EAST
CONTRA COSTA
SUBBASIN
Groundwater Sustainability Plan

# East Contra Costa Subbasin Groundwater Sustainability Plan

Prepared for ECC GSA Working Group

Luhdorff & Scalmanini
Consulting Engineers

October, 2021

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Groundwater Sustainability Plan


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# GROUNDWATER SUSTAINABILITY PLAN

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City of Antioch GSA, Byron-Bethany Irrigation District GSA, City of Brentwood GSA, Contra Costa Water District, County of Contra Costa GSA, Diablo Water District GSA, Discovery Bay Community Services District GSA, and East Contra Costa County Irrigation District GSA comprise the ECC Subbasin Working Group.

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| | |
|---|---|
| AB | Assembly Bill |
| AC | Advisory Councils |
| ACS | US Census American Community Survey |
| AF | Acre Feet |
| AFY | Acre feet per year |
| AMI | Automatic Meter Infrastructure |
| AMR | Automated Meter Reading |
| AMSL | above mean sea level |
| AN | Above Normal |
| ASR | Aquifer Storage & Recovery |
| AWMP | Agricultural Water Management Plan |
| BAC | Bacon Island at Old River |
| B&C | Brown & Caldwell |
| BBID | Byron Bethany Irrigation District |
| BBM | Basin Boundary Modification |
| bgs | Below Ground Surface |
| BIMID | Bethel Island Municipal Improvement District |
| bm | bench mark |
| BMP | Best Management Practices |
| BN | Below Normal |
| BPs | Best Water Use Practices |
| C | Critical |
| CA | California |
| Caltrans | State Department of Transportation |
| CASGEM | California Statewide Groundwater Elevation |
| CCC | Contra Costa County |
| CCCDCD | Contra Costa County Department of Conservation and Development |
| CCCEHD | Contra Costa County Environmental Health Division |
| CCCGP | Contra Costa County General Plan |
| CCHSHMP | Contra Costa Health Services Hazardous Materials Programs |
| CCR | California Code of Regulations |
| CCWD | Contra Costa Water District |
| CEC | Constituent of Emerging Concern |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| Cfs | Cubic Feet per Second |

| | |
|---|---|
| CGMA | Cooperative Monitoring/Adaptive Groundwater Management Agreement |
| CGPS | Continuous Global Positioning System |
| CIMIS | California Irrigation Management Information System |
| COA | Cooperated Use Agreement |
| CoAGP | City of Antioch General Plan |
| COB or Brentwood | City of Brentwood |
| CoBGP | City of Brentwood General Plan |
| CoOGP | City of Oakley General Plan |
| COBWTP | City of Brentwood Water Treatment Plant |
| CPTs | Cone Penetrating Testing |
| CSD | Community Services District |
| CVHM | Central Valley Hydrologic Model |
| CVP | Central Valley Project |
| CVPIA | Central Valley Project Improvement Act |
| CVRWQCB or Regional Board | Central Valley Regional Water Quality Control Board |
| CWC | California Water Code |
| D | Dry |
| DA | Disadvantaged Area |
| DAC | Disadvantaged Community |
| DBCSD | Discovery Bay Community Service District |
| days/yr | days per year |
| DD | Delta Diablo |
| DDW | California Division of Drinking Water |
| DFW | Department of Fish and Wildlife |
| DMS | Data Management System |
| DNPG | De Novo Water District |
| DO | dissolved oxygen |
| DOD | Department of Defense |
| DPC | Delta Protection Commission |
| DQO | Data Quality Objectives |
| ds/m | decimeters per meter |
| DTW | Depth to water |
| DWD | Diablo Water District |
| DWR | Department of Water Resources |
| DWSAP | Drinking Water Source Assessment and Protection |
| DZ | Deep Zone |
| EBMUD | East Bay Municipal Utilities District |

| | |
|---|---|
| EC | Electrical Conductivity |
| ECC or Subbasin | East Contra Costa Subbasin |
| ECCID | East Contra Costa Irrigation District |
| ECCSims | East Contra Costa Groundwater Surface Water Simulation Model |
| ECCWMA | East Contra Costa Water Management Association |
| EDA | Economically Distressed Area |
| EIR | Environmental Impact Report (under CEQA) |
| EIS | Environmental Impact Study (under NEPA) |
| EISIP | Expanded irrigation System Improvement Program |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| eWRIMS | Electric Water Rights Information Management System |
| ET (or ETo) | evapotranspiration |
| EWM | Water Data Library |
| EWMP | Efficient Water Management Practices |
| FMMP | California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program |
| FONSI | Finding of no significant impact |
| ft | feet or foot |
| ft/day | feet per day |
| ft/yr | feet per year |
| ft bgs | feet below ground surface |
| ft msl | feet above mean sea level |
| FSS | Facilitation Support Services |
| FTE | Fulltime equivalent |
| GAMA | Groundwater Ambient Monitoring and Assessment |
| GDE | Groundwater Dependent Ecosystem |
| GDEi | Groundwater Dependent Ecosystem indicators |
| GIS | geographic information systems |
| GMP | Groundwater Management Plan |
| gpd/ft | gallons per day per foot |
| gpm | gallons per minute |
| GPS | Global Positioning System |
| GQMP | Groundwater Quality Management Plant |
| GQTM | Groundwater Quality Trend Monitoring Plan |
| GSP or Plan | Groundwater Sustainability Plan |
| GSA | Groundwater Sustainability Agency |

| | |
|---|---|
| GSFLOW | Groundwater and Surface-water Flow Model |
| GSI | GSI Water Solutions, Inc. |
| GW | Groundwater |
| GWE | Groundwater Elevation |
| GWMP | Groundwater Management Program |
| HCM | Hydrogeologic Conceptual Model |
| ILRP | Irrigated Lands Regulatory Program |
| IMs | Interim Milestones |
| InSAR | Interferometric Synthetic-Aperture Radar |
| IRWM | Integrated Regional Water Management |
| IRWMP | Integrated Regional Water Management Plan |
| ISD | Ironhouse Sanitary District |
| IWFM | Integrated Water Flow Model |
| JPA | Joint Powers Authority |
| KDSA | Kenneth D. Schmidt & Associates |
| LID | Low Impact Development |
| LAO | Legislative Analyst's Office |
| LSA | LSA Associates |
| LSCE | Luhdorff & Scalmanini Consulting Engineers |
| LU | Land Use |
| LUST | Leaky Underground Storage Tank |
| MAF | Million Acre-Feet |
| MCL | Maximum Containment Level |
| MGD | Million gallons per day |
| µg/L | microgram per liter |
| mg/L | milligrams per liter |
| MHI | Median Household Income |
| MMP | Monitoring and Mitigation Program |
| MNM | Monitoring Network Module |
| MO | Measurable Objectives |
| MOA | Memorandum of Agreement |
| Model | Groundwater Model |
| MODFLOW | Modular Finite-difference Flow Model |
| MOU | Memorandum of Understanding |
| MRMP | Mitigation Monitoring and Reporting Program |
| msl | Mean seal level |
| MT | Minimum Thresholds |

| | |
|---|---|
| MTBE | methyl tertiary-butyl ether |
| MW | monitoring well |
| MWD | Municipal Water District of South California |
| MWR | Master Water Report |
| my | million years |
| mya | million years ago |
| mybp | million years before present |
| N | Nitrogen |
| NA | Not Applicable |
| NAHC | Native American Heritage Commission |
| NAIP | National Agricultural Imagery Program |
| NASL | Naval Air Station Lemoore |
| NDVI | Normalized Derived Vegetation Index |
| NAVD88 | North American Vertical Datum of 1988 |
| NCCAG | Natural Communities Commonly Associated with Groundwater |
| NEPA | National Environmental Policy Act |
| NHD | National Hydrography Dataset |
| NHP | Natural Hydrography Database |
| NMFS | National Marine Fisheries Service |
| NOI | Notice of Intent |
| NPDES | Natural Pollution Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| NWIC | Sonoma Northwest Information Center |
| NWIS | National Water Information System |
| °C | degrees Celsius |
| °F | degrees Fahrenheit |
| O&M | operations and maintenance |
| ORP | Oxidation Reduction |
| OS | Open Space |
| OSWCR | DWR Online System for Well Completion Reports |
| PBO | Plate Boundary Observatory |
| pH | potential of hydrogen |
| PLSS | Public Land Survey System |
| PMAs | Projects and Management Actions |
| ppm | parts per million |
| ppt | parts per trillion |
| PUC | Public Utilities Commission |

| | |
|---|---|
| PWIS | CA Water Boards Public Water Information System |
| PWS | Public Water System |
| QA/QC | Quality assurance/quality control |
| RBWTP | Randall Bold Water Treatment Plant |
| RC | Resource conservation |
| RD | Reclamation District |
| RMP | Representative Monitoring Point |
| RMS | Representative Monitoring Sites |
| RP | Reference Point |
| RPE | Reference Point Elevation |
| RW | recycled water |
| RWQCB | Regional Water Quality Control Board |
| RWSA | Raw Water Service Area |
| SAGBI | Soil Agricultural Groundwater Banking Index |
| SB | Senate Bill |
| SCADA | Supervisory Control and Data Acquisition |
| SDAC | Severely Disadvantaged Communities |
| SRF | State Water Resources Board Revolving Fund |
| SGMA | Sustainable Groundwater Management Act |
| SJR | San Joaquin River |
| SMC | Sustainable Management Criteria |
| SMCL | Secondary Maximum Containment Level |
| SNL | State Notification Level |
| SNMP | Salt and Nutrient Management Plan |
| SOI | Sphere of Influence |
| SPI | Standardized Precipitation Index |
| SRF | State Water Resources Control Board Revolving Fund |
| SSURGO | Soil Survey Geographic Database |
| SWP | State Water Project |
| SWQCB | State Water Quality Control Board |
| SWRCB | California State Water Resources Control Board |
| SZ | Shallow Zone |
| TDS | Total Dissolved Solids |
| TMDLs | Total Maximum Daily Load |
| TNC | The Nature Conservancy |
| TODB | Town of Discovery Bay Community Services District |
| UAVSAR | Uninhabited Aerial Vehicle Synthetic Aperture Radar |

| | |
|---|---|
| ULL | Urban Limit Line |
| Umhos/cm | micromhos per centimeter |
| UNAVCO | University NAVSTAR Consortium |
| UPRR | Union Pacific Railroad |
| USACE | United States Army Corps of Engineers |
| USFWS | US Fish and Wildlife Services |
| USGS | United States Geologic Survey |
| USBR | United States Bureau of Reclamation |
| USDA | United States Department of Agriculture |
| USFWS | United States Fish and Wildlife Service |
| UST | Underground Storage Tanks |
| UWMP | Urban Water Management Plan |
| Valley | San Joaquin Valley |
| VOC | volatile organic chemical |
| W | Wet |
| WCR | Well Completion Report |
| WDL | Water Data Library |
| WRAC | Water Resources Advisory Committee |
| WTP | Water Treatment Plant |
| WWTF | Wastewater Treatment Facilities |
| WWTP | Wastewater Treatment Plant |
| WY | Water Year |

## ES 1. EXECUTIVE SUMMARY (CCR §354.4(A))

In 2014, a legislative package, referred to as the Sustainable Groundwater Management Act (SGMA), created a fundamental change in the governance of California's groundwater. SGMA required the formation of groundwater sustainability agencies (GSAs) for over 140 groundwater basins, including the East Contra Costa (ECC) Subbasin. Signed into law by Governor Jerry Brown, and effective January 1, 2015, SGMA set forth a long-term, statewide framework to protect groundwater resources.

Under the new law, seven GSAs, each charged with the development and implementation of a groundwater sustainability plan (GSP), were formed within the ECC Subbasin (Subbasin). The purpose of a GSP is to sustainably manage groundwater and avoid undesirable results within and beyond the 50-year planning and implementation horizon. The GSAs along with partners, worked collaboratively to prepare a single GSP for the Subbasin in accordance with the codified principle that sustainable groundwater management is best achieved locally[1]. The Subbasin boundary and GSA areas are shown in **Figure ES-1**.

## ES 2. CONSIDERATION OF ALL BENEFICIAL USES AND USERS (WC §10723.2)

Beneficial uses and users of water are established in the state constitution and codified in the state Code of Regulations. The State Water Board, which is charged with protection of all water resources, designates or establishes beneficial uses throughout the state. In the ECC Subbasin, which lies within the San Joaquin River Basin, groundwater is considered suitable for municipal and domestic water supply, agricultural supply, and industrial uses.

The sustainability goal for this GSP establishes the protection of all beneficial uses and users of groundwater in the ECC Subbasin. The GSAs are comprised of two cities (Antioch and Brentwood), two special districts serving agricultural water supply (Byron Bethany Irrigation District and East Contra Costa Irrigation District), a special district and community services district providing municipal supply (Diablo Water District and Town of Discovery Bay), and Contra Costa County, which represents unincorporated areas not covered by other districts or cities. Along with Contra Costa Water District, which provides water to various municipal users in the region, these agencies represent and are responsible to the needs and values of all water users present in the Subbasin including urban and rural residents, farmers, various commercial industries, and environmental users all of which rely on groundwater to one degree or another. The GSAs have endeavored to reach out and engage these constituencies to ensure that this GSP reflects all concerns over water supply whether quality, quantity, or both. From residents that rely on a small capacity well providing drinking water in their homes, to small farmers that rely wholly on groundwater for their businesses and livelihoods, and to small water systems serving disadvantaged communities, this GSP recognizes that declining water levels and degradation of water quality as potentially having particularly harmful effects on health and welfare. It also values the unique Delta environment and long history of agricultural activity for which sustainable management is vital to the character and economic diversity of the region.

The GSAs have adopted sustainable management principles that include engagement of all interested parties and stakeholders; protection of potentially underrepresented communities; recognition and prioritization of environmental justice and groundwater dependent ecosystems; and continuation of cooperative water resources management to ensure that all activities needed to maintain sustainability are identified, funded, and implemented.

[1] California Water Code, Division 1, Section 113.

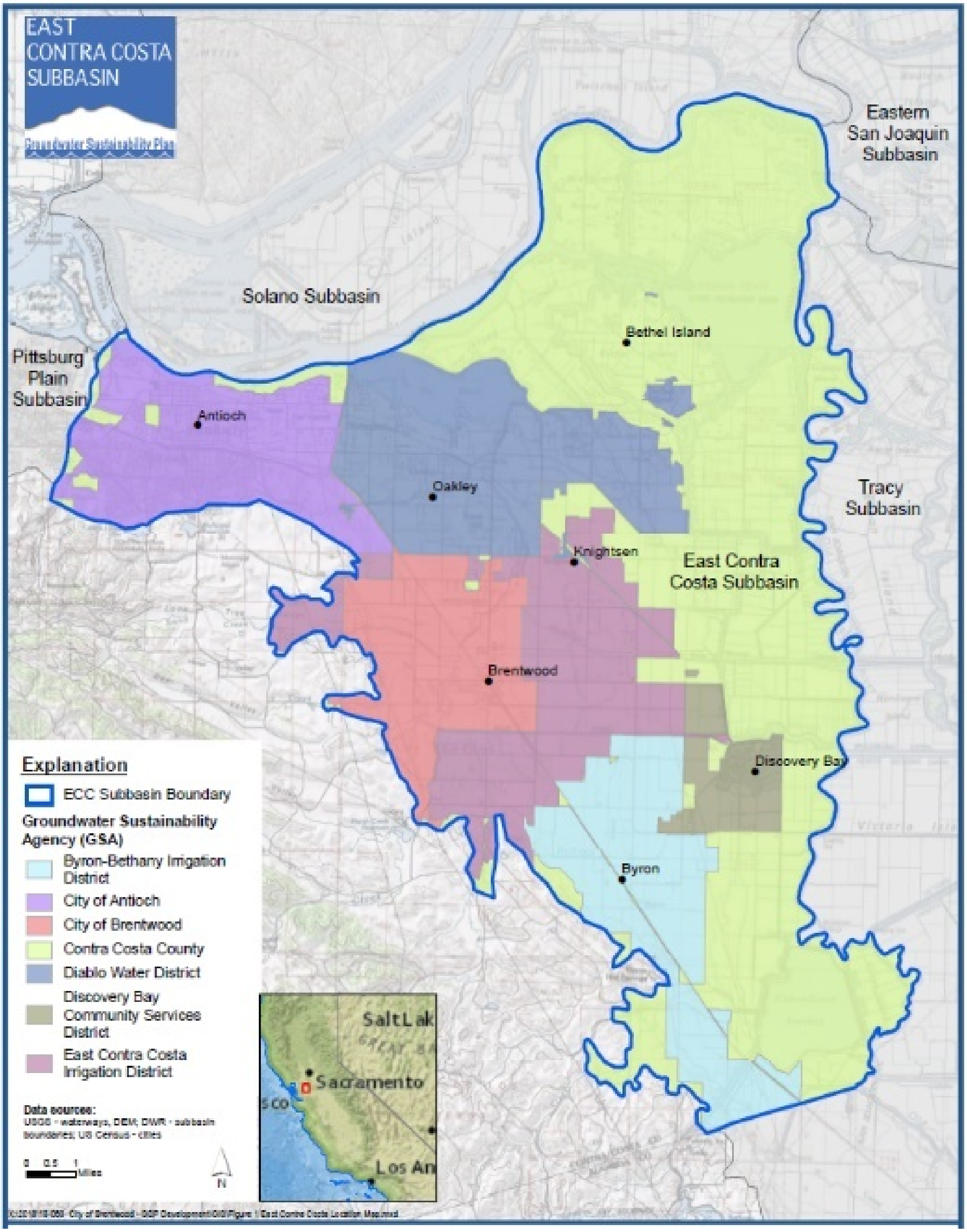


**Figure ES-1 East Contra Costa Subbasin Groundwater Sustainability Agencies**

## ES 3. KEY FACTORS FOR THE ECC SUBBASIN GSP

Through preparation of this GSP, key factors governed the approach and planning to meet the requirements of new SGMA regulations to ensure sustainability of groundwater resources in the plan area (see **Figure ES-1**). Some of these factors are listed below.

### ECC Subbasin Priority Ranking

Many groundwater basins and subbasins in the state have experienced significant adverse effects attributed to overpumping; that is, pumping that exceeds groundwater replenishment. Such basins were assigned Critically Overdrafted and High priority rankings. The ECC Subbasin shows no signs of over pumping and was assigned a Medium priority ranking and is required to submit a GSP in January 2022. Although the ECC Subbasin has not been overdrafted, its ranking was based on the importance that groundwater serves as a source of supply for varied uses including domestic, agricultural, and environmental. Domestic users include individual residences, small water systems, and municipalities. In addition, there are many disadvantaged communities[2] that rely on groundwater as a sole source of supply. East Contra Costa also has a long history of agriculture dating back over 100 years.

### Sustainable Conditions in the ECC Subbasin

Groundwater conditions in the ECC Subbasin are favorable and reflect stability over the past 30 years or more. Using various analogies, the Subbasin can be described as generally full through various water-year types, including drought, and is in good "health." The favorable conditions are in part due to surface water availability that represents the largest source of supply for municipal and agricultural uses in the Subbasin.

### Outlook for Future Sustainability

Using the best available data and a robust water budget model, the ECC Subbasin is projected to be sustainable under various future scenarios including those that incorporate climate change and sea level rise.

### Local Management of the ECC Subbasin

On March 28, 2019, the state approved a subdivision of the Tracy Subbasin that separated the East Contra Costa portion (now called the ECC Subbasin) from the San Joaquin County portion (retained the Tracy Subbasin name), thereby providing more local control of groundwater resources. In addition, seven GSAs were formed by local public agencies to ensure that their diverse constituents are represented in this GSP. If needed, each GSA has authorities to enact policies to protect groundwater resources based on conditions within their respective jurisdictions. This provides stakeholders with more focused engagement through a local GSA.

[2] Disadvantaged communities refer to the areas which most suffer from a combination of economic, health, and environmental burdens. The state identifies these areas by collecting and analyzing information from communities all over the state.
https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/disadvantaged-communities

### Non-Applicability to De Minimis Extractors

SGMA is intended to address existing and potential adverse effects typically attributed to the largest groundwater uses and users. Policies and programs aimed at achieving and maintaining sustainability may include pumping restrictions, fees, and reporting requirements. Such actions, which would be enacted locally by GSAs, *do not* apply to de minimis extractors. Under SGMA, a de minimis extractor is defined as a person who extracts two acre-feet or less per year of groundwater for domestic use. Thus, typical residential well owners are shielded from practically all potential management actions described in this GSP. Further, the GSP sustainability goal (**Section 7**) is intended to protect such users from adverse effects of sustainable management undertaken by the GSAs.

### Impacts to Individual Wells

The GSP is concerned with protecting groundwater resources for future generations and maintaining sustainability as required under SGMA legislation. The GSP identifies baseline groundwater levels and water quality that protect all classes of beneficial users. The GSP *does not* mitigate conditions that were present prior to January 1, 2015 (Water Code 10727.2(b)(4)) such operational problems related to well features (e.g., depth, perforation interval, pump setting).

### Water Quality

Groundwater contains numerous naturally occurring minerals that vary throughout the ECC Subbasin. While groundwater quality is generally favorable with respect to primary drinking water quality constituents, some areas have elevated total dissolved minerals, hardness, and some secondary constituents which may affect domestic and agricultural uses. The GSP is intended to avoid degradation of water quality as a result of implementing sustainable management policies, projects or actions; for example, projects that affect pumping patterns resulting in movement and mixing of groundwater sources would be evaluated to ensure that no adverse effects occur to any users. The GSP does not mitigate groundwater quality in the Subbasin that is naturally occurring during the historical baseline.

### Impacts of Drought

Temporary imbalances between extraction and replenishment due to drought are not considered an undesirable result as long as groundwater conditions recover in subsequent normal to wet years. Thus, a drop in groundwater levels may occur in very dry years, which may produce a short-term impact on wells.

## ES 4. GSP CONTENTS

The GSP provides information demonstrating that the past and present actions of the ECC GSAs have created a sustainably managed groundwater basin. The GSP outlines planned management oversight and activities that will result in continued sustainability of the groundwater resources in east Contra Costa.

This Executive Summary and the companion GSP are organized as follows:

- Executive Summary
- Section 1 Introduction
- Section 2 Plan Area
- Section 3 Basin Setting
- Section 4 Historical, Current, and Projected Water Supply

- Section 5 Water Budget
- Section 6 Monitoring Network and Data Management System
- Section 7 Sustainable Management Criteria
- Section 8 Project and Management Actions
- Section 9 Plan Implementation
- Section 10 Notice and Communication

An overview of each section of the ECC Subbasin GSP is presented below.

## Section 1 Introduction

The ECC Subbasin, also referred to as San Joaquin Valley-East Contra Costa Subbasin (5-022.19), is a Medium priority groundwater basin based on the Groundwater Basin Prioritization by the State Department of Water Resources (DWR). Under SGMA, Medium priority subbasins must submit an adopted GSP by January 31, 2022. Management of the ECC Subbasin through the GSP will be based on achieving and maintaining groundwater sustainability over a 50-year planning and implementation horizon.

SGMA authorizes a "local public agency that has water supply, water management, or land use responsibilities within a groundwater subbasin or basin to elect to become a GSA and to develop, adopt, and implement a GSP (Water Code § 10721(n).)" The following agencies formed GSAs and coordinated preparation of this GSP. **Figure ES-1** shows the service area for each GSA.

- Byron Bethany Irrigation District (BBID) GSA
- City of Antioch GSA
- City of Brentwood GSA
- Contra Costa County (CCC) GSA
- Diablo Water District (DWD) GSA
- Discovery Bay Community Services District (DBCSD[3]) GSA
- East Contra Costa Irrigation District (ECCID) GSA

Contra Costa Water District (CCWD), while not a GSA, is a partner in the development of this jointly prepared GSP. CCWD provides surface water to various entities within its service area. Because surface water plays a part in future water resources management for the Subbasin, CCWD is an equal partner in the development of the ECC Subbasin GSP.

On May 9, 2017, the seven GSAs and CCWD entered into a Memorandum of Understanding (MOU). Under this MOU the agencies share costs and management of the development and implementation of the GSP.

[3] Also referred to as Town of Discovery Bay (TODB).

## Section 2 Plan Area

The ECC Subbasin covers a 168-square mile area (107,596 acres) in the eastern portion of Contra Costa County (**Figure ES-1**). The Subbasin includes the communities of Antioch, Bethel Island, Byron, Brentwood, the Town of Discovery Bay (TODB), Knightsen, and Oakley and two agricultural districts (Byron Bethany Irrigation District and East Contra Costa Irrigation District). The Subbasin is located on the southwestern part of the Sacramento-San Joaquin Delta, which is the largest estuary on the West Coast and provides critical habitat to fish and wildlife species. The 2015 land use in the Subbasin is mainly agricultural (41 percent), followed by urban (about 23 percent), then by water and native vegetation (both about 14 percent). As quantified in Section 4, the Subbasin has three main water supply sources: surface water, groundwater, and recycled water. Surface water provides, on average, about 80 percent of the aggregate demand for all use sectors in the Subbasin. This percentage is projected to remain stable at 80 to 85 percent through at least 2050 (see **Section 4**, **Table 4-5**).

## Section 3 Basin Setting

The ECC Subbasin setting is described through a hydrogeologic conceptual model depicting the physical features of the aquifer system and groundwater conditions.

### Hydrogeologic Conceptual Model

- ECC Subbasin is bounded on the north, east, and south by the Contra Costa County line, which is contiguous with the San Joaquin River (north) and Old River (east). In the west, the Subbasin is bounded by marine sediments of the Coast Range.
- Topography and geological formations gently slope to the northwest. The upper 400 feet of sediments are comprised of alluvial deposits with discontinuous clay layers interspersed with more permeable coarse-grained units.
- The ECC Subbasin aquifer system is divided into the upper unconfined Shallow Zone (to about 150 feet below ground surface) and a lower semi-confined to confined Deep Zone (the Corcoran Clay is not present in the Subbasin). Most water wells are constructed within the upper 400 feet of the aquifer system.
- Groundwater conditions throughout the Subbasin are monitored through water level measurements and water quality testing. Water level data indicate that groundwater storage is largely stable and fluctuate with water-year type (wet, normal, dry).

### Sustainability Indicators

DWR is charged with determining the adequacy of GSPs in meeting SGMA's requirements. Generally, to achieve sustainability, the amount of groundwater extracted must be less than or equal to the amount of groundwater replenishment. Temporary imbalances between extraction and replenishment due to drought are not considered an undesirable result as long as groundwater conditions recover in subsequent normal to wet years. In addition, the GSP regulations[4] list six sustainability indicators that must be addressed in GSPs.

[4] California Water Code § 354.26


Following are the ECC findings for each of the sustainability indicators.

- **Groundwater Elevations**- Groundwater levels in the ECC Subbasin are stable indicating that the Subbasin has been managed within its sustainable yield[5]. This is partially due to surface water availability for agricultural and urban uses.
- **Change in Groundwater Storage** - As determined through the water budget analysis in **Section 5**, the cumulative change in groundwater storage was unchanged between 1997 and 2018 despite three drought periods (2001-2002, 2007-2009, 2012-2016).
- **Seawater Intrusion** - The ECC Subbasin is situated in the San Francisco Bay/Sacramento-San Joaquin Delta. This GSP recognizes the potential for interactions between saline baywater and shallow groundwater. While the baywater is fresh, adverse intrusion may occur if saline water infiltrates the Delta and intrudes into shallow groundwater. This potential mechanism may be triggered or exacerbated by sea level rise and/or shifts in groundwater flow directions and gradients caused by future pumping patterns. There is no direct connection between ocean seawater and groundwater in the Subbasin.
- **Groundwater Quality** - Groundwater quality is generally favorable with respect to primary drinking water quality constituents. Naturally elevated mineral content may pose localized restrictions for domestic (e.g., hardness) and agricultural (crop sensitivity) uses. Key monitoring constituents are total dissolved solids, chloride, hardness, nitrate, and boron. With the exception of nitrate, these constituents are naturally occurring in the ECC Subbasin.
- **Land Subsidence** - There is no historical evidence of inelastic land subsidence due to groundwater withdrawal in the ECC Subbasin.
- **Depletions of Interconnected Surface Water** – This indicator is of concern where shallow groundwater and surface water are hydraulically connected. Marsh Creek, the San Joaquin River, and Old River are considered interconnected surface water bodies in the ECC Subbasin. Impacts to these features due to groundwater pumping will be managed through this GSP through monitoring of shallow wells and stream gage stations.

[5] "Sustainable yield" means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result. Cited from: Section 10733.2, Water Code

## Section 4 Historical, Current, and Projected Water Supply

This section describes the ECC Subbasin land uses, population, and metered historical, current and projected water supplies. Water supply amounts were provided by the GSAs and CCWD. When historical or projected water supply were not provided, land uses and population data were used to estimate these data. This information is integrated into the Subbasin surface water/groundwater model (GSP **Section 5**).

## Section 5 Water Budget

In accordance with technical guidance documents provided by DWR, water budget scenarios were evaluated using a groundwater flow model that quantified historical, current, and projected groundwater budget conditions. The development of the ECC Groundwater-Surface Water Simulation Model (ECCSim) was a refinement of two other validated and widely used modeling platforms, IWFM and C2VSim-FG Beta2[6]. These were selected as the modeling platform due to the versatility in simulating crop-water demands in the predominantly agricultural setting of the Subbasin, groundwater surface-water interaction, the existing hydrologic inputs existing in the model for the time period through the end of water year 2015, and the ability to customize the existing C2VSim-FG Beta2 model to be more representative of local conditions in the area of the ECC Subbasin. Use of publicly available modeling platforms is a guiding principle under DWR Best Management Practices[7] and facilitates independent assessment of modeling results.

Based on the modeling results, the ECC Subbasin is historically, currently, and projected to be sustainable. **Figure ES-2** shows a breakdown in water budget components for the model base period of 1997 to 2018. The modeling results indicate that the cumulative change in groundwater storage fluctuated while cumulative storage was essentially unchanged at the end of the base period despite three state-wide drought periods (2001-2002, 2007-2009, 2012-2016). Over the base period, total pumping in the Subbasin ranged from 32,500 to 58,250 AFY and averaged 46,455 AFY.

[6] The development of the East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) involved starting with and evaluating the U.S. Geological Survey's Central Valley Hydrologic Model (CVHM) and the beta version (released 5/1/2018) of DWR's fine-grid version of the California Central Valley Groundwater-Surface Water Flow Model (C2VSim-FG Beta2). C2VSim-FG Beta2 utilizes the most current version of the Integrated Water Flow Model (IWFM) code available at the time of the ECCSim development.

[7] 23 CCR §352.4(f)

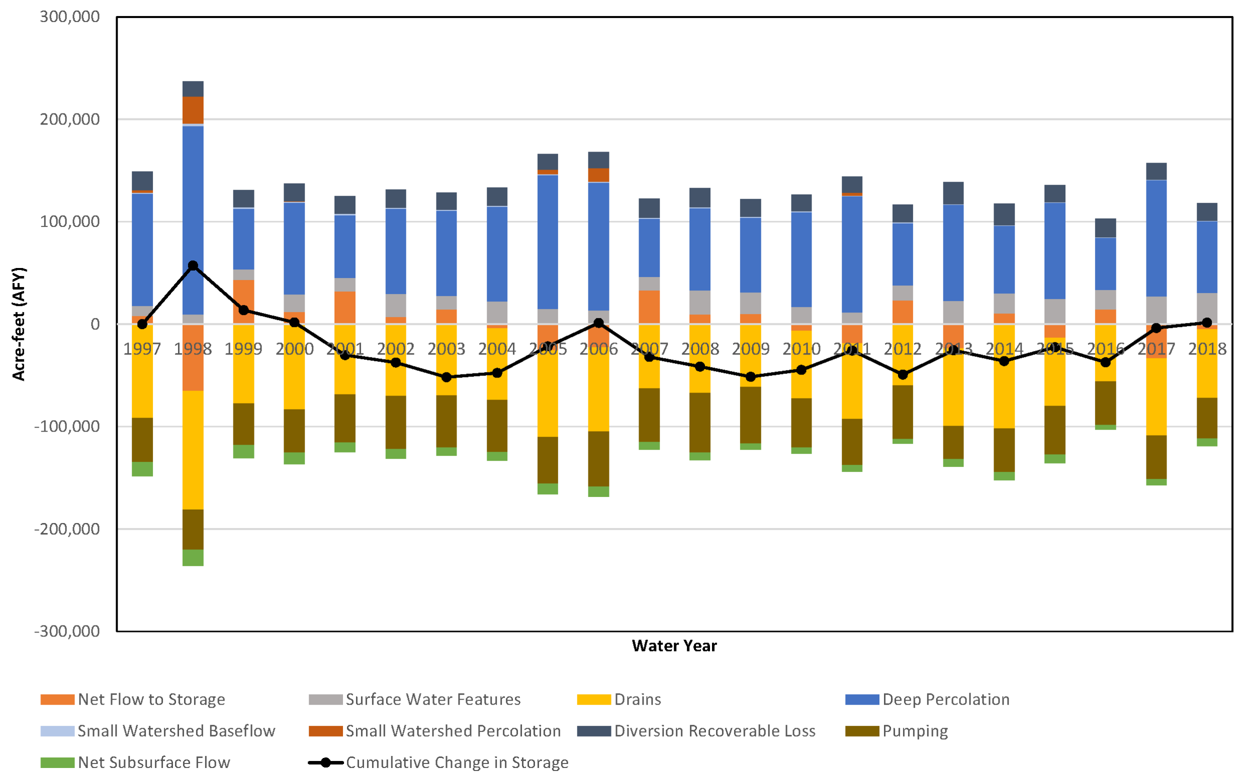


**Figure ES-2 Groundwater Budget for East Contra Costa Subbasin Historical Calibration Period (1997-2018)**

Various future scenarios were evaluated using the ECC Subbasin groundwater flow model including sustainable yield. The projected sustainable yield is the amount of pumping that can occur while avoiding undesirable results for the six sustainability indicators. The sustainable yield for the ECC Subbasin is estimated at approximately 72,000 AFY, or about 55 percent greater pumping than the historical average. At higher levels of pumping, the modeling indicates the potential to increase streamflow depletion and inter-basin flow beyond historical baselines. Like the base period scenario, a chronic decline in groundwater storage was not a factor in the sustainable yield threshold. The margin between the average pumping rate in the Subbasin over the base period (46,455 AFY) and the stated sustainable rate of 72,000 AFY provides an ability to meet short-term surface water supply shortages in critically dry years through increased groundwater pumping. This is a hallmark of effective conjunctive use of surface water and groundwater resources.

The projected water budget was also evaluated under climate change and sea level rise. Based on the model results, the ECC Subbasin is projected to be sustainable over the 50-year implementation and planning horizon required under SGMA.

Through adaptive management, the groundwater flow detailed in **Section 5** will be updated and refined to reflect actual future conditions and serve in the adaptive management of the ECC Subbasin using the best available information.

## Section 6 Monitoring Networks and Data Management System

Monitoring networks are developed to quantify current and future groundwater conditions in the ECC Subbasin, as well as within individual GSA jurisdictions. Monitoring networks were developed for each of the six SGMA sustainability indicators. Some sustainability indicators needed to be expanded to fill data gaps and improve the ability to demonstrate sustainability and refine the hydrogeologic conceptual model. The networks include:

- **Groundwater Level Monitoring Network**- Groundwater level data from a network of monitoring wells reflect groundwater occurrence, flow direction, hydraulic gradients between principal aquifers, and interaction between groundwater and surface water features. Dedicated monitoring wells are located within the jurisdiction of the seven GSAs. The ECC Subbasin has 55 basin-wide wells and 12 of these comprise a network of representative monitoring sites (RMS) as defined under new regulations governing GSPs.
- **Groundwater Storage** – Groundwater levels serve as a proxy for the groundwater storage sustainability indicator monitoring network.
- **Seawater Intrusion** – Intrusion of saline baywater, if it occurs, is evaluated based on chloride concentrations from monitoring wells adjacent to the San Joaquin River.
- **Groundwater Quality** –Groundwater quality monitoring will be conducted at an existing network of 22 basin-wide water supply wells, 11 of these are part of a representative monitoring network.
- **Land Subsidence** – A land subsidence monitoring network is comprised of four Plate Boundary Observatory (PBO) stations in and adjacent to the ECC Subbasin and data collected by DWR using InSAR[8] satellite data.
- **Interconnected Surface Water** – Interconnected surface water will be monitored through existing stream gages (19) and Shallow Zone groundwater level monitoring wells (15). New shallow wells were installed as part of this GSP to address a data gap.

A Data Management System (DMS) was developed to store and analyze data collected as part of this GSP. With submittal and implementation of the ECC Subbasin GSP, there will be a publicly accessible weblink to view reports, maps, graphs, and current data under the Subbasin monitoring plan.

## Section 7 Sustainable Management Criteria

Sustainable management criteria include establishing a sustainability goal for the Subbasin, defining undesirable results, and quantifying minimum thresholds and measurable objectives.

The sustainability goal for the ECC Subbasin GSP is to manage the groundwater Subbasin to:

- Protect and maintain safe and reliable sources of groundwater for all beneficial uses and users.
- Ensure current and future groundwater demands account for changing groundwater conditions due to climate change.

[8] InSAR is Interferometric Synthetic Aperture Radar.

- Establish and protect sustainable yield for the Subbasin by achieving measurable objectives set forth in this GSP in accordance with implementation and planning periods[9].
- Avoid undesirable results defined in the GSP in accordance with SGMA.

Sustainable management criteria (SMC) also define the conditions that constitute sustainable groundwater management. Note that undesirable results have not occurred historically in the ECC Subbasin and are not projected to occur in the future. The sustainable management criteria will commit the GSAs to meeting the sustainability goal for the Subbasin.

**Table ES-1** summarizes the SMC for the six SGMA sustainability indicators and includes the minimum thresholds and measurable objectives required under GSP regulations:

**Table ES-1 Sustainable Management Criteria Summary**

| Sustainability Indicator | Measurable Objective (MO) | Minimum Threshold (MT) | Undesirable Result |
|---|---|---|---|
| Chronic Lowering of Groundwater Levels | Average spring elevation of groundwater at the Representative Monitoring Site (RMS) and its vicinity | The lowest historical water levels observed in a well plus an additional 10 feet lower | The MT in any well is exceeded over three consecutive years, indicating a trend, and do not recover in normal to wet years |
| Reduction in Groundwater Storage | Use as a proxy, the MO for chronic lowering of groundwater levels | Use as a proxy, the MT for chronic lowering of groundwater levels | Use as a proxy, the undesirable result for chronic lowering of groundwater levels |
| Seawater intrusion | The MO at each RMS is the average chloride concentrations from 2013 to 2017. | Chloride concentration for any Shallow Zone or Deep Zone well is set at 250 mg/L secondary maximum contaminant level | A bayside monitoring well has a chloride concentration above 250 mg/L over three consecutive years and is determined to be induced by GSAs' actions. |
| Degraded Groundwater Quality | The MO for each RMS is the average concentrations (2013 to 2017) for each constituent of concern | The three-year running average exceedance of an MCL for a key monitoring constituent. | Any RMS that exceeds any state drinking water standard during GSP implementation because of GSAs' actions |
| Land Subsidence | The MO is set at UNAVCO station P256 at the average seasonal elastic movement (0.6 inch vertical). | An MT of 1-inch land surface elevation outside the historical elastic range over a three-year period as | Associated impacts due to groundwater pumping: impacts to infrastructure such as damage to roads and structures, reduced |

[9] As defined under SGMA, the GSP implementation period is 20 years. The planning and implementation horizon is a 50-year time period over which the GSAs determine that plans and measures will be implemented to ensure that the basin or subbasin is operated within its sustainable yield.

| Sustainability Indicator | Measurable Objective (MO) | Minimum Threshold (MT) | Undesirable Result |
|---|---|---|---|
| | | shown by monitoring data at the UNAVCO site P256. | capacity of water conveyances, and increased vulnerability to flooding. |
| Depletion of interconnected surface water | The MO is set at the average annual groundwater pumping during the Base Period 1997 to 2018, or 54,000 AFY. | Based on the groundwater flow model results, a conservative interim MT is set at a value for sustained basin-wide pumping above the historic baseline average which induces exceedances in estimated streamflow depletion as compared to baseline conditions. [10] | Depletions that result in reductions in flow or stage of major rivers and streams that are hydrologically connected to groundwater in the Subbasin and which cause significant and unreasonable impacts on beneficial uses and users of surface water and the environment |

## Section 8 Projects and Management Actions

Projects and management actions (PMAs) were developed to achieve the ECC Subbasin sustainability goal by 2042 and avoid undesirable results during and beyond the GSP planning and implementation horizon. Because the ECC Subbasin is currently and projected to be sustainable (i.e., no onset of undesirable results), PMAs are not expected to be essential for sustainability. However, future conditions are uncertain and PMAs will be employed through the principle of adaptive management on an as-needed basis.

Seven projects are included in the GSP representing a variety of project types to increase water supply availability and reliability including infrastructure to provide in-lieu recharge, improve water quality, and increase use of recycled wastewater. Projects are divided into three status categories: completed, under construction, and planned. The three completed projects are operating and provide in-lieu groundwater benefits of over 5,500 AFY. The two projects under construction will be operating by 2042 and are projected to provide over 8,000 AFY.

Management actions consisting of water well policies (e.g., metering and reporting, spacing, and construction features) and demand management would be implemented locally by individual GSAs on an as-needed basis. Except for a measure designed to protect water quality, such as seal depths, such management actions are not applicable to de minimis users.

[10] The interim MT for interconnected surface water will be replaced with monitored shallow groundwater levels and calculations of the rate or volume of depletion when the data gap for shallow monitoring is filled as described in **Section 6**.

## Section 9 Plan Implementation

**Estimated Cost to Implement the GSP**

The estimated total cost to the ECC GSP Working Group[11] over the first five years of GSP implementation is between $2.6 and 3.1 million. Costs are based on best available estimates. These costs include public outreach, monitoring and well maintenance, data management, and GSP reporting (e.g., annual and 5-year updates). Individual member agencies will continue to fund individual projects and/or management actions and monitoring activities. The budget will be adjusted over time as the GSP implementation costs are better understood through sustainable management activities and guidance from DWR on the submitted GSP and subsequent reporting.

Implementation of the projects will be borne by the project proponents.

**Funding Sources and Mechanisms**

GSA implementation costs will be paid for through contributions from the member GSAs and CCWD under a cost-sharing arrangement to be developed following GSP adoption. Grant funding will be pursued when available.

**Schedule for Implementation**

**Figure ES-3** provides a projected schedule for ECC GSP implementation including outreach and communication, monitoring, and GSP reporting activities.

[11] ECC GSP Working Group consists of the seven GSAs and Contra Costa Water District.

**Figure ES-3 GSP Implementation Schedule**

| Task Name | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plan Implementation | | | | | | | | | | | | | | | | | | | | | |
| GSP Submittal to DWR | x | | | | | | | | | | | | | | | | | | | | |
| Joint Implementation Agreement | | | x | | | | | | | | | | | | | | | | | | |
| Outreach and Communication | | | | | | | | | | | | | | | | | | | | | |
| Monitoring and DMS | | | | | | | | | | | | | | | | | | | | | |
| GSP Reporting | | | | | | | | | | | | | | | | | | | | | |
| Annual Reports | x | x | x | x | x | | x | x | x | x | | x | x | x | x | | x | x | x | x | |
| 5-year GSP Evaluation Reports | | | | | | x | | | | | x | | | | | x | | | | | x |

x Indicates a submittal.
Indicates ongoing event.

## Section 10 Notice and Communication

Development of the ECC GSP was a collaborative effort among the ECC GSP Working Group (seven GSAs and CCWD), technical consultants, community members, and stakeholders. The Working Group conducted over 40 meetings, from 2018 to 2021. Documents posted to a publicly accessible website, Working Group meeting notes, surveys, newspaper notices, and direct email outreach were used to keep the public informed of the GSP development and provide opportunities for public input.

The Working Group members also provided regular updates through individual agency public meetings and websites. Information was also provided through social media by those agencies with a presence on such platforms. Three public workshops, held between July 2020 and September 2021, were used to inform and engage beneficial users of groundwater in the ECC Subbasin and discuss each section of the GSP. Stakeholder comments were incorporated into the final GSP.

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## LIST OF APPENDICIES

# 1. INTRODUCTION

## 1.1. Background

### 1.1.1. Purpose of the Groundwater Sustainability Plan

The Sustainable Groundwater Management Act (SGMA), effective January 1, 2015, established a framework of priorities and requirements to facilitate sustainable groundwater management throughout California. The intent of the SGMA mandate is for groundwater to be managed by local public agencies (Groundwater Sustainability Agencies [GSAs]) to ensure a groundwater basin is operated within its sustainable yield through the development and implementation of a Groundwater Sustainability Plan (GSP or Plan).

### 1.1.2. Sustainability Goal

Each GSP must include a sustainability goal for the basin to manage groundwater in a manner that avoids undesirable results within 20 years of the statutory deadline (i.e., by or before January 31, 2042).

"Undesirable result means one or more of the following effects caused by groundwater conditions occurring throughout the basin" (Water Code §10721.x):

1. *Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.*
2. *Significant and unreasonable reduction of groundwater storage.*
3. *Significant and unreasonable seawater intrusion.*
4. *Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.*
5. *Significant and unreasonable land subsidence that substantially interferes with surface land uses.*
6. *Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.*

As required by SGMA regulations, the ECC GSAs developed a sustainability goal for the Subbasin that is described in detail in **Section 7**.

Definitions for terms used in SGMA from the California Water Code 10721 and the California Code of Regulations Title 23 351 are included in **Appendix 1a**.

### 1.1.3. Description of the East Contra Costa Subbasin

The original boundary of the Tracy Groundwater Subbasin included the jurisdiction of multiple cities and the counties of Contra Costa and San Joaquin. To streamline the development of the required GSP, the GSAs in Contra Costa and San Joaquin Counties, on September 6, 2018 applied to the State to divide the Tracy Subbasin along the border of Contra Costa and San Joaquin Counties. Dividing a groundwater basin is known as a Basin Boundary Modification or BBM. This allows the GSAs in each County to develop their own GSP under the Act. On February 11, 2019, the Department of Water Resources approved dividing the

Tracy Subbasin into two subbasins (e.g., East Contra Costa Subbasin and the new Tracy Subbasin) thereby creating a separate groundwater basin entirely within Contra Costa County.

The East Contra Costa Subbasin (ECC Subbasin), also referred to as San Joaquin Valley-East Contra Costa (5-022.19), is a medium priority groundwater basin based on the Groundwater Basin Prioritization by the State Department of Water Resources (DWR) (**Figure 1-1**). Under SGMA, medium priority subbasins must submit an adopted GSP by January 31, 2022. The ECC Subbasin's boundaries are generally defined by the San Joaquin River on the north, Old River on the East, the Contra Costa County boundary on the south, and the non-water bearing geologic units on the west. As mentioned above, the ECC Subbasin is contained entirely within Contra Costa County and underlies all or portions of the Cities of Antioch, Oakley, Brentwood, the Town of Discovery Bay and the communities of Bethel Island, Byron and Knightsen.

## 1.2. Agency Information

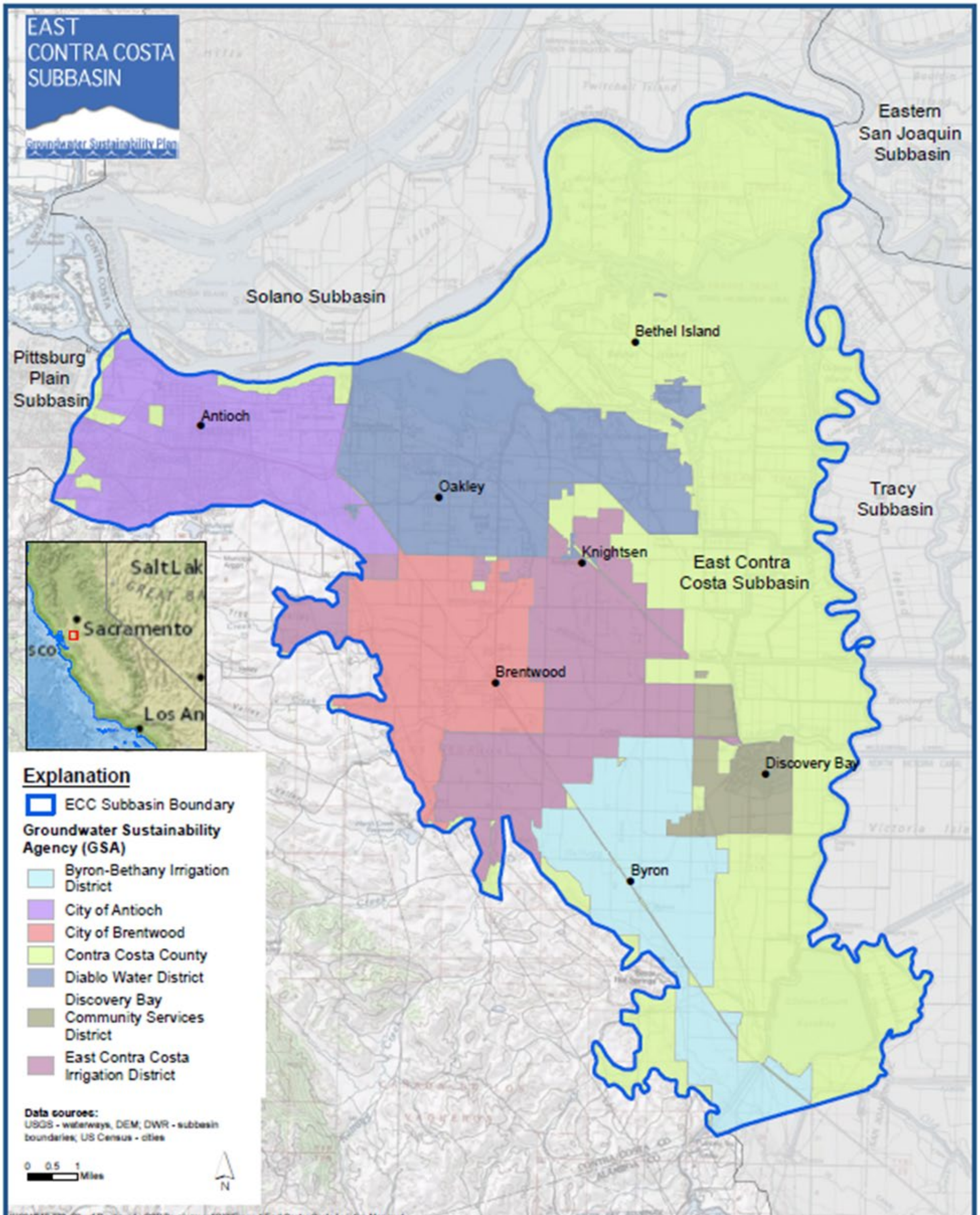
### 1.2.1. GSAs in East Contra Costa Subbasin

In the East Contra Costa Subbasin, eight agencies are working together in developing the GSP. The agencies include:

- Byron Bethany Irrigation District (BBID)
- City of Antioch
- City of Brentwood
- Contra Costa County (CCC)
- Contra Costa Water District (CCWD)
- Diablo Water District (DWD)
- Discovery Bay Community Services District (DBCSD or TODB)
- East Contra Costa Irrigation District (ECCID)

SGMA authorizes a "local public agency that has water supply, water management, or land use responsibilities within a groundwater subbasin or basin to elect to become a GSA and to develop, adopt, and implement a GSP (Water Code § 10721(n).)" All agencies listed above became GSAs with the exception of CCWD. CCWD is a water district that provides surface water to entities within their service area. Surface water may play a part in future management of a groundwater basin and so CCWD is an equal partner in the development of the ECC GSP. On May 9, 2017, the eight agencies entered a Memorandum of Understanding (MOU). Under this MOU the agencies share costs and management of the development and implementation of the GSP. In addition, the MOU was updated with the subbasin name change as a result of the BBM in March 2020 when the eight agencies signed an updated MOU to develop a GSP (**Appendix 1b**).

Prior to the basin boundary modification, the Tracy Subbasin was successful in obtaining one million dollars in Proposition 1 Round 2 grant funds for GSP development. After the BBM, the ECC and Tracy Subbasins split the grant funding to prepare a GSP for each of the two subbasins. On October 24, 2019, San Joaquin County and the City of Brentwood signed an agreement for the management of the grant funds. In addition, the ECC Subbasin received Proposition 68 Round 3 funding.

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**East Contra Costa Subbasin, GSAs, and Adjacent Subbasins**

**Figure 1-1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

### 1.2.2. Agency Names and Mailing Addresses

As per California Water Code §10723.8, the following contact information is provided for each GSA.

City of Brentwood GSA (**Plan Manager**)
Attention: Water Operations Manager Public Works Operations
Eric Brennan
2201 Elkins Way
Brentwood CA, 94513-7344
ebrennan@brentwoodca.gov

Byron Bethany Irrigation District
Attention: Assistant General Manager
7995 Bruns Road
Byron, CA 94514-1625

City of Antioch GSA
Attention: Project Manager
200 H Street
Antioch, CA 94509

Contra Costa County GSA
Attention: Manager, Contra Costa County Water Agency
30 Muir Road
Martinez, CA 94553

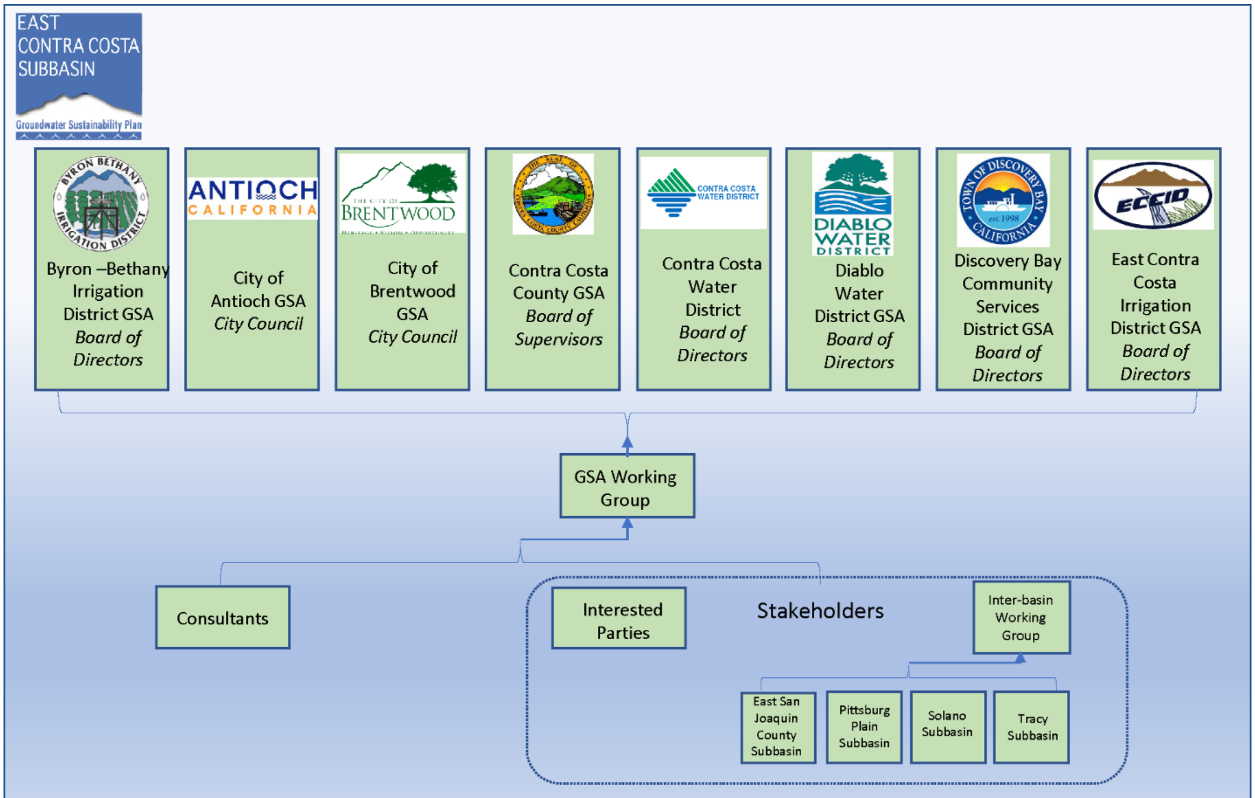
Diablo Water District GSA
Attention: General Manager
P.O. Box 127
87 Carol Lane
Oakley, CA 94561

Discovery Bay Community Services District GSA
Attention: General Manager
1800 Willow Lake Road
Discovery Bay, CA 94505-9376

East Contra Costa Irrigation District GSA
Attention: General Manager
1711 Sellers Avenue
Brentwood, CA 94513

### 1.2.3. Agencies' Organization, Management Structure, and Legal Authority of the GSAs and CCWD

The seven (7) GSAs that cover the ECC Subbasin and participate in the development and administration of the GSP each have their own organization and management structure and legal authority as described below. Prior to becoming a GSA, each entity submitted notifications to DWR as outlined in Water Code §10723.8. GSA boundaries are shown in **Figure 1-1,** and the ECC Subbasin management structure is shown in **Figure 1-2**. The GSA Working Group is made up of GSA representatives plus a representative from CCWD that meet monthly to coordinate GSP development. The organization and management structure for the seven GSAs and CCWD (an equal partner and financial contributor) are described below.

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**Management Structure, ECC Subbasin**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 1-2**

#### 1.2.3.1. City of Brentwood GSA (Plan Manager)

The City of Brentwood GSA operates within its current city organization and management structure as a General Law City. Government Code section 36501 authorizes general law cities be governed by a city council of five members (Mayor, Vice Mayor, and three Council Members). Bentwood's GSA activities are staffed through the City's Public Works Department and one member attends the monthly GSA Working Group meeting that coordinates GSP activities. The person with management authority for implementation of the Plan is the City Manager or designee.

#### 1.2.3.2. Byron-Bethany Irrigation District GSA

Byron-Bethany Irrigation District GSA operates within its current organization and management structure under its seven-member Board of Directors and its legal authority as a multi-county special district, operating under Division 11 of the California Water Code. It was originally created to deliver raw, agricultural water to area farmers. The District elected to serve as the GSA for the portion of BBID that is situated within the boundaries of the ECC Subbasin. A portion of BBID is also within the adjacent Tracy Subbasin. The General Manager sits on the GSA Working Group that coordinates ECC Subbasin GSP activities. The person with management authority for implementation of the Plan is the District's General Manager.

#### 1.2.3.3. City of Antioch GSA

The City of Antioch GSA operates within its current organization and management structure as a General Law City under its current City Council that consists of five members. Its legal authority is described in the City ordinances, and it abides by state codes. The GSA activities are staffed through the City's Capital Improvements Division. The Project Manager of the Capital Improvements Division sits on the GSA Working Group that coordinates ECC Subbasin GSP activities. The person with management authority for implementation of the Plan is the City Manager or designee.

#### 1.2.3.4. Contra Costa County GSA

The Contra Costa County GSA operates within its current organization and management structure by a five-member Board of Supervisors as well as its legal authority set forth in the Sustainable Groundwater Management Act, California Water Code section 10720, et seq. The GSA activities are staffed through the Contra Costa County Water Agency and one member sits on the monthly GSA Working Group meeting that coordinates GSP activities. The person with management authority for implementation of the Plan is the director of the Department of Conservation and Development.

#### 1.2.3.5. Contra Costa Water District

Contra Costa Water District is not a GSA but is an equal partner and financial contributor to the development of the ECC GSP through the District's execution of the ECC MOU.

#### 1.2.3.6. Diablo Water District GSA

The Diablo Water District GSA operates within its current organization and management structure by a five-member Board of Directors as well as its legal authority as a special district. The General Manager and staff operate the District following policies set by the Board. The General Manager and Manager of Water Operations sit on the GSA Working Group that coordinates ECC Subbasin GSP activities. The person with management authority for implementation of the Plan is the General Manager.

#### 1.2.3.7. Discovery Bay Community Services District GSA

The Town of Discovery Bay GSA operates within its current organization and management structure as a California Independent Community Services District and is governed by a five-member Board of Directors, as well as legal authority as a special district. The District's General Manager is tasked to carry out the policy decisions of the Board and oversee day-to-day operations. The General Manager sits on the GSA Working Group that coordinates ECC Subbasin GSP activities. The person with management authority for implementation of the Plan is the General Manager.

#### 1.2.3.8. East Contra Costa Irrigation District GSA

The East Contra Costa Irrigation District GSA operates within its current organization and management structure under a five-member Board of Directors representing five Divisions within the District as well as legal authority as a special district. The General Manager sits on the GSA Working Group that coordinates ECC Subbasin GSP activities. The person with management authority for implementation of the Plan is the General Manager.

### 1.2.4. Governance Structure

**Figure 1-1** shows the extent of the GSP area (the entire ECC Subbasin) and each of the seven GSA jurisdictional boundaries. The following powers and authorities are granted to GSAs to implement the GSP in accordance with the requirements of California Water Code § 10725 *et seq:*

- Adopt standards for measuring and reporting water use
- Adopt rules, regulations, policies and procedures to govern the adoption and implementation of the GSP, as authorized by SGMA including funding of the GSA, and the collection of fees or charges as may be applicable
- Develop and implement conservation best management practices
- Develop and implement metering, monitoring and reporting related to groundwater pumping
- Hire consultants as determined necessary or appropriate by the GSA
- Prepare a budget

#### 1.2.4.1. Memorandum of Understanding for GSP Development

As mentioned above, the seven GSAs and CCWD entered into a MOU on May 9, 2017. The purpose of the MOU was to collaborate to develop a single GSP for the ECC Subbasin and for each GSA to consider adopting and implementing the GSP within its GSA management area. The term of the MOU is until January 31, 2022 when the GSP is due to DWR. An updated MOU was required as a result of the BBM resulting in the new subbasin name. An updated MOU was signed on March 2020 (**Appendix 1b**).

#### 1.2.4.2. Description of Initial Notification

The first step in preparing a GSP is notifying DWR of the intent to develop a GSP. In February 2018, the City of Brentwood submitted an Initial Notification to prepare a GSP for the Tracy Subbasin. Although the new ECC Subbasin was formed on February 2019, the ECC GSP development efforts continued from February 12, 2018 (when the Tracy Subbasin Initial Notification was submitted). The initial Notification to DWR is posted on the DWR website: https://sgma.water.ca.gov/portal/gsp/init/all.

## 1.3. Report Organization and Elements Guide

This Report will be organized into the following sections:

Section 1: Introduction

Section 2: Plan Area

Section 3: Basin Setting

Section 4: Historical, Current, and Projected Water Supplies

Section 5: Water Budget

Section 6: Monitoring Network and Data management System

Section 7: Sustainable Management Criteria

Section 8: Projects and Management Actions

Section 9: Plan Implementation

Section 10: Notice and Communication

DWR has provided the Elements Guide[1] that lists information required to be included in a GSP by the Sustainable Groundwater Management Act and the Groundwater Sustainability Plan Emergency Regulations. It is a cross reference to where this information can be found in the GSP (e.g., page number, figure number, and/or table number).

[1] Source: https://sgma.water.ca.gov/portal/resources: Printable Elements Guide Excel Template

## 1.4. References

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Bradford Island Reclamation District 2059. https://bradfordisland.com/. Accessed January 2020

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# 2 PLAN AREA

## 2.1 Description of Plan Area

### 2.1.1 Summary of Jurisdictional Areas and Other Features (§354.8 a and b)

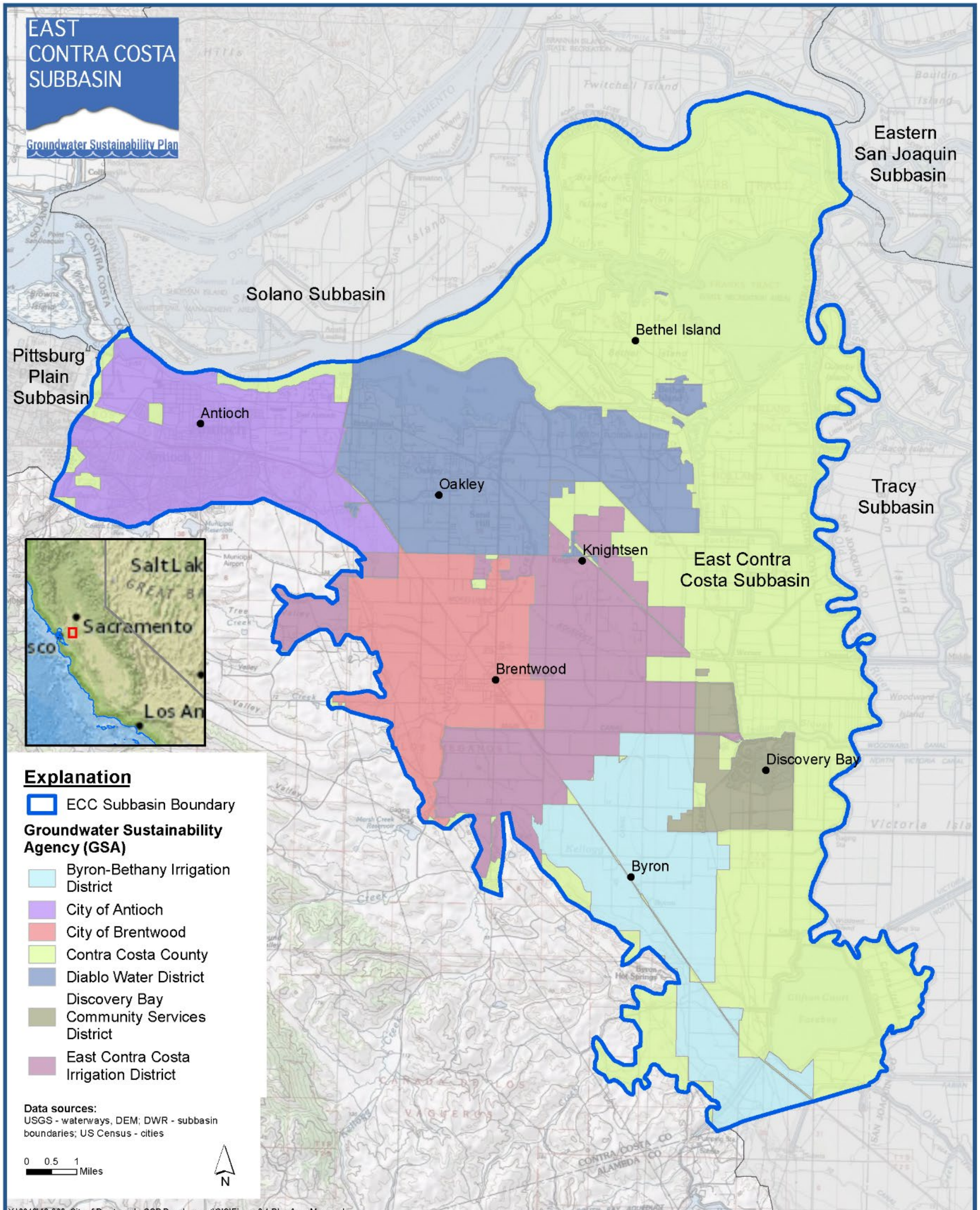
The ECC Subbasin (Subbasin) covers a 168 square mile area (107,596 acres) in the eastern portion of Contra Costa County, spans 18 miles from north to south and ranges from four to 13 miles from east to west, and includes seven communities: Antioch, Bethel Island, Byron, Brentwood, the Town of Discovery Bay (TODB), Knightsen, and Oakley. Three (Antioch, Brentwood and Oakley) are incorporated cities, Discovery Bay is a California Community Services District, Bethel Island is a Special Act District created by the California State legislature (1960) and named the Bethel Island Municipal Improvement District, the remaining two (Byron, and Knightsen) are census designated places. The Subbasin lies within the northwestern portion of the larger San Joaquin Valley Groundwater Basin. The Subbasin is bound by the Coast Range to the west and other groundwater subbasins to the northwest (Pittsburg Plain, DWR Subbasin 2-004), north (Solano Subbasin, DWR Subbasin 5-021.66), northeast (Eastern San Joaquin Basin, DWR Subbasin 5-022.01), and to the south and east (Tracy Subbasin, DWR Subbasin 5-022.15) (**Figure 2-1**). All adjacent subbasins are required to submit a GSP with the exception of Pittsburg Plain Subbasin (due to a "Very Low" basin prioritization that does not require a GSP to be completed).

#### 2.1.1.1 Adjudicated Areas and Areas Covered by an Alternative GSP

This GSP covers the entire ECC Subbasin and is managed by seven exclusive GSAs (**Figure 2-1**). There are no known adjudicated areas within the ECC Subbasin or any areas covered by an Alternative GSP.

#### 2.1.1.2 Cities and County Jurisdictions

**Figure 2-2a** shows city and county boundaries, and agencies with water management responsibilities. Apart from GSAs in the Subbasin, no other agencies have direct authority over groundwater, though Contra Costa County permits and regulates wells and septic systems throughout the Subbasin, including the cities, pursuant to Contra Costa County Ordinance code. Contra Costa Water District (CCWD) is a public water entity in Contra Costa County (County) but with no direct authority over groundwater within the Subbasin. Each City regulates land use within their city and the County regulates land use in the unincorporated areas of the Subbasin.

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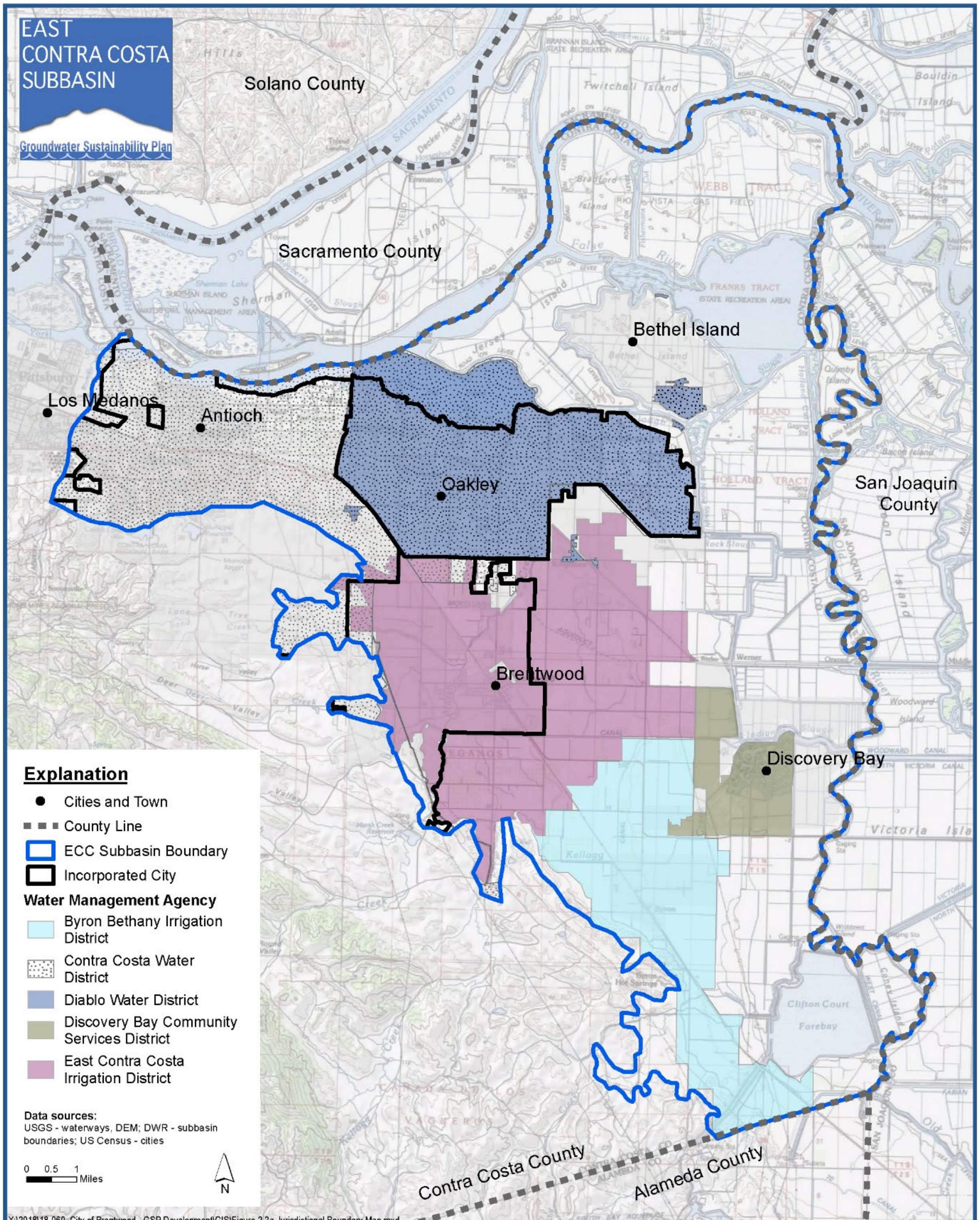
**East Contra Costa Subbasin, and Adjacent Subbasins**

**Figure 2-1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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**Jurisidictional Boundaries, Cities, Counties and Agencies with Water Management Responsibilities**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-2a**

### 2.1.1.3 Water Agency Jurisdictions and the East County Regional Water Management Association

The water agencies in East Contra Costa County are listed below with a description of their authorities and responsibilities. Each of the GSAs in the Subbasin belong to the East County Regional Water Management Association, in some capacity. Because of this association there is a long history of collaboration in water management decisions in the region. **Table 2-1** outlines the thirteen agencies joined together to form the Regional Water Management Group and their primary function (IRWMP, 2015). Seven of those members are GSAs, and they are described in more detail below.

**Table 2-1. Regional Water Management Group Members and Primary Function[1]**

| Member Agency | Water Supply/ Quality | Wastewater | Recycled | Stormwater/ Flood Management | Watershed/ Habitat |
|---|---|---|---|---|---|
| **City of Antioch** | X | X | X | X | X |
| **City of Brentwood** | X | X | X | X | X |
| **Byron-Bethany Irrigation District** | X | X[2] | | | |
| **Contra Costa County Flood Control** | | | | X | X |
| **Contra Costa County** | | X | | X | X |
| **Contra Costa Resource Conservation District** | X | | | | X |
| **Contra Costa Water District** | X | | | | X |
| **Delta Diablo** | | X | X | | |
| **Diablo Water District** | X | | | | |
| **Discovery Bay Community Services District** | X | X | | X | |
| **East Contra Costa County Habitat Conservancy** | X | | | | X |
| **East Contra Costa Irrigation District** | X | | | | |
| **Ironhouse Sanitary District** | | X | X | | |

[1] Source: 2015 IRWM Plan Update

[2] BBID provides management services and operations and maintenance support to the Byron Sanitary District, which provides wastewater and sewer services to Byron residents.

### *City of Antioch*

The City of Antioch is a public water purveyor that provides water to a population of approximately 108,000 (in 2015) within the service area (WYA, 2016); however, the City's total service area extends outside the Subbasin. Surface water is the City's only source of water supply and includes (for 2015, WYA, 2016): 1. surface water purchased from CCWD (12,000-acre feet per year [AFY]) 2. surface water diverted from the San Joaquin River through the City's intake (1,200 AFY), 3. Recycled water from Delta Diablo (50 AFY). Surface water is stored in a municipal reservoir and treated at the Antioch Water Treatment Plant. Recycled water is used to irrigate four parks and its municipal golf course. The City does not use groundwater for water supply, nor does it expect to use groundwater by the year 2040 (WYA, 2016).

### *City of Brentwood*

The City of Brentwood is a public water purveyor that provides water to a population of over 56,000 within the service area (B&C, 2016). The City's service area within the Subbasin is a subset of its total service area. The City's annual supply includes: 1. surface water purchased from CCWD (4,720 AFY pumped to the Randall Bold Water Treatment Plant (RBWTP) from the Rock Slough intake via the Contra Costa Canal), 2. groundwater from seven active wells with a capacity of 7,000 AFY), 3. surface water from ECCID (entitlement of 14,800 AFY pumped from Rock Slough through the Contra Costa Canal for treatment at the City of Brentwood Water Treatment Plant [COBWTP]) (B&C, 2016). In drought years, the City relies upon groundwater more than in normal years.

### *Byron-Bethany Irrigation District (BBID)*

BBID provides agricultural water to southeastern CCC. It is a public agency governed by an elected board of directors and was established for the purpose of providing water to the lands within Alameda County, Contra Costa and San Joaquin Counties. In 2012, BBID served 5,663 acres within CCC and delivered 18,484 AF of water (IRWIM, 2015). In 2014, CCWD began coordination with BBID to install an intertie between Byron Division Canal 45 and the CCWD Old River pipeline. This will facilitate water transfers with CCWD and/or storage of BBID water in the Los Vaqueros Reservoir for later use in the northern portions of the Byron Division. By July 2015, a portion of the project had been implemented. In 2015, 214 AF of groundwater from growers' wells was used to supplement surface water during the drought. Though some private pumping occurs, landowners predominantly rely on surface water allocation in the Byron and Bethany Divisions (AWMP, 2015).

### *Contra Costa Water District (CCWD)*

The CCWD was formed in 1936 to provide water for irrigation and industry. It is currently one of California's largest urban water districts that provides untreated and treated water to municipal, residential, commercial, industrial, landscape irrigation, and agricultural customers. It draws its water from the Delta primarily under a contract with the federal Central Valley Project (CVP). CCWD manages the Los Vaqueros Reservoir. The Contra Costa Canal is the backbone of CCWD conveyance system that was originally owned by the U.S. Bureau of Reclamation (USBR). CCWD is currently taking ownership of the Canal (expected by 2022) and will continue to operate and maintain the facility. Water is supplied to the canal from Rock Slough as well as from Old and Middle Rivers via pipelines. One of CCWD's two water treatment plants is located in the Subbasin (e.g., RBWTP in Oakley [jointly with DWD]). CCWD supplies water to the Cities of Antioch and Brentwood and Diablo Water District.

*Diablo Water District (DWD)*

DWD was established in 1953 to provide water to customers in downtown Oakley and now serves the City of Oakley, the Town of Knightsen, and some of Bethel Island.  It serves a population of about 42,000 people in a 21 square mile area (e.g., Oakley, Cypress Corridor, Hotchkiss Tract, and Summer Lakes, Bethel Island, and Knightsen). The majority (about 80% per CDM Smith, 2016) of water delivered is surface water supplied by CCWD and treated in RBWTP[1] (owned jointly with CCWD). Two municipal wells supplement DWD's surface water source providing about 2,000 AFY (CDM Smith, 2016).

*East Contra Costa Irrigation District (ECCID)*

ECCID is an independent special district established in 1926 to provide agricultural irrigation water to properties within ECCID (IRWM, 2019). ECCID boundaries include the City of Brentwood, and portions of the Cities of Oakley and Antioch and the unincorporated community of Knightsen. ECCID has a 1912 appropriative right to divert water from Indian Slough on Old River and also operates nine groundwater wells (IRWM, 2019*).* In 2012, ECCID pumped about 330 AF of groundwater.

*Town of Discovery Bay Community Services District (TODB)*

The TODB was formed in 1998 to provide over 15,000 residents with water, treatment, distribution, and storage. All the water supply is from six groundwater supply wells (IRWM, 2019) pumping about 3,000 AFY.

