each customer.

§64463.7. Tier 3 Public Notice.

(a) Each water system shall give public notice pursuant to this section if any of the following occurs:

- (1) Monitoring violations;
- (2) Failure to comply with a testing procedure, except where a Tier 1 public notice is required pursuant to section 64463.1 or the State Board determines that a Tier 2 public notice is required pursuant to section 64463.4; or
- (3) Operation under a variance or exemption.

(b) Each water system shall give the public notice within one year after it learns of the violation or begins operating under a variance or exemption.

(1) The water system shall repeat the public notice annually for as long as the violation, variance, exemption, or other occurrence continues.

(2) Posted public notices shall remain in place for as long as the violation, variance, exemption, or other occurrence continues, but in no case less than seven days.

(3) Instead of individual Tier 3 public notices, a water system may use an annual report detailing all violations and occurrences for the previous twelve months, as long as the water system meets the frequency requirements specified in this subsection.

(c) Each water system shall deliver the notice in a manner designed to reach persons served within the required time period, as follows:

(1) Unless otherwise directed by the State Board in writing based on its assessment of the violation or occurrence and the potential for adverse effects on public health and welfare, community water systems shall give public notice by

(A) Mail or direct delivery to each customer receiving a bill including those that provide their drinking water to others (e.g., schools or school systems, apartment building owners, or large private employers), and other service connections to which water is delivered by the water system; and

(B) Use of one or more of the following methods to reach persons not likely to be reached by a mailing or direct delivery (renters, university students, nursing home patients, prison inmates, etc.):

1. Publication in a local newspaper;
2. Posting in conspicuous public places served by the water system, or on the Internet; or
3. Delivery to community organizations.

(2) Unless otherwise directed by the State Board in writing based on its assessment of the violation or occurrence and the potential for adverse effects on public health and welfare, noncommunity water systems shall give the public notice by:

(A) Posting in conspicuous locations throughout the area served by the water system; and

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(B) Using one or more of the following methods to reach persons not likely to be reached by a posting:

1. Publication in a local newspaper or newsletter distributed to customers;
2. E-mail message to employees or students;
3. Posting on the Internet or intranet; or
4. Direct delivery to each customer.

(d) Community and nontransient-noncommunity water systems may use the Consumer Confidence Report pursuant to sections 64480 through 64483, to meet the initial and repeat Tier 3 public notice requirements in subsection 64463.7(b), as long as the Report meets the following:

- (1) Is given no later than one year after the water system learns of the violation or occurrence;
- (2) Includes the content specified in section 64465; and
- (3) Is distributed pursuant to paragraph (b)(1) and (2) or subsection (c).

§64465. Public Notice Content and Format.

(a) Each public notice given pursuant to this article, except Tier 3 public notices for variances and exemptions pursuant to subsection (b), shall contain the following:

- (1) A description of the violation or occurrence, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);
- (2) The date(s) of the violation or occurrence;
- (3) Any potential adverse health effects from the violation or occurrence, including the appropriate standard health effects language from appendices 64465-A through G;
- (4) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in drinking water;
- (5) Whether alternative water supplies should be used;
- (6) What actions consumers should take, including when they should seek medical help, if known;
- (7) What the water system is doing to correct the violation or occurrence;
- (8) When the water system expects to return to compliance or resolve the occurrence;
- (9) The name, business address, and phone number of the water system owner, operator, or designee of the water system as a source of additional information concerning the public notice;
- (10) A statement to encourage the public notice recipient to distribute the public notice to other persons served, using the following standard language: "Please share this information with all the other people who drink this water, especially those who may not have received this public notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this public notice in a public place or distributing copies by hand or mail."; and

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(11) For a water system with a monitoring and testing procedure violation, this language shall be included: “We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [*compliance period dates*], we [*‘did not monitor or test’ or ‘did not complete all monitoring or testing’*] for [*contaminant(s)*], and therefore, cannot be sure of the quality of your drinking water during that time.”

(b) A Tier 3 public notice for a water system operating under a variance or exemption shall include the elements in this subsection. If a water system has violated its variance or exemption conditions, the public notice shall also include the elements in subsection (a).

- (1) An explanation of the reasons for the variance or exemption;
- (2) The date on which the variance or exemption was issued;
- (3) A brief status report on the steps the water system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and
- (4) A notice of any opportunity for public input in the review of the variance or exemption.

(c) A public water system providing notice pursuant to this article shall comply with the following multilingual-related requirements:

- (1) For a Tier 1 public notice:
 - (A) The notice shall be provided in English, Spanish, and the language spoken by any non-English-speaking group exceeding 10 percent of the persons served by the public water system, and the notice shall include a telephone number or address where such individuals may contact the public water system for assistance; and
 - (B) If any non-English-speaking group exceeds 1,000 persons served by the public water system, but does not exceed 10 percent served, the notice shall include information in the appropriate language(s) regarding the importance of the notice, and the telephone number or address where such individuals may contact the public water system to obtain a translated copy of the notice from the public water system or assistance in the appropriate language;
- (2) For a Tier 2 or Tier 3 public notice:
 - (A) The notice shall contain information in Spanish regarding the importance of the notice, or contain a telephone number or address where Spanish-speaking residents may contact the public water system to obtain a translated copy of the notice or assistance in Spanish; and
 - (B) When a non-English speaking group other than Spanish-speaking exceeds 1,000 residents or 10 percent of the residents served by the public water system, the notice shall include:
 1. Information in the appropriate language(s) regarding the importance of the notice; or

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2. A telephone number or address where such residents may contact the public water system to obtain a translated copy of the notice or assistance in the appropriate language; and

(3) For a public water system subject to the Dymally-Alatorre Bilingual Services Act, Chapter 17.5, Division 7, of the Government Code (commencing with section 7290), meeting the requirements of this Article may not ensure compliance with the Dymally-Alatorre Bilingual Services Act.

(d) Each public notice given pursuant to this article shall:

(1) Be displayed such that it catches people's attention when printed or posted and be formatted in such a way that the message in the public notice can be understood at the eighth-grade level;

(2) Not contain technical language beyond an eighth-grade level or print smaller than 12 point; and

(3) Not contain language that minimizes or contradicts the information being given in the public notice.

