Aquifer Risk Map Methodology

# Introduction

The aquifer risk map is being developed to fulfill requirements of Senate Bill (SB 200, Monning, 2019), and is a component of California’s Safe and Affordable Fund for Equity and Resilience (SAFER) program. The aquifer risk map is intended to help prioritize areas where domestic wells and state small water systems may be accessing groundwater that does not meet primary drinking water standards (maximum contaminant level or MCL). In accordance with SB 200, the risk map is to be made available to the public and is to be updated annually starting January 1, 2021. SB 200 also requires that a Fund Expenditure Plan be developed annually. The Fund Expenditure Plan states the risk map will be used by Water Boards staff to help prioritize areas for available SAFER funding.

The aquifer risk map contains several data layers. The **water quality risk layer** compiles available de-clustered, depth-filtered water quality results, applies risk factors to those data, and ranks, by percentile, the relative risk of groundwater in an area not meeting primary drinking water standards. The **domestic well density layer** plots the density of domestic wells based on available well record data[[1]](#footnote-1). The **state small water system layer** shows the locations of state small water systems, based on data provided by Counties and other oversight agencies[[2]](#footnote-2). The **combined risk layer** combines the water quality risk ranking with the domestic well and state small system density of an area to calculate the overall risk to domestic well and state small systems. By combining these two data elements, areas with a relatively high density of reported domestic wells or state small water systems, and a high relative risk to water quality are assigned the highest combined risk. Other **reference layers** that can be overlain on the map for reference include boundaries of priority areas in the Central Valley CV-SALTS program, Groundwater Sustainability Agency boundaries, and Disadvantaged Community data.

# Intended Use of this Analysis

The water quality risk ranking developed using this methodology are not intended to depict actual groundwater quality conditions at any given domestic supply well or small water system location. The purpose of this risk map analysis is to prioritize areas that may not meet primary drinking water standards for additional investigation and sampling efforts. The current lack of available domestic well and state small system water quality data makes it not possible to characterize the water quality for individual domestic wells and state small systems. The analysis described herein represents a best effort at using the available data to estimate water quality risk for domestic wells and state small systems.

# Unit of Analysis

Groundwater quality risk is summarized by census block group. This allows the water quality risk to be combined with existing census information, such as disadvantaged community status and other demographic information. This also allows the data to be combined with the results of the Department of Water Resources Drought and Water Shortage Risk mapping, which identifies water accessibility risk throughout the state. Water quality data also can be viewed as individual well points and compiled into square mile public land survey sections. The well point and section-level data allow the user to better understand the potential distribution of available water quality data within a census block that contributed to the overall risk ranking for that block. State small system location data is available as point locations, and domestic well density information is available as both count per square mile and as count per census block group.

# Methodology

## Data Processing

Water quality results from the Division of Drinking Water (DDW), the US Geological Survey (USGS)-Groundwater Ambient Monitoring and Assessment (GAMA) programs’ Priority Basin and Domestic Well Projects, the USGS-National Water Information System dataset, the Department of Water Resources (DWR), local groundwater monitoring projects, and the Irrigated Lands Regulatory Program (AGLAND) were included in this analysis. Water quality data from most regulated clean-up and monitoring sites (Geotracker) were not included in this analysis as these data were not considered to be representative of groundwater typically accessed by domestic wells. Results were only included if the well met the depth-filtering criteria developed in Domestic Well Needs Assessment project. Data from all chemical constituents with a Maximum Contaminant Level (MCL) are assessed, and several additional chemical constituents including hexavalent chromium, copper, lead, and N-Nitrosodimethylamine (NDMA) are included in the analysis as well[[3]](#footnote-3). Water quality results were converted to an MCL Index[[4]](#footnote-4) to allow comparison between chemical constituents (see Appendix A for table with MCLs). A more detailed presentation of data collection, data standardization, and data filtering are outlined in the [Needs Assessment Domestic Well Water Quality Tool White Paper](https://gispublic.waterboards.ca.gov/portal/home/item.html?id=70feb9f4b00f4b3384a9a0bf89f9f18a). The R script used to download, process, and filter the water quality data is available on [GitHub](https://github.com/EmilyHoulihan/Aquifer_Risk_Map).

## Depth Filter

Most available groundwater quality data is sourced from public (municipal) supply wells. This is a result of California’s requirement for monitoring and reporting of groundwater from wells that are part of a water system that supplies water to 15 or more service connections. In contrast, domestic wells (any system that serves less than 5 connections) and state small water systems (5 – 14 connections) are not regulated by the state and therefore lack comprehensive data.

For many regions, municipal supply wells access a deeper portion of the groundwater resource when compared with domestic wells. This deeper groundwater is typically less affected by contaminants introduced at the ground surface than shallower groundwater. As a result, use of data from municipal wells would likely result in a systematic low bias for an estimate of the shallower groundwater typically accessed by domestic wells.

Staff developed a method to filter data that more likely represents shallower groundwater accessed by domestic wells, as summarized below.

Since well depth varies throughout the state, a domestic depth zone was defined numerically for each groundwater unit[[5]](#footnote-5) based on Total Completed Depth statistics from the OSWCR database. Based on well depth data in the OSCWR database, a well depth interval per groundwater unit was determined for wells classified as domestic and for wells classified as public (Figure 1). These well depth statistics were then compared to assess whether domestic and public well depth intervals overlap, indicating they access the same groundwater source. For groundwater units where the depth interval for public and domestic wells overlapped (or the public interval was shallower) water quality data from public wells was included in the analysis. For groundwater units where the depth interval for public wells was deeper than the depth interval for domestic wells water quality data from public wells was screened out of the analysis. For details on the maximum domestic well depth and the comparison of public and domestic wells for each groundwater unit, see Appendix B.

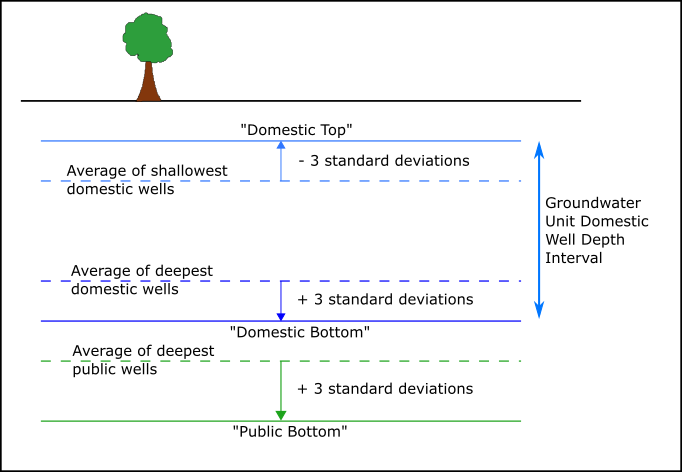


Figure . Numeric depth filter – based on average of section maximum/minimum well depths per Groundwater Unit. Wells with a known depth that fall within the “domestic well depth interval” are included in the analysis. Wells with a known depth that fall outside the “domestic well depth interval” are screened out of the analysis. For wells without a known depth - if the “public bottom” depth of a Groundwater Unit is shallower or within 10% of the “domestic bottom” depth, then wells classified as public are included in the analysis. If the “public bottom” depth of a Groundwater Unit is more than 10% deeper than the “domestic bottom” depth, then wells classified as public are screened out of the analysis.

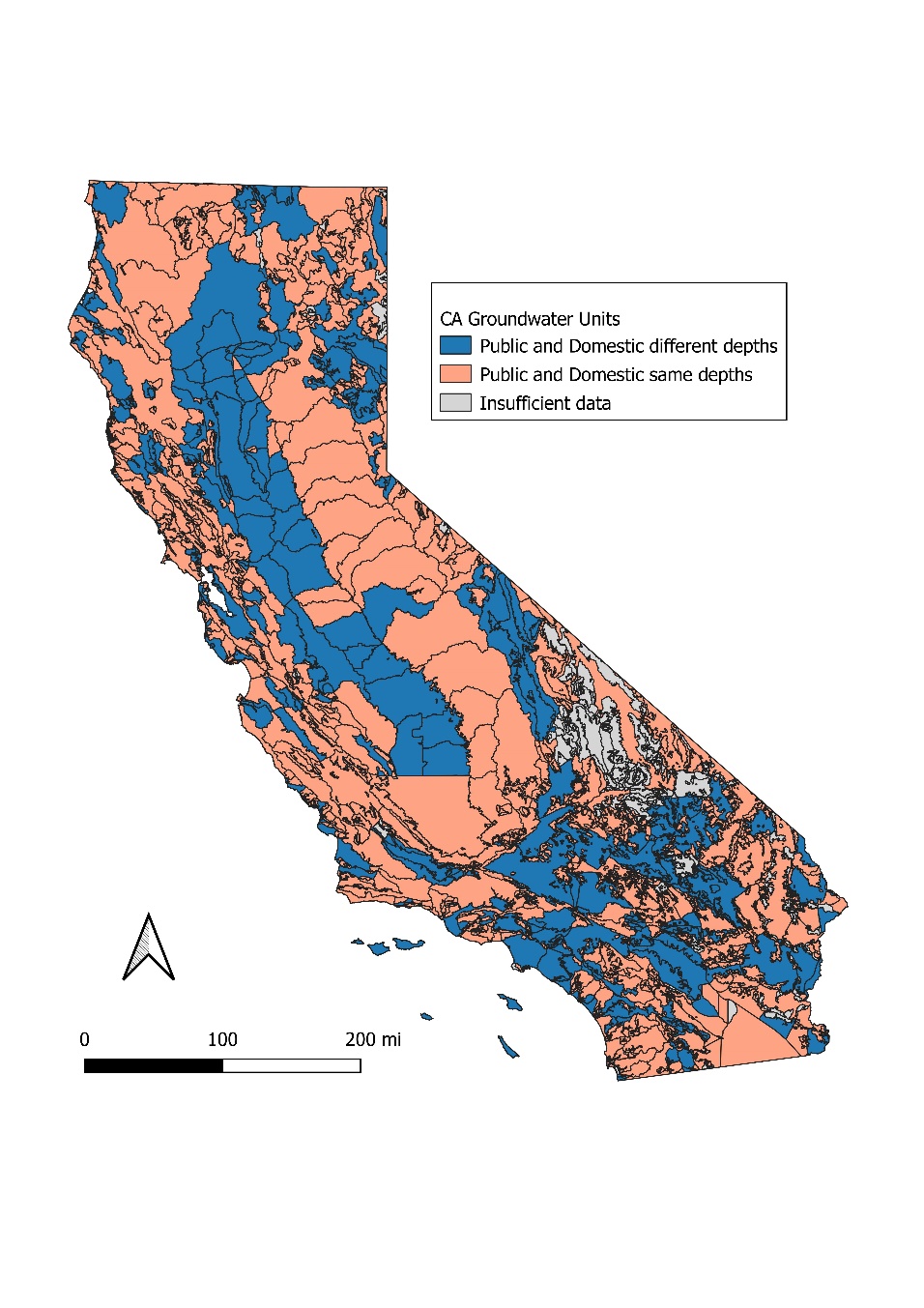


Figure . Depth filter by well type (for wells with unknown depth). This map shows basins where domestic wells and public wells may be accessing similar groundwater depths (pink) and basins where domestic wells and public wells are accessing different groundwater depths (blue). For the basins show in pink, public wells were used as a proxy for domestic depth water quality.

Most wells with water quality data do not have well construction data (depth of well or screen interval). Wells with depth data were filtered based on their numeric well construction; wells without numeric construction data were filtered by well type.

Wells with known numeric depths

Staff used OSWCR Total Completed Depth section summary statistics to determine a “Domestic Bottom” and “Domestic Top” depth for each Groundwater Unit. The domestic well depth zone was defined as the range between “Domestic Bottom” depth[[6]](#footnote-6) and “Domestic Top” depth[[7]](#footnote-7). For Group 1 wells, if the given depth of the well fell between the “Domestic Top” depth and the “Domestic Bottom” depth, water quality data from that well was included in the analysis.

Water quality data wells with unknown numeric depths

Staff used OSWCR well depth information to compare “Domestic Bottom” depth (defined above) to “Public Bottom” depth[[8]](#footnote-8) (defined below). If the “Public Bottom” depth for a given Groundwater Unit was shallower than the “Domestic Bottom” depth, or within 10% of “Domestic Bottom” depth (shallower or deeper), then it was considered reasonable to include data from public wells into the analysis for that Groundwater Unit. If the “Public Bottom” depth for a given Groundwater Unit was more than 10% deeper than the “Domestic Bottom” depth, water quality data from public wells was screened out of the analysis for that Groundwater Unit.

## De-clustering

Available water quality results were spatially and temporally de-clustered to square mile sections to account for differences in data sampling density within each section over space and time. This was conducted to prevent certain areas with a high density of wells and frequent sampling to achieve a disproportionate weighting to the overall risk characterization of an area. To expand the coverage of the water quality risk map, averaged, de-clustered data from sections that contain a well(s) that provide water quality data (“source sections”) are projected onto neighboring sections that do not include a well providing water quality data.

Water quality data is assessed using two metrics - the long-term (20 year[[9]](#footnote-9)) average and all recent results (within 2 years[[10]](#footnote-10)). The temporal and spatial de-clustering methodology for each metric is outlined below, and is further described in the Domestic Well Needs Assessment White Paper[[11]](#footnote-11):

### Long-term average

1. Water quality results from each well for each chemical constituent are averaged per year (for the past 20 years).
2. The results from step one is averaged per well.
3. The results from step two are averaged for all the wells that lie within a section.
4. For sections that do not contain a well with water quality data, the de-clustered data from step three is projected onto adjacent sections.

### Recent results

1. All recent (within the past 2 years) results in a section are categorized as “under” (less than 80 percent of MCL), “close” (80 percent – 100 percent of MCL), or “over” (greater than MCL).
2. The count of recent results in each category are summarized per square mile section for each constituent.
3. For square mile sections that do not contain a well with recent water quality data, the results from step two is averaged for all adjacent sections.

## Risk Factors

### Water Quality Risk (“Hazard”)

Water quality data for census block groups are calculated using data from all sections within the census block group. Prioritization of census block groups is based on five water quality risk factors that capture different aspects of water quality risk based on the available data. Several additional informational fields are included for reference.

|  |  |  |
| --- | --- | --- |
| **Risk Factor** | **Notation** | **Description** |
| Count of chemical constituents above MCL | CRF1 | Number of individual chemical constituents have a long-term (20 year) average or recent result (within the past 2 years) above the MCL. |
| Count of chemical constituents within 80 percent of MCL | CRF2 | Number of chemical constituents with a long-term average or recent result within 80 percent and 100 percent of the MCL. |
| Average MCL Index (for results above MCL) | CRF3 | Magnitude of the average result for chemical constituents with a long-term average or recent result above the MCL. |
| Percent of high risk sections | CRF4 | Percentage of square mile sections in the census block group that contain at least one constituent with a long-term average or recent result above the MCL (i.e., “high risk”). |
| Percent of medium risk sections | CRF5 | Percentage of square mile sections in the census block group that contain at least one constituent with a long-term average or recent result within 80 percent – 100 percent of the MCL (i.e., “medium risk”). |

|  |  |
| --- | --- |
| **Reference Data** | **Description** |
| List of chemical constituents above MCL | List of chemical constituents with a long-term or recent result above the MCL |
| List of chemical constituents within 80 percent of MCL | List of chemical constituents with a long-term or recent result within 80 percent – 100 percent of MCL. |
| Percent area with water quality data | The percentage of sections in the census block group that contain water quality data. |

These water quality risk factors are aggregated into a final water quality score, calculated as:

The water quality scores for all census block groups are converted into percentiles to normalize the scores. Higher scores and high percentiles indicate areas that are at relatively higher risk for water quality issues in domestic wells and state small water systems. Census block groups with a score of zero (no constituents above or close to the MCL) are automatically assigned to the 0th percentile and are not included in the percentile calculation. Approximately 33 percent of census blocks fall into this category. It is important to note that because of the data filtering and de-clustering involved in these calculations, a risk percentile of zero does not necessarily mean there is no water quality risk in an area (see discussion on areas with sparse/no available data, below).