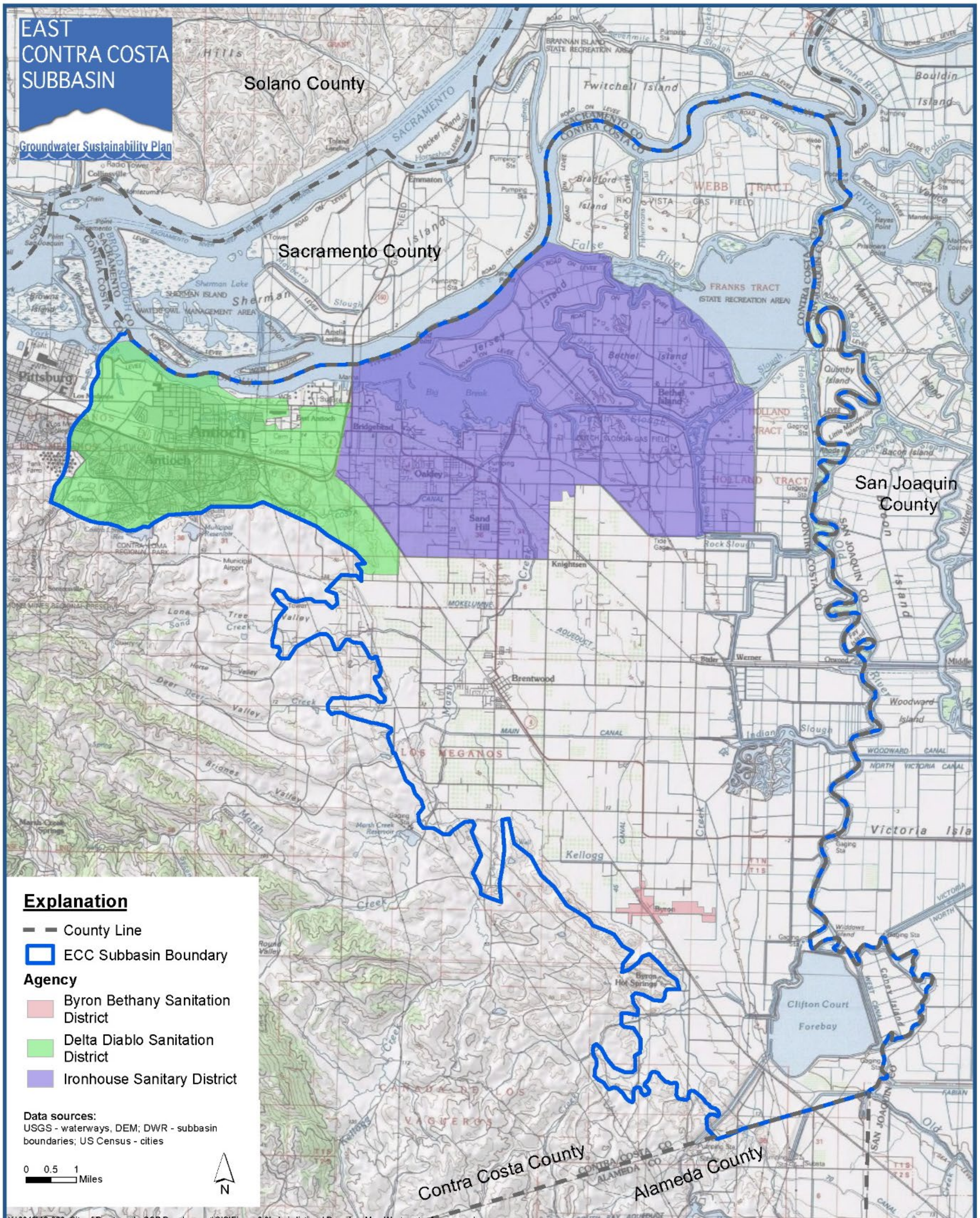
*Other Agencies*

Ironhouse Sanitary District (ISD) maintains sanitary services for nearly 30,000 customers in the Oakley and Bethel Island area (**Figure 2-2b**). Water is treated at its facility in Oakley California and recycled water is spread on its 3,600-acre Jersey Island fields, which are used for grazing of cattle. In addition, the fields are used for wildlife and habitat for waterfowl. ISD processes 4,800 AFY of recycled water and half is spread on ISD fields near the Oakley facility on Jersey Island to water hay fields and the other half is released into the San Joaquin River (SJR).

Delta Diablo (DD) District provides wastewater treatment and recycled water production for the City of Antioch, Bay Point and Pittsburg, however, only the City of Antioch is in the Subbasin. It treats 15,000 AFY of water (2016) and releases the treated water into New York Slough. It provides about 9,000 AFY of recycled water (treated domestic wastewater used more than once) used for cooling two power generating plants and irrigation of two golf courses and 12 city parks in the DD service area (**Figure 2-2b**).

Bethel Island Municipal Improvement District (BIMID) is responsible for maintaining levees and drainage on Bethel Island but also has the authority to create and maintain parks and playgrounds https://bimid.com/about-bimid/).

[1] Randall Bold Water Treatment Plant

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**Jurisdictional Boundaries,Wastewater Agencies**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-2b**

Byron Sanitary District[2] encompasses the unincorporated community of Byron and serves a population of 800. It is an independent special district with a five-member board of directors, and a General Manager. The wastewater treatment and disposal facility is located on 30 acres of land with 8 acres of evaporation ponds and 10 acres irrigated with treated effluent.

*Small Water Systems*

Small water systems and mutual water companies supply drinking water to communities between 2 and 199 service connections; or serve 25 or more people at least 60 days per year (days/yr). Three areas in the Subbasin (Bethel Island [twelve systems], Oakley [six systems], and Byron [four systems]) have small community water systems (15 to 199 service connections) that rely on groundwater as the only water supply source (IRWM, 2019, pg 2-31). Small community water systems are regulated by Contra Costa Environmental Health[3].

#### 2.1.1.4 Federal, State, Tribal, and Special District Jurisdictions

Other entities have authority and responsibilities within the Subbasin that need to be considered when developing a GSP. **Figure 2-3** shows Federal-owned and state-owned lands and the agency with jurisdiction over the land. Dutch Slough (managed by DWR) is 1,187 acres of land that is being transformed into tidal marsh to provide habitat for salmon and other native fish and wildlife. In addition, the map includes lands owned and managed by East Bay Regional Park District (a special district) that preserves natural and cultural resources in Alameda and Contra Costa Counties.

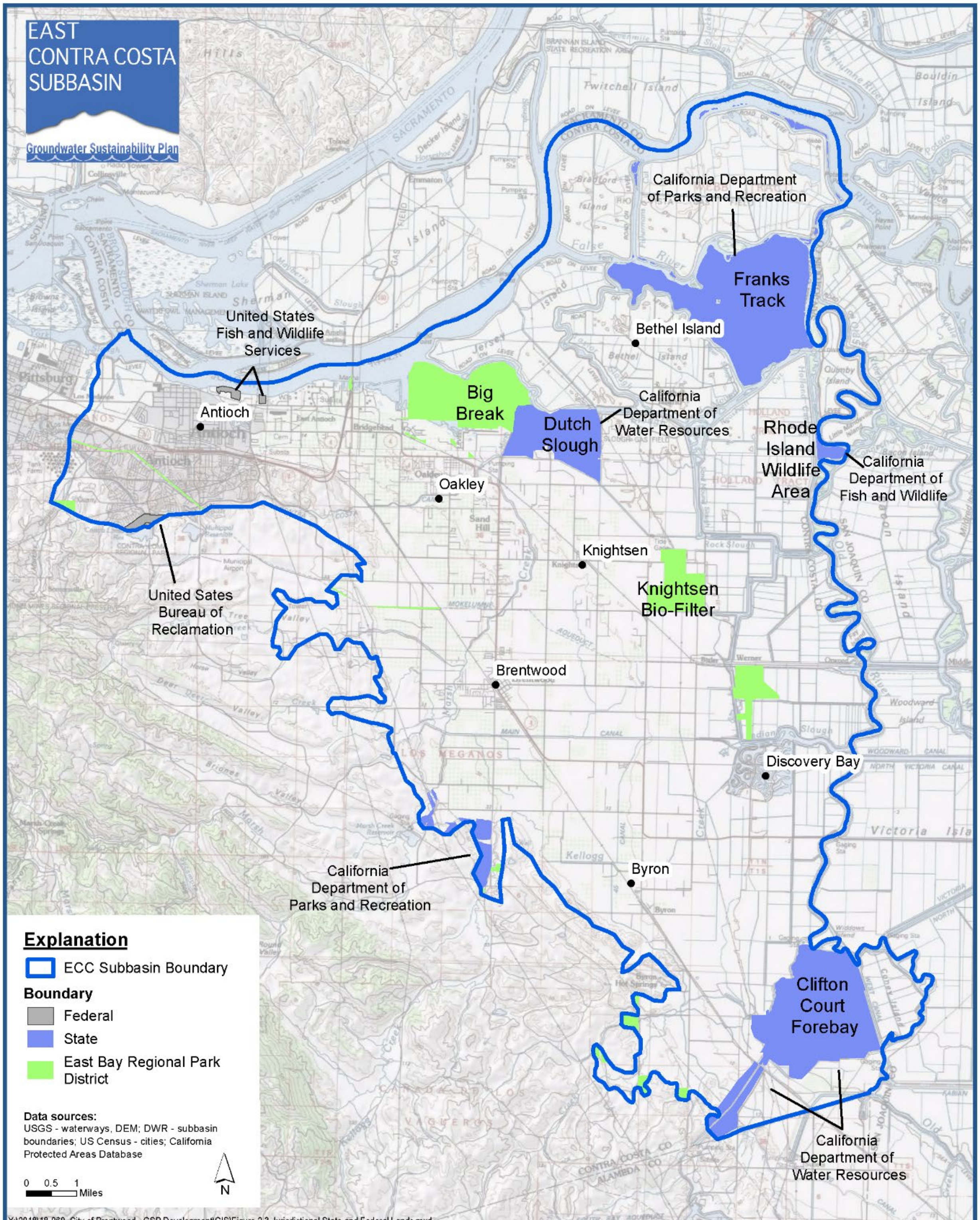
There are no known federally designated tribal lands or tribes in the Subbasin. The Sonoma Northwest Information Center (NWIC) (Sonoma State) searched for sacred lands, and none were found in the area. The Native American Heritage Commission (NAHC) record search returned no information for the Subbasin. NAHC further recommended contacting individual tribal leaders and provided a list of seven people for the GSAs to contact. On April 18, 2019, a separate email was sent to each person recommended by NAHC requesting information on whether there was knowledge of sacred lands in the vicinity of the Subbasin, followed by a phone call. To date, we received no responses identifying federally designated tribal lands in the East Contra Costa Subbasin.

#### 2.1.1.5 Major Water Related Infrastructure

Major water-related infrastructure in the Subbasin **Figure 2-4** is relied upon by multiple cities, water agencies and private water users. These facilities deliver supplies to GSA members and to the State Water Project (SWP) including the California Aqueduct and the Delta Mendota Canal.

[2] Source: https://contracostasda.specialdistrict.org/byron-sanitary-district-3715f00

[3] In addition to small community water systems listed above there are also Local Small Water Systems (2-4 connections), State Small Water Systems (5-14 connections), as well as non-community public water systems all regulated by Contra Costa Environment Health.

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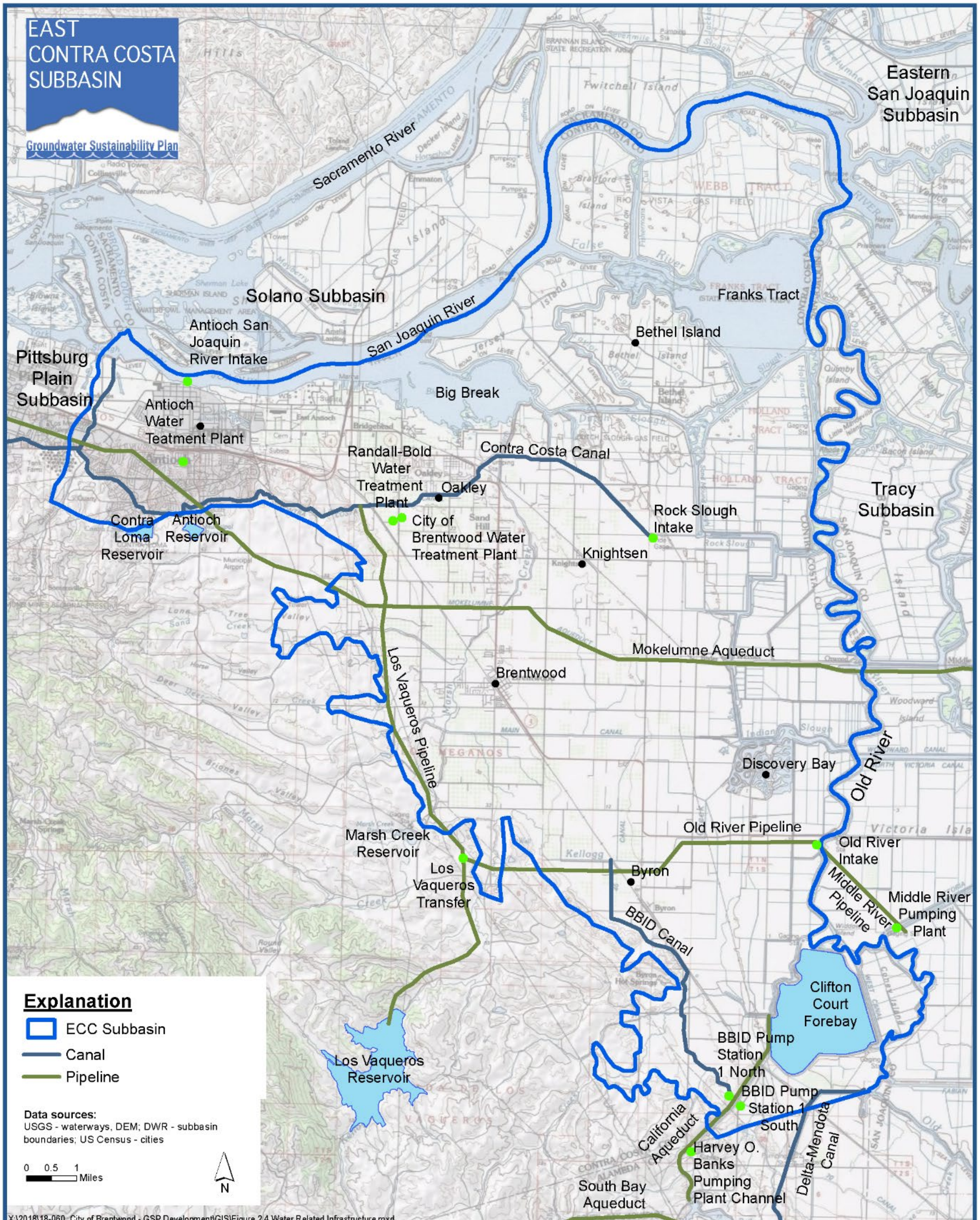
**Jurisdictional Boundaries, State, Federal Lands, and Special Districts**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-3**

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**Water Related Infrastructure**

**Figure 2-4**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

*Contra Costa Water District Facilities*

The Contra Costa Water District facilities in the ECC Subbasin are shown on **Figure 2-4.** CCWD jointly owns RBWTP with DWD which has been operated by CCWD since the plant came online in 1992. Raw water is conveyed to the RBWTP from the Rock Slough intake via the Contra Costa Canal (operated by CCWD) as well as from the Old River and Middle River intakes via pipelines. Water can be stored in the Los Vaqueros Reservoir from the Old River and Middle River intakes during periods of low salinity (winter and spring) in the Delta. It is then later used (late summer and early fall) to blend with raw water from the Rock Slough intake when high salinity conditions are experienced in the Delta. Surface water supplies for the City of Brentwood originate from Rock Slough. The supply is transported through the Contra Costa Canal for treatment at the City of Brentwood Water Treatment Plant (COBWTP). CCWD supplies water to the City of Antioch from diversions at the Middle River (Victoria Canal), Rock Slough, and Old River. The Los Vaqueros Reservoir Phase 2 Expansion project would increase capacity from 160,000 to 275,000-acre feet and is scheduled for completion by 2027. This expansion will improve water supply reliability while protecting Delta fisheries.

*Byron-Bethany Irrigation District Facilities*

BBID service area is both within the ECC Subbasin (Byron Division) and in the Tracy Subbasin (Bethany Division, raw water service area (RWSA) 1 and 2, and CVP Service Area). The water supply distribution system for the Byron, Bethany Divisions and RWSA1 includes pump stations on the intake channel at the Harvey O. Banks Pumping Plant (**Figure 2-4**). BBID Pump 1 diverts the District's pre-1914 water supply north to the Byron Division and south to the Bethany Division and RWSA 1.

*State Water Project (SWP)*

Clifton Court Forebay is part of the SWP and serves as the starting point of the California Aqueduct, which delivers water to Southern California. In addition, it provides water via the Delta-Mendota Canal to the San Joaquin Valley. The Harvey O. Banks Pumping Plant at Clifton Court Forebay lifts the water from the Delta into the California Aqueduct (**Figure 2-4**). Eleven pumps at the Banks Pumping Plant (2.5 miles southwest of Clifton Court Forebay) pull water from Old River. This water has been diverted from the Sacramento River near Walnut Grove (via Delta Cross Channel and Snodgrass Slough) to the Mokelumne River into the SJR and then south up Old River.

#### 2.1.1.6 Sacramento-San Joaquin River Delta (the Delta)

The Sacramento-San Joaquin Delta is the center of California's water supply, providing fresh water to the majority of the state's population and to millings of acres of farmland. It is the largest estuary on the West Coast and provides critical habitat to fish and wildlife species. The East Contra Costa Groundwater Subbasin is located on the southwestern part of the Delta. The Delta is a 1,300 square mile area where the Sacramento, San Joaquin, and Mokelumne Rivers come together that was once a tule marsh. In the mid to late 1800s and early 1900s, settlers installed a levee system that formed many of the islands. When the islands were dewatered for agricultural development, land subsidence resulted from oxidation of organic soils, some Delta Islands in the Subbasin have lowered more than 15 feet in response to peat oxidation (not related to groundwater extraction). Problems facing the delta are compounding because subsiding delta islands and rising sea levels would increase pressure on the levees and rising sea level would and push salt water further into the delta.

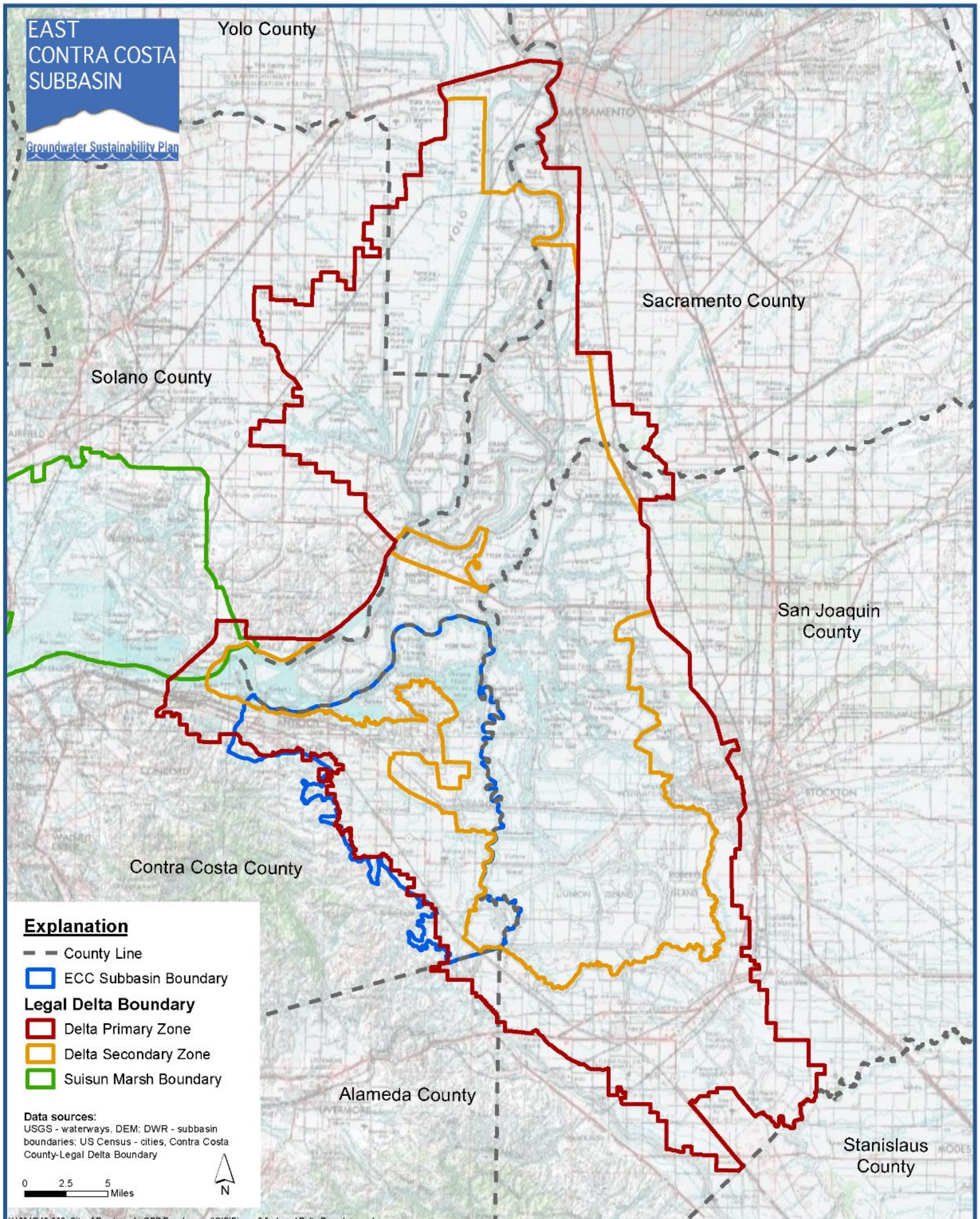
The Delta is composed of three zones. The Primary Zone is the center of the Delta (**Figure 2-5a, b**), the largest zone (490,050 acres) and is primarily rural farmland but includes a few small towns[4]. The Secondary Zone includes 247,320 acres of farmland and cities and suburbs. The third area (Suisun Marsh) is northwest of the Primary Zone and not discussed in this section. Two state agencies have land use jurisdiction in the Delta: Delta Stewardship Council described in the Delta Plan, 2013, and the Delta Protection Commission (DPC). The Council and the DPC have concurrent jurisdiction in the Delta's Primary Zone to ensure that local land use planning is consistent with their own laws and plans.

About two-thirds of the islands and tracts in the Sacramento-San Joaquin Delta are below sea level and are surrounded by levees that protect the land from floods and high tides. There are more than 1,100 miles of levees in the delta contracted to protect farmland. The predominant land use of the islands in the ECC Subbasin is agriculture with a small population of farm workers. Agencies with responsibilities for levee maintenance and drainage systems in the Subbasin include: BIMID, RD 2024 (Orwood and Palm Tracts), RD 2025 (Holland Tract), RD 2026 (Webb Tract), RD 2059 (Bradford Island), RD 2065 (Veale Tract), RD 2090 (Quimby Island), RD 2121 (Bixler Tract), RD 2137 (Dutch Slough Restoration Project site), RD 799 (Hotchkiss Tract, planned residential development and ecological restoration project), RD 800 (Byron Tract and Discovery Bay), RD 830 (Jersey Island owned by ISD and recycled water used to grow hay).

### 2.1.2 Density of Wells

The density of different well types provides a general distribution of agricultural, industrial and domestic well users and identify communities dependent on groundwater; another tool to understand groundwater use in the Subbasin. Well data and well construction information were obtained from DWR's well completion report database, ECC pumping records, and from DWR's Well Completion Report Map Application (DWR, 2019). DWR Well Completions Report Map Application is an interactive mapping tool that displays submitted well completions reports. DWR categorizes wells in the mapping application as either domestic, production and public supply, and this database was used to create **Figures 2-6a**, **b**, and **c**. **Figure 2-6a** illustrates the well density of domestic wells by each Public Land Survey System (PLSS) township-range and section (typically a 1-mile by 1-mile square grid). This map indicates that the highest density of domestic wells occurs along an east-west swath between Knightsen and Brentwood, as well as near Byron. The domestic wells are considered de minimis extractors, pumping less than two AF annually and would collectively pump less than 2,000 AFY. **Figure 2-6b** illustrates the well density of production wells per square mile and shows the highest density of these types of wells to be located in the vicinity of Oakley, Knightsen, and Brentwood, with others located in the Town of Discovery Bay and Byron. DWR defines "production wells" as "those wells that are designated as irrigation, municipal, public, or industrial on Well Completion Reports". **Figure 2-6c** illustrates the well density of public supply wells, with the highest density of public supply wells occurring in the Town of Discovery Bay. The DWR database allows the wells to be filtered for planned use and wells with the designation of Irrigation-Agriculture are illustrated on **Figure 2-6d** with the highest density of these wells om the Knightsen/Oakley area.

[4] The Delta Plan, Ensuring a reliable water supply for California, a healthy Delta ecosystem, and a place of enduring value.

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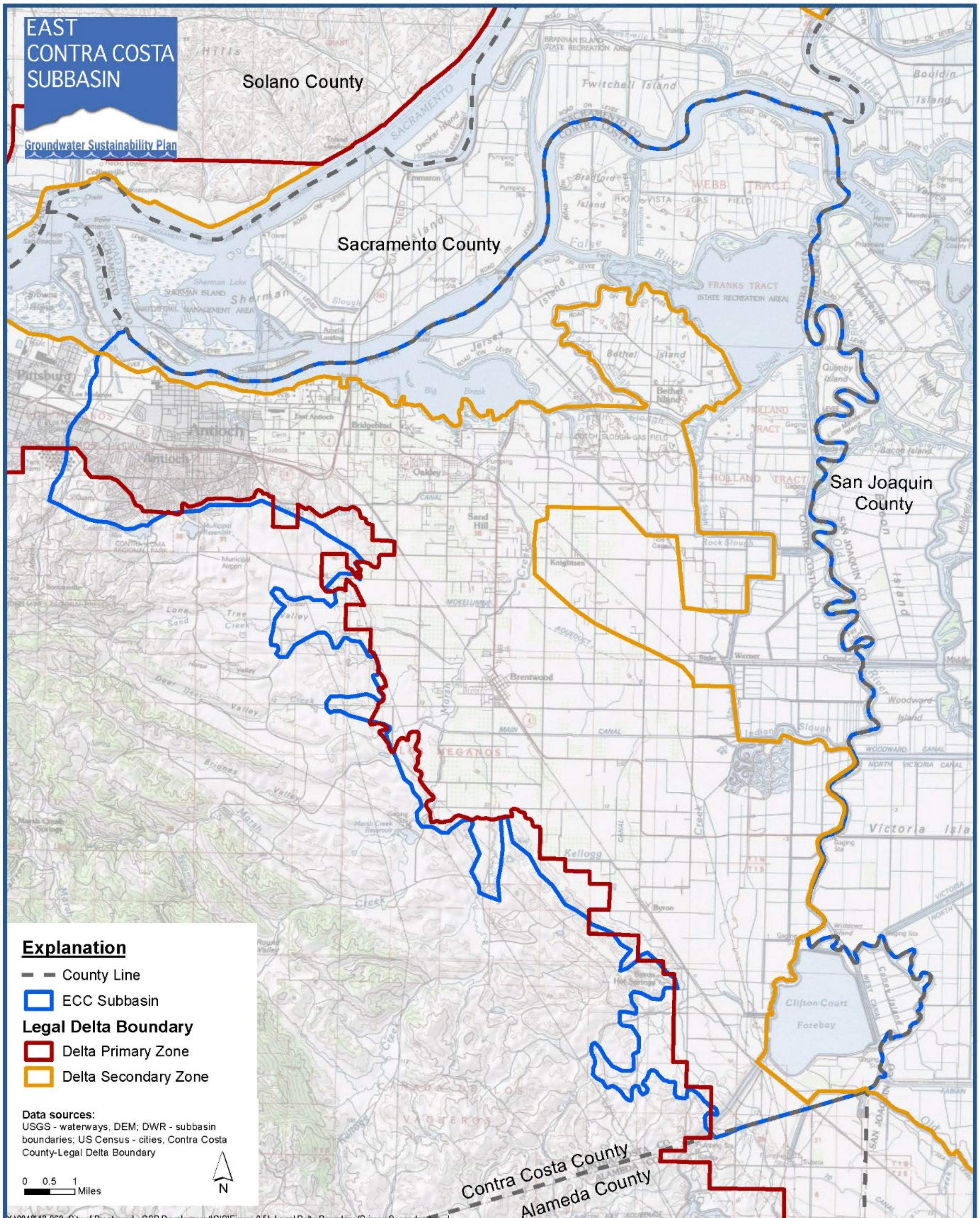
**Legal Delta Boundary**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-5a**

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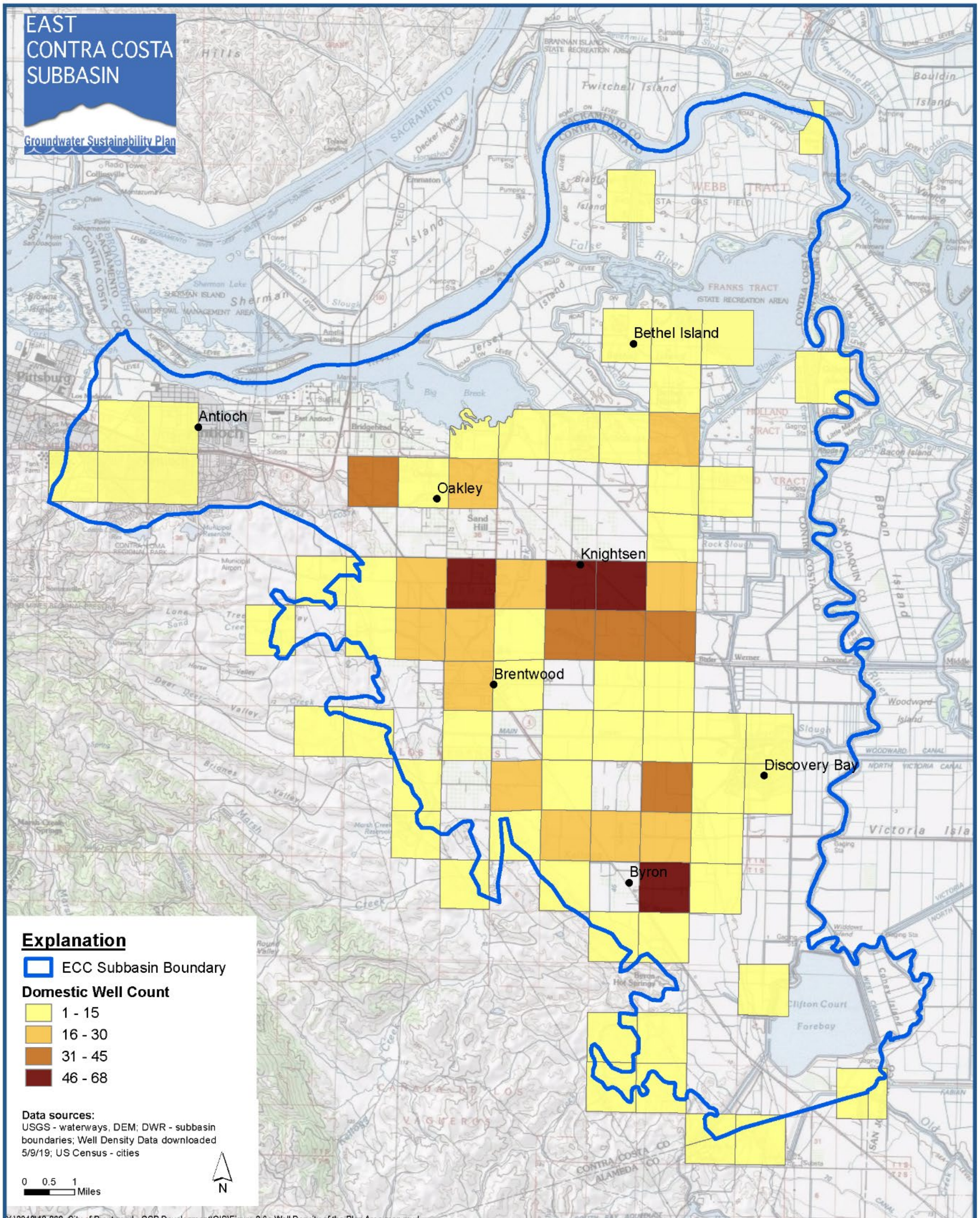
**Legal Delta Boundary- Primary and Secondary Zones**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-5b**

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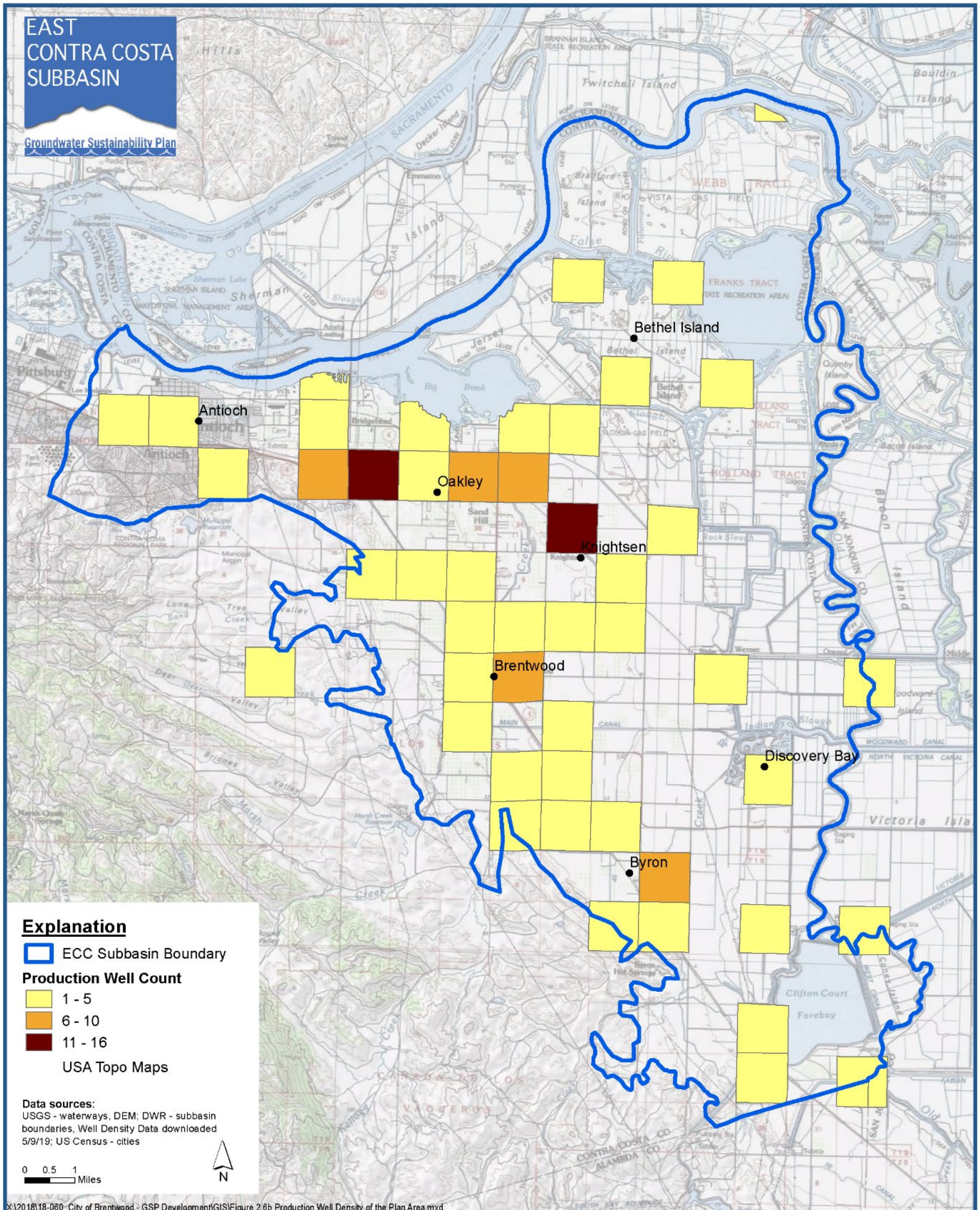
**Domestic Well Density per Square Mile**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-6a**

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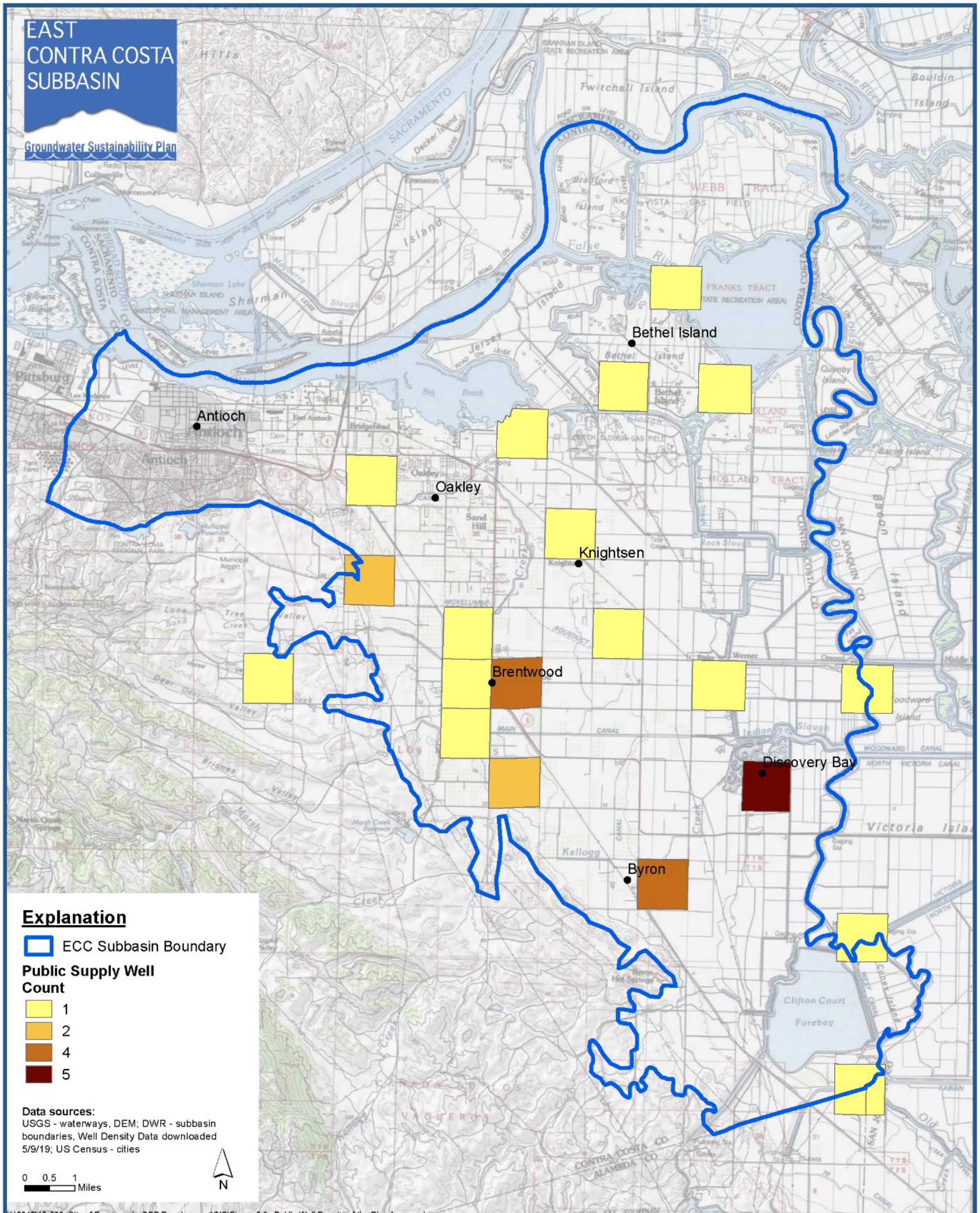
**Production Well Density per Square Mile**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-6b**

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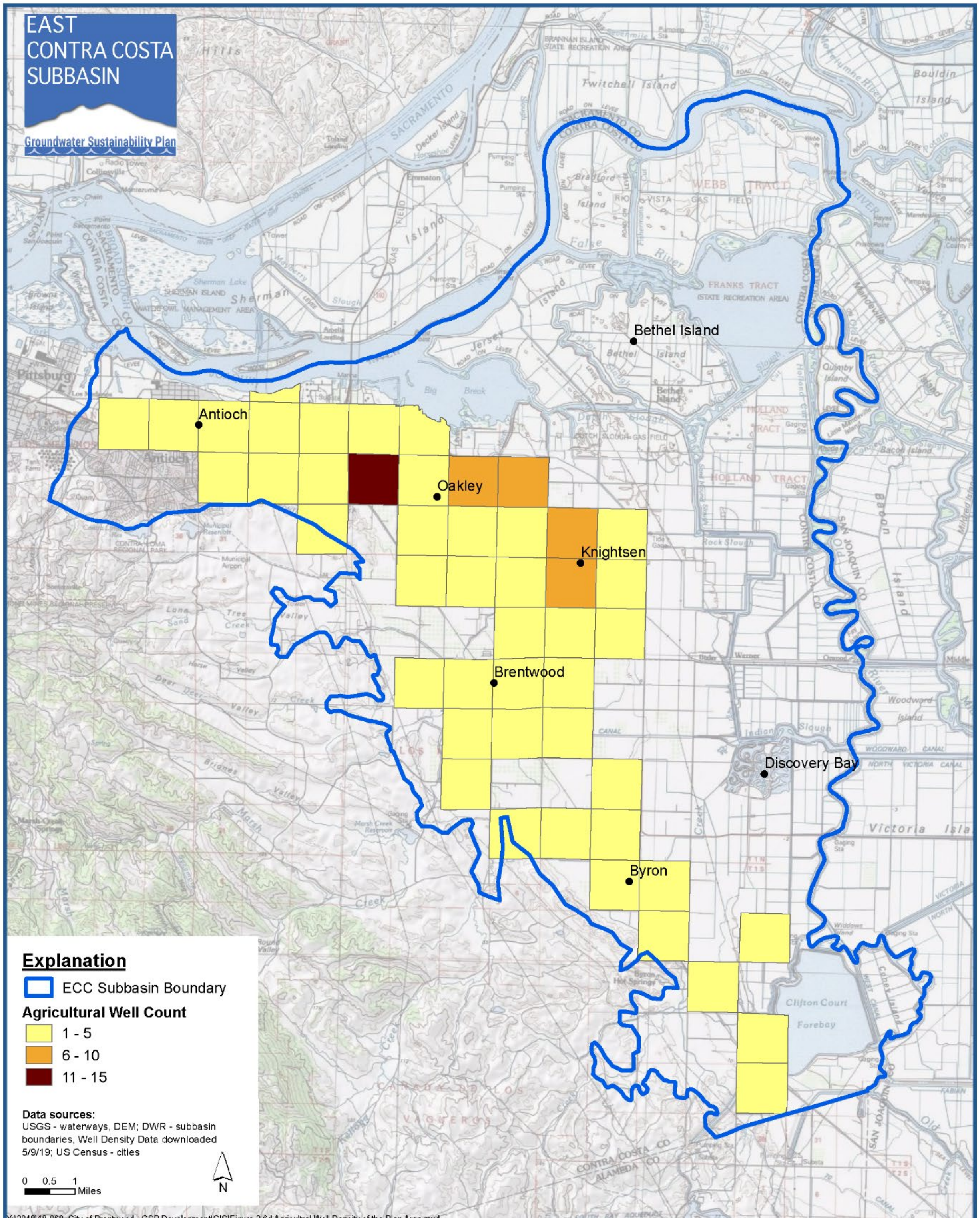
**Public Supply Well Density per Square Mile**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-6c**

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**Agricultural Well Density per Square Mile**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-6d**

The DWR well completion database contains over 5,000 wells historically drilled in the Subbasin. The DWR mapping application estimates the number of wells in ECC at approximately 1,180 wells. The difference between the two sources is thought to be due to wells that are inactive or destroyed. **Table 2-2** summarizes well types by use for the wells in the DWR Well Completion Report Map Application. Based on DWR's map application, the estimated well density ranges from approximately 1 to 68 wells per square mile, but as stated above, there are uncertainties associated with the DWR well coverage that may double count wells and/or include missing and incorrect values.

**Table 2-2. Types of Wells[1]**

| Type of Well | Total Wells |
|---|---|
| Domestic | 975 |
| Production | 156 |
| Public Supply | 51 |
| Agricultural | 136 |
| **TOTAL** | **1,182** |

**[1]DWR SGMA Data Viewer – Well Reports Statistics in ECC Subbasin; downloaded on May 9, 2019**

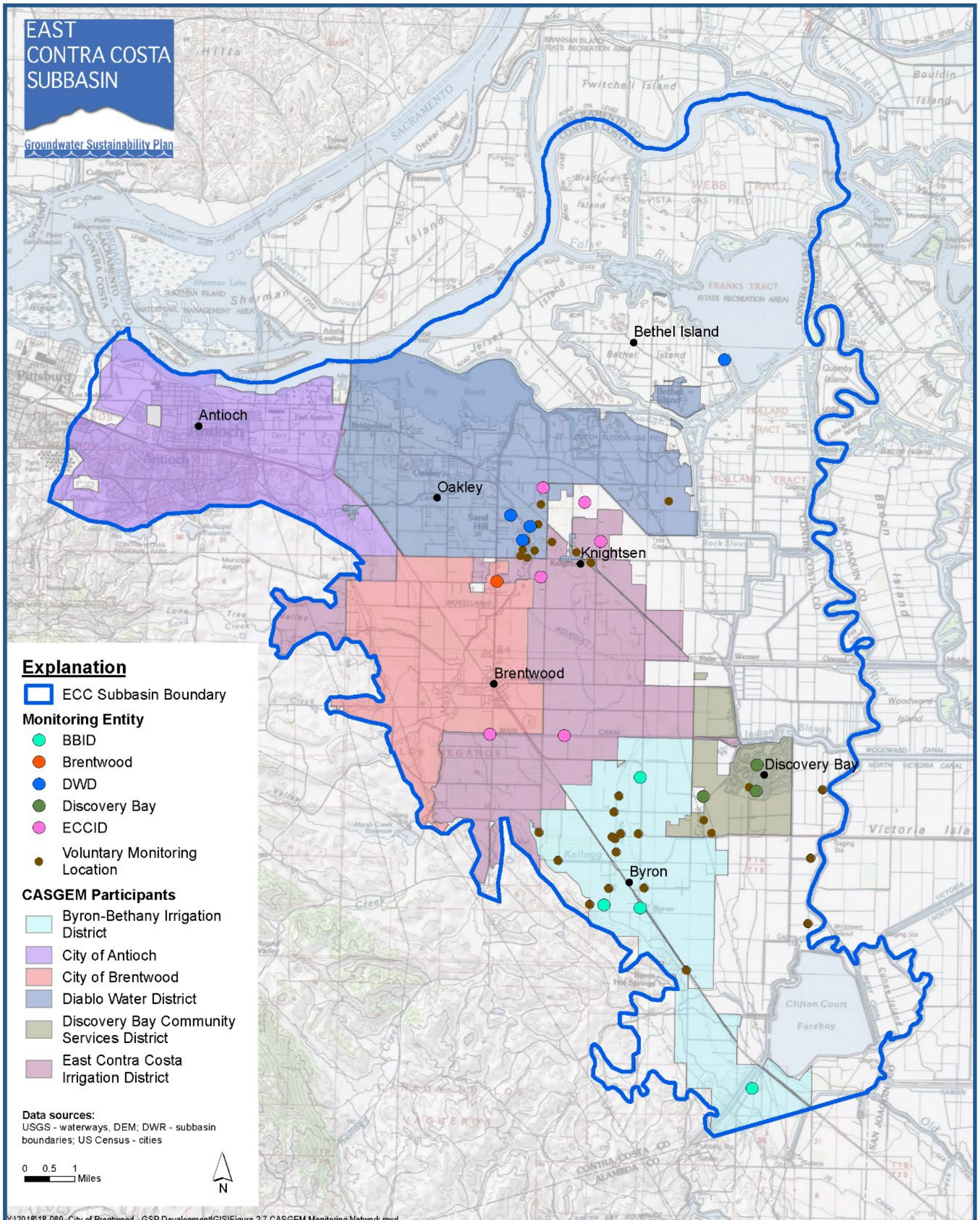
## 2.2 Water Resources Monitoring and Management Programs[5] (10727G) (§354.8c, d, and e)

### 2.2.1 CASGEM and Historical Groundwater Level Monitoring

The East Contra Costa County California Statewide Groundwater Elevation Monitoring (CASGEM) Network tracks seasonal and long-term groundwater level trends. The ECC CASGEM Network began in 2011 and is managed by DWD; it was updated in 2014 and updated again in 2018. **Figure 2-7** displays the CASGEM network of 27 wells by monitoring entity. In addition, BBID, DWD, ECCID, and TODB voluntarily share groundwater depth data for over an additional 20 wells. Once the GSP is implemented it will replace the CASGEM Monitoring Plan. The GSP monitoring well groundwater levels will be entered into the SGMA Monitoring Network Module (MNM) instead of CASGEM. However, voluntary or non-SGMA wells data will still upload the CASGEM Operating System.

Historically, groundwater levels have been monitored by various agencies since the 1950s. Numerous reports were prepared to evaluate these data and groundwater conditions in the basin and include: An Initial investigation of Ground Water Resources (LSCE, 1999) that serves as a baseline for future groundwater conditions reports, DWD Groundwater Management Plan (GMP) (LSCE, 2007), and Groundwater Quality Monitoring Plan (GQMP) (LSCE, 2018).

[5] It is not clear at this time how these programs will change with the development and implementation of the GSPs.

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**ECC CASGEM Monitoring Network**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-7**

### 2.2.2 Department of Water Resources (DWR) and EWM

DWR takes annual measurements (spring and fall) in three wells in the ECC Subbasin that are included in the Subbasin CASGEM well network. In addition, DWR manages the EWM (it used to be called the Water Data Library and then CASGEM). The EWM includes historical groundwater level measurements since the early 1900s and periodic water quality data.

### 2.2.3 Groundwater Ambient Monitoring and Assessment Program (GAMA)

As part of the GAMA program, the State Water Resources Control Board (SWRCB) collects data from water agencies and private well owners and makes it available to the public. The data aide interpretation of groundwater quality and monitoring efforts.

### 2.2.4 GeoTracker

The SWRCB provides data for sites that have impacted water quality including groundwater. These records contain not only general mineral and contaminated constituent concentrations but also groundwater levels.

### 2.2.5 California Division of Drinking Water (DDW)

Formerly the Department of Health Services, DDW is a division of the SWRCB that regulates public drinking water systems. They asses the quality of the drinking water and identify specific water quality problems. Public water system (PWS) wells are to meet Title 22 water quality requirements and DDW provides these PWS data to the public.

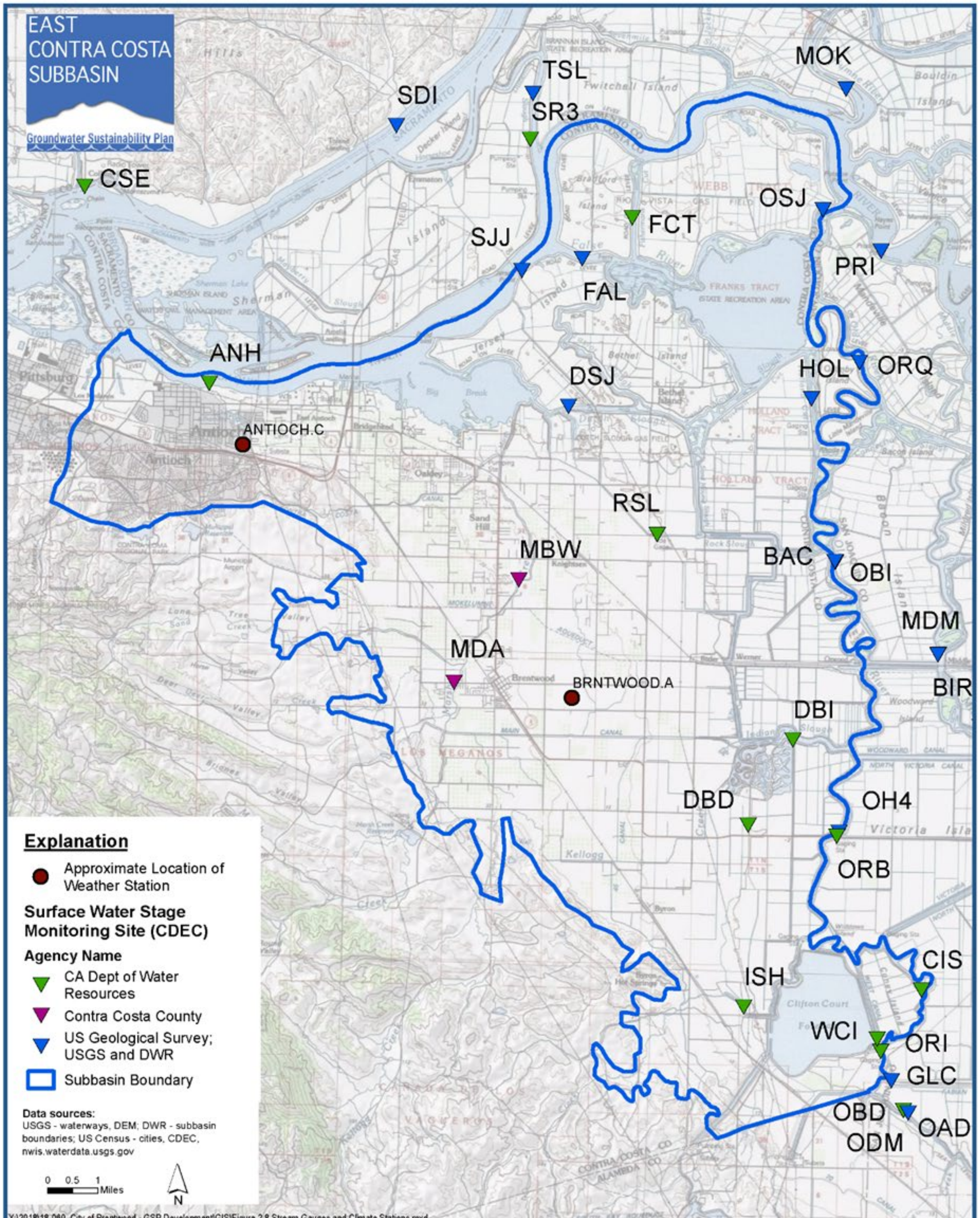
### 2.2.6 U.S. Geological Survey (USGS)

USGS monitors wells for water levels and water quality generally for special projects (i.e., not on a regular monitoring schedule). The USGS makes the data available for public on the National Water Information System (NWIS) website. The USGS maintains a series of stream gauges in the vicinity of the Subbasin. Fifteen of the USGS stream gauges have historical data and are currently active in the Subbasin (**Figure 2-8**).

### 2.2.7 Subsidence Monitoring

Subsidence monitoring in the Subbasin consists of a Continuous Global Positioning System (CGPS) station managed by the Plate Boundary Observatory/UNAVCO. These stations were generally constructed to monitor motions caused by plate tectonics, but they are also used for other applications (e.g., assessing subsidence). UNAVCO GPS (P256) is located in the ECC Subbasin with measurements starting in 2005.

Additional subsidence monitoring in adjacent subbasins includes DWR Surveying/spirit leveling (Solano and Yolo Subbasin), USGS Interferometric Synthetic-Aperture Radar (InSAR) (Delta-Mendota Subbasin), and an extensometer in the Yolo Subbasin.

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**Stream Gauges and Climate Stations**

**Figure 2-8**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

### 2.2.8 Climate Monitoring

The locations for two climate stations (Antioch and Brentwood) are shown on **Figure 2-8.** Climate is discussed in more detail in Chapter 5 of the GSP.

### 2.2.9 Incorporating Existing Monitoring Programs into the GSP

The existing monitoring programs listed above will provide the basis for the GSP monitoring program. Specifically, the CASGEM Network will provide the foundation of groundwater level data, as described in more detail in Chapter 3.3 of this document that describes the GSP Monitoring Program. In addition, the GSP monitoring program will incorporate production well water quality data as well as monitoring data from existing stream gauges.

### 2.2.10 Limits to Operational Flexibility

The existing monitoring programs are not anticipated to limit the operational flexibility of this GSP. The current groundwater monitoring programs will form the basis of the future GSP monitoring program. This includes some CASGEM wells for water levels, proposed dedicated groundwater monitoring wells (water level and quality), DDW monitoring for water quality and existing subsidence monitoring stations as appropriate. No existing groundwater management or monitoring programs are expected to limit the operational flexibility of the groundwater Subbasin.

### 2.2.11 Conjunctive Use

The majority of water used in the ECC Subbasin is surface water (e.g., the City of Antioch purchases surface water only from CCWD and has a water right to river diversion water). Conjunctive use programs (coordinated use of surface water and groundwater) in the ECC Subbasin are currently implemented and planned by individual agencies.

CCWD receives its water from the Sacramento-San Joaquin Delta and in recent years it has used Los Vaqueros Reservoir to help improve water quality and as an emergency supply resource (LSCE, 2007).

The City of Brentwood primarily receive surface water deliveries and pump groundwater on an as needed basis.

TODB operates solely on groundwater and has multiple pumping wells in the town's boundary.

DWD uses 80% surface water (CVP provides water and DWD also purchases surface water) and has the capacity to pump groundwater to meet up to 20% of the demand in its service area.

Both ECCID and BBID are able to operate fully on surface water in nearly all water years. ECCID has groundwater wells in its area to help meet water demands as needed. In 2000, the two agencies entered an agreement with CCWD that allows them to sell water to CCWD during drought years and allows CCWD to purchase a smaller amount in non-drought years (LSCE, 2007).

## 2.3 Land Use Elements or Topic Categories of Relevant General Plans (§354.8a and f)

Land use is a key factor in determining water demand. Changing land use conditions and irrigation practices are also factors that affect water demand from year to year.

### 2.3.1 Current and Historical Land Use

General land use conditions based on DWR survey data for CCC are illustrated in **Figures 2-9** through **2-11** and summarized in **Table 2-3** and **Figure 2-12**. The 2015 land use in the Subbasin is mainly agricultural (41%), followed by urban (about 23%), then by water and native vegetation (both about 14%) (source: DWR Crop Mapping Delta 2015 geospatial dataset[6]). The crop types with the highest land use coverage in the Subbasin are pasture (14%) and field crops (12%). Outside of the Subbasin, the existing land use is mainly field crops, truck crops and pasture **(Figure 2-9)** in the delta area.

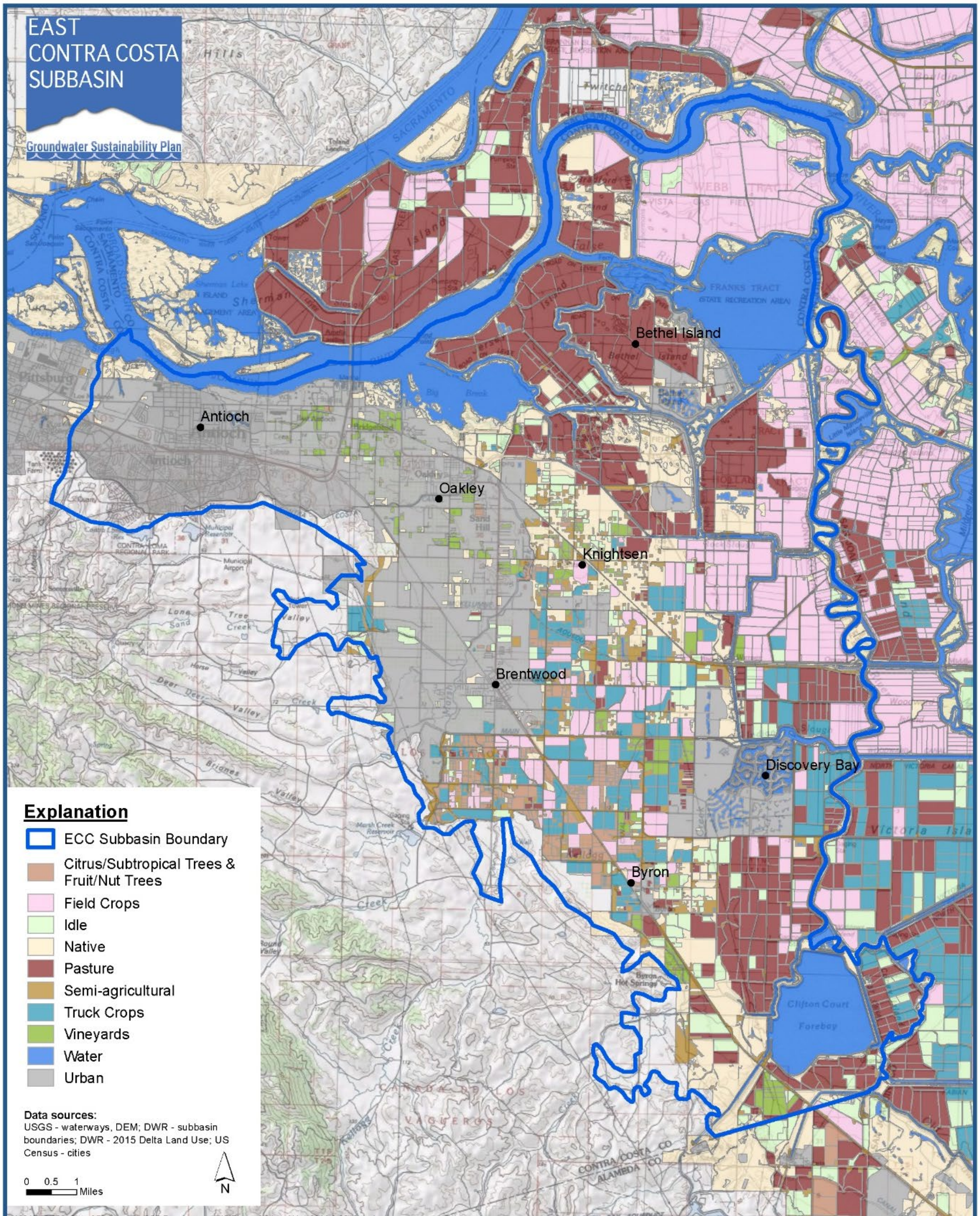
**Table 2-3. Land Use Summary**

| Land Use Designation | 1976 | | 1995 | | 2015 | |
|---|---|---|---|---|---|---|
| | acres | % | acres | % | acres | % |
| **Field Crops Total[1]** | 23,153 | 22% | 18,195 | 17% | 13,467 | 13% |
| **Idle** | 916 | 1% | 5,754 | 5% | 3,527 | 3% |
| **Native[2]** | 25,040 | 23% | 23,400 | 22% | 15,581 | 15% |
| **Fruit/Nut Trees & Citrus/Subtropical Trees** | 12,057 | 11% | 6,398 | 6% | 1,947 | 2% |
| **Pasture** | 12,979 | 12% | 11,087 | 10% | 14,809 | 15% |
| **Semi-agricultural[3]** | 797 | 1% | 868 | 1% | 6,276 | 6% |
| **Truck Crops** | 7,747 | 7% | 6,800 | 6% | 5,428 | 5% |
| **Urban[4]** | 9,726 | 9% | 19,231 | 18% | 23,523 | 23% |
| **Vineyards** | 848 | 1% | 876 | 1% | 1,980 | 2% |
| **Water** | 14,368 | 13% | 14,868 | 14% | 14,926 | 15% |
| **Total[5]** | **107,632** | **100%** | **107,477** | **100%** | **101,462** | **100%** |

**Source and Abbreviations:**
California Open Data Portal, https://data.ca.gov/dataset/crop-mapping-delta-2015, accessed June 2019. Also used 2014 data for areas not covered by 2015 mapping.
California Department of Water Resources, https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Land-Use-Surveys, accessed June 2019

1- Includes land designated as Grain and Hay in 1976.
2- Includes land designated as Native, Native Riparian, Native Vegetation.
3-Includes incidental to agricultural, farmsteads, feed lots, dairies, lawns, cemeteries.
4- Includes land designated as Recreation in 1976.
5-Total area differs due to different survey areas monitored. Total about 107,000 acres (168 square miles).
6-1995 and 2015 Surveys have land that was not surveyed and was given "Not Designated" description.

[6] California Open Data Portal, https://data.ca.gov/dataset/crop-mapping-delta-2015, accessed June, 2019.

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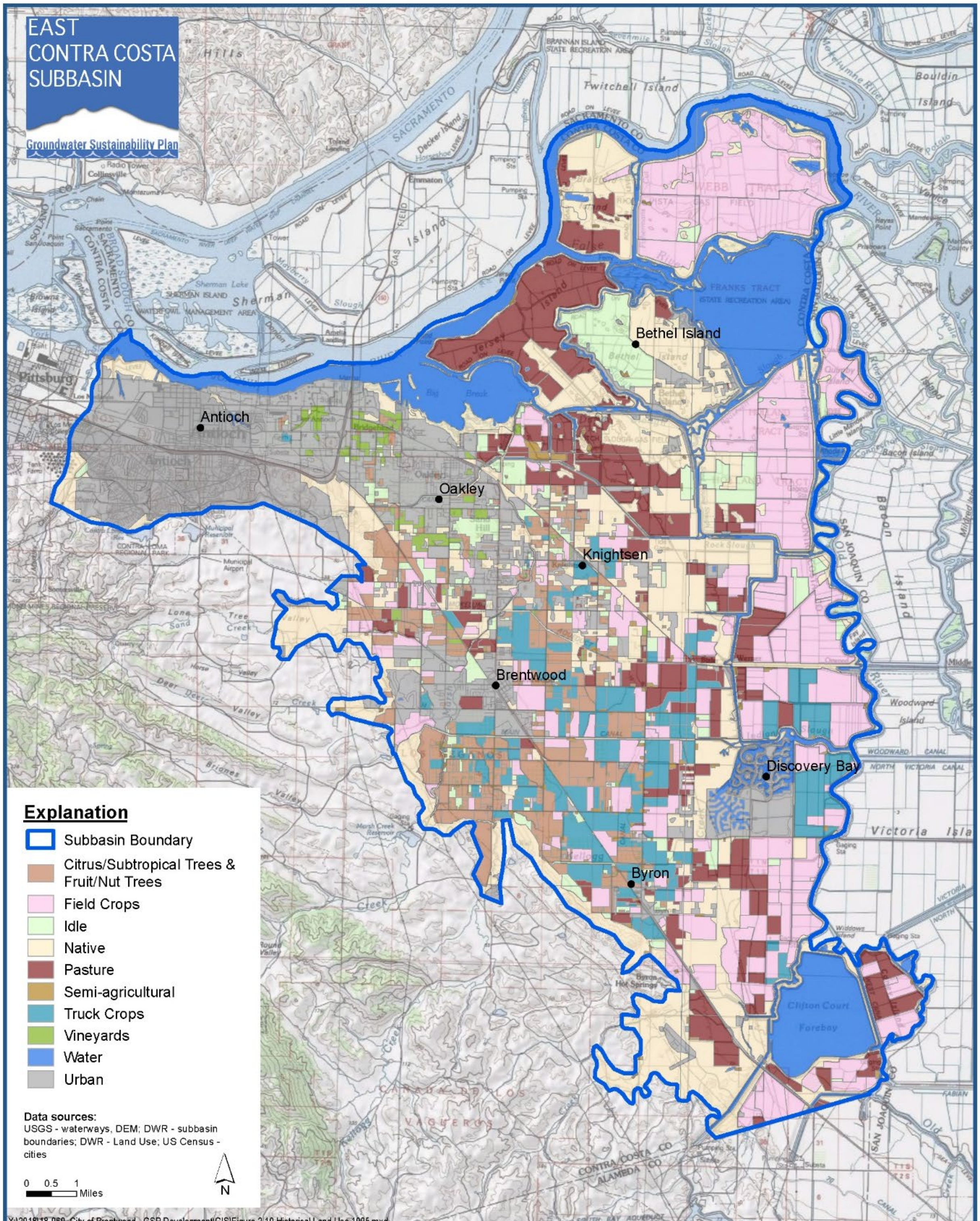
**Land Use- 2014 & 2015**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-9**

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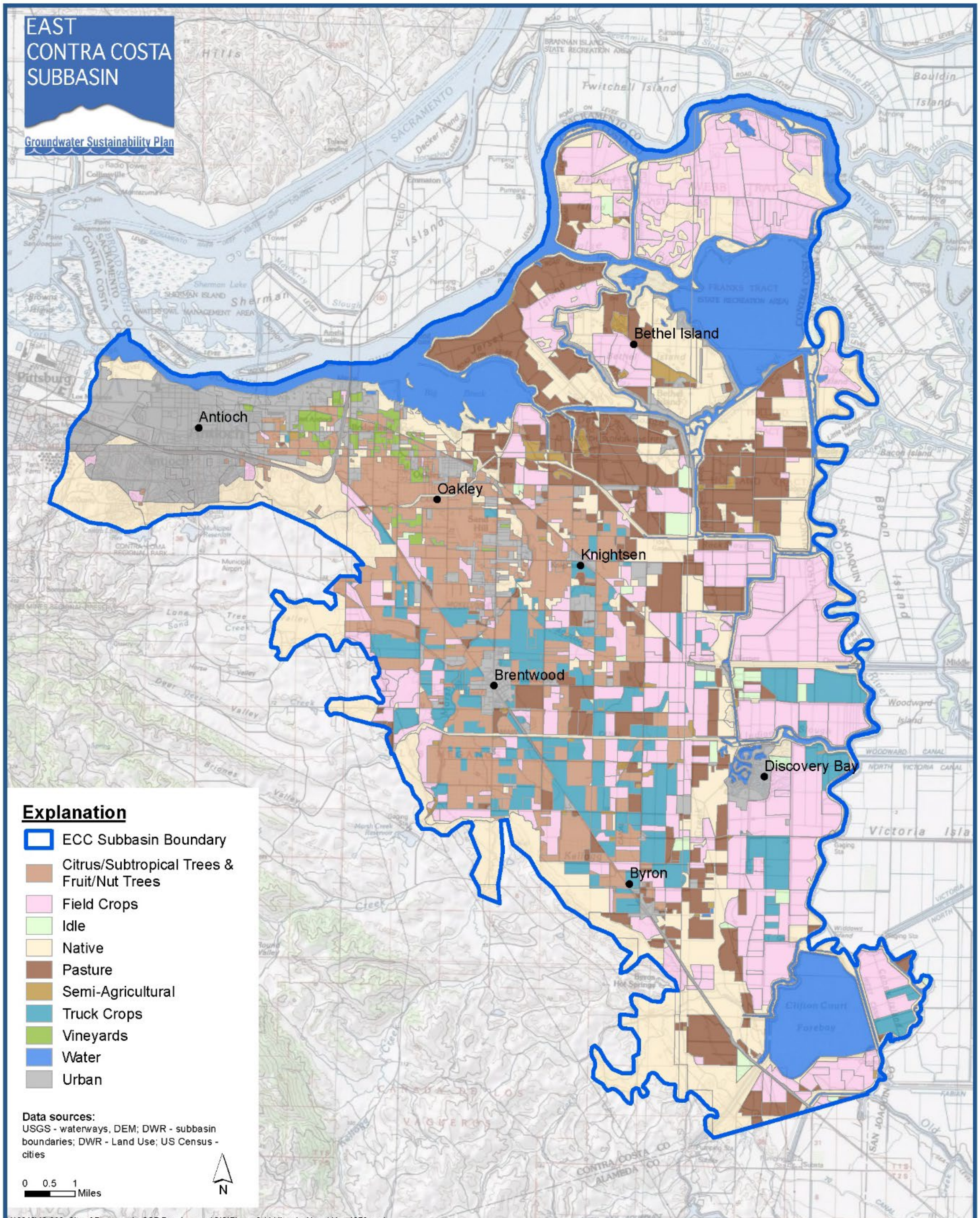
**Historical Land Use-1995**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-10**

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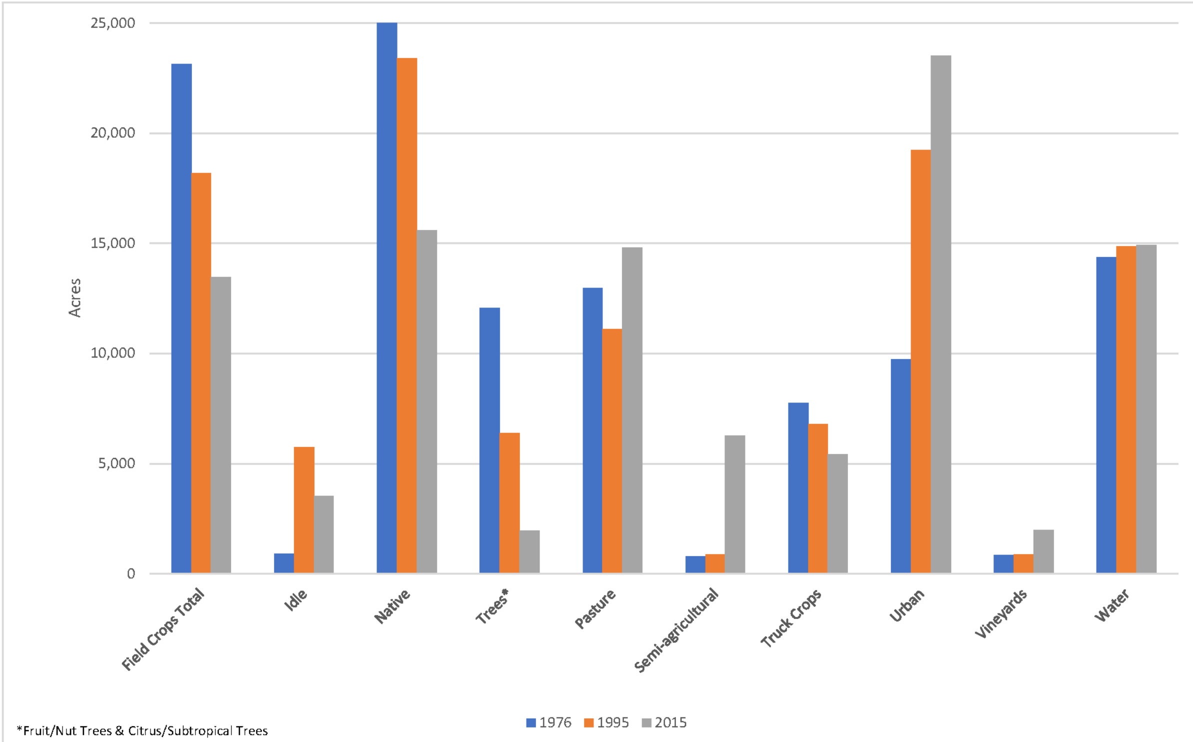
**Historical Land Use-1976**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-11**




Land Use Summary

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 2-12

**Figures 2-10** and **2-11** illustrate historical land use for the years 1995 and 1976, respectively. **Table 2-3** and **Figure 2-12** summarize land use trends over a 40-year span (1976 to 2015) that shows increasing urban lands and decreasing agricultural (field crops and fruit trees) and native lands. Chapter 4.1 provides additional detail on current and historical land uses.

### 2.3.2 Disadvantaged Area: DAC, SDAC and EDA

Nearly 35% of the ECC Subbasin is considered a Disadvantaged Area and (**Table 2-4** and **Figure 2-13a**), which accounts for almost 20% of the population of the Subbasin (**Table 2-5** and **Figure 2-13b)**. The term "Disadvantaged Area" includes the severely disadvantaged communities (SDAC), disadvantaged communities (DAC), and economically distressed areas (EDA), (collectively referred to as Disadvantaged Area [DA]).

There are 15,253 people in 5,610 acres of land in the ECC Subbasin that are categorized as a DAC, an additional 17,689 people in 5,095 acres are designated as SDACs, making approximately 18% of the 178,618 population and 10% of the 107,600 acres of the ECC Subbasin covered by DACs and SDACs. DACs are areas identified as having a median household income (MHI) of less than 80% of the California statewide annual MHI, and SDACs have an MHI of less than 60% of the statewide MHI. The DAC/SDAC acreage is based on the Median Household Income ($63,783) for 2012-2016 US Census American Community Survey (ACS) and in accordance with data from DWR's DAC Mapping Tools. The areas within the Subbasin identified as DACs and SDACs are displayed on **Figure 2-13**. A summary of DAC area by Census geography type (e.g., Census Block Groups, Census Place, and Census Tracts) is included in **Table 2-4**.

There are 2,645 people in 26,389 acres of land in the ECC Subbasin that are categorized as an EDA. The areas within the Subbasin identified as EDAs are displayed on **Figure 2-13a**, and **2-13b**. A summary of EDA areas by Census geography type (i.e., by Tracts and Blocks) is included in **Table 2-4 (by area)** and **Table 2-5 (by population)**. The EDAs by Tract and Block fulfill three criterion: EDA Criterion 1 and 2 municipality with MHI of less than 85% of the Statewide MHI and a population of less than 20,000; and EDA Criterion 3 has a low population density (less than or equal to 100 persons/square mile). The total percentage of people in the Subbasin comprising EDAs is about 2% and 24.5% percent of land are considered EDAs.

**Table 2-4. Summary of Disadvantaged Areas by Area**

| Area Description | Acres[1] | Percent of Subbasin | Cumulative Acres[1] | Cumulative Percent of Subbasin |
|---|---|---|---|---|
| **East Contra Costa Subbasin** | **107,596** | **100%** | **107,596** | **100%** |
| | | | | |
| **Disadvantaged Communities[2]** | | | | |
| Census Block Groups | | | | |
| SDAC | 1,512 | 1.41% | 1,512 | 1.41% |
| DAC | 3,218 | 2.99% | 4,730 | 4.40% |
| Census Place | | | | |
| SDAC | 3,583 | 3.33% | 8,313 | 7.73% |
| Census Tracts | | | | |
| DAC | 2,392 | 2.22% | 10,705 | 9.95% |
| **Total Census Block Group and Tract DACs & SDACs** | | | **10,705** | **9.95%** |
| | | | | |
| **Economically Distressed Areas[3]** | | | | |
| Census Tract and Block | | | | |
| Total EDA | 26,389 | 24.53% | 26,389 | 24.53% |
| | | | | |
| **Total DACs, SDACs, and EDAs for All Census Geographies** | | | **37,095** | **34.5%** |

[1] Areas calculated using geographic projection NAD 1983 California Teale Albers.

[2] DAC = Disadvantaged Community: $38,270 < median household income [MHI] < $51,026.
SDAC = Severely Disadvantaged Community: MHI < $38,270 (60% of statewide MHI).

[3] EDA=Economically Distressed Area: a municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 20,000 persons or less, with an annual median household income that is less than 85% of the Statewide median household income, and with one or more of the following conditions as determined by the department: (1) financial hardship, (2) unemployment rate at least 2% higher than the Statewide average, or (3) low population density. (Water Code §79702(k)).