**Appendix 64465-A. Health Effects Language
Microbiological Contaminants.**

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|--------------------------------|--|
| Total Coliform | Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems. |
| Fecal coliform/ <i>E. coli</i> | Fecal coliforms and <i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. |
| Turbidity | Turbidity has no health effects. However, high levels of turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. |

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**Appendix 64465-B. Health Effects Language
Surface Water Treatment**

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|--|--|
| <i>Giardia lamblia</i> Viruses Heterotrophic plate count bacteria <i>Legionella</i> <i>Cryptosporidium</i> | Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. |

**Appendix 64465-C. Health Effects Language
Radioactive Contaminants.**

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|--|--|
| Gross Beta particle activity | Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Strontium-90 | Some people who drink water containing strontium-90 in excess of the MCL over many years may have an increased risk of getting cancer. |
| Tritium | Some people who drink water containing tritium in excess of the MCL over many years may have an increased risk of getting cancer. |
| Gross Alpha particle activity | Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Combined Radium 226/228 | Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer. |
| Total Radium (for nontransient noncommunity water systems) | Some people who drink water containing radium 223, 224, or 226 in excess of the MCL over many years may have an increased risk of getting cancer. |
| Uranium | Some people who drink water containing uranium in excess of the MCL over many years may have kidney problems or an increased risk of getting cancer. |

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Appendix 64465-D. Health Effects Language Inorganic Contaminants.

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|--------------------|---|
| Aluminum | Some people who drink water containing aluminum in excess of the MCL over many years may experience short-term gastrointestinal tract effects. |
| Antimony | Some people who drink water containing antimony in excess of the MCL over many years may experience increases in blood cholesterol and decreases in blood sugar. |
| Arsenic | Some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage or circulatory system problems, and may have an increased risk of getting cancer. |
| Asbestos | Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps. |
| Barium | Some people who drink water containing barium in excess of the MCL over many years may experience an increase in blood pressure. |
| Beryllium | Some people who drink water containing beryllium in excess of the MCL over many years may develop intestinal lesions. |
| Cadmium | Some people who drink water containing cadmium in excess of the MCL over many years may experience kidney damage. |
| Chromium | Some people who use water containing chromium in excess of the MCL over many years may experience allergic dermatitis. |
| Copper | Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years may suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor. |
| Cyanide | Some people who drink water containing cyanide in excess of the MCL over many years may experience nerve damage or thyroid problems. |
| Fluoride | <p><i>For the Consumer Confidence Report:</i> Some people who drink water containing fluoride in excess of the federal MCL of 4 mg/L over many years may get bone disease, including pain and tenderness of the bones. Children who drink water containing fluoride in excess of the state MCL of 2 mg/L may get mottled teeth.</p> <p><i>For a Public Notice:</i> This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/L) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [<i>name</i>] has a fluoride concentration of [<i>insert value</i>] mg/L.</p> <p>Dental fluorosis may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from</p> |

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| | <p>the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water. Drinking water containing more than 4 mg/L of fluoride can increase your risk of developing bone disease.</p> <p>For more information, please call [<i>water system contact name</i>] of [<i>water system name</i>] at [<i>phone number</i>]. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call the State Board's Residential Water Treatment Device Registration Unit at (916) 449-5600.</p> |
| Lead | <p>Infants and children who drink water containing lead in excess of the action level may experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities. Adults who drink this water over many years may develop kidney problems or high blood pressure.</p> |
| Mercury | <p>Some people who drink water containing mercury in excess of the MCL over many years may experience mental disturbances, or impaired physical coordination, speech and hearing.</p> |
| Nickel | <p>Some people who drink water containing nickel in excess of the MCL over many years may experience liver and heart effects.</p> |
| Nitrate | <p>Infants below the age of six months who drink water containing nitrate in excess of the MCL may quickly become seriously ill and, if untreated, may die because high nitrate levels can interfere with the capacity of the infant's blood to carry oxygen. Symptoms include shortness of breath and blueness of the skin. High nitrate levels may also affect the oxygen-carrying ability of the blood of pregnant women.</p> |
| Nitrite | <p>Infants below the age of six months who drink water containing nitrite in excess of the MCL may become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blueness of the skin.</p> |
| Perchlorate | <p>Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse effects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function.</p> |
| Selenium | <p>Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years may experience hair or fingernail losses, numbness in fingers or toes, or circulation system problems.</p> |

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| Thallium | Some people who drink water containing thallium in excess of the MCL over many years may experience hair loss, changes in their blood, or kidney, intestinal, or liver problems. |
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**Appendix 64465-E. Health Effects Language
Volatile Organic Contaminants.**

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|----------------------------|---|
| Benzene | Some people who use water containing benzene in excess of the MCL over many years may experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer. |
| Carbon Tetrachloride | Some people who use water containing carbon tetrachloride in excess of the MCL over many years may experience liver problems and may have an increased risk of getting cancer. |
| 1,2-Dichlorobenzene | Some people who drink water containing 1,2-dichlorobenzene in excess of the MCL over many years may experience liver, kidney, or circulatory system problems. |
| 1,4-Dichlorobenzene | Some people who use water containing 1,4-dichlorobenzene in excess of the MCL over many years may experience anemia, liver, kidney, or spleen damage, or changes in their blood. |
| 1,1-Dichloroethane | Some people who use water containing 1,1-dichloroethane in excess of the MCL over many years may experience nervous system or respiratory problems. |
| 1,2-Dichloroethane | Some people who use water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer. |
| 1,1-Dichloroethylene | Some people who use water containing 1,1-dichloroethylene in excess of the MCL over many years may experience liver problems. |
| cis-1,2-Dichloroethylene | Some people who use water containing cis-1,2-dichloroethylene in excess of the MCL over many years may experience liver problems. |
| trans-1,2-Dichloroethylene | Some people who drink water containing trans-1,2-dichloroethylene in excess of the MCL over many years may experience liver problems. |
| Dichloromethane | Some people who drink water containing dichloromethane in excess of the MCL over many years may experience liver problems and may have an increased risk of getting cancer. |
| 1,2-Dichloropropane | Some people who use water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer. |
| 1,3-Dichloropropene | Some people who use water containing 1,3-dichloropropene in excess of the MCL over many years may have an increased risk of getting cancer. |
| Ethylbenzene | Some people who use water containing ethylbenzene in excess of the MCL over many years may experience liver or kidney problems. |