In addition to the census block group percentiles, detailed data layers show water quality data summarized at the square mile section level and at the point (well) level. These layers display similar risk factors for sections and well points:

|  |  |
| --- | --- |
| **Section Data Risk Information** | **Description** |
| Section Risk Category | Categorizes sections as being “high”, “medium”, or “low” water quality risk.  “High”: contains at least one constituent with a long-term average or recent result above the MCL  “Medium”: contains at least one constituent with a long-term average or recent result within 80 percent – 100 percent of the MCL  “Low”: contains no constituents with a long-term average or recent result greater than 80 percent of the MCL |
| Count of chemical constituents above MCL | Number of chemical constituents in the section that have a long-term (20 year) average or recent result (within the past 2 years) above the MCL. |
| Count of chemical constituents within 80 percent of MCL | Number of chemical constituents in the section that have a long-term (20 year) average or recent result (within the past 2 years) within 80 percent and 100 percent of the MCL. |
| Average MCL Index (for results above MCL) | Average magnitude of chemical constituents that are above the MCL in the section. |
| List of chemical constituents above MCL | List of chemical constituents with a long-term or recent result above the MCL in the section |
| List of chemical constituents close to MCL | List of chemical constituents with a long-term or recent result within 80 percent – 100 percent of MCL in the section |

|  |  |
| --- | --- |
| **Point Data Risk Information** | **Description** |
| Well Risk Category | Categorizes wells as being in a section that has a “high”, “medium”, or “low” water quality risk:  “High”: contains at least one constituent with a long-term average or recent result above the MCL  “Medium”: contains at least one constituent with a long-term average or recent result within 80 percent – 100 percent of the MCL  “Low”: contains no constituents with a long-term average or recent result greater than 80 percent of the MCL |
| Count of chemical constituents above MCL | Number of chemical constituents in the well that have a long-term (20 year) average or recent result (within the past 2 years) above the MCL. |
| Count of chemical constituents within 80 percent of MCL | Count of chemical constituents in the well that have a long-term (20 year) average or recent result (within the past 2 years) within 80 percent and 100 percent of the MCL. |
| Average MCL Index (for results above MCL) | Average magnitude of chemical constituents that are above the MCL in the well. |
| List of chemical constituents above MCL | List of chemical constituents with a long-term or recent result above the MCL in the well. |
| List of chemical constituents close to MCL | List of chemical constituents with a long-term or recent result within 80 percent – 100 percent of MCL in the well. |

## 

#### Areas with No Available Water Quality Data

Out of 23,212 census block groups, approximately 5,183 (22 percent) do not contain water quality data for any of the chemical constituents.

Most (3,250, or 63 percent) of these “no data” block groups are in the densely populated areas (i.e., Los Angeles and San Francisco Bay), where census block groups are very small (less than 1 square mile) and do not overlap a square mile section with a well with water quality data. These areas are predominantly served by municipal water systems and are less likely to have a significant population on domestic wells. However, there are several block groups with no data in Imperial County and parts of Humboldt, Trinity, and Shasta Counties, where there is likely populations of domestic well users. Currently, block groups with no water quality data are not included in the percentile ranking process and are assigned a water quality risk percentile of zero. Due to the data filtering and de-clustering involved in these calculations, a risk percentile score of “zero” does not mean there is not a water quality risk in each area.

#### Areas with Sparse Available Water Quality Data

Additionally, there are 118 census block groups that contain sparse (less than 10 percent) data coverage. While these block groups are included in the percentile ranking, they are flagged on the tool with the hatch marks to alert the user.

#### Individual Chemical Constituents

Single-chemical constituent layers are available as square mile section data for Nitrate, Arsenic, 1,2,3-Trichloropropane, Hexavalent Chromium, and Uranium. These layers display the long-term average and the count of recent results over, close to, and under the MCL per square mile section for a single chemical constituent.

### Domestic Well and State Small System Density (“Exposure”)

This layer identifies areas where available data indicates a relatively high density of domestic wells and state small systems. The density of domestic wells is calculated from the count of domestic well records per mile in the California Department of Water Resources Online System for Well Completion Reports (OSWCR). OSWCR records with a completion date prior to 1970 were not included in this assessment to avoid including wells that may no longer be in use. Exposure risk is based on the number of domestic wells and state small water systems per square mile in the census block group (density). The “exposure risk” is calculated by normalizing the density to percentiles for all census block groups.

### Combined Risk (Water Quality and Domestic Well/State Small Reliant Population)

The combined risk layer combines the water quality risk (“hazard”) with the domestic well and state small density (“exposure”) using the following equation.

To avoid under-representing the risk of areas with little to no data, the final equation to calculate combined risk is additive (instead of multiplicative) because areas with a water quality risk or domestic well and state small system density of “zero” might just have low or no available data. A “zero” does not necessarily indicate no risk to water quality or no domestic well/state small system users because of the uncertainty in both individual risk layers. The final combined risk value is then re-normalized to a percentile.

The metadata for this layer includes the following fields:

|  |  |
| --- | --- |
| **Combined Risk Factor** | **Description** |
| Water quality risk percentile | See above section “Water Quality Risk (Hazard)” |
| Domestic well and state small system density percentile | See above section “Domestic Well and State Small System Density (Exposure)” |
| **Reference Data** | **Description** |
| Count of domestic wells in census block group | Count of domestic wells from OSWCR, excluding those drilled prior to 1970. |
| Count of state small water systems in census block group | Count of state small water systems from RCAC. |
| Disadvantaged community status of census block group | From the Department of Water Resources (2018), this indicates if a census block group is disadvantaged (Median Household Income (MHI) is less than $56,982, or 80% of California MHI) or severely disadvantaged (MHI is less than $42,737, or 60% of California MHI). MHI information is not available for some areas. |

# Appendix A – Chemical Abbreviations and Comparison Concentrations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Chemical Abbreviation (Web Tool)** | **Chemical Name** | **Units** | **Comparison Concentration Value** | **Comparison Concentration Type** |
| 24D | 2,4-Dichlorophenoxyacetic acid (2,4 D) | UG/L | 70 | MCL |
| AL | Aluminum | UG/L | 1000 | MCL |
| ALACL | Alachlor | UG/L | 2 | MCL |
| ALPHA | Gross Alpha radioactivity | pCi/L | 15 | MCL |
| AS | Arsenic | UG/L | 10 | MCL |
| ATRAZINE | Atrazine | UG/L | 1 | MCL |
| BA | Barium | MG/L | 1 | MCL |
| BDCME | Bromodichloromethane (THM) | UG/L | 80 | MCL |
| BE | Beryllium | UG/L | 4 | MCL |
| BETA | Gross beta | pCi/L | 50 | MCL |
| BHCGAMMA | Lindane (Gamma-BHC) | UG/L | 0.2 | MCL |
| BIS2EHP | Di(2-ethylhexyl)phthalate (DEHP) | UG/L | 4 | MCL |
| BRO3 | Bromate | UG/L | 10 | MCL |
| BTZ | Bentazon | UG/L | 18 | MCL |
| BZ | Benzene | UG/L | 1 | MCL |
| BZAP | Benzo(a)pyrene | UG/L | 0.2 | MCL |
| BZME | Toluene | UG/L | 150 | MCL |
| CD | Cadmium | UG/L | 5 | MCL |
| CHLORDANE | Chlordane | UG/L | 0.1 | MCL |
| CHLORITE | Chlorite | MG/L | 1 | MCL |
| CLBZ | Chlorobenzene | UG/L | 70 | MCL |
| CN | Cyanide (CN) | UG/L | 150 | MCL |
| CR | Chromium | UG/L | 50 | MCL |
| CR6 | Chromium, Hexavalent (Cr6) | UG/L | 10 | Temporary comparison level\* |
| CRBFN | Carbofuran | UG/L | 18 | MCL |
| CTCL | Carbon Tetrachloride | UG/L | 0.5 | MCL |
| CU | Copper | MG/L | 1.3 | Action Level |
| DALAPON | Dalapon | UG/L | 200 | MCL |
| DBCME | Dibromochloromethane (THM) | UG/L | 80 | MCL |
| DBCP | 1,2-Dibromo-3-chloropropane (DBCP) | UG/L | 0.2 | MCL |
| DCA11 | 1,1-Dichloroethane (1,1 DCA) | UG/L | 5 | MCL |
| DCA12 | 1,2 Dichloroethane (1,2 DCA) | UG/L | 0.5 | MCL |
| DCBZ12 | 1,2 Dichlorobenzene (1,2-DCB) | UG/L | 600 | MCL |
| DCBZ14 | 1,4-Dichlorobenzene (p-DCB) | UG/L | 5 | MCL |
| DCE11 | 1,1 Dichloroethylene (1,1 DCE) | UG/L | 6 | MCL |
| DCE12C | cis-1,2 Dichloroethylene | UG/L | 6 | MCL |
| DCE12T | trans-1,2, Dichloroethylene | UG/L | 10 | MCL |
| DCMA | Dichloromethane (Methylene Chloride) | UG/L | 5 | MCL |
| DCP13 | 1,3 Dichloropropene | UG/L | 0.5 | MCL |
| DCPA12 | 1,2 Dichloropropane (1,2 DCP) | UG/L | 5 | MCL |
| DINOSEB | Dinoseb | UG/L | 7 | MCL |
| DIQUAT | Diquat | UG/L | 20 | MCL |
| DOA | Di(2-ethylhexyl)adipate | MG/L | 0.4 | MCL |
| EBZ | Ethylbenzene | UG/L | 300 | MCL |
| EDB | 1,2 Dibromoethane (EDB) | UG/L | 0.05 | MCL |
| ENDOTHAL | Endothall | UG/L | 100 | MCL |
| ENDRIN | Endrin | UG/L | 2 | MCL |
| F | Fluoride | MG/L | 2 | MCL |
| FC11 | Trichlorofluoromethane (Freon 11) | UG/L | 150 | MCL |
| FC113 | 1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113) | MG/L | 1.2 | MCL |
| GLYP | Glyphosate (Round-up) | UG/L | 700 | MCL |
| H-3 | Tritium | pCi/L | 20000 | MCL |
| HCCP | Hexachlorocyclopentadiene | UG/L | 50 | MCL |
| HCLBZ | Hexachlorobenzene (HCB) | UG/L | 1 | MCL |
| HEPTACHLOR | Heptachlor | UG/L | 0.01 | MCL |
| HEPT-EPOX | Heptachlor Epoxide | UG/L | 0.01 | MCL |
| HG | Mercury | UG/L | 2 | MCL |
| MOLINATE | Molinate | UG/L | 20 | MCL |
| MTBE | MTBE (Methyl-tert-butyl ether) | UG/L | 13 | MCL |
| MTXYCL | Methoxychlor | UG/L | 30 | MCL |
| NI | Nickel | UG/L | 100 | MCL |
| NNSM | N-Nitrosodimethylamine (NDMA) | UG/L | 0.01 | NL |
| NO2 | Nitrite as N | MG/L | 1 | MCL |
| NO3N | Nitrate as N | MG/L | 10 | MCL |
| OXAMYL | Oxamyl | UG/L | 50 | MCL |
| PB | Lead | UG/L | 15 | Action Level |
| PCA | 1,1,2,2 Tetrachloroethane (PCA) | UG/L | 1 | MCL |
| PCATE | Perchlorate | UG/L | 6 | MCL |
| PCB1016 | Polychlorinated Biphenyls (PCBs) | UG/L | 0.5 | MCL |
| PCE | Tetrachloroethene (PCE) | UG/L | 5 | MCL |
| PCP | Pentachlorophenol (PCP) | UG/L | 1 | MCL |
| PICLORAM | Picloram | MG/L | 0.5 | MCL |
| RA-226 | Radium 226 | pCi/L | 5 | MCL |
| RA-228 | Radium 228 | pCi/L | 5 | MCL |
| SB | Antimony | UG/L | 6 | MCL |
| SE | Selenium | UG/L | 50 | MCL |
| SILVEX | 2,4,5-TP (Silvex) | UG/L | 50 | MCL |
| SIMAZINE | Simazine | UG/L | 4 | MCL |
| SR-90 | Strontium 90 | pCi/L | 8 | MCL |
| STY | Styrene | UG/L | 100 | MCL |
| TBME | Bromoform (THM) | UG/L | 80 | MCL |
| TCA111 | 1,1,1-Trichloroethane | UG/L | 200 | MCL |
| TCA112 | 1,1,2-Trichloroethane | UG/L | 5 | MCL |
| TCB124 | 1,2,4- Trichlorobenzene (1,2,4 TCB) | UG/L | 5 | MCL |
| TCDD2378\*\* | 2,3,7,8-Tetrachlorodibenzodioxin (Dioxin) | UG/L | 3.00E-05 | MCL |
| TCE | Trichloroethene (TCE) | UG/L | 5 | MCL |
| TCLME | Chloroform (THM) | UG/L | 80 | MCL |
| TCPR123 | 1,2,3-Trichloropropane (1,2,3 TCP) | UG/L | 0.005 | MCL |
| THIOBENCARB | Thiobencarb | UG/L | 70 | MCL |
| THM | Total Trihalomethanes | UG/L | 80 | MCL |
| TL | Thallium | UG/L | 2 | MCL |
| TOXAP | Toxaphene | UG/L | 3 | MCL |
| U | Uranium | pCi/L | 20 | MCL |
| VC | Vinyl Chloride | UG/L | 0.5 | MCL |
| XYLENES | Xylenes (total) | UG/L | 1750 | MCL |

\*Since there is currently no MCL for Hexavalent Chromium (CR6), a temporary comparison value was to remain consistent with the risk assessment for public water systems.

\*\*No data for 2,3,7,8-Tetrachlorodibenzodioxin (Dioxin) was available for this analysis, because there are no samples from wells that met our depth/time criteria.