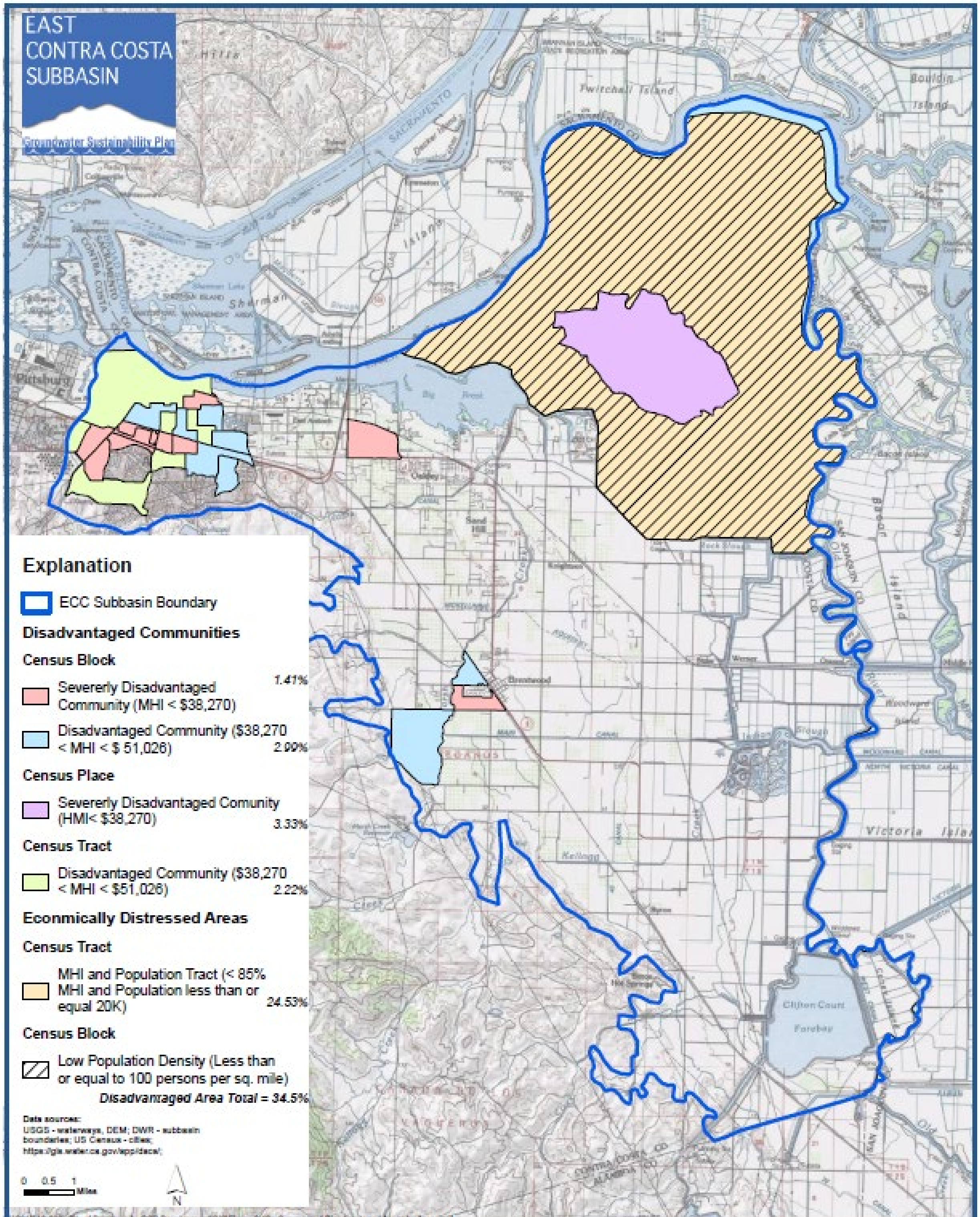
**Table 2-5. Summary of Disadvantaged Areas by Population**

| Area Description | Population[1] | Percent of Subbasin | Cumulative Population[1] | Cumulative Percent of Subbasin |
|---|---|---|---|---|
| **East Contra Costa Subbasin** | **178,618** | **100%** | **178,618** | **100%** |
| | | | | |
| **Disadvantaged Communities[2]** | | | | |
| Census Block Groups | | | | |
| SDAC | 15,490 | 8.67% | 15,490 | 8.67% |
| DAC | 13,684 | 7.66% | 29,174 | 16.33% |
| Census Place | | | | |
| SDAC | 2,199 | 1.23% | 41,373 | 17.56% |
| Census Tracts | | | | |
| DAC | 1,569 | 0.88% | 32,942 | 18.44% |
| **Total Census Block Group and Tract DACs & SDACs** | | | **32,942** | **18.44%** |
| | | | | |
| **Economically Distressed Areas[3]** | | | | |
| Census Tract and Block | | | | |
| **Total EDA** | **2,645** | **1.48%** | **2,645** | **1.48%** |
| | | | | |
| **Total DACs, SDACs, and EDAs for All Census Geographies** | | | **35,587** | **19.9%** |

[1] Population calculated using Census Tract data.

[2] DAC = Disadvantaged Community: $38,270 < median household income [MHI] < $51,026.
SDAC = Severely Disadvantaged Community: MHI < $38,270 (60% of statewide MHI).

[3] EDA=Economically Distressed Area: a municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 20,000 persons or less, with an annual median household income that is less than 85% of the Statewide median household income, and with one or more of the following conditions as determined by the department: (1) financial hardship, (2) unemployment rate at least 2% higher than the Statewide average, or (3) low population density. (Water Code §79702(k)).

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**Summary of Disadvantaged Areas by Area**

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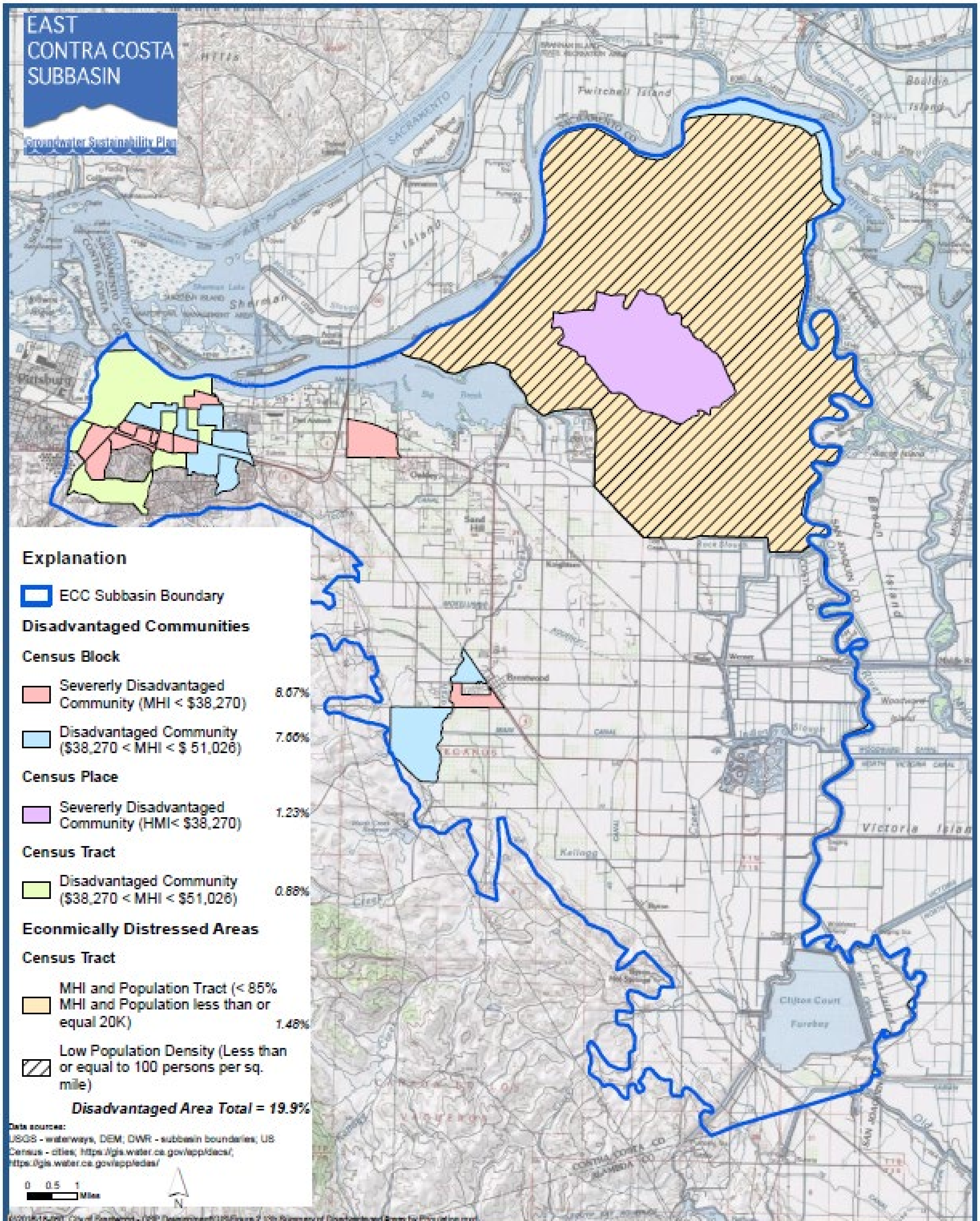
*Contra Costa County, California*

**Figure 2-13a**

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**Summary of Disadvantaged Areas by Population**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-13b**

### 2.3.3 Water Use Sector and Water Source Type

SGMA regulations define "water use sector" as "categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation[7]." **Figure 2-14** shows the distribution of the water use sectors in the Subbasin. Agriculture is the predominant water use sector followed by urban (Cities of Antioch, Oakley, Brentwood, and Discovery Bay) and native vegetation.

The Subbasin has three water source types: surface water (primary source about 80,000 AFY); groundwater (secondary source about 8,000 AFY); and recycled water (about 2,700 AFY) (IRWMP, 2019, based on 2010 Urban Water Management Plans). Land use by water source in the ECC Subbasin is shown in **Figure 2-15.** Conjunctive use of surface water and groundwater is practiced throughout much of the Subbasin. Urban centers water sources vary The City of Antioch uses surface water exclusively, while the Cities of Brentwood and Oakley (water provided by DWD) use a combination of surface water and groundwater, and the Town of Discovery Bay uses only groundwater. ECCID and BBID hold water rights to divert surface water from Old River and meet remaining demand with groundwater. The unincorporated portions of the Subbasin generally have surface water as the water source however, these amounts are not quantified. The exceptions to this are domestic users and small community water systems which rely on groundwater. The Ironhouse Sanitary District uses recycled water to irrigate crops for animal feed on Jersey Island (2,700 AF in 2010).

### 2.3.4 General Plans

Four entities in the ECC Subbasin have land use authority[8] (**Figure 2-16**), which is an important factor in water management. Below is a description of the plans and how they may affect implementing the GSP. The Town of Discovery Bay does not have land use authority; however, the Town can advise the County on decisions affecting land use. The following section describes policies in the Plans related to water resources management in the ECC Subbasin. General Plans in the ECC Subbasin include:

- Contra Costa County General Plan (CCCDCD,2005)
- City of Antioch General Plan (LSA, 2003)
- City of Brentwood General Plan (DNPG, 2014)
- City of Oakley General Plan (CoO, 2016)

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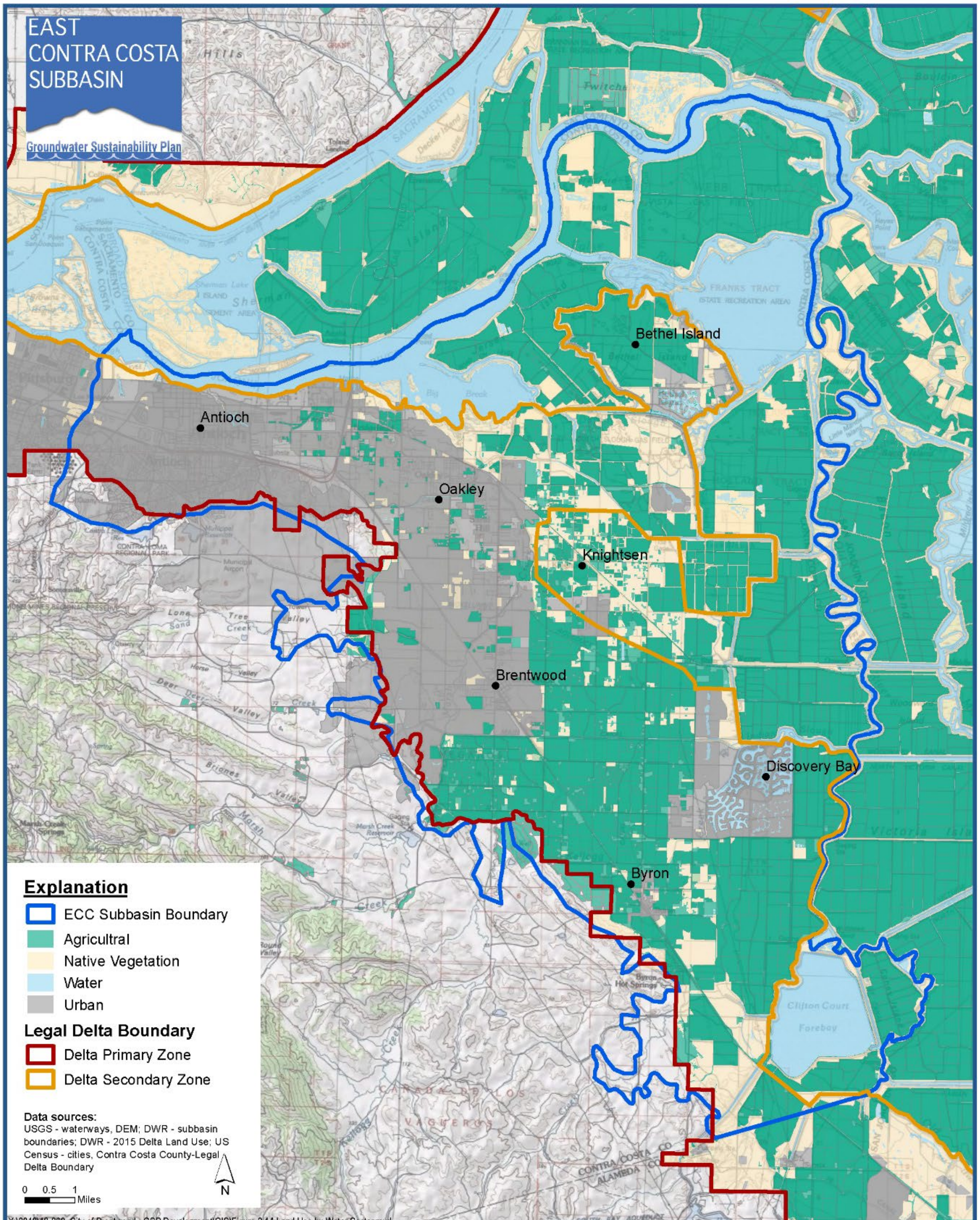
[7] California Code of Regulations, Title 23. Waters, Division 2. Department of Water Resources, Chapter 1.5. Groundwater Management, Subchapter 2. Groundwater Sustainability Plans, Article 2. Definitions

[8] CC County -Title 8, Zoning
https://library.municode.com/ca/contra_costa_county/codes/ordinance_code?nodeId=TIT8ZO
City of Brentwood – Title 17, Zoning
http://qcode.us/codes//brentwood/?view=desktop&topic=17-viii-17_467-17_467_002
City of Antioch – Title 9, Planning and Zoning
https://codelibrary.amlegal.com/codes/antioch/latest/overview
City of Oakley – Title 9 Land Use Regulation
https://www.codepublishing.com/CA/Oakley/

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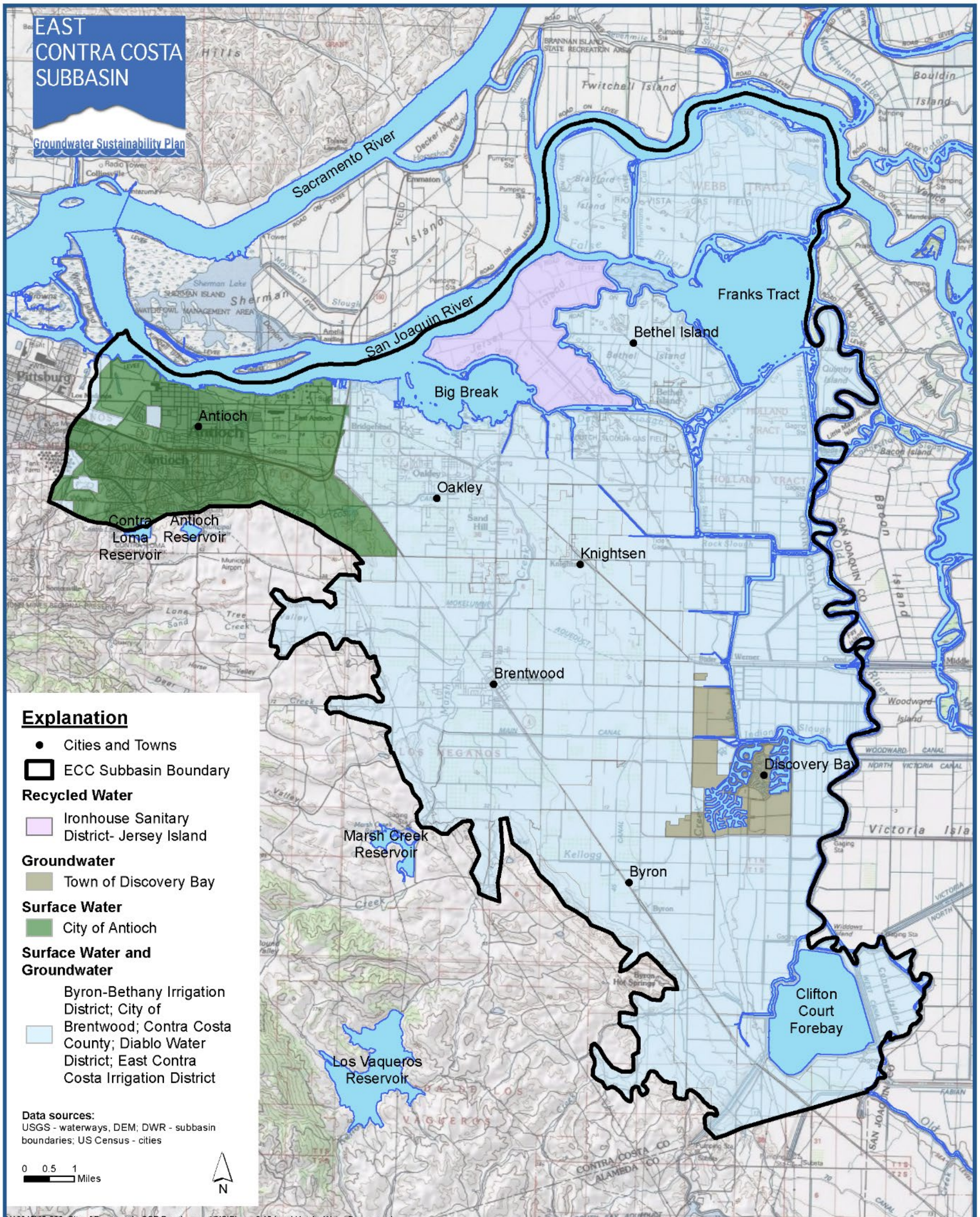
**Land Use by Water Sector**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 2-14**

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**Land Use by Water Source (2010)**

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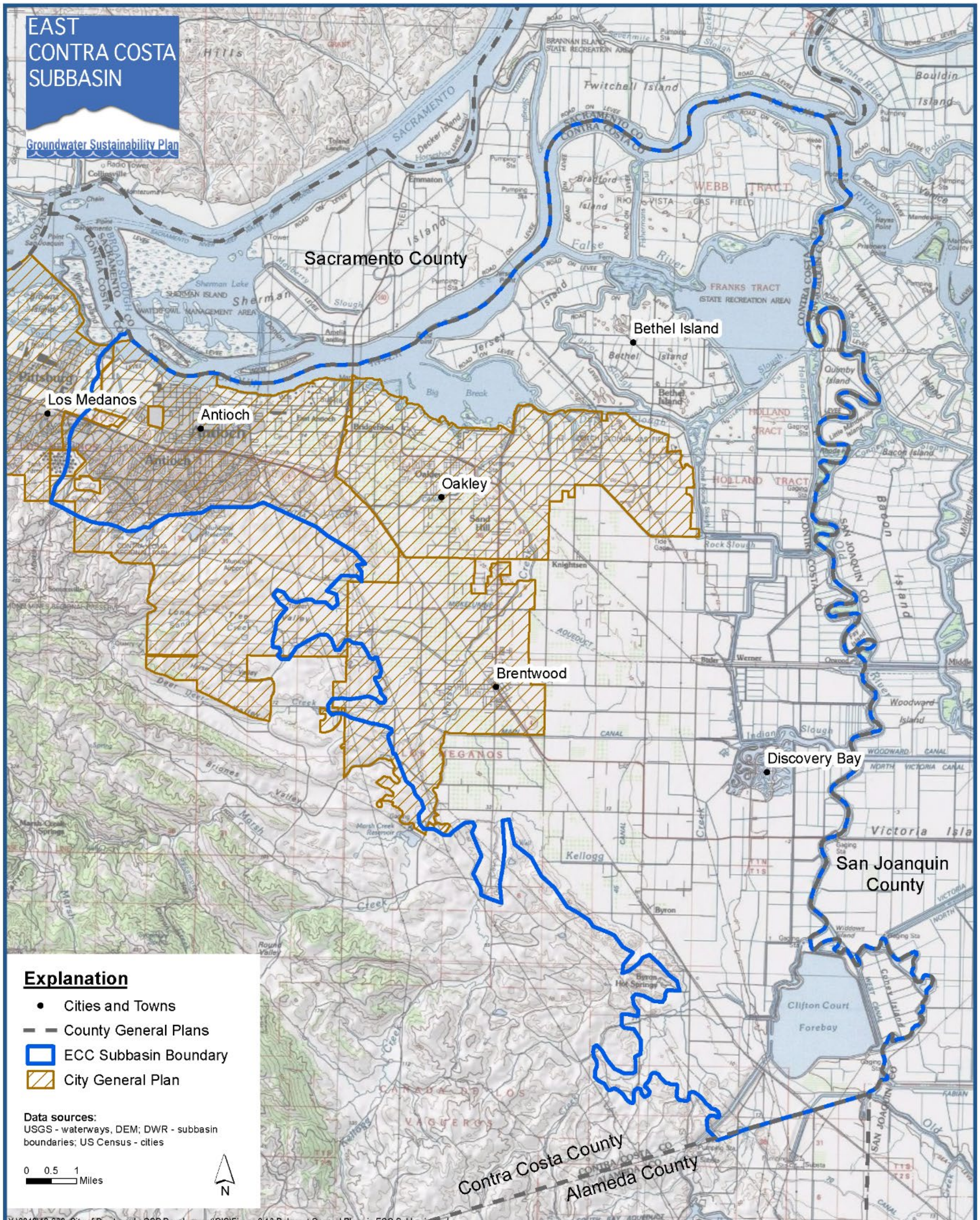
*Contra Costa County, California*

**Figure 2-15**

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**Relevant General Plans in ECC Subbasin**

**Figure 2-16**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

#### 2.3.4.1 Contra Costa General Plan

The planned land use for the Subbasin is outlined in the Contra Costa County General Plan (CCCGP). The CCCGP was developed for 2005 to 2020 (CCC, 2005). Currently the county is working on a comprehensive update to the General Plan; a draft is anticipated to be ready for review in 2021. The county is mandated by California Government Code (§65350-65362) to prepare a General Plan to help and guide future development in the county as related to land use, development, and conservation. It describes that much of the county's future growth (2000 to 2010) was planned along the Pittsburg-Antioch corridor.

In regard to conservation the CCCGP developed five overall policies:

- 8-1. Resource utilization and development shall be planned within a framework of maintaining a healthy and attractive environment.
- 8-2. Areas that are highly suited to prime agricultural production shall be protected and preserved for agriculture and standards for protecting the viability of agricultural land shall be established.
- 8-3. Watersheds, natural waterways, and areas important for the maintenance of natural vegetation and wildlife populations shall be preserved and enhanced.
- 8-4. Areas designated for open space/agricultural uses shall not be considered as a reserve for urban uses and the 65 percent standard for non-urban uses must not be violated.
- 8-5. In order to reduce adverse impacts on agricultural and environmental values, and to reduce urban costs to taxpayers, scattered urban development in outlying areas shall be precluded outside the urban limit line.

#### 2.3.4.2 City of Antioch General Plan

The City of Antioch prefers that development not outpace infrastructure. The City foresees that a lot of development will occur in the area and requires developers to pay for infrastructure improvements so current infrastructure will not be overly stressed. The City also wants the infrastructure to be outlined prior to completing development to avoid want temporary work arounds. The City anticipates more growth, and its goal is to continue water conservation efforts. The City presents several options to meet water demands besides conservation. These include (LSA, 2003):

- Confirm new developments can be supported with a reliable water source
- New development landscaping must be drought tolerant
- Work to make recycled water a viable option
- Protect potential groundwater recharge areas
- Fight policies that would reduce river rights (i.e., increase salinity)

#### 2.3.4.3 City of Brentwood General Plan

The City of Brentwood General Plan was updated in 2014 (DNPG) and provides the framework to guide growth and conserve open space. The City's goal with regard to water requirements is to provide safe and reliable water to its citizens. The General Plan outlines three ways it plans to achieve this goal. The City plans to continually assess water saving strategies and water demands. The City also plans to discuss the possibility of receiving additional water from East Bay Municipal Utility District (EBMUD), CCWD, and ECCID. In 2006, voters approved an Urban Limit Line (ULL); the line would limit the development of urban infrastructure. Current land use maps show small areas are planned for future development (DNPG, 2014).

#### 2.3.4.4 City of Oakley General Plan

The City of Oakley also has a ULL and a desire to "preserve quality of life for residents". The City's goal to meet current and future water requirements is to require new development to detail how water supplies will be met, request that water agencies meet quality standards, and protect water sources from pollution by working with regulatory agencies. The City also will urge water agencies to have written plans in case of drought (CoO, 2016).

#### 2.3.4.5 Land Use Plans and the GSP Water Supply Assumptions

In general, land use and water supply assumptions included in the General Plans in the ECC Subbasin are consistent with current and future land use and water demand projections used in the GSP. The county and cities' policies include water conservation and sustainable management of groundwater resources. GSP implementation is expected to be consistent with future water use and land use as projected in the General Plans, urban water management plans, and agricultural water management plans. These documents were used to project future land use and resulting water demand for the future water budgets used in the GSP.

### 2.3.5 Water Management Plans

Many water management plans cover the Subbasin. These are described below.:

#### 2.3.5.1 Urban Water Management Plan

Urban Water Management Plans (UWMP) are required by the Urban Water Management Plan Act for any water supplier distributing more than 3,000 AFY or that has more than 3,000 connections. A UWMP must be prepared and submitted to DWR every 5 years. Each UWMP should asses the reliability of water for the next 20 years, how demands are met including shortages, conservation efforts with the goal being a 20% reduction in water use per person, and finally a goal for recycled water use in the agency's sphere of influence. The following UWMPs have been developed in the Subbasin:

- City of Antioch Urban Water Management Plan (WYA, 2015)
- City of Brentwood Urban Water Management Plan (B&C, 2016)
- Diablo Water District 2015 Urban Water Management Plan (CDM, 2015)
- Town of Discovery Bay Community Services District 2015 Urban Water Management Plan (LSCE, 2017)
- Contra Costa Water District Urban Water Management Plan (CCWD, 2015)

#### 2.3.5.2 Agricultural Water Management Plan

Agricultural Water Management Plans (AWMP) are required by the Water Conservation Act of 2009 (SB X7-7) for any water supplier distributing more than 25,000 AFY (excluding recycled water deliveries) to prepare a plan and submit it to DWR. The Act requires that each agency/region develop a water budget for a water year identifying inflow and outflow components, ways to improve water efficiency, quantify water use, and outline a plan for droughts. In addition, the AWMP must include the status of Efficient Water Management Practices (EWMP). EWMP must be followed for delivery point measurements and volumetric pricing; the remaining EWMPs are to be implemented if they are technically feasible or funding is available. The following AWMP was developed in the Subbasin:

- Byron Bethany Irrigation District Agricultural Water Management Plan (CH2M, 2017)

#### 2.3.5.3 Integrated Regional Water Management Plan

In an effort to address California's water supply and management practices, DWR created policies that encourage Integrated Regional Water Management Plans (IRWMP) and grant funding to implement the program. The goal of the IRWMP is to evaluate all aspects of water management. In 2015, CCC updated their IRWMP (ECCWMA, 2015). Their plan has 25 objectives that are used by the ECCWMA members to address their water management issues:

- Protect/improve source water quality
- Maintain/improve regional treated drinking water quality
- Maintain/improve regional recycled water quality
- Increase understanding of groundwater quality and potential threats to groundwater quality
- Meet current and future water quality requirements for discharges to the Delta
- Limit quantity and improve quality of stormwater discharges to the Delta
- Manage local stormwater
- Improve regional flood risk management
- Enhance understanding of how groundwater fits into the water portfolio and investigate groundwater as a regional source (e.g., conjunctive use)
- Protect, restore and enhance habitat in the Delta and connected waterways
- Protect, restore and enhance the watersheds that feed and contribute to the Delta ecosystem
- Minimize impacts to the Delta ecosystem and other environmental resources
- Reduce greenhouse gas emissions
- Protect Delta ecosystem against habitat disruption due to emergencies, such as levee failure
- Increase shoreline access for subsistence fishing and recreation
- Increase regional cost efficiencies in treatment and delivery of water, wastewater, and recycled water
- Develop projects with regional benefits that are implementable and competitive for grant funding
- Use financial resources strategically to maximize return on investment on grant applications for project development/implementation
- Develop a funding pool to self-fund regional efforts such as grant applications, outreach, website development, and other planning activities
- Increase public awareness of project importance to pass ballot measures or obtain matching funds through other means that require public support
- Ensure projects with existing matching funds are prioritized to maximize regional funding opportunities
- Identify and engage DACs
- Collaborate with and involve DACs in the IRWM process
- Promote equitable distribution of proposed projects across the region
- Increase awareness of water resource management issues and projects with the general public

#### 2.3.5.4 Additional Water Plans in Subbasin

The City of Brentwood developed and updated a Water Master Plan in 2003 and 2017 (Ennis, 2017). The plan has two main goals: 1) identify limitations of the current water system and whether current infrastructure could be modified to resolve any deficiencies, and 2) identify what infrastructure will need to be modified to serve new development.

In 2012, the TODB developed a Water Master Plan (LSCE, 2012). The plan has two main objectives 1) evaluate system efficiency, and 2) outline any capital improvement projects that would enable TODB to meet the current and future water demands of the service area.

CCWD prepares a Water Management Plan to be submitted to the USBR as part of their contract for CVP water. CCWD prepares a Water Management Plan (Plan) every five years (the last one was submitted in 2017) and also periodically prepares a Future Water Supply Study. The intent of the Plan is for CCWD to demonstrate federal water "is put to reusable and beneficial use." CCWD demonstrates this to USBR by outlining water conservation efforts, providing information on water-related infrastructure, and description of the district which includes district demographics, topography, climate, natural and cultural resources, district rules and regulations, and billing and pricing.

As a result of Assembly Bill (AB) 3030, the California Water Code (CWC), Section 10750, DWD board of directors agreed to prepare a groundwater management plan. DWD's goal was "to provide a management framework for maintaining a high quality, reliable, and sustainable supply of groundwater within the District's sphere of influence." In 2007, DWD implemented the Diablo Water District Groundwater Management Plan for AB 3030 (LSCE, 2007).

## 2.4 County Well Construction, Destruction and Permitting

### 2.4.1 Wellhead Protection and Well Permitting

Wellhead protection is governed by county, state and federal regulations within the Subbasin.

Well permitting in the Subbasin is overseen by the CCC Health Services, Environmental Health Division. The Environmental Health Division requires a Well Permit Application to be completed prior to any ground surface breaking that includes well construction, reconstruction, or destruction, including water wells, dewatering wells, monitoring wells, cathodic protection wells, geothermal wells, piezometers, inclinometers, soil vapor probes, Cone Penetrating Testing (CPTs), soil borings, and geotechnical borings. Environmental Health Division reviews the well permit and either approves, denies, or requests modification. CCC also has well regulations to meet water supply demands for new housing construction (CCC, 1981).

#### 2.4.1.1 Well Installations

A county official reviews permits for new well construction, and the application will be approved, dismissed, or more information will be requested. The well must be installed by a licensed C-57 Driller that maintains current registration with the county. Well installation requirements follow the standards outlined in the California Well Standards, Bulletin 74-81 and 74-90. The bulletin discusses the proper well locations (i.e. distance from property line, septic tanks, streams, livestock) for water supply wells, proper approaches for sealing the annulus (materials, methods, conditions and placement), casing material, and the material/construction of the completion monument (flush or stick up, with respect to the ground surface). A county official is required to inspect the grout mixture prior to well completion, and it is the responsibility of the driller to schedule the inspection. A pump test might be required if the county determines the need for one in the area.

#### 2.4.1.2 Well Abandonment

As per Section 21 of Bulletin 74-81:

*A well is considered 'abandoned' or permanently inactive if it has not been used for one year, unless the owner demonstrates intention to use the well again. In accordance with Section 24400 of the California Health and Safety Code, the well owner shall properly maintain an inactive well as evidence of intention for future use in such a way that the following requirements are met:*

*(1) The well shall not allow impairment of the quality of water within the well and groundwater encountered by the well.*
*(2) The top of the well or well casing shall be provided with a cover that is secured by a lock or by other means to prevent its removal without the use of equipment or tools, prevent unauthorized access, prevent a safety hazard to humans and animals, and prevent illegal disposal of wastes in the well. The cover shall be watertight where the top of the well casing or other surface openings to the well are below ground level, such as in a vault or below known levels of flooding. The cover shall be watertight if the well is inactive for more than five consecutive years. A pump motor, angle drive, or other surface feature of a well, when in compliance with the above provisions, shall suffice as a cover.*
*(3) The well shall be marked so as to be easily visible and located and labeled so as to be easily identified as a well.*
*(4) The area surrounding the well shall be kept clear of brush, debris, and waste materials."*

#### 2.4.1.3 Well Destruction

*A permit must be submitted to the agency for approval of well destruction. The county states its requirements are as follows:*

*(1) Remove any obstructions from the well.*
*(2) Perforate or remove the well casing to the bottom of the well.*
*(3) Excavate around the casing to a depth of 6 ft.*
*(4) Place approved sealing material in the well extending from the bottom to the surface. Environmental Health staff will inspect this stage of the work. The well contractor is responsible for contacting Contra Costa Environmental Health to schedule inspection appointments. The greater the advance notice, the more likely a mutually convenient inspection appointment can be arranged.*

## 2.5 Additional Plan Elements (WCS 10727.4)

**Table 2-6** lists the additional Plan Elements listed in Water Code Section 10727.4 that should be included in a GSP, where appropriate, and the location in the GSP where these are addressed.

**Table 2-6. Additional Plan Elements**

| Section Number | Code Description | Section in GSP with More Detail |
|---|---|---|
| **10727.4 (a)** | Control of saline water intrusion. | 3.3.4 |
| **10727.4 (b)** | Wellhead protection areas and recharge areas. | 2.4.1 and 3 |
| **10727.4 (c)** | Migration of contaminated groundwater. | 3.3.6 |
| **10727.4 (d)** | A well abandonment and well destruction program. | 2.4 |
| **10727.4 (e)** | Replenishment of groundwater extractions. | 3 |
| **10727.4 (f)** | Activities implementing, opportunities for, and removing impediments to, conjunctive use or underground storage. | 2.2 |
| **10727.4 (g)** | Well construction policies. | 2.4 |
| **10727.4 (h)** | Measures addressing groundwater contamination cleanup, groundwater recharge, in-lieu use, diversions to storage, conservation, water recycling, conveyance, and extraction projects. | 3 and 4 |
| **10727.4 (i)** | Efficient water management practices, as defined in Section 10902, for the delivery of water and water conservation methods to improve the efficiency of water use. | 4 and 8 |
| **10727.4 (j)** | Efforts to develop relationships with state and federal regulatory agencies. | 8 |
| **10727.4 (k)** | Processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity. | 8 |
| **10727.4 (l)** | Impacts on groundwater dependent ecosystems. | 3.3.9 |

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## SECTION 3 CONTENTS

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## APPENDICES

# 3. BASIN SETTING

## 3.1 Overview

This Basin Setting section of the East Contra Costa (ECC) Groundwater Sustainability Plan (GSP) describes the Hydrogeologic Conceptual Model (HCM) (Section 3.2) and historical and current Groundwater Conditions (Section 3.3). The sections were developed using best available science and serve as the basis upon which ECC GSAs will select management criteria to maintain sustainable groundwater conditions in the ECC Subbasin. Groundwater Sustainability Agencies (GSAs) "have the responsibility for adopting a Plan that defines the basin setting and establishes criteria that will maintain or achieve sustainable groundwater management" as detailed by DWR in the GSP regulations (Title 23 California Code of Regulations [CCR] Section 350.4e). The two main topics covered in this section include:

- **Hydrogeologic Conceptual Model (HCM):** Section 3.2 describes the physical components of the Subbasin including the regional geology, structural properties, boundaries of the Subbasin, principal aquifer descriptions with cross sections, topographic and soil characteristics, recharge areas, and significant surface water bodies.
- **Groundwater Conditions:** Section 3.3 provides current and historical groundwater conditions including discussions of groundwater level maps and time-series graphs, groundwater storage, seawater intrusion, groundwater quality, land subsidence, interconnected surface water systems, and groundwater dependent ecosystems.

## 3.2 Hydrogeologic Conceptual Model

The HCM describes the geologic and hydrologic framework that governs how water moves through the ECC Subbasin. This description provides the basis to develop water budgets, monitoring networks, and ultimately a surface water/groundwater mathematical model (**Section 5** of this GSP). This section includes information about the regional geologic and structural setting, lateral and vertical basin boundaries, and principal aquifers. This section is based on technical studies and maps that characterize the physical components and interaction of the surface water and groundwater systems, pursuant to Section 354.14 Hydrogeologic Conceptual Model. Information was compiled for this section from two main references: *Investigation of Ground-Water Resources in the East Contra Costa Area* (LSCE, 1999) and *An Evaluation of Geological Conditions, East Contra Costa County* (LSCE, 2016). Both reports are included in this document as **Appendices 3a and 3b**.

### 3.2.1 Regional Geological and Structural Setting

The San Joaquin Valley formed between two mountain ranges (Coast Ranges and the Sierras). The ECC Subbasin lies on the western side of the northern San Joaquin Valley portion of the Great Valley province of California. The western boundary of the Subbasin is a no flow boundary with respect to groundwater and is delineated by exposed bedrock of highly deformed Tertiary age and older marine sediments of the Coast Range Diablo Mountains. Most of the Subbasin is filled with freshwater-bearing alluvium, eroded continental sediments from the Coast Ranges, that are Quaternary in age. Surficial geology from multiple sources is provided in **Figure 3-1a** and a detailed legend is in **Figure 3-1b and c**.


**Surficial Geology and Faults**

**Figure 3-1a**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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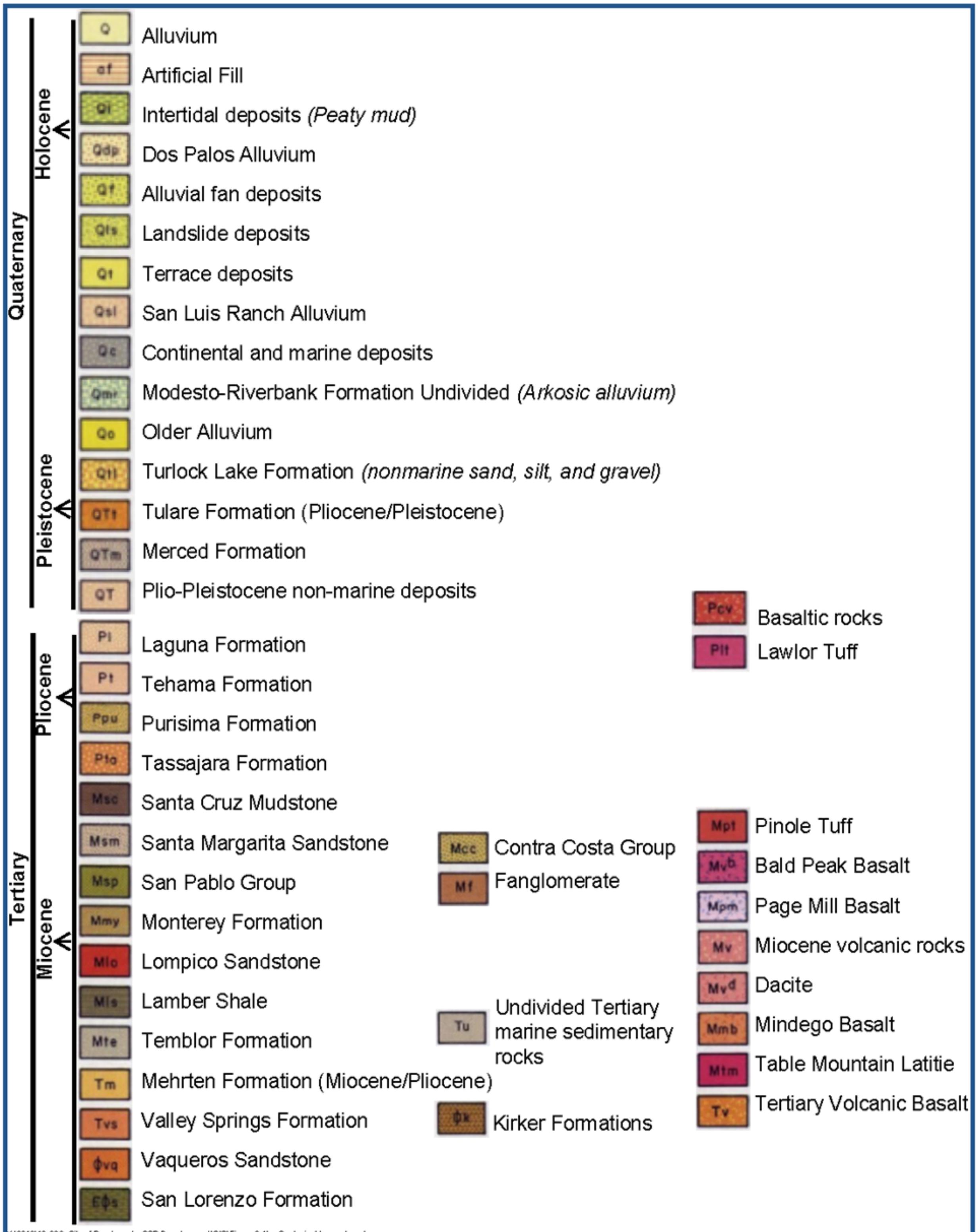


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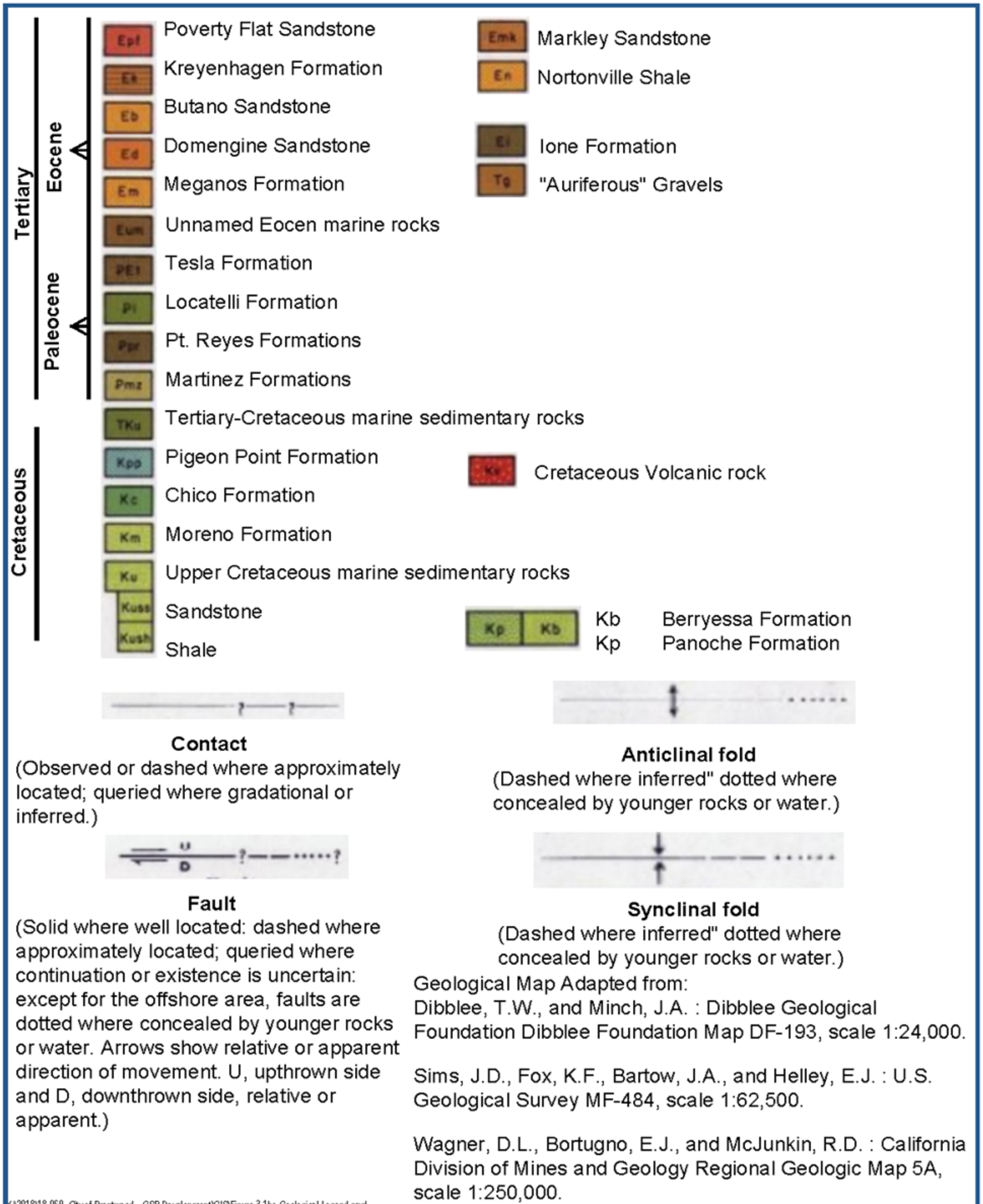
**Surficial Geology Legend**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-1b**

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**Surficial Geology Legend**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-1c**

#### 3.2.1.1 Topographic Information

The topography of the Subbasin is generally flat with land surface elevations that slope gently downward to the east. Topographic elevations vary from about 200 feet above mean sea level (msl) in the west to less than 10 feet from msl in the delta area over a distance of about 10 miles (**Figure 3-2**). There are portions of the Subbasin (e.g., Delta islands) in the northeast and southeast that are below sea level.

#### 3.2.1.2 Depositional Model

Regional geologic studies (Bartow, 1991; and Bertoldi and others, 1991) reported that Miocene marine deposition occurred in the area as shown by the Tertiary marine rocks exposed in the Coast Ranges. During the following Pliocene epoch, the San Joaquin Valley drained south to the ocean via the Salinas Valley. The Sacramento Valley drained westward through the Delta area, and the Coast Range locally had not yet been uplifted. Deposition may have been confined to distal fluvial plains sourced from the Sierra Nevada area, such that little sand was carried into the area. Similar aged fine-grained deposits are seen in southern Sacramento County, near Vacaville, and around Rio Vista reaching thicknesses of 2,000 to 2,500 feet.

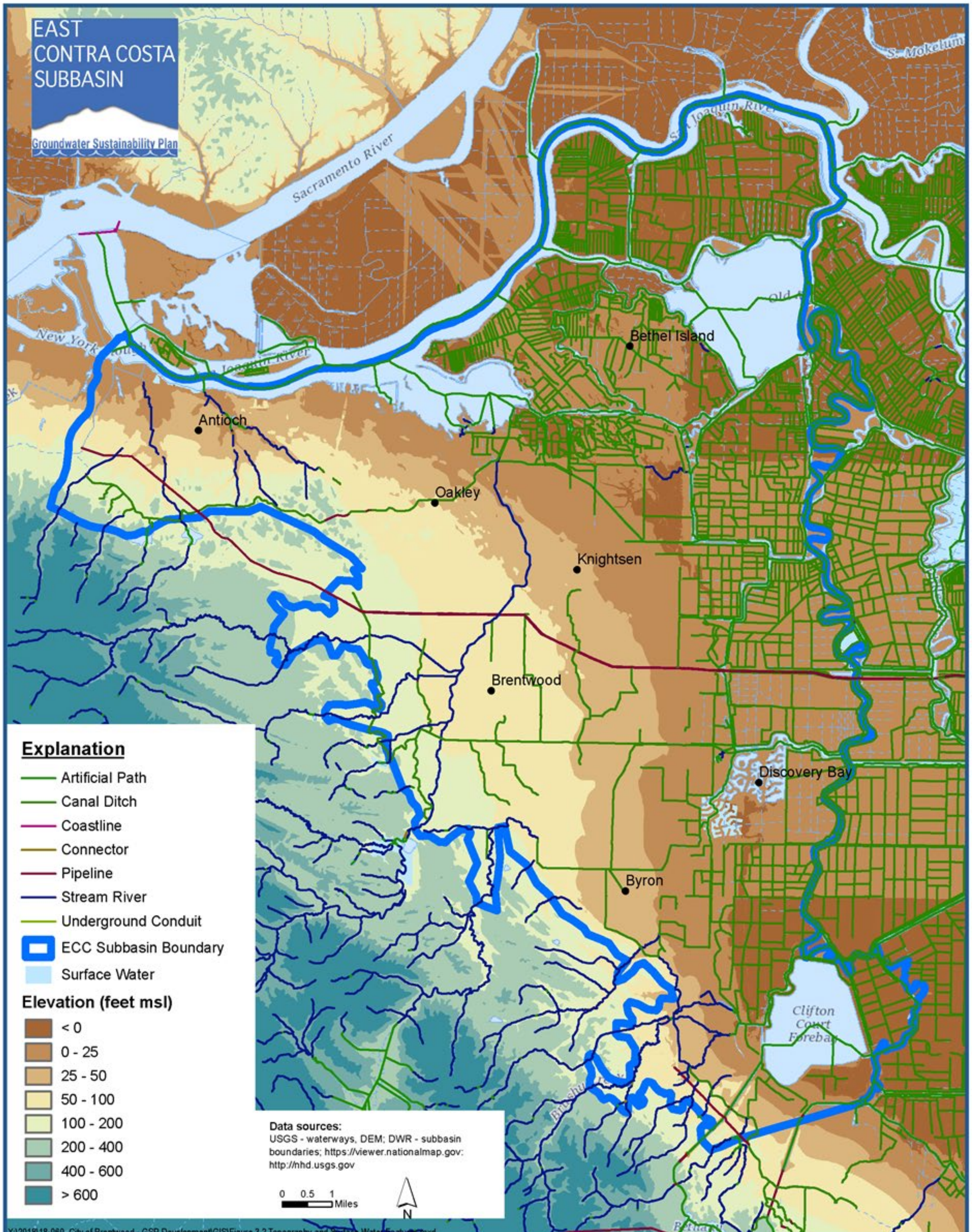
In the Quaternary (mid-Pleistocene) period, the San Joaquin Valley south of Tracy was occupied by a large freshwater lake known as Corcoran Lake. Associated with the lake was deposition of the Corcoran Clay, also termed E-Clay unit. Neither the lake nor the Corcoran Clay unit extended as far north as the ECC Subbasin distinguishing the Subbasin from other parts of the San Joaquin Valley Groundwater Basin to the south and east. At about 600,000 years ago, northern San Joaquin River drainage and local Coast Range uplift began. It is suspected that this activity marked the beginning of the alluvium deposition where coarse-grained deposits were formed and carried into the area by the San Joaquin River and from erosion of the uplifting Coast Ranges.

#### 3.2.1.3 Surficial Geology and Geological Formations

Bedrock formations observed in outcrops along the western boundary of the ECC Subbasin consist of strongly deformed marine sedimentary rocks that range in age from over 63 million years (my) to 5my. The Tertiary marine rocks of sandstones, shales and mudstones dip east beneath the San Joaquin Valley with increasing depths. Because of their marine origin, well consolidated nature, and saline water, the Mesozoic and Tertiary marine rocks are not a source of fresh groundwater in the Subbasin (LSCE, 1999; 2016). Additional information about these units can be found in **Appendix 3a**.

Overlying the Tertiary marine rocks are a sequence of Tertiary-Quaternary non-marine sedimentary deposits (Pliocene to Pleistocene). These older sediments have limited areas of exposure along the edge of the Coast Range. These deposits are not well understood in the study area, but they are believed to consist of fine-grained clays, silts, and mudstones with a few sand beds. They dip moderately to the east and northeast under the San Joaquin Valley. Limited information from a few deep water well boreholes indicate they occur from 400 feet to depths of over 1,500 feet below the San Joaquin River. The lower portion of these deposits may be equivalent to the Mehrten Formation on the east side of the San Joaquin Valley. The upper portion of these older non-marine sediments may be equivalent to the Tulare Formation to the south of the Subbasin and the Tehama Formation to the north. Water quality appears to become brackish with depth (LSCE, 1999 and 2016).

Overlying the Tertiary/Quaternary non-marine sediments are the primary groundwater-bearing units in the ECC Subbasin.

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**Topography and Surface Water Features**

**Figure 3-2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

These Quaternary alluvium deposits are unconsolidated beds of gravel, sand, silts, and clays becoming weakly consolidated with increasing age and burial depth. The alluvium thickens eastward to over 300 feet beneath Brentwood and about 400 feet below Old River. As discussed in Section 3.2.4, the units around Brentwood are believed to have been deposited by streams forming alluvial fans of silts and clays off the uplifted Diablo Mountains. Units around Discovery Bay are believed to be stream channel deposits of coarser sands and gravels. Separation of the alluvium into distinct units is difficult using well drillers' reports. The sand and gravel can be correlated locally, but the fine-grained sand and clays are so massive, a greater spatial correlation is not possible (LSCE, 1999). Sand and gravel beds and their distribution are discussed further in this chapter.

About 600,000 years before present, Corcoran Lake formed in nearly the entire San Joaquin Valley northward to the Stockton-Tracy area. A blue lake clay was deposited across the San Joaquin Valley and is known as the Corcoran Clay or E-clay. However, as cited above, this clay unit has not been identified north of the Stockton-Tracy area into the Delta area of Contra Costa County or in the Sacramento Valley (LSCE, 2016).

### 3.2.2 Faults and Structural Features

Three inactive faults (Midland, Sherman, and Antioch) trend in a north-south direction across the Subbasin (**Figure 3-1,** dashed lines). They are not known to inhibit groundwater flow or to impact water conveyance infrastructure. The Vernalis Fault is located southeast of Clifton Court Forebay (off of the geology map, **Figure 3-1**). Uplift or deformation along this fault may have caused a ridge that may influence groundwater flow as discussed below. No surface expression has been noted of this fault (LSCE, 2016).

### 3.2.3 Basin Boundaries

The lateral extent of the ECC Subbasin is defined primarily by jurisdictional and surface water boundaries (**Figure 3-3**). ECC Subbasin is bounded on the north, east, and south by the Contra Costa County line, which is contiguous with the San Joaquin River (north) and Old River (east). In the west, a non-jurisdictional Subbasin boundary corresponds to the non-water bearing geologic units which form a bedrock barrier to groundwater flow. **Figure 3-3** is a diagrammatic illustration of the western ECC Subbasin boundary in relation to the bedrock outcrop of older consolidated marine sediments (green, blue, and tan colors).

The base of the ECC Subbasin is defined by the vertical extent of available and extractable freshwater. The base of freshwater has been mapped previously in the general area by Page (1973) and Berkstressser (1973), and in a detailed map of the ECC Subbasin constructed by LSCE (2016). The base of freshwater map prepared by LSCE (**Figure 3-4**) updates the delineation of freshwater resources through additional oil and gas well electric logs in Montezuma Hills, Rio Vista, and the northwestern hills of Mount Diablo (Davis et al., 2018). The base of freshwater aquifers was determined from electric log responses in thick sand beds that had high resistivity values, and the character of the spontaneous-potential (S-P). This approach distinguished zones of poor water quality within sand beds, though it did not quantify salinity. Nevertheless, the geophysical characteristics of sand beds from electric logs provide a sound estimate of the vertical extent of freshwater in the Subbasin. Deeper sandy units with low resistivity values and indeterminable S-P characteristics were considered to be non-viable as aquifers. The examination by LSCE (2016) showed the deepest base of freshwater is to the northeast and east near the Subbasin boundary (-1,000 to -1,200 feet from msl) and rising to the west to elevations of 200 feet msl. In the Clifton Court Forebay area a subsurface ridge-like feature, possibly caused by the Vernalis Fault, extends eastward from the valley edge and may influence groundwater flow around the ridge or impede any northwest flow from the south at depths below -400 feet elevation.


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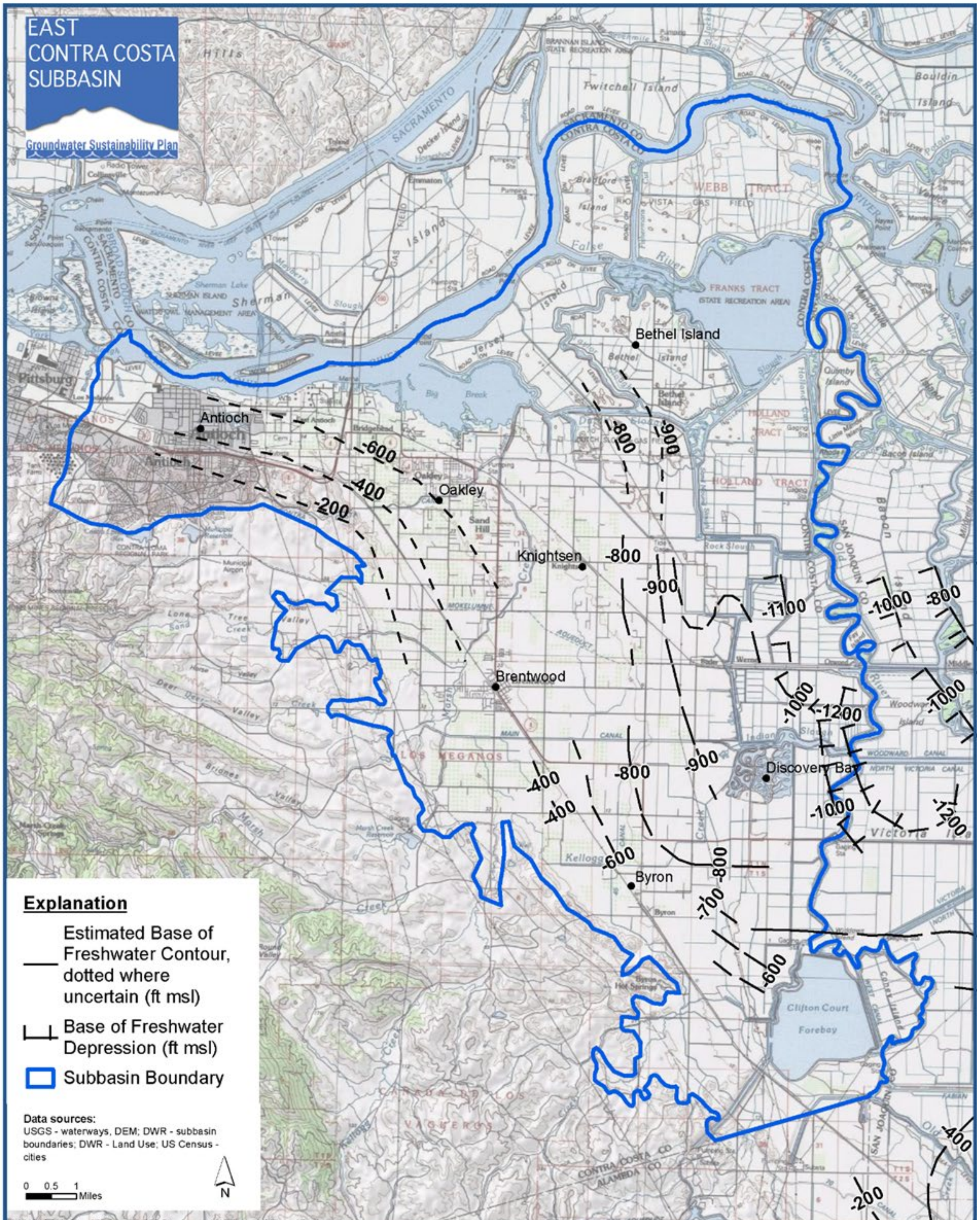
**Basin Boundary- Jurisdictional and Natural**

**Figure 3-3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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**Base of Freshwater**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-4**

### 3.2.4 Geologic Cross Sections and Depositional Facies Model

In 1999, LSCE performed a detailed hydrogeologic study of eastern Contra Costa County groundwater. The focus of the study was the uppermost 500 feet where most water wells are completed in the region. This study included construction of cross sections from drillers' logs and oil and gas logs to assess sand bed characteristics and their extent. Five cross sections were constructed in an east-west direction perpendicular to the Coast Range and three were drawn in a north-south direction (**Figure 3-5**). Two cross sections (4-4' and C-C', **Figures 3-6a and 3-6b**) are included in this report and all eight cross sections are included in **Appendix 3a**. These sections illustrate the ground surface, lithology associated with each well log, and the base of fresh water (LSCE, 2016).

The geologic cross-sections show the interbedded and variable nature of fine- and coarse-grained sediments both laterally and vertically and throughout the study area. They illustrate in detail the primary water-bearing units for water supply purposes. Coarse-grained units were identified primarily in the upper 400 feet where the majority of public supply wells are perforated however, it was noted that the units are difficult to correlate laterally. Well information was lacking for depths below 400 feet below ground surface (bgs) but consistent with the discussion in the previous section, it was expected that the units are fine grained and become brackish at depth.

From the vertical and lateral variability in sediments reflected in cross sections, general patterns in the occurrence and character of sand and gravel aquifers could be identified. These variations were explained by different depositional environments (e.g., stream and delta) as detailed below. In addition, these depositional environments were used to inform groundwater model calibration and for other quantitative purposes.

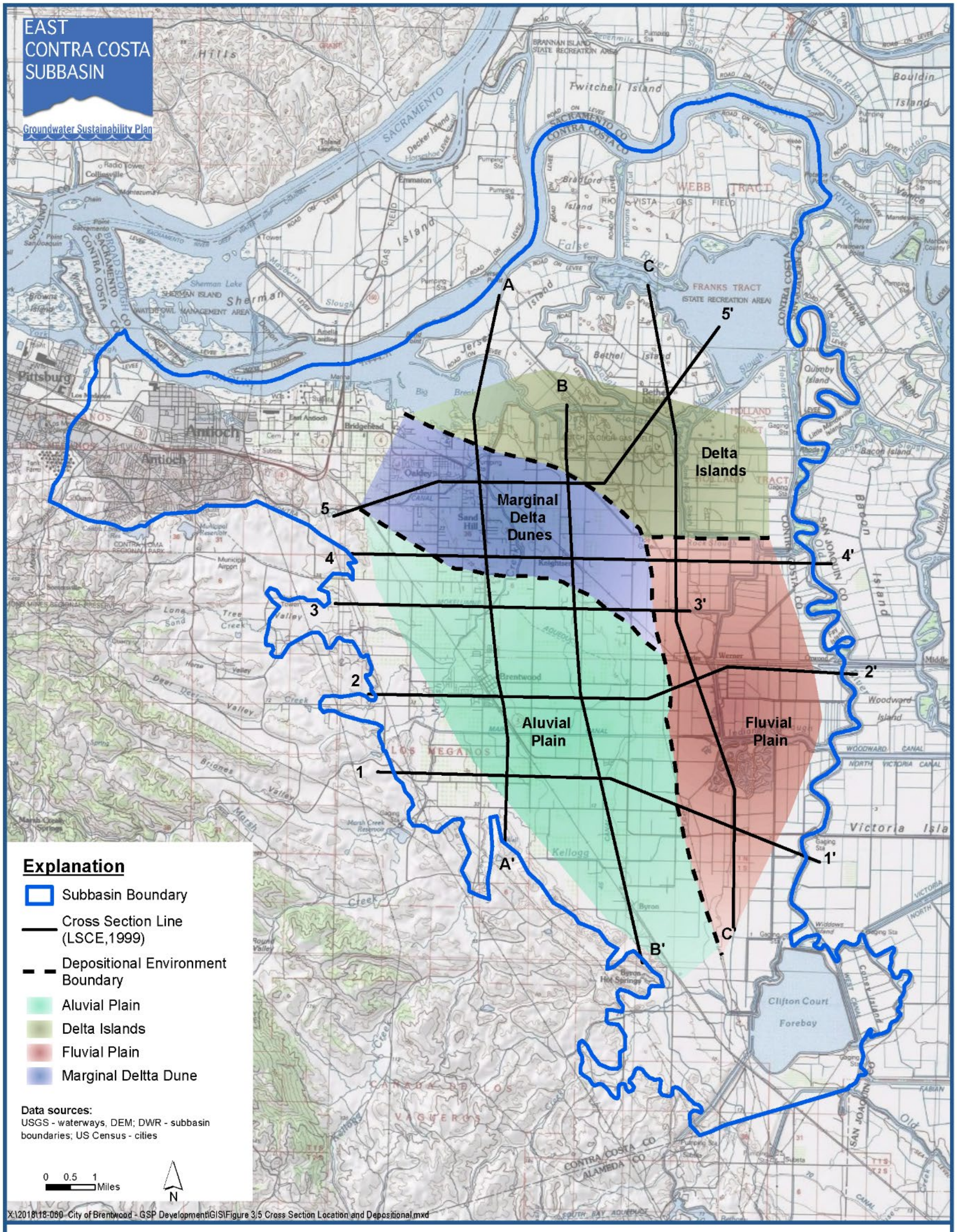
From the work described above, a facies model for four depositional regions in the Subbasin was developed as part of the Subbasin HCM (**Figure 3-5**). The depositional regions are detailed below:

Fluvial Plain

This is representative of the eastern portions of the Subbasin including Discovery Bay. It is defined by a zone of well-defined, thick-bedded sands and gravels with sand thickness of generally 30 feet or more per 100 feet. The depositional environment was probably similar to that which occurs in the present-day area with northward flowing river channels, distributaries, and sloughs across floodplains of overbank areas. Deposits extend to depths of about 350 feet, below which occur largely fine-grained silts and clays with poor to brackish water quality (TODB et al., 2017).

Delta Islands

This is representative of the northeastern portion of Subbasin (Diablo Water District GSA and encompasses Bethel Island and vicinity). Sand and gravel beds may correlate to the Fluvial Plain, but net sand thicknesses increase northward from about 30 to 60 feet per 100 feet below Bethel Island. Sand beds exist to depths of about 300 to 350 feet bgs. There is evidence of shallow saline or brackish water that may be present in shallow sand beds below the Delta Islands. The depositional environment is interpreted as multiple stream channels meandering between islands. Channels would be active with through-flowing waters, then abandoned as new channels developed. Possibly slower stream flow and tidal fluctuations allowed thicker, fine-grained sand deposits to form.

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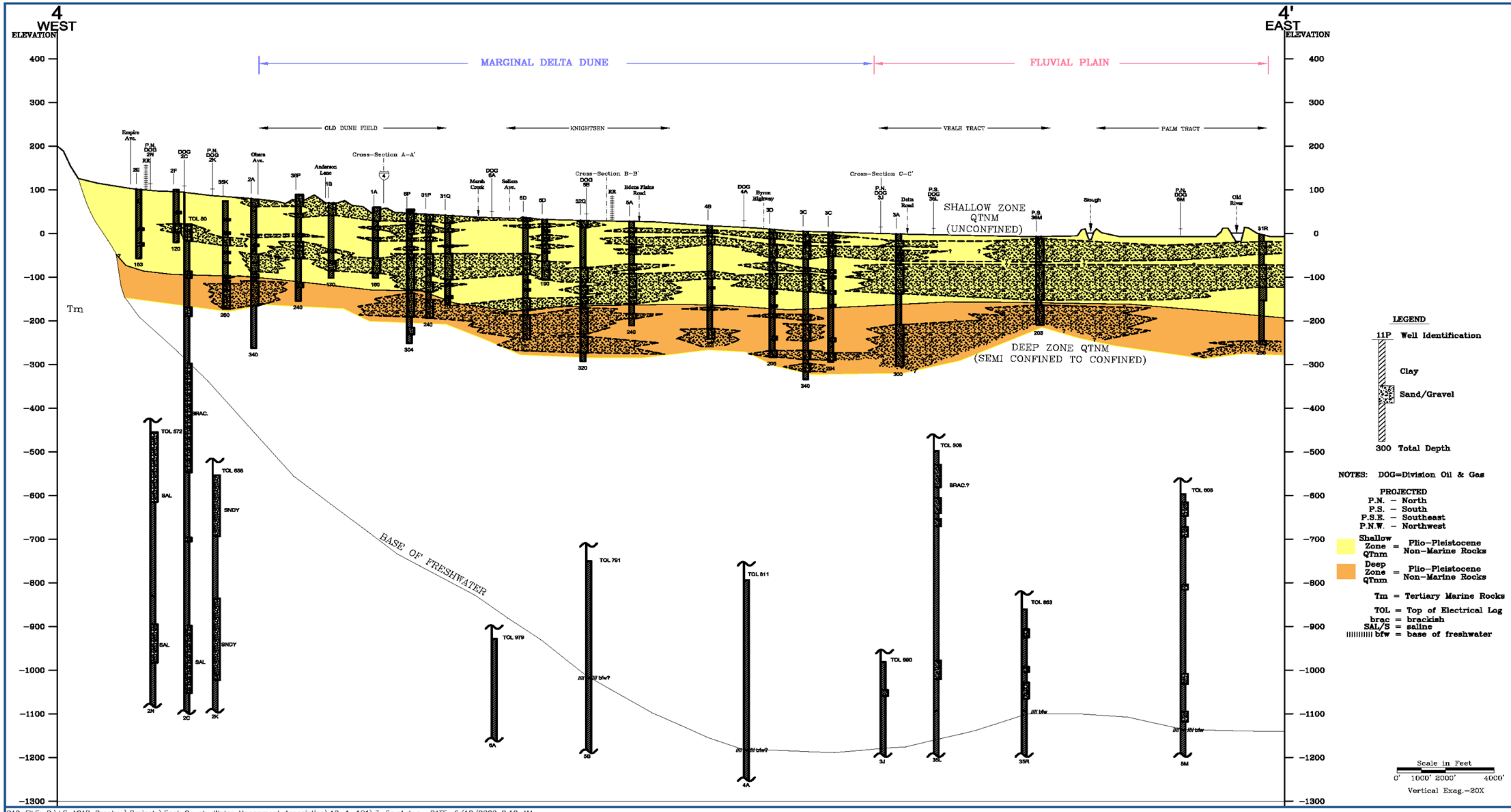
**Cross Section Location and Depositional Environment**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

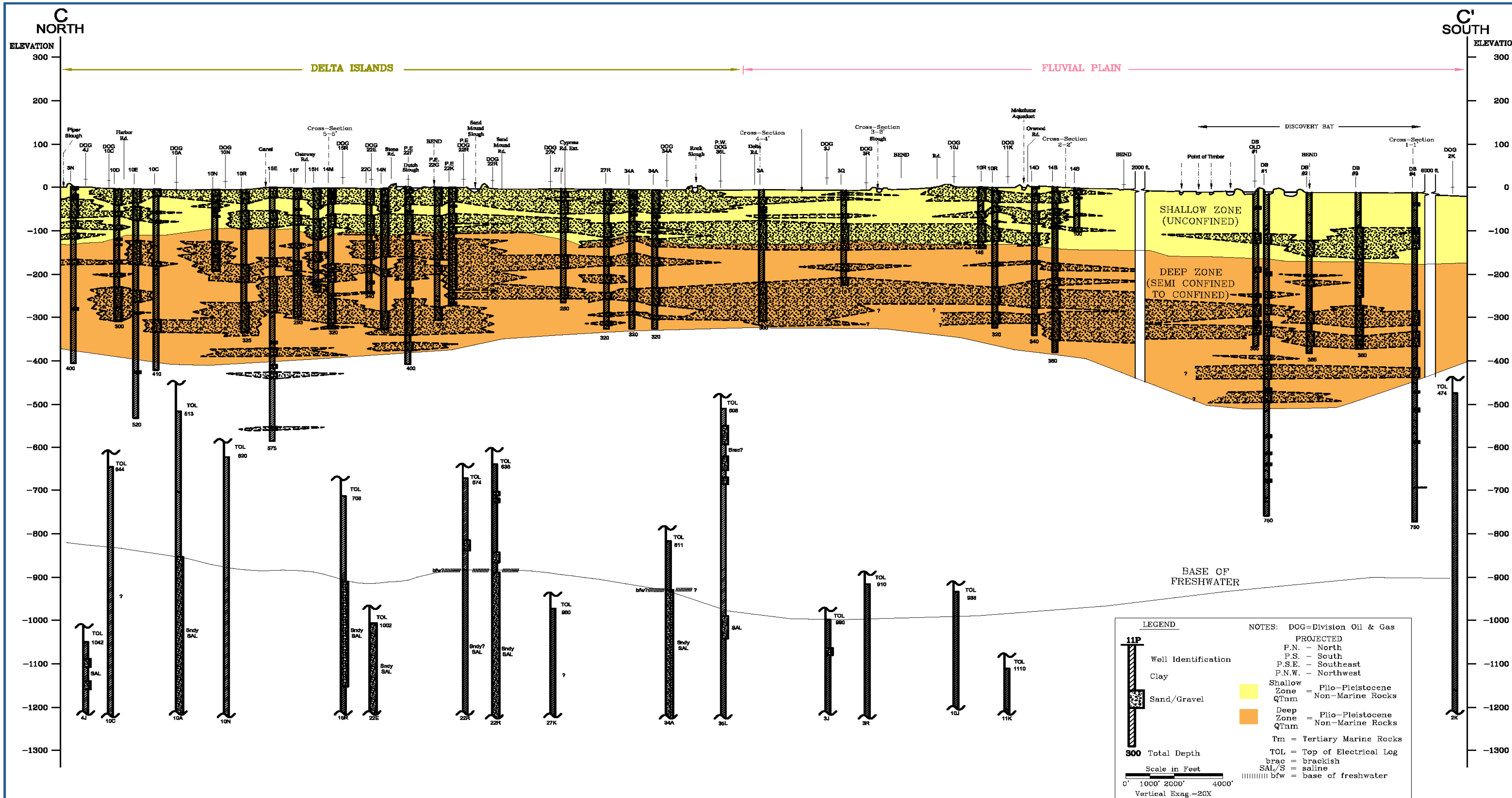
**Figure 3-5**




**Geologic Cross Section 4-4'**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-6a**

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**Geologic Cross Section C-C'**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-6b**

Marginal Delta Dunes

This is representative of the Oakley area and defined by numerous thin to thick sand beds that are on the order of 30 to 60 feet thick per 100 feet. The depositional environment is a mixture of delta fluvial distributary channels and possibly aeolian dune fields. A surface deposit of rolling gentle hills of relic sand dunes occurs between Oakley and northern Brentwood. These sand dunes are believed to have been generated by strong winds blowing sand off the delta margins. Some deeper sand beds across the Marginal Delta Dunes area may be older dune fields.

Alluvial Plain

This is representative of greater Brentwood south of the Marginal Delta Dune and City of Oakley, and west of the Fluvial Plain and defined by thin sand and gravel beds with a lower sand thickness (less than 20 feet per 100 feet). The depositional environment is small streams draining eastward from the Coast Range foothills to the west. Flood flows of these streams spread out from the hills depositing fine-grained materials, possibly as mudflows with high sediment content. Stream flows deposited thicker sand and gravel beds that tended to stack upon each other causing the thicker bands of sand beds. The thicker stream deposited sand and gravel bands extend eastward until the sands either thin out or have not been reached by wells. In the north, the stream deposits appear to reach into the Marginal Delta Dunes area, blending into the sand units that are present there.

Antioch and Byron Areas

Due to lack of well control, these two areas could not be examined in detail. The Antioch area is poorly defined, but it appears to be a thin alluvial plain with thin sand beds overlying Plio-Pleistocene non-marine deposits. The Byron area appears to have only a few thin sand beds in a small alluvial plan area that is marginal to the Fluvial Plain region where fine-grained deposits dominate.

### 3.2.5 Principal Aquifers and Aquitards

Two primary aquifer zones are identified in the East Contra Costa Subbasin: an unconfined to semi- confined Shallow Zone and a semi-confined to confined Deep Zone, with clay layers separating the two. These aquifers are composed of alluvial deposits as illustrated on the representative cross sections (**Figures 3-6a** and **3-6b)**. The Shallow Zone extends from ground surface to a less permeable material (i.e., clay and silt) generally to a depth of less than 150 feet bgs. The Deep Zone directly underlies the shallow zone, is the primary production zone for public supply wells (generally 200-400 feet in depth, LSCE, 2011), and extends to the base of fresh water (a maximum of 1,200 feet from mean sea level).

As indicated previously, the Corcoran Clay does not extend into the ECC Subbasin nor does a similar feature occur that separates major aquifer units. However, in the Alluvial Plain (around the City of Brentwood) there appears to be local confinement by multiple clay layers which separates shallow and deep zones (LSCE, 1999). This separation is seen through distinctive water levels (see **Section 3.3.1**). The Fluvial Plain (around Discovery Bay, **Figure 3-6a**) and Marginal Delta Dune (around Oakley) both have a confined Deep Zone with an extensive layer of clay separating a shallow zone from the deep zone that serves as the primary production aquifer. The Delta Islands area does not have clay layers separating a deep confined zone from shallower aquifer materials nor water levels that reflect it. The primary use of the Shallow Zone is by domestic wells and small community water systems which may have poorer water quality due to Bay-Delta influences. The primary use of the Deep Zone is for municipal supply (City of Brentwood, Discovery Bay and DWD) and agricultural irrigation supply (ECCID and BBID).

### Groundwater System Conceptualization

The ECC Subbasin aquifer system is subdivided into two zones: an upper unconfined Shallow Zone that sits above discontinuous to locally continuous clay layers and, a lower semi-confined to confined Deep Zone. As illustrated in the geologic cross-sections described above, the upper 400 feet of sediments is comprised of alluvial deposits with discontinuous clay layers interspersed with more permeable coarse-grained units. Most water wells are constructed within the upper 400 feet where coarse grained units are identified. Water well information is lacking for depths below 400 feet bgs to the base of fresh water but the units are likely fine grained and become brackish at and below that depth based on the current HCM.

## 3.2.6 Soil Characteristics

There are many soil types found throughout the Subbasin (**Figure 3-7a**). The soil data were gathered from the Natural Resource Conservation Service (NRCS) as part of the Soil Survey Geographic Database (SSURGO). The data are compiled from various maps, which are updated on a yearly basis. The predominate soil types in the Subbasin are the Brentwood, Capay, Delhi, Marcuse, and Rindge series. The Brentwood series is reported to be a well-drained silty clay loam found in valleys and valley floors near Brentwood. The Capay series is noted to be a moderately well-drained clay and is found throughout the Subbasin often near the Brentwood series. The Delhi series is noted to be a somewhat excessively drained sand found primarily in Oakley and Antioch and is derived from eolian deposits. The Marcuse series is noted to be a poorly drained clay and silty clay with a small amount of sand and is found throughout the center of the Subbasin. The Rindge is noted to be a very poorly drained silty clay loam to muck, and is found along the Delta Islands (i.e., Bethel Island) and near the Old River boundary.