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| Methyl-tert-butyl ether | Some people who use water containing methyl-tert-butyl ether in excess of the MCL over many years may have an increased risk of getting cancer. |
| Monochlorobenzene | Some people who use water containing monochlorobenzene in excess of the MCL over many years may experience liver or kidney problems. |
| Styrene | Some people who drink water containing styrene in excess of the MCL over many years may experience liver, kidney, or circulatory system problems. |
| 1,1,2,2-Tetrachloroethane | Some people who drink water containing 1,1,2,2-tetrachloroethane in excess of the MCL over many years may experience liver or nervous system problems. |
| Tetrachloroethylene | Some people who use water containing tetrachloroethylene in excess of the MCL over many years may experience liver problems, and may have an increased risk of getting cancer. |
| 1,2,4-Trichlorobenzene | Some people who use water containing 1,2,4-trichlorobenzene in excess of the MCL over many years may experience adrenal gland changes. |
| 1,1,1,-Trichloroethane | Some people who use water containing 1,1,1-trichloroethane in excess of the MCL over many years may experience liver, nervous system, or circulatory system problems. |
| 1,1,2-Trichloroethane | Some people who use water containing 1,1,2-trichloroethane in excess of the MCL over many years may experience liver, kidney, or immune system problems. |
| Trichloroethylene (TCE) | Some people who use water containing trichloroethylene in excess of the MCL over many years may experience liver problems and may have an increased risk of getting cancer. |
| Toluene | Some people who use water containing toluene in excess of the MCL over many years may experience nervous system, kidney, or liver problems. |
| Trichlorofluoromethane | Some people who use water containing trichlorofluoromethane in excess of the MCL over many years may experience liver problems. |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | Some people who use water containing 1,1,2-trichloro-1,2,2-trifluoroethane in excess of the MCL over many years may experience liver problems. |
| Vinyl Chloride | Some people who use water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer. |
| Xylenes | Some people who use water containing xylenes in excess of the MCL over many years may experience nervous system damage. |

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Appendix 64465-F. Health Effects Language Synthetic Organic Contaminants.

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|------------------------------|---|
| 2,4-D | Some people who use water containing the weed killer 2,4-D in excess of the MCL over many years may experience kidney, liver, or adrenal gland problems. |
| 2,4,5-TP (Silvex) | Some people who drink water containing Silvex in excess of the MCL over many years may experience liver problems. |
| Alachlor | Some people who use water containing alachlor in excess of the MCL over many years may experience eye, liver, kidney, or spleen problems, or experience anemia, and may have an increased risk of getting cancer. |
| Atrazine | Some people who use water containing atrazine in excess of the MCL over many years may experience cardiovascular system problems or reproductive difficulties. |
| Bentazon | Some people who drink water containing bentazon in excess of the MCL over many years may experience prostate and gastrointestinal effects. |
| Benzo(a)pyrene [PAH] | Some people who use water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |
| Carbofuran | Some people who use water containing carbofuran in excess of the MCL over many years may experience problems with their blood, or nervous or reproductive system problems. |
| Chlordane | Some people who use water containing chlordane in excess of the MCL over many years may experience liver or nervous system problems, and may have an increased risk of getting cancer. |
| Dalapon | Some people who drink water containing dalapon in excess of the MCL over many years may experience minor kidney changes. |
| Dibromochloro-propane (DBCP) | Some people who use water containing DBCP in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |
| Di (2-ethylhexyl) adipate | Some people who drink water containing di(2-ethylhexyl) adipate in excess of the MCL over many years may experience weight loss, liver enlargement, or possible reproductive difficulties. |
| Di (2-ethylhexyl) phthalate | Some people who use water containing di(2-ethylhexyl) phthalate well in excess of the MCL over many years may experience liver problems or reproductive difficulties, and may have an increased risk of getting cancer. |
| Dinoseb | Some people who drink water containing dinoseb in excess of the MCL over many years may experience reproductive difficulties. |
| Dioxin (2,3,7,8-TCDD) | Some people who use water containing dioxin in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |

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| Diquat | Some people who drink water containing diquat in excess of the MCL over many years may get cataracts. |
| Endothall | Some people who drink water containing endothall in excess of the MCL over many years may experience stomach or intestinal problems. |
| Endrin | Some people who drink water containing endrin in excess of the MCL over many years may experience liver problems. |
| Ethylene dibromide (EDB) | Some people who use water containing ethylene dibromide in excess of the MCL over many years may experience liver, stomach, reproductive system, or kidney problems, and may have an increased risk of getting cancer. |
| Glyphosate | Some people who drink water containing glyphosate in excess of the MCL over many years may experience kidney problems or reproductive difficulties. |
| Heptachlor | Some people who use water containing heptachlor in excess of the MCL over many years may experience liver damage and may have an increased risk of getting cancer. |
| Heptachlor epoxide | Some people who use water containing heptachlor epoxide in excess of the MCL over many years may experience liver damage, and may have an increased risk of getting cancer. |
| Hexachlorobenzene | Some people who drink water containing hexachlorobenzene in excess of the MCL over many years may experience liver or kidney problems, or adverse reproductive effects, and may have an increased risk of getting cancer. |
| Hexachlorocyclopentadiene | Some people who use water containing hexachlorocyclopentadiene in excess of the MCL over many years may experience kidney or stomach problems. |
| Lindane | Some people who drink water containing lindane in excess of the MCL over many years may experience kidney or liver problems. |
| Methoxychlor | Some people who drink water containing methoxychlor in excess of the MCL over many years may experience reproductive difficulties. |
| Molinate (Ordram) | Some people who use water containing molinate in excess of the MCL over many years may experience reproductive effects. |
| Oxamyl [Vydate] | Some people who drink water containing oxamyl in excess of the MCL over many years may experience slight nervous system effects. |
| PCBs [Polychlorinated biphenyls] | Some people who drink water containing PCBs in excess of the MCL over many years may experience changes in their skin, thymus gland problems, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer. |
| Pentachlorophenol | Some people who use water containing pentachlorophenol in excess of the MCL over many years may experience liver or kidney problems, and may have an increased risk of getting cancer. |
| Picloram | Some people who drink water containing picloram in excess of the MCL over many years may experience liver problems. |