# Appendix B. Depth Filter

This table lists the depth filter output for each groundwater unit in California. The table shows the ID, name, maximum domestic depth (in feet) and whether that groundwater unit has domestic and public wells at similar depths. The numeric value in the third column indicates the domestic depth maximum cutoff – only wells with shallower depths are used to estimate domestic/state small water quality. A “no” in the final column indicates that domestic and public wells are accessing different groundwater depths, and public wells are not used to estimate domestic/state small water quality when well depth is unknown. A “yes” in the final column indicates that domestic and public wells are accessing similar groundwater depths, and public wells are used to estimated domestic/state small water quality when well depth is unknown.

|  |  |  |  |
| --- | --- | --- | --- |
| **GU ID** | **GU Name** | **Max domestic depth (ft)** | **Use public wells as domestic proxy?** |
| "1-1" | "SMITH RIVER PLAIN" | 303.93 | "yes" |
| "1-10" | "EEL RIVER VALLEY" | 605.85 | "no" |
| "1-11" | "COVELO ROUND VALLEY" | 428.61 | "no" |
| "1-12" | "LAYTONVILLE VALLEY" | 658.95 | "no" |
| "1-13" | "LITTLE LAKE VALLEY" | 563.14 | "yes" |
| "1-14" | "LOWER KLAMATH RIVER VALLEY" | 281.09 | "yes" |
| "1-15" | "HAPPY CAMP TOWN AREA" | 467.41 | "yes" |
| "1-16" | "SEIAD VALLEY" | 746.63 | "yes" |
| "1-17" | "BRAY TOWN AREA" | 875.51 | "yes" |
| "1-18" | "RED ROCK VALLEY" | 503.32 | "yes" |
| "1-19" | "ANDERSON VALLEY" | 529.56 | "no" |
| "1-2" | "KLAMATH RIVER VALLEY" | 620.88 | "no" |
| "1-20" | "GARCIA RIVER VALLEY" | 362.71 | "no" |
| "1-21" | "FORT BRAGG TERRACE AREA" | 553.94 | "yes" |
| "1-22" | "FAIRCHILD SWAMP VALLEY" | NA | NA |
| "1-25" | "PRAIRIE CREEK AREA" | 177.81 | "no" |
| "1-26" | "REDWOOD CREEK AREA" | 195.02 | "yes" |
| "1-27" | "BIG LAGOON AREA" | 436.91 | "yes" |
| "1-28" | "MATTOLE RIVER VALLEY" | 228.38 | "no" |
| "1-29" | "HONEYDEW TOWN AREA" | 322.63 | "no" |
| "1-3" | "BUTTE VALLEY" | 958.82 | "no" |
| "1-30" | "PEPPERWOOD TOWN AREA" | 416.8 | "no" |
| "1-31" | "WEOTT TOWN AREA" | 367.26 | "yes" |
| "1-32" | "GARBERVILLE TOWN AREA" | 662.79 | "no" |
| "1-33" | "LARABEE VALLEY" | 483.9 | "yes" |
| "1-34" | "DINSMORES TOWN AREA" | 435.49 | "no" |
| "1-35" | "HYAMPOM VALLEY" | 430.59 | "yes" |
| "1-36" | "HETTENSHAW VALLEY" | 413.74 | "yes" |
| "1-37" | "COTTONEVA CREEK VALLEY" | 554 | "yes" |
| "1-38" | "LOWER LAYTONVILLE VALLEY" | 420.39 | "yes" |
| "1-39" | "BRANSCOMB TOWN AREA" | 487.26 | "no" |
| "1-4" | "SHASTA VALLEY" | 747.85 | "yes" |
| "1-40" | "TEN MILE RIVER VALLEY" | 562.72 | "yes" |
| "1-41" | "LITTLE VALLEY" | 393.4 | "yes" |
| "1-42" | "SHERWOOD VALLEY" | 415.74 | "no" |
| "1-43" | "WILLIAMS VALLEY" | 646.02 | "yes" |
| "1-44" | "EDEN VALLEY" | NA | NA |
| "1-45" | "BIG RIVER VALLEY" | 465.77 | "yes" |
| "1-46" | "NAVARRO RIVER VALLEY" | 483.51 | "yes" |
| "1-48" | "GRAVELLY VALLEY" | 642.7 | "yes" |
| "1-49" | "ANNAPOLIS OHLSON RANCH FM HIGHLANDS" | 490.35 | "yes" |
| "1-5" | "SCOTT RIVER VALLEY" | 515.07 | "yes" |
| "1-50" | "KNIGHTS VALLEY" | 758.9 | "yes" |
| "1-51" | "POTTER VALLEY" | 560.78 | "yes" |
| "1-52" | "UKIAH VALLEY" | 715.52 | "no" |
| "1-53" | "SANEL VALLEY" | 433.26 | "no" |
| "1-54" | "ALEXANDER VALLEY" | 976.93 | "yes" |
| "1-55" | "SANTA ROSA VALLEY" | 1362.23 | "yes" |
| "1-56" | "McDOWELL VALLEY" | 486.59 | "no" |
| "1-57" | "BODEGA BAY AREA" | 428.91 | "yes" |
| "1-59" | "WILSON GROVE FORMATION HIGHLANDS" | 1217.47 | "yes" |
| "1-6" | "HAYFORK VALLEY" | 587.9 | "yes" |
| "1-60" | "LOWER RUSSIAN RIVER VALLEY" | 719.49 | "yes" |
| "1-61" | "FORT ROSS TERRACE DEPOSITS" | 569.19 | "no" |
| "1-62" | "WILSON POINT AREA" | 411.9 | "yes" |
| "1-7" | "HOOPA VALLEY" | 141.32 | "no" |
| "1-8" | "MAD RIVER VALLEY" | 402.93 | "yes" |
| "1-9" | "EUREKA PLAIN" | 511.62 | "no" |
| "2-1" | "PETALUMA VALLEY" | 985.42 | "yes" |
| "2-10" | "LIVERMORE VALLEY" | 872.83 | "no" |
| "2-11" | "SUNOL VALLEY" | 876.94 | "yes" |
| "2-19" | "KENWOOD VALLEY" | 1251.08 | "yes" |
| "2-2" | "NAPA-SONOMA VALLEY" | 1899.36 | "yes" |
| "2-22" | "HALF MOON BAY TERRACE" | 927.66 | "yes" |
| "2-24" | "SAN GREGORIO VALLEY" | 465.57 | "yes" |
| "2-26" | "PESCADERO VALLEY" | 588.54 | "yes" |
| "2-27" | "SAND POINT AREA" | 757.86 | "yes" |
| "2-28" | "ROSS VALLEY" | 685.24 | "yes" |
| "2-29" | "SAN RAFAEL VALLEY" | 521.51 | "yes" |
| "2-3" | "SUISUN-FAIRFIELD VALLEY" | 625.17 | "yes" |
| "2-30" | "NOVATO VALLEY" | 830.12 | "no" |
| "2-31" | "ARROYO DEL HAMBRE VALLEY" | 520 | "yes" |
| "2-32" | "VISITACION VALLEY" | NA | NA |
| "2-33" | "ISLAIS VALLEY" | 857 | "no" |
| "2-35" | "WESTSIDE" | 850.94 | "no" |
| "2-36" | "SAN PEDRO VALLEY" | 515 | "yes" |
| "2-37" | "SOUTH SAN FRANCISCO" | NA | NA |
| "2-38" | "LOBOS" | NA | NA |
| "2-39" | "MARINA" | NA | NA |
| "2-4" | "PITTSBURG PLAIN" | 462.55 | "no" |
| "2-40" | "DOWNTOWN" | 626 | "yes" |
| "2-5" | "CLAYTON VALLEY" | 838.78 | "yes" |
| "2-6" | "YGNACIO VALLEY" | 602.18 | "yes" |
| "2-7" | "SAN RAMON VALLEY" | 806.04 | "yes" |
| "2-8" | "CASTRO VALLEY" | 426.72 | "yes" |
| "2-9" | "SANTA CLARA VALLEY" | 1060.55 | "no" |
| "3-1" | "SOQUEL VALLEY" | 1346.59 | "no" |
| "3-12" | "SANTA MARIA" | 1134.13 | "no" |
| "3-13" | "CUYAMA VALLEY" | 1120.79 | "no" |
| "3-14" | "SAN ANTONIO CREEK VALLEY" | 1320.08 | "no" |
| "3-15" | "SANTA YNEZ RIVER VALLEY" | 1350.11 | "yes" |
| "3-16" | "GOLETA" | 1225.45 | "no" |
| "3-17" | "SANTA BARBARA" | 1012.33 | "yes" |
| "3-18" | "CARPINTERIA" | 1383.34 | "yes" |
| "3-19" | "CARRIZO PLAIN" | 670.96 | "yes" |
| "3-2" | "PAJARO VALLEY" | 1701.33 | "yes" |
| "3-20" | "ANO NUEVO AREA" | 426.84 | "no" |
| "3-21" | "SANTA CRUZ PURISIMA FORMATION" | 1283.49 | "no" |
| "3-22" | "SANTA ANA VALLEY" | 809.44 | "yes" |
| "3-23" | "UPPER SANTA ANA VALLEY" | 540 | "yes" |
| "3-24" | "QUIEN SABE VALLEY" | NA | NA |
| "3-25" | "TRES PINOS VALLEY" | 662.71 | "yes" |
| "3-26" | "WEST SANTA CRUZ TERRACE" | 999.51 | "yes" |
| "3-27" | "SCOTTS VALLEY" | 1329.59 | "yes" |
| "3-28" | "SAN BENITO RIVER VALLEY" | 629.78 | "no" |
| "3-29" | "DRY LAKE VALLEY" | 873.14 | "yes" |
| "3-3" | "GILROY-HOLLISTER VALLEY" | 952.14 | "yes" |
| "3-30" | "BITTER WATER VALLEY" | 728.86 | "yes" |
| "3-31" | "HERNANDEZ VALLEY" | 317.82 | "yes" |
| "3-32" | "PEACH TREE VALLEY" | 89.02 | "yes" |
| "3-33" | "SAN CARPOFORO VALLEY" | 1187.22 | "yes" |
| "3-34" | "ARROYO DE LA CRUZ VALLEY" | 555 | "yes" |
| "3-35" | "SAN SIMEON VALLEY" | NA | NA |
| "3-36" | "SANTA ROSA VALLEY" | NA | NA |
| "3-37" | "VILLA VALLEY" | 545 | "yes" |
| "3-38" | "CAYUCOS VALLEY" | NA | NA |
| "3-39" | "OLD VALLEY" | 670 | "yes" |
| "3-4.1" | "180/400 FOOT AQUIFER; EAST SIDE AQUIFER; SEASIDE AREA; LANGLEY AREA; CORRAL DE TIERRA AREA" | 1304.73 | "yes" |
| "3-4.2" | "FOREBAY AQUIFER; UPPER VALLEY AQUIFER" | 922.55 | "no" |
| "3-4.06" | "PASO ROBLES AREA" | 1098.8 | "yes" |
| "3-40" | "TORO VALLEY" | NA | NA |
| "3-41" | "MORRO VALLEY" | 529 | "yes" |
| "3-42" | "CHORRO VALLEY" | 958.95 | "yes" |
| "3-43" | "RINCONADA VALLEY" | 680 | "yes" |
| "3-44" | "POZO VALLEY" | 1087.59 | "yes" |
| "3-45" | "HUASNA VALLEY" | 563.01 | "yes" |
| "3-46" | "RAFAEL VALLEY" | NA | NA |
| "3-47" | "BIG SPRING AREA" | NA | NA |
| "3-49" | "MONTECITO" | 1443.33 | "yes" |
| "3-5" | "CHOLAME VALLEY" | 515.75 | "yes" |
| "3-50" | "FELTON AREA" | 1266.77 | "yes" |
| "3-51" | "MAJORS CREEK" | NA | NA |
| "3-52" | "NEEDLE ROCK POINT" | 595.82 | "yes" |
| "3-53" | "FOOTHILL" | 1411.11 | "yes" |
| "3-6" | "LOCKWOOD VALLEY" | 832.69 | "yes" |
| "3-7" | "CARMEL VALLEY" | 1514.58 | "yes" |
| "3-8" | "LOS OSOS VALLEY" | 418.38 | "no" |
| "3-9" | "SAN LUIS OBISPO VALLEY" | 808.99 | "yes" |
| "4-1" | "UPPER OJAI VALLEY" | 902.08 | "no" |
| "4-10" | "CONEJO" | 1412.55 | "yes" |
| "4-11" | "COASTAL PLAIN OF LOS ANGELES" | 1597.74 | "no" |
| "4-12" | "SAN FERNANDO VALLEY" | 891.3 | "no" |
| "4-13" | "SAN GABRIEL VALLEY" | 1338.38 | "no" |
| "4-15" | "TIERRA REJADA" | 1029.45 | "yes" |
| "4-16" | "HIDDEN VALLEY" | 1225.32 | "yes" |
| "4-17" | "LOCKWOOD VALLEY" | 746.89 | "no" |
| "4-18" | "HUNGRY VALLEY" | 502.7 | "no" |
| "4-19" | "THOUSAND OAKS AREA" | 397.08 | "no" |
| "4-2" | "OJAI VALLEY" | 1082.7 | "yes" |
| "4-20" | "RUSSELL VALLEY" | 518.78 | "yes" |
| "4-22" | "MALIBU VALLEY" | 1512.81 | "yes" |
| "4-23" | "RAYMOND" | 960.03 | "no" |
| "4-3" | "VENTURA RIVER VALLEY" | 1079.17 | "yes" |
| "4-4" | "SANTA CLARA RIVER VALLEY" | 1585.71 | "no" |
| "4-5" | "ACTON VALLEY" | 1206.24 | "yes" |
| "4-6" | "PLEASANT VALLEY" | 1681.78 | "no" |
| "4-7" | "ARROYO SANTA ROSA VALLEY" | 1575.78 | "yes" |
| "4-8" | "LAS POSAS VALLEY" | 2067.73 | "yes" |
| "4-9" | "SIMI VALLEY" | 889.63 | "yes" |
| "5-1" | "GOOSE LAKE" | 599.2 | "yes" |
| "5-10" | "AMERICAN VALLEY" | 677.03 | "no" |
| "5-11" | "MOHAWK VALLEY" | 1046.79 | "yes" |
| "5-12" | "SIERRA VALLEY" | 849.56 | "no" |
| "5-13" | "UPPER LAKE VALLEY" | 507.1 | "yes" |
| "5-14" | "SCOTTS VALLEY" | 560.33 | "yes" |
| "5-15" | "BIG VALLEY" | 739.77 | "yes" |
| "5-16" | "HIGH VALLEY" | 609.98 | "no" |
| "5-17" | "BURNS VALLEY" | 640.38 | "yes" |
| "5-18" | "COYOTE VALLEY" | 657.74 | "yes" |
| "5-19" | "COLLAYOMI VALLEY" | 558.37 | "no" |
| "5-2" | "ALTURAS AREA" | 844.37 | "yes" |
| "5-20" | "BERRYESSA VALLEY" | 716.5 | "yes" |
| "5-21.50" | "RED BLUFF" | 680.7 | "no" |
| "5-21.51" | "CORNING" | 557.5 | "no" |
| "5-21.52" | "COLUSA" | 672.5 | "no" |
| "5-21.53" | "BEND" | 821.36 | "no" |
| "5-21.54" | "ANTELOPE" | 515.9 | "no" |
| "5-21.55" | "DYE CREEK" | 312.15 | "yes" |
| "5-21.56" | "LOS MOLINOS" | 367.72 | "no" |
| "5-21.57" | "VINA" | 617.92 | "no" |
| "5-21.58" | "WEST BUTTE" | 638.35 | "no" |
| "5-21.59" | "EAST BUTTE" | 566.68 | "no" |
| "5-21.60" | "NORTH YUBA" | 782.05 | "yes" |
| "5-21.61" | "SOUTH YUBA" | 706.49 | "no" |
| "5-21.62" | "SUTTER" | 497.25 | "no" |
| "5-21.63" | "WEST SUTTER" | 483.65 | "no" |
| "5-21.64" | "NORTH AMERICAN" | 707.24 | "no" |
| "5-21.65" | "SOUTH AMERICAN" | 681.92 | "no" |
| "5-21.66" | "SOLANO" | 751.28 | "no" |
| "5-21.67" | "YOLO" | 984.31 | "no" |
| "5-21.68" | "CAPAY VALLEY" | 578.47 | "no" |
| "5-22.01" | "EASTERN SAN JOAQUIN" | 837.9 | "no" |
| "5-22.02" | "MODESTO" | 777.06 | "yes" |
| "5-22.03" | "TURLOCK" | 649.55 | "yes" |
| "5-22.04" | "MERCED" | 909.03 | "no" |
| "5-22.05" | "CHOWCHILLA" | 890.56 | "no" |
| "5-22.06" | "MADERA" | 952.15 | "no" |
| "5-22.07" | "DELTA-MENDOTA" | 701.78 | "no" |
| "5-22.08" | "KINGS" | 818.71 | "no" |