### 3.2.6.1 Soil Properties

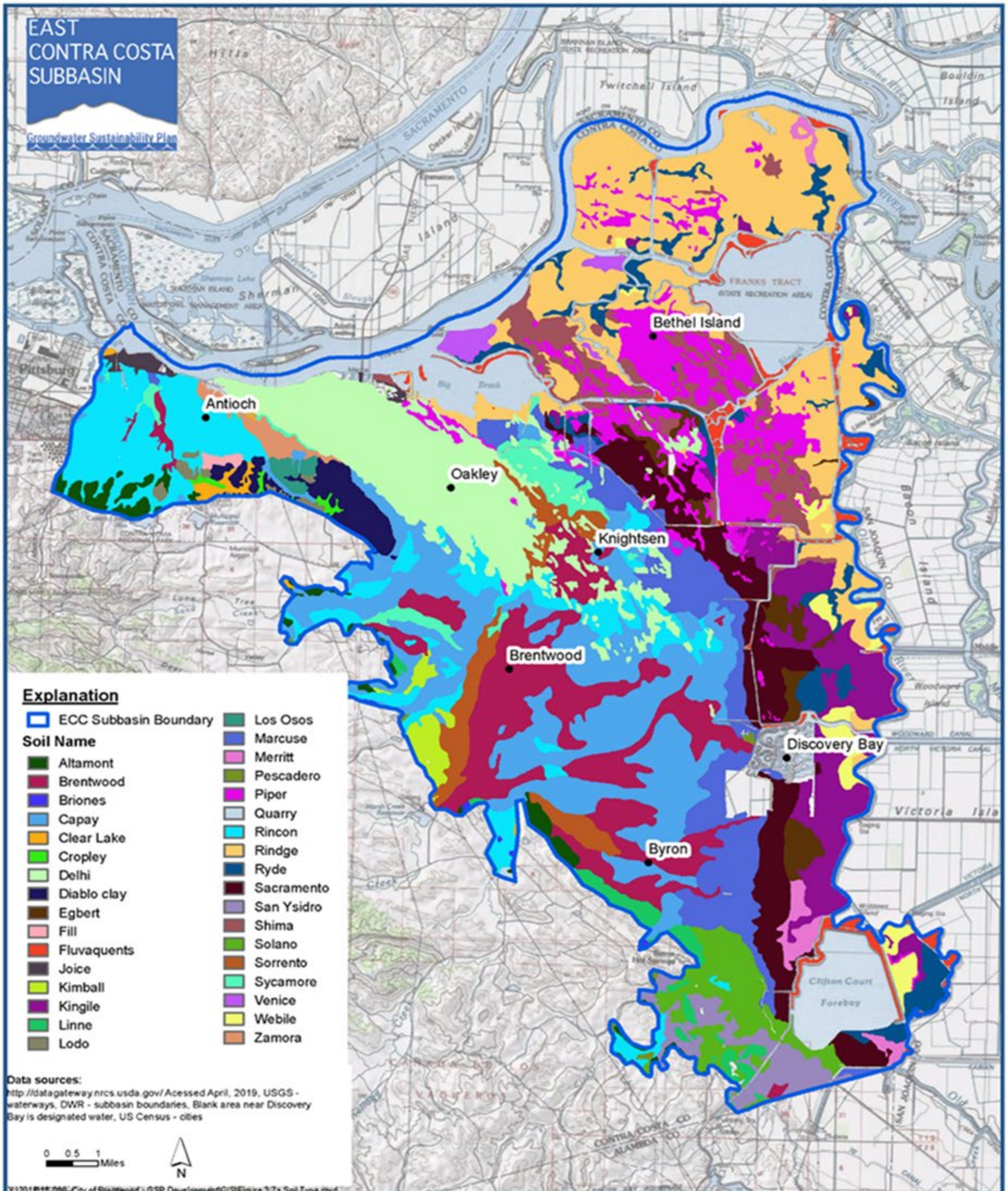
Soil properties are important to the HCM to the extent that they provide a pathway for groundwater infiltration through the soil and have high or low runoff potential. This information is used to calculate surface water recharge and to estimate deep percolation for surface water/ groundwater models. **Figure 3-7b** illustrates the soil texture of the surficial soils found in the Subbasin as outlined by NRCS. The dominant soil textures are clay, clay loam, sand, and muck. Clays and clay loams are found throughout the Subbasin. Sand is concentrated near Antioch and Oakley in the northwestern part of the Subbasin. Muck is found in the eastern portion of the Subbasin along the Old River and the Delta Islands. Muck is defined by the NRCS as "the most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic material".

**Figure 3-7c** presents the average hydraulic conductivity[1] for soils in the Subbasin. The hydraulic conductivity of soils ranges from less than 1 ft per day to more than 15 ft per day (ft/day). The highest conductivity areas are those with soil textures of muck, sand, or loamy sand. The areas around Oakley and on the northeastern and eastern border of the Subbasin have the highest hydraulic conductivity possibly due to the occurrence of dune sands.

**Figure 3-7d** shows the soil salinity for the Subbasin. Soil salinity is measured by electric conductivity (EC) and is measured by the amount of soluble salts in the soil. Almost the entire Subbasin has electric conductivity values of less than 2 deSiemens per meter (dS/m) which is low. Higher EC is noted in the center of the Subbasin, following a similar pattern as the distribution of the Marcuse soil, which was noted to be poorly

[1] Capacity for soil to transmit water with units of Length/Time. Units used in this report are feet/day.

drained clay. There is also a small area near Antioch that has ECs greater than 15 dS/m, in an area with a muck texture.

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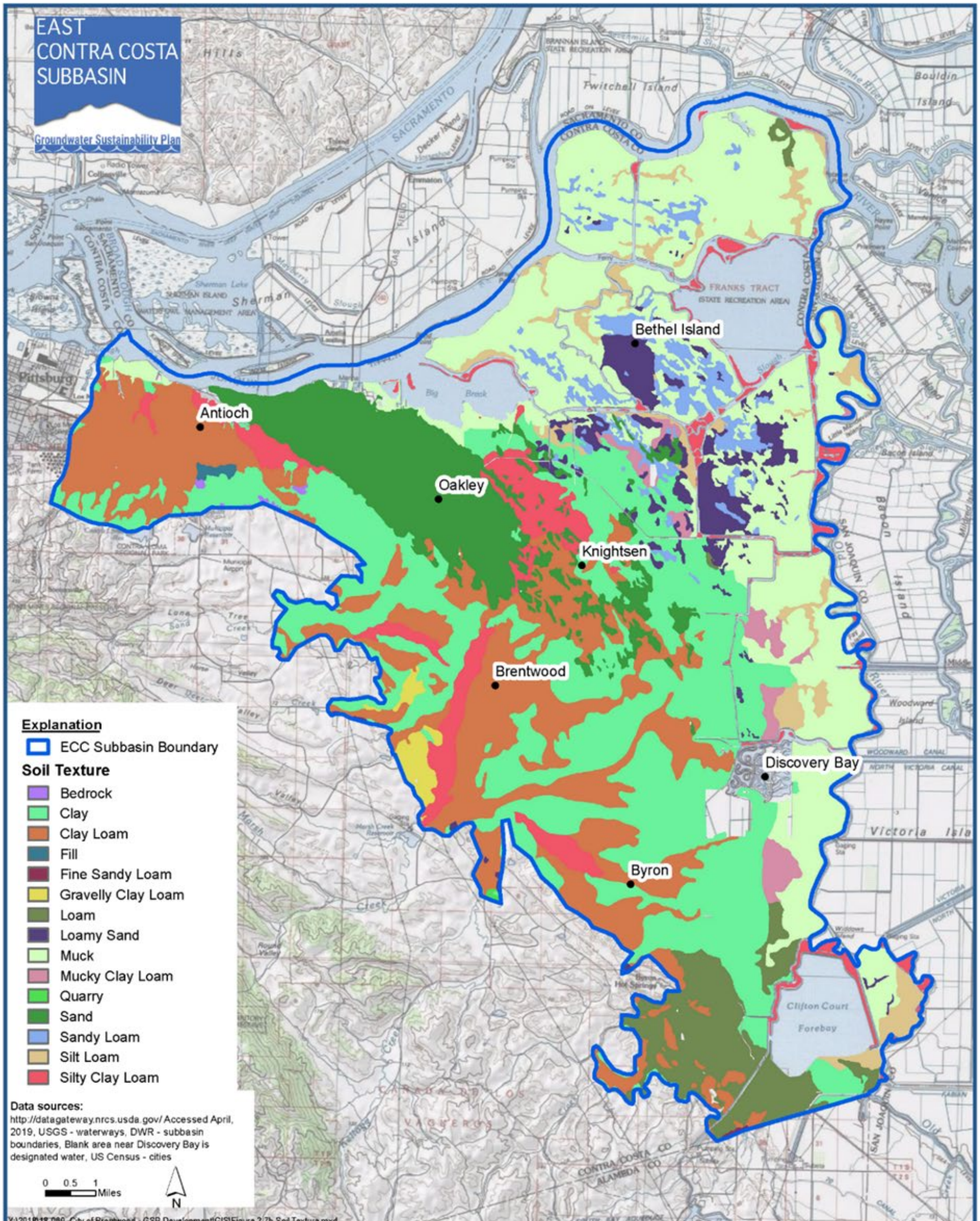
**Soil - Type**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-7a**

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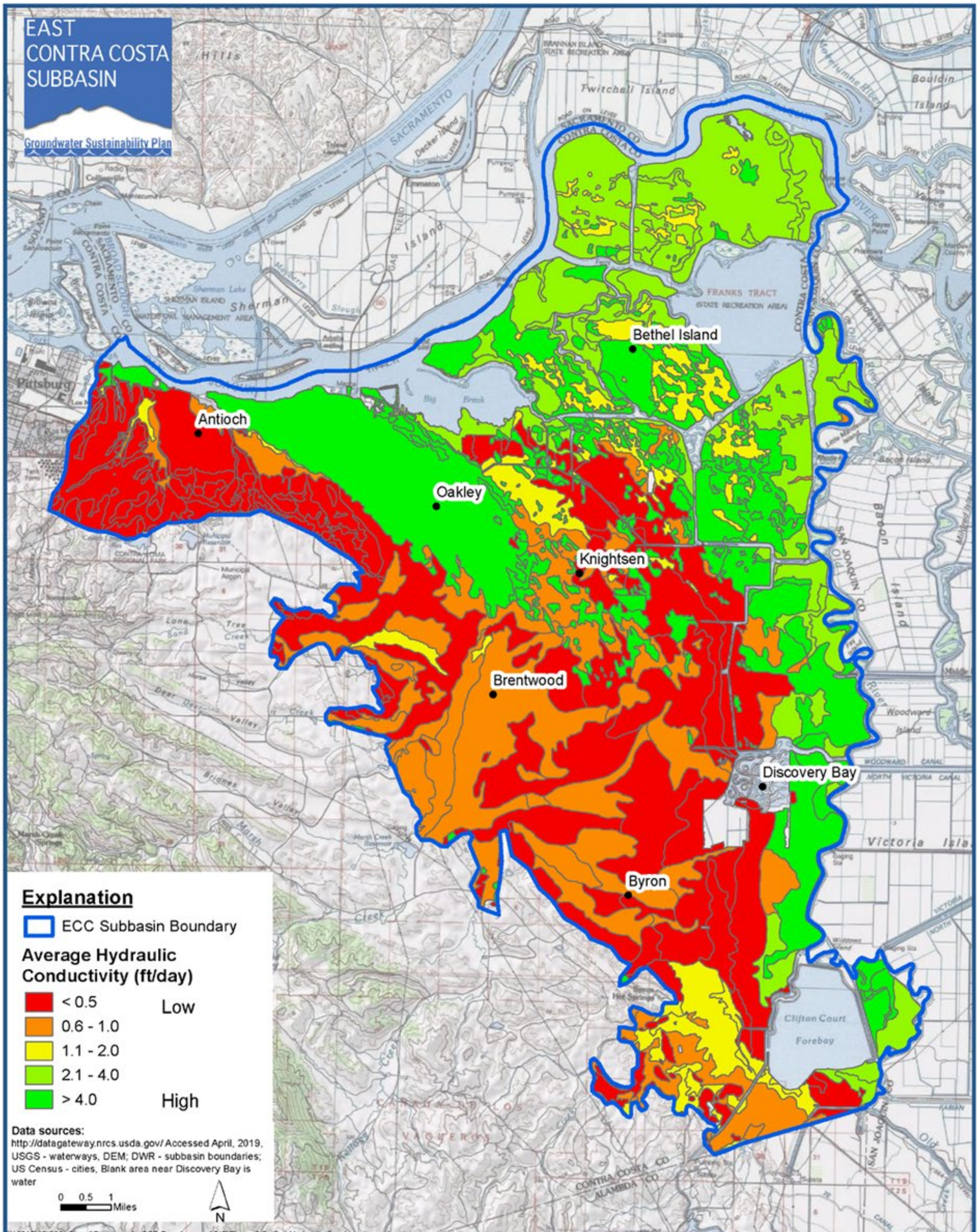
**Soil - Texture**

**Figure 3-7b**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*




Luhdorff & Scalmanini Consulting Engineers

**Soil - Hydraulic Conductivity**

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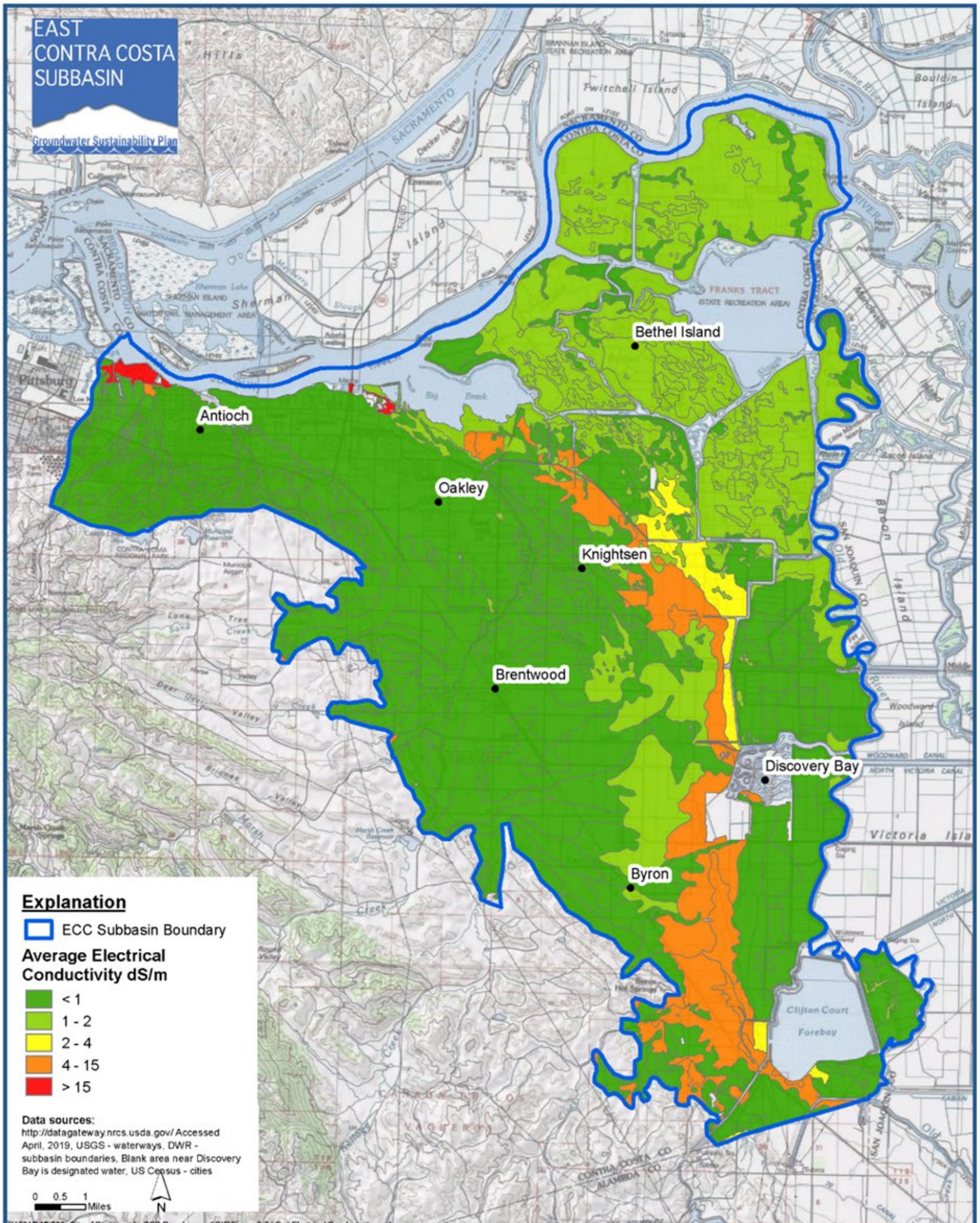
*Contra Costa County, California*

**Figure 3-7c**

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**Soil - Electrical Conductivity**

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*Contra Costa County, California*

**Figure 3-7d**

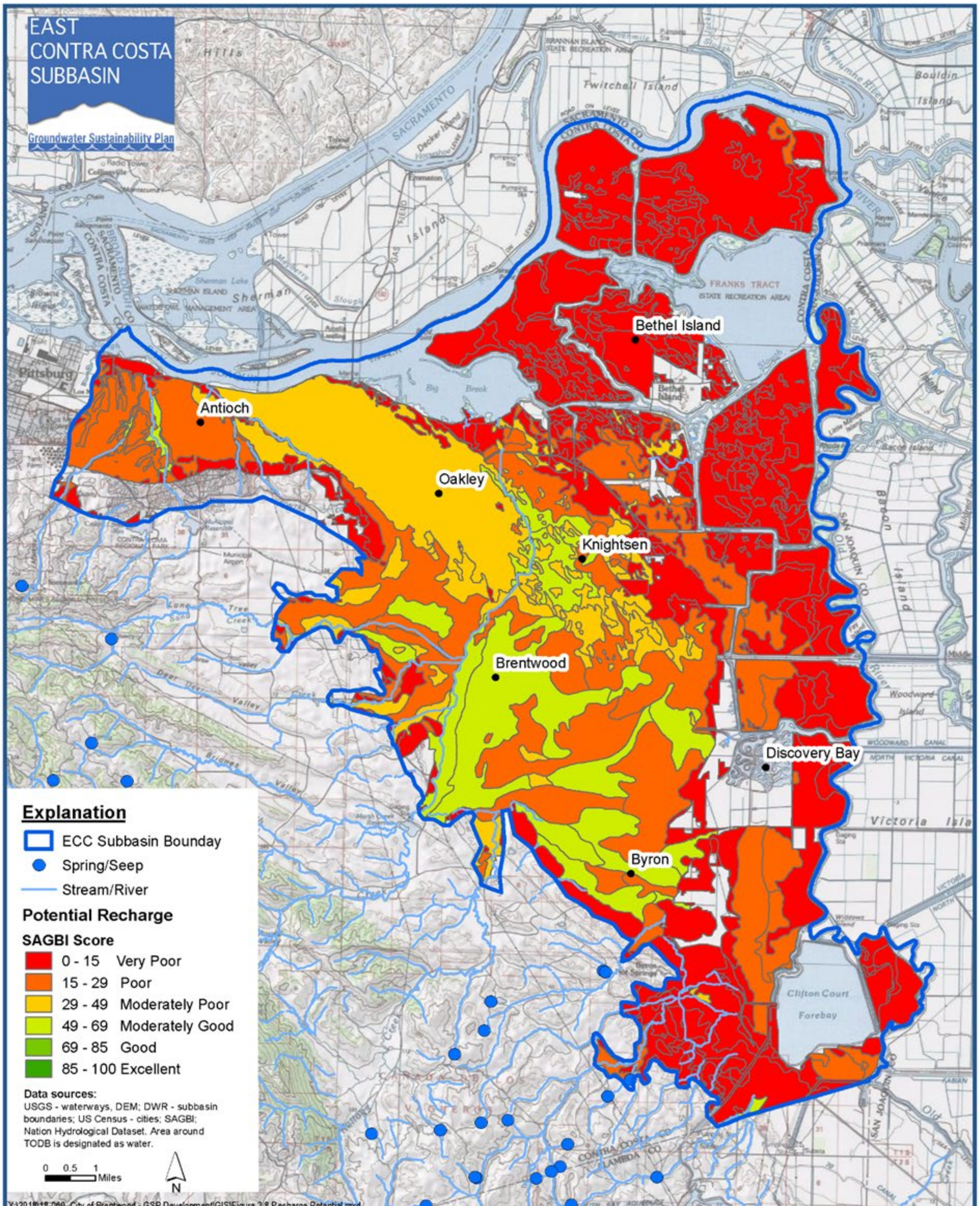
### 3.2.7 Groundwater Recharge and Discharge Areas

Groundwater recharge can occur from infiltration of precipitation and applied water (e.g., irrigation), surface water infiltration, subsurface inflows from outside the Subbasin, and unintentional recharge (e.g., leaky pipes). This section identifies the areas that may provide greater potential for future managed surficial recharge under the GSP implementation. Surface areas with favorable recharge potential (**Figure 3-8**) were evaluated using soil mapping data and the Soil Agricultural Groundwater Banking Index (SAGBI). The SAGBI provides a characterization of potential for groundwater recharge on agricultural land. The SAGBI score is based on five elements: deep percolation, root zone residence time, topography, chemical limitations, and soil surface conditions. **Figure 3-8** illustrates the main areas of percolation; however, these are not the same areas as those with high hydraulic conductivity (**Figure 3-7c**) and high infiltration potential (**Figure 3-7d**). The areas with highest recharge potential are along Marsh Creek near Brentwood and Kellogg Creek in the Byron area (moderately good), and the dune sands in the Oakley area (moderately poor). However, as discussed below, water levels indicate very little space, if any, available in the aquifer for additional recharge.

Due to the different depositional environments that occur in the Subbasin, there are a variety of natural recharge sources. The Alluvial Plain area is recharged from the Coast Range Foothills and groundwater moves through the Alluvial Plain and the Marginal Delta Dunes' area. The Fluvial Plain area likely has a different recharge source from the south as a function of its fluvial setting (LSCE, 1999). Recharge for the Delta Islands may be a combination of different sources, including fluvial influence from the Delta.

Groundwater discharge from the Subbasin can occur from discharge to surface water and springs, subsurface outflow from the Subbasin, and groundwater extraction by wells. Groundwater discharge from the Subbasin is from groundwater pumping (agricultural, municipal, domestic, and industrial uses). Maps of general locations of wells are provided in **Figures 2-6a** to **2-6d**. These maps indicate that the majority of domestic wells are located in the western portion of the Subbasin, public supply wells are mostly concentrated in urban centers of Discovery Bay, Brentwood, and Oakley, and agricultural wells are located on the western side of the Subbasin. Maps of the average depths (in feet) of domestic, agricultural, and public supply wells by section are provided in **Figures 3-9a** to **3-9c**. Domestic well depths are generally less than 200 feet bgs (**Figure 3-9d**). Agricultural well depths vary across the Subbasin with ranges from 60 to 800 feet bgs. Public supply wells are most commonly in the 200 to 400-foot bgs range.

The USGS's National Hydrography Dataset (NHD) maps one spring in the Subbasin located along the southwestern boundary. There are multiple springs that could be sources of recharge, in addition to streams, located in the foothills west of the Subbasin boundary (**Figure 3-8**).

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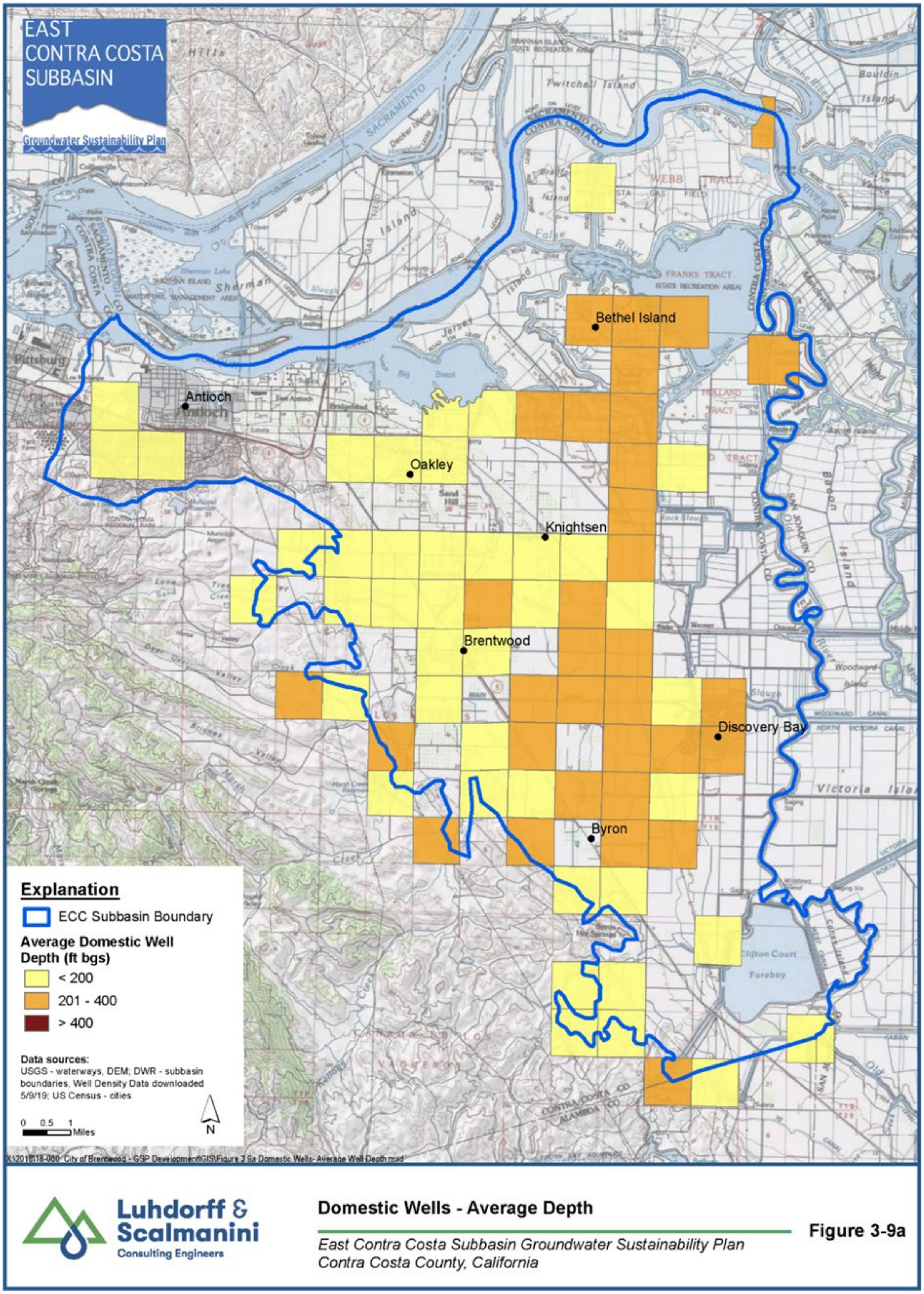
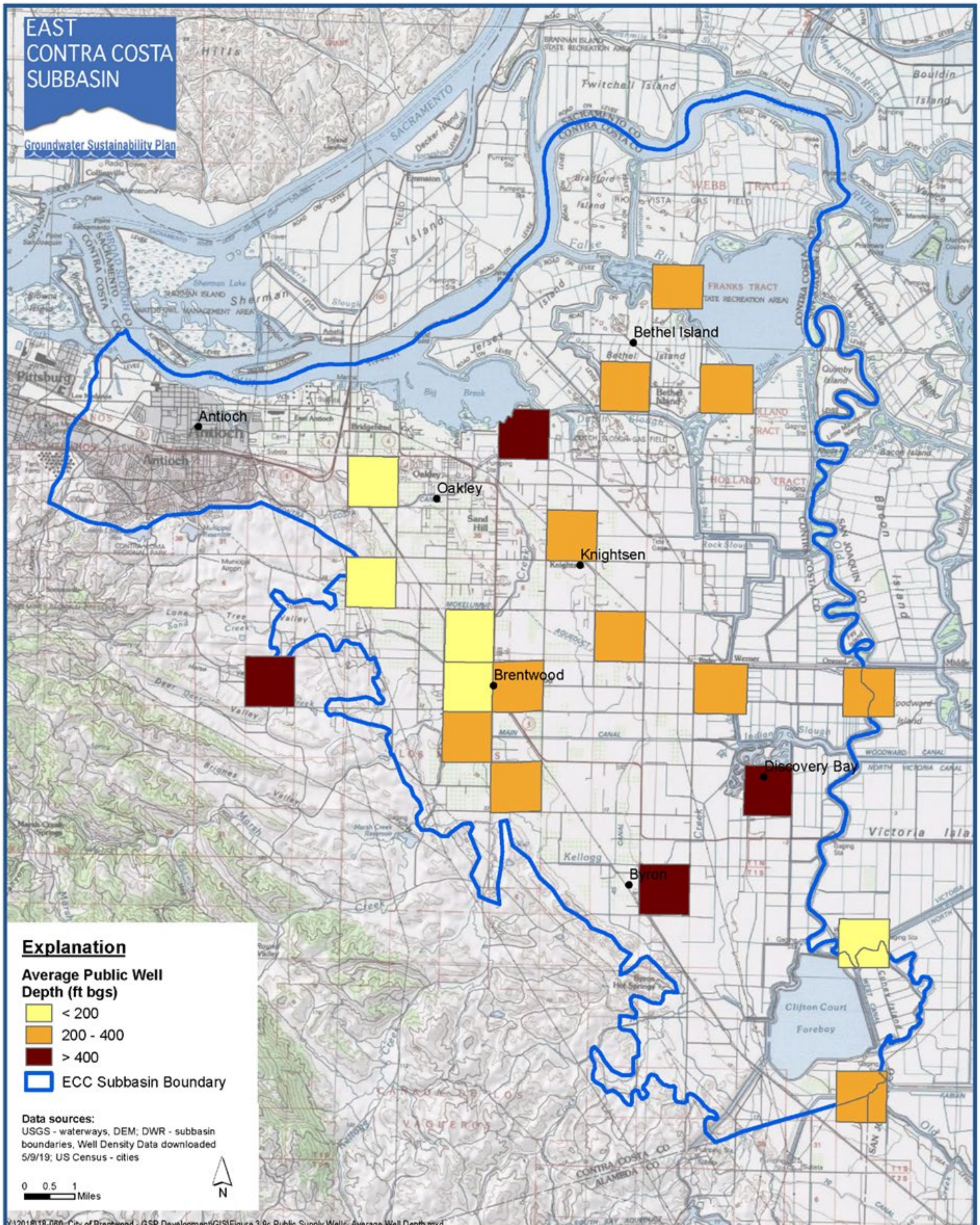
**Soil - Potential Recharge**

**Figure 3-8**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*


EAST CONTRA COSTA SUBBASIN
Groundwater Sustainability Plan
Bethel Island
Antioch
Oakley
Knightsen
Brentwood
Discovery Bay
Byron
Explanation
ECC Subbasin Boundary
Average Domestic Well Depth (ft bgs)
< 200
201 - 400
> 400
Data sources:
USGS - waterways, DEM; DWR - subbasin boundaries, Well Density Data downloaded 5/9/19; US Census - cities
0 0.5 1 Miles
N
Luhdorff & Scalmanini Consulting Engineers
Domestic Wells - Average Depth
East Contra Costa Subbasin Groundwater Sustainability Plan
Contra Costa County, California
Figure 3-9a

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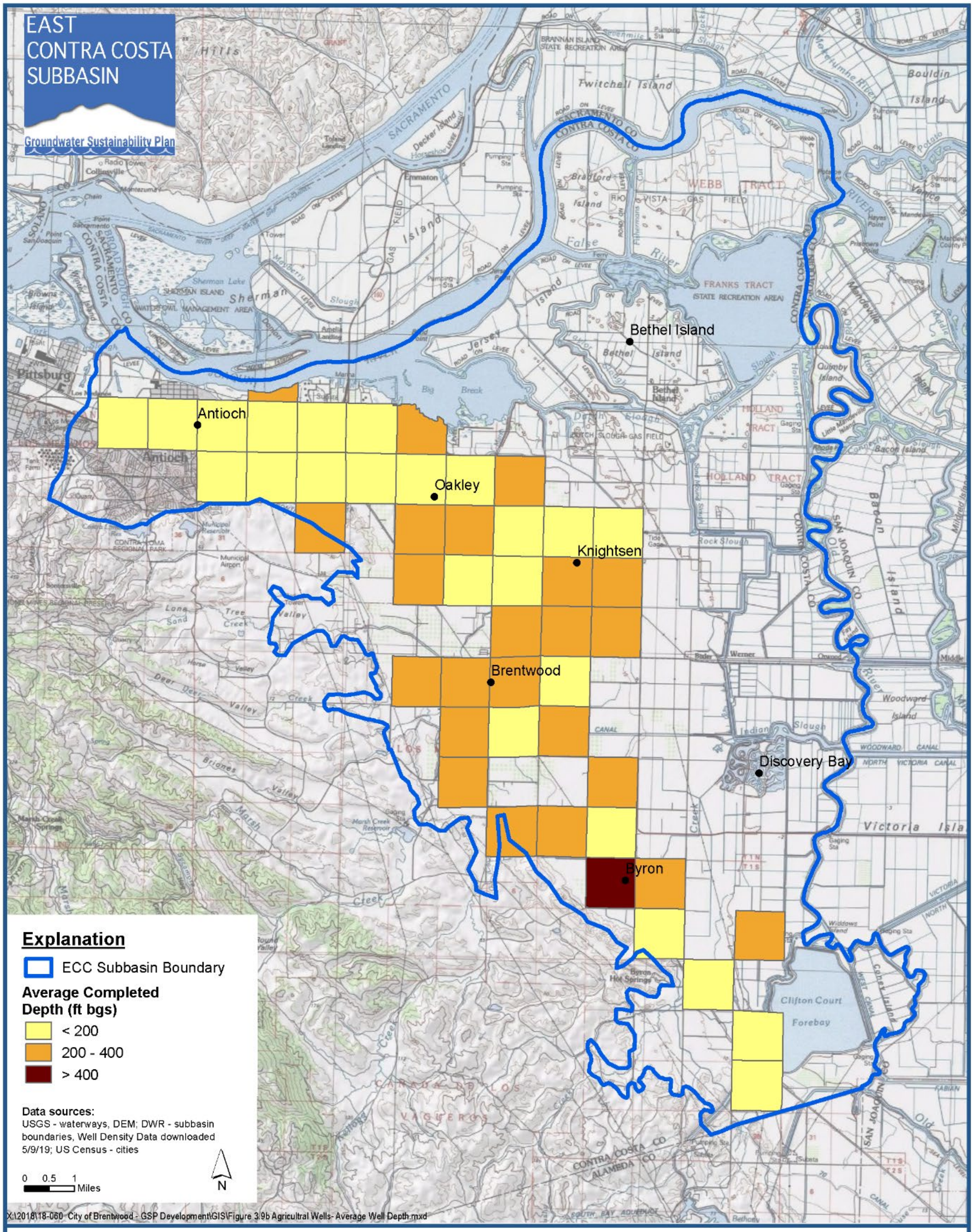
**Public Supply Wells - Average Depth**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-9b**

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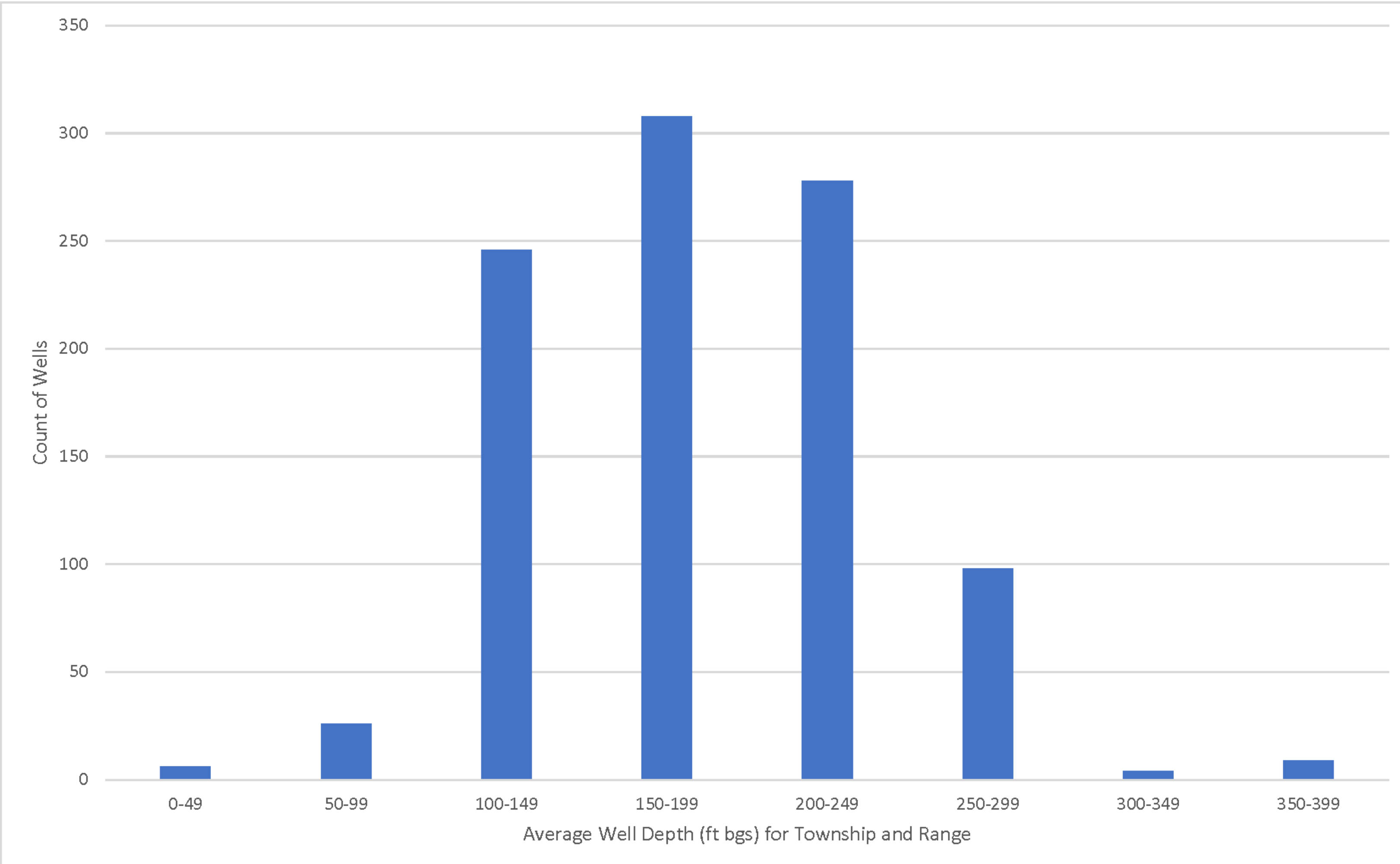
**Agricultural Wells - Average Depth**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-9c**

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**Domestic Well Depths**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-9d**

### 3.2.8 Imported Supplies

Contra Costa Water District draws water from the Delta primarily under a contract with the federal Central Valley Project (CVP). Surface water is diverted at two intake locations within the Subbasin: Rock Slough and Old River (**Figure 2-4**). Two entities in the Subbasin purchase water from CCWD: City of Antioch and Diablo Water District. In addition, CCWD diverts and conveys ECCID surface water for the City of Brentwood.

### 3.2.9 Surface Water Bodies

There are a number of surface water bodies that are significant to the management of the Subbasin (**Figure 3-10**). The Clifton Court Forebay, Franks Tract, and Big Break are large surface water bodies in the Subbasin. Two rivers are the primary natural surface water features in the ECC Subbasin. The San Joaquin River flows from east to west along the northern edge of the Subbasin and Old River flows from north to south on the eastern edge of the Subbasin. Numerous streams from the Coast Range enter the Subbasin from the west and discharge into the Delta (ECC IRWM, 2019). Marsh Creek drains parts of Mt. Diablo and has flows impounded (stored/captured) by the Marsh Creek Reservoir. Flow and water quality information is available for 2012 to 2013[2] in connection to the Dutch Slough Project. Similar to groundwater quality, March Creek water quality analyses showed TDS and chloride that exceeded the recommended secondary MCL (500 mg/L and 250 mg/l, respectively). Kellogg Creek drains the watershed south of Marsh Creek and includes the CCWD operated Los Vaqueros Reservoir. Brushy Creek is south of Kellogg Creek and drains into Old River and Clifton Court Forebay.

### 3.2.10 Hydrogeologic Conceptual Model Data Gaps and Uncertainty

This section identifies the data gaps and levels of uncertainty of the information for the physical setting and characteristics of the basin and current conditions.

Lithologic, water quality, and water level measurement controls exist for purposes of developing the hydrogeologic conceptual model mostly in the urban areas of Brentwood, Discovery Bay and Oakley. There are large areas in the north near Antioch and Bethel Island and in the south, west of Clifford Court Forebay, that have low well density as a result of a more rural setting. Many wells used for municipal purposes were also primarily screened to less than 500 feet bgs, which leads to uncertainty in the nature of the deeper subsurface materials. Many lithological descriptions come from drillers' logs which are limited in quality as a function of driller's experience and attention to detail. Geophysical logs provide the most consistent and quantitative information, but well control is highly variable as a function of current and historic groundwater use patterns. Expanded monitoring by aquifer for groundwater quality and level measurements and additional lithologic descriptions outside the urban areas would benefit development of the hydrogeologic conceptual model.

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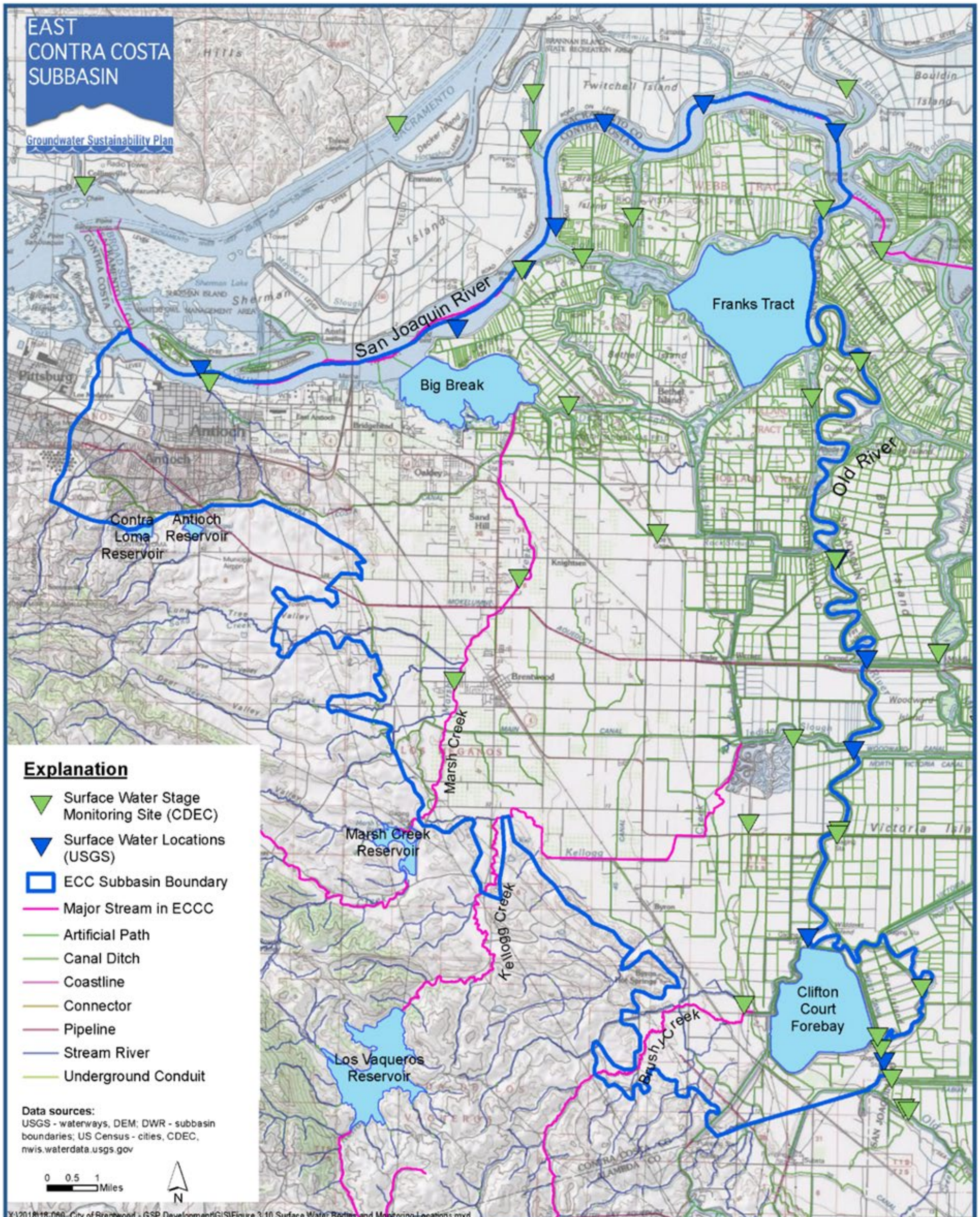
[2] Hydrofocus Inc. 2014. Dutch Slough Restoration Area Surface Water Quality Monitoring Report, September 2012 to August 2013. April 11, 2014. 228 pages.

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**Surface Water Bodies and Monitoring Locations**

**Figure 3-10**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

## 3.3 Groundwater Conditions

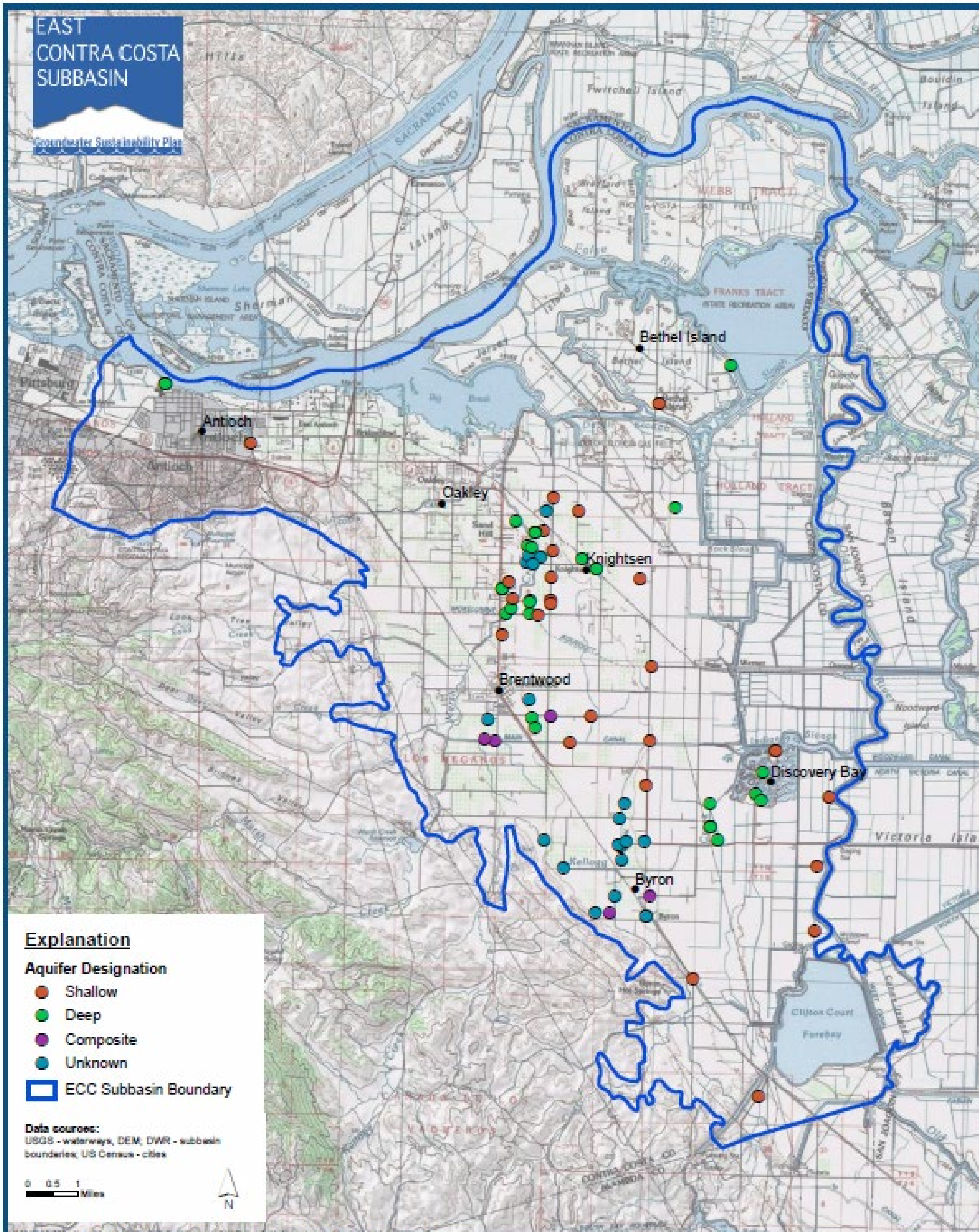
This Groundwater Conditions section describes historical groundwater conditions in the ECC Subbasin through present day. Groundwater levels and storage, seawater intrusion, groundwater and surface water quality, land subsidence, interconnected surface water, and groundwater dependent ecosystems are presented in this section.

### 3.3.1 Groundwater Levels

Groundwater levels provide useful data for understanding groundwater conditions and trends over time. Groundwater levels are affected by natural recharge and discharge which are in turn governed by variations in climate conditions. Groundwater pumping and water usage such as in agriculture also affect groundwater levels. Groundwater movement, as governed by regional and local gradients and aquifer properties are also reflected in groundwater levels. All factors play a role in changes in groundwater storage over time which is a primary consideration in the HCM.

Groundwater level records were compiled from the various entities in the Subbasin in addition to data from Geotracker, USGS, and DWR. A small subset of wells has a long period of record for water level monitoring, but most data are relatively recent, within the last 15 years. The wells with the longest period of record have over 50 years of data and are primarily concentrated in the ECCID area (**Figure 2-1**). All data were reviewed and compiled in a Data Management System (DMS). Data of similar type was converted to the same units and, if applicable, the method used to gather data was noted (e.g., surveyed reference point elevations versus estimated elevations). A well was assigned an aquifer zone designation (Shallow Zone, Deep Zone, Composite, or Unknown) based on the well screen interval and/or total well depth. This well construction information is presented in **Appendix 3c** for over 1,100 wells in the ECC Subbasin. The contact between the Shallow Zone and Deep Zone ranges in depth from 100 and 150 ft bgs throughout the Subbasin but is generally about 120 ft bgs. Wells with screen intervals in both zones were given the designation Composite. Wells with missing well construction information were designated Unknown. **Figure 3-11** illustrates the groundwater level monitoring well locations in the Subbasin and their assigned aquifer designations (Shallow Zone, Deep Zone, Composite, or Unknown) based on well construction. Selected groundwater level hydrographs are presented for Shallow Zone wells in **Figure 3-12a**, for Deep and Composite Zone wells in **Figure 3-12b,** and all hydrographs are presented in **Appendix 3d**. Overall, water levels are stable for the periods of record.

**Figure 3-12a** is a panel map with hydrographs from wells completed in the unconfined Shallow Zone. Shallow groundwater level information is concentrated in the Oakley, Brentwood, and Discovery Bay areas. These data indicate that basin-wide Shallow Zone water levels have remained fairly stable with no evidence of long-term declines. A minor shift in water level is seen in one well, 5 Binn in the southern portion of the Subbasin, that has dropped five feet over a 22-year period. This is not considered a significant factor to either groundwater quantity or quality in the Subbasin.

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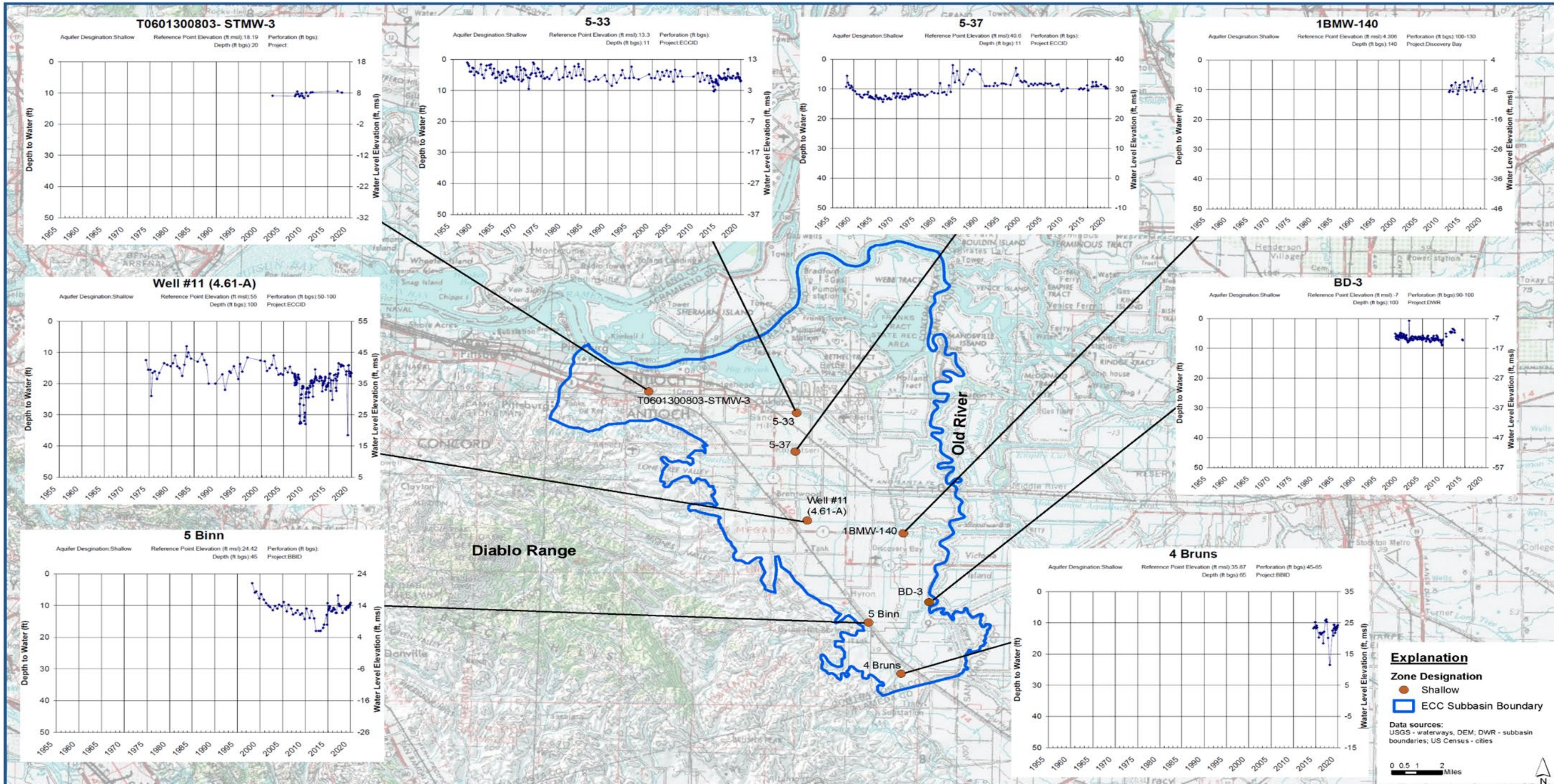
**Groundwater Level Monitoring Locations**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contro Coasta County, California*

**Figure 3-11**

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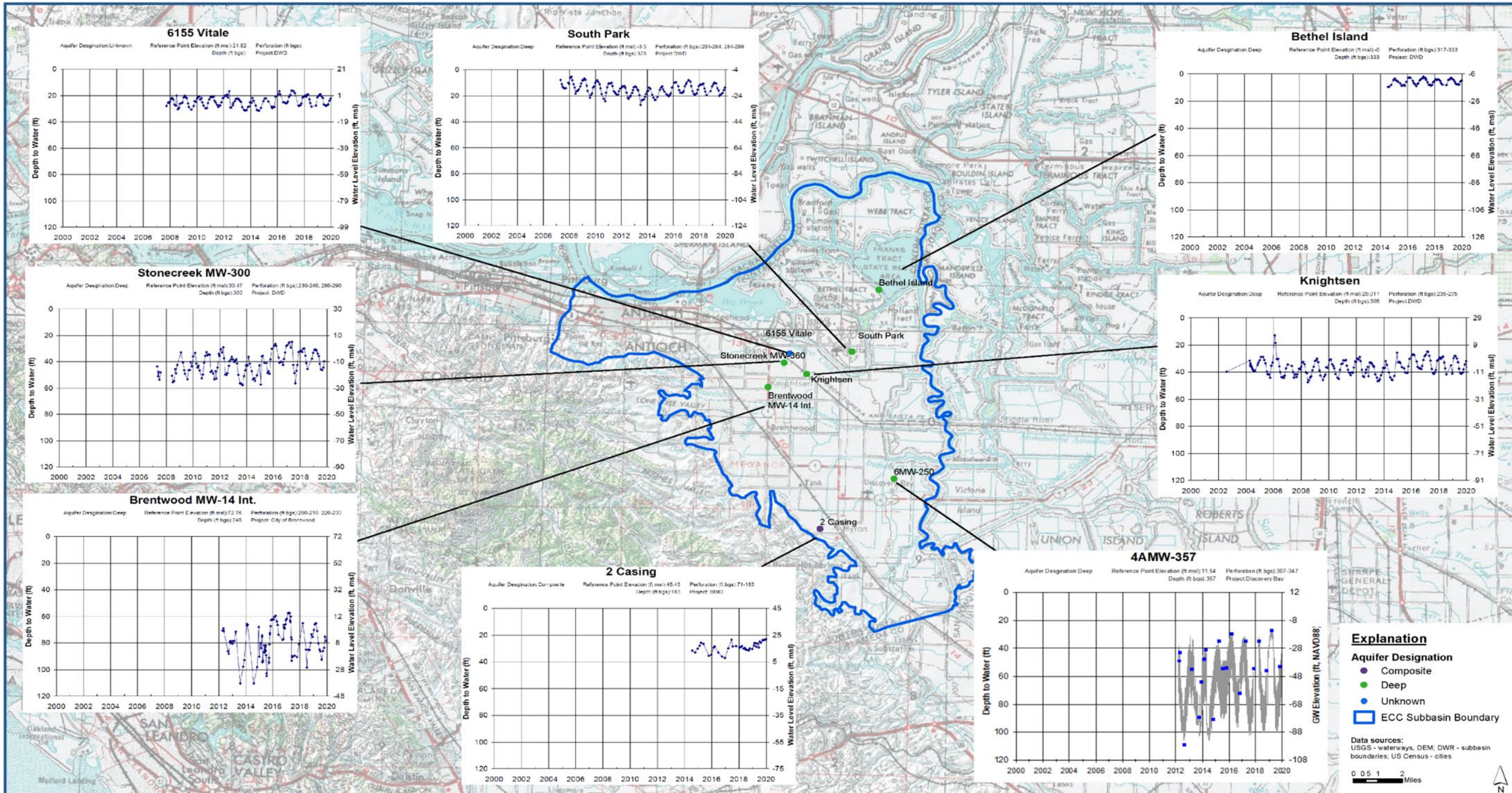
**Selected Graphs of Groundwater Elevations - Shallow Zone**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-12a**

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**Selected Graphs of Groundwater Elevations - Deep and Composite Zone**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

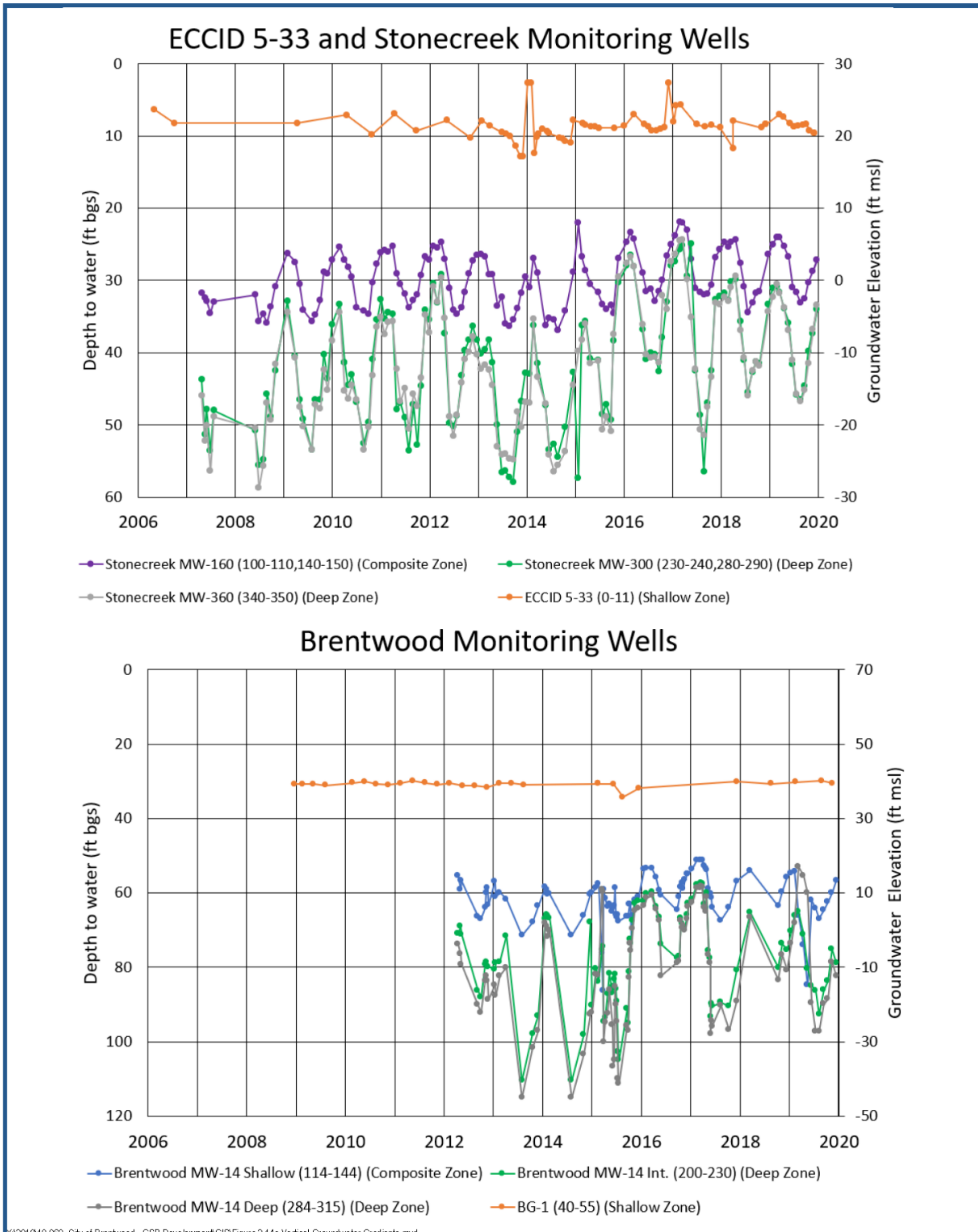
**Figure 3-12b**

Shallow Zone seasonal variations in groundwater levels on a regional basis are very minor (one to three feet). In the Oakley and Brentwood areas, a few Shallow Zone wells with deeper completions (100 to 150 ft bgs) show more variable seasonal trends (10 to 15 feet annual fluctuation in water levels) that suggest a slight increase in confinement (semi-confined) with depth. Shallow monitoring wells in the Discovery Bay area and eastward along Old River (BD-1, 2, 3) do not have pronounced seasonal water level changes (less than five feet annually) that may be attributed to influence by and proximity to the Delta. Shallow wells located in the western portion of the Subbasin (e.g., Well #11 [4.61-A], **Appendix 3d**) have more pronounced seasonal water level changes (about 10 feet annually) that is likely influenced by boundary effects due to proximity to the edge of the groundwater basin (e.g., the Diablo Range). The Delta Islands have a unique shallow groundwater situation unlike the rest of the Subbasin. Depth to water in subsided Delta islands (described in more detail below) is controlled by drainage ditches that convey irrigation water and seepage water from adjacent channels that is then pumped back into Delta channels. Deverel et al. (2016) reports that, due to this drainage system, groundwater levels are generally maintained at about 2-1/2 to 4 feet bgs in the Delta islands area.

**Figure 3-12b** shows select hydrographs of the confined Deep and Composite Zone wells in the Subbasin. Regional large capacity supply wells target the Deep Zone and are generally over 200 feet in depth (LSCE, 2011). The hydrographs show generally stable conditions with seasonal water level fluctuation from 10 to 30 feet bgs with maximum decline during the summer months. This is followed by a full recovery of water levels during wet months (November to March). Some variation in annual peak water levels according to climatic trends is noted in the period between 2007 and 2010 and 2012 to 2015 when water levels appear to be affected by the state-wide droughts (**Appendix 3d**). There is no evidence of pumping-induced groundwater level declines.

Vertical groundwater gradients can be monitored with nested monitoring wells. When plotted together, the water levels show the variation of groundwater levels in an unconfined, semi-confined and confined aquifer system (**Figures 3-13a and b**). The ECC Subbasin has three locations with nested monitoring wells: Stonecreek Monitoring Wells, Brentwood MW-14 Monitoring Wells, and Discovery Bay (**Figure 3-13c**). The Stonecreek Monitoring Well cluster has three monitoring wells screened between 100 and 350 ft bgs with a local shallow well (ECCID 5-33) that has a well depth of 11 ft bgs. Brentwood MW 14 has three wells screened between 114 and 315 ft bgs and a shallower well (BG-1) screened between 40-55 ft bgs. Discovery Bay MW4A has two wells screened between 122 and 347 ft bgs. All three nested wells show similar trends. In Stonecreek and Brentwood wells, the two deeper screened wells exhibit similar groundwater levels with seasonal variations of up to 30 ft. The shallower wells have higher groundwater levels with less seasonal variation (less than five feet for the ECCID 5-33 well). The Discovery Bay Deep Zone monitoring well (4AMW-357) has up to 60 feet seasonal variation and the Shallow Zone monitoring well (4AMW-152) has less than 5 feet of seasonal variation.

These hydrographs demonstrate that groundwater levels in ECC Subbasin wells are stable and that groundwater conditions in the Subbasin are consistent with sustainable use. The water levels, by virtue of their consistent seasonal recoveries, also indicate that the Subbasin on the whole is full, with no room for additional groundwater recharge.

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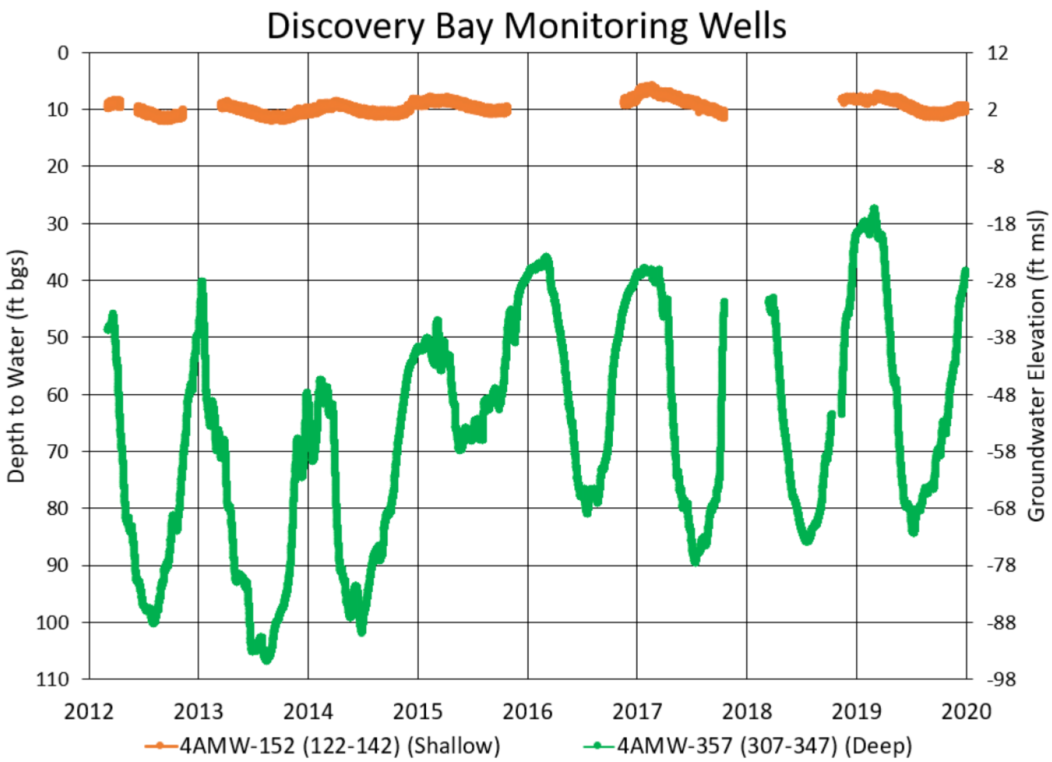
**Vertical Groundwater Gradients**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-13a**




X:\2018\18-060 City of Brentwood - GSP Development\GIS\Figure 3.14b Vertical Groundwater Gradients.mxd

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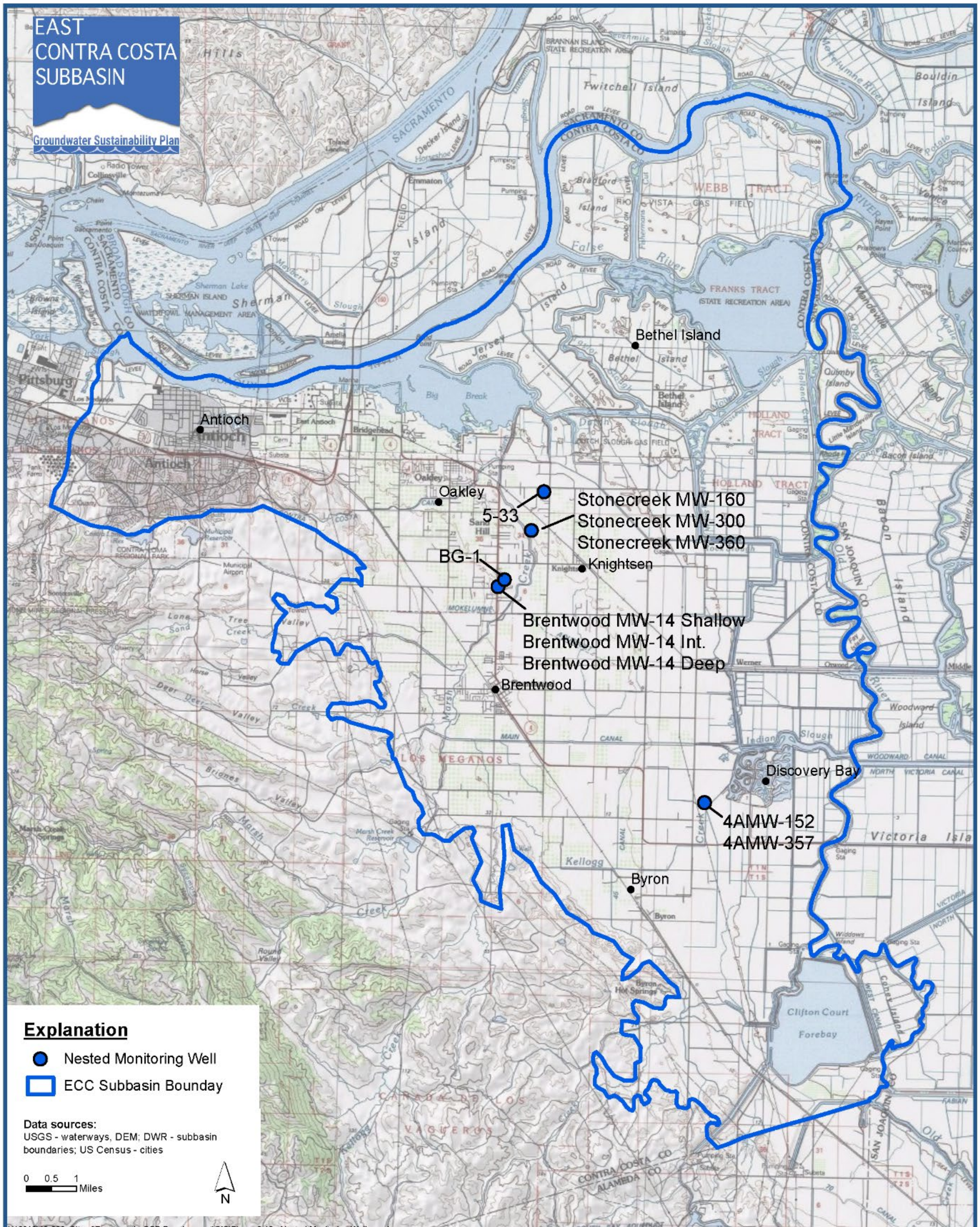
**Vertical Groundwater Gradients**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-13b**

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**Nested Monitoring Well Locations**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contro Coasta County, California*

**Figure 3-13c**

### 3.3.2 Groundwater Elevation Contours

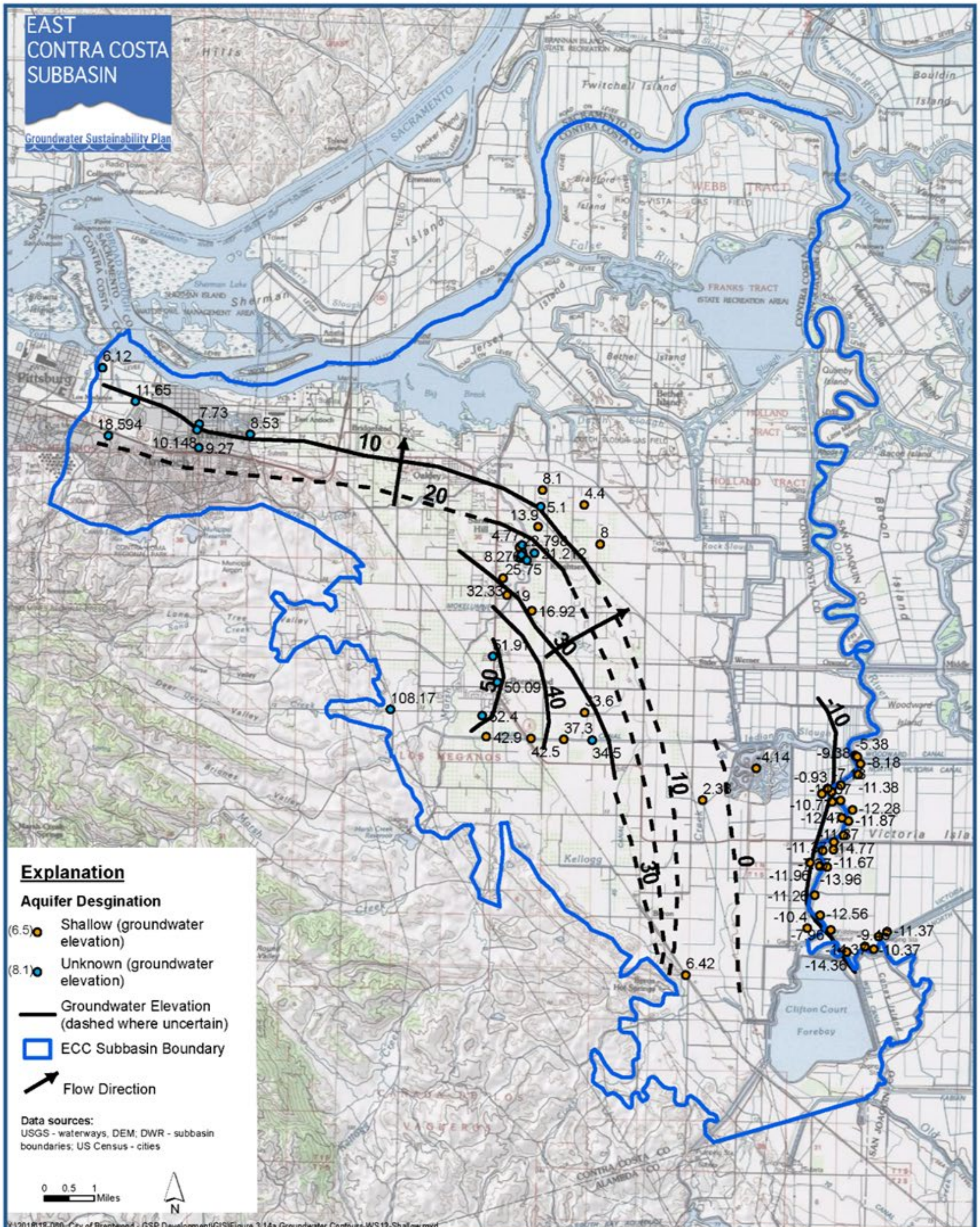
Maps of groundwater elevation from 1958 to present indicate groundwater flow direction is from the Diablo foothills towards the Delta, generally from the southwest to the northeast in the central East Contra Costa Subbasin. Groundwater elevation contour maps developed by LSCE (1999) are available for selected years between 1958 to 1996 (**Appendix 3e**). These maps were developed with water level measurements for wells mostly constructed in the Shallow Zone and are representative of the unconfined aquifer. To evaluate recent groundwater level conditions in the Subbasin, groundwater elevation contour maps were prepared for Spring 2012 and 2018 for both the Shallow and Deep Zones (**Figures 3-14a** to **Figure 3-14d)**.

Shallow Zone

The spring 1958 through spring 2018 groundwater contours for the Shallow Zone exhibit a similar pattern of flow, generally from the southwest to the northeast. In 1958, groundwater elevations ranged from about 55 feet msl in Brentwood to about 5 feet msl near the Delta north of Oakley; however, data is only available in the vicinity of Brentwood and Oakley. In spring 1991 additional data were available for the area south of Brentwood on the basin boundary where the groundwater elevation was as high as 75 ft msl to -15 ft msl around Discovery Bay. In spring 2012 (**Figure 3-14a**), the highest groundwater elevations were south of Brentwood at about 45 ft msl to a low of about -10 ft msl along Old River. In spring 2018 (**Figure 3-14b**) the Shallow Zone high groundwater elevations were again located south of Brentwood at about 40 ft msl to a low of about -5 ft in Discovery Bay. The general groundwater flow directions remained the same (to the northeast) and elevations north of Oakley were still around 5 ft msl.

Deep Zone

Contouring groundwater elevations in the Deep Zone is difficult due to the lack of well control exclusively in the Deep Zone. In contouring groundwater levels in the Deep Zone, water levels were used from wells with known construction in the Deep Zone and composite wells (constructed in both the Deep and Shallow Zones). The composite wells are identified by a different colored symbol on the contour maps and allow contours to tentatively be extended outward. Deep Zone groundwater level data is not available until 2007 around Oakley and 2012 around Brentwood and Discovery Bay. Given the limited data points and spatial representation, two Deep Zone groundwater contour maps were constructed: spring 2012 and spring 2018 (**Figures 3-14c and d**). In spring 2012, the highest Deep Zone groundwater elevations were about 50 ft msl south of Brentwood to a low of less than -20 feet msl around Discovery Bay. The spring 2018 Deep Zone contour map illustrates similar groundwater elevations to spring 2012 with high levels of 52 ft msl south of Brentwood, less than -20 ft msl in Discovery Bay, and about 2 ft msl north of Oakley. The Deep Zone groundwater flow direction is to the northeast which is similar to the Shallow Zone flow direction. Due to the limited spatial coverage of Deep Zone wells, evaluating groundwater flow and gradients within the Subbasin are challenging.