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| Simazine | Some people who use water containing simazine in excess of the MCL over many years may experience blood problems. |
| Thiobencarb | Some people who use water containing thiobencarb in excess of the MCL over many years may experience body weight and blood effects. |
| Toxaphene | Some people who use water containing toxaphene in excess of the MCL over many years may experience kidney, liver, or thyroid problems, and may have an increased risk of getting cancer. |
| 1,2,3-Trichloropropane | Some people who drink water containing 1,2,3-trichloropropane in excess of the MCL over many years may have an increased risk of getting cancer. |

**Appendix 64465-G. Health Effects Language
Disinfection Byproducts, Byproduct Precursors, and Disinfectant Residuals**

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|---|--|
| TTHMs [Total Trihalomethanes] | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience liver, kidney, or central nervous system problems, and may have an increased risk of getting cancer. |
| Haloacetic Acids | Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. |
| Bromate | Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. |
| Chloramines | Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia. |
| Chlorine | Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort. |
| Chlorite | Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia. |
| Chlorine dioxide (2 consecutive daily samples at the entry point to the distribution system that are greater than the MRDL) | Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. <i>Add for public notification only:</i> The chlorine dioxide violations reported today are the result of exceedances at the treatment facility |

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| | only, not within the distribution system that delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers. |
| Chlorine dioxide (one or more distribution system samples are above the MRDL) | Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. <i>Add for public notification only:</i> The chlorine dioxide violations reported today include exceedances of the State standard within the distribution system that delivers water to consumers. These violations may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure. |
| Control of DBP precursors (TOC) | Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer. |

**Appendix 64465-H. Health Effects Language
Other Treatment Techniques**

| <i>Contaminant</i> | <i>Health Effects Language</i> |
|--------------------|--|
| Acrylamide | Some people who drink water containing high levels of acrylamide over a long period of time may experience nervous system or blood problems, and may have an increased risk of getting cancer. |
| Epichlorohydrin | Some people who drink water containing high levels of epichlorohydrin over a long period of time may experience stomach problems, and may have an increased risk of getting cancer. |

§64466. Special Notice for Unregulated Contaminant Monitoring Results.

Water systems required to monitor pursuant to section 64450 (Unregulated Chemicals – Monitoring) and/or Federal Register 64(180), p 50556-50620, September 17, 1999, shall notify persons served by the water system of the availability of the results, as follows:

- (a) No later than 12 months after the results are known;
- (b) Pursuant to sections 64463.7(c) and (d)(1) and (3); and

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(c) Include a contact and telephone number where information on the results may be obtained.

Article 19. Records, Reporting and Recordkeeping

§64469. Reporting Requirements.

(a) Analytical results of all sample analyses completed in a calendar month shall be reported to the State Board no later than the tenth day of the following month.

(b) Analytical results of all sample analyses completed by water wholesalers in a calendar month shall be reported to retail customers and the State Board no later than the tenth day of the following month.

(c) Analytical results shall be reported to the State Board electronically using the Electronic Deliverable Format as defined in The Electronic Deliverable Format [EDF] Version 1.2i Guidelines & Restrictions dated April 2001 and Data Dictionary dated April 2001.

(d) Within 10 days of giving initial or repeat public notice pursuant to Article 18 of this Chapter, except for notice given under section 64463.7(d), each water system shall submit a certification to the State Board that it has done so, along with a representative copy of each type of public notice given.

§64470. Recordkeeping.

(a) A water supplier shall maintain records on all water quality and system water outage complaints received, both verbal and written, and corrective action taken. These records shall be retained for a period of five years for State Board review.

(b) A water supplier shall retain, on or at a convenient location near the water utility premises, records as indicated below:

(1) Records of microbiological analyses and turbidity analyses from at least the most recent five years and chemical analyses from at least the most recent 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided the following information is included:

(A) The date, place, and time of sampling; and identification of the person who collected the sample;

(B) Identification of the sample as a routine sample, check sample, raw or finished water or other special sample;

(C) Date of report;

(D) Name of the laboratory and either the person responsible for performing the analysis or the laboratory director;

(E) The analytical technique or method used; and

(F) The results of the analysis.

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(2) Records and resultant corrective actions shall be kept not less than three years following the final action taken to correct a particular violation;

(3) Copies of any written reports, summaries, or communications relating to sanitary surveys of the system conducted by the water supplier, a private consultant or any local, state or federal agency, for not less than 10 years following completion of the sanitary survey involved;

(4) Variances or exemptions granted to the system, for not less than five years following the expiration of such variance or exemption;

(5) Copies of any Tier 1, Tier 2, and Tier 3 public notices, for not less than three years; and

(6) Copies of monitoring plans developed pursuant to sections 64416, 64422, and 64534.8 for the same period of time as the records of analyses taken under the plan are required to be kept pursuant to paragraph (1).

Article 20. Consumer Confidence Report

§64480. Applicability and Distribution.

(a) Except as provided in subsection (b), each community and nontransient-noncommunity (NTNC) water system shall prepare and deliver the first Consumer Confidence Report by July 1, 2001, and subsequent reports by July 1 annually thereafter. The first Consumer Confidence Report shall contain data collected during, or prior to, calendar year 2000, as prescribed by section 64481(d)(1). Each Consumer Confidence Report thereafter shall contain data collected during, or prior to, the previous calendar year.

(b) A new community or NTNC water system shall deliver its first Consumer Confidence Report by July 1 of the year after its first full calendar year in operation and subsequent reports by July 1 annually thereafter.