| "5-22.09" | "WESTSIDE" | 1968.87 | "yes" |
| "5-22.10" | "PLEASANT VALLEY" | 1491.26 | "no" |
| "5-22.11" | "KAWEAH" | 727.88 | "no" |
| "5-22.12" | "TULARE LAKE" | 1348.86 | "no" |
| "5-22.13" | "TULE" | 921.73 | "no" |
| "5-22.14" | "KERN COUNTY" | 1667.18 | "yes" |
| "5-22.15" | "TRACY" | 787.19 | "no" |
| "5-22.16" | "COSUMNES" | 757.95 | "no" |
| "5-23" | "PANOCHE VALLEY" | 770.07 | "no" |
| "5-25" | "KERN RIVER VALLEY" | 884.15 | "yes" |
| "5-26" | "WALKER BASIN CREEK VALLEY" | 770.7 | "yes" |
| "5-27" | "CUMMINGS VALLEY" | 901.56 | "yes" |
| "5-28" | "TEHACHAPI VALLEY WEST" | 1219 | "yes" |
| "5-29" | "CASTAC LAKE VALLEY" | 1017.22 | "yes" |
| "5-3" | "JESS VALLEY" | 630 | "yes" |
| "5-30" | "LOWER LAKE VALLEY" | 492.47 | "no" |
| "5-31" | "LONG VALLEY" | 431.62 | "yes" |
| "5-35" | "MCCLOUD AREA" | 559.47 | "yes" |
| "5-36" | "ROUND VALLEY" | 611.32 | "yes" |
| "5-37" | "TOAD WELL AREA" | NA | NA |
| "5-38" | "PONDOSA TOWN AREA" | NA | NA |
| "5-4" | "BIG VALLEY" | 870.66 | "yes" |
| "5-40" | "HOT SPRINGS VALLEY" | 733.03 | "yes" |
| "5-41" | "EGG LAKE VALLEY" | 750 | "yes" |
| "5-43" | "ROCK PRAIRIE VALLEY" | 722.02 | "yes" |
| "5-44" | "LONG VALLEY" | NA | NA |
| "5-45" | "CAYTON VALLEY" | NA | NA |
| "5-46" | "LAKE BRITTON AREA" | 678.8 | "yes" |
| "5-47" | "GOOSE VALLEY" | 423.68 | "yes" |
| "5-48" | "BURNEY CREEK VALLEY" | 499.22 | "yes" |
| "5-49" | "DRY BURNEY CREEK VALLEY" | 860 | "yes" |
| "5-5" | "FALL RIVER VALLEY" | 725.69 | "yes" |
| "5-50" | "NORTH FORK BATTLE CREEK" | 806.57 | "yes" |
| "5-51" | "BUTTE CREEK VALLEY" | NA | NA |
| "5-52" | "GRAYS VALLEY" | NA | NA |
| "5-53" | "DIXIE VALLEY" | NA | NA |
| "5-54" | "ASH VALLEY" | 665 | "yes" |
| "5-56" | "YELLOW CREEK VALLEY" | 622.5 | "yes" |
| "5-57" | "LAST CHANCE CREEK VALLEY" | 855 | "yes" |
| "5-58" | "CLOVER VALLEY" | 431.9 | "yes" |
| "5-59" | "GRIZZLY VALLEY" | 772.84 | "yes" |
| "5-6" | "REDDING AREA" | 687.58 | "no" |
| "5-60" | "HUMBUG VALLEY" | 968.41 | "no" |
| "5-61" | "CHROME TOWN AREA" | 511.07 | "yes" |
| "5-62" | "ELK CREEK AREA" | 309.69 | "yes" |
| "5-63" | "STONYFORD TOWN AREA" | 291.06 | "no" |
| "5-64" | "BEAR VALLEY" | 600 | "yes" |
| "5-65" | "LITTLE INDIAN VALLEY" | 529.37 | "no" |
| "5-66" | "CLEAR LAKE CACHE FORMATION" | 585.51 | "no" |
| "5-68" | "POPE VALLEY" | 844.16 | "yes" |
| "5-69" | "YOSEMITE VALLEY" | 905 | "yes" |
| "5-7" | "LAKE ALMANOR VALLEY" | 159.98 | "no" |
| "5-70" | "LOS BANOS CREEK VALLEY" | NA | NA |
| "5-71" | "VALLECITOS CREEK VALLEY" | 660 | "yes" |
| "5-8" | "MOUNTAIN MEADOWS VALLEY" | 574.49 | "yes" |
| "5-82" | "CUDDY CANYON VALLEY" | 806.21 | "yes" |
| "5-83" | "CUDDY RANCH AREA" | 1139.34 | "yes" |
| "5-84" | "CUDDY VALLEY" | 936.88 | "yes" |
| "5-85" | "MIL POTRERO AREA" | 725 | "no" |
| "5-86" | "JOSEPH CREEK" | 718.4 | "yes" |
| "5-87" | "MIDDLE FORK FEATHER RIVER" | 977.74 | "yes" |
| "5-88" | "STONY GORGE RESERVOIR" | 600 | "yes" |
| "5-89" | "SQUAW FLAT" | NA | NA |
| "5-9" | "INDIAN VALLEY" | 696.11 | "no" |
| "5-90" | "FUNKS CREEK" | 166.05 | "yes" |
| "5-91" | "ANTELOPE CREEK" | 570 | "yes" |
| "5-92" | "BLANCHARD VALLEY" | 225.41 | "yes" |
| "5-93" | "NORTH FORK CACHE CREEK" | NA | NA |
| "5-94" | "MIDDLE CREEK" | 480.04 | "yes" |
| "5-95" | "MEADOW VALLEY" | 775.7 | "yes" |
| "6-1" | "SURPRISE VALLEY" | 753.61 | "no" |
| "6-10" | "ADOBE LAKE VALLEY" | 447.89 | "yes" |
| "6-100" | "SECRET VALLEY" | 997.06 | "yes" |
| "6-101" | "BULL FLAT" | NA | NA |
| "6-104" | "LONG VALLEY" | 698.79 | "yes" |
| "6-105" | "SLINKARD VALLEY" | NA | NA |
| "6-106" | "LITTLE ANTELOPE VALLEY" | 1089.94 | "yes" |
| "6-107" | "SWEETWATER FLAT" | NA | NA |
| "6-11" | "LONG VALLEY" | 822 | "yes" |
| "6-12" | "OWENS VALLEY" | 742.98 | "no" |
| "6-13" | "BLACK SPRINGS VALLEY" | NA | NA |
| "6-14" | "FISH LAKE VALLEY" | 984.02 | "yes" |
| "6-15" | "DEEP SPRINGS VALLEY" | 732 | "no" |
| "6-16" | "EUREKA VALLEY" | NA | NA |
| "6-17" | "SALINE VALLEY" | 640 | "yes" |
| "6-18" | "DEATH VALLEY" | 744 | "yes" |
| "6-19" | "WINGATE VALLEY" | NA | NA |
| "6-2" | "MADELINE PLAINS" | 597.55 | "no" |
| "6-20" | "MIDDLE AMARGOSA VALLEY" | 703.67 | "yes" |
| "6-21" | "LOWER KINGSTON VALLEY" | NA | NA |
| "6-22" | "UPPER KINGSTON VALLEY" | 648.68 | "no" |
| "6-23" | "RIGGS VALLEY" | 530 | "no" |
| "6-24" | "RED PASS VALLEY" | 730 | "no" |
| "6-25" | "BICYCLE VALLEY" | NA | NA |
| "6-26" | "AVAWATZ VALLEY" | NA | NA |
| "6-27" | "LEACH VALLEY" | NA | NA |
| "6-28" | "PAHRUMP VALLEY" | 426.22 | "yes" |
| "6-29" | "MESQUITE VALLEY" | 924.33 | "yes" |
| "6-3" | "WILLOW CREEK VALLEY" | 785.44 | "yes" |
| "6-30" | "IVANPAH VALLEY" | 1253.12 | "yes" |
| "6-31" | "KELSO VALLEY" | 774.79 | "yes" |
| "6-32" | "BROADWELL VALLEY" | NA | NA |
| "6-33" | "SODA LAKE VALLEY" | 540.12 | "no" |
| "6-34" | "SILVER LAKE VALLEY" | 652.5 | "no" |
| "6-35" | "CRONISE VALLEY" | 610 | "no" |
| "6-36" | "LANGFORD VALLEY" | 1176.5 | "yes" |
| "6-37" | "COYOTE LAKE VALLEY" | 627.32 | "no" |
| "6-38" | "CAVES CANYON VALLEY" | 548.17 | "no" |
| "6-4" | "HONEY LAKE VALLEY" | 804.01 | "no" |
| "6-40" | "LOWER MOJAVE RIVER VALLEY" | 536.46 | "no" |
| "6-41" | "MIDDLE MOJAVE RIVER VALLEY" | 749.83 | "yes" |
| "6-42" | "UPPER MOJAVE RIVER VALLEY" | 1053.72 | "no" |
| "6-43" | "EL MIRAGE VALLEY" | 1006.18 | "no" |
| "6-44" | "ANTELOPE VALLEY" | 986.36 | "no" |
| "6-45" | "TEHACHAPI VALLEY EAST" | 925.15 | "yes" |
| "6-46" | "FREMONT VALLEY" | 842.46 | "no" |
| "6-47" | "HARPER VALLEY" | 704.36 | "no" |
| "6-48" | "GOLDSTONE VALLEY" | NA | NA |
| "6-49" | "SUPERIOR VALLEY" | 1015 | "yes" |
| "6-5" | "TAHOE VALLEY" | 584.37 | "no" |
| "6-50" | "CUDDEBACK VALLEY" | 651.2 | "yes" |
| "6-51" | "PILOT KNOB VALLEY" | 1070 | "yes" |
| "6-52" | "SEARLES VALLEY" | 932.91 | "yes" |
| "6-53" | "SALT WELLS VALLEY" | 750 | "yes" |
| "6-54" | "INDIAN WELLS VALLEY" | 911.55 | "no" |
| "6-55" | "COSO VALLEY" | NA | NA |
| "6-56" | "ROSE VALLEY" | 885.61 | "yes" |
| "6-57" | "DARWIN VALLEY" | NA | NA |
| "6-58" | "PANAMINT VALLEY" | NA | NA |
| "6-6" | "CARSON VALLEY" | 803.51 | "yes" |
| "6-61" | "CAMEO AREA" | NA | NA |
| "6-62" | "RACE TRACK VALLEY" | NA | NA |
| "6-63" | "HIDDEN VALLEY" | NA | NA |
| "6-64" | "MARBLE CANYON AREA" | NA | NA |
| "6-65" | "COTTONWOOD SPRING AREA" | NA | NA |
| "6-66" | "LEE FLAT" | 158.39 | "yes" |
| "6-67" | "MARTIS VALLEY" | 1415.89 | "no" |
| "6-68" | "SANTA ROSA FLAT" | NA | NA |
| "6-69" | "KELSO LANDER VALLEY" | 777.5 | "yes" |
| "6-7" | "ANTELOPE VALLEY" | 784.25 | "yes" |
| "6-70" | "CACTUS FLAT" | NA | NA |
| "6-71" | "LOST LAKE VALLEY" | NA | NA |
| "6-72" | "COLES FLAT" | NA | NA |
| "6-73" | "WILD HORSE MESA AREA" | NA | NA |
| "6-74" | "HARRISBURG FLATS" | NA | NA |
| "6-75" | "WILDROSE CANYON" | NA | NA |
| "6-76" | "BROWN MOUNTAIN VALLEY" | NA | NA |
| "6-77" | "GRASS VALLEY" | NA | NA |
| "6-78" | "DENNING SPRING VALLEY" | NA | NA |
| "6-79" | "CALIFORNIA VALLEY" | 850 | "yes" |
| "6-8" | "BRIDGEPORT VALLEY" | 562.34 | "yes" |
| "6-80" | "MIDDLE PARK CANYON" | NA | NA |
| "6-81" | "BUTTE VALLEY" | NA | NA |
| "6-82" | "SPRING CANYON VALLEY" | NA | NA |
| "6-84" | "GREENWATER VALLEY" | NA | NA |
| "6-85" | "GOLD VALLEY" | NA | NA |
| "6-86" | "RHODES HILL AREA" | NA | NA |
| "6-88" | "OWL LAKE VALLEY" | NA | NA |
| "6-89" | "KANE WASH AREA" | 650 | "yes" |
| "6-9" | "MONO VALLEY" | 783.21 | "yes" |
| "6-90" | "CADY FAULT AREA" | NA | NA |
| "6-91" | "COW HEAD LAKE VALLEY" | NA | NA |
| "6-92" | "PINE CREEK VALLEY" | NA | NA |
| "6-93" | "HARVEY VALLEY" | NA | NA |
| "6-94" | "GRASSHOPPER VALLEY" | 640 | "yes" |
| "6-95" | "DRY VALLEY" | 1171.43 | "yes" |
| "6-96" | "EAGLE LAKE AREA" | 409.67 | "no" |
| "6-97" | "HORSE LAKE VALLEY" | NA | NA |
| "6-98" | "TULEDAD CANYON VALLEY" | NA | NA |
| "6-99" | "PAINTERS FLAT" | NA | NA |
| "7-1" | "LANFAIR VALLEY" | 1301.37 | "no" |
| "7-10" | "TWENTYNINE PALMS VALLEY" | 790.48 | "no" |
| "7-11" | "COPPER MOUNTAIN VALLEY" | 843.08 | "no" |
| "7-12" | "WARREN VALLEY" | 979.23 | "no" |
| "7-13" | "DEADMAN VALLEY" | 1237.18 | "yes" |
| "7-14" | "LAVIC VALLEY" | 624 | "no" |
| "7-15" | "BESSEMER VALLEY" | NA | NA |
| "7-16" | "AMES VALLEY" | 905.86 | "yes" |
| "7-17" | "MEANS VALLEY" | 1056.45 | "yes" |
| "7-18" | "JOHNSON VALLEY" | 970.62 | "yes" |
| "7-19" | "LUCERNE VALLEY" | 747.12 | "yes" |
| "7-2" | "FENNER VALLEY" | 1203.62 | "yes" |
| "7-20" | "MORONGO VALLEY" | 715.47 | "yes" |
| "7-21" | "COACHELLA VALLEY" | 1332.43 | "no" |
| "7-22" | "WEST SALTON SEA" | 373.18 | "no" |
| "7-24" | "BORREGO VALLEY" | 1113.59 | "yes" |
| "7-25" | "OCOTILLO-CLARK VALLEY" | 884.61 | "yes" |
| "7-26" | "TERWILLIGER VALLEY" | 1079.83 | "yes" |
| "7-27" | "SAN FELIPE VALLEY" | 744.81 | "yes" |
| "7-28" | "VALLECITO-CARRIZO VALLEY" | 1055.67 | "yes" |
| "7-29" | "COYOTE WELLS VALLEY" | 879.22 | "yes" |
| "7-3" | "WARD VALLEY" | 880 | "yes" |
| "7-30" | "IMPERIAL VALLEY" | 1233.47 | "yes" |
| "7-31" | "OROCOPIA VALLEY" | 1177.44 | "no" |
| "7-32" | "CHOCOLATE VALLEY" | 814.31 | "yes" |
| "7-33" | "EAST SALTON SEA" | 759.21 | "yes" |
| "7-34" | "AMOS VALLEY" | 705 | "no" |
| "7-35" | "OGILBY VALLEY" | 523.63 | "yes" |
| "7-36" | "YUMA VALLEY" | 460.87 | "no" |
| "7-37" | "ARROYO SECO VALLEY" | 625 | "yes" |
| "7-38" | "PALO VERDE VALLEY" | 592.52 | "no" |
| "7-39" | "PALO VERDE MESA" | 673.55 | "no" |
| "7-4" | "RICE VALLEY" | 510 | "yes" |
| "7-40" | "QUIEN SABE POINT VALLEY" | 492 | "yes" |
| "7-41" | "CALZONA VALLEY" | 419.4 | "no" |
| "7-42" | "VIDAL VALLEY" | 980 | "yes" |
| "7-43" | "CHEMEHUEVI VALLEY" | 597.5 | "no" |
| "7-44" | "NEEDLES VALLEY" | 468.76 | "no" |
| "7-45" | "PIUTE VALLEY" | 1260 | "yes" |
| "7-46" | "CANEBRAKE VALLEY" | 842 | "yes" |
| "7-47" | "JACUMBA VALLEY" | 814.57 | "yes" |
| "7-48" | "HELENDALE FAULT VALLEY" | 663 | "yes" |
| "7-49" | "PIPES CANYON FAULT VALLEY" | 1040.33 | "yes" |
| "7-5" | "CHUCKWALLA VALLEY" | 1201.72 | "no" |
| "7-50" | "IRON RIDGE AREA" | NA | NA |
| "7-51" | "LOST HORSE VALLEY" | 734.64 | "yes" |
| "7-52" | "PLEASANT VALLEY" | NA | NA |
| "7-53" | "HEXIE MOUNTAIN AREA" | NA | NA |
| "7-54" | "BUCK RIDGE FAULT VALLEY" | NA | NA |
| "7-55" | "COLLINS VALLEY" | 860 | "yes" |
| "7-56" | "YAQUI WELL AREA" | 526.2 | "no" |
| "7-59" | "MASON VALLEY" | 350.06 | "yes" |
| "7-6" | "PINTO VALLEY" | 853 | "yes" |
| "7-61" | "DAVIES VALLEY" | NA | NA |
| "7-62" | "JOSHUA TREE" | 762.43 | "no" |
| "7-63" | "VANDEVENTER FLAT" | 936.97 | "yes" |
| "7-7" | "CADIZ VALLEY" | 1015 | "yes" |
| "7-8" | "BRISTOL VALLEY" | 597.2 | "no" |
| "7-9" | "DALE VALLEY" | 709.27 | "yes" |