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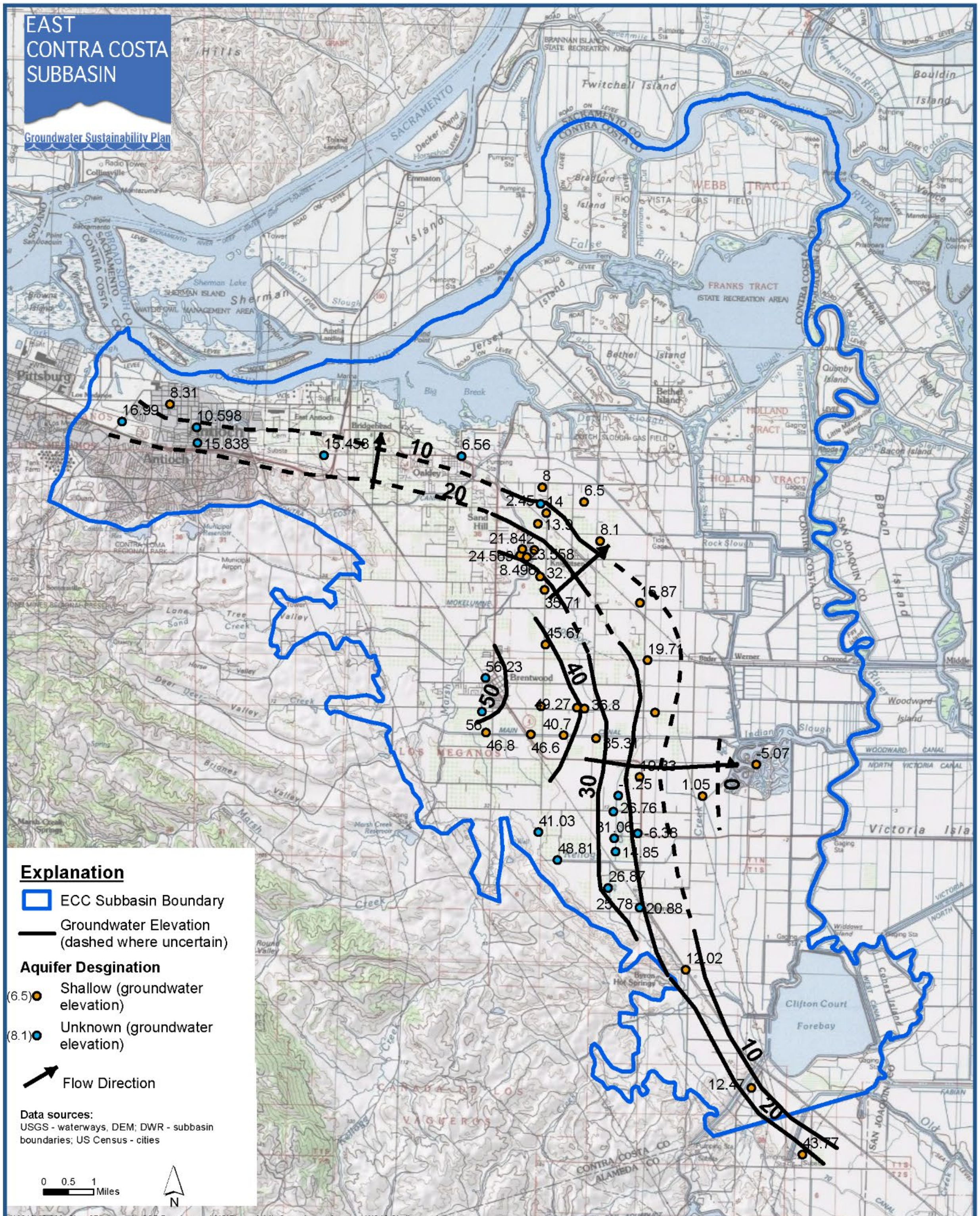
**Groundwater Contours Spring 2012 - Shallow Zone**

**Figure 3-14a**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*




Groundwater Contours Spring 2018 - Shallow Zone

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-14b**

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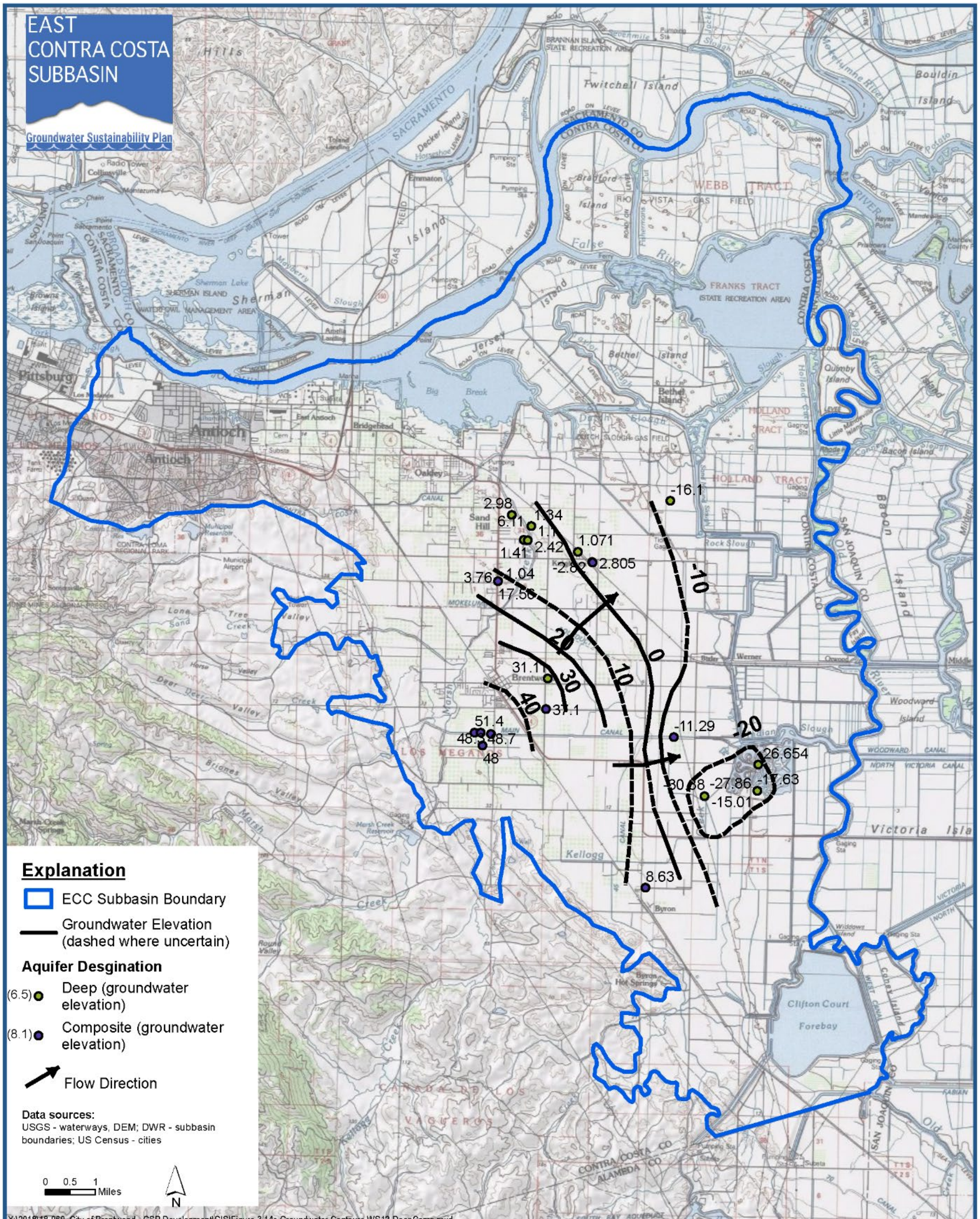


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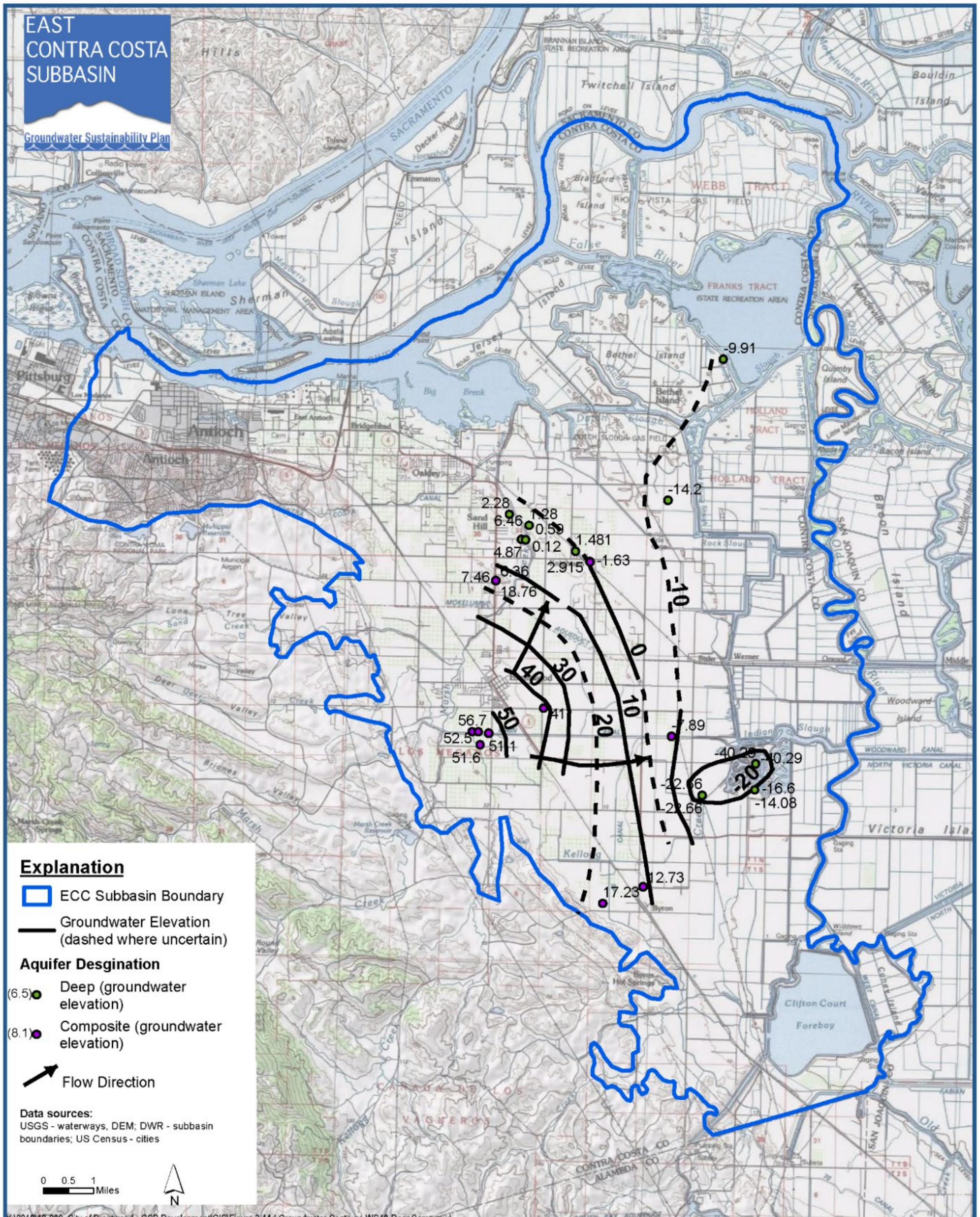
**Groundwater Contours Spring 2012 - Deep Zone and Composite Wells**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-14c**

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**Groundwater Contours Spring 2018 - Deep Zone and Composite Wells**

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*Contra Costa County, California*

**Figure 3-14d**

### 3.3.3 Storage

The total groundwater storage volume within the East Contra Costa Subbasin above the base of freshwater is estimated to be between 4.5 million AF (MAF) and 9.0 MAF based on the specific yield range of 5 to 10 percent and using spring 2018 groundwater level contours. DWR Bulletin 118 (2016 update), did not estimate total groundwater storage in the ECC Subbasin but did provide specific yield value ranges of 7 to 10 percent for the San Joaquin Subbasin and Delta for water bearing deposits. **Table 3-1** summarizes calculations of total groundwater storage in the Subbasin using the 7 and 10 percent specific yield values and a lower value of 5 percent as a sensitivity for lower computed storage. An additional analysis is included in **Table 3-1** ("To Base of Major Production Zone") that estimates groundwater storage for the saturated thickness in the Subbasin from the regional water table (spring 2018) to the base of the major production zone (about 300 feet bgs). The total groundwater storage volume for this subsurface unit is estimated to be between 1.5 MAF and 3.0 MAF. There has not been a change in groundwater storage over time because groundwater levels between 1993 to 2019 have been stable. Sustainable yield[3] refers to conditions under which extraction has not adversely impacted a variety of parameters including groundwater levels, storage, quality, etc. Historical conditions as reflected in the hydrographs and contour maps, where data is available, indicate that groundwater extraction has not impacted groundwater levels and storage and that the Subbasin is operating within its sustainable yield.

**Table 3-1. Estimates of Total Groundwater Storage (2018)**

| Area | ECC Subbasin Volume (acre-feet) | Specific Yield (percent) | Total Groundwater Storage (acre-feet) | Notes on Specific Yield Basis |
|---|---|---|---|---|
| **To Base of Major Production Zone** | 30,254,373 | 5% | 1,513,000 | |
| | | 7% | 2,118,000 | Range of 7 to 10% for water bearing deposits DWR Bull. 118 (2003) Tracy Subbasin |
| | | 10% | 3,025,000 | |
| **To Base of Freshwater** | 89,839,409 | 5% | 4,493,000 | |
| | | 7% | 6,290,000 | Range of 7 to 10% for water bearing deposits DWR Bull. 118 (2003) Tracy Subbasin |
| | | 10% | 8,986,000 | |

### 3.3.4 Seawater Intrusion

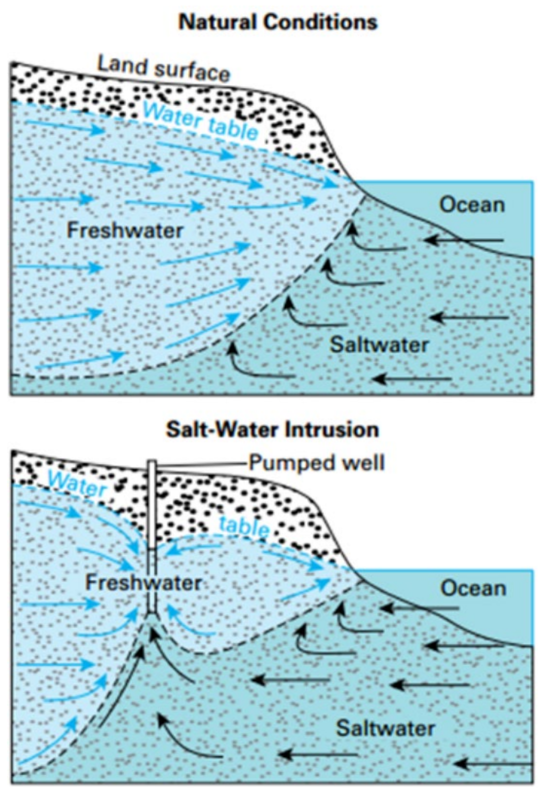
The East Contra Costa Subbasin has no coastline, is not bordered by the ocean, and direct seawater intrusion is not present. The Sacramento-San Joaquin River Delta has historically had brackish tidal water drawn in from the San Francisco Bay; however, levees installed around Delta islands to facilitate agriculture, and development of the Central Valley and State Water Projects, have altered the movement

[3] "In general, the sustainable yield of a basin is the amount of groundwater that can be withdrawn annually without causing undesirable results. Sustainable yield is referenced in SGMA as part of the estimated basinwide water budget and as the outcome of avoiding undesirable results." DWR, 2017.

of tidal water through the Delta to maximize freshwater flow. A surface water salinity interface of two parts per thousand near Chipps Island west of the ECC Subbasin, is the State Water Resources Control Board adopted[4] water quality objective to regulate Delta outflow. Though salinity in groundwater may occur naturally in parts of the Subbasin, it is not due to direct seawater intrusion into aquifers.

The mechanism for seawater intrusion is illustrated in **Figure 3-15.** When a direct connection exists such as along the coast, seawater may be drawn into aquifers when the gradient for freshwater outflow is reduced or reversed due to over-pumping. This causes the saltwater/freshwater aquifer interface to move inland. As mentioned above, this is not present in the ECC Subbasin.

### Figure 3-15 The Process of Saltwater Intrusion from an Aquifer




Source: https://www.usgs.gov/media/images/process-saltwater-intrusion

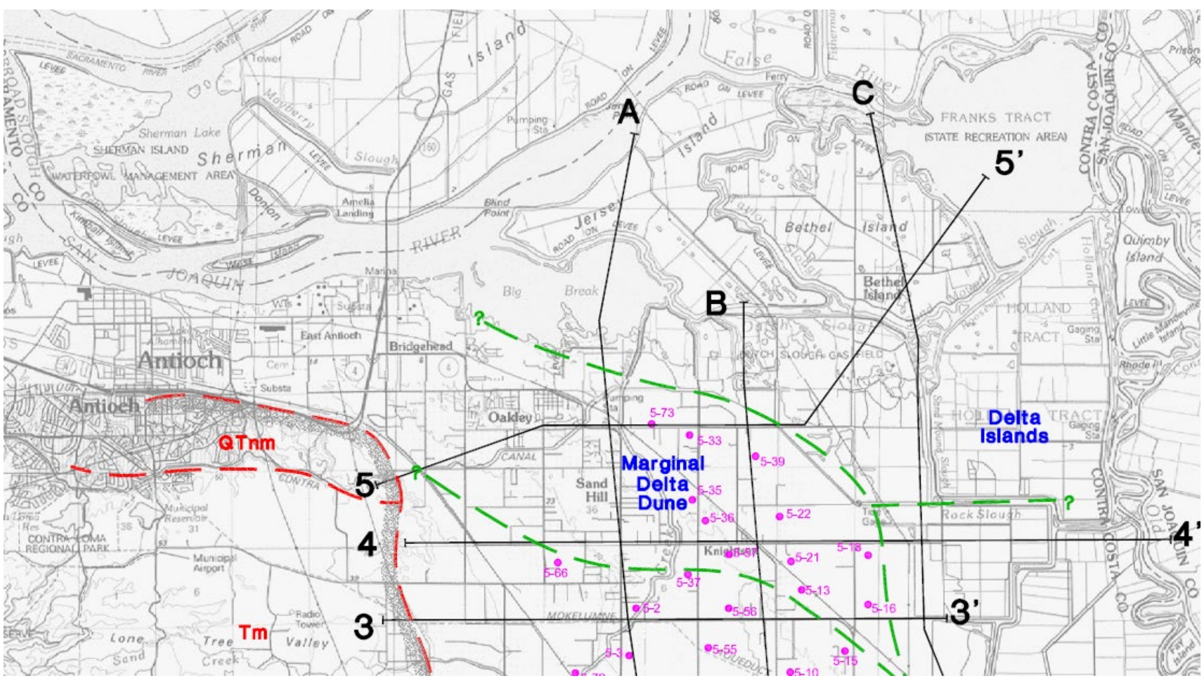
In the Bay-Delta setting of the ECC Subbasin, there is no saltwater interface in the subsurface and the aquifers are freshwater. A potential source of saline water intrusion might be migration of baywater into the Shallow Zone aquifers. While fresh baywater outflow through the Delta is managed, increases in baywater salinity could potentially occur due to sea-level rise. This occurrence may potentially impact sustainability if intruded shallow groundwater migrated vertically downward into the Deep Zone aquifers used for water supply. This mechanism is illustrated by two cross-sections (A-A' and C-C') from the 1999 LSCE report (**Figure 3-16a, b, c**). **Figures 3-16b** and **3-16c** show the potential for interactions through hydraulic pathways between stream and delta channels and shallow aquifers. **Figure 3-16b** shows

[4] https://www.baydeltalive.com/maps/11634

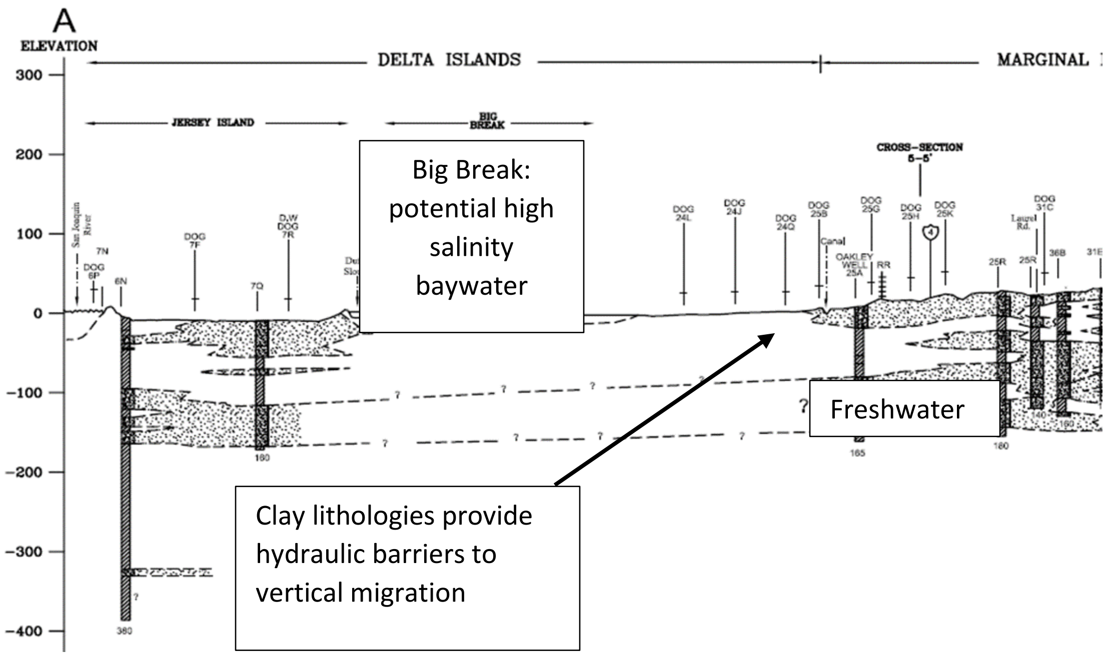
substantial clay layers that impede vertical migration to the Deep Zone. Connection to the Deep Zone may be of concern for some areas where domestic and agricultural pumping occurs. One possible area is depicted on Section C-C' (**Figure 3-16c**) where there are fewer hydraulic clay barriers present. **Figure 3-16d** presents the average chloride concentrations measured in the Shallow Zone and Deep Zone wells over the last ten years. Chloride concentrations are below 500 mg/L and are generally around the 250 mg/L Recommended MCL with a few isolated exceptions.

Seawater Intrusion (or baywater in the ECC Subbasin) will be evaluated with chloride concentration maps that include the new dedicated Shallow Zone monitoring wells (see **Section 6.2.4** for monitoring well list and well map). These wells will act as sentinels for intrusion-related degradation of water quality. There is currently no chloride concentration contour since the monitoring wells have not been installed. A chloride concentration map will be produced for the initial annual report and then for each 5-year update unless more frequent reporting is warranted through analysis of test results. Based on initial sampling and an assessment of basin-wide Shallow Zone water quality characteristics, a baseline for intrusion will be determined. A threshold is set at 250 mg/L, which is the Recommended Limit Secondary Maximum Contaminant Level (SMCL) for chloride as defined by the EPA and below which are the majority of chloride concentration is in the Subbasin.

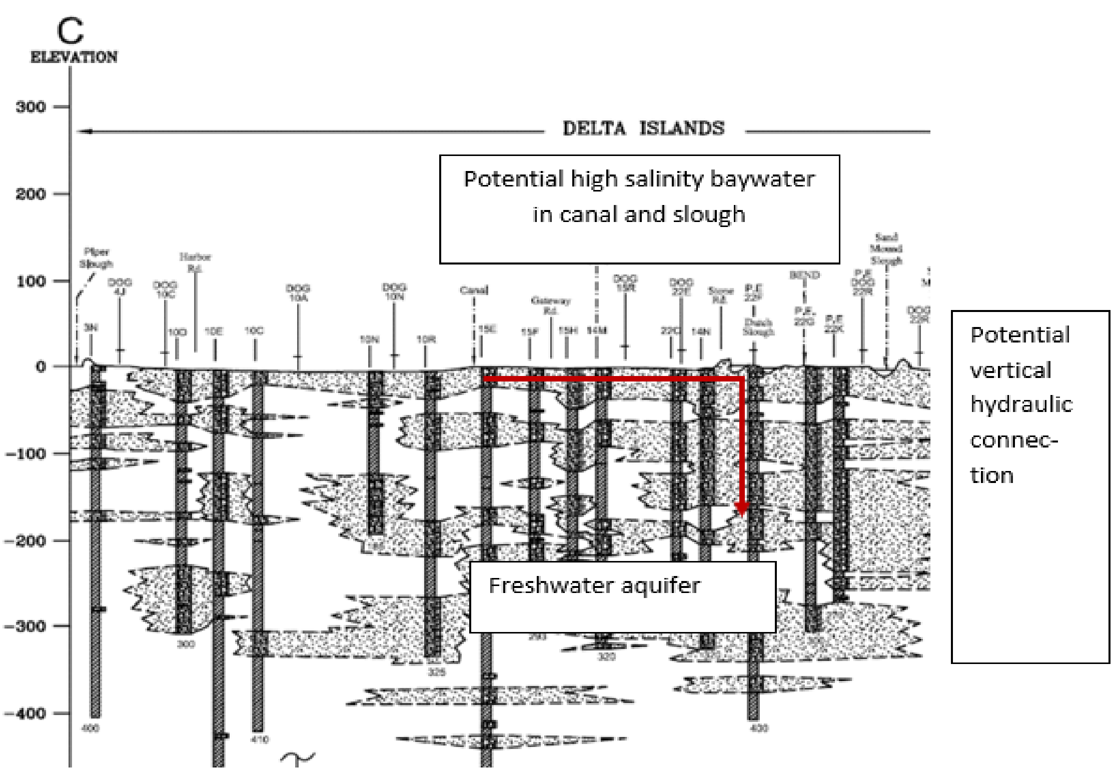
**Figure 3-16a Partial Cross Section Location**

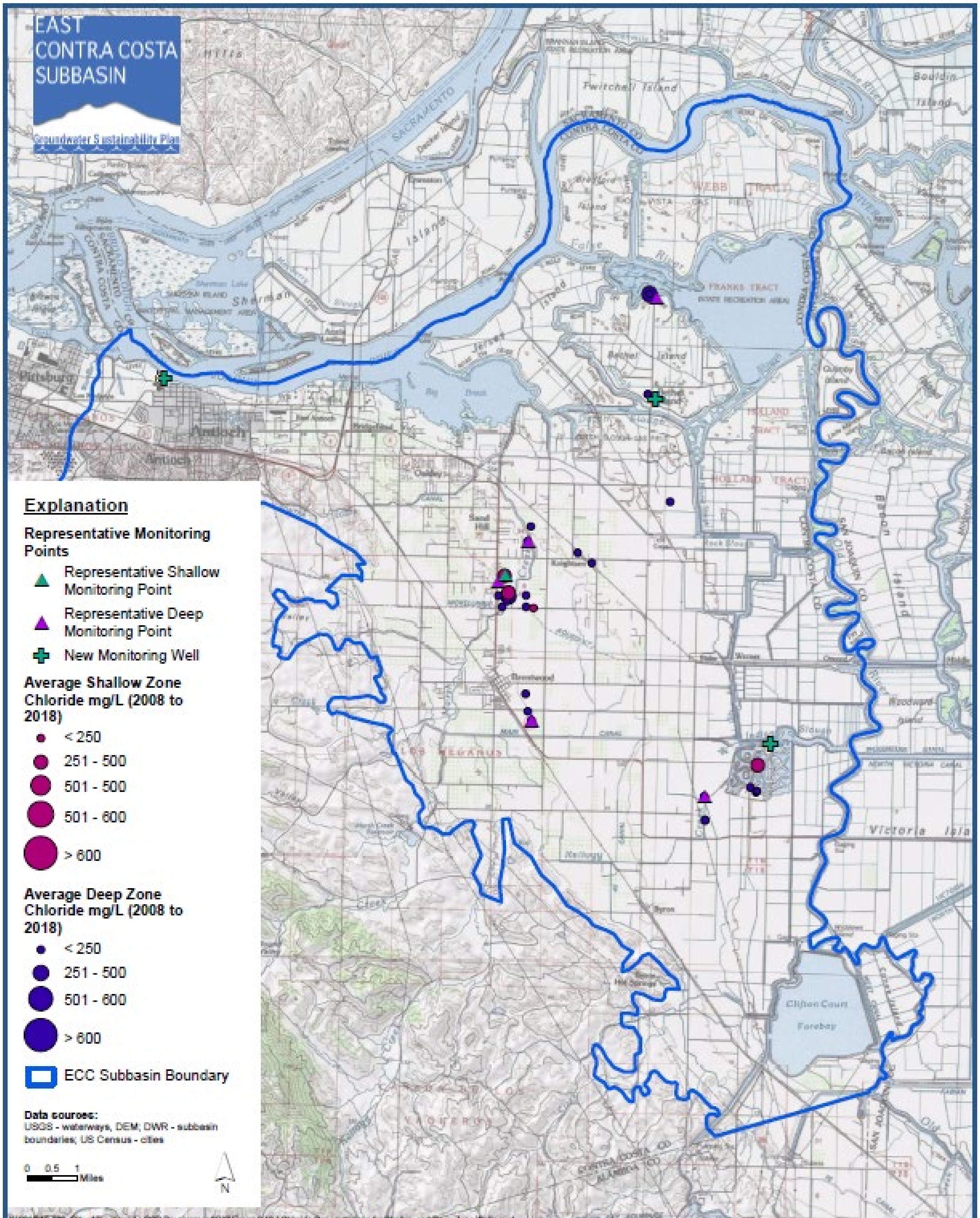


## Figure 3-16b Partial of Cross Section A-A'-Clay Barriers Prevent Vertical Baywater Migration




## Figure 3-16c Partial Cross Section C-C': Potential for High Salinity Baywater Migration



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**Chloride Concentrations for Shallow and Deep Zone Wells**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contro Coasta County, California*

**Figure 3-16d**

### 3.3.5 Groundwater Quality

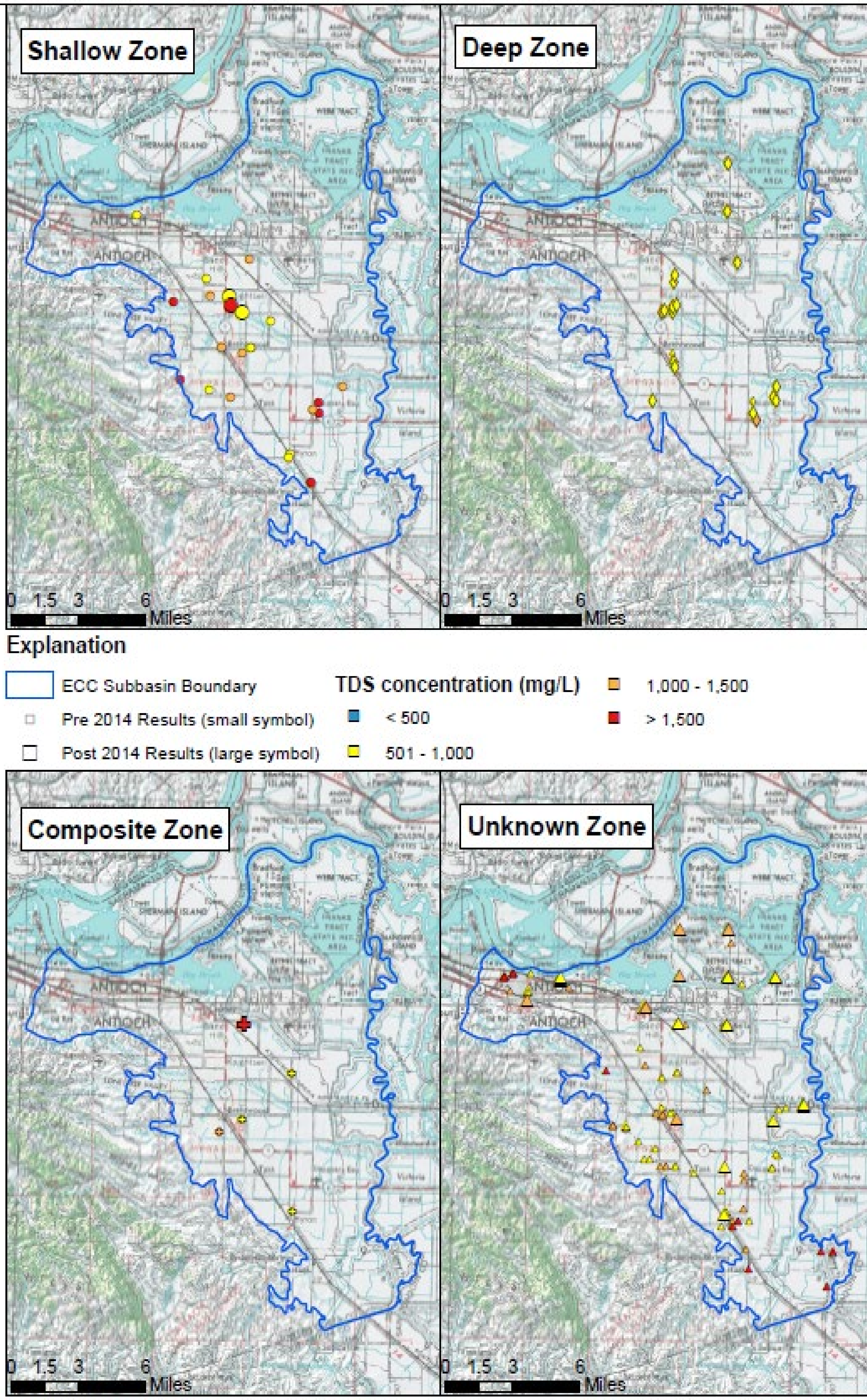
Groundwater quality in the Subbasin is characterized for this section through a variety of tables, maps and graphs. The entire water quality data set is provided in **Appendix 3f**. Key groundwater quality constituents discussed below include total dissolved solids (TDS), nitrate, chloride, arsenic, boron, and mercury. These constituents were selected because they have the potential to influence sustainability (as opposed to localized, or site-specific contamination). A concern for domestic water supply, including individual domestic wells and large public water systems serving municipalities, is groundwater hardness. This concern is included as a sustainability issue in **Section 7 Sustainable Management Criteria**. Monitoring and reporting on trends in hardness of well water are also discussed in **Section 6 Monitoring Network and Data Management System**.

Maps of average and maximum concentration for the selected constituents are displayed in **Figures 3-17a** and **b** through **3-20a** and **b.** Recent data (after 2014) are lacking for some constituents so concentrations for wells with results prior to 2014 are included on the map with a smaller symbol. Time series graphs for these same constituents are presented in **Appendix 3g** and can be used to evaluate trends over time (e.g., TDS or chloride increasing or decreasing over time). In general, groundwater quality meets most water quality objectives and serves a variety of domestic and agricultural uses throughout the Subbasin. However, minor restrictions (discussed in more detail below) are caused by naturally occurring salinity levels that are elevated basin wide and nitrate levels that are slightly elevated in the shallow zone (less than 150 ft bgs).

Water quality concentrations in wells are compared for some constituents (nitrate as nitrate, arsenic, and mercury) to the California State Water Quality Control Board (SWQCB) drinking water standards called maximum contaminant levels (MCLs). Not all constituents (e.g., TDS and chloride) have an MCL and are compared to the secondary MCLs (SMCLs) that address esthetics such as taste and odor.

#### Total Dissolved Solids

TDS is a general measure of salinity and overall water quality. Salinity of groundwater may increase as influenced by land use or may be naturally sourced where subsurface geologic materials are derived from marine sediments. **Figures 3-17a** and **b** illustrate the average and maximum TDS concentrations for Shallow, Deep, and Composite Zones and for wells where the zone is unknown. TDS varies widely across the Subbasin, although it is characteristically high, ranging between 500 and 1,500 mg/L, in all areas. The Secondary maximum contaminant level (SMCL) for TDS is 500 mg/L (Recommended), 1,000 mg/l (Upper Limit), and 1,500 (Short-Term Limit). The SMCL is established for aesthetic reasons such as taste and odor and is not based on public health concerns. In the Shallow Zone, only three wells in Brentwood have recent results (since 2014) with TDS concentrations ranging between 500 and over 1,500 mg/L and older data indicate similar values. The lack of data for Shallow Zone wells is noted as a data gap. A lower portion of the Shallow Zone (between 80 and 140 ft bgs) in the vicinity of Discovery Bay contains brackish to saline water with EC levels between 2,000 and 6,500 uS/cm (Wells 1B, 4A, and 7, spring 2013). To prevent cross contamination of aquifer units, production wells are constructed with a deep cement seal below 140 ft bgs. The Deep Zone has many wells with TDS concentrations between 500 and 1,000 mg/L. The Deep Zone Discovery Bay wells have TDS concentrations generally below 600 mg/L and three City of Brentwood wells (wells 6, 7, and 8) increased from 600 mg/L and have stabilized with TDS concentrations around 1,000 mg/L (the upper secondary MCL) (**Appendix 3g**). The areas around Antioch and Byron have elevated TDS concentrations compared to the rest of the Subbasin, with some average results over 2,000 mg/L.

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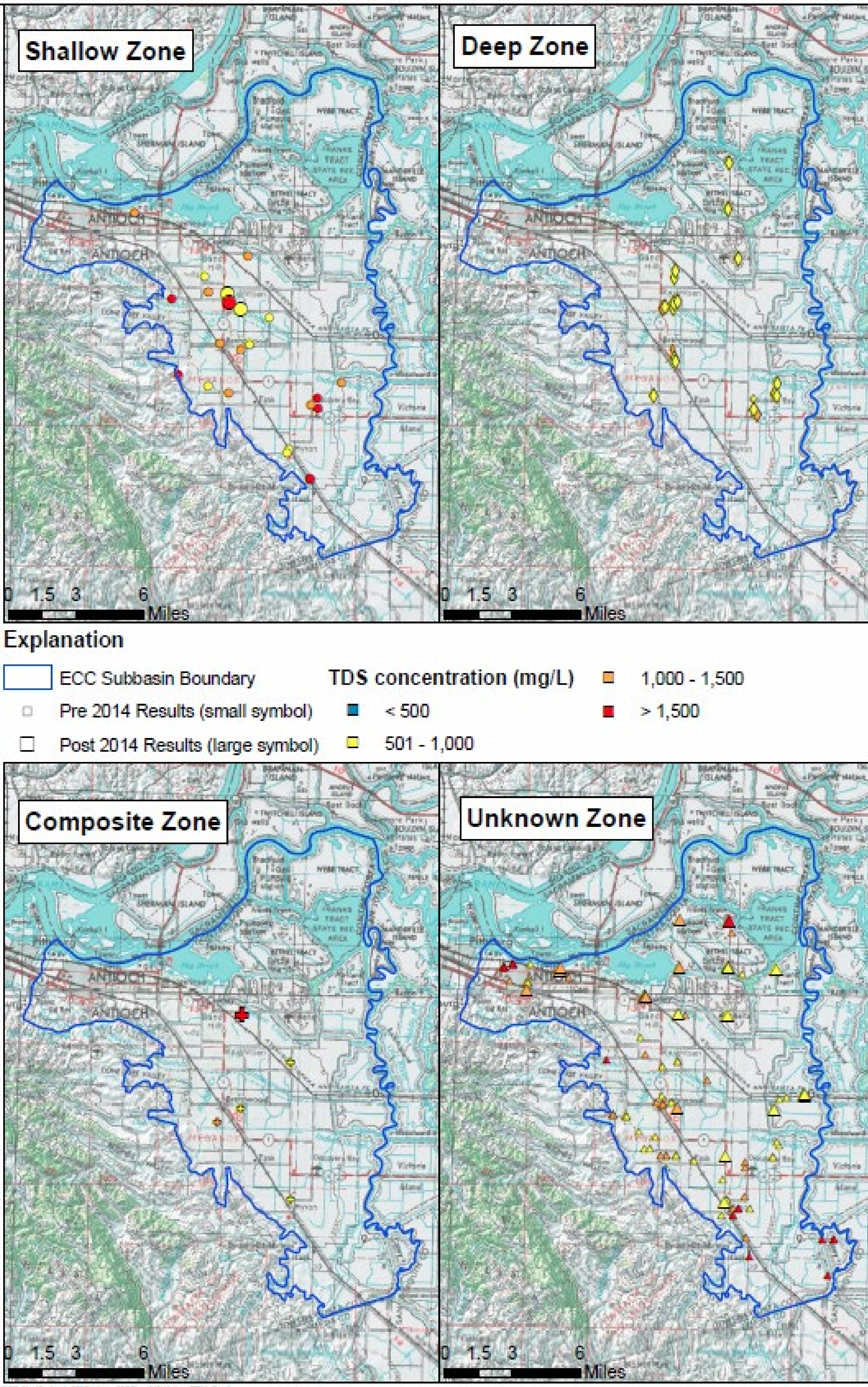
**Average Total Dissolved Solids**

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-17a**

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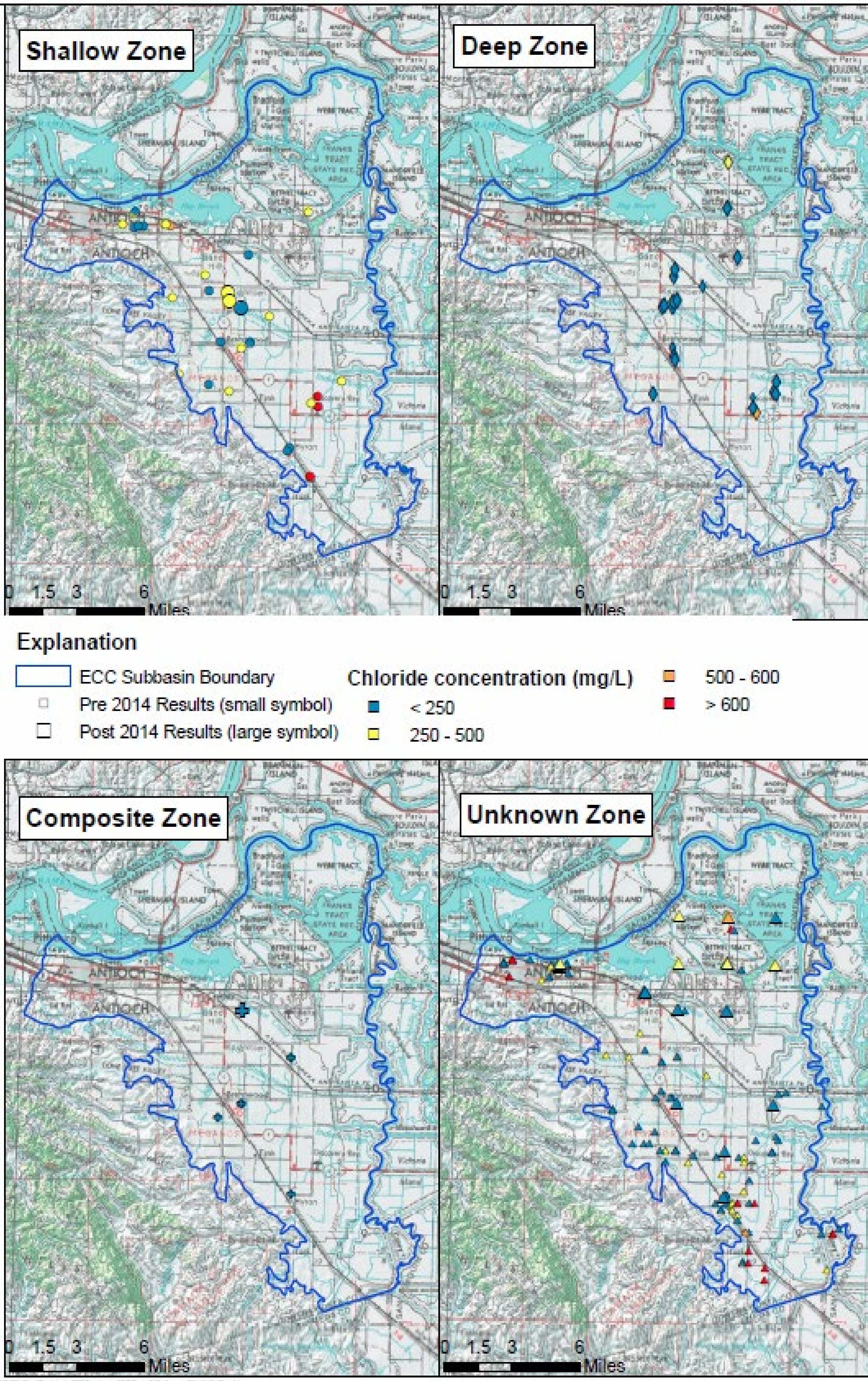
**Maximum Total Dissolved Solids**

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-17b**

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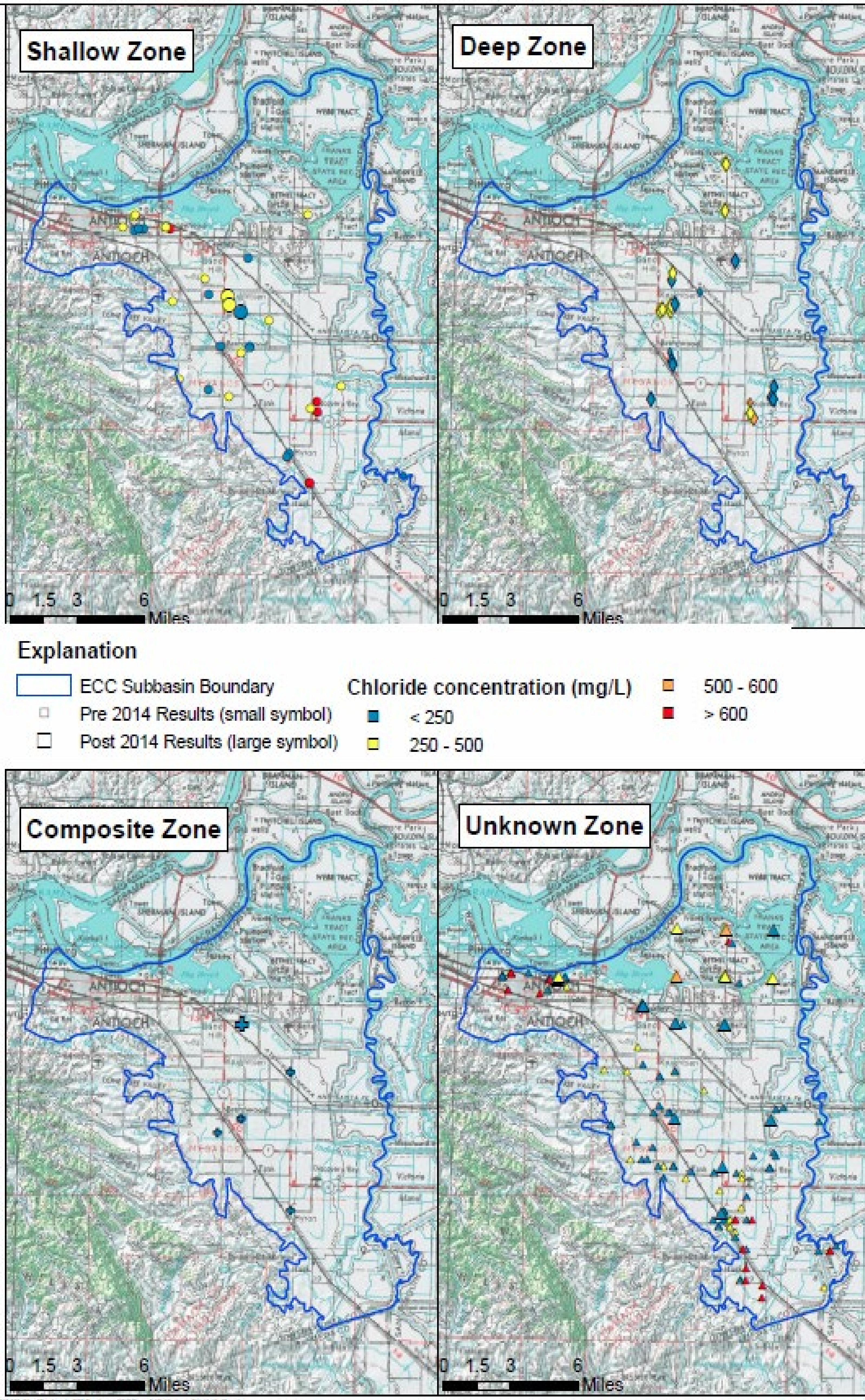
**Average Chloride**

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-18a**

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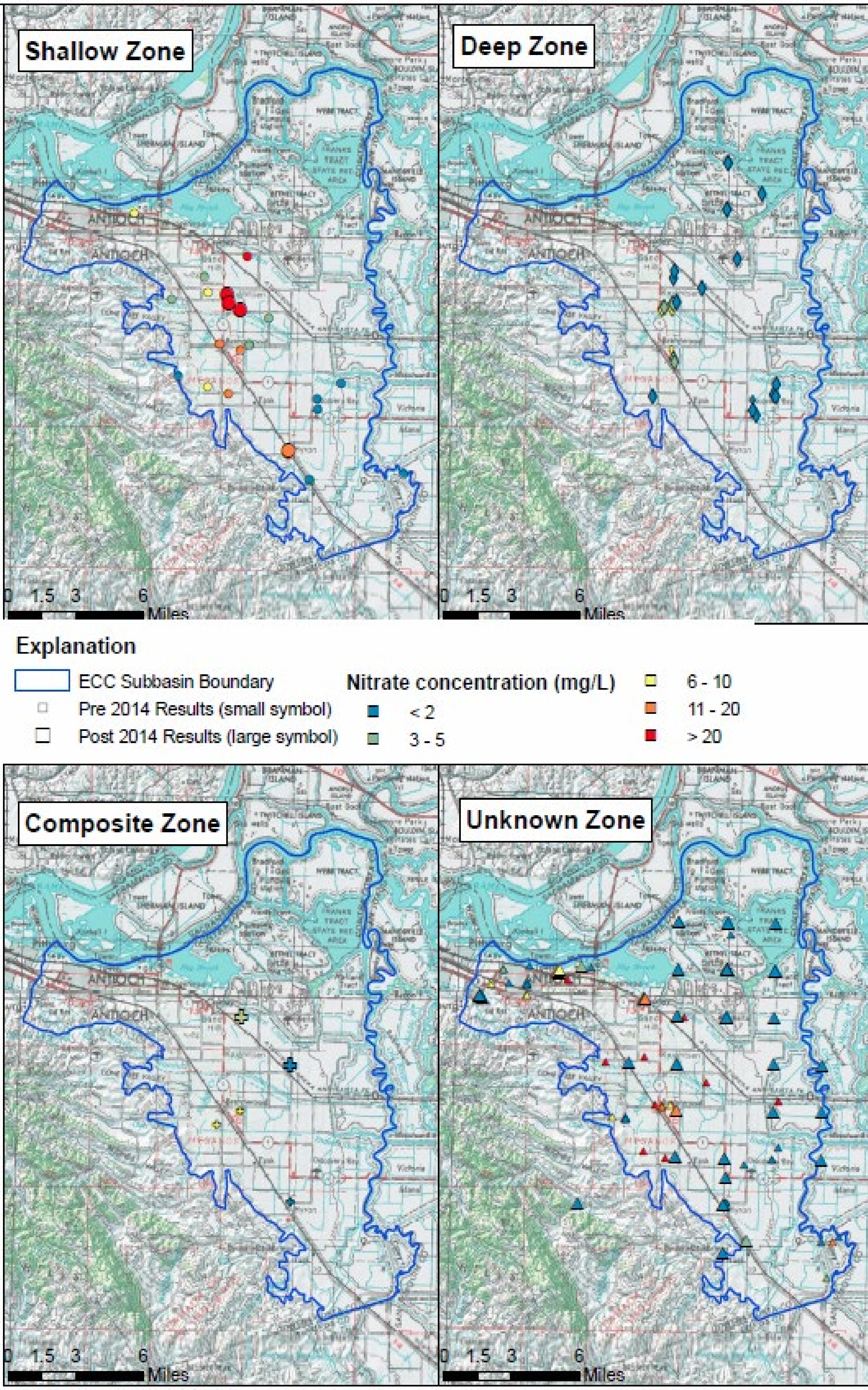
**Maximum Chloride**

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-18b**

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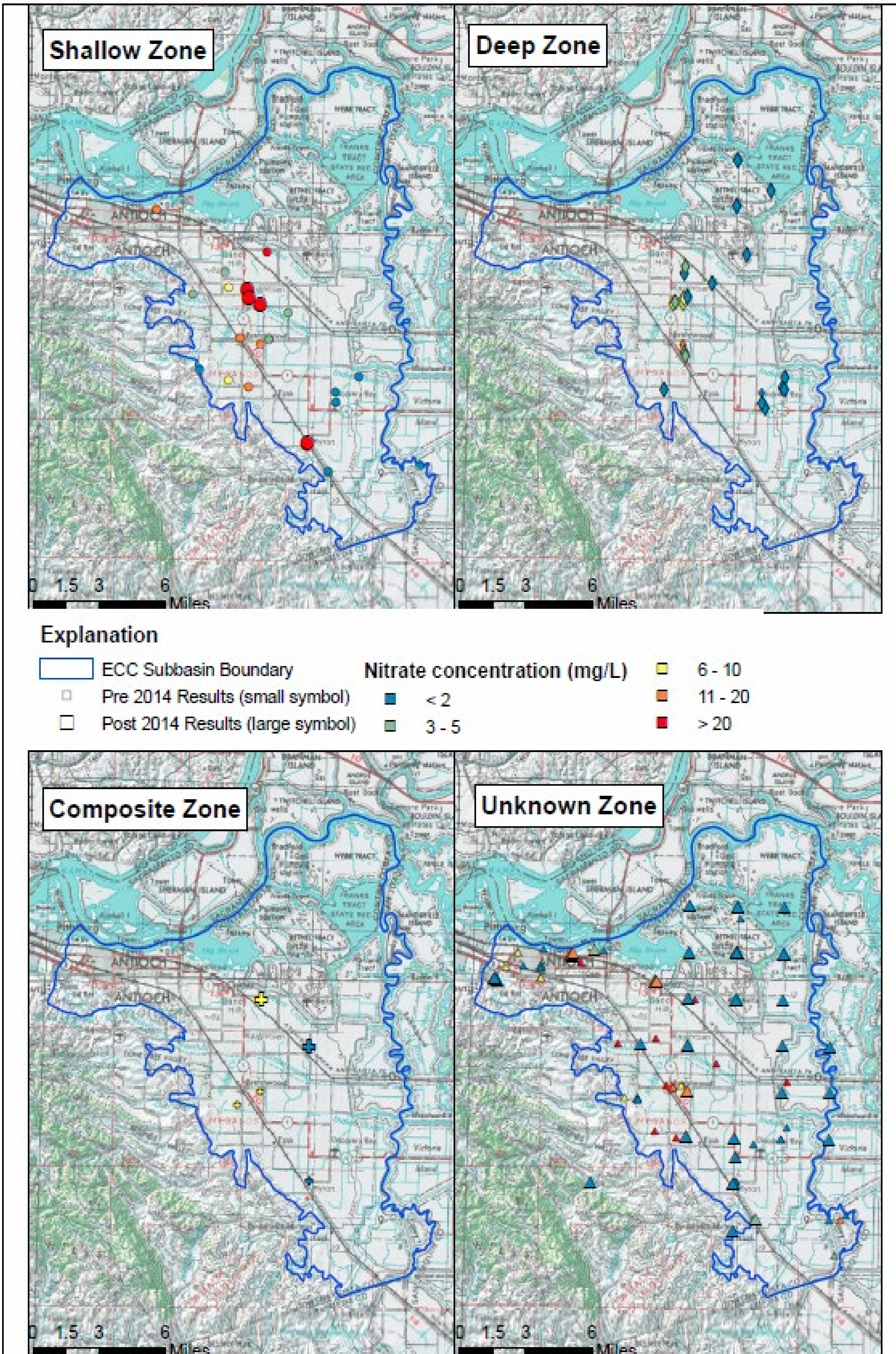
Average Nitrate

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 3-19a

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**Maximum Nitrate**

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-19b**

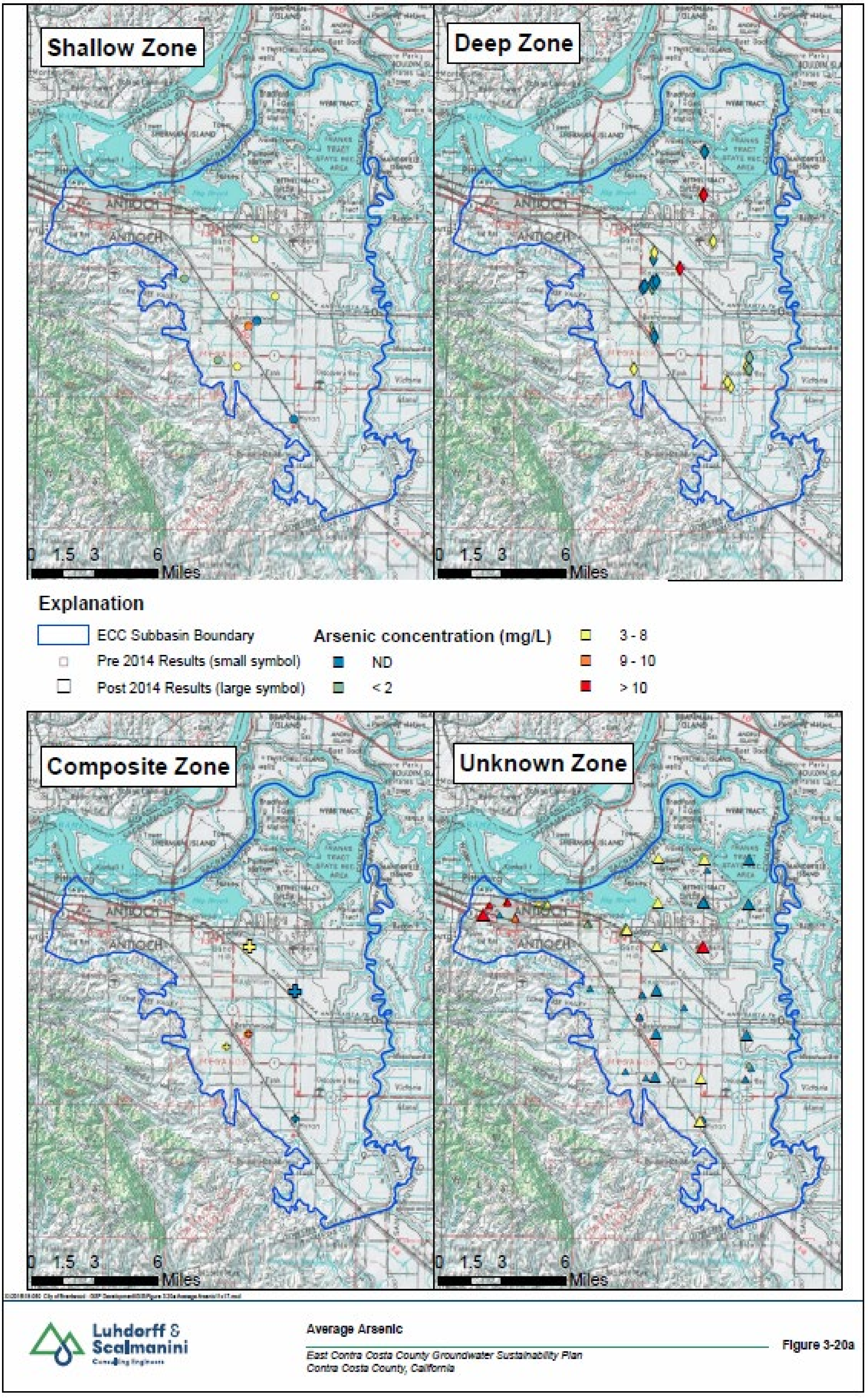
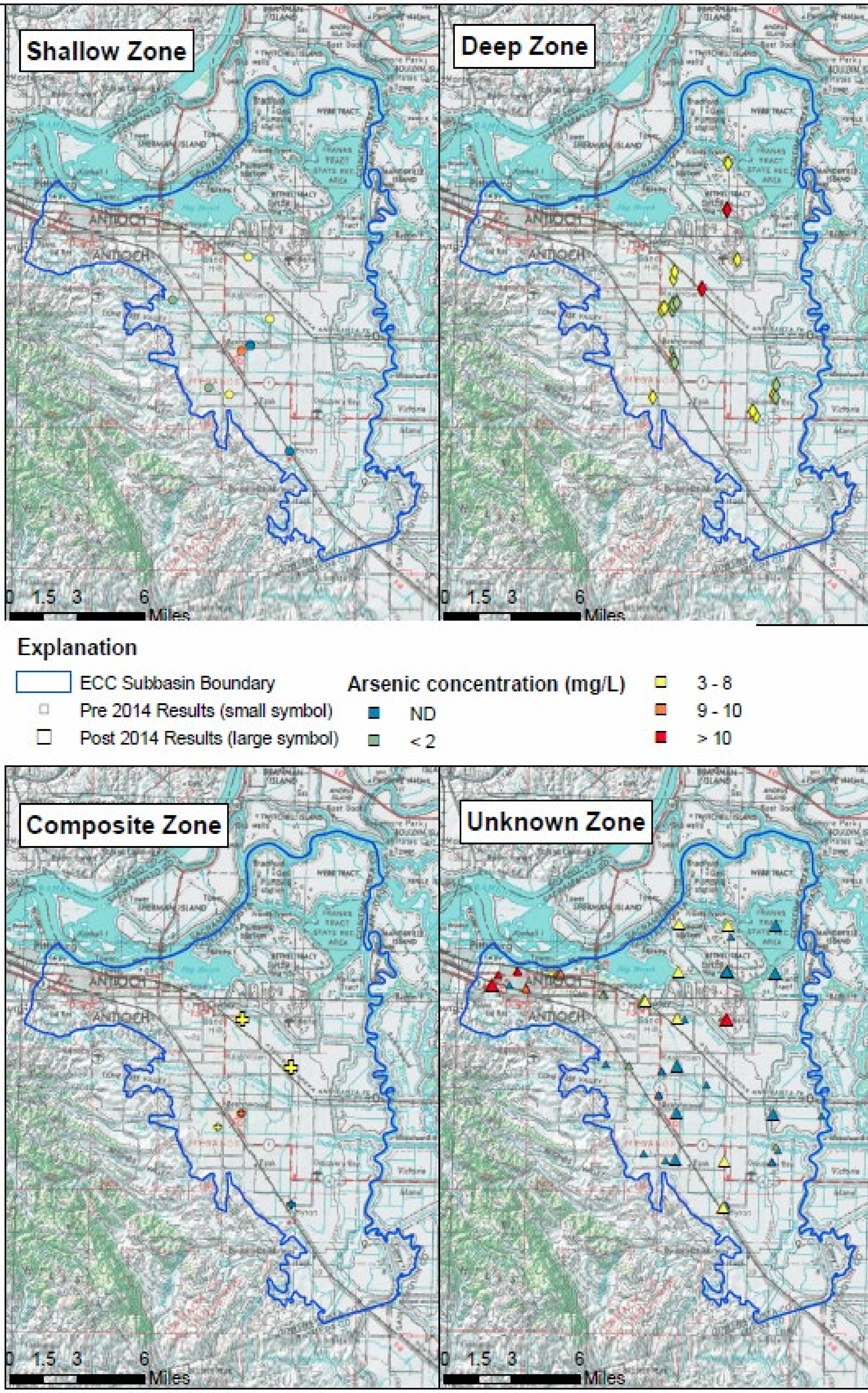

Shallow Zone
Deep Zone
Composite Zone
Unknown Zone
0 1.5 3 6
Miles
Explanation
ECC Subbasin Boundary
Pre 2014 Results (small symbol)
Post 2014 Results (large symbol)
Arsenic concentration (mg/L)
ND
< 2
3 - 8
9 - 10
> 10
Luhdorff & Scalmanini
Average Arsenic
East Contra Costa County Groundwater Sustainability Plan
Contra Costa County, California

Figure 3-20a

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**Maximum Arsenic**

*East Contra Costa County Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-20b**

In summary, TDS concentrations in groundwater in the Subbasin exceed or are near the recommended SMCL (500 mg/L) in most wells (**Table 3-2**) suggesting that water concentrations are naturally higher for TDS (LSCE 1999).

**Table 3-2. Water Quality Concentrations for Key Constituents**

| Constituent (Units) | Date Range | Number of Wells | | | | | No. of Measurements | Concentration | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DDW | DWR | Geo-tracker | USGS | Total | | Range | Median | Average | St Dev |
| **TDS (mg/L)** | 1957-2019 | 87 | 46 | 73 | 22 | 228 | 802 | 86 - 20,400 | 885 | 1,098 | 1,431 |
| **Chloride (mg/L)** | 1957-2019 | 97 | 67 | 80 | 36 | 280 | 1562 | 11 - 4,900 | 168 | 231 | 310 |
| **NO3-N (mg/L)** | 1957-2019 | 135 | 23 | 125 | 30 | 313 | 2360 | ND - 1,400 | 0.5 | 4.7 | 30.5 |
| **Arsenic (ug/L)** | 1957-2019 | 88 | 12 | 81 | 9 | 190 | 959 | ND - 750 | 3 | 8 | 29 |

## Chloride

Chloride is also a common way to indicate salinity. **Figures 3-18a** and **b** illustrate the average and maximum chloride results for the Shallow, Deep, and Composite Zones and the wells where the zone is unknown. Where zones are known, chloride concentrations generally decrease with depth to under 200 mg/L. Shallow Zone wells have higher chloride concentrations in the vicinity of Brentwood (230 to 280 mg/L) and Discovery Bay (360 to 2,000 mg/L) than the Deep Zone wells. Deep Zone wells (Wells 6, 7, and 8) in Brentwood have increased from less than 100 mg/L to over 200 mg/L) and Discovery Bay wells are stable and generally <100 mg/L. All results in the two zones (Shallow and Deep) are generally under 500 mg/. The areas around Antioch and Byron have elevated chloride concentrations compared to the rest of the Subbasin, with average results up to over 1,800 mg/L. The SMCL for chloride is 250 mg/L (Recommended), 500 mg/L (Upper Limit), and 600 mg/L (Short-Term).

In summary, chloride concentrations in groundwater in the Subbasin exceed or are near the recommended SMCL for chloride (250 mg/l) in most wells (**Table 3-2**) suggesting that water concentrations are naturally higher for chloride (LSCE 1999).

## Nitrate

Nitrate is both naturally occurring and can be a result of human activity (e.g., fertilizers, septic systems, and animal waste). The MCL for nitrate as nitrogen (N) is 10 mg/L for drinking water. **Figures 3-19a** and **b** illustrate the average and maximum nitrate concentrations as N for the Shallow, Deep, and Composite Zones and for wells with an unknown aquifer zone. Wells with average nitrate as N concentrations that exceed the MCL are Shallow Zone wells in the Brentwood area (24 to 121 mg/L) and Unknown Zone wells scattered in the central western portion of the Subbasin. A few City of Brentwood composite production wells have been taken out of service due to high nitrate concentrations. In previous work, the higher Shallow Zone concentrations have been attributed to agricultural influences in the area and lack of confining clay units between soil horizons and shallow aquifer materials. Continued monitoring of

Brentwood Deep Zone wells (currently all below 10 mg/L) will monitor whether nitrate is migrating from the Shallow Zone. Deep Zone production wells in the Discovery Bay and Oakley area have nitrate concentrations less than 2 mg/L. Wells in the Delta Island area in the northern and eastern portion of the Subbasin generally have very low nitrate as N concentrations.

In summary, nitrate is observed in some Shallow Zone areas of the Subbasin (i.e., Brentwood), with concentrations exceeding the MCL (10 mg/L) that may be linked to historical agricultural influences in the area.

Arsenic

Arsenic is a naturally occurring constituent and is commonly found in groundwater throughout California. An MCL was established at 10 ug/L in California in 2008. **Figures 3-20a** and **b** illustrate the average and maximum arsenic concentrations for the Shallow, Deep, and Composite Zones and the wells where the zone is unknown. For wells in the Shallow and Deep Zones, all have average and maximum arsenic concentrations at or below 10 µg/L with four exceptions: Knightsen, two public water systems on Sandmound Blvd., and Bethel Island. Near Discovery Bay, there have been detections of 10 µg/L; but, on average, the Discovery Bay area has concentrations less than 8 µg/L. For Unknown Zones, most of the wells are less than 8 µg/L. An exception is in the Antioch area which has higher concentrations of arsenic with average results over 100 µg/L.

In summary, arsenic concentrations are less than the MCL (10 ug/L) basin wide.

Boron

Boron is a naturally occurring constituent in groundwater and particularly in Contra Costa County[5]. The most common sources of boron in drinking water are from leaching of rocks and soils, wastewater, and fertilizers/pesticides. Boron concentrations in the Subbasin range from 500 ug/L to over 4,000 ug/L with the majority over 1,000 (**Appendix 3f**). MCLs for boron have not been established but there is an agricultural goal (700 ug/L) where some crops may become sensitive, a state notification level (SNL)l[6] (1,000 ug/L), and a US EPA Health Advisory for non-cancer health effect (5,000 ug/L). Boron concentrations in groundwater in the Subbasin exceed the agricultural and SNL (1,000 ug/L) in most wells but are less than the EPA Health Advisory (5,000 ug/L) suggesting that water concentrations are naturally higher.

Mercury

Marsh Creek runs from Mt. Diablo through Brentwood and out to the San Joaquin River and drains water from the Mt. Diablo Mercury Mine operated from 1849 to 1971. There is potential for rainwater to leach mercury from mine tailings and to flow into the Marsh Creek watershed. However, there is no evidence that mercury has contaminated groundwater in the Subbasin and no wells in the ECC Subbasin tested for mercury have exceeded the MCL (2 ug/L).

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[5] The SWQCB Division of Water Quality GAMA Program “Groundwater Information Sheet for Boron (B), revised November 2017. Contra Costa County was identified on one of the top three counties in the state for boron detection from a study of public water supply wells from 2007 to 2017.
[6] Notification levels are non-regulatory health-based advisory levels establish by the SWRCB for chemicals with not established MCL.

**Appendix 3f** is a table of all groundwater quality (general minerals and trace elements) in the Subbasin, by zone. Most of the wells in the Subbasin are missing construction information so water quality for the Shallow and Deep Zones is limited.

In summary, groundwater in the Subbasin generally exceeds or is near the recommended SMCL for TDS (500 mg/L) and chloride (250 mg/l) (**Table 3-2**). The observed concentrations may reflect a naturally higher baseline for these constituents (LSCE 1999). Nitrate is observed in some Shallow Zone areas (i.e., Brentwood) in the Subbasin, with concentrations generally exceeding the MCL (10 mg/L) that may be linked to past agricultural influences in the area. Arsenic concentrations are generally less than the MCL (10 ug/L) basin wide. Boron concentrations are high in most wells and are attributed to a naturally elevated baseline. Groundwater serves a variety of domestic and agricultural uses throughout the Subbasin with limited restrictions due to natural (salinity and boron) and anthropogenic (nitrate) causes. The availability of surface water gives the opportunity to mitigate these issues when necessary. Depending on local groundwater quality, the stringent municipal standards for drinking water are met by a mix of water sources: City of Antioch uses surface water only, DWD and Brentwood blend groundwater with surface water, and TODB uses groundwater only. The ECC Subbasin's groundwater quality is generally stable which indicates that groundwater extraction is not degrading water quality and the Subbasin is being operated within its sustainable yield.

### 3.3.6 Groundwater Contamination Risk

There are numerous potential anthropogenic sources of groundwater contamination in the ECC Subbasin. Almost any human related activity involving hazardous substances and waste has the potential to contaminate groundwater. Some activities may lead to groundwater contamination by first contacting soil and then seeping to groundwater. In the ECC Subbasin, the depth to groundwater may occur within a few feet of the ground surface thus increasing the risk that soil contamination may reach a shallow aquifer. Other sources may involve more direct contact between groundwater and hazardous substances such as associated with hydrocarbon transmission lines or leaky storage tanks at retail gasoline stations. Historical and current industrial activity in the east Contra Costa region is also a source of past and potential future groundwater contamination. In Oakley, shallow groundwater and soil contamination occurred at a former Dupont plant that manufactured a gasoline agent, refrigeration cooling compounds, and additives for household products and food. That site operated from 1956 to 1998 and, in 2015, remedial obligations were transferred to Chemours, a subsidiary of Dupont. Chemours worked with the Department of Toxic Substances Control (DTSC) to remediate the site and ultimately returning most of it to a new commercial use now underway[7].

Another potential source of groundwater contamination is the historical and current oil and gas activity in the area. Although areas of current and future activity may be more restrictive in areas of urban growth, it is expected that continued development and redevelopment of oil and gas fields may occur in rural and unincorporated areas of the subbasin. In the ECC Subbasin, oil and gas wells would penetrate the Shallow and Deep Zone freshwater aquifers that are a source of supply for domestic, agricultural, industrial, and environmental uses. Pathways for contamination via these wells would be present and may be of concern

[7] https://eastcountytoday.net/oakley-officially-breaks-ground-on-new-logistics-center-could-create-2800-jobs/

to GSAs seeking to protect water quality and maintain long-term sustainability of groundwater resources in the subbasin.

The following sections provide an overview of these anthropogenic sources of potential concern to groundwater quality. Although, SGMA does not transfer oversight of regulation of hazardous substances to GSAs, the agencies may seek to mitigate risks by informing the applicable regulatory agency of the intersection between contamination sources and mechanisms by which degradation may occur in the unique hydrogeologic setting of the ECC Subbasin. **Section 8** discusses a potential policy for GSA engagement with agencies responsible for mitigating and remediating hazardous waste that may reach groundwater.

#### 3.3.6.1 Groundwater Contamination Sites

**Figures 3-21a and 3-21b** illustrate the open and closed groundwater contamination sites in the ECC Subbasin. Contaminated sites can pose a hazard to human health through the contamination of aquifers if the area is using groundwater. Contamination site data were taken from Geotracker[8] and are divided into cleanup program sites, leaky underground storage tank (LUST) sites, and land disposal sites. **Appendix 3h** lists the 35 open sites and 105 closed sites including the potential contaminants of concern for each site. The majority of sites are in Antioch and Brentwood and the most common contaminant is hydrocarbon.

#### 3.3.6.2 Oil and Gas Wells

Oil and gas wells are regulated and permitted through the state Department of Conservation, Geologic Energy Management Division (CalGEM). In east Contra Costa County, there are as many as eleven oil and gas fields either wholly or partially within the ECC Subbasin which target oil and/or gas sands at several thousand feet below ground surface. Produced water in these sands is saline based on interpretation of electric geophysical logs performed in open boreholes prior to well installation.

As with all oil and gas wells in the subbasin, CalGEM regulations require a separate surface casing to be installed below the base of freshwater[9]. In Brentwood, for example, surface casings extend to 1,750 feet. This depth is consistent with the basin conceptualization presented in this GSP. Even though the interpreted base of freshwater is as deep as 1,750 feet, most groundwater production in the ECC Subbasin is shallower than 500 feet.

The legacy of oil and gas activity in the ECC Subbasin is the presence of up to several hundred abandoned and plugged wells. The abandonment programs are regulated through CalGEM requiring cement plugs at various depths to ensure that fluids in the oil zone (oil, gas and connate water) do not migrate upward into freshwater aquifers. **Appendix 3i** contains figures showing oil and gas fields and wells located in the ECC Subbasin as obtained from CalGEM's online well finder tool[10]. Production records are also available online through CalGEM[11].