(c) A community or NTNC water system that sells water to another community or NTNC water system shall deliver the applicable information required in section 64481 to the purchasing system by no later than April 1 of each year or on a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

§64481. Content of the Consumer Confidence Report.

(a) A Consumer Confidence Report shall contain information on the source of the water delivered, including:

(1) The type of water delivered by the water system (e.g., surface water, ground water) and the commonly used name (if any) and location of the body (or bodies) of water; and

(2) If a source water assessment has been completed, notification that the assessment is available, how to obtain it, the date it was completed or last updated, and a

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brief summary of the system's vulnerability to potential sources of contamination, using language provided by the State Board if the State Board conducted the assessment.

(b) For any of the following terms used in the Consumer Confidence Report, the water system shall provide the specified language below:

(1) Regulatory Action Level: “The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.”

(2) Maximum Contaminant Level or MCL: “The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.”

(3) Maximum Contaminant Level Goal or MCLG: “The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.”

(4) Public Health Goal or PHG: “The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.”

(5) Primary Drinking Water Standard or PDWS: “MCLs, MRDLs, and treatment techniques for contaminants that affect health, along with their monitoring and reporting requirements.”

(6) Treatment technique: “A required process intended to reduce the level of a contaminant in drinking water.”

(7) Variances and exemptions: “State Board permission to exceed an MCL or not comply with a treatment technique under certain conditions.”

(8) Maximum residual disinfectant level or MRDL: “The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.”

(9) Maximum residual disinfectant level goal or MRDLG: “The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.”

(c) If any of the following are detected, information for each pursuant to subsection (d) shall be included in the Consumer Confidence Report:

(1) Contaminants subject to an MCL, regulatory action level, MRDL, or treatment technique (regulated contaminants), as specified in sections 64426.1, 64431, 64442, 64443, 64444, 64448, 64449, 64533, 64533.5, 64536, 64536.2, 64653 and 64678;

(2) Contaminants specified in 40 Code of Federal Regulations part 141.40 (7-1-2007 edition) for which monitoring is required (unregulated contaminants);

(3) Microbial contaminants detected as provided under subsection (e); and

(4) Sodium and hardness.

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(d) For contaminants identified in subsection (c), the water system shall include in the Consumer Confidence Report one table or several adjacent tables that have been developed pursuant to this subsection. Any additional monitoring results that a water system chooses to include in its Consumer Confidence Report shall be displayed separately.

(1) The data in the table(s) shall be derived from data collected to comply with U.S. Environmental Protection Agency (USEPA) and State Board monitoring and analytical requirements during calendar year 2000 for the first Consumer Confidence Report and subsequent calendar years thereafter. Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) shall include the date and results of the most recent sampling and the Consumer Confidence Report shall include a brief statement indicating that the data presented in the table(s) are from the most recent testing done in accordance with the regulations. No data older than 9 years need be included.

(2) For detected regulated contaminants referenced in subsection (c)(1), the table(s) shall include:

(A) The MCL expressed as a number equal to or greater than 1.0;

(B) For a primary MCL, the public health goal (PHG) in the same units as the MCL; or if no PHG has been set for the contaminant, the table shall include the USEPA maximum contaminant level goal in the same units as the MCL;

(C) For a detected contaminant that does not have an MCL, the table(s) shall indicate whether there is a treatment technique or specify the regulatory action level or MRDL (and MRDLG) applicable to that contaminant, and the Consumer Confidence Report shall include the appropriate language specified in subsection (b);

(D) For detected contaminants subject to an MCL, except turbidity and total coliforms, the sample result(s) collected at compliance monitoring sampling points shall be reported in the same units as the MCL as follows:

1. When compliance is determined by the results of a single sample, an initial sample averaged with one or two confirmation sample(s), or an average of four quarterly or six monthly samples, results shall be reported as follows:

A. For a single sampling point, or multiple sampling points for which data is being individually listed on the Consumer Confidence Report: the sample result and, if more than one sample was collected, the average and range of the sample results;

B. For multiple sampling points, each of which has been sampled only once and for which data is being summarized together on the Consumer Confidence Report: the average and range of the sample results. If the waters from the sampling points are entering the distribution system at the same point, a flow-weighted average may be reported; and

C. For multiple sampling points, one or more of which has been sampled more than once and for which data is being summarized together on the Consumer Confidence Report: the average of the individual sampling point averages and range of all the sample results. If the waters from the sampling points are entering the distribution system at the same point, a flow-weighted average may be reported.

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2. When compliance with the MCL is determined by calculating a running annual average of all samples taken at a monitoring location:

A. The highest running annual average of the monitoring location and the range of sample results or, if monitoring locations are summarized together for the Consumer Confidence Report, the highest running annual average of any of the monitoring locations and the range of sample results from all the monitoring locations; and

B. For TTHM and HAA5 monitored pursuant to section 64534.2(d): the highest locational running annual average (LRAA) for TTHM and HAA5 and the range of individual sample results for all monitoring locations. If more than one location exceeds the TTHM or HAA5 MCL, include the LRAA for all locations that exceed the MCL.

3. When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all monitoring location averages: the highest running annual average and the range of sample results from all the sampling points.

4. When compliance with the MCL is determined on the basis of monitoring after treatment installed to remove a contaminant: the average level detected in the water entering the distribution system and the range of sample results; and

5. If an MCL compliance determination was made in the year for which sample results are being reported and that determination was based on an average of results from both the previous and reporting years, then the compliance determination average shall be reported, but the range shall be based only on results from the year for which data is being reported.

(E) For turbidity:

1. When it is reported pursuant to the requirements of section 64652.5 (filtration avoidance): the highest value; and

2. When it is reported pursuant to section 64653 (filtration): the highest single measurement based on compliance reporting and the lowest monthly percentage of samples meeting the turbidity limits specified in section 64653 for the filtration technology being used;

(F) For lead and copper: the 90th percentile value of the most recent round of sampling, the number of sites sampled, and the number of sampling sites exceeding the action level;

(G) For total coliform:

1. The highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or

2. The highest monthly percentage of positive samples for systems collecting at least 40 samples per month.

(H) For fecal coliform or *E. coli*: the total number of positive samples during the year; and

(I) The likely source(s) of any detected contaminants having an MCL, MRDL, regulatory action level, or treatment technique. If the water system lacks specific information on the likely source, the table(s) shall include one or more of the typical

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sources for that contaminant listed in appendix 64481-A or 64481-B that are most applicable to the system.