| "8-1" | "COASTAL PLAIN OF ORANGE COUNTY" | 1257.67 | "no" |
| "8-2" | "UPPER SANTA ANA VALLEY" | 1218.31 | "no" |
| "8-4" | "ELSINORE" | 1555.32 | "no" |
| "8-5" | "SAN JACINTO" | 1763.03 | "yes" |
| "8-6" | "HEMET LAKE VALLEY" | 1153.63 | "yes" |
| "8-7" | "BIG MEADOWS VALLEY" | 351.56 | "no" |
| "8-8" | "SEVEN OAKS VALLEY" | 755.7 | "yes" |
| "8-9" | "BEAR VALLEY" | 701.61 | "no" |
| "9-1" | "SAN JUAN VALLEY" | 455.13 | "yes" |
| "9-10" | "SAN PASQUAL VALLEY" | 1696.16 | "yes" |
| "9-11" | "SANTA MARIA VALLEY" | 1678.24 | "yes" |
| "9-12" | "SAN DIEGUITO CREEK" | 753.79 | "yes" |
| "9-13" | "POWAY VALLEY" | 1679.84 | "yes" |
| "9-14" | "MISSION VALLEY" | 459.34 | "yes" |
| "9-15" | "SAN DIEGO RIVER VALLEY" | 2059.2 | "yes" |
| "9-16" | "EL CAJON VALLEY" | 1533.3 | "yes" |
| "9-17" | "SWEETWATER VALLEY" | 544.31 | "no" |
| "9-18" | "OTAY VALLEY" | 637.5 | "no" |
| "9-19" | "TIA JUANA" | 374.67 | "no" |
| "9-2" | "SAN MATEO VALLEY" | NA | NA |
| "9-22" | "BATIQUITOS LAGOON VALLEY" | 1012 | "yes" |
| "9-23" | "SAN ELIJO VALLEY" | 1650 | "yes" |
| "9-24" | "PAMO VALLEY" | 1028.61 | "yes" |
| "9-25" | "RANCHITA TOWN AREA" | 1249.18 | "yes" |
| "9-27" | "COTTONWOOD VALLEY" | 1276.13 | "yes" |
| "9-28" | "CAMPO VALLEY" | 1653.84 | "yes" |
| "9-29" | "POTRERO VALLEY" | 1442.5 | "yes" |
| "9-3" | "SAN ONOFRE VALLEY" | 525 | "yes" |
| "9-32" | "SAN MARCOS AREA" | 295.92 | "no" |
| "9-4" | "SANTA MARGARITA VALLEY" | 234.31 | "yes" |
| "9-5" | "TEMECULA VALLEY" | 1253.95 | "no" |
| "9-6" | "CAHUILLA VALLEY" | 1339.56 | "yes" |
| "9-7" | "SAN LUIS REY VALLEY" | 1607.39 | "yes" |
| "9-8" | "WARNER VALLEY" | 966.37 | "no" |
| "9-9" | "ESCONDIDO VALLEY" | 957.7 | "yes" |
| "Hgb-1-1" | "SMITH RIVER PLAIN HIGHLANDS" | 360.83 | "no" |
| "Hgb-1-10" | "EEL RIVER VALLEY HIGHLANDS" | 482.3 | "yes" |
| "Hgb-1-11" | "COVELO ROUND VALLEY HIGHLANDS" | 460.77 | "no" |
| "Hgb-1-12" | "LAYTONVILLE VALLEY HIGHLANDS" | 597.14 | "no" |
| "Hgb-1-13" | "LITTLE LAKE VALLEY HIGHLANDS" | 550.04 | "yes" |
| "Hgb-1-14" | "LOWER KLAMATH RIVER VALLEY HIGHLANDS" | 477.68 | "yes" |
| "Hgb-1-15" | "HAPPY CAMP TOWN AREA HIGHLANDS" | 486.8 | "yes" |
| "Hgb-1-16" | "SEIAD VALLEY HIGHLANDS" | 740.12 | "yes" |
| "Hgb-1-17" | "BRAY TOWN AREA HIGHLANDS" | 833.12 | "yes" |
| "Hgb-1-18" | "RED ROCK VALLEY HIGHLANDS" | 664.1 | "yes" |
| "Hgb-1-19" | "ANDERSON VALLEY HIGHLANDS" | 516.19 | "no" |
| "Hgb-1-2" | "KLAMATH RIVER VALLEY HIGHLANDS" | 733.6 | "no" |
| "Hgb-1-20" | "GARCIA RIVER VALLEY HIGHLANDS" | 425.88 | "yes" |
| "Hgb-1-21" | "FORT BRAGG TERRACE AREA HIGHLANDS" | 518.79 | "yes" |
| "Hgb-1-22" | "FAIRCHILD SWAMP VALLEY HIGHLANDS" | NA | NA |
| "Hgb-1-25" | "PRAIRIE CREEK AREA HIGHLANDS" | 195.2 | "no" |
| "Hgb-1-26" | "REDWOOD CREEK AREA HIGHLANDS" | 408.04 | "no" |
| "Hgb-1-27" | "BIG LAGOON AREA HIGHLANDS" | 380.02 | "yes" |
| "Hgb-1-28" | "MATTOLE RIVER VALLEY HIGHLANDS" | 423.91 | "no" |
| "Hgb-1-29" | "HONEYDEW TOWN AREA HIGHLANDS" | 501.42 | "yes" |
| "Hgb-1-3" | "BUTTE VALLEY HIGHLANDS" | 862.92 | "no" |
| "Hgb-1-30" | "PEPPERWOOD TOWN AREA HIGHLANDS" | 431.99 | "no" |
| "Hgb-1-31" | "WEOTT TOWN AREA HIGHLANDS" | 469.53 | "yes" |
| "Hgb-1-32" | "GARBERVILLE TOWN AREA HIGHLANDS" | 500.36 | "no" |
| "Hgb-1-33" | "LARABEE VALLEY HIGHLANDS" | 448.76 | "no" |
| "Hgb-1-34" | "DINSMORES TOWN AREA HIGHLANDS" | 470.17 | "yes" |
| "Hgb-1-35" | "HYAMPOM VALLEY HIGHLANDS" | 646.53 | "yes" |
| "Hgb-1-36" | "HETTENSHAW VALLEY HIGHLANDS" | 394.66 | "yes" |
| "Hgb-1-37" | "COTTONEVA CREEK VALLEY HIGHLANDS" | 554 | "yes" |
| "Hgb-1-38" | "LOWER LAYTONVILLE VALLEY HIGHLANDS" | 591.3 | "no" |
| "Hgb-1-39" | "BRANSCOMB TOWN AREA HIGHLANDS" | 469.95 | "no" |
| "Hgb-1-4" | "SHASTA VALLEY HIGHLANDS" | 725.24 | "yes" |
| "Hgb-1-40" | "TEN MILE RIVER VALLEY HIGHLANDS" | 484.07 | "no" |
| "Hgb-1-41" | "LITTLE VALLEY HIGHLANDS" | 386.06 | "yes" |
| "Hgb-1-42" | "SHERWOOD VALLEY HIGHLANDS" | 436.63 | "no" |
| "Hgb-1-43" | "WILLIAMS VALLEY HIGHLANDS" | 515.04 | "yes" |
| "Hgb-1-44" | "EDEN VALLEY HIGHLANDS" | 650 | "yes" |
| "Hgb-1-45" | "BIG RIVER VALLEY HIGHLANDS" | 480.3 | "yes" |
| "Hgb-1-46" | "NAVARRO RIVER VALLEY HIGHLANDS" | 486.69 | "yes" |
| "Hgb-1-48" | "GRAVELLY VALLEY HIGHLANDS" | 642.7 | "yes" |
| "Hgb-1-49" | "ANNAPOLIS OHLSON RANCH FM HIGHLANDS" | 480.36 | "yes" |
| "Hgb-1-5" | "SCOTT RIVER VALLEY HIGHLANDS" | 518.91 | "yes" |
| "Hgb-1-50" | "KNIGHTS VALLEY HIGHLANDS" | 790.2 | "yes" |
| "Hgb-1-51" | "POTTER VALLEY HIGHLANDS" | 537.8 | "yes" |
| "Hgb-1-52" | "UKIAH VALLEY HIGHLANDS" | 614.61 | "no" |
| "Hgb-1-53" | "SANEL VALLEY HIGHLANDS" | 523.39 | "no" |
| "Hgb-1-54" | "ALEXANDER VALLEY HIGHLANDS" | 1020.12 | "yes" |
| "Hgb-1-55" | "SANTA ROSA VALLEY HIGHLANDS" | 1111.74 | "yes" |
| "Hgb-1-56" | "McDOWELL VALLEY HIGHLANDS" | 535.99 | "no" |
| "Hgb-1-57" | "BODEGA BAY AREA HIGHLANDS" | 665.72 | "yes" |
| "Hgb-1-59" | "WILSON GROVE FORMATION HIGHLANDS" | 755.99 | "yes" |
| "Hgb-1-6" | "HAYFORK VALLEY HIGHLANDS" | 649.22 | "yes" |
| "Hgb-1-60" | "LOWER RUSSIAN RIVER VALLEY HIGHLANDS" | 615.59 | "yes" |
| "Hgb-1-61" | "FORT ROSS TERRACE DEPOSITS HIGHLANDS" | 550.64 | "no" |
| "Hgb-1-62" | "WILSON POINT AREA HIGHLANDS" | 505.45 | "yes" |
| "Hgb-1-7" | "HOOPA VALLEY HIGHLANDS" | 554.31 | "yes" |
| "Hgb-1-8" | "MAD RIVER VALLEY HIGHLANDS" | 463.03 | "yes" |
| "Hgb-1-9" | "EUREKA PLAIN HIGHLANDS" | 462.38 | "no" |
| "Hgb-2-1" | "PETALUMA VALLEY HIGHLANDS" | 1068.17 | "yes" |
| "Hgb-2-10" | "LIVERMORE VALLEY HIGHLANDS" | 741.47 | "yes" |
| "Hgb-2-11" | "SUNOL VALLEY HIGHLANDS" | 734.28 | "no" |
| "Hgb-2-19" | "KENWOOD VALLEY HIGHLANDS" | 1280.06 | "yes" |
| "Hgb-2-2" | "NAPA-SONOMA VALLEY HIGHLANDS" | 1651.51 | "yes" |
| "Hgb-2-22" | "HALF MOON BAY TERRACE HIGHLANDS" | 893.43 | "yes" |
| "Hgb-2-24" | "SAN GREGORIO VALLEY HIGHLANDS" | 953.57 | "yes" |
| "Hgb-2-26" | "PESCADERO VALLEY HIGHLANDS" | 826.5 | "yes" |
| "Hgb-2-27" | "SAND POINT AREA HIGHLANDS" | 758.32 | "yes" |
| "Hgb-2-28" | "ROSS VALLEY HIGHLANDS" | 653.26 | "yes" |
| "Hgb-2-29" | "SAN RAFAEL VALLEY HIGHLANDS" | 759.48 | "yes" |
| "Hgb-2-3" | "SUISUN-FAIRFIELD VALLEY HIGHLANDS" | 1070.56 | "yes" |
| "Hgb-2-30" | "NOVATO VALLEY HIGHLANDS" | 833.46 | "no" |
| "Hgb-2-31" | "ARROYO DEL HAMBRE VALLEY HIGHLANDS" | 838.36 | "yes" |
| "Hgb-2-35" | "WESTSIDE HIGHLANDS" | 688.83 | "no" |
| "Hgb-2-36" | "SAN PEDRO VALLEY HIGHLANDS" | 515 | "yes" |
| "Hgb-2-4" | "PITTSBURG PLAIN HIGHLANDS" | 828.19 | "no" |
| "Hgb-2-5" | "CLAYTON VALLEY HIGHLANDS" | 924.91 | "yes" |
| "Hgb-2-6" | "YGNACIO VALLEY HIGHLANDS" | 742.11 | "yes" |
| "Hgb-2-7" | "SAN RAMON VALLEY HIGHLANDS" | 768.19 | "yes" |
| "Hgb-2-8" | "CASTRO VALLEY HIGHLANDS" | 667.36 | "yes" |
| "Hgb-2-9" | "SANTA CLARA VALLEY HIGHLANDS" | 949.72 | "yes" |
| "Hgb-3-12" | "SANTA MARIA HIGHLANDS" | 907.97 | "yes" |
| "Hgb-3-13" | "CUYAMA VALLEY HIGHLANDS" | 860.88 | "no" |
| "Hgb-3-14" | "SAN ANTONIO CREEK VALLEY HIGHLANDS" | 1450.01 | "yes" |
| "Hgb-3-15" | "SANTA YNEZ RIVER VALLEY HIGHLANDS" | 1089.13 | "yes" |
| "Hgb-3-16" | "GOLETA HIGHLANDS" | 1577.33 | "yes" |
| "Hgb-3-17" | "SANTA BARBARA HIGHLANDS" | 1277.72 | "yes" |
| "Hgb-3-18" | "CARPINTERIA HIGHLANDS" | 1575.31 | "yes" |
| "Hgb-3-19" | "CARRIZO PLAIN HIGHLANDS" | 613.52 | "yes" |
| "Hgb-3-2" | "PAJARO VALLEY HIGHLANDS" | 1217.58 | "yes" |
| "Hgb-3-20" | "ANO NUEVO AREA HIGHLANDS" | 501.09 | "no" |
| "Hgb-3-21" | "SANTA CRUZ PURISIMA FORMATION HIGHLANDS" | 1175.34 | "yes" |
| "Hgb-3-22" | "SANTA ANA VALLEY HIGHLANDS" | 1057.32 | "yes" |
| "Hgb-3-23" | "UPPER SANTA ANA VALLEY HIGHLANDS" | 128.26 | "yes" |
| "Hgb-3-24" | "QUIEN SABE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-3-25" | "TRES PINOS VALLEY HIGHLANDS" | 678.13 | "yes" |
| "Hgb-3-26" | "WEST SANTA CRUZ TERRACE HIGHLANDS" | 1307.41 | "yes" |
| "Hgb-3-27" | "SCOTTS VALLEY HIGHLANDS" | 1274.99 | "yes" |
| "Hgb-3-28" | "SAN BENITO RIVER VALLEY HIGHLANDS" | 627.14 | "no" |
| "Hgb-3-29" | "DRY LAKE VALLEY HIGHLANDS" | 727.78 | "yes" |
| "Hgb-3-3" | "GILROY-HOLLISTER VALLEY HIGHLANDS" | 964.91 | "yes" |
| "Hgb-3-30" | "BITTER WATER VALLEY HIGHLANDS" | 749.47 | "yes" |
| "Hgb-3-31" | "HERNANDEZ VALLEY HIGHLANDS" | 339.99 | "yes" |
| "Hgb-3-32" | "PEACH TREE VALLEY HIGHLANDS" | 516.5 | "yes" |
| "Hgb-3-33" | "SAN CARPOFORO VALLEY HIGHLANDS" | 991.4 | "yes" |
| "Hgb-3-34" | "ARROYO DE LA CRUZ VALLEY HIGHLANDS" | 176.23 | "yes" |
| "Hgb-3-35" | "SAN SIMEON VALLEY HIGHLANDS" | 722.42 | "yes" |
| "Hgb-3-36" | "SANTA ROSA VALLEY HIGHLANDS" | 530.49 | "yes" |
| "Hgb-3-37" | "VILLA VALLEY HIGHLANDS" | 545 | "yes" |
| "Hgb-3-38" | "CAYUCOS VALLEY HIGHLANDS" | NA | NA |
| "Hgb-3-39" | "OLD VALLEY HIGHLANDS" | 670 | "yes" |
| "Hgb-3-4.1" | "180/400 FOOT AQUIFER; EAST SIDE AQUIFER; SEASIDE AREA; LANGLEY AREA; CORRAL DE TIERRA AREA HIGHLANDS" | 1255.75 | "no" |
| "Hgb-3-4.2" | "FOREBAY AQUIFER; UPPER VALLEY AQUIFER HIGHLANDS" | 820.43 | "yes" |
| "Hgb-3-4.06" | "PASO ROBLES AREA HIGHLANDS" | 872.67 | "yes" |
| "Hgb-3-40" | "TORO VALLEY HIGHLANDS" | 675 | "yes" |
| "Hgb-3-41" | "MORRO VALLEY HIGHLANDS" | 596.49 | "yes" |
| "Hgb-3-42" | "CHORRO VALLEY HIGHLANDS" | 1163.95 | "yes" |
| "Hgb-3-43" | "RINCONADA VALLEY HIGHLANDS" | 680 | "yes" |
| "Hgb-3-44" | "POZO VALLEY HIGHLANDS" | 1026.87 | "yes" |
| "Hgb-3-45" | "HUASNA VALLEY HIGHLANDS" | 530.58 | "yes" |
| "Hgb-3-46" | "RAFAEL VALLEY HIGHLANDS" | NA | NA |
| "Hgb-3-47" | "BIG SPRING AREA HIGHLANDS" | 590 | "yes" |
| "Hgb-3-49" | "MONTECITO HIGHLANDS" | 1400.87 | "yes" |
| "Hgb-3-5" | "CHOLAME VALLEY HIGHLANDS" | 513.12 | "yes" |
| "Hgb-3-50" | "FELTON AREA HIGHLANDS" | 989.2 | "yes" |
| "Hgb-3-51" | "MAJORS CREEK HIGHLANDS" | 859.41 | "yes" |
| "Hgb-3-52" | "NEEDLE ROCK POINT HIGHLANDS" | 757.78 | "yes" |
| "Hgb-3-53" | "FOOTHILL HIGHLANDS" | 1213.23 | "no" |
| "Hgb-3-6" | "LOCKWOOD VALLEY HIGHLANDS" | 841.87 | "yes" |
| "Hgb-3-7" | "CARMEL VALLEY HIGHLANDS" | 1332.14 | "no" |
| "Hgb-3-8" | "LOS OSOS VALLEY HIGHLANDS" | 586.54 | "yes" |
| "Hgb-3-9" | "SAN LUIS OBISPO VALLEY HIGHLANDS" | 847.37 | "yes" |
| "Hgb-4-1" | "UPPER OJAI VALLEY HIGHLANDS" | 954.56 | "yes" |
| "Hgb-4-10" | "CONEJO HIGHLANDS" | 1456.54 | "yes" |
| "Hgb-4-11" | "COASTAL PLAIN OF LOS ANGELES HIGHLANDS" | 1122.72 | "yes" |
| "Hgb-4-12" | "SAN FERNANDO VALLEY HIGHLANDS" | 954.82 | "yes" |
| "Hgb-4-13" | "SAN GABRIEL VALLEY HIGHLANDS" | 800.13 | "no" |
| "Hgb-4-15" | "TIERRA REJADA HIGHLANDS" | 1044.04 | "yes" |
| "Hgb-4-16" | "HIDDEN VALLEY HIGHLANDS" | 1319.19 | "yes" |
| "Hgb-4-17" | "LOCKWOOD VALLEY HIGHLANDS" | 791.32 | "no" |