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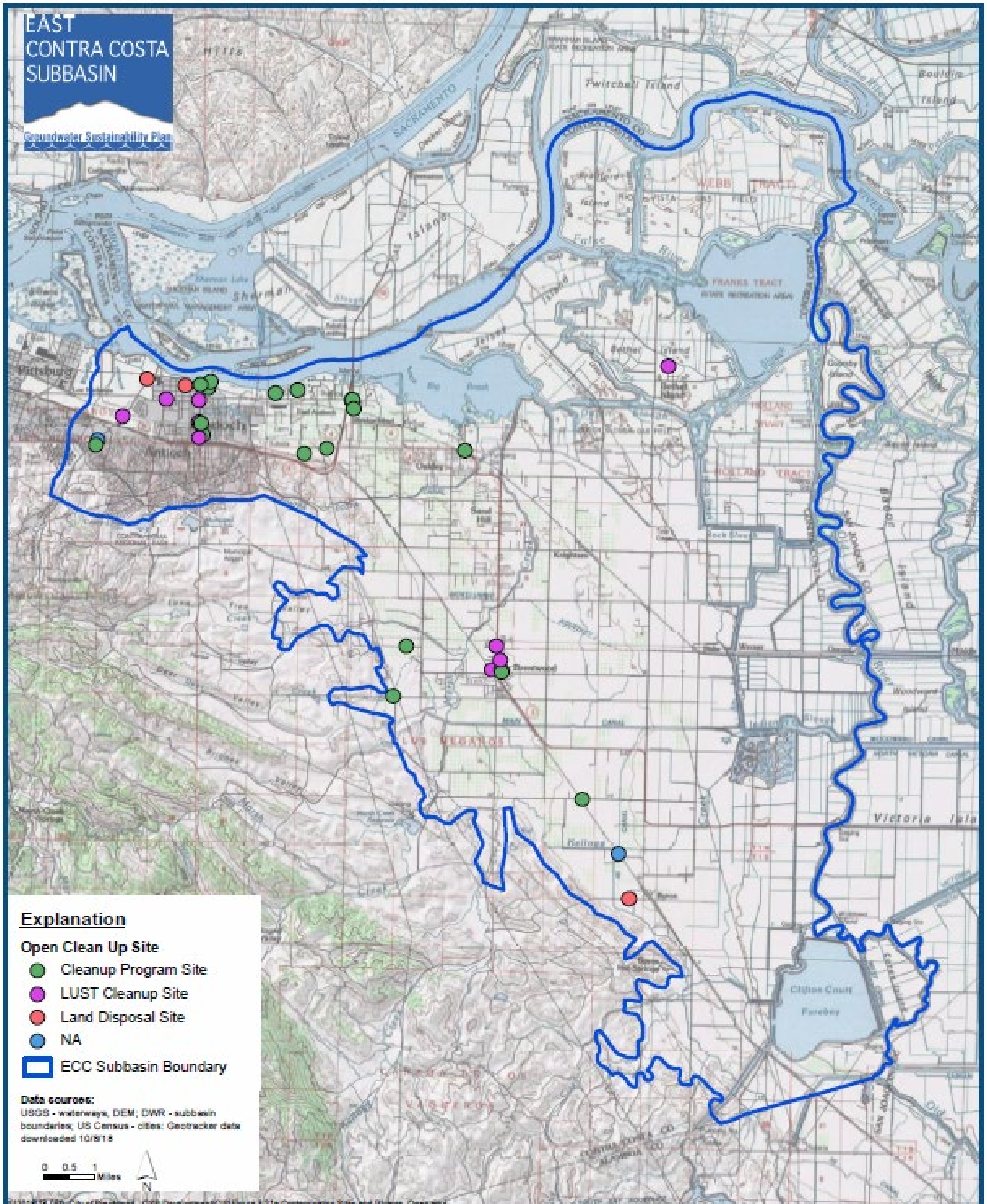
[8] Geotracker is the state Water Board's online resource to track data from waste discharges to land and includes unauthorized releases of hazardous substances from underground tanks: https://geotracker.waterboards.ca.gov/.
[9] https://www.conservation.ca.gov/calgem/Pages/Oil,-Gas,-and-Geothermal-Rulemaking-and-Laws.aspx
[10] https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx
[11] https://filerequest.conservation.ca.gov/?q=production_injection_data

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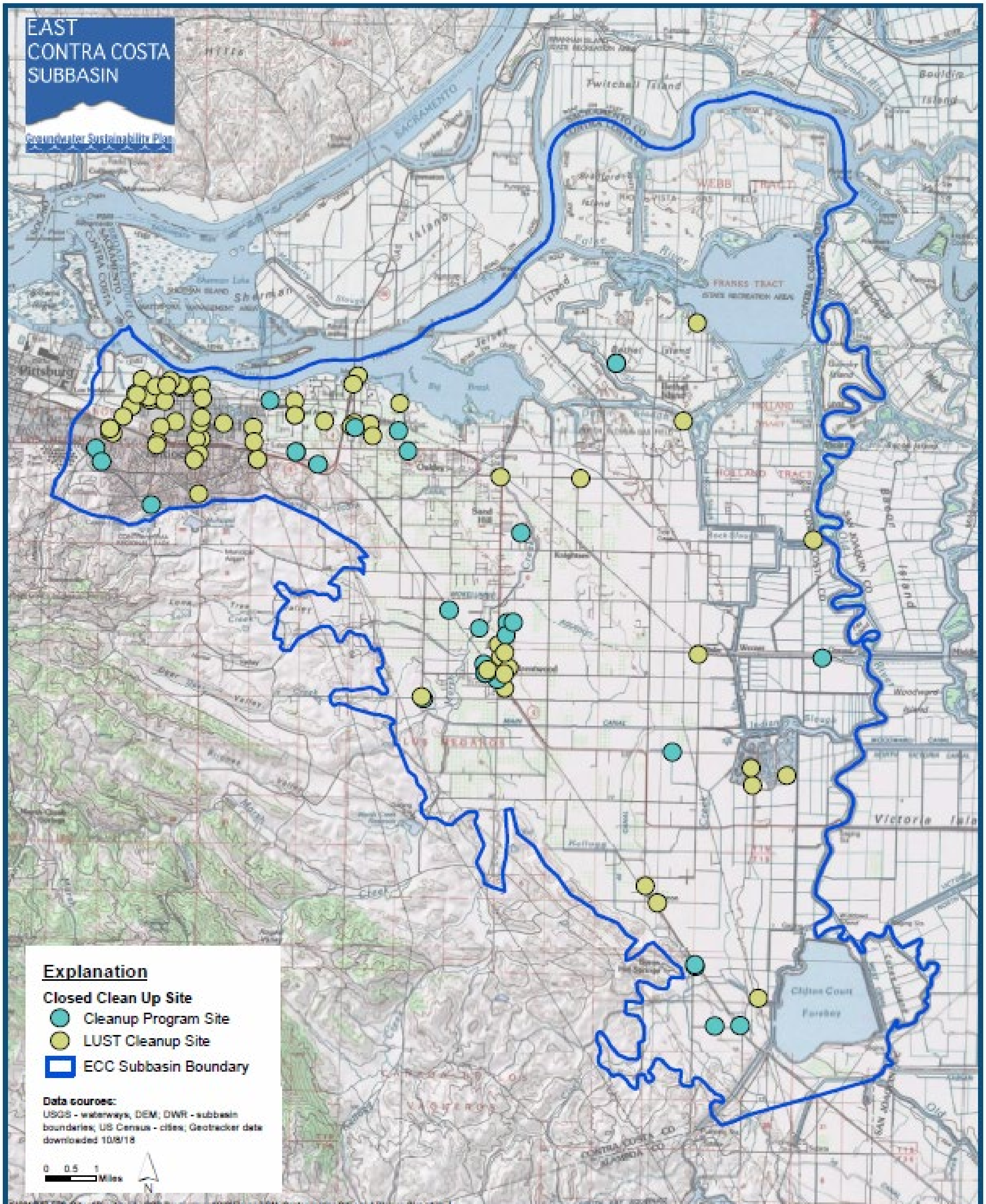
Groundwater Contamination Sites and Plumes: Open Sites

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 3-21a

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**Groundwater Contamination Sites and Plumes- Closed Sites**

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*Contra Costa County, California*

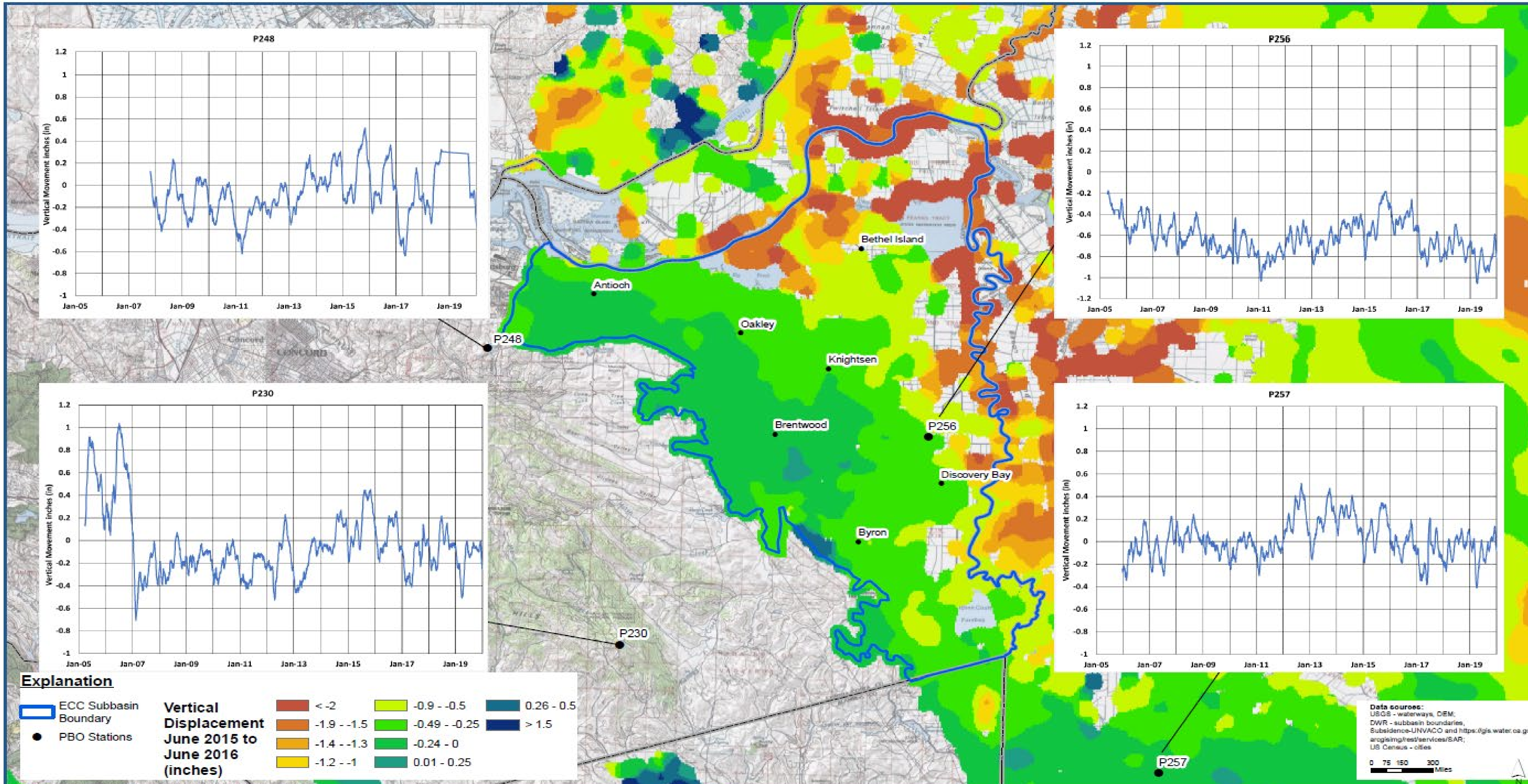
**Figure 3-21b**

### 3.3.7 Land Subsidence

There are no historical records of impacts from subsidence due to groundwater withdrawal in the ECC Subbasin. Land subsidence in the Subbasin is continuously monitored by the Plate Boundary Observatory (PBO) monitoring network managed by University NAVSTAR Consortium (UNVACO). The PBO's main task is to "quantify three-dimensional deformation and its temporal variability across the active boundary zone between the Pacific and North American plates." The PBO stations can be used to monitor for land subsidence using vertical land surface measurements. PBO stations are used to measure centimeter to millimeter-scale movement on the Earth's surface. Four stations located in or near the Subbasin (**Figure 3-22**) all show minor displacements. PBO stations take measurement once per day, to mitigate erroneous data a 30-day rolling average was applied to the data. PBO Station 256 (P256), located inside the Subbasin, has shown a vertical displacement from 2005 to 2019 of -0.01096 inches per year. PBO Station 230 (P230) west in the Diablo Mountains also has a slight downward displacement of -0.01461 inches per year. Two stations near Antioch and Tracy (P248 and P257) have a slight upward displacement of the land surface. **Table 3-3** below provides the estimated rate of land surface change. Trends do not indicate inelastic downward displacement in the land surface.

**Table 3-3. Land Surface Displacement Rates at PBO Sites**

| Monitoring Location | Location Relative to Subbasin | Period of Record | Rate of Land Surface Displacement (inches per year) | Rate of Land Surface Displacement (feet per year) |
|---|---|---|---|---|
| Inside East Contra Costa Subbasin | | | | |
| **P256** | East of Center of Subbasin | 2005-2019 | -0.0093 | -0.00077 |
| Outside East Contra Costa Subbasin | | | | |
| **P230** | Southwest of Subbasin | 2005-2019 | -0.01487 | -0.00124 |
| **P248** | Northwest of Subbasin | 2007-2019 | .01092 | 0.00091 |
| **P257** | Southeast of Subbasin | 2006-2019 | .001461 | 0.00122 |

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**Land Subsidence Monitoring Locations**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 3-22

DWR has also published Interferometric Synthetic Aperture Radar (InSAR) results in partnership with the European Space Agency's Sentinel-1A satellite with the data processed by TRE ALTAMIRA[12]. These data present measurements of vertical ground surface displacement between two different dates. InSAR mapping of land surface elevation is particularly useful for complementing high spatial and temporal resolution data at CGPS station locations with observations of land subsidence over a large area for highlighting locations where change is occurring. Throughout most of the Subbasin there has been minimal vertical changes between June 2015 and June 2019 (**Figure 3-22**), vertical measurement accuracy is reported to be about 18 millimeters (0.7in) (DWR 2021). Vertical displacement during this time period was mostly stable, no change to slightly downward with most values ranging from -0.5in to 0.25in in the western portion of the Subbasin. The Delta area (northern and eastern portion of the Subbasin) shows higher vertical displacement that is due to a mechanism that is described below (hydrocompaction). The InSAR data in the vicinity of P256 has a similar vertical displacement (about 0.4in) as observed at P256 during the June 2015 to June 2019 time period.

In the late 1800s to the early 1900s levees were built along stream channels in the delta and the rich land was converted to agriculture (discussed in more detail in **Section 2.1**). However, this caused ongoing land subsidence associated with drainage for agriculture, called hydrocompaction, on islands in the Delta including parts of the ECC Subbasin specifically.

Hydrocompaction is due to dewatering of peat soil that dries out and compresses[13] as a result of land reclamation. This caused many central Delta islands to drop 10 to nearly 25 feet below sea level (USGS, 1999, **Figure 3-23a).** The Delta soils are composed of 1) coarser sediments concentrated near the natural waterways of the Delta and 2) peat from decaying marsh vegetation concentrated near the centers of the islands (up to 60 feet thick in the western Delta). **Figure 3-23b** illustrates the late 1880's freshwater tidal marsh land surface profile (upper diagram) and the current configuration of many islands (lower diagram) that is saucer-shaped due to compacted peat soils in the interior and mineral sediments at their edge. Currently, groundwater levels are maintained on the islands by a network of drains at three to six feet bgs with drainage water pumped back into the stream channels (**Figure 3-23b**). Though this GSP is only required to discuss subsidence due to groundwater withdrawal, understanding of how these Delta islands are constructed improves understanding of interactions between surface water and groundwater in the Delta area.

[12] https://gis.water.ca.gov/arcgisimg/rest/services/SAR

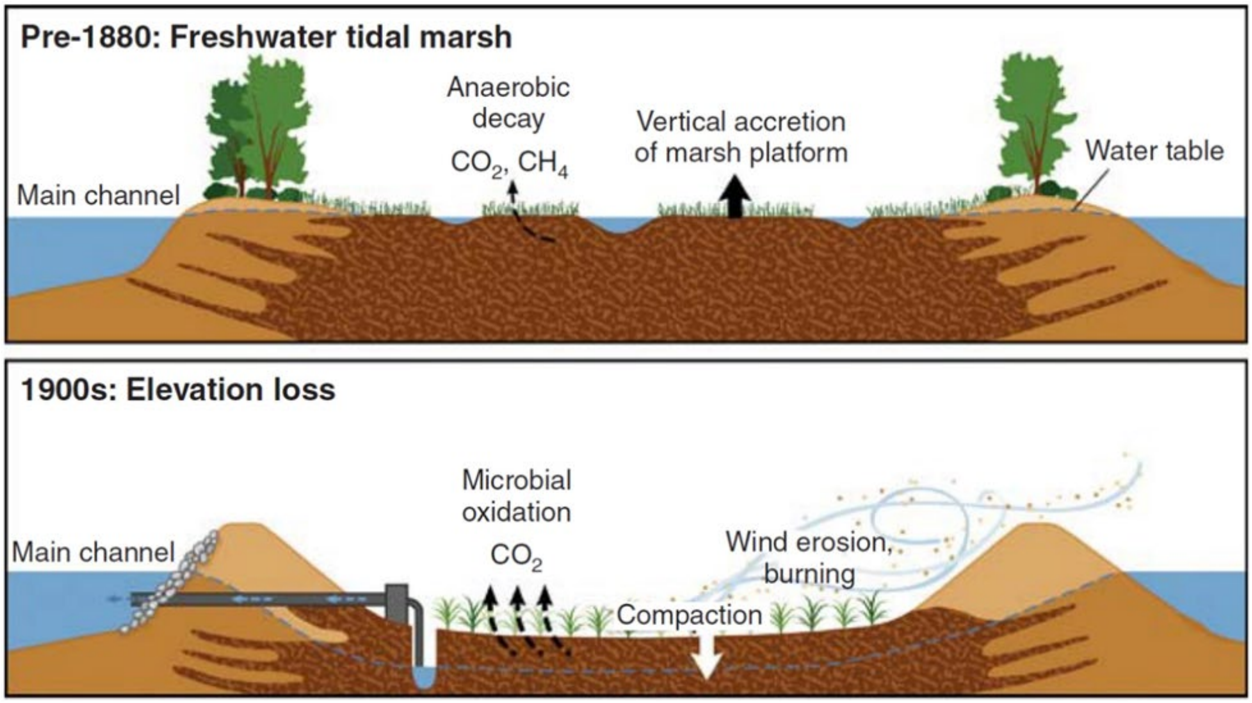
[13] Source: Water Education Foundation, 2020. Can Carbon Credits Save Sacramento-San Joaquin Delta Islands and Protect California's Vital Water Hub? Gary Pitzer, February 27, 2020.

## Figure 3-23a. Subsidence on Delta Islands


(California Department of Water Resources)

(source: https://www.usgs.gov/centers/ca-water-ls/science/subsidence-sacramento-san-joaquin-delta?qt-science_center_objects=0#qt-science_center_objects)

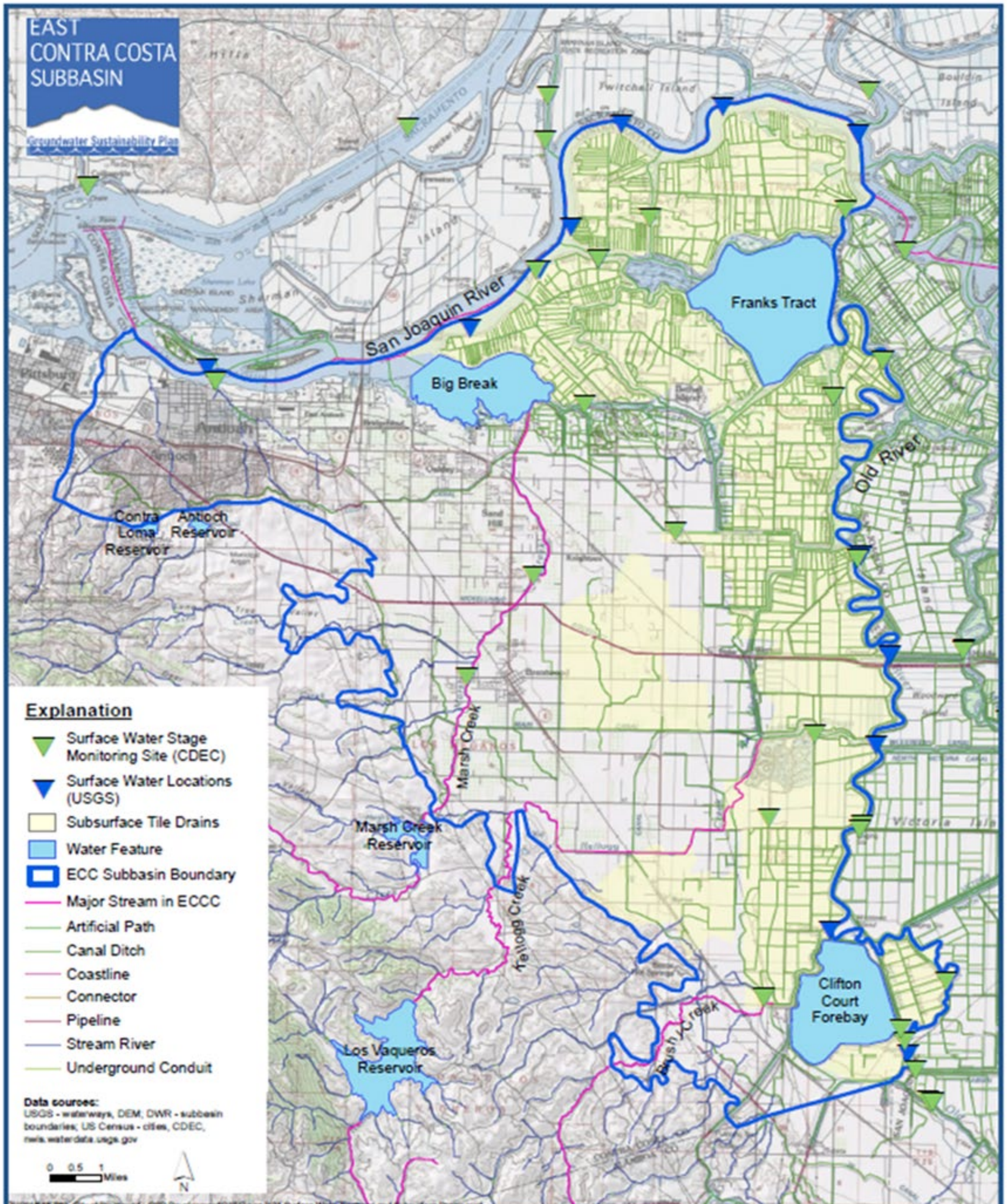
**Figure 3-23b. Cross-section of Subsidence and Drains on Delta Island. Source: Mount and Twiss (2005)**




### 3.3.8 Interconnected Surface Water Systems

Interconnected surface water systems are the locations where groundwater and surface water are hydrologically connected. It is important to know where these systems are located in order to minimize impacts of groundwater pumping on the surface water bodies and biological communities that rely on the interconnected water system. The ECC Subbasin is bounded by the San Joaquin River to the north and Old River to the east with an extensive network of canals installed (**Figure 3-10**). Delta islands located in the northern and eastern portion of the Subbasin, as described above, are protected by levees and require excess water that collects in subsurface drains to be discharged to the Delta. **Figure 3-24** identifies the surface water features in the Subbasin and vicinity and illustrates coverage of subsurface tile drains installed at between 5 and 8[14] feet bgs to provide drainage of water to the river. Given this unusual configuration, Old River and the San Joaquin River are considered interconnected rivers and currently or historically, surface water depletions have not occurred along these rivers. In the western portion of the Subbasin a few creeks are present that are considered a natural source of recharge to the Subbasin (**Figure 3-24**) and have the potential to be considered interconnected systems. Marsh Creek, the most prominent, is earthen lined and channelized, and is adjacent to both the City of Brentwood and DWD pumping wells. The Marsh Creek dam passively drains all flows that enter it until the level subsides to the primary spillway level.  It may be vulnerable to impacts from the loss of interconnected surface water due to groundwater pumping and groundwater level declines. Currently there is an incomplete understanding of the ECC Subbasin surface water/groundwater connection, but this is expected to be remedied through installation of multiple completion monitoring wells and future monitoring efforts related to this GSP.

[14] As communicated by individual water districts.

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**Surface Water Features and Subsurface Drains**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-24**

**Figure 3-25a** is a map illustrating the spring 2018 depth to shallow groundwater in the ECC Subbasin. There is not complete coverage of the Subbasin, but it does present the 30 ft depth to water contour that may represent the point when a stream is no longer considered interconnected to groundwater. Review of the depth to water figure indicates that the majority of the Subbasin may have interconnected surface water and groundwater. Specifically, the San Joaquin River, Old River, and portions of western creeks are likely connected to the groundwater system and there is then potential for regional groundwater pumping to impact groundwater dependent ecosystems (GDEs). **Figure 3-25b** shows the natural and artificial channels in the Subbasin with the most conservative estimates of potential for interconnectivity using 2018 shallow DTW created from subtracting the digital elevation model from groundwater elevation contours. Most of the natural channels in the Subbasin are located in the west of the Subbasin. Marsh Creek however starts to become likely connected with groundwater in Brentwood. Many artificial channels in the eastern part of the Subbasin may exhibit interconnectedness with groundwater as they are commonly located in areas where DTW is less than 10 feet.

### 3.3.9 Groundwater Dependent Ecosystems

Groundwater dependent ecosystems (GDEs) "refers to ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" outlined in the GSP Emergency Regulations. Each plan is required to identify groundwater dependent ecosystems within the basin, utilizing data available from DWR or the best available information. GSAs are only responsible for impacts to GDEs resulting from changing groundwater conditions resulting from pumping or groundwater management in the Subbasin (TNC, 2019). For example, if groundwater conditions stay the same but GDEs lose access to water due to surface water diversions/depletions, this is not the GSA's responsibility.

GDEs are similarly defined as "the plants, animals, and natural communities that rely on groundwater to sustain all or a portion of their water needs" by The Nature Conservancy (TNC) in the Guidance for preparing Groundwater Sustainability Plans (Rohde et al, 2018). GDEs are an important aspect of the diverse California landscape and are found in nearly all subbasins. The GDEs are diminishing rapidly and largely due to human interference and unsustainable groundwater extraction (Rohde et al, 2018). Water Code Section 10723.2 requires the GSP to identify GDEs and determine how groundwater does or does not affect them. The following section describes the process for identifying the GDEs within the ECC Subbasin and mapping their location.

The Natural Communities Commonly Associated with Groundwater (NCCAG) Dataset was used as a starting point to identify GDEs within the Subbasin. This dataset is compiled from 48 publicly available agencies datasets and was then reviewed by a working group comprised of DWR, TNC, and the California Fish and Wildlife **(Figures 3-26a** and **b)**. The Subbasin GDEs exhibited in **Figures 3-26a** and **b** were compared by the county with local information, and it was concluded that these are the best available data. Further analysis of GDEs in ECC was conducted by identifying areas where depth to groundwater is greater than 30 feet, the general vegetation maximum rooting depth. The assumption was that those areas could be eliminated however, groundwater level monitoring is lacking in some of the western areas of the Subbasin so no changes to Wetland or Vegetation NCCAG Datasets were made. Current land use was also analyzed to determine if the parcel was still a GDE. Using DWR's 2016 Land use data set it was found that 67 acres of vegetation and 18 acres of wetland were no longer classified as native materials and the corresponding GDEs were removed. A total of 13,970 potential GDE acres (11,985 wetlands and 4,304 vegetation with some areas of overlap in the ECC Subbasin) were identified by the NCCAG database and retained for this GSP. Most of these areas are located in the Delta with a few occurring along western creeks. **Table 3-4** includes all species in the ECC Subbasin as identified by TNC. TNC has identified 22 vegetation species and additional category of Not Applicable. The majority of species represent a small percentage of the total GDEs; the largest designation is Not Applicable. **Figure 3-27** identifies critical habitat for species in the ECC Subbasin: Steelhead (threatened), Delta smelt (threatened), and vernal pool fairy shrimp (threatened).

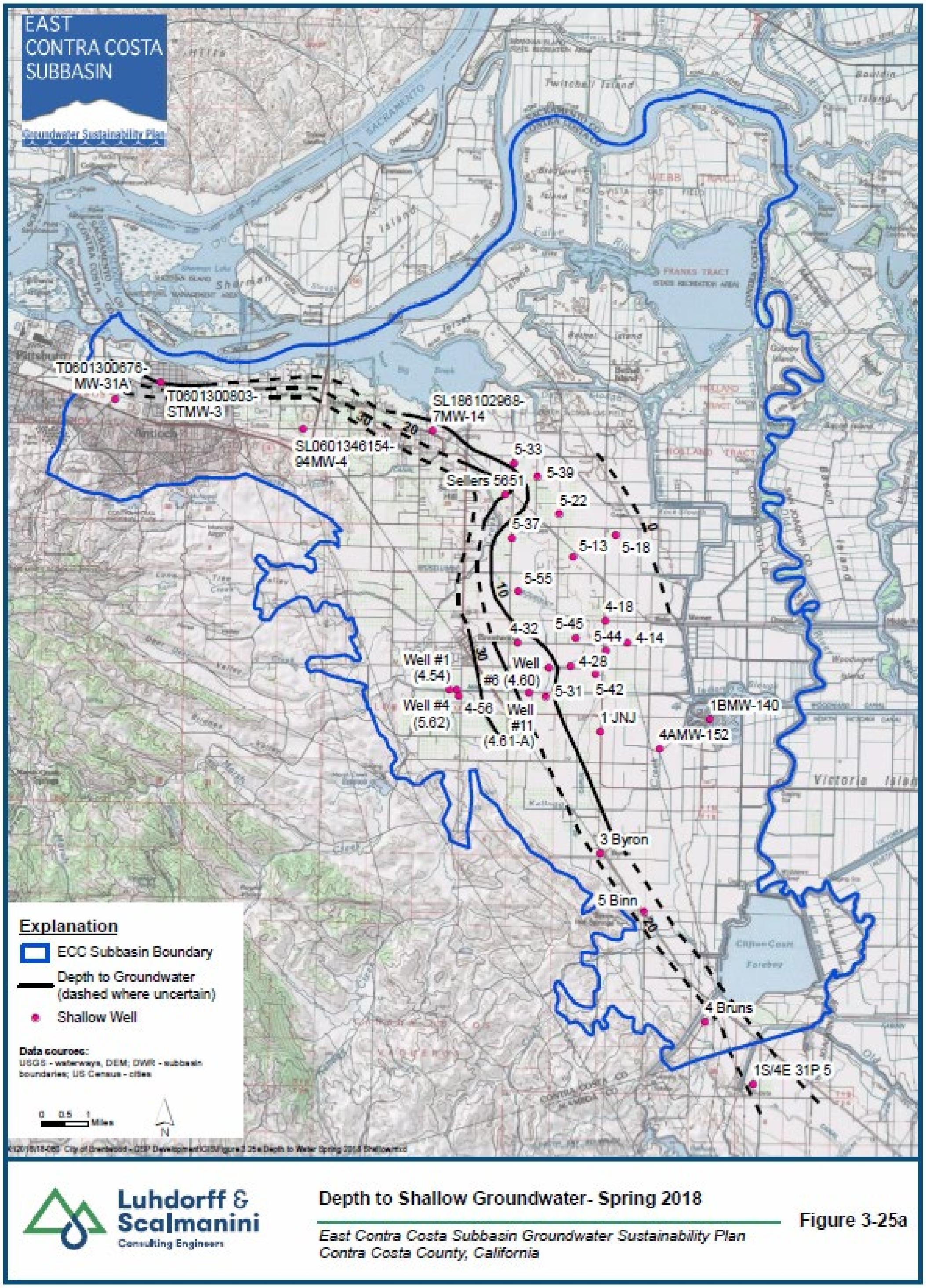
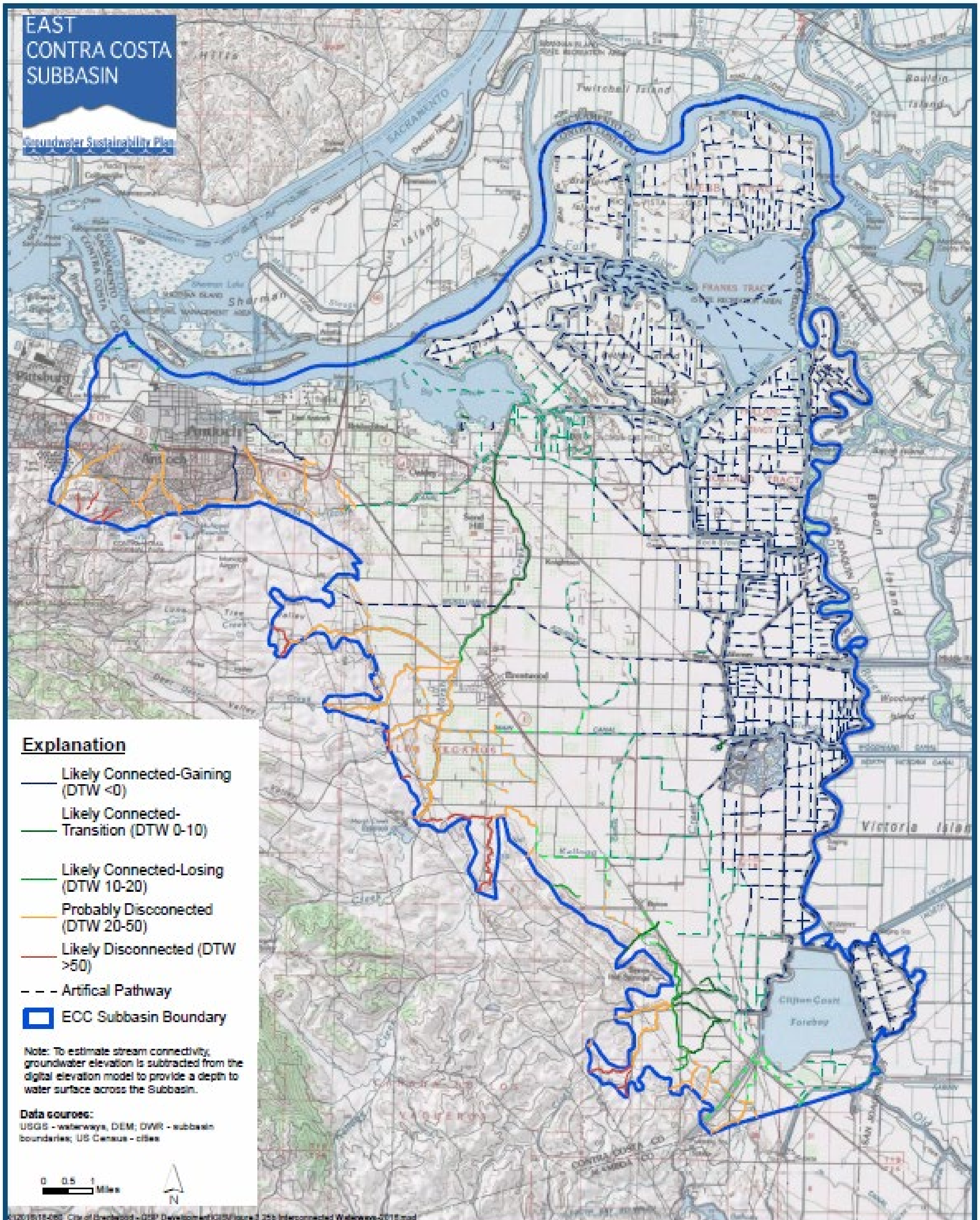


Figure 3-25a

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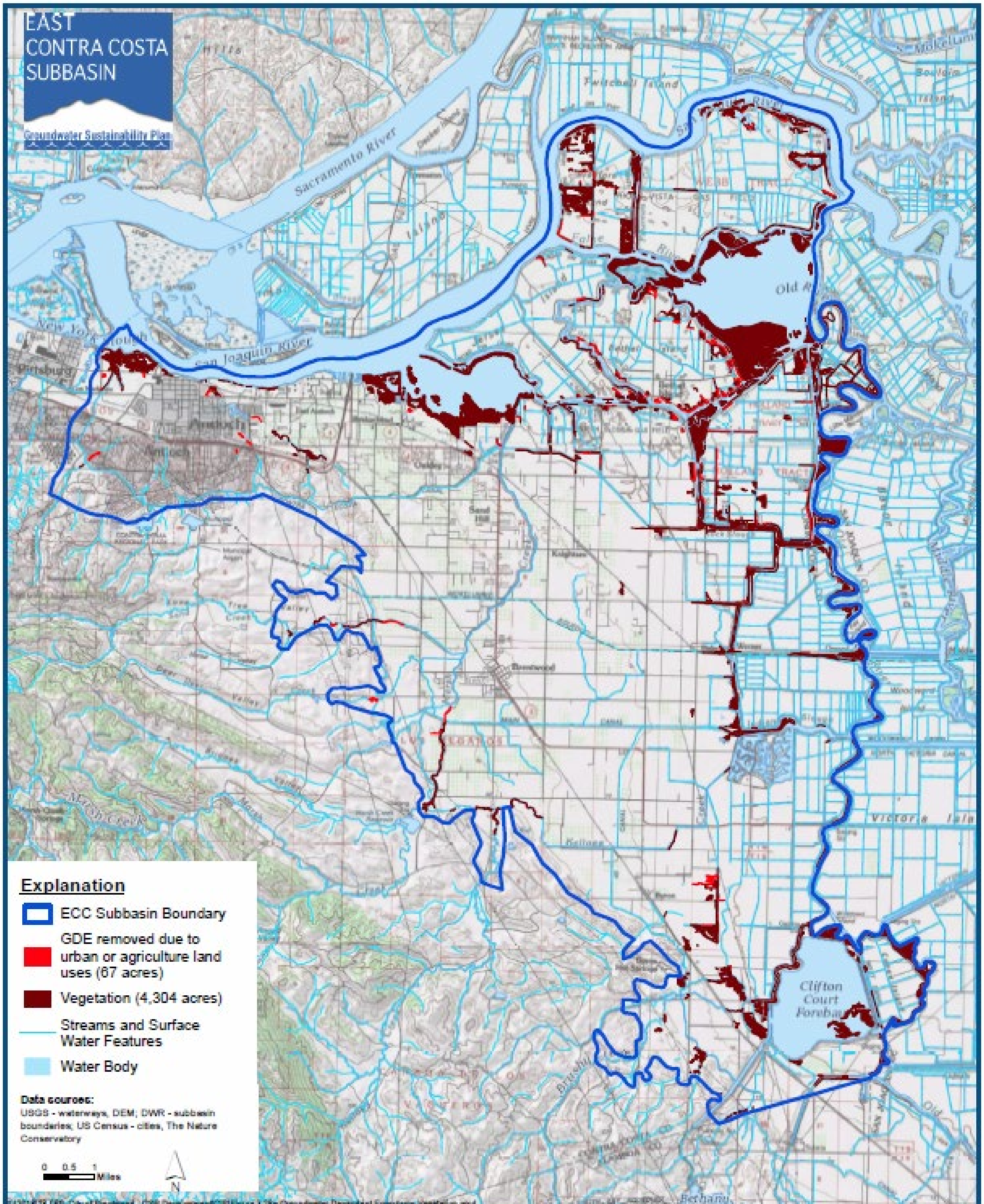
**Interconected Surface Water-
Minumum Depth to Water Spring 2018**

*East Contra Costa Subbasin Groundwater Sustainability Plan
Contra Costa County, California*

**Figure 3-25b**

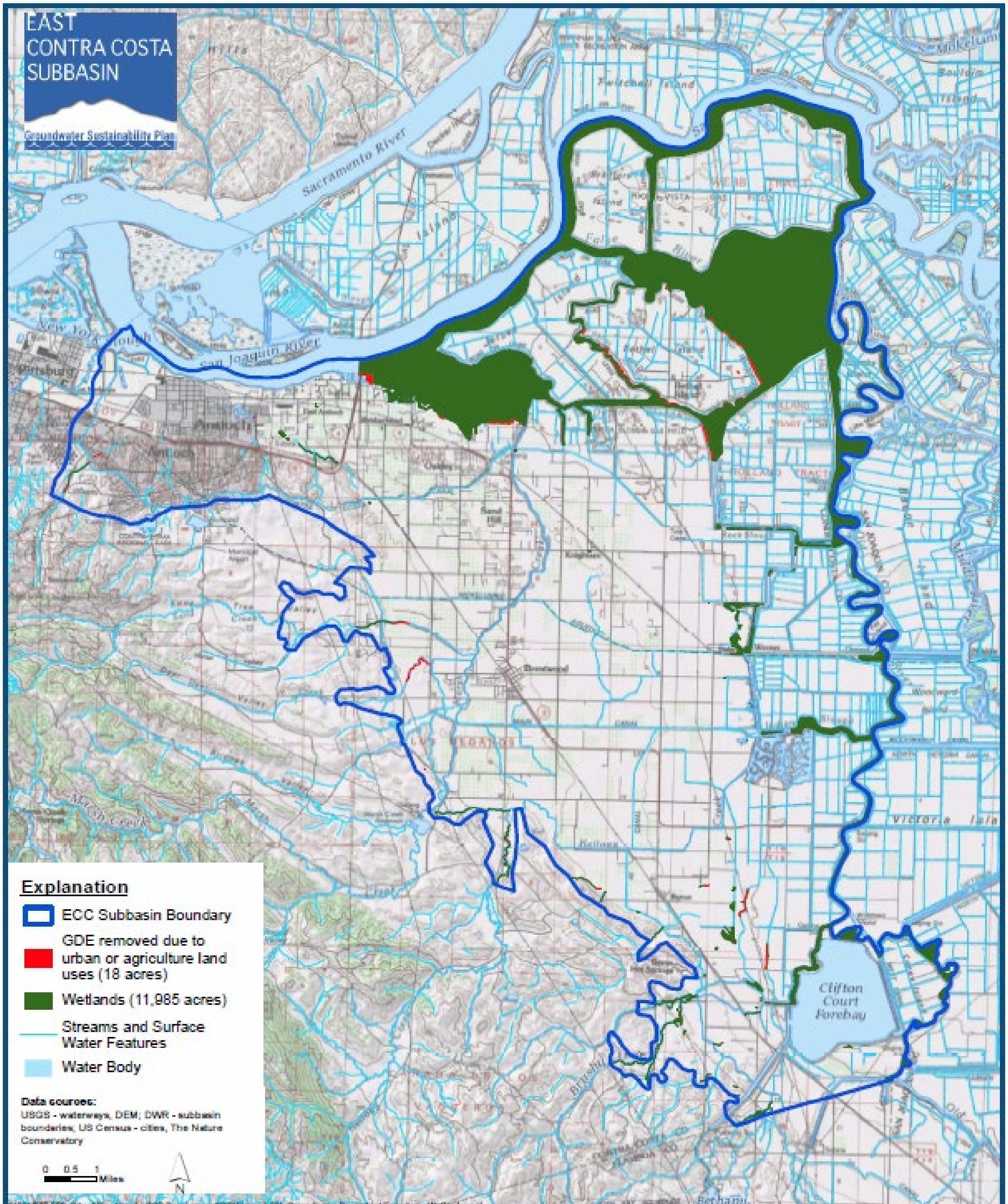



Groundwater Dependent Ecosytems-Vegetation

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 3-26a

Luhdorff & Scalmanini Consulting Engineers

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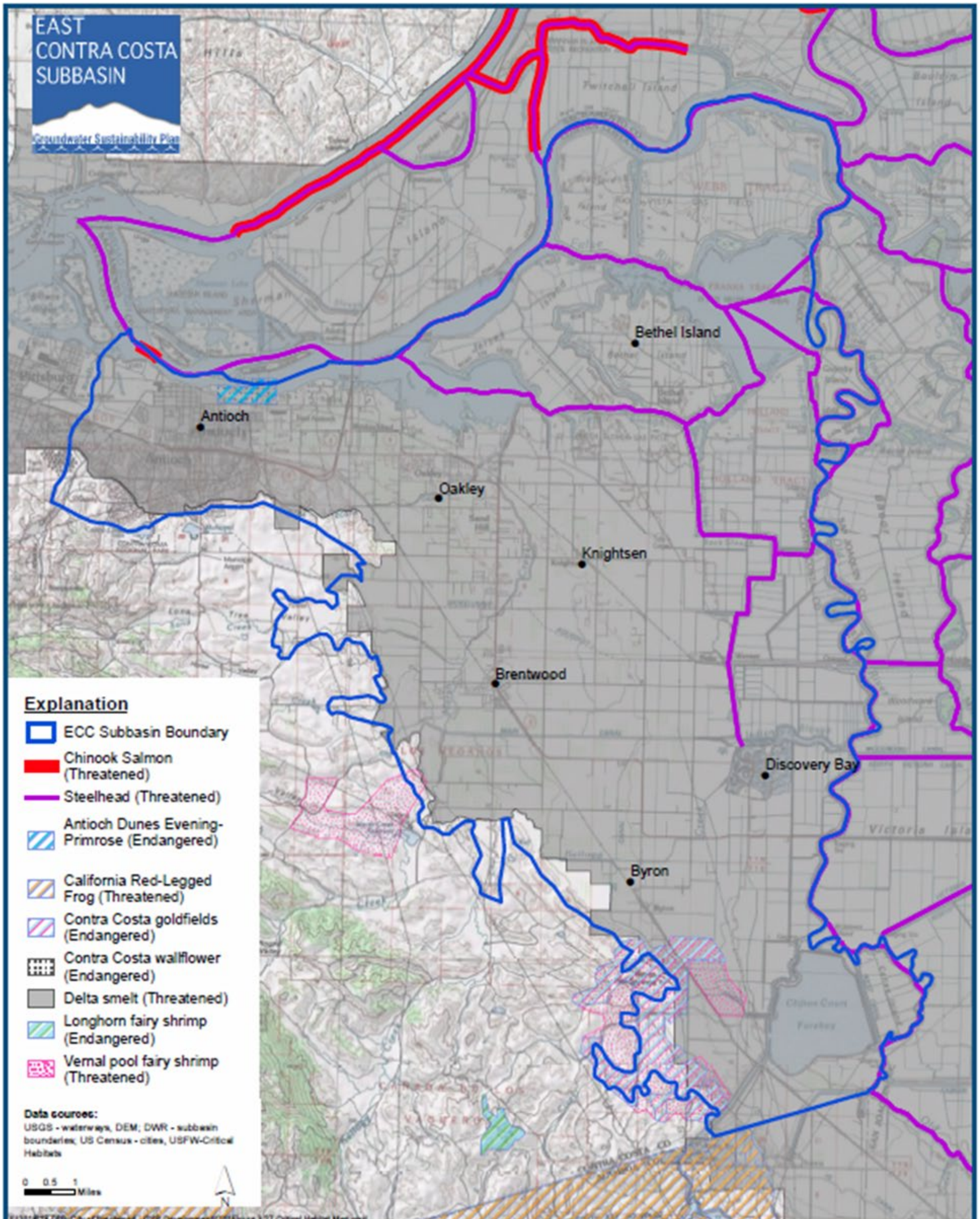
Groundwater Dependent Ecosytems- Wetlands

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 3-26b

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**Critical Habitat Map**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contro Coasta County, California*

**Figure 3-27**

**Table 3-4 Vegetation Species in Subbasin**

| Dominate Species | Percentage of Total Vegetation | Dominant Species | Percentage of Total Vegetation |
|---|---|---|---|
| **Arctic Rush** | < 1% | **Iodine Bush** | 4% |
| **Arroyo Willow** | 9% | **Narrowleaf Cattail** | < 1% |
| **Broadleaf Cattail** | 1% | **Narrowleaf Willow** | 2% |
| **Broadleaf Pepper-grass** | 4% | **Northern California Black Walnut** | < 1% |
| **California Bulrush** | 7% | **Not applicable** | 37% |
| **California Rose** | < 1% | **Red Willow** | 0% |
| **Common Reed** | 1% | **Shrubby Seepweed** | 1% |
| **Fremont Cottonwood** | 1% | **Three-square Bulrush** | < 1% |
| **Giant Reed** | < 1% | **Tree-of-Heaven** | < 1% |
| **Goodding's Willow** | 10% | **Valley Oak** | < 1% |
| **Hardstem Bulrush** | 16% | **White Alder** | < 1% |
| **Himalayan blackberry** | 5% | **--** | -- |

The Subbasin has multiple GDE areas, mostly in the Delta in the north along the San Joaquin River and the east along the Old River in addition to various canals located in the east. However, these areas have minimum groundwater pumping from mostly domestic wells (**Figure 2-3a**). TODB is wholly reliant on groundwater and has GDEs noted around the town; a shallow zone groundwater monitoring well has been identified as a Data Gap and will be installed as part of this GSP. Brentwood also uses groundwater but no GDEs are noted in the area; however, three shallow zone monitoring wells are part of the monitoring network. Bethel Island has a groundwater production well that is located near GDEs for both wetlands and vegetation, and this also has been identified as a Shallow Zone monitoring well Data Gap. The southern portion of the Subbasin has small areas of GDEs but with no municipal groundwater production; however, this area is also identified as a Shallow Zone monitoring well Data Gap for this GSP.

New projects that include construction of wetlands are in the planning and/or constructions phase and will be added to the GDE maps when completed. They include Dutch Slough Tidal Restoration Project[15] located at the intersection of Marsh Creek and the Delta (managed marsh and tidal), Three Creeks Parkway Project[16] located in Brentwood, and Franks Track State Park[17]. Municipal Water District of Southern California (MWD) owns all or parts of two islands[18] in the Delta area of the ECC Subbasin:

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[15] Information can be access here: https://water.ca.gov/Programs/Integrated-Regional-Water-Management/Delta-Ecosystem-Enhancement-Program/Dutch-Slough-Tidal-Restoration-Project. Construction to restore 1,200 acres launched in 2018, planting occurred in 2020 and a levee breach is planned for 2021.
[16] Information can be accessed here: https://www.contracosta.ca.gov/5814/Three-Creeks-Parkway-Project
[17] Information can be accessed on Franks Tract Futures here: https://franks-tract-futures-ucdavis.hub.arcgis.com/
[18] Holland and Webb Tracts are owned by Municipal Water District (MWD) that are part of the proposed water storage project call Delta Wetlands Project. Information can be accessed here:

Webb Tract (100% MWD owned) and Holland Tract (75% MWD owned). Originally Webb Tract was slated to be a Reservoir Island to store available water in winter and discharged in summer or fall and 845 acres of Holland Tract was to be wetlands and a dedicated Habitat Island. However, as of September 2020 the islands are projected to continue as farms for at least the next 5 years with no major land use change and MWD is reportedly not pursuing the island storage project[19]. Future updates to the GSP will include refinement of GDE locations in the Subbasin as land use changes.

#### 3.3.9.1 Evaluation of GDE Health

The GDE Pulse dataset, developed by TNC, was also reviewed and evaluated for the Subbasin (Klausmeyer et al., 2019) in relation to GDEs. The GDE Pulse dataset utilizes remote sensing data from Landsat satellites to monitor the health of GDEs by observing how moisture and greenness change over time (Klausmeyer et al., 2019). The most common way to assess the health of the GDEs using remote sensing data is through the Normalized Derived Vegetation Index (NDVI). NDVI is calculated as follows:

$$NDVI = \frac{Near\ Infrared - Visible\ Red\ Light}{Near\ Infared + Visible\ Red\ Light}$$

Calculated NDVI values less than zero indicate unhealthy or dead vegetation, values between zero and 0.1 are most likely barren, values of 0.2 to 0.3 are considered moderate vegetation, and values above 0.6 are very dense and green vegetation (Weier and Herring, 2000). TNC merged the NCCAG and remote sensing datasets together and removed background noises such as clouds and calculated the NDVI yearly average values. According to Klausmeyer et al. (2019), yearly average NDVI values between July 9 to September 7 represent readings during the typically dry months when GDEs would be dependent on groundwater. The yearly average was calculated by finding the medoid, which is "a multi-dimensional feature space median" (Klausmeyer et al., 2019). **Figure 3-28a through Figure 3-28e** illustrates the NDVI changes in the Subbasin for 1997, 2004, 2010, 2015, and 2018. The five years selected show the likely GDEs identified in the Subbasin under a variety of water year conditions ranging from wet (1997, during and after several wet years), dry (2004, during and after several dry years), more moderate (2010, above normal after a dry year; 2018, below normal after a very wet year), and critically dry (2015, during and after two critical years).

For evaluating the GDE health in the Subbasin over the last 20 years, NDVI values greater than 0.2 were interpreted to be healthy, based on guidance from Weier and Herring (2000), and values less than 0.2 were interpreted to be unhealthy. The NDVI changes throughout the Subbasin have occurred through many different water year types. NDVI data changed the most in Clifton Court Forebay and the Delta region of the Subbasin. Throughout time the GDE health has changed in several areas of the Subbasin particularly in Franks Tract, but in general GDE health poorer historically compared to recent years. In the earlier periods, larger areas had values of less than 0.2 while, in the more recent surveys (2015 and 2018), the overall health of the vegetation is greater than 0.2. NDVI data along Franks Tract and Clifton Court Forebay appear to be consistently below 0.2; however, in some instances, the values rise 0.2, but other factors could be contributing to this phenomenon. The values of less than 0.2 can be due to the NCCAG

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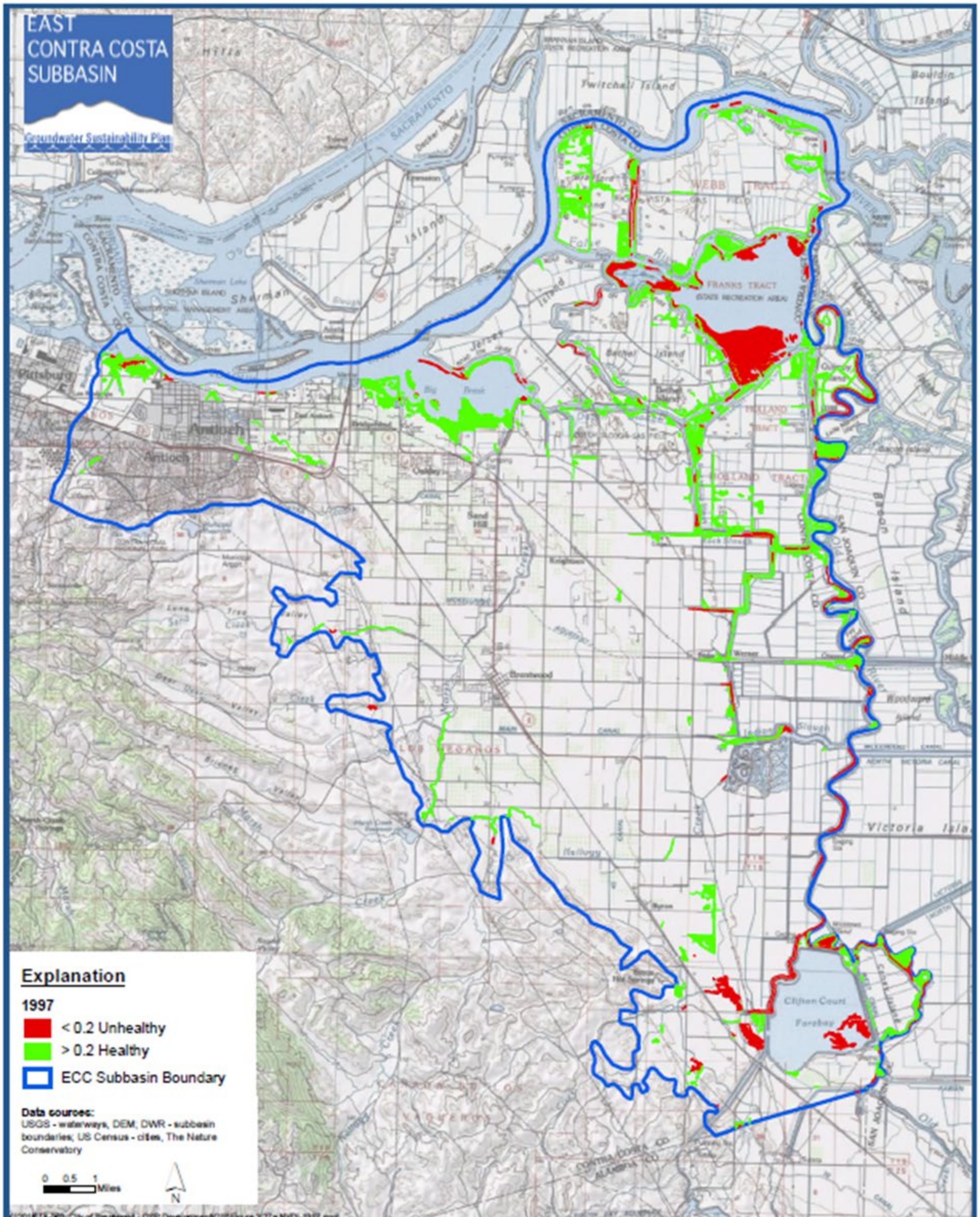
https://www.spk.usace.army.mil/Portals/12/documents/regulatory/eis/190109804-eis/190109804-SDEIS/AppendixJ.pdf

[19] Delta Protection Commission meeting, September 17, 2020, report by Stephen Arakawa, MWD, on Delta Islands.

vegetation dataset, which is based on more current conditions and historically vegetation may not have always been present in these areas.

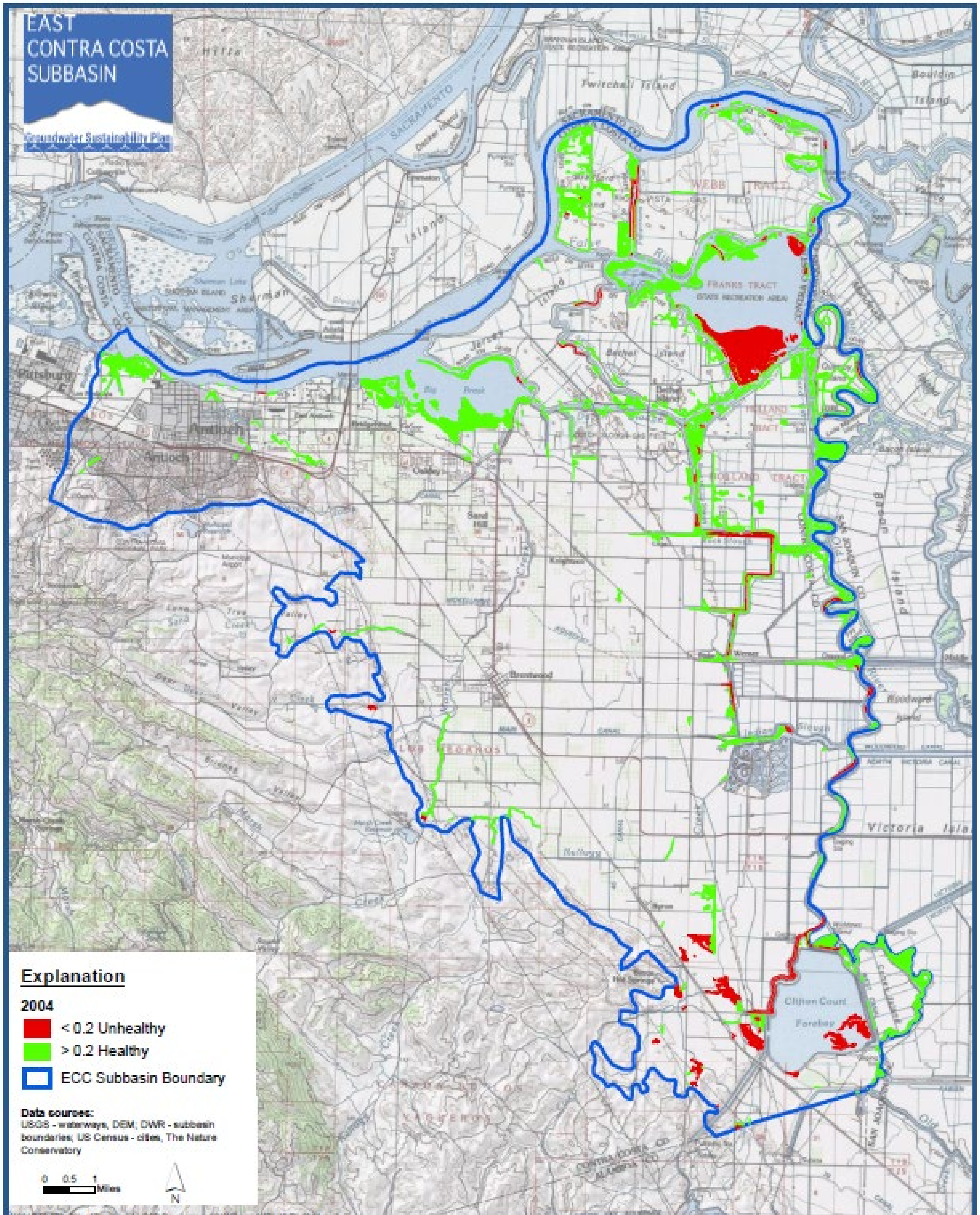
The evaluation of NDVI data suggest that the overall GDE health within the Subbasin has experienced changes but generally remained stable between 1997 and 2018. The greatest periods of stress to GDE communities appears to have occurred during the earliest and later part of the 1997-2018 period, in 1997 and 2018. This could be explained by changes geography in the area, what was historically water channels could presently have vegetation or be considered a wetland. Very few areas of stressed GDE health are evident in 2015, when the groundwater conditions in the Subbasin were at historically low levels because of drought conditions, compared to the moderate 2018 conditions. **Figure 3-28f and Figure 3-28g** shows the NDVI changes throughout the available record (1985-2018) for likely GDE areas along Big Break and Marsh Creek. The NDVI data for communities along Big Break shows a gradual increase in GDE health with the average plotting above 0.2 for the entire record, only a small portion of GDEs plotted below 0.2 in the early part of the record. In Marsh Creek there are limited GDEs identified, and the health has been stable throughout time. These data suggest that overall health of the GDE communities along Big Break and Marsh Creek are healthy with majority of NDVI values above 0.2 and a long-term upward trend (Big Break) and stable healthy conditions (Marsh Creek), suggestive of general improving or stable health conditions between 1985 and 2018.




**Normalized Difference Vegetation Index-1997**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-28a**

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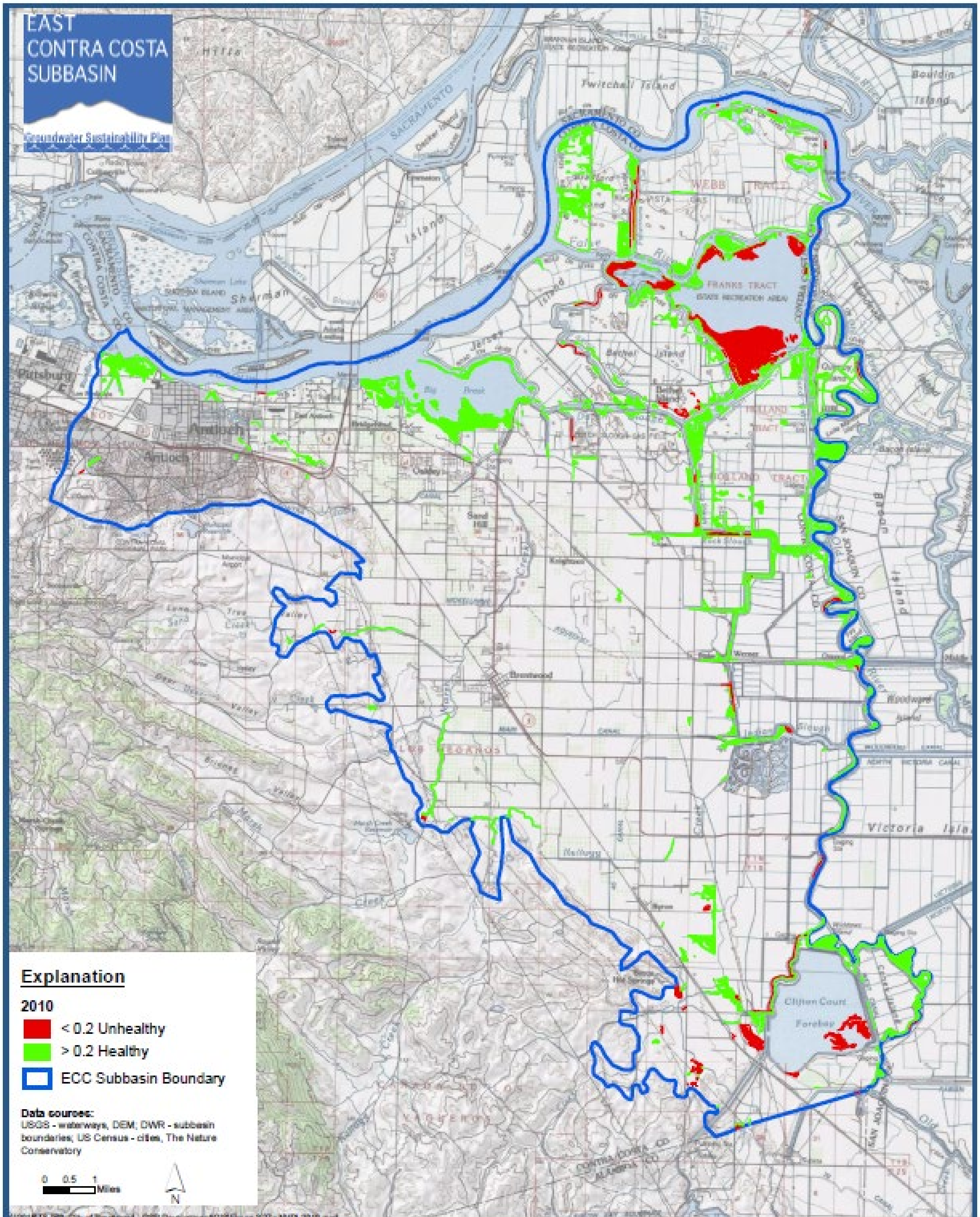
**Normalized Difference Vegetation Index- 2004**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

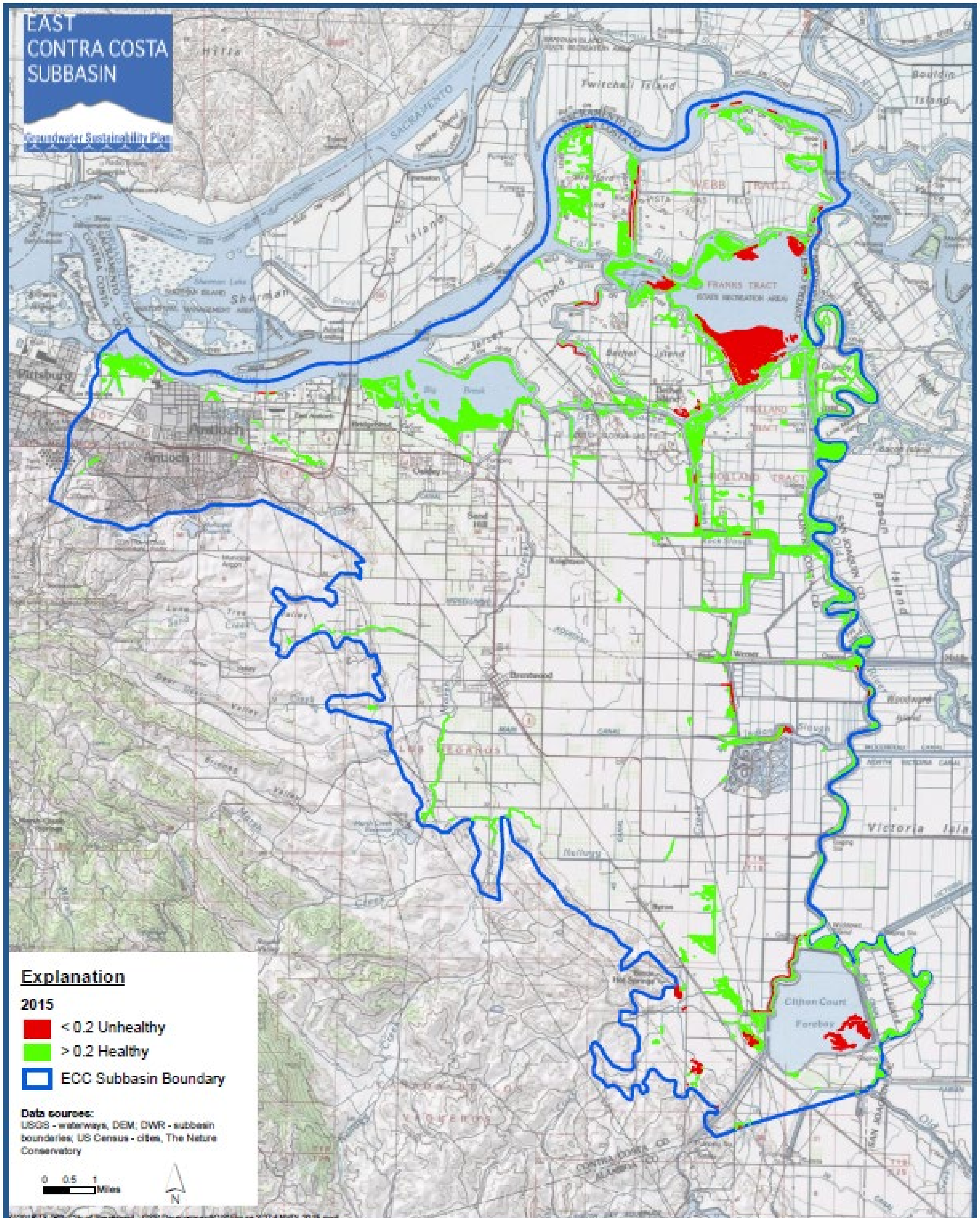
**Figure 3-28b**




Normalized Difference Vegetation Index- 2010

Figure 3-28c

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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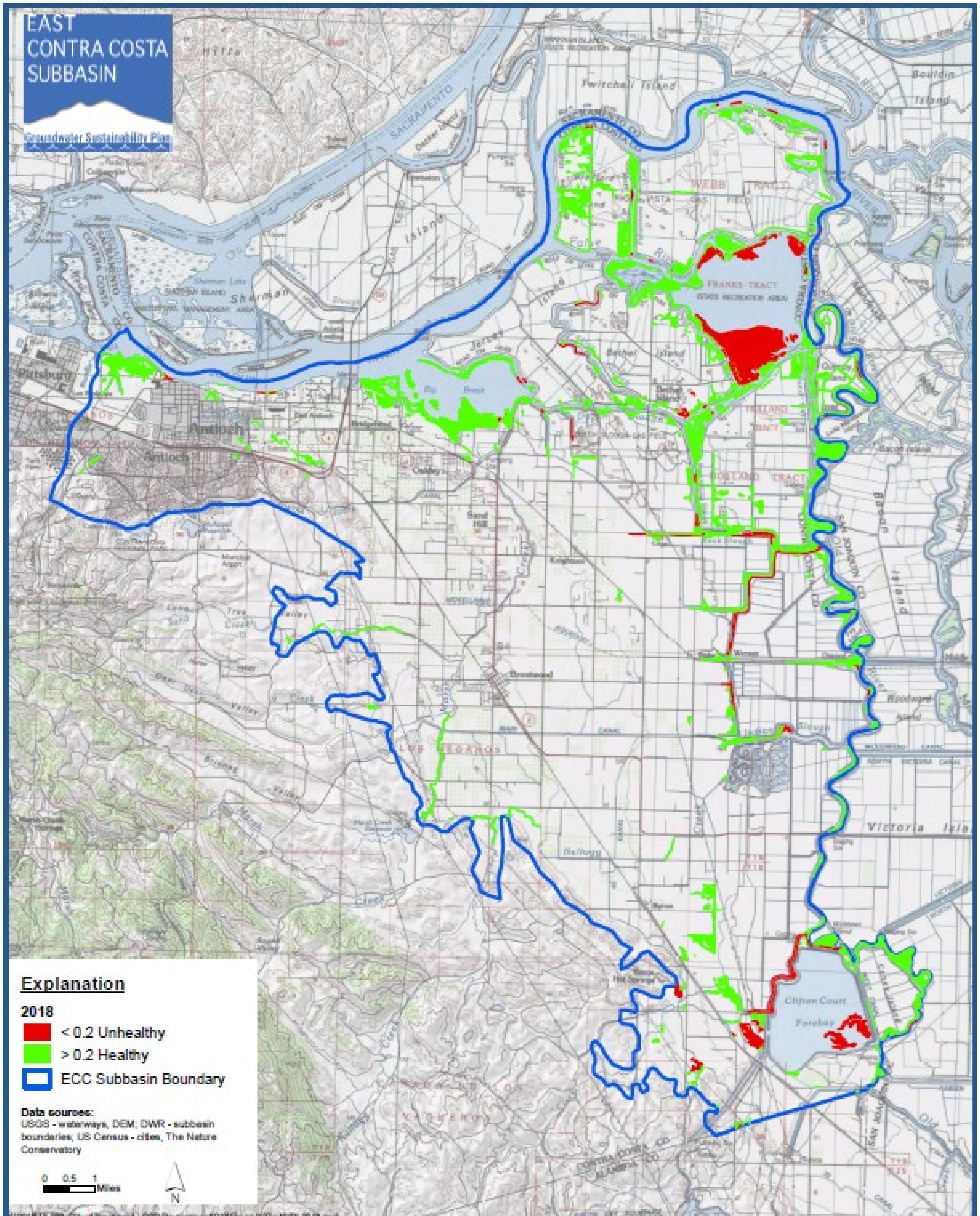
**Normalized Difference Vegetation Index- 2015**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-28d**

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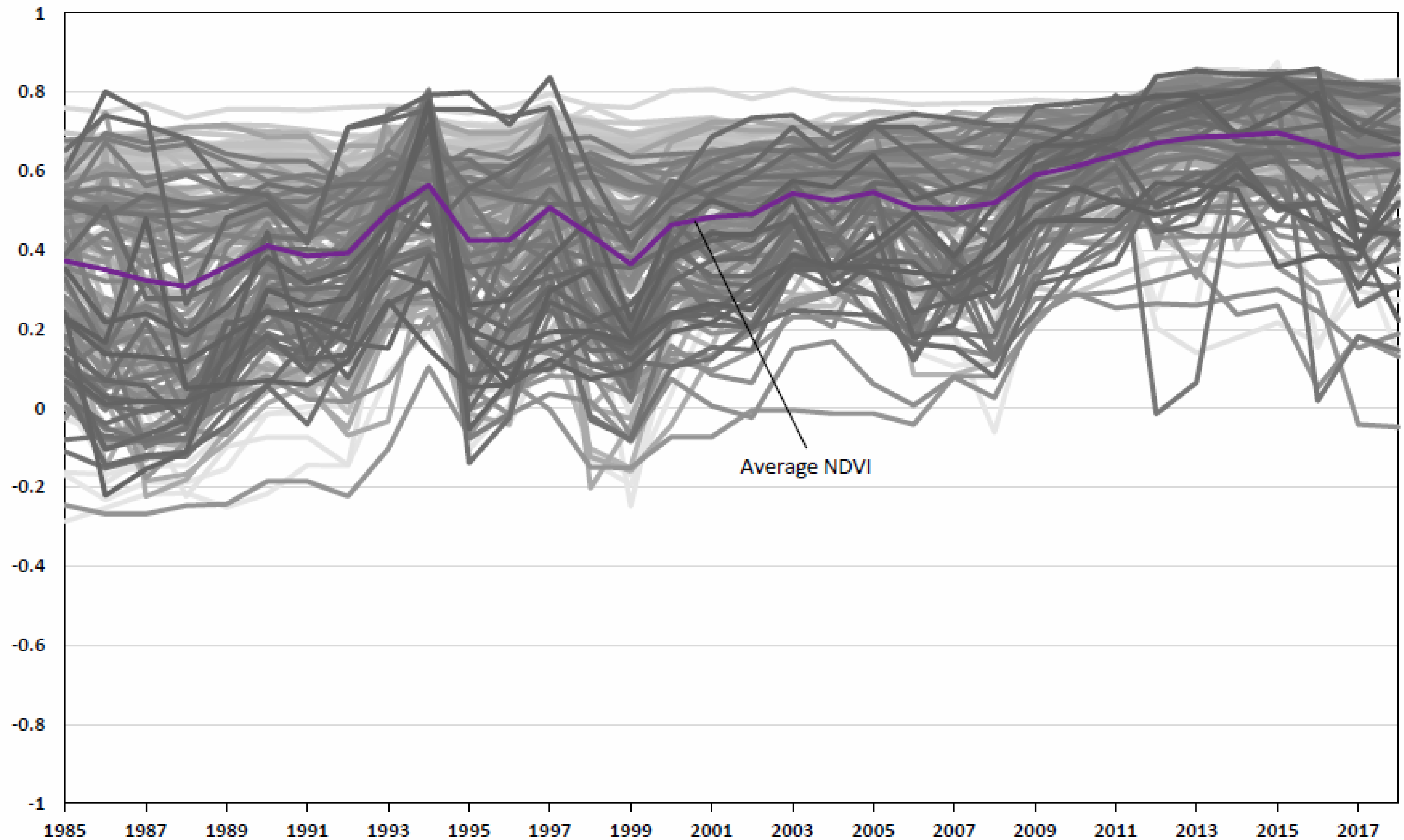
**Normalized Difference Vegetation Index- 2018**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-28e**




Data Source: *https://gde.codefornature.org*

\\server-01\Clerical\2018\18-060 City of Brentwood - GSP Development\REPORT\Figures\Figure 3-27f Big Break NVDI.xlsx

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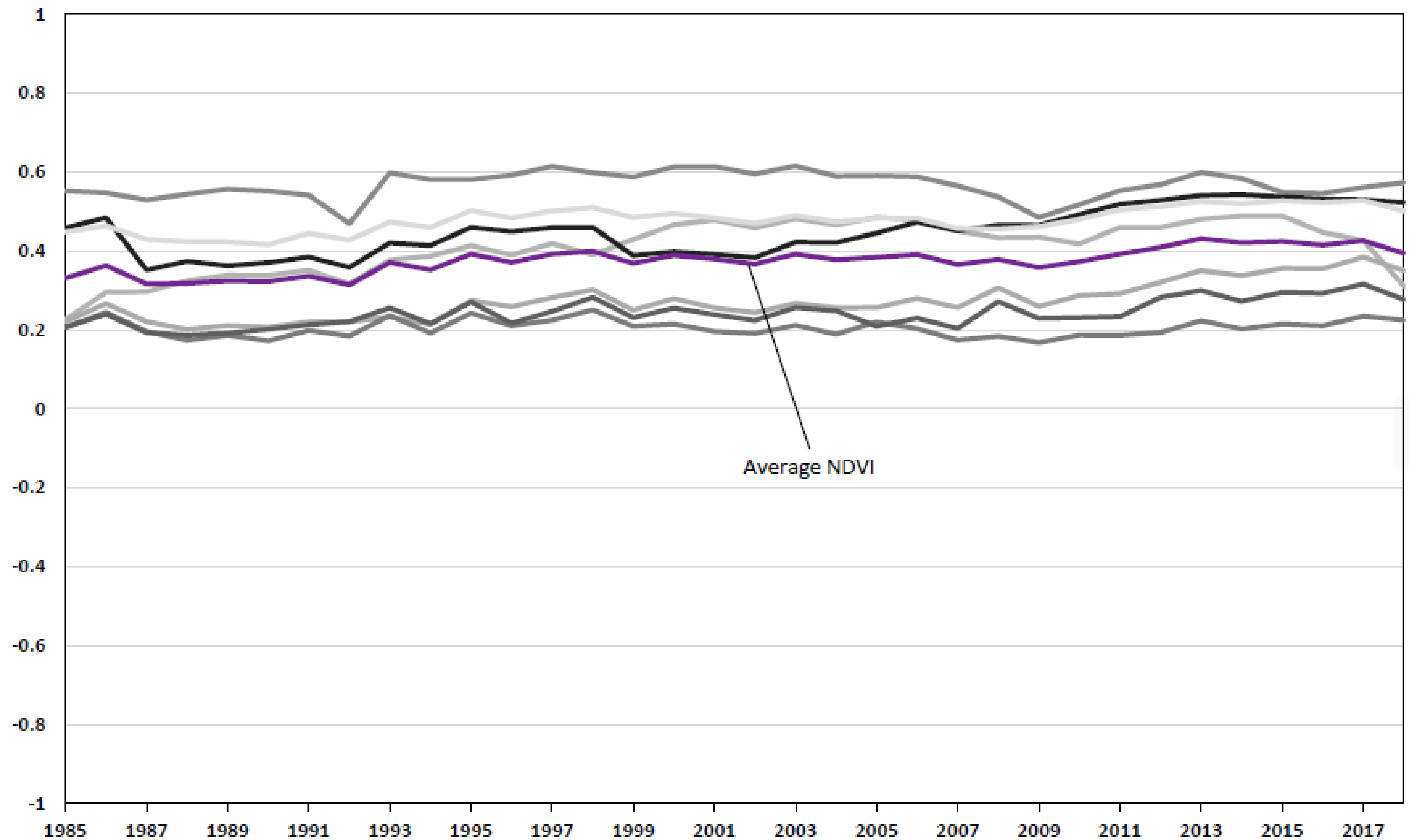
**Normalized Difference Vegetation Index- Big Break**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-28f**




Data Source: *https://gde.codefornature.org*

\\server-01\Clerical\2018\18-060 City of Brentwood - GSP Development\REPORT\Figures\Figure 3-27f Marsh Creek NVDI.xlsx

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**Normalized Difference Vegetation Index- Marsh Creek**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-28g**

## 3.4 Summary

Basin Setting

- ECC Subbasin is bounded on the north, east, and south by the Contra Costa County line, which is contiguous with the San Joaquin River (north) and Old River (east). In the west, the Subbasin is bounded by marine sediments of the Coast Range.
- Topography and geological formations gently slope to the northwest. The upper 400 feet of Subbasin sediments is comprised of alluvial deposits with discontinuous clay layers interspersed with more permeable coarse-grained units.
- The ECC Subbasin aquifer system is divided into the upper unconfined Shallow Zone (to about 150 ft bgs) and a lower semi-confined to confined Deep Zone (the Corcoran Clay is not present in the Subbasin). Most water wells are constructed within the upper 400 feet.

Groundwater Conditions

- Groundwater levels in the ECC Subbasin are stable which indicates that the Subbasin is being operated within its sustainable yield. This is due to surface water being the major supply source for agricultural and urban uses. Groundwater flow direction is generally from the southwest to the northeast toward the Delta.
- Groundwater quality is generally good with no restrictions for agricultural or urban uses in the Subbasin. Constituents of concern are TDS, chloride, nitrate as N, and boron which all have natural sources with the exception of nitrate. TDS concentrations in both the Shallow Zone and Deep Zone are generally stable and average 1,100 mg/L, around the SMCL of 1,000 mg/L. Chloride is another indicator of salinity and averages around 230 mg/L which is near the SMCL of 250 mg/L. Nitrate levels are primarily below the MCL of 10 mg/L, with slightly elevated concentrations in the Shallow Zone around Brentwood due to past land uses. Boron does not have a drinking water standard, but the agricultural goal is 700 ug/L where some crops may become sensitive to it. Boron concentrations in ECC wells are generally over 1,000 ug/L.
- Groundwater Storage: the total volume of groundwater in storage in the Subbasin was estimated to be between 4.5 MAF and 9 MAF when measuring to the base of fresh water (to over 1,000 ft bgs) and between 1.5 MAF to 3 MAF when measuring the current production zone (to average of 300 ft bgs). There has not been a change in groundwater storage overtime because groundwater levels between 1993 to 2019 have been stable.
- Land Subsidence: there are no historical records of inelastic subsidence due to groundwater withdrawal in the ECC Subbasin.
- Seawater Intrusion: the East Contra Costa Subbasin is located in the Bay-Delta with the potential for interactions between saline baywater and shallow groundwater. While the baywater is fresh, intrusion may be of concern if saline water infiltrates the Delta and intrudes into shallow groundwater. This potential mechanism may be triggered or exacerbated by sea level rise. There are no direct connections between ocean seawater and groundwater in the Subbasin.

- Interconnected Surface Water: are locations where groundwater and surface water are hydrologically connected. The San Joaquin River and Old River are considered interconnected rivers in this Subbasin. Impacts on these surface water bodies due to groundwater pumping will be managed under this GSP to minimize stream depletion.
- Groundwater Dependent Ecosystems: potential GDEs are identified and GDE health is stable or improving.

## 3.5 References

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## SECTION 4 CONTENTS



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# 4. HISTORICAL, CURRENT AND PROJECTED WATER SUPPLY

This section describes the East Contra Costa (ECC) Subbasin land uses, population, and metered historical, current and projected water supplies. Water supply amounts were provided by the Groundwater Sustainability Agencies (GSA) and Contra Costa Water District (CCWD). When historical or projected water supply were not provided, land uses and population data was used to estimate these data. This information is integrated into the Subbasin surface water/groundwater model (GSP **Section 5**).