(3) The table(s) shall clearly identify any data indicating violations of MCLs, regulatory action levels, MRDLs, or treatment techniques and the Consumer Confidence Report shall give information on each violation including the length of the violation, potential adverse health effects (PDWS only), and actions taken by the system to address the violation. To describe the potential health effects, the system shall use the relevant language pursuant to appendices 64465-A through H; and

(4) For detected unregulated contaminants for which monitoring is required (except *Cryptosporidium*), the table(s) shall contain the average and range at which the contaminant was detected.

(e) If the system has performed any monitoring for *Cryptosporidium* that indicates that *Cryptosporidium* may be present in the source water or the finished water, the Consumer Confidence Report shall include a summary of the monitoring results and an explanation of their significance.

(f) If the system has performed any monitoring for radon that indicates that radon is present in the finished water, the Consumer Confidence Report shall include the monitoring results and an explanation of their significance.

(g) For the year covered by the report, the Consumer Confidence Report shall note any violations of paragraphs (1) through (7) and give related information, including any potential adverse health effects, and the steps the system has taken to correct the violation.

(1) Monitoring and reporting of compliance data.

(2) Filtration, disinfection, and recycled provisions prescribed by sections 64652, 64652.5, 64653, 64653.5(b), or 64654. For systems that have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes that constitutes a violation, the Consumer Confidence Report shall include the health effects language pursuant to appendix 64465-B as part of the explanation of potential adverse health effects.

(3) One or more actions prescribed by the lead and copper requirements in sections 64673, 64674, 64683 through 64686, and 64688. To address potential adverse health effects, the Consumer Confidence Report shall include the applicable language pursuant to appendix 64465-D for lead, copper, or both.

(4) Treatment technique requirements for Acrylamide and Epichlorohydrin in section 64448; to address potential adverse health effects, the Consumer Confidence Report shall include the relevant language from appendix 64465-H.

(5) Recordkeeping of compliance data.

(6) Special monitoring requirements prescribed by section 64449(b)(2) and (g).

(7) Terms of a variance, an exemption, or an administrative or judicial order.

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(h) If a system is operating under the terms of a variance or an exemption issued under section 116430 or 116425 of the Health and Safety Code, the Consumer Confidence Report shall contain:

- (1) An explanation of the reasons for the variance or exemption;
- (2) The date on which the variance or exemption was issued;
- (3) A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and
- (4) A notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

(i) A Consumer Confidence Report shall contain the language in paragraphs (1) through (4).

(1) "The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity."

(2) "Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.

Radioactive contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities."

(3) "In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health."

(4) "Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791)."

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(j) A Consumer Confidence Report shall prominently display the following language: “Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).”

(k) A Consumer Confidence Report shall include the telephone number of the owner, operator, or designee of the water system as a source of additional information concerning the report.

(l) A Consumer Confidence Report shall contain information in Spanish regarding the importance of the report or contain a telephone number or address where Spanish-speaking residents may contact the system to obtain a translated copy of the report or assistance in Spanish. For each non-English speaking group other than Spanish-speaking that exceeds 1,000 residents or 10% of the residents in a community, the Consumer Confidence Report shall contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

(m) A Consumer Confidence Report shall include information (e.g., time and place of regularly scheduled board meetings) about opportunities for public participation in decisions that may affect the quality of the water.

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Appendix 64481-A.
Typical Origins of Contaminants with Primary MCLs, MRDLs
Regulatory Action Levels, and Treatment Techniques

| <i>Contaminant</i> | <i>Major origins in drinking water</i> |
|--|--|
| <i>Microbiological</i> | |
| Total coliform bacteria | Naturally present in the environment |
| Fecal coliform and <i>E. coli</i> | Human and animal fecal waste |
| Turbidity | Soil runoff |
| <i>Surface water treatment</i> | |
| <i>Giardia lamblia</i> | Naturally present in the environment |
| Viruses | |
| Heterotrophic plate count bacteria | |
| <i>Legionella</i> | |
| <i>Cryptosporidium</i> | |
| <i>Radioactive</i> | |
| Gross Beta particle activity | Decay of natural and man-made deposits |
| Strontium-90 | Decay of natural and man-made deposits |
| Tritium | Decay of natural and man-made deposits |
| Gross Alpha particle activity | Erosion of natural deposits |
| Combined Radium 226/228 | Erosion of natural deposits |
| Total Radium (for nontransient noncommunity water systems) | Erosion of natural deposits |
| Uranium | Erosion of natural deposits |
| <i>Inorganic</i> | |
| Aluminum | Erosion of natural deposits; residue from some surface water treatment processes |
| Antimony | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder |
| Arsenic | Erosion of natural deposits; runoff from orchards; glass and electronics production wastes |
| Asbestos | Internal corrosion of asbestos cement water mains; erosion of natural deposits |
| Barium | Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits |

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| | |
|-------------|--|
| Beryllium | Discharge from metal refineries, coal-burning factories, and electrical, aerospace, and defense industries |
| Cadmium | Internal corrosion of galvanized pipes; erosion of natural deposits; discharge from electroplating and industrial chemical factories, and metal refineries; runoff from waste batteries and paints |
| Chromium | Discharge from steel and pulp mills and chrome plating; erosion of natural deposits |
| Copper | Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives |
| Cyanide | Discharge from steel/metal, plastic and fertilizer factories |
| Fluoride | Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories |
| Lead | Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits |
| Mercury | Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and cropland |
| Nickel | Erosion of natural deposits; discharge from metal factories |
| Nitrate | Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits |
| Nitrite | Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits |
| Perchlorate | Perchlorate is an inorganic chemical used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store, or dispose of perchlorate and its salts. |
| Selenium | Discharge from petroleum, glass, and metal refineries; erosion of natural deposits; discharge |