| "Hgb-4-18" | "HUNGRY VALLEY HIGHLANDS" | 454.72 | "no" |
| "Hgb-4-19" | "THOUSAND OAKS AREA HIGHLANDS" | 1017.73 | "yes" |
| "Hgb-4-2" | "OJAI VALLEY HIGHLANDS" | 1185.28 | "yes" |
| "Hgb-4-20" | "RUSSELL VALLEY HIGHLANDS" | 671.37 | "yes" |
| "Hgb-4-22" | "MALIBU VALLEY HIGHLANDS" | 1052.16 | "yes" |
| "Hgb-4-23" | "RAYMOND HIGHLANDS" | 904.34 | "no" |
| "Hgb-4-3" | "VENTURA RIVER VALLEY HIGHLANDS" | 1188.14 | "yes" |
| "Hgb-4-4" | "SANTA CLARA RIVER VALLEY HIGHLANDS" | 1119.58 | "yes" |
| "Hgb-4-5" | "ACTON VALLEY HIGHLANDS" | 1196.49 | "yes" |
| "Hgb-4-6" | "PLEASANT VALLEY HIGHLANDS" | 1193.72 | "yes" |
| "Hgb-4-7" | "ARROYO SANTA ROSA VALLEY HIGHLANDS" | 1857.18 | "yes" |
| "Hgb-4-8" | "LAS POSAS VALLEY HIGHLANDS" | 1577.49 | "yes" |
| "Hgb-4-9" | "SIMI VALLEY HIGHLANDS" | 891.2 | "no" |
| "Hgb-5-1" | "GOOSE LAKE HIGHLANDS" | 685.07 | "yes" |
| "Hgb-5-10" | "AMERICAN VALLEY HIGHLANDS" | 665.77 | "no" |
| "Hgb-5-11" | "MOHAWK VALLEY HIGHLANDS" | 979.25 | "no" |
| "Hgb-5-12" | "SIERRA VALLEY HIGHLANDS" | 763.13 | "no" |
| "Hgb-5-13" | "UPPER LAKE VALLEY HIGHLANDS" | 507.46 | "yes" |
| "Hgb-5-14" | "SCOTTS VALLEY HIGHLANDS" | 507.76 | "yes" |
| "Hgb-5-15" | "BIG VALLEY HIGHLANDS" | 887.07 | "yes" |
| "Hgb-5-16" | "HIGH VALLEY HIGHLANDS" | 586.26 | "yes" |
| "Hgb-5-17" | "BURNS VALLEY HIGHLANDS" | 549.75 | "no" |
| "Hgb-5-18" | "COYOTE VALLEY HIGHLANDS" | 738.14 | "yes" |
| "Hgb-5-19" | "COLLAYOMI VALLEY HIGHLANDS" | 658.7 | "yes" |
| "Hgb-5-2" | "ALTURAS AREA HIGHLANDS" | 1020.53 | "yes" |
| "Hgb-5-20" | "BERRYESSA VALLEY HIGHLANDS" | 451.43 | "yes" |
| "Hgb-5-21.50" | "RED BLUFF HIGHLANDS" | 573.54 | "no" |
| "Hgb-5-21.51" | "CORNING HIGHLANDS" | 584.58 | "no" |
| "Hgb-5-21.52" | "COLUSA HIGHLANDS" | 466.71 | "no" |
| "Hgb-5-21.53" | "BEND HIGHLANDS" | 652.13 | "no" |
| "Hgb-5-21.54" | "ANTELOPE HIGHLANDS" | 483.96 | "no" |
| "Hgb-5-21.55" | "DYE CREEK HIGHLANDS" | 498.52 | "no" |
| "Hgb-5-21.56" | "LOS MOLINOS HIGHLANDS" | 711.96 | "no" |
| "Hgb-5-21.57" | "VINA HIGHLANDS" | 1422.73 | "yes" |
| "Hgb-5-21.58" | "WEST BUTTE HIGHLANDS" | 1244.45 | "yes" |
| "Hgb-5-21.59" | "EAST BUTTE HIGHLANDS" | 1034.78 | "yes" |
| "Hgb-5-21.60" | "NORTH YUBA HIGHLANDS" | 1166.02 | "yes" |
| "Hgb-5-21.61" | "SOUTH YUBA HIGHLANDS" | 1259.64 | "yes" |
| "Hgb-5-21.62" | "SUTTER HIGHLANDS" | 1052.56 | "yes" |
| "Hgb-5-21.64" | "NORTH AMERICAN HIGHLANDS" | 1376.06 | "yes" |
| "Hgb-5-21.65" | "SOUTH AMERICAN HIGHLANDS" | 1368.98 | "yes" |
| "Hgb-5-21.66" | "SOLANO HIGHLANDS" | 752.99 | "no" |
| "Hgb-5-21.67" | "YOLO HIGHLANDS" | 429.37 | "yes" |
| "Hgb-5-21.68" | "CAPAY VALLEY HIGHLANDS" | 604.03 | "no" |
| "Hgb-5-22.01" | "EASTERN SAN JOAQUIN HIGHLANDS" | 1206.88 | "yes" |
| "Hgb-5-22.02" | "MODESTO HIGHLANDS" | 1455.86 | "yes" |
| "Hgb-5-22.03" | "TURLOCK HIGHLANDS" | 1519.22 | "yes" |
| "Hgb-5-22.04" | "MERCED HIGHLANDS" | 1304.99 | "no" |
| "Hgb-5-22.06" | "MADERA HIGHLANDS" | 1694.69 | "yes" |
| "Hgb-5-22.07" | "DELTA-MENDOTA HIGHLANDS" | 728.92 | "no" |
| "Hgb-5-22.08" | "KINGS HIGHLANDS" | 1557.23 | "yes" |
| "Hgb-5-22.09" | "WESTSIDE HIGHLANDS" | 393.85 | "yes" |
| "Hgb-5-22.10" | "PLEASANT VALLEY HIGHLANDS" | 919.13 | "yes" |
| "Hgb-5-22.11" | "KAWEAH HIGHLANDS" | 1100.54 | "yes" |
| "Hgb-5-22.13" | "TULE HIGHLANDS" | 971.19 | "yes" |
| "Hgb-5-22.14" | "KERN COUNTY HIGHLANDS" | 1067.98 | "yes" |
| "Hgb-5-22.15" | "TRACY HIGHLANDS" | 702.13 | "yes" |
| "Hgb-5-22.16" | "COSUMNES HIGHLANDS" | 1293.13 | "yes" |
| "Hgb-5-23" | "PANOCHE VALLEY HIGHLANDS" | 794.43 | "yes" |
| "Hgb-5-25" | "KERN RIVER VALLEY HIGHLANDS" | 854.02 | "yes" |
| "Hgb-5-26" | "WALKER BASIN CREEK VALLEY HIGHLANDS" | 808.57 | "yes" |
| "Hgb-5-27" | "CUMMINGS VALLEY HIGHLANDS" | 1020.49 | "no" |
| "Hgb-5-28" | "TEHACHAPI VALLEY WEST HIGHLANDS" | 1264.79 | "yes" |
| "Hgb-5-29" | "CASTAC LAKE VALLEY HIGHLANDS" | 963.6 | "yes" |
| "Hgb-5-3" | "JESS VALLEY HIGHLANDS" | 331.9 | "no" |
| "Hgb-5-30" | "LOWER LAKE VALLEY HIGHLANDS" | 812.07 | "yes" |
| "Hgb-5-31" | "LONG VALLEY HIGHLANDS" | 412.3 | "no" |
| "Hgb-5-35" | "MCCLOUD AREA HIGHLANDS" | 675.95 | "yes" |
| "Hgb-5-36" | "ROUND VALLEY HIGHLANDS" | 845.25 | "no" |
| "Hgb-5-37" | "TOAD WELL AREA HIGHLANDS" | NA | NA |
| "Hgb-5-38" | "PONDOSA TOWN AREA HIGHLANDS" | NA | NA |
| "Hgb-5-4" | "BIG VALLEY HIGHLANDS" | 939.7 | "yes" |
| "Hgb-5-40" | "HOT SPRINGS VALLEY HIGHLANDS" | 708.37 | "yes" |
| "Hgb-5-41" | "EGG LAKE VALLEY HIGHLANDS" | 685 | "yes" |
| "Hgb-5-43" | "ROCK PRAIRIE VALLEY HIGHLANDS" | 1634.57 | "yes" |
| "Hgb-5-44" | "LONG VALLEY HIGHLANDS" | NA | NA |
| "Hgb-5-45" | "CAYTON VALLEY HIGHLANDS" | 714.5 | "yes" |
| "Hgb-5-46" | "LAKE BRITTON AREA HIGHLANDS" | 671.97 | "no" |
| "Hgb-5-47" | "GOOSE VALLEY HIGHLANDS" | 548.39 | "yes" |
| "Hgb-5-48" | "BURNEY CREEK VALLEY HIGHLANDS" | 621.32 | "yes" |
| "Hgb-5-49" | "DRY BURNEY CREEK VALLEY HIGHLANDS" | 755 | "yes" |
| "Hgb-5-5" | "FALL RIVER VALLEY HIGHLANDS" | 869.2 | "yes" |
| "Hgb-5-50" | "NORTH FORK BATTLE CREEK HIGHLANDS" | 868.39 | "yes" |
| "Hgb-5-51" | "BUTTE CREEK VALLEY HIGHLANDS" | 590 | "yes" |
| "Hgb-5-52" | "GRAYS VALLEY HIGHLANDS" | 514 | "yes" |
| "Hgb-5-53" | "DIXIE VALLEY HIGHLANDS" | 745.73 | "yes" |
| "Hgb-5-54" | "ASH VALLEY HIGHLANDS" | 1811.05 | "yes" |
| "Hgb-5-56" | "YELLOW CREEK VALLEY HIGHLANDS" | 622.5 | "yes" |
| "Hgb-5-57" | "LAST CHANCE CREEK VALLEY HIGHLANDS" | 625.75 | "yes" |
| "Hgb-5-58" | "CLOVER VALLEY HIGHLANDS" | 537.74 | "yes" |
| "Hgb-5-59" | "GRIZZLY VALLEY HIGHLANDS" | 647.01 | "yes" |
| "Hgb-5-6" | "REDDING AREA HIGHLANDS" | 688.93 | "no" |
| "Hgb-5-60" | "HUMBUG VALLEY HIGHLANDS" | 984.36 | "no" |
| "Hgb-5-61" | "CHROME TOWN AREA HIGHLANDS" | 478.64 | "yes" |
| "Hgb-5-62" | "ELK CREEK AREA HIGHLANDS" | 355.86 | "yes" |
| "Hgb-5-63" | "STONYFORD TOWN AREA HIGHLANDS" | 263.77 | "no" |
| "Hgb-5-64" | "BEAR VALLEY HIGHLANDS" | 367 | "yes" |
| "Hgb-5-65" | "LITTLE INDIAN VALLEY HIGHLANDS" | 462.56 | "yes" |
| "Hgb-5-66" | "CLEAR LAKE CACHE FORMATION HIGHLANDS" | 566.33 | "yes" |
| "Hgb-5-68" | "POPE VALLEY HIGHLANDS" | 949.21 | "yes" |
| "Hgb-5-69" | "YOSEMITE VALLEY HIGHLANDS" | 1459.6 | "yes" |
| "Hgb-5-7" | "LAKE ALMANOR VALLEY HIGHLANDS" | 659.15 | "no" |
| "Hgb-5-70" | "LOS BANOS CREEK VALLEY HIGHLANDS" | 815 | "yes" |
| "Hgb-5-71" | "VALLECITOS CREEK VALLEY HIGHLANDS" | 660 | "yes" |
| "Hgb-5-8" | "MOUNTAIN MEADOWS VALLEY HIGHLANDS" | 774.57 | "yes" |
| "Hgb-5-82" | "CUDDY CANYON VALLEY HIGHLANDS" | 809.33 | "yes" |
| "Hgb-5-83" | "CUDDY RANCH AREA HIGHLANDS" | 1079.54 | "yes" |
| "Hgb-5-84" | "CUDDY VALLEY HIGHLANDS" | 936.88 | "yes" |
| "Hgb-5-85" | "MIL POTRERO AREA HIGHLANDS" | 725 | "no" |
| "Hgb-5-86" | "JOSEPH CREEK HIGHLANDS" | 905.29 | "yes" |
| "Hgb-5-87" | "MIDDLE FORK FEATHER RIVER HIGHLANDS" | 889.4 | "yes" |
| "Hgb-5-88" | "STONY GORGE RESERVOIR HIGHLANDS" | 447.93 | "no" |
| "Hgb-5-89" | "SQUAW FLAT HIGHLANDS" | 642 | "yes" |
| "Hgb-5-9" | "INDIAN VALLEY HIGHLANDS" | 632.4 | "no" |
| "Hgb-5-90" | "FUNKS CREEK HIGHLANDS" | 315.93 | "yes" |
| "Hgb-5-91" | "ANTELOPE CREEK HIGHLANDS" | 227.38 | "yes" |
| "Hgb-5-92" | "BLANCHARD VALLEY HIGHLANDS" | 299.56 | "yes" |
| "Hgb-5-93" | "NORTH FORK CACHE CREEK HIGHLANDS" | 334.22 | "no" |
| "Hgb-5-94" | "MIDDLE CREEK HIGHLANDS" | 537.36 | "yes" |
| "Hgb-5-95" | "MEADOW VALLEY HIGHLANDS" | 440.92 | "no" |
| "Hgb-6-1" | "SURPRISE VALLEY HIGHLANDS" | 850.58 | "yes" |
| "Hgb-6-10" | "ADOBE LAKE VALLEY HIGHLANDS" | 447.89 | "no" |
| "Hgb-6-100" | "SECRET VALLEY HIGHLANDS" | 1002.93 | "yes" |
| "Hgb-6-101" | "BULL FLAT HIGHLANDS" | NA | NA |
| "Hgb-6-104" | "LONG VALLEY HIGHLANDS" | 655.22 | "yes" |
| "Hgb-6-105" | "SLINKARD VALLEY HIGHLANDS" | 550 | "yes" |
| "Hgb-6-106" | "LITTLE ANTELOPE VALLEY HIGHLANDS" | 1089.94 | "yes" |
| "Hgb-6-107" | "SWEETWATER FLAT HIGHLANDS" | NA | NA |
| "Hgb-6-11" | "LONG VALLEY HIGHLANDS" | 754.41 | "no" |
| "Hgb-6-12" | "OWENS VALLEY HIGHLANDS" | 884.8 | "no" |
| "Hgb-6-13" | "BLACK SPRINGS VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-14" | "FISH LAKE VALLEY HIGHLANDS" | 605 | "yes" |
| "Hgb-6-15" | "DEEP SPRINGS VALLEY HIGHLANDS" | 469.33 | "no" |
| "Hgb-6-16" | "EUREKA VALLEY HIGHLANDS" | 754 | "yes" |
| "Hgb-6-17" | "SALINE VALLEY HIGHLANDS" | 688.2 | "yes" |
| "Hgb-6-18" | "DEATH VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-19" | "WINGATE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-2" | "MADELINE PLAINS HIGHLANDS" | 953.01 | "yes" |
| "Hgb-6-20" | "MIDDLE AMARGOSA VALLEY HIGHLANDS" | 819.38 | "yes" |
| "Hgb-6-21" | "LOWER KINGSTON VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-22" | "UPPER KINGSTON VALLEY HIGHLANDS" | 550 | "yes" |
| "Hgb-6-23" | "RIGGS VALLEY HIGHLANDS" | 530 | "no" |
| "Hgb-6-24" | "RED PASS VALLEY HIGHLANDS" | 730 | "no" |
| "Hgb-6-25" | "BICYCLE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-26" | "AVAWATZ VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-27" | "LEACH VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-28" | "PAHRUMP VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-29" | "MESQUITE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-3" | "WILLOW CREEK VALLEY HIGHLANDS" | 619.55 | "yes" |
| "Hgb-6-30" | "IVANPAH VALLEY HIGHLANDS" | 1250 | "yes" |
| "Hgb-6-31" | "KELSO VALLEY HIGHLANDS" | 893.61 | "yes" |
| "Hgb-6-32" | "BROADWELL VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-33" | "SODA LAKE VALLEY HIGHLANDS" | 563.71 | "yes" |
| "Hgb-6-34" | "SILVER LAKE VALLEY HIGHLANDS" | 530 | "no" |
| "Hgb-6-35" | "CRONISE VALLEY HIGHLANDS" | 610 | "no" |
| "Hgb-6-36" | "LANGFORD VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-37" | "COYOTE LAKE VALLEY HIGHLANDS" | 850 | "yes" |
| "Hgb-6-38" | "CAVES CANYON VALLEY HIGHLANDS" | 782.5 | "yes" |
| "Hgb-6-4" | "HONEY LAKE VALLEY HIGHLANDS" | 840.63 | "no" |
| "Hgb-6-40" | "LOWER MOJAVE RIVER VALLEY HIGHLANDS" | 623.35 | "no" |
| "Hgb-6-41" | "MIDDLE MOJAVE RIVER VALLEY HIGHLANDS" | 899.06 | "yes" |
| "Hgb-6-42" | "UPPER MOJAVE RIVER VALLEY HIGHLANDS" | 950.28 | "yes" |
| "Hgb-6-43" | "EL MIRAGE VALLEY HIGHLANDS" | 1017.74 | "no" |
| "Hgb-6-44" | "ANTELOPE VALLEY HIGHLANDS" | 1041.46 | "yes" |
| "Hgb-6-45" | "TEHACHAPI VALLEY EAST HIGHLANDS" | 889.93 | "yes" |
| "Hgb-6-46" | "FREMONT VALLEY HIGHLANDS" | 742.61 | "yes" |
| "Hgb-6-47" | "HARPER VALLEY HIGHLANDS" | 794.24 | "yes" |
| "Hgb-6-48" | "GOLDSTONE VALLEY HIGHLANDS" | 980 | "yes" |
| "Hgb-6-49" | "SUPERIOR VALLEY HIGHLANDS" | 678.17 | "yes" |
| "Hgb-6-5" | "TAHOE VALLEY HIGHLANDS" | 606.8 | "no" |
| "Hgb-6-50" | "CUDDEBACK VALLEY HIGHLANDS" | 830 | "yes" |