## 4.1 Land Uses

### Department of Water Resources Land Use Surveys

Since the 1950s, DWR has periodically conducted detailed and high-quality land use surveys. The project began as an effort to understand water and land use as well as to understand current and projected water demands. DWR land use surveys conducted in Contra Costa County provide historical land use details of the Subbasin for the years 1976 and 1995 (**Figures 2-11 and 2-10**, respectively). The most current land use conditions for the Subbasin are derived from a Delta crop map for 2015 (**Figure 2-9)** integrated with a 2014 statewide map to fill in areas not covered by the former. The resultant map does not cover the entire Subbasin leaving small areas along the western boundary as not designated, approximately 6,200 acres, which is about 6 percent of the area of the Subbasin. These lands were assigned a land use based on the 1995 land survey and cross-checked with Google earth. The total area of the Subbasin is 107, 596[1] acres.

A breakdown of land use categories reported in historical and current surveys is given in **Table 2-3**. In 1976, native vegetation and field crops were the major land use categories (about 25,000 and 23,000 acres, respectively), which collectively accounted for about 45 percent of the area within the Subbasin. Surface water and pasture (about 14,000 and 13,000 acres, respectively) covered about 25 percent of the land area. After field crops, deciduous trees and truck crops (e.g., melons and tomatoes) were the major cultivated crops (about 12,000 and 8,000 acres, respectively) accounting for about 18 percent of the area. Approximately 9 percent of the area in the Subbasin (about 9,700 acres) was designated as urban areas. The remaining land cover was comprised of semi-agricultural lands, idle lands, and vineyards.

Between 1976 and 1995, acreage of urban lands (**Figure 2-12**) increased to about 19,000 acres (about 18 percent of the Subbasin area). Area of the idle lands increased from about 900 acres in 1976 to 5,800 acres in 1995 (from about 1 percent to 5 percent of the Subbasin area). During this period, both deciduous trees and field crops acreages decreased by about 5,700 and 5,000 acres, respectively. Decrease of pasture, native vegetation and truck crops were about 1,900, 1,600 and 950 acres, respectively. Acreages of the other land use categories remained nearly unchanged during this period.

In 2015, the total area of urban lands was about 23,500 acres (22 percent of the Subbasin area), making it the largest single land use category within the Subbasin. Native vegetation coverage was about 15,500 acres (14 percent of the Subbasin area), which was a decrease of about 9,500 acres from 1995. A part of this decrease, approximately 4,000 acres may be attributed to the lands that were designated as native vegetation in previous surveys but categorized as “Not Designated” in the 2015 survey. Pasture and surface water bodies each covered about 14 percent of the Subbasin area (each about 15,000 acres). The

[1] The California Department of Water Resources ECC subbasin boundary shape file was used to calculate the area in GIS based on the map projection.

total area of all crop lands was about 23,000 acres (21 percent of the Subbasin area) in 2015. Field crops, which accounted for about 13,500 acres (13 percent of the Subbasin area) was the major crop category, and it showed a decrease of about 4,700 acres from 1995. Areas of truck crops, deciduous trees and vineyards totaled about 9,400 acres (about 9 percent of the Subbasin area). Semi-agricultural lands, which include farmsteads, feed lots (livestock and poultry), and dairies, increased from about 900 acres in 1995 to 6,300 acres in 2015 (6 percent of the Subbasin area). These figures indicate a transition from a predominantly agricultural area of field crops and other deciduous crops to a roughly even split between urban and agriculture. Within the Subbasin, a large area of native vegetation has been preserved over the time period evaluated (15,000 acres in 2015).

The current Contra Costa County General Plan (CCC, 2005) extends until 2020. The county is presently working to develop its 2040 General Plan that will outline the planned land use for the unincorporated areas of the subbasin. The 2040 General Plan is expected to be available in late 2020.

#### Farmland Mapping and Monitoring Program – Land Use Information

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program (FMMP) has reported on the ECCC Subbasin land use. Land use data for the Subbasin has been recorded since 1984 on a biannual basis. The FMMP has designated the following eight types of land use:

1. Prime Farmland- Irrigated land with the best combination of physical and chemical features able to sustain long term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the four years prior to the mapping date.
2. Farmland of Statewide Importance- Irrigated land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops. This land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. Land must have been used for production of irrigated crops at some time during the four years prior to the mapping date.
3. Unique Farmland- Lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
4. Farmland of Local Importance- These lands (the Antioch area and the Delta) are typically used for livestock grazing. They are capable of producing dryland grain on a two-year summer fallow or longer rotation with volunteer hay and pasture. The farmlands in this category are included in the U.S. Natural Resources Conservation Service's Land Capability Classes I, II, III, and IV, and lack some irrigation water.
5. Grazing Land- Land on which the existing vegetation is suited to the grazing of livestock. This category is used only in California and was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.
6. Urban and Built-Up Land- Urban and Built-Up land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples

include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures.

7. Other land- Land which does not meet the criteria of any other category. Typical uses include low density rural development, heavily forested land, mined land, or government land with restrictions on use.
8. Water- Water areas with an extent of at least 40 acres.

All eight types of land use are present in the ECC Subbasin. The majority of land use has consistently been a type of farmland. Prime farmland has been the highest percentage of land use in the Subbasin since 1984 (**Figure 4-1**). Prime farmland had steady decline from 1984 to 2008 and from 2009 to 2016 the acreage was stable. Since 1984 there has been an increase in urban and farmland of local importance. The data produced by FMMP is not as detailed compared to DWR land use data. FMMP collects its data from aerial images, public review, computer mapping, and field inspections. The data provides the ECC Subbasin an approximation of changes in land use over time that supports DWR land use data findings of increasing urban land and decreasing farmland.

### Irrigation Methods

DWR has irrigation data for the 1976 and 1995 land use surveys. The 1995 land use surveys also detail the irrigation method used. About 52 percent of lands in the ECC Subbasin were designated as irrigated in the 1976 survey. That percentage has decreased to about 45 percent in 1995, mainly due to increased urbanization. In the 1995 survey, DWR categorize irrigated lands into four groups based on irrigation methods employed in those lands:

Gravity - Surface Irrigations (most common method in the Subbasin area)

Micro - Low volume irrigation such as drip and micro spray

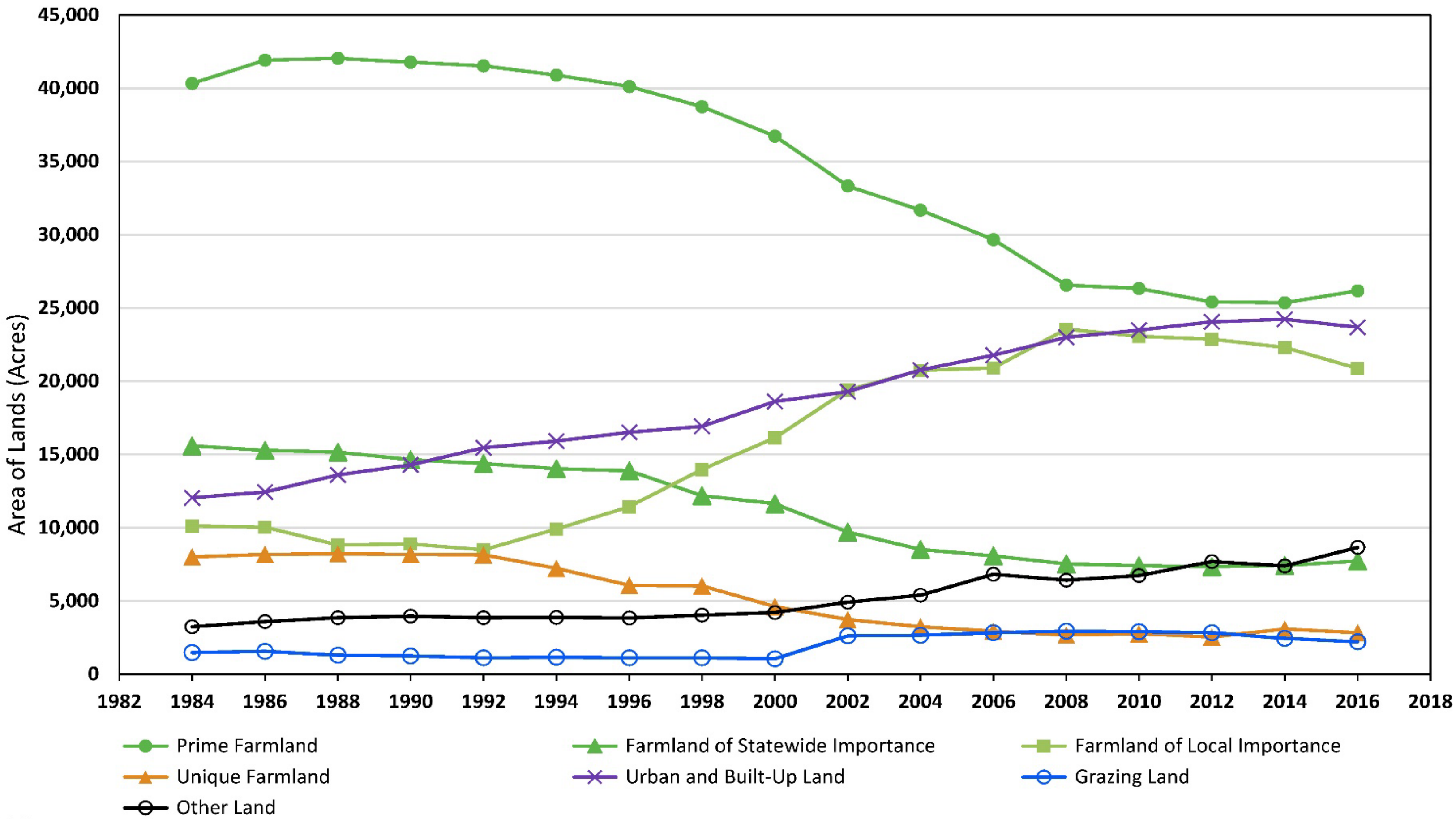
Sprinkler- Permanent, solid set, and movable sprinkler systems

- Irrigation method unknown

The crop map data sets of 2014 and 2015 provided by DWR do not include irrigation details. However, recent information on irrigation methods are available from local agencies that provide irrigation water. Byron Bethany Irrigation District (BBID) reports that in 2014[2] approximately 50 percent (3,100 acres) of irrigated lands in its service area uses drip and micro-spray methods (BBID, 2017 AWMP). Flood irrigation and sprinklers are used in about 39 percent and 11 percent of irrigated lands, respectively.

Drip and micro-spray methods are the primary irrigation methods in the ECCID service area (personal communication, Aaron Trott, August 2020).

[2] Since 2016, and in response to drought conditions, the percent of irrigated lands using drip and micro-spray methods has increased to nearly 90 percent, mostly a switch from prior flood irrigation methods.




Data Source:
California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program

\\server-01\Clerical\2018\18-060 City of Brentwood - GSP Development\REPORT\Figures\Figure 4-1 Land Use Summary.xlsx

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**Change in Land Use 1984 - 2016**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-1**

## 4.2 Population Trends

The East Contra Costa County region has exhibited increasing population growth over time (ECCC IRWMP, 2019). The Cities of Antioch, Brentwood, Oakley and the unincorporated communities of Town of Discovery Bay, Bethel Island, Byron, and Knightsen located within the ECC Subbasin have exhibited an increasing trend of population at variable rates. Parts of Antioch and Brentwood are located outside the ECC Subbasin. Therefore, in the following discussion, population of those two cities are proportioned based on the area located within the Subbasin (74 percent of the City of Antioch and 90 percent of the City of Brentwood). The comparatively smaller populations in rural areas in the Subbasin (i.e., outside the boundaries of cities, towns, and service areas of public water supply entities) are uncertain and are not included in the estimates presented in this discussion.

Historical, current, and projected populations of the cities and unincorporated communities are given in **Table 4-1** and shown in graphical form in **Figure 4-2**. Populations for 1950 through 2010 are based on the US decennial census data. Estimated population of 2015 through 2040 are based on the projections presented in 2015 Urban Water Management Plans (UWMP) of City of Antioch, City of Brentwood, and the Diablo Water District, as well as the Town of Discovery Bay 2020 Draft UWMP (population of 2020-2045) and the City of Antioch 2020 Water System Master Plan Update Technical Memorandum (Brown and Caldwell, 2020), and the DWD 2020 Facilities Plan (CDM Smith, 2020). Projections for 2045 and 2050 were obtained by applying the countywide population growth rate provided in CA Department of Finance Population Projections as detailed below.

According to the US census data, the total population within the ECC Subbasin in 2010 was about 176,000. Population in the Cities of Antioch, Brentwood and Oakley were about 75,500, 46,300 and 35,400, respectively. In unincorporated communities, the Town of Discovery Bay (TODB) had the highest population (about 13,400) and the other three communities had a combined population of about 5,000. Historical data show that the population of the Cities of Antioch, Brentwood and Oakley increased at a rapid rate (112 percent, 426 percent, and 800 percent, respectively, or 198 percent in their combined areas, from 1980 to 2000 (**Figure 4-2**). The growth rate has decreased since then but remained higher than the overall growth rate of Contra Costa County (49 percent in the three cities in the ECC Subbasin versus 22 percent in the County). The eastern region of the County in which the Subbasin is situated "is expected to be the fastest growing area of the County in the foreseeable future" (ECCC IRWMP, 2019). As the Cities reach the build-out population limits in 2040, growth is expected to continue but at a slower rate. This post-2040 slower growth rate was the basis to apply the countywide growth rate to estimate the 2045 and 2050 population given in **Table 4-1**. The total population in the Subbasin is expected to increase to about 264,000 in 2040 and 279,000 in 2050, which correspond to increases of 50 percent and 59 percent compared to 2010 population **(Table 4-1**). For these same time periods, the countywide population has an expected growth rate of 27 percent (2040) and 32 percent (2050) relative to 2010 population (Department of Finance Population Projections, 2019).

## Table 4-1 Historical, Current and Projected Population

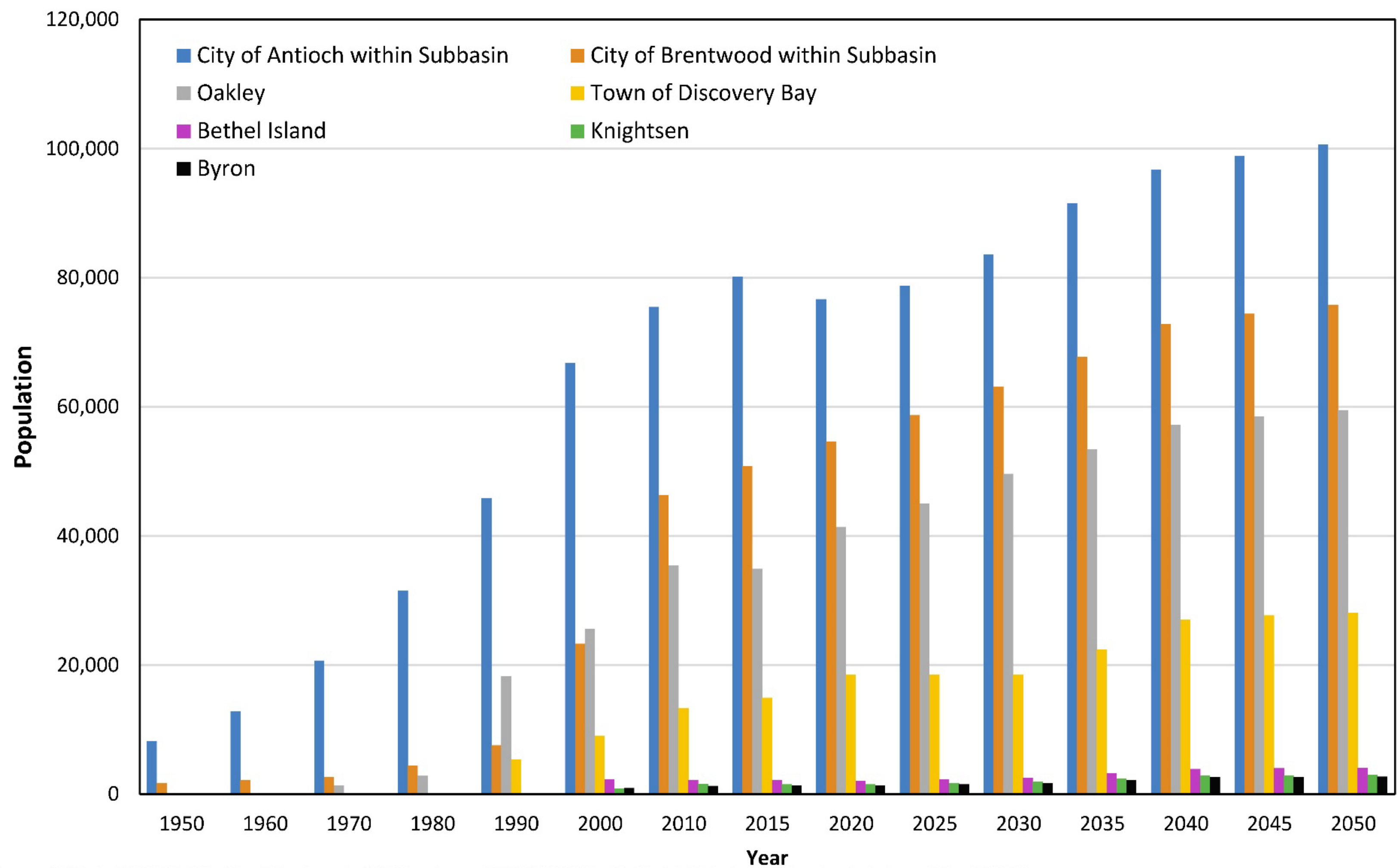
| Year | Population within ECC Subbasin[1] | | | | | | | | | Entire City Population | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | City of Antioch within Subbasin[2] | City of Brentwood within Subbasin[3] | Oakley | Town of Discovery Bay | Bethel Island | Knight-sen | Byron | Subbasin Total | % increase since 2010 | City of Antioch | City of Brent-wood |
| 1950 | 8,200 | 1,729 | | | | | | 9,929 | – | 11,051 | 1,729 |
| 1960 | 12,800 | 2,186 | | | | | | 14,986 | – | 17,305 | 2,186 |
| 1970 | 20,700 | 2,649 | 1,306 | | | | | 24,655 | – | 28,060 | 2,649 |
| 1980 | 31,500 | 4,434 | 2,844 | | | | | 38,778 | – | 42,683 | 4,434 |
| 1990 | 45,900 | 7,563 | 18,225 | 5,351 | | | | 77,039 | – | 62,195 | 7,563 |
| 2000 | 66,800 | 23,302 | 25,619 | 8,981 | 2,312 | 861 | 916 | 128,791 | – | 90,532 | 23,302 |
| 2010 | 75,500 | 46,300 | 35,432 | 13,352 | 2,137 | 1,568 | 1,277 | 175,566 | 0% | 102,372 | 51,481 |
| 2015 | 79,900 | 50,800 | 34,900 | 14,895 | 2,200 | 1,500 | 1,300 | 185,500 | 6% | 108,298 | 56,493 |
| 2020 | 76,400 | 54,600 | 41,400 | 15,575 | 2,000 | 1,500 | 1,400 | 192,900 | 10% | 103,595 | 60,702 |
| 2025 | 78,600 | 58,700 | 45,000 | 18,600 | 2,300 | 1,700 | 1,500 | 206,400 | 18% | 106,480 | 65,225 |
| 2030 | 83,300 | 63,100 | 49,600 | 21,600 | 2,500 | 1,900 | 1,700 | 223,700 | 27% | 112,960 | 70,084 |
| 2035 | 91,300 | 67,800 | 53,400 | 24,500 | 3,200 | 2,400 | 2,200 | 244,800 | 39% | 123,755 | 75,306 |
| 2040 | 96,500 | 72,800 | 57,200 | 28,300 | 3,900 | 2,900 | 2,600 | 264,200 | 50% | 130,725 | 80,917 |
| 2045 | 98,600 | 74,400 | 58,500 | 32,600 | 4,000 | 2,900 | 2,600 | 273,600 | 56% | 133,600 | 82,700 |
| 2050 | 100,300 | 75,800 | 59,500 | 33,200 | 4,100 | 3,000 | 2,700 | 278,600 | 59% | 136,000 | 84,200 |

1. Populations of rural areas in the Subbasin are uncertain and not included in this table.
2. Area-weighted adjustments were applied for all years to estimate City of Antioch population within the Subbasin (about 74% of the City's area in the Subbasin).
3. Area-weighted adjustments were applied for 2010 and later years to estimate the City of Brentwood population within the Subbasin (expansion of the City outside the Subbasin was about 10% in and after 2010.

**Data Sources**

-US Census Bureau (1950 through 2010 population data)

-2015 through 2040 population estimates: 2015 Urban Water Management Plans (City of Antioch, City of Brentwood, Diablo Water District); City of Antioch 2020 Water System Master Plan Update Technical Memorandum; Diablo Water District 2020 Facilities Plan; Town of Discovery Bay Community Services District 2020 Draft UWMP (population of 2020-2045).
-Bethel Island, Knightsen and Byron 2010 and 2015 populations--https://worldpopulationreview.com
-Populations of 2045 and 2050 were estimated applying the countywide growth rates (provided by CA Department of Finance) to 2040 polulations.




*\\server-01\Clerical\2018\18-060 City of Brentwood - GSP Development\REPORT\Tables\Table 4-1 Historic current and projected population 2020-08-20_Updated.xlsx*

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**Historical, Current and Projected Population**

*East Contra Costa Subbasin Groundwater Sustainability Plan*

**Figure 4-2**

## 4.3 Water Demands, Supplies and Utilization

The purpose of defining water demand (outflows) and supplies (inflows) is that they contribute to the understanding of the ECC Subbasin water budget. This section describes the groundwater and surface water components of the water budget that are measured (e.g., groundwater pumping and surface water deliveries). Other water budget components will be developed in the groundwater/surface water model described in **Section 5**. A water budget accounts for the total groundwater and surface water entering and leaving a subbasin and are necessary to develop a sustainable water budget for the ECC Subbasin.

### 4.3.1 Historic and Current Water Supplies

Annual water usage and sources of water supply from 1985 to 2019 by seven entities in the Subbasin are provided in **Tables 4-2 and Table 4-3. Table 4-2** lists annual metered groundwater extracted by water use sector (urban, industrial, and agricultural). Groundwater production by domestic well users (de minimis user) and small community systems are not metered but are estimated and described below. Groundwater use by private agricultural wells and native vegetation are estimated in **Section 4**. **Table 4-3** lists annual metered surface water use for the seven entities by sector and individual surface water diverters with water rights permits. **Table 4-4** lists the total water use by source and water use sector from 1985 to 2019. Projected available supplies and water demand (2020 through 2050) for the seven entities are provided in **Table 4-5**. Below is a description of the seven retail and wholesale water suppliers that operate within the Subbasin, their water rights, and sources of water. Surface water diverted out of Old River for uses outside the ECC Subbasin (e.g., California Aqueduct and the Delta Mendota Canal) does not play a role in supplying water to fulfill the demand of the Subbasin and is therefore not included in the water budget.

#### Byron Bethany Irrigation District

The BBID service area extends beyond the ECC Subbasin boundaries, into the adjacent Tracy and Delta Mendota Subbasins. Byron and a portion of the Bethany Divisions of BBID are located within the ECC Subbasin. For purposes of this GSP, only the reported Byron Division supply will be used and the small portion of the Bethany Division that falls in the ECC Subbasin will not be estimated. The Byron and Bethany Divisions are served by the District's pre-1914 water rights of 50,000 AFY[3]. Water is obtained from the intake channel at the Harvey O. Banks Pumping Plant located between the Byron and Bethany Divisions and delivered to customers through distribution canals. During normal conditions, water is delivered for agricultural uses from March to November. During drought periods (e.g., 2013-2015) the water delivery period was extended depending on supply and demand conditions.

From 1997 to 2019, the pre-1914 surface water supply to the Byron Division ranged from about 7,000 AF (2017) to 28,000 AF (2009) and averaged about 14,500 AFY (**Table 4-3**). In 2015, during the drought, available surface water was not sufficient to meet water demands of the service area. Byron Division received two additional sources of water: about 2,000 AF purchased (transfer) water and, for the first time in its operational history, BBID obtained about 510 AF of groundwater (3 percent of total supplies) from private well owners in the Byron District. BBID does not maintain records on groundwater use for irrigation by private well owners in the District.

[3] Ch2M, 2017: "The District asserts claims under this pre-1914 water right for reasonable and beneficial use of 60,000 AF. In exchange for operational certainty, the District has agreed to limit their annual diversion from the Delta to 50,000 AF through their Agreement with DWR"

**Table 4-2 Groundwater Extractions by Water Use Sector, Historical and Current ECC Subbasin (acre-feet), 23CCR $354.18(b)(3)**

| Year | Urban and Industrial (metered) | | | Agricultural (metered) | | Total Metered | Unmetered Groundwater | | | Total Un-metered |
|---|---|---|---|---|---|---|---|---|---|---|
| | City of Brent-wood[a] | DWD | TODB | ECCID | BBID[b] | | Dom-estic Wells[c] | Small PWS[d] | Native Vege-tation | |
| 1994 | 2,100 | 270 | 1,811 | | 0 | **4,181** | | | | |
| 1995 | 2,312 | 270 | 1,912 | | 0 | **4,494** | | | | |
| 1996 | 2,524 | 269 | 2,019 | | 0 | **4,813** | | | | |
| 1997 | 2,735 | 287 | 2,256 | | 0 | **5,277** | | | | |
| 1998 | 3,109 | 252 | 2,157 | | 0 | **5,518** | | | | |
| 1999 | 4,011 | 178 | 2,403 | | 0 | **6,592** | | | | |
| 2000 | 3,619 | 70 | 2,480 | | 0 | **6,169** | | | | |
| 2001 | 3,840 | | 2,510 | | 0 | **6,350** | | | | |
| 2002 | 4,852 | | 2,612 | | 0 | **7,464** | | | | |
| 2003 | 5,196 | | 2,826 | | 0 | **8,023** | | | | |
| 2004 | 5,302 | | 3,176 | | 0 | **8,478** | | | | |
| 2005 | 5,350 | | 3,695 | | 0 | **9,045** | | | | |
| 2006 | 5,788 | 198 | 3,637 | | 0 | **9,622** | | | | |
| 2007 | 4,085 | 942 | 4,057 | 977 | 0 | **10,061** | | | | |
| 2008 | 4,016 | 927 | 4,075 | 3,127 | 0 | **12,145** | | | | |
| 2009 | 3,791 | 791 | 3,934 | 4,176 | 0 | **12,692** | | | | |
| 2010 | 3,536 | 1,032 | 4,009 | 793 | 0 | **9,370** | | | | |
| 2011 | 2,709 | 1,326 | 3,600 | 751 | 0 | **8,385** | | | | |
| 2012 | 3,076 | 650 | 3,738 | 327 | 0 | **7,790** | | | | |
| 2013 | 5,053 | 787 | 3,947 | 415 | 0 | **10,202** | | | | |
| 2014 | 4,503 | 965 | 3,446 | 1,028 | 0 | **9,942** | | | | |
| 2015 | 2,541 | 736 | 2,613 | 2,132 | 515 | **8,537** | 600 | 500 | | **1,100** |
| 2016 | 1,328 | 524 | 2,765 | 514 | 23 | **5,154** | 600 | 500 | | **1,100** |
| 2017 | 2,081 | 819 | 2,842 | 456 | 0 | **6,197** | 600 | 500 | | **1,100** |
| 2018 | 1,685 | 900 | 2,724 | 600 | 11 | **5,920** | 600 | 500 | | **1,100** |
| 2019 | 1,992 | 905 | 2,970 | 694 | 0 | **6,561** | 600 | 500 | | **1,100** |

Notes: Red text indicate estimated values. Blank space indicates no information.

a. Groundwater volumes were not adjusted because all groundwater is pumped from areas within the ECC Subbasin.

b. Bethany and Mountain House Divisions of BBID are located outside the ECC Subbasin and are not included in this estimate

c. It was estimated that 620 domestic wells are active in the subbasin and that the average domestic well pumps about 1 AFY. The Total Domestic well uses is about 600 AFY. This is identified as a data gap and will be refined over the next five years.

d. Small public water systems groundwater pumping was estimated from reported pumpage from 11 water systems and the estimated population served. This is identified as a data gap and will be refined in future reports.

**Table 4-3 Historical and Current Metered Surface Water Supplies by Water Use Sector ECC Subbasin (AF)**

| Entity | Urban and Industrial | | | | | | Agricultural | | | | | Total Metered Surface Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | City of Antioch[a] | | Brentwood[b] | | | DWD[d] | BBID[e] | | ECCID | CCWD | Individual Diverters with Water Rights Permits[f] | |
| Water Supply Type | Purchased from CCWD (CVP) | River Water Rights | Purchased from ECCID (via CCWD RBWTP[c]) | Purchased from ECCID (COBWTP[c]) | Purchased from ECCID for Irrigation | Purchased from CCWD RBWTP (CVP) | Pre-1914 Surface Water Rights | Purchased (transfer) | Surface Water Rights (pre-1914) | Agricultural water (Antioch area) | | |
| 1994 | 9,548 | 4,233 | | | | 4,430 | 15,000 | 0 | 33,513 | 87 | | 66,811 |
| 1995 | 6,619 | 4,396 | | | | 4,639 | 15,000 | 0 | 32,315 | 64 | | 63,033 |
| 1996 | 8,122 | 4,559 | | | | 4,790 | 15,000 | 0 | 32,420 | 35 | | 64,926 |
| 1997 | 9,049 | 9,516 | 241 | | | 4,790 | 16,225 | 0 | 36,031 | 103 | | 75,954 |
| 1998 | 3,020 | 9,307 | 359 | | | 3,565 | 12,656 | 0 | 27,294 | 62 | | 56,264 |
| 1999 | 7,523 | 6,091 | 850 | | | 3,925 | 15,981 | 0 | 31,785 | 62 | | 66,218 |
| 2000 | 9,098 | 4,668 | 1,794 | | | 4,132 | 15,664 | 0 | 30,382 | 80 | | 65,818 |
| 2001 | 11,462 | 3,361 | 2,574 | | | 4,593 | 16,173 | 0 | 26,605 | 61 | | 64,828 |
| 2002 | 10,278 | 5,205 | 2,636 | | | 4,915 | 14,858 | 0 | 24,197 | 10 | | 62,099 |
| 2003 | 8,915 | 6,451 | 2,714 | | | 5,055 | 13,615 | 0 | 24,119 | 5 | | 60,874 |
| 2004 | 11,868 | 4,077 | 3,742 | | | 5,374 | 15,094 | 0 | 25,861 | 11 | | 66,026 |
| 2005 | 9,428 | 5,895 | 4,535 | | | 5,470 | 13,615 | 0 | 21,968 | 3 | | 60,914 |
| 2006 | 8,896 | 5,975 | 4,720 | | | 5,257 | 13,074 | 0 | 21,132 | 4 | | 59,059 |
| 2007 | 12,462 | 3,548 | 7,320 | | 1,525 | 5,492 | 16,137 | 0 | 27,900 | 4 | | 74,387 |
| 2008 | 10,898 | 3,638 | 4,827 | 2,475 | 1,554 | 5,453 | 26,373 | 0 | 23,994 | 14 | 89,861 | 169,087 |
| 2009 | 9,507 | 3,794 | 1,551 | 5,727 | 1,377 | 4,895 | 27,734 | 0 | 21,813 | 3 | 142,655 | 219,057 |
| 2010 | 6,971 | 5,619 | 1,556 | 4,706 | 1,098 | 4,676 | 12,489 | 0 | 20,883 | 3 | 177,649 | 235,650 |
| 2011 | 5,015 | 8,110 | 2,288 | 4,631 | 1,154 | 4,365 | 12,038 | 0 | 20,576 | 4 | 179,091 | 237,271 |
| 2012 | 9,099 | 3,786 | 704 | 6,768 | 1,197 | 5,359 | 13,537 | 0 | 22,252 | 6 | 176,444 | 239,152 |
| 2013 | 8,371 | 3,482 | 1,629 | 4,898 | 1,102 | 5,327 | 14,681 | 0 | 21,743 | 6 | 195,874 | 257,112 |
| 2014 | 11,100 | 1,263 | 2,567 | 3,252 | 829 | 4,526 | 15,859 | 0 | 21,201 | 20 | 140,380 | 200,997 |
| 2015 | 8,908 | 926 | 1,948 | 3,052 | 739 | 3,730 | 11,259 | 2,224 | 18,922 | 4 | 122,719 | 174,430 |
| 2016 | 7,077 | 3,262 | 1,572 | 4,794 | 594 | 4,005 | 8,776 | 0 | 18,057 | 2 | 155,526 | 203,664 |
| 2017 | 6,046 | 4,909 | 2,112 | 4,901 | 488 | 4,334 | 7,200 | 0 | 16,090 | 4 | 145,912 | 191,995 |
| 2018 | 8,509 | 2,833 | 960 | 6,734 | 696 | 4,657 | 9,531 | 0 | 16,933 | 5 | 114,184 | 165,043 |
| 2019 | 6,112 | 4,860 | 1,620 | 5,862 | 781 | 4,566 | 8,318 | 0 | 18,529 | 2 | 137,186 | 187,835 |

Notes: Red text indicates estimated values. Blue text indicates uncertain values. Blank space indicates no information.

a. City of Antioch: Area-weighted adjustments (about 74%) were applied to all supplies from 1994 when google earth images show development in areas outside the subbasin. Amounts purchased from CCWD are based on data provided by CCWD.

b. City of Brentwood: Area-weighted adjustments (95% from 2005 to 2009 and 90% from 2010) were applied to surface water and recycled water supplies. Google Earth images were used to identify development in areas outside the subbasin. Groundwater volumes were not adjusted because all groundwater is pumped from areas within the ECC Subbasin.

c. The annual surface water supply reported in this table from RBWTP and COBWTP are reported by the City of Brentwood. These amounts are generally 20% to 0% less than the amount reported for the same period by CCWD, possibly due to water losses.

d. The annual supply listed was reported by DWD with the exception of 2001-2003 and 2005 when CCWD annual supply was used because DWD data were incomplete. The annual supply of 1995, 1996 and 1999 reported by DWD are 7% to 12% higher than annual supply reported by CCWD. In other years, CCWD reports annual supply amounts that vary from DWD amounts by up to 5%.

e. BBID: includes Byron Division only, the Bethany and Mountain House Divisions of BBID are located outside the ECC Subbasin and are not included in this estimate.

f. Individual Diverters: The uncertainty of diversion data has been acknowledged by the Water Boards and will be improved in the future.

## Table 4-4 Total Water Use by Source and Water Use Sector ECC Subbasin (AF)

| | Urban and Industrial[a] | | | PWS and Rural Domestic | Agricultural[b] | | Managed Wetlands, Managed Recharge, Native Vegetation | | Total |
|---|---|---|---|---|---|---|---|---|---|
| Water Supply Type | Groundwater | Surface Water | Recycled Water | Groundwater | Groundwater | Surface Water | Groundwater | Surface Water | |
| 1994 | 4,181 | 18,211 | 0 | | | 48,600 | | | 70,991 |
| 1995 | 4,494 | 15,654 | 0 | | | 47,379 | | | 67,528 |
| 1996 | 4,813 | 17,471 | 0 | | | 47,455 | | | 69,738 |
| 1997 | 5,277 | 23,596 | 0 | | | 52,359 | | | 81,232 |
| 1998 | 5,518 | 16,251 | 0 | | | 40,012 | | | 61,782 |
| 1999 | 6,592 | 18,389 | 0 | | | 47,828 | | | 72,809 |
| 2000 | 6,169 | 19,692 | 0 | | | 46,126 | | | 71,987 |
| 2001 | 6,350 | 21,990 | 0 | | | 42,839 | | | 71,179 |
| 2002 | 7,464 | 23,034 | 0 | | | 39,065 | | | 69,563 |
| 2003 | 8,023 | 23,134 | 0 | | | 37,739 | | | 68,896 |
| 2004 | 8,478 | 25,061 | 0 | | | 40,965 | | | 74,504 |
| 2005 | 9,045 | 25,328 | 115 | | | 35,586 | | | 70,074 |
| 2006 | 9,622 | 24,848 | 78 | | | 34,210 | | | 68,759 |
| 2007 | 9,084 | 30,347 | 23 | | 977 | 44,041 | | | 84,472 |
| 2008 | 9,018 | 28,845 | 73 | | 3,127 | 140,242 | | | 181,305 |
| 2009 | 8,516 | 26,851 | 67 | | 4,176 | 192,206 | | | 231,815 |
| 2010 | 8,577 | 24,626 | 50 | | 793 | 211,024 | | | 245,070 |
| 2011 | 7,634 | 25,563 | 66 | | 751 | 211,709 | | | 245,722 |
| 2012 | 7,463 | 26,913 | 99 | | 327 | 212,239 | | | 247,041 |
| 2013 | 9,787 | 24,809 | 195 | | 415 | 232,303 | | | 267,510 |
| 2014 | 8,915 | 23,537 | 374 | | 1,028 | 177,460 | | | 211,313 |
| 2015 | 5,891 | 19,303 | 371 | 1,100 | 2,647 | 155,128 | | | 184,439 |
| 2016 | 4,617 | 21,304 | 466 | 1,100 | 537 | 182,361 | | | 210,384 |
| 2017 | 5,741 | 22,790 | 501 | 1,100 | 456 | 169,205 | | | 199,793 |
| 2018 | 5,309 | 24,389 | 495 | 1,100 | 611 | 140,654 | | | 172,558 |
| 2019 | 5,867 | 23,801 | 401 | 1,100 | 694 | 164,035 | | | 195,897 |

Note: Blank space indicates no information. Red indicates Estimated or uncertain. Black text indicates metered values. Blue text indicates some uncertain metered values adjusted (see table 4-3).

a. Area-weighted adjustments were applied to the Cities of Antioch (from 1994) and Brentwood (from 2005) supplies to account for parts of the cities in the Subbasin. Google Earth images were used to identify development in areas outside the subbasin. City of Brentwood adjustments applied to surface water and recycled water supplies only, all groundwater supplies are assumed to be used inside the ECC Subbasin.

b. Includes BBID Byron Division only , the Bethany and Mountain House Divisions of BBID are located outside the ECC Subbasin and are not included in this estimate.

**Table 4-5 Projected Water Demand and Supply** (including Antioch and Brentwood areas outside the Subasin)

| Entity | Water Demand/Supply Type | Projected Water Demand (AFY) | | | | | | | Projected Available Supply (AFY) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
| Bethany-Byron Irrigation District Total Water[1] | | 9,242 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| | Demand within ECC Subbasin (Byron Division) | 9,242 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | | | | | | | |
| | Surface Water (Pre-1914 Rights) | | | | | | | | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| City of Antioch Total Water | | 12,100 | 12,400 | 12,600 | 12,800 | 13,100 | 13,400 | 13,600 | 59,000 | 59,000 | 59,000 | 59,000 | 59,000 | 59,000 | 59,000 |
| (including areas outside the subbasin) | Surface Water (purchased from CCWD, CVP)[2] | 11,100 | 10,900 | 11,100 | 11,300 | 11,600 | 11,900 | 12,100 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Surface Water (City of Antioch River Rights)[3] | | | | | | | | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 |
| | Recycled Water | 1,000 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,000 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| City of Brentwood Total Water | | 13,800 | 15,100 | 16,300 | 17,700 | 19,200 | 19,600 | 20,000 | 28,200 | 30,800 | 30,800 | 30,800 | 30,800 | 30,800 | 30,800 |
| (including areas outside the subbasin) | Groundwater | *3,300* | *3,550* | *3,800* | *4,100* | *4,400* | *4,500* | *4,600* | 5,600 | 5,600 | 5,600 | 5,600 | 5,600 | 5,600 | 5,600 |
| | Surface Water (ECCID entitlement[4], RBWTP purchased from CCWD) | | | | | | | | 6,700 | 6,700 | 6,700 | 6,700 | 6,700 | 6,700 | 6,700 |
| | Surface Water (ECCID entitlement[4], COBWTP) | *9,900* | *10,650* | *11,400* | *12,300* | *13,200* | *13,500* | *13,800* | 7,300 | 7,300 | 7,300 | 7,300 | 7,300 | 7,300 | 7,300 |
| | Surface Water (ECCID entitlement[4], non-potable raw water for irrigation) | | | | | | | | 800 | 800 | 800 | 800 | 800 | 800 | 800 |
| | Total demand potable and raw water | 13,200 | 14,200 | 15,200 | 16,400 | 17,600 | 18,000 | 18,400 | | | | | | | |
| | Recycled Water | 600 | 900 | 1,100 | 1,300 | 1,600 | 1,600 | 1,600 | 7,800 | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 |
| Contra Costa Water District | Surface Water- irrigation to Antioch Area[5] | <60 | <60 | <60 | <60 | <60 | <60 | <60 | | | | | | | |
| Diablo Water District Total Water | | 5,900 | 7,900 | 10,000 | 12,000 | 14,000 | 14,400 | 14,600 | 16,800 | 16,800 | 20,400 | 20,400 | 20,400 | 20,400 | 20,400 |
| | Surface Water (purchased from CCWD, CVP) | 4,700 | 6,300 | 8,000 | 9,600 | 11,200 | 11,500 | 11,700 | 14,000 | 14,000 | 16,800 | 16,800 | 16,800 | 16,800 | 16,800 |
| | Groundwater[6] | 1,200 | 1,600 | 2,000 | 2,400 | 2,800 | 2,900 | 2,900 | 2,800 | 2,800 | 3,600 | 3,600 | 3,600 | 3,600 | 3,600 |
| East Contra Costa Irrigation District Total Water | | 20,038 | 20,038 | 20,038 | 20,038 | 20,038 | 20,038 | 20,038 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| | Surface Water (Pre-2014 Rights)[7] | | | | | | | | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| Town of Discovery Bay (Discovery Bay Community Services District) | Groundwater | 3,200 | 4,400 | 5,000 | 5,600 | 6,600 | 7,600 | 7,900 | 7,700 | 7,700 | 7,700 | 7,700 | 7,700 | 7,700 | 7,700 |
| | Total | 68,280 | 73,838 | 77,938 | 82,138 | 86,938 | 89,038 | 90,138 | 171,900 | 175,000 | 178,600 | 178,600 | 178,600 | 178,600 | 178,600 |
| | SW Total (AF) | 54,980 | 57,888 | 60,538 | 63,238 | 66,038 | 66,938 | 67,638 | 147,000 | 147,000 | 149,800 | 149,800 | 149,800 | 149,800 | 149,800 |
| | GW Total (AF) | 7,700 | 9,550 | 10,800 | 12,100 | 13,800 | 15,000 | 15,400 | 16,100 | 16,100 | 16,900 | 16,900 | 16,900 | 16,900 | 16,900 |
| | Recycled (AF) | 1,600 | 2,400 | 2,600 | 2,800 | 3,100 | 3,100 | 3,100 | 8,800 | 11,900 | 11,900 | 11,900 | 11,900 | 11,900 | 11,900 |
| | SW Total % | 81% | 78% | 78% | 77% | 76% | 75% | 75% | 86% | 84% | 84% | 84% | 84% | 84% | 84% |
| | GW Total% | 11% | 13% | 14% | 15% | 16% | 17% | 17% | 9% | 9% | 9% | 9% | 9% | 9% | 9% |
| | Recycled% | 2% | 3% | 3% | 3% | 4% | 3% | 3% | 5% | 7% | 7% | 7% | 7% | 7% | 7% |

Footnotes

1. BBID pre-1914 water right is 50,000 AFY for both Byron and Bethany Districts. 25,000 AFY is used here as available supply for Byron District.
2. City of Antioch: Calculated based on the peak supply of 36.0 MGD (40,000 AFY)
3. City of Antioch available supply from river water rights is limited at 7,500 AFY by the water conveyance infrastructure capacity
4. ECCID and Brentwood have an agreement that ECCID will provide up to 14,800 AFY of raw water. Total demand "potable and raw water" amounts provided in COB UWMP (2016). Separation of Groundwater and surface water based on 25% estimated groundwater use from historical record. It is not know if this is viable.
5. Demand will be between 0 and 60 based on recent supply data and expected land developments
6. When groundwater supply fully implemented it could comprise up to 20% of DWD's total supply (page 4-1 CDM Smith, 2020).
7. ECCID total pre-2014 surface water rights are 50,000 AFY however, 14,800 AFY are shown under the City of Brentwood and not shown here.

**Notes on projected demand/supply:**

a. Projected demands and supplies of 2020 through 2040 were taken from 2015 or 2020 UWMPs of entities
b. 2045 and 2050 water demands were estimated using the projected population and per capita water demand (PCWD) of each entity
c. 2045 and 2050 water demands of DWD are based on the estimated total population of Oakley, Bethel Island and Knightsen

Data Sources

1 - City of Antioch 2020 UWMP
2 - Town of Discovery Bay 2015 UWMP
3 - City of Brentwood 2020 UWMP
4 - Diablo Water District 2015 UWMP and 2020 Water Master Plan

### City of Antioch

The City of Antioch (Antioch) relies entirely on surface water for water supply. Antioch purchases raw water from CCWD and pumps water from the Sacramento-San Joaquin Delta when the chloride concentration is not over 250 milligrams per liter (mg/L). The current agreement between Antioch and CCWD is for a peak supply of 40,000 AFY (WYA, 2015). Antioch's water right to obtain water from the Delta for beneficial use does not specify a limitation, but the withdrawal rate is currently constrained to about 18,000 AFY by pumping and conveyance systems. Raw water from both sources can be directly pumped to Antioch's Water Treatment Plant (WTP) or into a municipal reservoir (Antioch Reservoir, **Figure 2-4**[1]) for storage. The municipal reservoir has a capacity of 736 AF and is used to maintain a reliable supply to the WTP when the ability to pump from the Delta is limited due to water quality. The maximum capacity of the WTP is over 40,000 AFY.

From 1997 to 2019, surface water supplies for the entire City of Antioch ranged from a low of around 14,000 AFY (2015 to 2017) to a high of 19,000 AFY to 21,000 AFY (2001 to 2008). However, 26 percent of the City's jurisdiction falls outside the ECC Subbasin. To account for this, the total Antioch supply is adjusted in **Table 4-3** to remove the estimated 26 percent delivered to the portion of the city that falls outside the Subbasin. The adjusted surface water supply for the Subbasin ranges from around 10,000 AFY to 11,500 AFY (2015 to 2019) and 14,000 AFY to 16,000 AFY (2001 to 2008). The reduction in demand in recent years (2015 to 2019) is due to changes in customer water use patterns since the recent drought. As a result, projected demands are expected to decrease due to conservation and continuation of the drought-influenced water use patterns through 2040. Antioch's projected total water demand (**Table 4-4**) is expected to increase to about 13,500 AFY in 2050 with 12,000 AFY derived from surface water and 1,500 AFY from recycled water. Since 2011, the City has purchased recycled water from Delta Diablo for landscape irrigation, which currently accounts for about 0.25 percent of the City's total water usage.

### The City of Brentwood

The City of Brentwood (COB or Brentwood) uses three sources of water to meet demand: surface water, groundwater, and recycled water. In 1999, Brentwood entered into an agreement with ECCID to obtain up to 14,800 AFY of raw surface water that is pumped from the Delta. The majority of water is transported from the Rock Slough intake through the Contra Costa Canal to the City of Brentwood Water Treatment Plant (COBWTP). The COBWTP was constructed in 2008 jointly by the City and CCWD. The current capacity of the COBWTP is 18,500 AFY[4] (16.5 million gallons per day [MGD]), but it can be increased to 36,000 AFY to meet future water demand. In addition, raw surface water used for landscape irrigation is purchased from ECCID and transported through their Main Canal. A portion of the ECCID entitlement is treated at the Randall-Bold Water Treatment Plant (RBWTP) under an agreement with CCWD[5]. In a 1999 agreement with a 2000 amendment, COB has a permanent capacity of around 3,200 AFY (6 MGD) at the RBWTP[6]. Historically, surface water purchased by COB from both ECCID and CCWD has increased from a low in 1994 to 1999 (less than 1,000 AFY) to the higher range in 2007 to 2019 (6,300 AFY to 9,600 AFY). Future surface water supply (to 2050) is expected to not exceed the current allocation of 14,800 AFY.

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[4] Personal communication, Eric Brennan, City of Brentwood November 13, 2020.
[5] Even though this water is provided under an agreement with CCWD it is included as part of the total 14,800 AFY agreement with ECCID; it is not CVP water.
[6] Personal communication, Jill Mosley, CCWD, November 13, 2020.

As of 2015, the City has seven active groundwater production wells within its service area. Capacity of the active wells in 2015 was over 7,000 AFY (COB 2015 UWMP). From 1998 to 2019, COB pumped between 1,300 AFY (2016) to 5,800 AFY (2006). On an annual basis, contribution of groundwater has decreased in relation to the total city demand over the last 25 years. COB groundwater supply percentage was the highest from 1994 to 1999 with 80 percent to 90 percent (2,000 AFY to 4,000 AFY). From 2000 to 2006, 50 percent to 70 percent (3,600 AFY to 5,800) of COB water supply was from groundwater. In the last 13 years groundwater supply decreased to 15 percent and 25 percent (1,300 AFY to 3,000 AFY) in normal years and from 30 percent to about 40 percent (4,000 AFY to 5,000 AFY) in drought years (2007 to 2009 and 2013 and 2014) as a result of the greater use of surface water sources. Future City pumpage is expected to not exceed 5,600 AFY through 2050 (**Table 4-4**).

Recycled water provided by the City's wastewater treatment plant has been used for landscape irrigation and industrial purposes. Recycled water has accounted for less than 1 percent to 5 percent of the total water supply of the City since 2005 when recycled water became available. Projected buildout recycled water demand for 2040 was estimated at 1,500 AFY (COB 2015).

### Contra Costa Water District

CCWD is a regional water supplier to entities within and outside the Subbasin. It has a contract with the United States Bureau of Reclamation (USBR) for 195,000 AF per year through February 2045 (CDM Smith, 2016). The Sacramento-San Joaquin Delta (Delta) is the primary source of water and CCWD receives this water from the Central Valley Project (CVP). CCWD also obtains water through Delta surplus water right, Mallard Slough water rights and transfers from ECCID, as well as uses recycled water and a minor amount of local groundwater (CCWD, 2016).

CCWD serves both as a retail and wholesale water supplier to the northern, eastern, and central parts of Contra Costa County but only CCWD surface water supplies for the ECC Subbasin will be discussed here. In the ECC Subbasin area, CCWD is a wholesale supplier of treated and raw water to the City of Antioch and Diablo Water District (DWD). CCWD also diverts and conveys ECCID surface water for the City of Brentwood. CCWD water supplied to these three entities is listed in **Table 4-3** under the entity name. Water supplied to these entities is pumped from Rock Slough, Old River, and Victoria Canal (Middle River) intakes located in the Sacramento-San Joaquin Delta (Delta) and, is treated at the RBWTP and COBWTP. The RBWTP is jointly owned by CCWD and DWD and operated by CCWD and primarily serves the Subbasin. Water pumped from Old River and Victoria Canal intakes can be stored in the Los Vaqueros Reservoir, which has a 160,000 AF capacity, and released when supplies from the Delta are limited due to poor water quality. In addition, CCWD supplies agricultural water (**Table 4-3**) to the Antioch area inside the ECC Subbasin. These agricultural water supplies within the Subbasin (Antioch area) have ranged from 60-100 AFY (1994-2001) to 2-5 AFY (2015-2019). Future agricultural demands may decrease further depending on the conversion of agricultural lands to urban.

### Diablo Water District

DWD supplies water to the City of Oakley, the Town of Knightsen, and some areas of Bethel Island. DWD uses two sources of water to meet demand (CDM Smith, 2020), the primary source is surface water with additional supply from groundwater (10-20 percent, 2007 to 2019). Surface water is purchased from CCWD, supplied from the Contra Costa Canal and the Los Vaqueros Project, and treated at the RBWTP. DWD's current capacity of the RBWTP is 8,400 AFY but this can be increased to 16,800 AFY per agreement with

CCWD. DWD purchases CVP water from CCWD which has a contract with the US Bureau of Reclamation (USBR) for 195,000 AFY through February 2045. From 1994 to 2019 total water supply ranged from around 3,000 AFY (2001) to about 6,400 AFY (2007 and 2008). DWD's surface water supply has ranged from 3,100 AFY (2001) to 5,500 AFY (2007) (**Table 4-3**) and groundwater supply has ranged from a low of 0 AFY (2001-2005) to a high of 1,300 AFY (2011) (**Table 4-2**). From 2012 to 2019, groundwater supply has averaged about 800 AFY. Future demand is dependent on rate of DWD's growth and consumer conservation but is expected to be about 14,000 AFY in 2040 with 80 percent met by surface water and 20 percent met by groundwater (**Table 4-4**). DWD is proposing the installation of two new groundwater production wells in the vicinity of the Glen Park well (south-central portion of the District) in the next 10 to 20 years.

Groundwater is currently pumped from two wells in Oakley, then conveyed to the Blending Facility, where it is treated and blended with treated surface water prior to distribution to customers. The Blending Facility is operated so that the distributed water does not exceed 280 mg/L total dissolved solids (TDS). During water shortages this may be relaxed by DWD to 500 mg/L (TDS). Groundwater is supplied year-round because it can be provided at a lower cost than surface water.

DWD does not use recycled water for any beneficial use. Ironhouse Sanitary District (ISD) owns and operates the wastewater treatment system in DWD's service area and also includes Bethel Island, Jersey Island, and part of Holland Tract. In 2011, ISD completed construction of the Waste Recycling Facility producing tertiary-treated recycled water. The operating capacity is currently 4,800 AFY with an expansion capacity up to 7,600 AFY. The recycled water is currently applied on agricultural land owned by ISD (on Jersey Island), provided at fill stations, or discharged to the San Joaquin River.

Other groundwater pumping in the DWD service area is described in the Oakley General Plan (City of Oakley, 2016 amended) that states that over 30 small water companies or service districts serving less than 5,000 people are located in the eastern portion of the District's sphere of influence (SOI). Also, within the District's SOI are residences with individual domestic wells, generally shallower than 200 feet, that are considered di minimis users for SGMA purposes. However, these wells will be considered as beneficial users and potentially impacted by other groundwater pumping as discussed further below. The Oakley General Plan has a policy (4.8.8) that encourages rural residences currently served by well water to connect to municipal water service when it becomes available. DWD assumes that the small water systems would be replaced by a system meeting DWD standards when DWD treated water service becomes available in these areas (CDM Smith, 2020).

### East Contra Costa Irrigation District

The East Contra Costa Irrigation District (ECCID) is an independent special district established in 1926. The primary purpose of ECCID is to provide agricultural irrigation water to properties within the District boundaries. In addition, it provides raw water for treatment facilities in urban areas. ECCID's approximately 40 square mile service area includes the City of Brentwood, parts of the Cities of Antioch and Oakley, the unincorporated community of Knightsen, and unincorporated areas located south and east of Brentwood. Water is supplied primarily from surface water diverted from Indian Slough off Old River but is also supplemented with groundwater. ECCID holds pre-1914 water rights for up to 50,000 AFY, that is not subject to delivery reduction during water shortages including regulatory-restricted and drought years.

Surface water provided for agricultural irrigation ranged from about 30,000 AFY to 34,000 AFY) between 1994 to 2000 to about 17,000 AFY in 2017 and 2018 (**Table 4-3**). The decrease reflects the conversion of agricultural lands to urban lands within ECCID's service area.

ECCID also operates nine groundwater wells (ECWMA, 2019) that generally pump between 300 to 800 AFY in normal years and increases to between 1000 to 4,000 AFY in drought years (2008, 2009, 2014, and 2015). As mentioned above, CCWD has an agreement with ECCID to provide groundwater to CCWD when there is a shortage of CVP water as represented in ECCID's drought year pumping.

ECCID provides surface water to Brentwood and CCWD through agreements described below. These annual surface water diversions for Brentwood and CCWD are tabulated under the Brentwood heading in **Table 4-3**.

- In 1999, Brentwood and ECCID entered into an agreement under which ECCID would provide up to 14,800 AFY of raw water each year. The water is available on Indian Slough, Rock Slough, or the intake on Old River to the Vaqueros Project. The City treats and distributes water to customers located within the City or ECCID boundaries.
- In 2000, CCWD and ECCID entered into an agreement in which ECCID provides up to 8,200 AFY surplus irrigation water to CCWD to serve municipal and industrial needs within the overlapping areas of the two agencies. Furthermore, ECCID may provide up to 4,000 AFY of groundwater to CCWD by exchange for the use within the CCWD service area when there is a shortage of CVP water.

In the future, ECCID anticipates some reduction in agricultural lands, however, these lands have been fallowed for many years so water demand by the agricultural core area is not expected to change and would remain at about 20,000 AFY. In the next 15 years, ECCID expects a 15 percent increase in urban non-potable landscape water deliveries for Brentwood that is fed through the ECCID main canal.

### The Town of Discovery Bay

TODB Community Services District operates the public water supply system of the Town. The TODB relies exclusively on groundwater. Raw water pumped from six groundwater wells are treated at two water treatment plants (Willow Lake WTP and Newport WTP) located in the area. The combined capacity of wells is approximately 16,000 AFY, while the combined capacity of the two water treatment plants is approximately 12,000 AFY. Groundwater pumped between 1994 varied from about 1,800 AFY in 1994 to over 4,000 AFY in the drought years of 2007 to 2009 (**Table 4-2**). The District operates two wastewater treatment facilities, but recycled water is not used for any beneficial purpose because it is not cost effective and all water demands can be sustainably met with groundwater. Projected demand is expected to reach about 6,200 AFY by 2040 that will be met entirely by groundwater (**Table 4-4**).

### Small Water Systems and De Minimis Users

Additional groundwater is pumped in the Subbasin by small public water systems (PWS) and rural domestic (de minimis) wells that are not metered. In order to estimate groundwater pumped by the PWS, a variety of information was collected. In 2018, Contra Costa County Environmental Health reported 62 small public water systems (those with <200 connections) in the ECC Subbasin. This list was refined with duplicates removed leaving 51 PWS currently in the ECC Subbasin. These consisted of a variety of facilities including marinas, schools, churches, a golf course, restaurants, and mutual water companies.

However, the County does not estimate total groundwater demand by these users. The California State Water Resources Control Board (Water Board) collects self-reported annual inventory information of public water systems. As per the most recent data available from the Water Board[7] (reporting year 2016, data set updated in October 2019), 26 small water systems owned by local governments or private parties exist within the ECC Subbasin. These water systems are designed to serve a population of more than 4,500. Reported data from 11 water systems show that about 83 AFY of water, entirely obtained from groundwater wells, has been distributed to a population of about 2,300 in 2016. Supply details of the other 15 water systems are not available. To account for these groundwater users, an estimate was assigned of about 500 AFY total water for the PWS. PWS locations and groundwater demand have been identified as a data gap and will be refined over the next five years.

DWR's well completion report database[8] lists about 975 domestic wells (de minimis user) in the ECC Subbasin (**Figure 2-6a**). This list was refined to remove any well installed over 30 years ago (assuming that a domestic well life span is 30 years) leaving about 620 domestic wells. It was assumed that the average domestic well pumps about 1[9] AFY; domestic wells in the ECC subbasin produce about 600 AFY. The number of domestic wells, their locations, and average water use has been identified as a data gap and will be refined over the next five years.

### Individual Surface Water Diversions

Individual surface water diversions are made by those with water rights permits and are reported by the State Water Resources Control Board (SWRCB). **Table 4-3** lists the annual amount reported[10] as diverted by individual water rights holders in the ECC Subbasin and ranges in the last 10 year from between 114,000 AFY (2018) to 196,000 AFY (2013). California Water Code § 5101 requires individual surface water diversions made by those with water rights permits to report water diversion to the state on an annual basis. At present, there are 272 currently active "Application Numbers", each of which uniquely identifies a surface water diversion point and its owner, in the ECC Subbasin. However, the Electronic Water Rights Information Management System (eWRIMS) of the SWRCB does not contain diversion records of any of those Application Numbers until 2008. Diversion data of about 15% of Application Numbers are available for 2009, but that percentage is 68% for 2010, 79% for 2015 and 95% for 2019. **Appendix 4a** lists the diversions by tract and subarea. The State Water Board acknowledges that the data is uncertain, possibly due to a mix of units (gallons vs acre-feet) and/or double reporting[11] and they are working to improve the reporting. For purposes of calculating total water use in the ECC Subbasin, these amounts are used and will be refined in the future.

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[7] https://data.ca.gov/dataset/drinking-water-public-water-system-annually-reported-water-production-and-delivery-information. Downloaded July 14, 2020.

[8] Downloaded May 2019.

[9] Estimate for domestic well pumpage: 100 gallons/day/person x 4 persons/household*365 days/year=about .5 AFY plus extra for irrigation= total for one domestic well annual pumpage 1 AFY.

[10] Monthly self-reported surface water diversions for the years 2008-2019 downloaded from: https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/reportingDiversionDownloadPublicSetup.do.
GIS files of Points of Diversion downloaded from:
https://waterrightsmaps.waterboards.ca.gov/viewer/index.html?viewer=eWRIMS.eWRIMS_gvh#

[11] Michael George, Delta Watermaster, Delta Protection Commission meeting, September 17, 2020.

### Summary

In the previous 10 years (2010 to 2019), the ECC Subbasin total metered and estimated water use (**Table 4-4**) has ranged from, 173,000 AFY (2018) to, 214,000 AFY (2013). Sources of water supplies during this same time frame included: surface water ranging from 165,000 AFY to 259,000 AFY (95 percent to 97 percent of total supply); groundwater supplies range from about 6,000 AFY to 11,000 AFY (3 percent to 5 percent of total supply); and recycled water supplies ranged from 50 AFY to 500 AFY (less than 1 percent of total supply).

## 4.3.2 Projected Water Demands and Supplies

**Table 4-5** provides the projected water demand from 2020 to 2050 in five-year intervals within the service area of each supplier. Note that projections are for major water users and do not include unmetered di minimis users, PWS, or individual surface water diverters. Estimated demands and supplies for the 2020-2040 period were obtained from the following sources: 2015 or draft 2020 Urban Water Management Plans of the water suppliers, Technical Memorandum of City of Antioch 2020 Existing and Projected Water Use, Diablo Water District 2020 Facilities Plan, and personal communication (ECCID and BBID). Water demands for 2045 and 2050 were estimated using the projected population for those years and 2040 per capita water demands given in UWMPs and other reports. Available supplies for the 2045 and 2050 were assumed to be equal to the supplies estimated for 2040 in UWMPs.

As mentioned above, population in the ECC Subbasin will be increasing and water demand in service areas of water suppliers are expected to stay the same or increase with the new development in the area. In comparison to reported water supplies in 2019, water demand in 2050 is projected to decrease by 7 percent in Antioch because of water conservation practices. Irrigation water demand of ECCID and BBID service area is expected to remain nearly unchanged during the projected period. Projected water demands for all other entities are expected to increase with population growth and other developments in the area. Within the same period, the increase of water demand will be about 70 percent in Brentwood, 170 percent in both the DWD and TODB service areas. The demand for water is expected to increase: for surface water from the 2019 amount[12] (50,000 AF) to the 2050 amount[13] (68,000 AF), for groundwater[14] from the 2019 pumped amount (10,000 AF) to the projected amount in 2050 (15,000 AF), and recycled water from the current 2019 amount (400 AF) to the projected 2050 amount (3,000 AF). In 2050, groundwater is expected to supply 17 percent (15,000 AFY) of the ECC Subbasin demand which is an increase of 5,000 AFY from 2019.

[12] All 2019 amounts are from Table 4-3 for the ECC Subbasin only,

[13] 2050 amounts are from Table 4-4 and are for the entire ECC Subbasin.

[14] Note that groundwater totals from 2019 and projected 2050 include an estimated groundwater use for domestic wells and public water systems totally 4,000 AFY.

### 4.3.3 Water Availability and Reliability

Historically, 80 to 87 percent of annual water demand in the Subbasin was met with surface water (2000 – 2019 period). Availability of water from the Delta, the primary source of surface water, largely depends on water quality and water rights.

It has been reported that the water quality of the Delta has been degrading regardless of the measures taken to improve it (CCWD, 2015 UWMP). CCWD, one of the main water suppliers in the Subbasin, identified several contributing factors to deteriorating water quality in its 2015 UWMP.

Changes in local and regional precipitation patterns can affect the timing and quantity of freshwater flow into the Delta. Lack of local precipitation and reduced flow from the upstream contribute to increased salinity levels in the Delta.

Excessive pumping of Delta water and sea level rise can increase the salinity of the Delta water.

- Increased flows of wastewater, storm water and agricultural drainage to the Delta also degrade the water quality of Delta.

Water quality of the Delta is generally evaluated using its chloride concentration. The secondary maximum contaminant level of chloride in drinking water is 250 mg/L. Historically, chloride concentration at Delta water intakes has fluctuated between 20 and 250 mg/L (DWD, 2015 UWMP), but periods where daily mean chloride concentration increased over 1,000 mg/L have been reported (CCWD, 2010). The Los Vaqueros reservoir (160,000 AF capacity) is used to store higher quality Delta water to blend with high salinity water pumped from the Delta during late summer and fall months as well as dry periods. Furthermore, the reservoir can provide emergency supply; a minimum of 70,000 AF in wet years and 44,000 AF in dry years (CCWD, 2015 UWMP).

Another critical factor that affects availability of CCWD CVP water from the Delta is regulatory actions imposed due to biological opinions associated with environmental protection. As per some biological opinions, quantity and timing of CVP and State Water Project water supplies used for urban or irrigation purposes may be limited when environmental supplies are prioritized. As a policy, CCWD plans to meet the entire demand in normal years and meet 85 percent of demand during drought periods. The unmet supply of 15 percent is to be managed with short-term demand management measures.

The City of Antioch, which entirely relies on surface water to meet its water demands, is expected to meet 100 percent of the projected water demands in normal years (COA, 2015 UWMP). During drought conditions, at least 85 percent of the 2040 projected demand will be met during the third year of a drought period. The deficiency of supplies will be managed with short-term water purchases and short-term water conservation programs during droughts.

Raw and treated water supplies that Brentwood receives may be affected by the limitations of availability of surface water. At present, groundwater quality of the City's active supply wells meets potable water quality requirements. Groundwater is pumped from the Tulare Formation from wells perforated from 200 to 500 ft deep. Relatively high total dissolved solids (TDS), nitrate and chloride concentrations have been reported in shallow groundwater, but water quality improves with the increasing depth. If necessary, in the future, groundwater will be mixed with surface water to preserve quality. Available supplies exceed the 2040 projected water demand even in the third year of a drought period (COB, 2015 UWMP).

DWD is capable of meeting 100 percent of 2040 projected water demand in normal years and until the first year of a drought period only with water received from CCWD RBWTP (CDM Smith, 2016). Surface water supplies from CCWD are expected to fulfil up to 94 percent and 85 percent of the 2040 projected demand in the second and third years of a drought period, respectively. The remaining demand will be met with groundwater supplies from the District's wells. DWD plans to increase the groundwater supply up to about 20 percent of the total supplies by 2030 (CDM Smith, 2020) and it is expected to remain at 20 percent through 2040. However, if sufficient amounts of groundwater are not available during drought periods, DWD will request additional water from CCWD, explore other local sources, and/or implement water conservation programs as needed.

TODB, which uses groundwater to meet its entire water demand, has been conducting a groundwater monitoring program since 1980s. The perforated interval of supply wells ranges from 250 to 350 ft bgs. Groundwater water level data indicate that groundwater pumping has been sustainable, even during the 2013 to 2015 drought period (TODB, 2015 UWMP). Groundwater quality from its supply wells meet all state of California primary drinking water standards. Manganese concentration exceeds the maximum limit specified in the secondary standards (0.005 mg/L); therefore, water is treated to remove excess manganese before distribution. Groundwater supplies can meet 100 percent of 2040 projected water demand during the third year of a drought period.

Both irrigation districts (BBID and ECCID) have pre-1914 rights which is projected to meet the Districts' water demands in 2050. To prepare for reliable water during droughts, BBID has executed an agreement with CCWD for an intertie between the Byron Division Canal 45 and the Old River Pipeline to allow storage of BBID water in the Los Vaqueros Reservoir for later use in the Byron Division and to facilitate water transfers with CCWD (Ch2M, 2017).

Available supplies for the BBID, Antioch, Brentwood, CCWD, DWD, ECCID, and TODB meet or exceed the projected water demand of 2050 in normal years.

## 4.4 References

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## APPENDICES

# 5. WATER BUDGET (§ 354.18)

The water budget developed for the East Contra Costa Subbasin provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the Subbasin, including historical, current and projected water budget conditions, and the change in the volume of water stored. The water budgets for various future scenarios were quantified in accordance with DWR Best Management Practices guidelines for water budgets and modeling (DWR, 2016).

## 5.1 East Contra Costa Subbasin Hydrologic Base Period[1]

In accordance with GSP regulations and BMP guidelines, a base period was selected in order to reduce bias that might result from the selection of an overly wet or dry period, while accounting for changes in other conditions including land use and water demands. The historical base period must include a minimum of 10 years of surface water supply information, with 30 years recommended. The current base period must also include a representative recent one-year period; and the projected base period must include a minimum of 50 years of historical precipitation, evapotranspiration, and streamflow data.

The historical, current, and projected water budget base periods were selected on a water year(WY) basis considering the following criteria:

1. Cumulative departure from average annual precipitation curves[2];
2. San Joaquin Valley water year type[3];
3. Inclusion of both wet and dry periods;
4. Antecedent dry conditions[4];
5. Adequate data availability; and
6. Inclusion of current hydrologic, cultural, and water management conditions in the Subbasin.

For the ECC Subbasin, a 22-year historical water budget base period of water years 1997-2018 was selected. The cumulative departure from mean annual precipitation curve provided an efficient way to analyze historic and current water conditions in the Subbasin. The cumulative departure curve is presented in **Figure 5-1 Cumulative Departure from Mean Annual Precipitation** and illustrates that the

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[1] A base period is representative of long-term conditions in the basin that reflects natural variations in precipitation and is not biased by being overly wet.

[2] Cumulative departure curves are used to show patterns of precipitation or streamflow to characterize long-term hydrology including drier and wetter periods relative to the mean annual precipitation. Negative, or downward, slopes indicate dry patterns while positive or upward slopes indicate wetter periods relative to the mean. Flatter portions of the cumulative departure curve indicate stable, or average, conditions during that period.

[3] Water year types are used for the development of historical and current water budgets as available from the Department of Water Resources. The dataset applicable to the ECC Subbasin is based on the San Joaquin Valley Index from which precipitation is derived for various conditions (i.e., wet, above normal, below normal, dry, critical); DWR (2021).

[4] Selecting a base period with antecedent (or prior) dry conditions minimizes the effects of the unsaturated zone on basin-wide groundwater budgets. The volume of water in the unsaturated zone is difficult to determine on the scale of a groundwater basin, so it is best to select a base period that has relatively dry conditions antecedent to the beginning of the study or base period.

selected base period (1997 to 2018) includes both wet and dry periods, along with dry conditions prior to the beginning of the start of the base period and represents current land use and water practices.

The selected base period also has the best collection of groundwater and surface water data. Groundwater pumping records from entities within the Subbasin are typically not available prior to the 1990s, and the quality and quantity of specific groundwater data improves closer to the present. Surface water data is also available during the selected base period through public databases, and greatly improves in quality and quantity to the present, particularly for surface water deliveries.

## 5.2 Summary of Water Year 2015 Hydrologic Conditions

For the current water budget, the water year 2015 is used. This year is appropriate because it represents current land use in years with available data at the initiation of SGMA data collection and analysis work. Hydrologic conditions in water year 2015 including precipitation[5], evapotranspiration[6], groundwater levels[7], and surface water flows[8] can also be used to represent current conditions.

## 5.3 Projected 50-Year Hydrology (§354.18(c)(3))

The projected 50-year hydrology was developed using average historical precipitation, evapotranspiration, and streamflow information from the selected model base period as the baseline condition for estimating future hydrology. A numerical groundwater flow model was used to simulate projected future scenarios including under expected changes in urban growth[9] (land use), and anticipated climate change[10] and sea level rise[11] (hydrology). Model selection is described in **Section 5.1.5** and is referred to as the East Contra Costa Groundwater-Surface Water Simulation Model, or ECCSim. Model simulation scenarios are run from WY 2019 through 2068 (50 years) beginning on October 1, 2018, and ending September 30, 2068, at a monthly time step.

The projected water demand uses the most recent land use at the beginning of the scenario and follows urban growth patterns from IRWMP, UWMP, or Contra Costa LAFCO documents. For future scenarios, evapotranspiration, precipitation, and streamflow are varied using DWR's SGMA Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development document (DWR, 2018). DWR provides adjustments for different climate change scenarios. DWR summarizes the various model outputs and respective timelines, which indicates that the most recent fifty-year period of common simulation periods is 1954-2003. Therefore, the historic simulation period selected to apply climatic adjustments over a 50-year period for ECC is 1954-2003. The adjustment factors for precipitation and reference evapotranspiration were gridded over the entire state and provided by DWR. Sea level rise is also considered and incorporated into the future scenarios using DWR's guidance documentation that provides median predicted values for the years 2030 and 2070 that translate to about 0.5 to 1.4 feet of

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[5] Precipitation is water released from clouds in the form of rain, freezing rain, sleet, snow, or hail.

[6] Evapotranspiration is the sum of evaporation from the land surface plus transpiration from plants.

[7] Groundwater level is the depth or elevation above or below sea level at which the surface of groundwater stands.

[8] Surface water flow is the continuous movement of water in runoff or open channels

[9] Urban growth is the rate at which the population of an urban area increases.

[10] Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional, and global climates.

[11] Sea level rise is an increase in the level of the world's oceans due to the effects of global warming.

sea-level rise, respectively[12]. The combination of land use, climate change, and sea level rise is also simulated for the projected 50-year hydrology simulations.

The water demand uncertainty associated with projected changes in local land use planning, population growth, and climate is addressed by evaluating the groundwater budget components using all of the various future model scenarios.

Projected surface water supply uses the most recent water supply information as the baseline condition for estimating future surface water supply. The surface water supply availability and reliability are a function of the historical surface water supply, which has been generally stable over the model Base Period where records of diversions are available. While some users in the Subbasin rely wholly on groundwater as a source of supply (e.g., individual domestic well owners and small domestic water systems[13]), large-scale users (e.g., municipal water systems and agriculture) are projected to use groundwater to supplement surface water when insufficient amounts are available.

## 5.4 Water Budget Framework

The water budget framework for the ECC Subbasin accounts for the total annual volumes of groundwater and surface water entering and leaving the subbasin. These volumes are described as inflows and outflows as described below.

### 5.4.1 Surface Water Inflows and Outflows

There are many surface water bodies that comprise the surface water system in the ECC basin, including Marsh Creek, Clifton Court Forebay, Franks Tract, Old River, San Joaquin River, Big Break, and other Delta features. Surface water inflows and outflows are summarized below:

- Surface water inflows into the Subbasin as streamflow occur via Marsh Creek, San Joaquin River, and Old River;
- Surface water inflows to the Subbasin from outside through conveyance facilities via a series of sloughs and canals off of Old River and San Joaquin River;
- Surface water outflows from the Subbasin as runoff and groundwater discharge to surface water bodies including the Delta.

### 5.4.2 Groundwater Inflows and Outflows

Groundwater flows are summarized below for the Subbasin:

- Groundwater inflows to the Subbasin from groundwater recharge and subsurface inflows along Subbasin boundaries;
- Groundwater outflows from the Subbasin via subsurface lateral flow; and

[12] Department of Water Resources, Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development, July 2018.

[13] In Contra Costa County, a small water system is defined as a Public Water System (CA Health and Safety Code §11625) serving domestic purposes for two to one-hundred ninety-nine connections (County Ordinance Code §414-4.221).

- Groundwater outflows due to evapotranspiration, subsurface drains, and groundwater pumping.

### 5.4.3 Summary of Water Budget Components

All water budget components and sources of data used with the ECCSim model are summarized in **Table 5-1**, including a) general components included in every water use sector water budget and b) specific components unique to individual water use sectors.

**Table 5-1. Water Budget Components**

| Component | Category | Data Type | Calculation Or Estimation Method |
|---|---|---|---|
| **Precipitation** | Inflow | Meteorological Data | C2VSim and Antioch/Brentwood precipitation stations |
| **Subsurface Lateral Flow** | Inflow/Outflow | Groundwater Data | ECCSim |
| **Surface Water Deliveries** | Inflow | Surface Water Data | Reported by historical water rights and statements of diversion (eWRIMS); estimated based on records when unavailable. |
| **Evapotranspiration (ET) of Applied Water** | Outflow | Meteorological Data, Crop Water Use | Estimated by the Integrated Water Flow Model Demand Calculator (IDC) component of the ECCSim model |
| **Evapotranspiration (ET) of Precipitation** | Outflow | Meteorological Data, Crop Water Use | Estimated by the Integrated Water Flow Model Demand Calculator (IDC) component of the ECCSim model |
| **Runoff** | Outflow | Surface Data | Estimated by the Integrated Water Flow Model Demand Calculator (IDC) component of the ECCSim model |
| **Groundwater Pumping** | Outflow | Groundwater Data | Pumping records for municipalities and closure term for domestic/irrigation pumping (pumping records provided by Brentwood, ECCID, Town of Discovery Bay, and Diablo Water District (Oakley). |
| **Drains** | Outflow | Groundwater Data | Drain elevations and extent based on historic maps and data requests to GSAs |
| **Change in Storage** | Inflow/Outflow | Groundwater Data | Estimated using analytical methods and numerical modeling (ECCSim) techniques. |

## 5.5 Groundwater/Surface Water Flow Model

### 5.5.1 Evaluation of Existing Integrated Hydrologic Models

The development of the East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) involved starting with and evaluating the U.S. Geological Survey's Central Valley Hydrologic Model (CVHM) and the beta version (released 5/1/2018) of DWR's fine-grid version of the California Central Valley Groundwater-Surface Water Flow Model (C2VSim-FG Beta2). Both publicly available models were evaluated for suitability in the preparation of the ECC Subbasin GSP. The CVHM model was published in 2009, but the simulation period ends in September 2003. C2VSim-FG Beta2 simulated to September 2015. Neither of these models were current at the time of ECCSim development, and they lacked important simulated surface water features specific to the ECC area due to their application for more regional analyses. Additionally, neither existing model had sufficient calibration points in the ECC Subbasin.

Since the C2VSim model's simulation period more closely matched the end of the model Base Period (i.e., water years 1997-2018), and that the aquifer parameters in the ECC domain were more similar, the C2VSim-fine grid beta version was selected for use as a basis for the ECC Subbasin model. This led to extracting a local model domain and conducting local refinements to the model structure (e.g., nodes, elements) and modifying or replacing inputs as needed to accurately simulate local conditions in the Subbasin within the model domain.

C2VSim-FG Beta2 utilizes the most current version of the Integrated Water Flow Model (IWFM) code available at the time of the ECCSim development. IWFM and C2VSim-FG Beta2 were selected as the modeling platform, in part, due to:

1. the versatility in simulating crop-water demands in the predominantly agricultural setting of the subbasins,
2. groundwater surface-water interaction,
3. the existing hydrologic inputs existing in the model for the time period through the end of water year 2015, and
4. the ability to customize the existing C2VSim-FG Beta2 model to be more representative of local conditions in the area of the ECC Subbasin.
5. ECCSim was refined from C2VSim-FG Beta2 and calibrated to a diverse set of available historical data using industry standard techniques.