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| | |
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| | from mines and chemical manufacturers; runoff from livestock lots (feed additive) |
| Thallium | Leaching from ore-processing sites; discharge from electronics, glass, and drug factories |

Synthetic organic

| | |
|-----------------------------|--|
| 2,4-D | Runoff from herbicide used on row crops, range land, lawns, and aquatic weeds |
| 2,4,5-TP (Silvex) | Residue of banned herbicide |
| Acrylamide | Added to water during sewage/wastewater treatment |
| Alachlor | Runoff from herbicide used on row crops |
| Atrazine | Runoff from herbicide used on row crops and along railroad and highway right-of-ways |
| Bentazon | Runoff/leaching from herbicide used on beans, peppers, corn, peanuts, rice, and ornamental grasses |
| Benzo(a)pyrene [PAH] | Leaching from linings of water storage tanks and distribution mains |
| Carbofuran | Leaching of soil fumigant used on rice and alfalfa, and grape vineyards |
| Chlordane | Residue of banned insecticide |
| Dalapon | Runoff from herbicide used on right-of-ways, and crops and landscape maintenance |
| Dibromochloropropane (DBCP) | Banned nematocide that may still be present in soils due to runoff/leaching from former use on soybeans, cotton, vineyards, tomatoes, and tree fruit |
| Di(2-ethylhexyl) adipate | Discharge from chemical factories |
| Di(2-ethylhexyl) phthalate | Discharge from rubber and chemical factories; inert ingredient in pesticides |
| Dinoseb | Runoff from herbicide used on soybeans, vegetables, and fruits |
| Dioxin [2,3,7,8-TCDD] | Emissions from waste incineration and other combustion; discharge from chemical factories |
| Diquat | Runoff from herbicide use for terrestrial and aquatic weeds |
| Endothall | Runoff from herbicide use for terrestrial and aquatic weeds; defoliant |
| Endrin | Residue of banned insecticide and rodenticide |
| Epichlorohydrin | Discharge from industrial chemical factories; impurity of some water treatment chemicals |
| Ethylene dibromide (EDB) | Discharge from petroleum refineries; underground gas tank leaks; banned nematocide that may still be present |

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| | in soils due to runoff and leaching from grain and fruit crops |
| Glyphosate | Runoff from herbicide use |
| Heptachlor | Residue of banned insecticide |
| Heptachlor epoxide | Breakdown of heptachlor |
| Hexachlorobenzene | Discharge from metal refineries and agricultural chemical factories; byproduct of chlorination reactions in wastewater |
| Hexachlorocyclopentadiene | Discharge from chemical factories |
| Lindane | Runoff/leaching from insecticide used on cattle, lumber, and gardens |
| Methoxychlor | Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, and livestock |
| Molinate [Ordram] | Runoff/leaching from herbicide used on rice |
| Oxamyl [Vydate] | Runoff/leaching from insecticide used on field crops, fruits and ornamentals, especially apples, potatoes, and tomatoes |
| Pentachlorophenol | Discharge from wood preserving factories, cotton and other insecticidal/herbicidal uses |
| Picloram | Herbicide runoff |
| Polychlorinated biphenyls [PCBs] | Runoff from landfills; discharge of waste chemicals |
| Simazine | Herbicide runoff |
| Thiobencarb | Runoff/leaching from herbicide used on rice |
| Toxaphene | Runoff/leaching from insecticide used on cotton and cattle |
| 1,2,3-Trichloropropane | Discharge from industrial and agricultural chemical factories; leaching from hazardous waste sites; used as cleaning and maintenance solvent, paint and varnish remover, and cleaning and degreasing agent; byproduct during the production of other compounds and pesticides. |

Volatile organic

| | |
|----------------------|--|
| Benzene | Discharge from plastics, dyes and nylon factories; leaching from gas storage tanks and landfills |
| Carbon tetrachloride | Discharge from chemical plants and other industrial activities |
| 1,2-Dichlorobenzene | Discharge from industrial chemical factories |
| 1,4-Dichlorobenzene | Discharge from industrial chemical factories |

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|---------------------------------------|--|
| 1,1-Dichloroethane | Extraction and degreasing solvent; used in manufacture of pharmaceuticals, stone, clay and glass products; fumigant |
| 1,2-Dichloroethane | Discharge from industrial chemical factories |
| 1,1-Dichloroethylene | Discharge from industrial chemical factories |
| cis-1,2-Dichloroethylen | Discharge from industrial chemical factories; major biodegradation byproduct of TCE and PCE groundwater contamination |
| trans-1,2-Dichloroethylene | Discharge from industrial chemical factories; minor biodegradation byproduct of TCE and PCE groundwater contamination |
| Dichloromethane | Discharge from pharmaceutical and chemical factories; insecticide |
| 1,2-Dichloropropane | Discharge from industrial chemical factories; primary component of some fumigants |
| 1,3-Dichloropropene | Runoff/leaching from nematocide used on croplands |
| Ethylbenzene | Discharge from petroleum refineries; industrial chemical factories |
| Methyl-tert-butyl ether (MTBE) | Leaking underground storage tanks; discharge from petroleum and chemical factories |
| Monochlorobenzene | Discharge from industrial and agricultural chemical factories and drycleaning facilities |
| Styrene | Discharge from rubber and plastic factories; leaching from landfills |
| 1,1,2,2-Tetrachloroethane | Discharge from industrial and agricultural chemical factories; solvent used in production of TCE, pesticides, varnish and lacquers |
| Tetrachloroethylene (PCE) | Discharge from factories, dry cleaners, and auto shops (metal degreaser) |
| 1,2,4-Trichlorobenzene | Discharge from textile-finishing factories |
| 1,1,1-Trichloroethan | Discharge from metal degreasing sites and other factories; manufacture of food wrappings |
| 1,1,2-Trichloroethan | Discharge from industrial chemical factories |
| Trichloroethylene (TCE) | Discharge from metal degreasing sites and other factories |
| Toluene | Discharge from petroleum and chemical factories; underground gas tank leaks |
| Trichlorofluoromethane | Discharge from industrial factories; degreasing solvent; propellant and refrigerant |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | Discharge from metal degreasing sites and other factories; drycleaning solvent; refrigerant |