| "Hgb-6-51" | "PILOT KNOB VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-52" | "SEARLES VALLEY HIGHLANDS" | 668.06 | "yes" |
| "Hgb-6-53" | "SALT WELLS VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-54" | "INDIAN WELLS VALLEY HIGHLANDS" | 786.97 | "yes" |
| "Hgb-6-55" | "COSO VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-56" | "ROSE VALLEY HIGHLANDS" | 703.5 | "yes" |
| "Hgb-6-57" | "DARWIN VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-58" | "PANAMINT VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-6" | "CARSON VALLEY HIGHLANDS" | 851.14 | "yes" |
| "Hgb-6-61" | "CAMEO AREA HIGHLANDS" | NA | NA |
| "Hgb-6-62" | "RACE TRACK VALLEY HIGHLANDS" | 756 | "yes" |
| "Hgb-6-63" | "HIDDEN VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-64" | "MARBLE CANYON AREA HIGHLANDS" | NA | NA |
| "Hgb-6-65" | "COTTONWOOD SPRING AREA HIGHLANDS" | NA | NA |
| "Hgb-6-66" | "LEE FLAT HIGHLANDS" | 158.39 | "yes" |
| "Hgb-6-67" | "MARTIS VALLEY HIGHLANDS" | 1190.98 | "yes" |
| "Hgb-6-68" | "SANTA ROSA FLAT HIGHLANDS" | NA | NA |
| "Hgb-6-69" | "KELSO LANDER VALLEY HIGHLANDS" | 855.81 | "yes" |
| "Hgb-6-7" | "ANTELOPE VALLEY HIGHLANDS" | 896.22 | "yes" |
| "Hgb-6-70" | "CACTUS FLAT HIGHLANDS" | NA | NA |
| "Hgb-6-71" | "LOST LAKE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-72" | "COLES FLAT HIGHLANDS" | NA | NA |
| "Hgb-6-73" | "WILD HORSE MESA AREA HIGHLANDS" | NA | NA |
| "Hgb-6-74" | "HARRISBURG FLATS HIGHLANDS" | NA | NA |
| "Hgb-6-75" | "WILDROSE CANYON HIGHLANDS" | NA | NA |
| "Hgb-6-76" | "BROWN MOUNTAIN VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-77" | "GRASS VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-78" | "DENNING SPRING VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-79" | "CALIFORNIA VALLEY HIGHLANDS" | 850 | "yes" |
| "Hgb-6-8" | "BRIDGEPORT VALLEY HIGHLANDS" | 528.44 | "yes" |
| "Hgb-6-80" | "MIDDLE PARK CANYON HIGHLANDS" | NA | NA |
| "Hgb-6-81" | "BUTTE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-82" | "SPRING CANYON VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-84" | "GREENWATER VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-85" | "GOLD VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-86" | "RHODES HILL AREA HIGHLANDS" | NA | NA |
| "Hgb-6-88" | "OWL LAKE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-89" | "KANE WASH AREA HIGHLANDS" | NA | NA |
| "Hgb-6-9" | "MONO VALLEY HIGHLANDS" | 775.36 | "yes" |
| "Hgb-6-90" | "CADY FAULT AREA HIGHLANDS" | NA | NA |
| "Hgb-6-91" | "COW HEAD LAKE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-92" | "PINE CREEK VALLEY HIGHLANDS" | 514 | "yes" |
| "Hgb-6-93" | "HARVEY VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-94" | "GRASSHOPPER VALLEY HIGHLANDS" | 767.93 | "yes" |
| "Hgb-6-95" | "DRY VALLEY HIGHLANDS" | 1154.39 | "yes" |
| "Hgb-6-96" | "EAGLE LAKE AREA HIGHLANDS" | 388.65 | "no" |
| "Hgb-6-97" | "HORSE LAKE VALLEY HIGHLANDS" | 527.5 | "yes" |
| "Hgb-6-98" | "TULEDAD CANYON VALLEY HIGHLANDS" | NA | NA |
| "Hgb-6-99" | "PAINTERS FLAT HIGHLANDS" | NA | NA |
| "Hgb-7-1" | "LANFAIR VALLEY HIGHLANDS" | 1491.04 | "yes" |
| "Hgb-7-10" | "TWENTYNINE PALMS VALLEY HIGHLANDS" | 847.82 | "no" |
| "Hgb-7-11" | "COPPER MOUNTAIN VALLEY HIGHLANDS" | 868.92 | "no" |
| "Hgb-7-12" | "WARREN VALLEY HIGHLANDS" | 894.35 | "no" |
| "Hgb-7-13" | "DEADMAN VALLEY HIGHLANDS" | 556 | "yes" |
| "Hgb-7-14" | "LAVIC VALLEY HIGHLANDS" | 624 | "no" |
| "Hgb-7-15" | "BESSEMER VALLEY HIGHLANDS" | 670 | "yes" |
| "Hgb-7-16" | "AMES VALLEY HIGHLANDS" | 768.66 | "yes" |
| "Hgb-7-17" | "MEANS VALLEY HIGHLANDS" | 1048.63 | "yes" |
| "Hgb-7-18" | "JOHNSON VALLEY HIGHLANDS" | 982.46 | "yes" |
| "Hgb-7-19" | "LUCERNE VALLEY HIGHLANDS" | 788.61 | "yes" |
| "Hgb-7-2" | "FENNER VALLEY HIGHLANDS" | 852 | "yes" |
| "Hgb-7-20" | "MORONGO VALLEY HIGHLANDS" | 724.73 | "yes" |
| "Hgb-7-21" | "COACHELLA VALLEY HIGHLANDS" | 1137.61 | "no" |
| "Hgb-7-22" | "WEST SALTON SEA HIGHLANDS" | 1675.83 | "yes" |
| "Hgb-7-24" | "BORREGO VALLEY HIGHLANDS" | 759.16 | "no" |
| "Hgb-7-25" | "OCOTILLO-CLARK VALLEY HIGHLANDS" | 651.69 | "yes" |
| "Hgb-7-26" | "TERWILLIGER VALLEY HIGHLANDS" | 1324.45 | "yes" |
| "Hgb-7-27" | "SAN FELIPE VALLEY HIGHLANDS" | 1293.4 | "yes" |
| "Hgb-7-28" | "VALLECITO-CARRIZO VALLEY HIGHLANDS" | 1145.07 | "no" |
| "Hgb-7-29" | "COYOTE WELLS VALLEY HIGHLANDS" | 1228.22 | "yes" |
| "Hgb-7-3" | "WARD VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-30" | "IMPERIAL VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-31" | "OROCOPIA VALLEY HIGHLANDS" | 650 | "yes" |
| "Hgb-7-32" | "CHOCOLATE VALLEY HIGHLANDS" | 627 | "yes" |
| "Hgb-7-33" | "EAST SALTON SEA HIGHLANDS" | 696.83 | "yes" |
| "Hgb-7-34" | "AMOS VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-35" | "OGILBY VALLEY HIGHLANDS" | 489.69 | "yes" |
| "Hgb-7-36" | "YUMA VALLEY HIGHLANDS" | 293.26 | "yes" |
| "Hgb-7-37" | "ARROYO SECO VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-38" | "PALO VERDE VALLEY HIGHLANDS" | 484 | "yes" |
| "Hgb-7-39" | "PALO VERDE MESA HIGHLANDS" | NA | NA |
| "Hgb-7-4" | "RICE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-40" | "QUIEN SABE POINT VALLEY HIGHLANDS" | 484 | "yes" |
| "Hgb-7-41" | "CALZONA VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-42" | "VIDAL VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-43" | "CHEMEHUEVI VALLEY HIGHLANDS" | 520 | "yes" |
| "Hgb-7-44" | "NEEDLES VALLEY HIGHLANDS" | 665 | "yes" |
| "Hgb-7-45" | "PIUTE VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-46" | "CANEBRAKE VALLEY HIGHLANDS" | 842 | "yes" |
| "Hgb-7-47" | "JACUMBA VALLEY HIGHLANDS" | 807.37 | "yes" |
| "Hgb-7-48" | "HELENDALE FAULT VALLEY HIGHLANDS" | 619.23 | "yes" |
| "Hgb-7-49" | "PIPES CANYON FAULT VALLEY HIGHLANDS" | 899.7 | "yes" |
| "Hgb-7-5" | "CHUCKWALLA VALLEY HIGHLANDS" | 1048 | "yes" |
| "Hgb-7-50" | "IRON RIDGE AREA HIGHLANDS" | NA | NA |
| "Hgb-7-51" | "LOST HORSE VALLEY HIGHLANDS" | 771.95 | "yes" |
| "Hgb-7-52" | "PLEASANT VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-53" | "HEXIE MOUNTAIN AREA HIGHLANDS" | NA | NA |
| "Hgb-7-54" | "BUCK RIDGE FAULT VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-55" | "COLLINS VALLEY HIGHLANDS" | 1084.42 | "yes" |
| "Hgb-7-56" | "YAQUI WELL AREA HIGHLANDS" | 915.36 | "no" |
| "Hgb-7-59" | "MASON VALLEY HIGHLANDS" | 638.5 | "yes" |
| "Hgb-7-6" | "PINTO VALLEY HIGHLANDS" | 650 | "yes" |
| "Hgb-7-61" | "DAVIES VALLEY HIGHLANDS" | NA | NA |
| "Hgb-7-62" | "JOSHUA TREE HIGHLANDS" | 831.66 | "no" |
| "Hgb-7-63" | "VANDEVENTER FLAT HIGHLANDS" | 1158.89 | "yes" |
| "Hgb-7-7" | "CADIZ VALLEY HIGHLANDS" | 1015 | "yes" |
| "Hgb-7-8" | "BRISTOL VALLEY HIGHLANDS" | 719.35 | "no" |
| "Hgb-7-9" | "DALE VALLEY HIGHLANDS" | 804.84 | "no" |
| "Hgb-8-1" | "COASTAL PLAIN OF ORANGE COUNTY HIGHLANDS" | 971.72 | "no" |
| "Hgb-8-2" | "UPPER SANTA ANA VALLEY HIGHLANDS" | 1566.98 | "yes" |
| "Hgb-8-4" | "ELSINORE HIGHLANDS" | 1625.86 | "no" |
| "Hgb-8-5" | "SAN JACINTO HIGHLANDS" | 2091.7 | "yes" |
| "Hgb-8-6" | "HEMET LAKE VALLEY HIGHLANDS" | 1082.38 | "yes" |
| "Hgb-8-7" | "BIG MEADOWS VALLEY HIGHLANDS" | 491.63 | "no" |
| "Hgb-8-8" | "SEVEN OAKS VALLEY HIGHLANDS" | 873.94 | "yes" |
| "Hgb-8-9" | "BEAR VALLEY HIGHLANDS" | 711.91 | "no" |
| "Hgb-9-1" | "SAN JUAN VALLEY HIGHLANDS" | 1868.07 | "yes" |
| "Hgb-9-10" | "SAN PASQUAL VALLEY HIGHLANDS" | 2012.47 | "yes" |
| "Hgb-9-11" | "SANTA MARIA VALLEY HIGHLANDS" | 1734.29 | "yes" |
| "Hgb-9-12" | "SAN DIEGUITO CREEK HIGHLANDS" | 1665.04 | "yes" |
| "Hgb-9-13" | "POWAY VALLEY HIGHLANDS" | 1844.83 | "yes" |
| "Hgb-9-14" | "MISSION VALLEY HIGHLANDS" | 1878.6 | "yes" |
| "Hgb-9-15" | "SAN DIEGO RIVER VALLEY HIGHLANDS" | 1706.75 | "yes" |
| "Hgb-9-16" | "EL CAJON VALLEY HIGHLANDS" | 1948.4 | "yes" |
| "Hgb-9-17" | "SWEETWATER VALLEY HIGHLANDS" | 1847.91 | "yes" |
| "Hgb-9-18" | "OTAY VALLEY HIGHLANDS" | 1802.48 | "yes" |
| "Hgb-9-19" | "TIA JUANA HIGHLANDS" | 394.59 | "no" |
| "Hgb-9-2" | "SAN MATEO VALLEY HIGHLANDS" | 1832.92 | "yes" |
| "Hgb-9-22" | "BATIQUITOS LAGOON VALLEY HIGHLANDS" | 929.56 | "no" |
| "Hgb-9-23" | "SAN ELIJO VALLEY HIGHLANDS" | 1944.58 | "yes" |
| "Hgb-9-24" | "PAMO VALLEY HIGHLANDS" | 1529.59 | "yes" |
| "Hgb-9-25" | "RANCHITA TOWN AREA HIGHLANDS" | 1199.29 | "yes" |
| "Hgb-9-27" | "COTTONWOOD VALLEY HIGHLANDS" | 1198.19 | "no" |
| "Hgb-9-28" | "CAMPO VALLEY HIGHLANDS" | 1370.06 | "yes" |
| "Hgb-9-29" | "POTRERO VALLEY HIGHLANDS" | 1384.48 | "yes" |
| "Hgb-9-3" | "SAN ONOFRE VALLEY HIGHLANDS" | 525 | "no" |
| "Hgb-9-32" | "SAN MARCOS AREA HIGHLANDS" | 1906.82 | "no" |
| "Hgb-9-4" | "SANTA MARGARITA VALLEY HIGHLANDS" | 1466.27 | "yes" |
| "Hgb-9-5" | "TEMECULA VALLEY HIGHLANDS" | 1639.68 | "yes" |
| "Hgb-9-6" | "CAHUILLA VALLEY HIGHLANDS" | 1476.15 | "yes" |
| "Hgb-9-7" | "SAN LUIS REY VALLEY HIGHLANDS" | 1567.14 | "no" |
| "Hgb-9-8" | "WARNER VALLEY HIGHLANDS" | 1214.8 | "yes" |
| "Hgb-9-9" | "ESCONDIDO VALLEY HIGHLANDS" | 1642.68 | "no" |
| "Hp-1.1" | "Northern Coast Ranges - North Coast" | 422.31 | "yes" |
| "Hp-1.2" | "Northern Coast Ranges - Central Coast" | 548.79 | "yes" |
| "Hp-1.3" | "Northern Coast Ranges - Southern Coast" | 530.46 | "yes" |
| "Hp-1.4" | "Northern Coast Ranges - Point Reyes" | 627.93 | "yes" |
| "Hp-10.1" | "Desert - Eastern" | 555 | "yes" |
| "Hp-10.2" | "Desert - Southern" | 1031.21 | "no" |
| "Hp-11" | "Southern Cal Islands (Group)" | 139.84 | "no" |
| "Hp-2" | "Klamath Mountains" | 664.32 | "yes" |
| "Hp-3" | "Modoc Plateau and Cascades" | 1005.27 | "yes" |
| "Hp-4.1" | "Sierra Nevada - Tahoe" | 1302.03 | "yes" |
| "Hp-4.2" | "Sierra Nevada - Alpine County" | 843.78 | "yes" |
| "Hp-5" | "Basin and Range" | 592.54 | "yes" |
| "Hp-6" | "Northern and Southern Coast Ranges - San Francisco Bay and Delta" | 644.95 | "yes" |
| "Hp-7.1" | "Southern Coast Ranges - Santa Cruz / Half Moon Bay" | 917.33 | "no" |
| "Hp-7.2" | "Southern Coast Ranges - Big Sur/Carmel" | 1309.51 | "yes" |
| "Hp-7.3" | "Southern Coast Ranges - San Luis Obispo" | 736.35 | "no" |
| "Hp-8.1" | "Transverse and Selected Peninsular Ranges - Santa Barbara" | 1381.97 | "yes" |
| "Hp-8.2" | "Transverse and Selected Peninsular Ranges - Malibu" | 1263.12 | "yes" |
| "Hp-8.3" | "Transverse and Selected Peninsular Ranges - Palos Verdes" | NA | NA |
| "Hp-9.1" | "San Diego Drainages - North San Diego Coastal" | 816.39 | "no" |
| "Hp-9.2" | "San Diego Drainages - South San Diego Coastal" | 1407.6 | "yes" |
| "Hp-9.3" | "San Diego Drainages - South San Diego" | 1553.4 | "yes" |