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| | |
|----------------|--|
| Vinyl chloride | Leaching from PVC piping; discharge from plastics factories; biodegradation byproduct of TCE and PCE groundwater contamination |
| Xylenes | Discharge from petroleum and chemical factories; fuel solvent |

Disinfection Byproducts, Disinfection Byproduct Precursors, and Disinfectant Residuals

| | |
|---|---|
| Total trihalomethanes (TTHM) | Byproduct of drinking water disinfection |
| Haloacetic acids (five) (HAA5) | Byproduct of drinking water disinfection |
| Bromate | Byproduct of drinking water disinfection |
| Chloramines | Drinking water disinfectant added for treatment |
| Chlorine | Drinking water disinfectant added for treatment |
| Chlorite | Byproduct of drinking water disinfection |
| Chlorine dioxide | Drinking water disinfectant added for treatment |
| Control of disinfection byproduct precursors (Total Organic Carbon) | Various natural and manmade sources |

**Appendix 64481-B.
Typical Origins of Contaminants with Secondary MCLs**

| <i>Contaminant</i> | <i>Major origins in drinking water</i> |
|--------------------------------|---|
| Aluminum | Erosion of natural deposits; residual from some surface water treatment processes |
| Color | Naturally-occurring organic materials |
| Copper | Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives |
| Foaming Agents (MBAS) | Municipal and industrial waste discharges |
| Iron | Leaching from natural deposits; industrial wastes |
| Manganese | Leaching from natural deposits |
| Methyl-tert-butyl ether (MTBE) | Leaking underground storage tanks; discharge from petroleum and chemical factories; |
| Odor---Threshold | Naturally-occurring organic materials |
| Silver | Industrial discharges |
| Thiobencarb | Runoff/leaching from rice herbicide |
| Turbidity | Soil runoff |

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| | |
|------------------------|---|
| Zinc | Runoff/leaching from natural deposits; industrial wastes |
| Total dissolved solids | Runoff/leaching from natural deposits |
| Specific Conductance | Substances that form ions when in water; seawater influence |
| Chloride | Runoff/leaching from natural deposits; seawater influence |
| Sulfate | Runoff/leaching from natural deposits; industrial wastes |

§64482. Required Additional Health Information.

(a) A system that detects arsenic at levels above 0.005 mg/L, but below or equal to the MCL, shall include the following in its Consumer Confidence Report: "While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems."

(b) A system that detects nitrate at levels above 5 mg/L (as nitrogen), but below the MCL, shall include the following in its Consumer Confidence Report: "Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider. If a system cannot demonstrate to the State Board with at least five years of the most current monitoring data that its nitrate levels are stable, it shall also add the following language to the preceding statement on nitrate: "Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity."

(c) A system that detects lead above the action level in more than 5%, and up to and including 10%, of sites sampled, shall include the following in its Consumer Confidence Report: "Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and/or flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the USEPA Safe Drinking Water Hotline (1-800-426-4791)."

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§64483. Consumer Confidence Report Delivery and Recordkeeping.

(a) Each water system shall mail or directly deliver one copy of the Consumer Confidence Report to each customer.

(b) The system shall make a good faith effort to reach consumers who are served by the water system but are not bill-paying customers, such as renters or workers, using a mix of methods appropriate to the particular system such as: Posting the Consumer Confidence Reports on the Internet; mailing to postal patrons in metropolitan areas; advertising the availability of the Consumer Confidence Report in the news media; publication in a local newspaper; posting in public places such as cafeterias or lunch rooms of public buildings; delivery of multiple copies for distribution by single-biller customers such as apartment buildings or large private employers; and delivery to community organizations.

(c) No later than the date the water system is required to distribute the Consumer Confidence Report to its customers, each water system shall mail a copy of the report to the State Board, followed within 3 months by a certification that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the State Board.

(d) No later than the date the water system is required to distribute the Consumer Confidence Report to its customers, each privately-owned water system shall mail a copy of the report to the California Public Utilities Commission.

(e) Each water system shall make its Consumer Confidence Report available to the public upon request.

(f) Each water system serving 100,000 or more persons shall post its current year's Consumer Confidence Report on a publicly-accessible site on the Internet.

(g) Each water system shall retain copies of its Consumer Confidence Reports for no less than 3 years.

CHAPTER 15.5 DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS

Article 1. General Requirements and Definitions

§64530. Applicability of this Chapter.

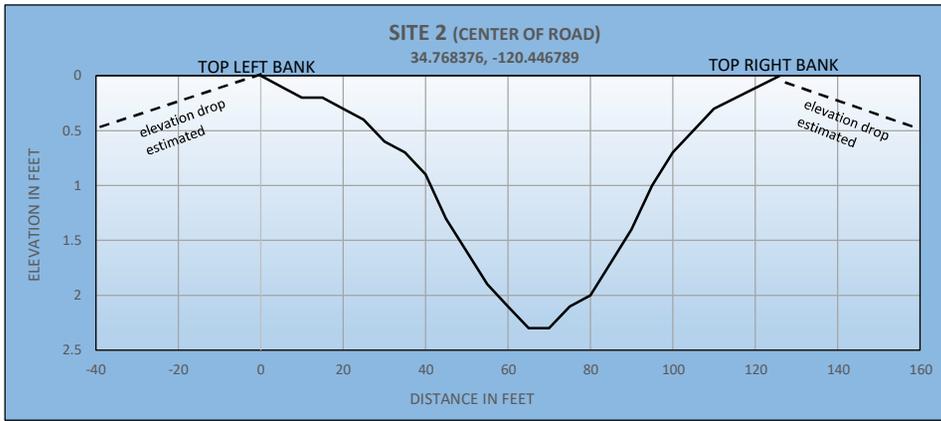
(a) Community water systems and nontransient noncommunity water systems that treat their water with a chemical disinfectant in any part of the treatment process or which provide water that contains a chemical disinfectant shall comply with the requirements of

APPENDIX D-8

Stream Channel Cross-Sections

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SITE 1

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