1. The well record information is from the Department of Water Resources [Online System for Well Completion Reports](https://dwr.maps.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37). [↑](#footnote-ref-1)
2. The small water system location data may not represent the actual location of the well head or of the service boundaries. Due to constraints in locating small water systems, the location may represent the administrative address, or another location associated with the system. Additionally, the locations for Monterey County were provided for all systems with 2 – 14 connections. To isolate the systems in Monterey County that fit the definition of state small water systems (5 – 14 connections) only systems that serve four or more APNs were included in this analysis (totaling 268 systems in Monterey County). [↑](#footnote-ref-2)
3. The comparison concentration values for chemicals without an MCL are as follows: Hexavalent Chromium – 10 micrograms per liter (µG/L); Copper – 1.3 milligrams per liter (MG/L); Lead – 15 µG/L; N-Nitrosodimethylamine (NDMA) – 0.1 µG/L. [↑](#footnote-ref-3)
4. See page 5 of the Domestic Well Needs Assessment White Paper. The MCL index consists of the finding divided by the MCL, with a special consideration for non-detect results with a reporting limit above the MCL. [↑](#footnote-ref-4)
5. This project uses Groundwater Units as areas of analysis. Groundwater Units consist of groundwater basins as defined by [DWR Bulletin 118](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/B118-Interim-Update-2016.pdf), and the connecting upland areas associated with each of these basins as delineated by the [USGS](https://www.sciencedirect.com/science/article/pii/S2214581814000305?via%3Dihub). Use of Groundwater Units results in coverage of the entire state. Averaging of well depths and groundwater quality within a Groundwater Unit was considered reasonable based on the assumed relative consistency of hydrogeologic conditions within each Unit. [↑](#footnote-ref-5)
6. Domestic Bottom = average of section maximum domestic well depths (from OSWCR) plus 3 standard deviations of section maximum well depths for each groundwater unit. [↑](#footnote-ref-6)
7. Domestic Top = average of section minimum domestic well depths (from OSWCR) minus 3 standard deviations of section minimum well depths for groundwater unit. [↑](#footnote-ref-7)
8. Public Bottom = average of section maximum public well depths (from OSWCR) plus 3 standard deviations of section maximum well depths for groundwater units. [↑](#footnote-ref-8)
9. To calculate the 20-year average, water quality results with sample collection dates between January 1, 2000 and January 1, 2020 were used. [↑](#footnote-ref-9)
10. To calculate results within the last two years, water quality results with sample collection dates between January 1, 2018 and January 1, 2020 were used. [↑](#footnote-ref-10)
11. For this map, on the “source” and “neighbor” sections described in the Domestic Well Needs Assessment White Paper are used. The White Paper also describes the calculations for “groundwater unit” sections, which are not included in this map. [↑](#footnote-ref-11)