### 5.5.2 Selection and Refinements to Model Platform

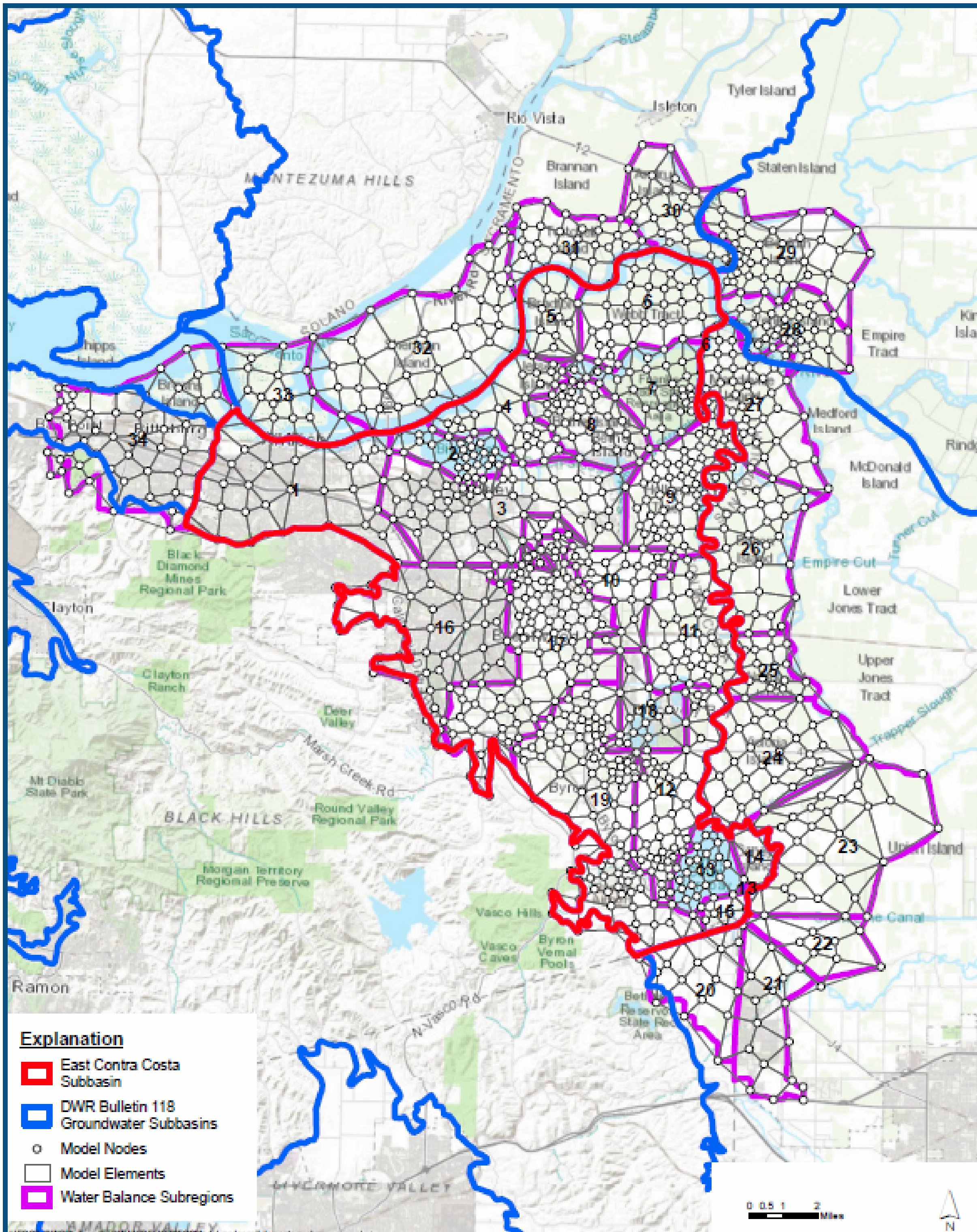
The modeling code and platform utilized for ECCSim are described below. As required by GSP regulations, the selected model code is in the public domain (see link below or request data from groundwaterinfo@dcd.cccounty.us). The decision to select the model codes for the ECCSim was based on providing the Subbasin with a modeling tool that can be used for GSP development and future planning with sufficient representation of local conditions, while utilizing to the extent possible, other available modeling tools, including regional models.

Several refinements were performed to the C2VSim-FG Beta2 model during development of ECCSim. These refinements produce a clearer, more comprehensive water budget model for future planning analyses and include the following:

- Model grid (node and element) refinements (**Figure 5-1a**)
    - The ECCSim grid contains 1,097 nodes and 1,209 elements that align with GSA boundaries, surface water features, and delta island geometry.
- Model subregion refinements (**Figure 5-1b** and **Table 5-2**)
    - The ECCSim model domain groups elements into subregions to assist in the summarization of model results and development of water budgets.
    - The ECCSim has 34 subregions; 19 of which are in the ECC Subbasin.
- Surface water bodies (**Figure 5-1c**)
    - CVHM and C2VSim-FG Beta2 only simulated the San Joaquin River and the Delta; ECCSim simulates Marsh Creek, Old River, Middle River, San Joaquin River, Big Break, Franks Tract, and Clifton Court Forebay.
- Model layers
    - The C2VSim-FG Beta2 model layering was adapted for ECCSim purposes to better represent the hydrogeological conceptual model (HCM) of the aquifer system through model layering.
    - The ECCSim model includes four aquifer layers (Shallow Aquifer in layers 1 and 2; Deep Aquifer in layers 3 and 4).
- Land use refinements
    - Due to changes in the model element and node configurations, the land use was updated and refined relative to C2VSim-FG Beta2 using land use surveys from 1995, 2014, and 2016 (DWR). The major land use types include irrigated agriculture crops, riparian and native vegetation, and urban.
- Aquifer parameter refinements
    - Due to differences in model layering and the more extensive calibration associated with ECCSim, aquifer parameters were refined by incorporating information about depositional environments for subsurface materials such as Alluvial Plain, Delta Islands, Fluvial Plain, and Marginal Delta Dune which are part of the basin setting (see **Section 3**).
- Model boundary conditions
    - General head boundaries were developed along the northern, eastern, and southern borders based on interpreted groundwater elevations from C2VSimFG Beta2 and calculated horizontal conductivity, distance between boundary nodes, aquifer layer thickness, and the distance from the model boundary.
- Groundwater pumping
    - Pumping within ECCSim is simulated using a combination of individual wells with assigned pumping and elemental pumping[14].

[14] The IWFM modeling platform allows for prescribed groundwater pumping from individual wells as time-series extraction data. Alternatively, for wells of known construction, water use type, and location, IWFM can estimate the amount of monthly pumping necessary to fulfill the water demands within each water balance subregion. These wells are assigned an extraction amount by the model itself, to the particular model element they are located within, and are therefore considered to be “elemental pumping”.

  - Wells serving municipalities for which GSAs provided monthly pumping records were simulated directly.
  - Elemental pumping is calculated internally by the Integrated Water Flow Model Demand Calculator component of the ECCSim model to meet both agricultural and domestic/urban demands after available surface water deliveries have been accounted for.
  - The distribution of pumping by layer was modified based on well construction information in DWR's database of Well Completion Reports for wells within the model domain.
- Tile drains
  - Tile drains were incorporated in ECCSim based on historic drain maps and direct information from GSAs.
  - Information from GSAs indicate that tile drains occur at 5 to 8 feet below land surface.
- Surface water deliveries
  - Surface water deliveries for ECCSim were assigned as diversions from specified stream nodes with an assigned delivery destination (water balance subregion), and amounts were based on data received from individual GSAs as well as the State Water Resources Control Board Electronic Water Rights Information Management System (eWRIMS) database.

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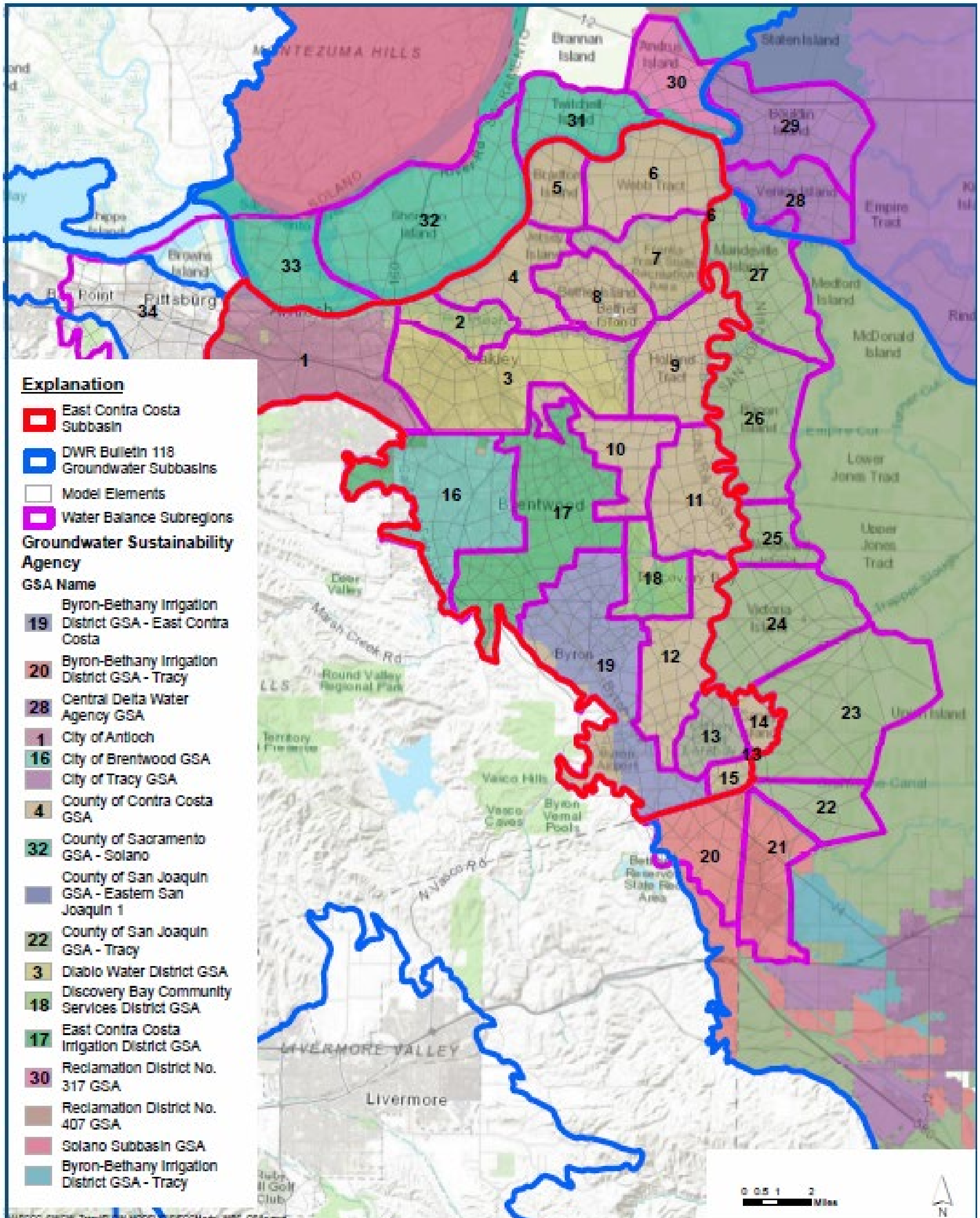
**Model Grid and Node Refinement**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim)*

**Figure 5-1a**




**Model Grid and Node Refinement**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim)*

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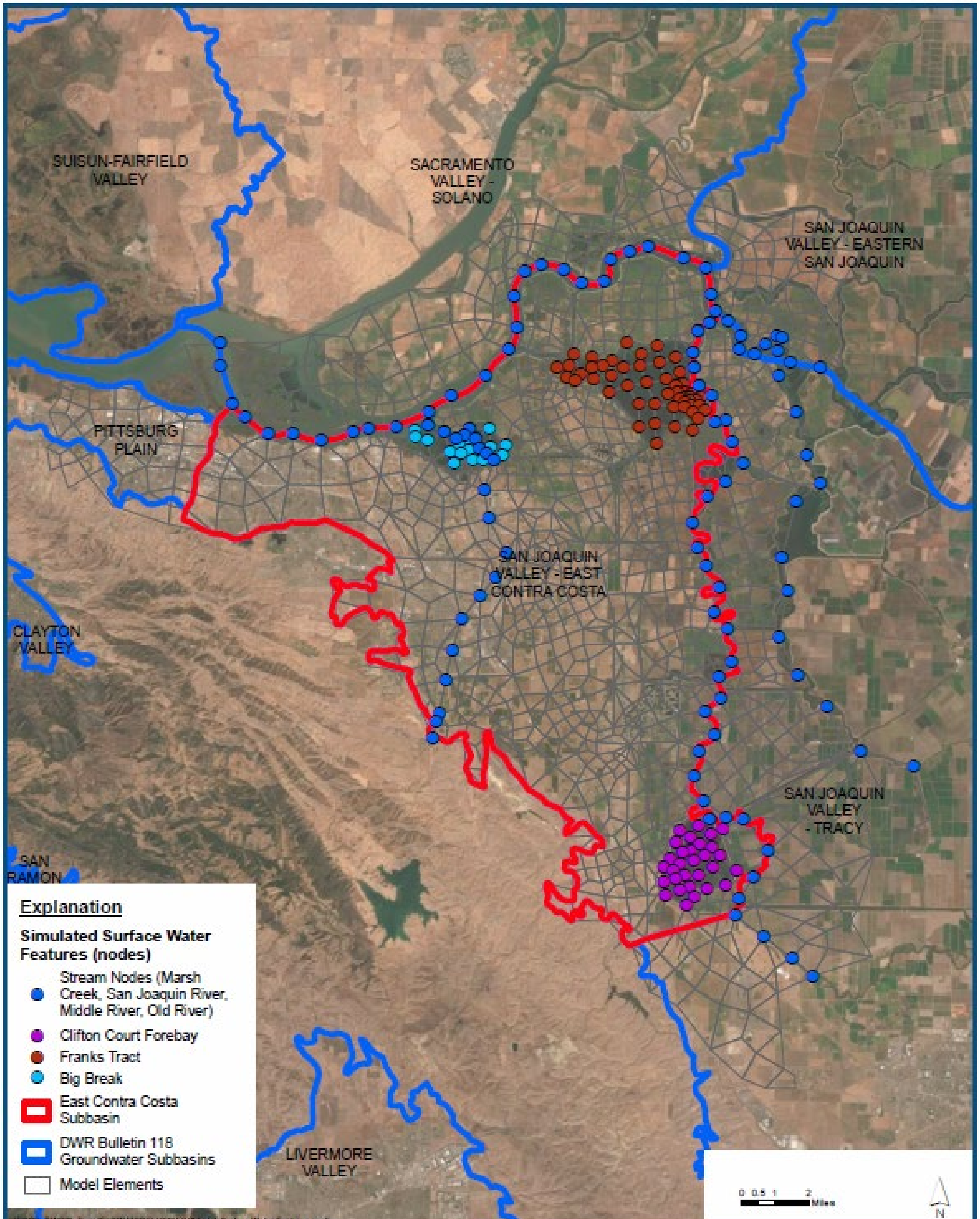
**Figure 5-1b**

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**Model Nodes for Simulated Surface Water Features**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim)*

**Figure 5-1c**

**Table 5-2 Water Balance Subregions**

| Subregion | Subbasin/Basin | GSA | Area |
|---|---|---|---|
| 1 | East Contra Costa | City of Antioch GSA | Antioch |
| 2 | East Contra Costa | Diablo Water District GSA | Big Break |
| 3 | | | Oakley |
| 4 | East Contra Costa | County of Contra Costa GSA | Jersey Island |
| 5 | | | Bradford Island |
| 6 | | | Webb Tract |
| 7 | | | Franks Tract |
| 8 | | | Bethel Island |
| 9 | | | Holland Tract |
| 10 | | | Knightsen |
| 11 | | | Orwood |
| 12 | | | South Discovery Bay |
| 13 | | | Clifton Court Forebay |
| 14 | | | Coney Island |
| 15 | | | South Clifton Court Forebay |
| 16 | East Contra Costa | City of Brentwood GSA | Brentwood |
| 17 | East Contra Costa | East Contra Costa Irrigation District GSA | ECCID |
| 18 | East Contra Costa | Discovery Bay Community Services District GSA | Town of Discovery Bay |
| 19 | East Contra Costa | Byron-Bethany Irrigation District GSA – East Contra Costa | BBID North (Byron Division) |
| 20 | Tracy | Byron-Bethany Irrigation District GSA - Tracy | BBID South (Bethany Division) |
| 21 | | | BBID Mountain House Division |
| 22 | Tracy | County of San Joaquin GSA – Tracy | Hammer Island |
| 23 | | | Union Island |
| 24 | | | Victoria Island |
| 25 | | | Woodward Island |
| 26 | | | Bacon Island |
| 27 | | | Mandeville Island |
| 28 | Eastern San Joaquin | Central Delta Water Agency GSA | Venice Island |
| 29 | | | Bouldin Island |
| 30 | Solano | Reclamation District No. 317 GSA | Andrus Island |
| 31 | Solano | County of Sacramento GSA - Solano | Twitchell Island |
| 32 | | | Sherman Island |
| 33 | | | Kimball Island |
| 34 | Pittsburg Plain | Not Applicable | Pittsburg |

### 5.5.3 Projected (Future) Model Scenario(s)

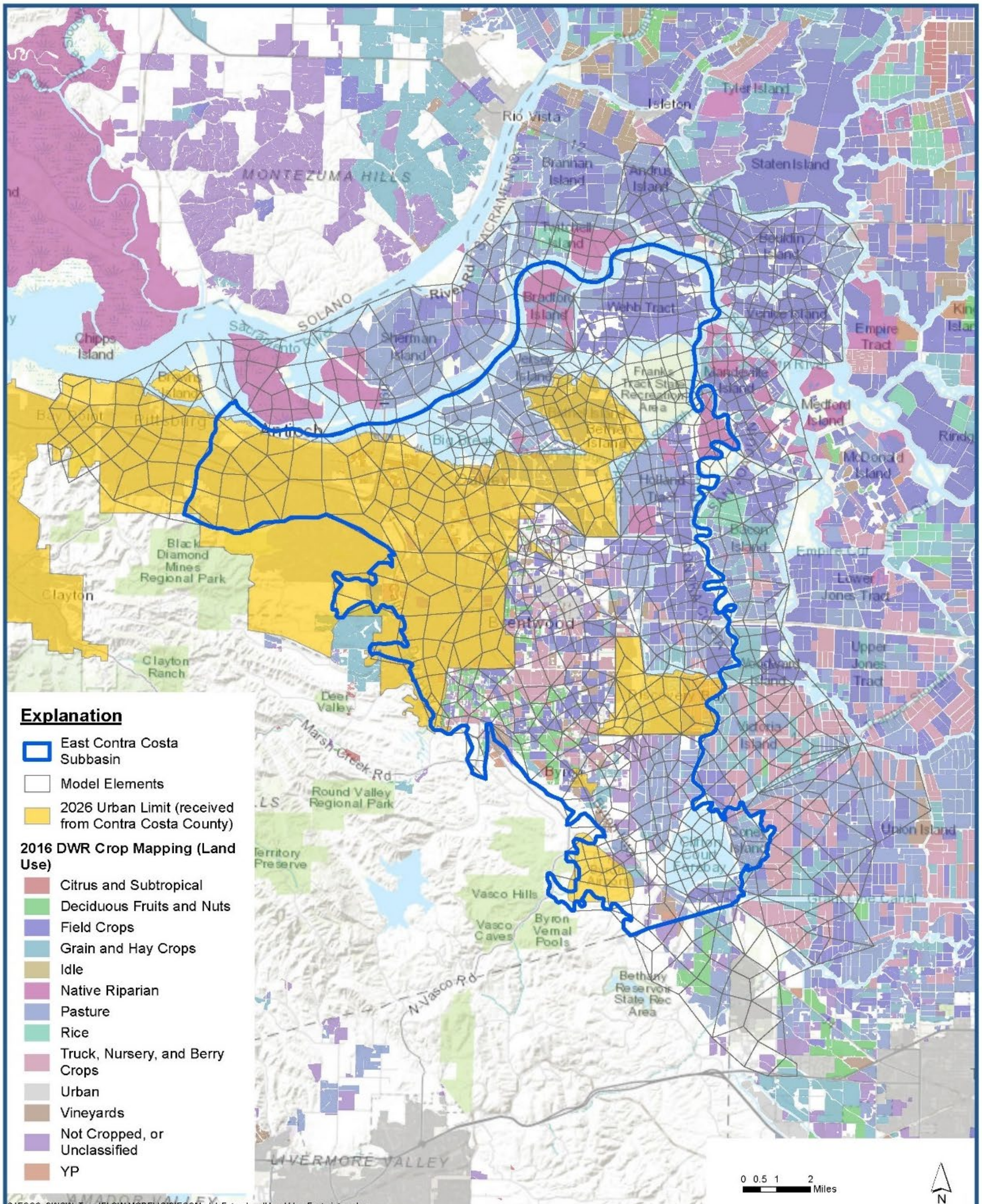
The projected future model scenarios involve simulating conditions in the ECC Subbasin from water year 2019 through water year 2068. Various future projected model scenarios were developed for this GSP document:

1) Future Land Use Change – this model scenario incorporates anticipated urban growth by 2026, as provided by Contra Costa County, with repeated hydrology;
2) Future Climate Change – this model scenario utilizes the land use change (urban growth) as well as the 2070 Central Tendency climate change adjustment factors to hydrologic conditions including evapotranspiration (ET), precipitation, surface water levels, and diversions;
3) Future Sea Level Rise – this model scenario utilizes the land use change (urban growth) in addition to incremental sea level rise on the northern surface water bodies in the ECCSim model domain, while using repeated hydrology;
4) Future Climate Change Plus Sea Level Rise – this model scenario incorporates land use change (urban growth), as well as both climate change and sea level rise adjustments to the hydrology;
5) Sustainable Yield – this model scenario incorporates land use change (urban growth) but was developed to increase groundwater pumping to determine an estimated sustainable yield of the ECC Subbasin.

The future land use scenario results in a larger urban footprint **(Figure 5-2)** based on planning information from the County[15]. Hydrology including evapotranspiration, precipitation, and surface water levels were adapted from values from previous years using the pattern of water year type associated with the historic 50-year time period (1954 to 2003). Development of the future climate change hydrology conditions inputs are based on DWR's Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development document (DWR, 2018). DWR provides climate change adjustment values for climate data, streamflow data, and sea-level rise information. These adjustments are applied to historical hydrology to achieve a future hydrologic period of 50 years that are representative of hydrology potentially occurring in the future. The 2070 central tendency climate change scenario was selected for this future climate scenario analysis.

Regarding sea level rise, DWR's Guidance Document mentions that sea-level rise estimates by the National Research Council (NRC) provide two values of expected sea-level rise as median predicted values for the years 2030 and 2070. These two values are 15 and 45 centimeters, respectively, or about 0.5 to 1.4 feet of sea-level rise. Values were assigned on an annual basis through linear interpolation of these projections.

[15] Contra Costa County provided a GIS shapefile representing the 2030 urban footprint via email (pers. comm. Ryan Hernandez, February 18, 2021).

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**Future Urban Footprint (2026) & Land Use (2016)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim)*

**Figure 5–2**

## 5.6 Subbasin Water Budget Results (§354.18(a) to (d))

This section includes a description of the accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in the volume of water stored.

### 5.6.1 Inflows and Outflows Entering and Leaving the Basin

The various water budget components of inflows and outflows including surface water entering and leaving the basin occurs through various locations along the border of the ECC Subbasin. Using the integrated groundwater and surface water model, ECCSim, it is possible to quantify the amount of water entering and exiting the basin via various water budget components. Groundwater inflows include subsurface groundwater inflow and infiltration of precipitation, applied water, and surface water systems (e.g., streams, rivers, canals, and conveyance systems). Groundwater outflows include evapotranspiration, groundwater extraction (pumping), groundwater discharge to surface water sources, and subsurface groundwater outflow.

Water budget components can be grouped or categorized into detailed water budget accounting centers to represent different mechanisms within the Subbasin:

1. land and water use activities (such as supply and demand for urban and agricultural land uses),
2. root zone activities (such as agricultural applied water, precipitation, evapotranspiration, and percolation), as well as
3. groundwater activities (such as surface water/groundwater interaction, tile drain flows, groundwater pumping, recharge via deep percolation, small watershed contributions, and subsurface lateral flow).

Water budget components for these three accounting centers are qualitatively described in **Table 5-3** below. Each water budget component listed in in the table is calculated on a monthly basis using ECCSim and summarized annually for each water year. The quantitative values are presented in both graphical and tabular form for the model Base Period (water years 1997 to 2018) depending on the detailed water budget accounting center.

**Table 5-3. Water Budget Accounting Components Simulated Using ECCSim**

| Simulated Water Budget Accounting Center | Detailed Component | Category | Description |
|---|---|---|---|
| Land and Water Use (Agricultural and urban land use sectors) | Surface Water Deliveries | Inflow | Deliveries from conveyance systems to customers; includes diversions and surface water rights. This water component is separated for urban and agricultural water uses. |
| | Groundwater Extraction | Inflow | Groundwater pumping to meet water demands. This water component is separated for urban and agricultural water uses. |
| | Urban Demand | Outflow | Water demand associated with urban land use. |
| | Agricultural Demand | Outflow | Water demand associated with agricultural land use. |
| Root Zone (Agricultural, urban, and native/riparian vegetation land use sectors) | Agricultural Applied Water | Inflow | Applied water to satisfy agricultural water demand (may come from surface water deliveries and/or groundwater extraction). |
| | Agricultural Effective Precipitation | Inflow | Precipitation on agricultural land that helps meet agricultural demand. |
| | Agricultural Evapotranspiration | Outflow | Evapotranspiration associated with the variety of crops within the Subbasin. |
| | Agricultural Percolation | Outflow | Applied water and precipitation on agricultural land that is in excess of the evapotranspiration requirement and passes through the root zone to reach the groundwater water table. |
| | Urban Applied Water | Inflow | Water applied to landscaping within urban land use features (can come from surface water deliveries and/or groundwater pumping). |
| | Urban Effective Precipitation | Inflow | Water from precipitation that helps support outdoor urban land use demands such as landscaping. |
| | Urban Evapotranspiration | Outflow | Evapotranspiration associated with outdoor urban water demand. |
| | Urban Percolation | Outflow | Applied water and precipitation on urban land that is in excess of the evapotranspiration requirement and passes through the root zone to reach the groundwater water table. |

| Simulated Water Budget Accounting Center | Detailed Component | Category | Description |
|---|---|---|---|
| | Native/Riparian Vegetation Effective Precipitation | Inflow | Water from precipitation that supports native and riparian vegetation. |
| | Native/Riparian Vegetation Evapotranspiration | Outflow | Evapotranspiration associated with native and riparian vegetation within the Subbasin. |
| | Native/Riparian Vegetation Percolation | Outflow | Precipitation on native/riparian vegetation that is in excess of the evapotranspiration requirement and passes through the root zone to reach the groundwater water table. |
| Groundwater (all land use sectors including urban, agricultural, and native/riparian vegetation) | Groundwater flow to/from Surface Water Features | Inflow or Outflow | This is the surface water/groundwater interaction component that represents stream leakage (in the case of losing stream conditions) or groundwater contributions to surface water (during gaining stream conditions). Streams include Marsh Creek, Old River, and the San Joaquin River. For the ECC Subbasin, this component also includes surface water interaction with groundwater associated with delta island surface water features, such as Big Break and Franks Tract, but also Clifton Court Forebay to the south. |
| | Drains | Outflow | Tile drains historically and currently used to lower the water table in certain areas within the Subbasin. |
| | Diversion Recoverable Loss | Inflow | This water budget component represents leakage of surface water through conveyances within the Subbasin. |
| | Small Watershed Contributions | Inflow | Small watersheds along the western boundary of the Subbasin contribute some water to the groundwater system. |
| | Recharge via Deep Percolation | Inflow | Water that travels vertically through the root zone to reach the water table and enter the groundwater system. |
| | Groundwater Extraction (Pumping) | Outflow | Pumping of groundwater to satisfy urban and agricultural water demands. |
| | Subsurface Inflow and Outflow | Inflow or Outflow | Subsurface lateral flow into or out of the Subbasin. |
| | Groundwater Storage | Inflow minus Outflow = Change in Storage | This component is used to determine the change in aquifer storage over time and can help determine if a basin is in balance, is full, or is in overdraft. |

The first simulated water budget accounting center, for land and water use, utilizes well pumping information developed for the GSP by the GSAs within the ECC Subbasin. Elemental groundwater pumping (where pumping rates are not directly input) is invoked when surface water deliveries (specified for urban, agricultural, or both land uses) are insufficient to meet water demands. Elemental groundwater pumping is based on well completion report (WCR) records for which well depths and well types are known or estimated. Surface water deliveries previously developed for the GSP as reported by GSAs within ECC Subbasin were supplemented by individual water rights adapted from eWRIMS. **Table 5-4** below shows the simulated land and water use for the Subbasin, as well as the average land and water use amounts associated with the model Base Period (water years 1997-2018). ECCSim simulates the majority of agricultural and urban demand being satisfied by surface water deliveries. The simulation indicates that during some years there are small amounts of surplus water supplies (agricultural or urban demand shortage term is negative), and other years there are small amounts of water demand shortage.

The simulated root zone budget details the movement of different water sources within agricultural, urban, and native/riparian vegetation land use sectors, the land surface, and the underlying groundwater aquifer system. Using the ECCSim monthly timestep simulated outputs, these components are summarized for water years during the model Base Period (water years 1997-2018). The annual values of simulated applied water, effective precipitation, evapotranspiration, and percolation that occur in the root zone are provided in **Table 5-5** for agricultural, urban, and native/riparian vegetation land uses.

**Table 5-4. Simulated Land and Water Use Budget Components for Base Period, WY 1997-2018 (Units in Acre-Feet per Year, AFY)**

| Water Year | Ag. Supply Requirement | Ag. Pumping | Ag. Deliveries | Ag. Demand Shortage | Urban Supply Requirement | Urban Pumping | Urban Deliveries | Urban Water Demand Shortage |
|---|---|---|---|---|---|---|---|---|
| **1997** | 173,948 | 35,436 | 138,553 | -41 | 24,246 | 7,470 | 17,102 | -325 |
| **1998** | 139,759 | 29,767 | 110,091 | -99 | 25,303 | 8,980 | 15,356 | 967 |
| **1999** | 164,080 | 32,735 | 130,615 | 730 | 26,360 | 8,176 | 17,085 | 1,100 |
| **2000** | 166,727 | 34,359 | 132,094 | 275 | 27,393 | 7,612 | 18,403 | 1,377 |
| **2001** | 173,716 | 39,147 | 132,851 | 1,719 | 28,425 | 7,713 | 19,969 | 743 |
| **2002** | 174,548 | 42,841 | 131,694 | 13 | 29,458 | 8,794 | 20,389 | 274 |
| **2003** | 167,222 | 41,496 | 125,794 | -68 | 30,490 | 9,349 | 20,583 | 558 |
| **2004** | 174,627 | 41,093 | 133,654 | -120 | 31,523 | 9,798 | 21,708 | 17 |
| **2005** | 150,977 | 35,293 | 115,679 | 5 | 32,555 | 10,123 | 21,844 | 588 |
| **2006** | 162,067 | 42,915 | 119,338 | -187 | 33,588 | 10,830 | 21,565 | 1,193 |
| **2007** | 182,393 | 42,027 | 139,957 | 410 | 34,620 | 10,213 | 24,181 | 226 |
| **2008** | 186,743 | 47,873 | 138,754 | 116 | 35,303 | 10,378 | 23,183 | 1,743 |
| **2009** | 174,105 | 45,618 | 129,367 | -880 | 32,658 | 10,024 | 23,112 | -477 |
| **2010** | 155,735 | 37,990 | 117,843 | -98 | 33,084 | 10,080 | 22,931 | 73 |
| **2011** | 147,850 | 35,498 | 112,640 | -289 | 33,509 | 9,467 | 23,847 | 195 |
| **2012** | 174,046 | 43,108 | 128,765 | 2,173 | 33,935 | 9,088 | 24,383 | 465 |
| **2013** | 191,902 | 21,655 | 169,710 | 537 | 33,982 | 10,849 | 21,663 | 1,470 |
| **2014** | 194,431 | 31,298 | 163,386 | -253 | 34,407 | 11,017 | 22,070 | 1,320 |
| **2015** | 166,604 | 39,747 | 127,011 | -155 | 25,924 | 7,893 | 17,768 | 264 |
| **2016** | 172,588 | 35,734 | 136,356 | 498 | 26,607 | 6,439 | 20,495 | -327 |
| **2017** | 156,725 | 35,233 | 121,314 | 178 | 26,724 | 7,174 | 19,836 | -285 |
| **2018** | 159,944 | 32,947 | 127,004 | -7 | 26,724 | 6,733 | 20,170 | -178 |
| | | | | | | | | |
| **Average** | 168,670 | 37,446 | 131,021 | 203 | 30,310 | 9,009 | 20,802 | 499 |

**Table 5-5. Simulated Root Zone Budget Components for Base Period, WY 1997-2018 (Units in Acre-Feet per Year, AFY)**

| Water Year | Agricultural Land Use Area (Acres) | Ag. Precip. (+) | Ag. Applied Water (+) | Ag. Et (-) | Ag. Perc. (-) | Urban Land Use Area (Acres) | Urban Precip (+) | Urban Applied Water (+) | Urban Et (-) | Urban Perc. (-) | Native & Riparian Veg. Land Use Area (Acres) | Native & Riparian Veg. Precip (+) | Native & Riparian Veg. Et (-) | Native & Riparian Veg. Perc. (-) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1997 | 50,035 | 67,815 | 173,990 | 179,806 | 61,747 | 19,396 | 25,436 | 24,571 | 16,831 | 33,165 | 39,719 | 52,569 | 36,907 | 15,679 |
| 1998 | 50,035 | 113,418 | 139,858 | 170,867 | 82,546 | 19,396 | 44,125 | 24,336 | 21,809 | 46,600 | 39,719 | 88,097 | 59,334 | 28,389 |
| 1999 | 50,035 | 51,736 | 163,350 | 173,000 | 41,955 | 19,396 | 19,096 | 25,260 | 18,297 | 26,083 | 39,719 | 39,688 | 34,648 | 5,331 |
| 2000 | 50,035 | 67,803 | 166,453 | 179,642 | 54,775 | 19,396 | 25,724 | 26,016 | 19,556 | 32,171 | 39,719 | 52,511 | 41,042 | 11,453 |
| 2001 | 50,035 | 50,060 | 171,997 | 182,790 | 39,257 | 19,396 | 18,350 | 27,682 | 19,440 | 26,596 | 39,719 | 39,294 | 35,012 | 4,296 |
| 2002 | 50,035 | 53,812 | 174,535 | 181,778 | 46,484 | 19,396 | 20,229 | 29,184 | 19,049 | 30,375 | 39,719 | 42,216 | 34,929 | 7,464 |
| 2003 | 50,035 | 60,586 | 167,289 | 179,842 | 48,083 | 19,396 | 22,172 | 29,932 | 20,183 | 31,909 | 39,719 | 47,479 | 38,591 | 8,699 |
| 2004 | 50,035 | 53,734 | 174,747 | 181,061 | 47,444 | 19,396 | 20,049 | 31,506 | 18,722 | 32,802 | 39,719 | 41,940 | 33,746 | 8,079 |
| 2005 | 50,035 | 89,122 | 150,972 | 177,575 | 62,718 | 19,396 | 35,331 | 31,967 | 24,160 | 43,133 | 39,719 | 69,438 | 54,484 | 15,051 |
| 2006 | 50,035 | 82,988 | 162,253 | 183,310 | 61,892 | 19,396 | 32,715 | 32,395 | 23,020 | 42,103 | 39,719 | 64,515 | 50,055 | 14,569 |
| 2007 | 50,035 | 34,448 | 181,984 | 180,444 | 36,028 | 19,396 | 12,766 | 34,394 | 19,289 | 27,840 | 39,719 | 26,252 | 23,110 | 3,194 |
| 2008 | 50,035 | 42,795 | 186,627 | 183,910 | 45,315 | 19,396 | 15,828 | 33,560 | 18,248 | 31,192 | 39,719 | 33,414 | 26,749 | 6,813 |
| 2009 | 50,035 | 51,320 | 174,985 | 185,103 | 41,132 | 19,396 | 21,119 | 33,135 | 21,764 | 32,480 | 39,719 | 40,184 | 34,840 | 5,031 |
| 2010 | 50,035 | 66,927 | 155,833 | 175,730 | 47,212 | 19,396 | 27,654 | 33,011 | 23,930 | 36,728 | 39,719 | 52,014 | 45,226 | 6,928 |
| 2011 | 50,035 | 81,377 | 148,138 | 173,735 | 55,812 | 19,396 | 31,783 | 33,314 | 24,446 | 40,655 | 39,719 | 63,282 | 51,093 | 12,048 |
| 2012 | 50,035 | 41,388 | 171,873 | 178,126 | 35,115 | 19,396 | 16,672 | 33,470 | 21,315 | 28,821 | 39,719 | 31,933 | 28,907 | 3,199 |
| 2013 | 41,730 | 39,117 | 191,365 | 181,222 | 48,381 | 21,454 | 19,479 | 32,512 | 22,012 | 35,438 | 45,965 | 42,132 | 33,445 | 6,708 |
| 2014 | 41,730 | 29,643 | 194,684 | 183,458 | 40,737 | 21,454 | 15,859 | 33,087 | 20,758 | 28,235 | 45,965 | 32,179 | 29,069 | 3,252 |
| 2015 | 41,329 | 42,671 | 166,759 | 163,801 | 46,733 | 22,585 | 24,714 | 25,660 | 18,676 | 32,463 | 45,236 | 46,561 | 35,228 | 11,194 |
| 2016 | 41,329 | 20,731 | 172,090 | 161,966 | 30,947 | 22,585 | 11,211 | 26,934 | 16,102 | 22,038 | 45,236 | 21,969 | 19,246 | 2,789 |
| 2017 | 41,329 | 63,558 | 156,547 | 168,560 | 51,785 | 22,585 | 33,834 | 27,009 | 21,803 | 39,012 | 45,236 | 68,607 | 53,525 | 14,773 |
| 2018 | 41,329 | 41,399 | 159,951 | 165,665 | 35,596 | 22,585 | 21,522 | 26,903 | 20,655 | 27,783 | 45,236 | 44,783 | 39,796 | 5,051 |
| Average | 47,697 | 56,657 | 168,467 | 176,881 | 48,259 | 20,163 | 23,439 | 29,811 | 20,458 | 33,074 | 41,290 | 47,321 | 38,135 | 9,090 |

The simulated groundwater budget embodies the movement of water within the groundwater aquifer. Using the ECCSim monthly timestep simulated outputs, these components are summarized for water years during the model Base Period (water years 1997-2018). Simulated values of groundwater leaving the subsurface via drains, the movement, or exchange, of water between surface water features, contributions from small watersheds in the western portion of the Subbasin, contributions from unlined conveyances (diversion recoverable loss), groundwater leaving the aquifer via groundwater extraction (pumping), and subsurface lateral flow are presented in **Table 5-6**. These groundwater budget terms provide the inflows and outflows from which the change in storage can be calculated (inflow minus outflow = change in storage). The annual changes in groundwater storage and the cumulative change in groundwater storage are also presented in **Table 5-6**.

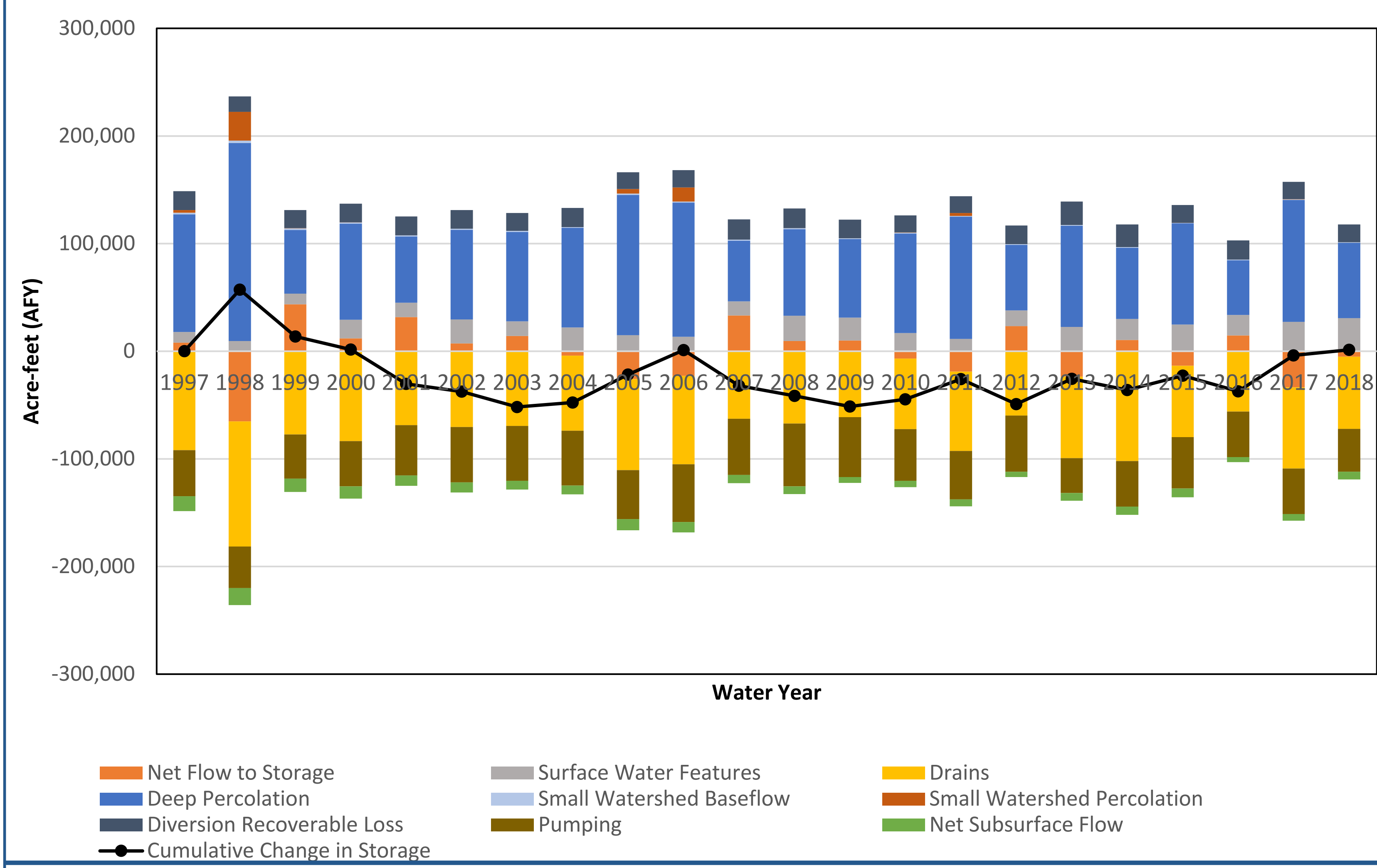
### 5.6.2 ECC Subbasin Water Balance

Generally, water leaves the groundwater system within ECC Subbasin through drains, groundwater extraction (pumping), and through subsurface lateral flow (leaving the subbasin). Water enters the groundwater body via surface water features, deep percolation (recharge), small watershed contributions, and diversion recoverable loss. The change in storage term along with the cumulative change in storage term indicate that the ECC Subbasin is in balance. If the subbasin was depleting groundwater storage, or in overdraft, the change in storage and the cumulative change in storage would be negative and growing more negative over time. The simulation results indicate that this is not the case in the ECC Subbasin. The simulated groundwater budget timeseries components are plotted along with the cumulative change in storage in order to illustrate the proportions of the various components and to see that the basin is operating within its sustainable yield during the model Base Period (water year 1997-2018) (**Figure 5-3**).

The following sections discuss groundwater inflows and outflows in the ECC Subbasin and the resultant changes in storage.

**Table 5-6. Simulated Groundwater Budget Components for Base Period, WY 1997-2018 (Units in Acre-Feet per Year, AFY)**

| WATER YEAR | DRAINS | SURFACE WATER FEATURES | DEEP PERCOLATION | SMALL WATERSHED BASEFLOW | SMALL WATERSHED PERCOLATION | DIVERSION RECOVERABLE LOSS | PUMPING | NET SUBSURFACE FLOW | NET STORAGE CHANGE | CUMULATIVE CHANGE IN STORAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| **1997** | -91,890 | 9,843 | 109,296 | 1,417 | 2,499 | 17,688 | -42,906 | -13,738 | -8,095 | 0 |
| **1998** | -116,071 | 9,481 | 184,027 | 2,320 | 26,702 | 14,255 | -38,747 | -15,817 | 65,310 | 57,214 |
| **1999** | -77,389 | 10,075 | 58,923 | 1,617 | 110 | 16,784 | -40,910 | -12,461 | -43,556 | 13,659 |
| **2000** | -83,593 | 17,343 | 89,128 | 1,340 | 85 | 17,102 | -41,971 | -11,243 | -12,012 | 1,647 |
| **2001** | -68,650 | 13,188 | 61,586 | 1,160 | 0 | 17,366 | -46,860 | -9,614 | -31,853 | -30,206 |
| **2002** | -70,279 | 22,222 | 83,420 | 1,034 | 0 | 17,282 | -51,636 | -9,302 | -7,272 | -37,478 |
| **2003** | -69,411 | 13,556 | 83,001 | 949 | 0 | 16,634 | -50,844 | -8,204 | -14,293 | -51,771 |
| **2004** | -69,792 | 22,056 | 92,525 | 853 | 0 | 17,655 | -50,891 | -8,218 | 4,180 | -47,591 |
| **2005** | -84,609 | 14,873 | 130,479 | 1,102 | 4,232 | 15,628 | -45,417 | -10,363 | 25,834 | -21,757 |
| **2006** | -82,001 | 13,348 | 124,671 | 1,172 | 13,094 | 16,012 | -53,745 | -9,590 | 22,896 | 1,139 |
| **2007** | -62,782 | 13,268 | 56,414 | 965 | 0 | 18,652 | -52,240 | -7,426 | -33,147 | -32,008 |
| **2008** | -67,260 | 23,472 | 80,468 | 860 | 0 | 18,402 | -58,251 | -7,163 | -9,469 | -41,477 |
| **2009** | -61,145 | 21,351 | 72,929 | 764 | 0 | 17,327 | -55,642 | -5,523 | -9,933 | -51,410 |
| **2010** | -65,629 | 16,888 | 92,632 | 730 | 71 | 15,997 | -48,070 | -5,897 | 6,732 | -44,679 |
| **2011** | -73,746 | 11,409 | 113,521 | 850 | 2,717 | 15,510 | -44,965 | -6,426 | 18,871 | -25,807 |
| **2012** | -59,777 | 14,511 | 60,715 | 768 | 0 | 17,403 | -52,196 | -4,888 | -23,432 | -49,239 |
| **2013** | -75,616 | 22,718 | 93,805 | 695 | 0 | 21,747 | -32,504 | -7,131 | 23,716 | -25,523 |
| **2014** | -101,955 | 19,546 | 66,114 | 612 | 0 | 21,075 | -42,315 | -7,768 | -10,493 | -36,016 |
| **2015** | -66,415 | 24,787 | 93,960 | 572 | 0 | 16,452 | -47,640 | -8,290 | 13,411 | -22,605 |
| **2016** | -56,081 | 19,034 | 50,799 | 498 | 0 | 17,824 | -42,173 | -4,664 | -14,713 | -37,319 |
| **2017** | -75,304 | 27,194 | 113,293 | 682 | 212 | 16,040 | -42,407 | -6,123 | 33,549 | -3,769 |
| **2018** | -66,938 | 30,852 | 69,813 | 518 | 0 | 16,724 | -39,680 | -7,161 | 5,216 | 1,447 |
| | | | | | | | | | | |
| **Average** | -74,833 | 17,773 | 90,069 | 976 | 2,260 | 17,253 | -46,455 | -8,500 | 66 | -21,980 |

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**Groundwater Budget for East Contra Costa Subbasin Historical Calibration Period (1997-2018)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

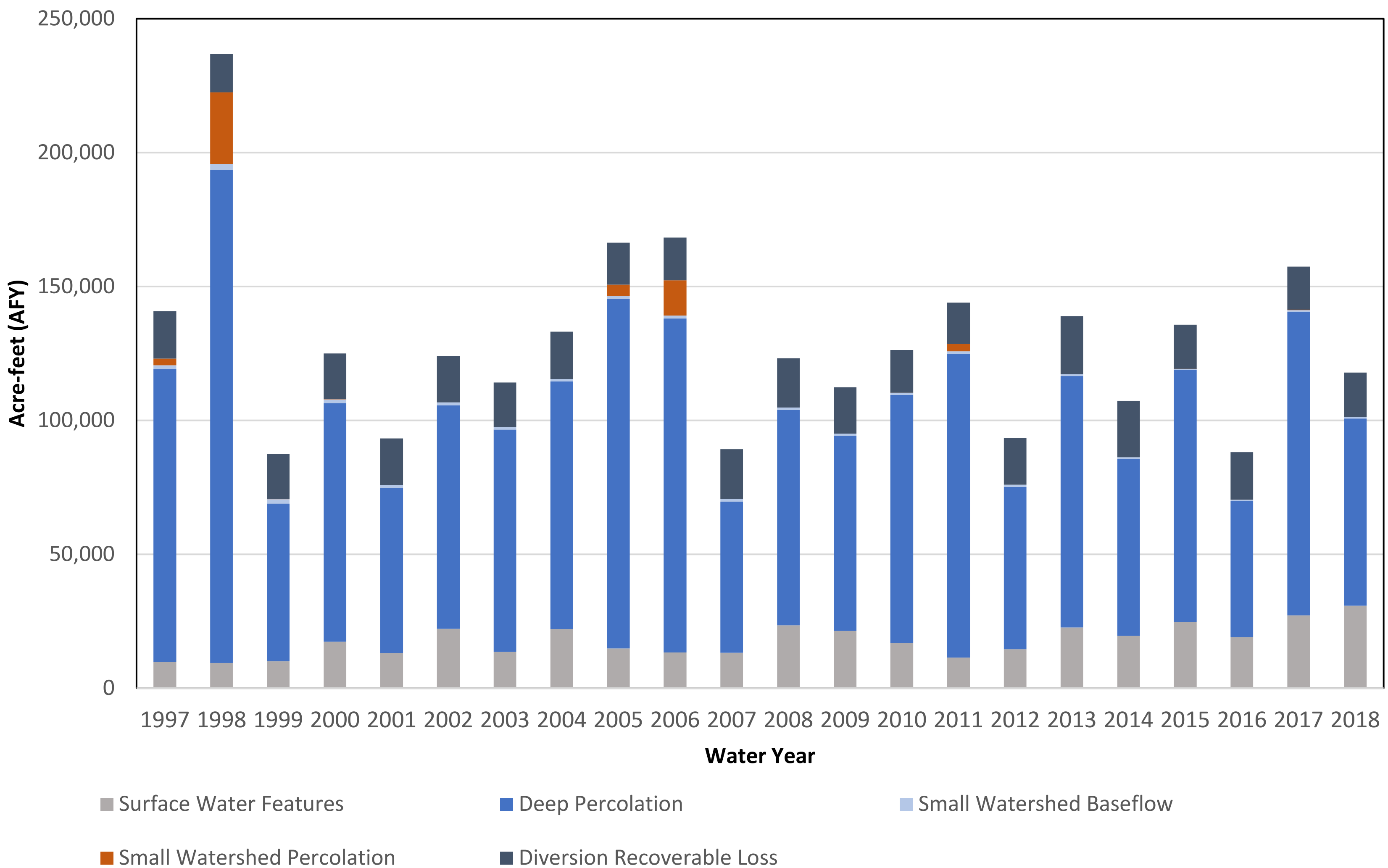
**Figure 5-3**

### 5.6.3 Quantification of Groundwater Inflow

The simulated groundwater budget described and quantified above indicate that the groundwater inflow components of the water budget include contributions from surface water features, deep percolation (recharge), small watershed contributions, and diversion recoverable loss (conveyance systems). These groundwater inflows are presented in tabular form in **Table 5-7** and graphically in **Figure 5-4**. The largest groundwater inflow component is groundwater recharge through deep percolation. Deep percolation includes water reaching past the root zone to the water table from precipitation and excess applied water. Surface water features and diversion recoverable losses account for most of the remaining groundwater inflows, with a very small proportion contributed by the small watersheds to the west of the Subbasin.

**Table 5-7. Simulated Groundwater Inflow Components for Base Period, WY 1997-2018 (Units are in Acre-Feet per Year, AFY)**

| Water Year | Surface Water Features | Deep Percolation | Small Watershed Baseflow | Small Watershed Percolation | Diversion Recoverable Loss |
|---|---|---|---|---|---|
| **1997** | 9,843 | 109,296 | 1,417 | 2,499 | 17,688 |
| **1998** | 9,481 | 184,027 | 2,320 | 26,702 | 14,255 |
| **1999** | 10,075 | 58,923 | 1,617 | 110 | 16,784 |
| **2000** | 17,343 | 89,128 | 1,340 | 85 | 17,102 |
| **2001** | 13,188 | 61,586 | 1,160 | 0 | 17,366 |
| **2002** | 22,222 | 83,420 | 1,034 | 0 | 17,282 |
| **2003** | 13,556 | 83,001 | 949 | 0 | 16,634 |
| **2004** | 22,056 | 92,525 | 853 | 0 | 17,655 |
| **2005** | 14,873 | 130,479 | 1,102 | 4,232 | 15,628 |
| **2006** | 13,348 | 124,671 | 1,172 | 13,094 | 16,012 |
| **2007** | 13,268 | 56,414 | 965 | 0 | 18,652 |
| **2008** | 23,472 | 80,468 | 860 | 0 | 18,402 |
| **2009** | 21,351 | 72,929 | 764 | 0 | 17,327 |
| **2010** | 16,888 | 92,632 | 730 | 71 | 15,997 |
| **2011** | 11,409 | 113,521 | 850 | 2,717 | 15,510 |
| **2012** | 14,511 | 60,715 | 768 | 0 | 17,403 |
| **2013** | 22,718 | 93,805 | 695 | 0 | 21,747 |
| **2014** | 19,546 | 66,114 | 612 | 0 | 21,075 |
| **2015** | 24,787 | 93,960 | 572 | 0 | 16,452 |
| **2016** | 19,034 | 50,799 | 498 | 0 | 17,824 |
| **2017** | 27,194 | 113,293 | 682 | 212 | 16,040 |
| **2018** | 30,852 | 69,813 | 518 | 0 | 16,724 |
| **Average** | 17,773 | 90,069 | 976 | 2,260 | 17,253 |

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**Groundwater Budget Inflow Components**
**East Contra Costa Subbasin Base Period (1997-2018)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

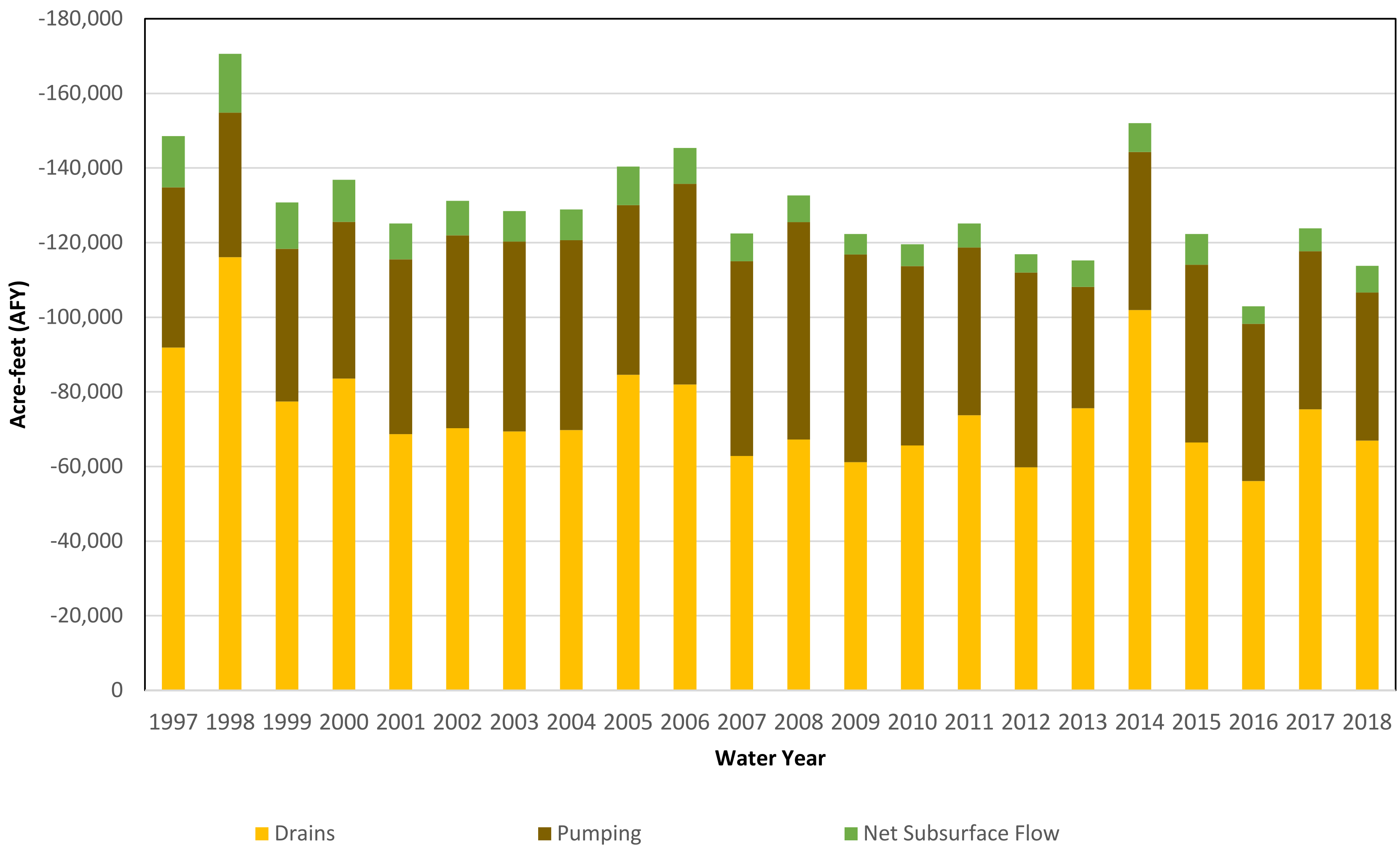
**Figure 5-4**

### 5.6.4 Quantification of Groundwater Outflow

The simulated groundwater budget described and quantified in **Section 5.6.3** indicates that the groundwater outflow components of the water budget consist of drains, groundwater pumping, and the net of subsurface lateral flow. These groundwater outflows are presented in tabular form in **Table 5-8** and graphically in **Figure 5-5**. The largest groundwater outflow components are tile drains and pumping. Net subsurface lateral flow makes up the remaining groundwater outflow components.

**Table 5-8. Simulated Groundwater Outflows for Base Period, WY 1997-2018 (Units are in Acre-Feet per Year, AFY)**

| Water Year | Drains | Pumping | Net Subsurface Flow |
|---|---|---|---|
| **1997** | -91,890 | -42,906 | -13,738 |
| **1998** | -116,071 | -38,747 | -15,817 |
| **1999** | -77,389 | -40,910 | -12,461 |
| **2000** | -83,593 | -41,971 | -11,243 |
| **2001** | -68,650 | -46,860 | -9,614 |
| **2002** | -70,279 | -51,636 | -9,302 |
| **2003** | -69,411 | -50,844 | -8,204 |
| **2004** | -69,792 | -50,891 | -8,218 |
| **2005** | -84,609 | -45,417 | -10,363 |
| **2006** | -82,001 | -53,745 | -9,590 |
| **2007** | -62,782 | -52,240 | -7,426 |
| **2008** | -67,260 | -58,251 | -7,163 |
| **2009** | -61,145 | -55,642 | -5,523 |
| **2010** | -65,629 | -48,070 | -5,897 |
| **2011** | -73,746 | -44,965 | -6,426 |
| **2012** | -59,777 | -52,196 | -4,888 |
| **2013** | -75,616 | -32,504 | -7,131 |
| **2014** | -101,955 | -42,315 | -7,768 |
| **2015** | -66,415 | -47,640 | -8,290 |
| **2016** | -56,081 | -42,173 | -4,664 |
| **2017** | -75,304 | -42,407 | -6,123 |
| **2018** | -66,938 | -39,680 | -7,161 |
| **Average** | -74,833 | -46,455 | -8,500 |

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**Groundwater Budget Outflow Components**
**East Contra Costa Subbasin Base Period (1997-2018)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

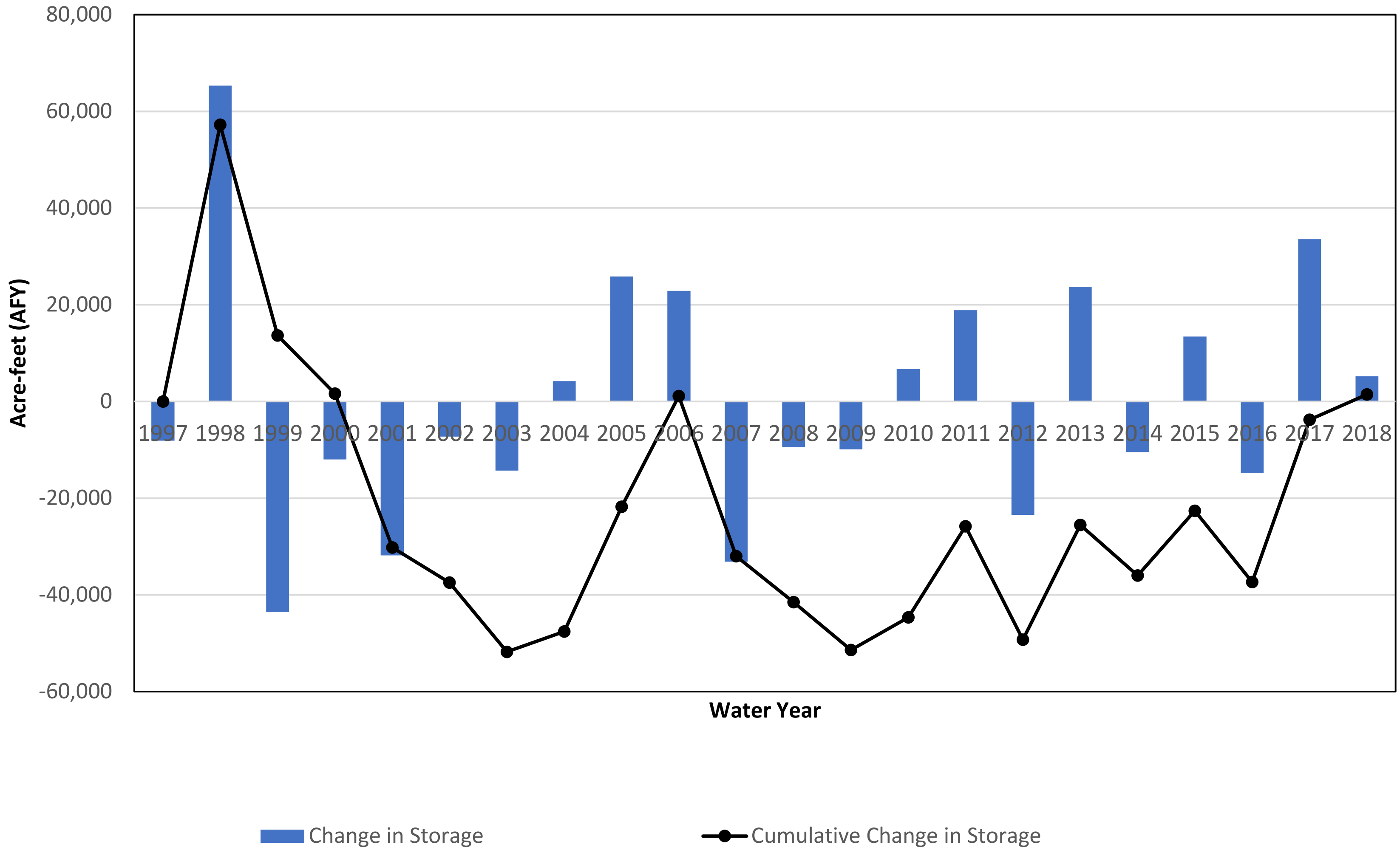
**Figure 5-5**

### 5.6.5 Change in Groundwater Storage

Quantification of the change in annual groundwater storage is presented on a water year annual basis in **Table 5-9**. The net annual simulated change in storage and the cumulative change in storage are plotted graphically in **Figure 5-6**. This figure illustrates that the basin is not in overdraft over the model Base Period (water years 1997-2018). The average change in storage over this period is almost 70 AFY. This represents 0.05% of the groundwater inflows and outflows that comprise the groundwater budget for the groundwater Subbasin.

**Table 5-9. Simulated Groundwater Storage Component for Base Period,WY 1997-2018 (Units are in Acre-Feet per Year, AFY)**

| Water Year | Net Storage Change | Cumulative Change In Storage |
|---|---|---|
| **1997** | -8,095 | 0 |
| **1998** | 65,310 | 57,214 |
| **1999** | -43,556 | 13,659 |
| **2000** | -12,012 | 1,647 |
| **2001** | -31,853 | -30,206 |
| **2002** | -7,272 | -37,478 |
| **2003** | -14,293 | -51,771 |
| **2004** | 4,180 | -47,591 |
| **2005** | 25,834 | -21,757 |
| **2006** | 22,896 | 1,139 |
| **2007** | -33,147 | -32,008 |
| **2008** | -9,469 | -41,477 |
| **2009** | -9,933 | -51,410 |
| **2010** | 6,732 | -44,679 |
| **2011** | 18,871 | -25,807 |
| **2012** | -23,432 | -49,239 |
| **2013** | 23,716 | -25,523 |
| **2014** | -10,493 | -36,016 |
| **2015** | 13,411 | -22,605 |
| **2016** | -14,713 | -37,319 |
| **2017** | 33,549 | -3,769 |
| **2018** | 5,216 | 1,447 |
| | | |
| **Average** | 66 | |

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**Groundwater Budget Storage Component**
**East Contra Costa Subbasin Base Period (1997-2018)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-6**

### 5.6.6 Water Year Types

The ECCSim model Base Period of water years 1997 through 2018 contain wet, above normal, below normal, dry, and critical water year types (see **Table 5-10** below). This modeling tool can be used to quantify water budget components according to water year types. Water budget components including the annual supply, demand, and change in groundwater storage can vary according to water year type. The simulated agricultural and urban supply and demand amounts are averaged for the various water year types that occur during the base period. These values are quantified in **Table 5-11**, and show that during drier years, agricultural and urban demand is higher than in wetter years. Due to the reliably available agricultural surface water deliveries in the Subbasin, surface water supplies have not been impacted during dry years. The reliability of surface water is reflected in the fact that over half the available supply is based on pre-1914 water rights owned by City of Antioch, ECCID, and BBID (see **Section 4**, **Table 4-5**).

The change in groundwater storage can also be quantified based on water year type using the ECCSim tool. There is variability associated with groundwater storage changes that are not directly attributable to water year types. Changes in land use and supply mechanisms can have an impact on groundwater storage that may or may not have to do with the water year type. The box plot of average change in groundwater storage by water year type (**Figure 5-7)** shows that there is a general relationship of replenishing groundwater storage in wet years, and storage depletion in drier years. However, these relationships are not completely consistent. For example, in 1999 and 2000, storage depletion is indicated by the simulation (negative change in storage), despite being categorized as "above normal" water year type. Similarly, 2013 and 2015, which are considered "critical" water year types, have storage replenishment being simulated. These exceptions are due to the amount of surface water deliveries reported during those years and the amount of groundwater pumping needed to satisfy the demand.

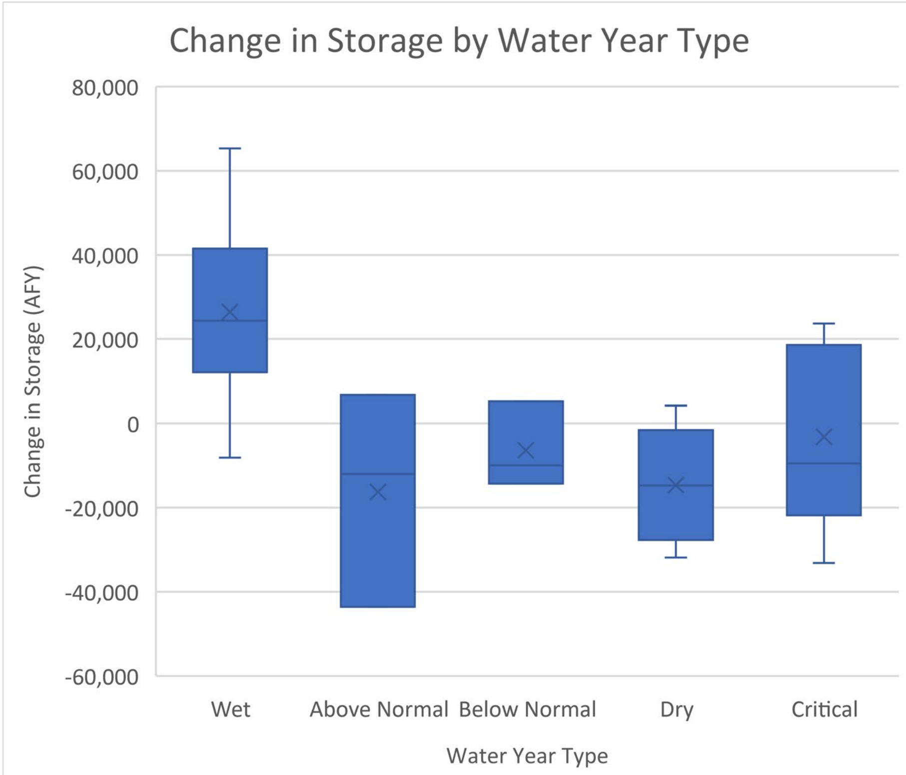
**Table 5-10. Water Year Types During the Base Period**

| Water Year | Water Year Type | Water Year | Water Year Type |
|---|---|---|---|
| **1997** | W | 2013 | C |
| **1998** | W | 2014 | C |
| **1999** | AN | 2015 | C |
| **2000** | AN | 2016 | D |
| **2001** | D | 2017 | W |
| **2002** | D | 2018 | BN |
| **2003** | BN | | |
| **2004** | D | W = Wet | |
| **2005** | W | | |
| **2006** | W | D = Dry | |
| **2007** | C | | |
| **2008** | C | AN = Above Normal | |
| **2009** | BN | | |
| **2010** | AN | BN = Below Normal | |
| **2011** | W | | |
| **2012** | D | C = Critical | |

**Table 5-11. Simulated Agricultural and Urban Supply and Demand (Units in Acre-Feet Per Year, AFY)**

| Water Year Type | Average Agricultural Demand | Average Agricultural Pumping | Average Agricultural Sw Deliveries | Average Agricultural Effective Precipitation | Average Urban Demand | Average Urban Pumping | Average Urban Sw Deliveries |
|---|---|---|---|---|---|---|---|
| **Wet (6 simulated years in the base period)** | 155,221 | 35,690 | 119,603 | 46,141 | 29,321 | 9,007 | 19,925 |
| **Above Normal (3 simulated years in the base period)** | 162,181 | 35,028 | 126,851 | 41,878 | 28,946 | 8,623 | 19,473 |
| **Below Norma (3 simulated years in the base period)** | 167,090 | 40,020 | 127,388 | 36,044 | 29,958 | 8,702 | 21,288 |
| **Dry (5 simulated years in the base period)** | 173,905 | 40,385 | 132,664 | 32,680 | 29,990 | 8,367 | 21,389 |
| **Critical (5 simulated years in the base period)** | 184,415 | 36,520 | 147,764 | 27,339 | 32,847 | 10,070 | 21,773 |

**Figure 5-7. Average Simulated Change in Storage by Water Year Type**



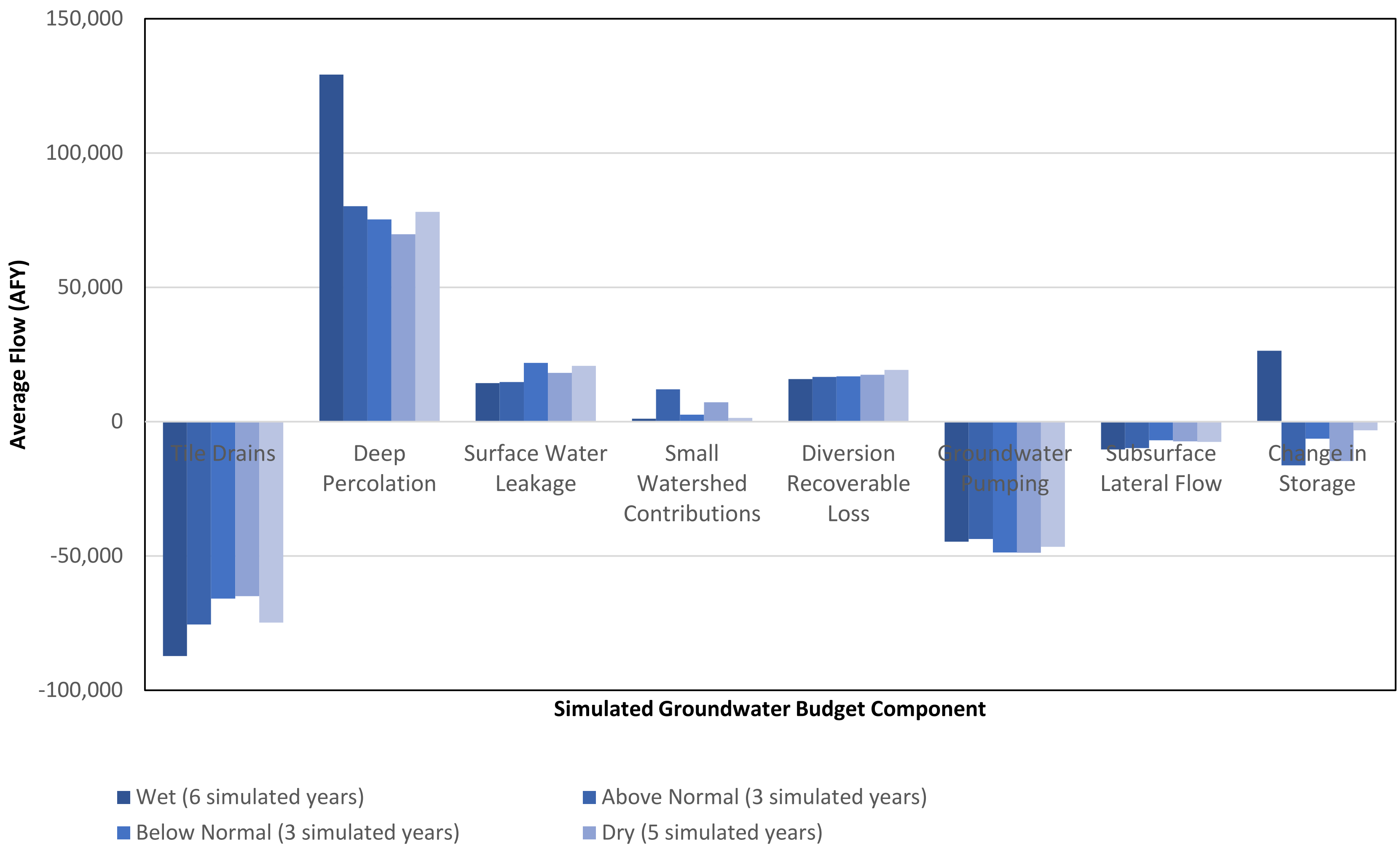

### 5.6.7 Historical Water Budget

The historical water budget quantified during the model Base Period extends from the most recently available information (water year 2018) to 1997, or 22 years. This period is sufficient to calibrate and reduce uncertainty with the ECCSim model, and therefore reduce the uncertainty of the future aquifer response to planned or anticipated changes in land use or hydrology (e.g., climate change or sea level rise). Historical conditions of hydrology, water demand, and surface water supply availability and reliability are the factors that have enabled the ECC Subbasin to operate well within the sustainable yield. In fact, the Subbasin has had stable groundwater levels with no apparent undesirable results as discussed in **Section 3**, **Basin Setting**.

The historical water budget can be summarized based on water year type, as quantified in the above section and further detailed below. **Table 5-12** quantifies the average groundwater budget components based on water year type. These values are also plotted in **Figure 5-8**. The historical groundwater budget by water year type indicates that tile drains increase the amount of flow leaving the Subbasin during wetter years. The data also show that deep percolation (groundwater recharge) typically increases during wetter years. Surface water leakage (downward migration of surface water) and recoverable losses from diversions increase during drier years as the hydraulic gradient between the water table and surface water bodies increases. The contribution from small watersheds decreases during drier years. Groundwater pumping remains relatively constant regardless of water year type. Subsurface lateral flow also remains generally constant between water year types but shows a slight increase in the amount of water leaving the Subbasin during wetter years. The change in storage does not seem to be directly correlated with water year type, as the basin is full, with stable groundwater levels, and thus operating sustainably.

**Table 5-12. Average Simulated Groundwater Budget Components by Water Year Type (Units in Acre-Feet Per Year, AFY)**

| Water Year Type | Tile Drains | Deep Percolation | Surface Water Leakage | Small Watershed Contributions | Diversion Recoverable Loss | Groundwater Pumping | Subsurface Lateral Flow | Change In Storage |
|---|---|---|---|---|---|---|---|---|
| **Wet (6 simulated years)** | -87,270 | 129,214 | 14,358 | 1,101 | 15,855 | -44,698 | -10,343 | 26,394 |
| **Above Normal (3 simulated years)** | -75,537 | 80,228 | 14,769 | 12,067 | 16,628 | -43,651 | -9,867 | -16,279 |
| **Below Normal (3 simulated years)** | -65,831 | 75,248 | 21,920 | 2,558 | 16,895 | -48,722 | -6,963 | -6,337 |
| **Dry (5 simulated years)** | -64,916 | 69,809 | 18,202 | 7,198 | 17,506 | -48,751 | -7,337 | -14,618 |
| **Critical (5 simulated years)** | -74,806 | 78,152 | 20,758 | 1,387 | 19,266 | -46,590 | -7,556 | -3,196 |

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**Average Groundwater Budget Components During the Base Period (1997-2018) by Water Type**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-8**

### 5.6.8 Summary of Water Year 2015 Water Budget Results

For the representative recent water year 2015, the following simulated water budget results are presented. The groundwater budget components for the entire ECC Subbasin are presented in **Table 5-13**; the root zone budget components are presented in **Table 5-14**; and the land and water use budget components are presented in **Table 5-15**.

**Table 5-13. Groundwater Budget Components for Water Year 2015 (AFY)**

| Water Year | Change In Storage | Inflow Components | | | | | Outflow Components | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Surface Water Features | Deep Percolation | Small Watershed Baseflow | Small Watershed Percolation | Diversion Recoverable Loss | Drains | Pumping | Net Subsurface Flow |
| 2015 | 13,411 | 24,787 | 93,960 | 572 | 0 | 16,452 | -66,415 | -47,640 | -8,290 |

**Table 5-14. Root Zone Budget for Water Year 2015**

| Land Use Type | Land Use Area (Acres) | Precipitation (Afy) | Applied Water (Afy) | Evapotranspiration (Afy) | Percolation (Afy) |
|---|---|---|---|---|---|
| **Agricultural** | 41,329 | 42,671 | 166,759 | 163,801 | 46,733 |
| **Urban** | 22,585 | 24,714 | 25,660 | 18,676 | 32,463 |
| **Native and Riparian Vegetation** | 45,236 | 46,561 | 0 | 35,228 | 11,194 |

**Table 5-15. Land and Water Use Budget Components for Water Year 2015**

| Agricultural Supply Requirement | Agricultural Pumping | Agricultural Deliveries | Agricultural Shortage | Urban Supply Requirement | Urban Pumping | Urban Deliveries | Urban Shortage |
|---|---|---|---|---|---|---|---|
| 166,604 | 39,747 | 127,011 | -155 | 25,924 | 7,893 | 17,768 | 264 |

### 5.6.9 Projected 50-Year Water Budget

Six different future scenarios were developed to estimate the projected 50-year water budget as follows:

- The first future scenario relies on county-provided land use changes to accommodate anticipated urban growth for the year 2036. This future condition is maintained for all the projected 50-year scenarios, refer to **Figure 5-9**.
- The second future scenario uses both the anticipated land use change as well as adjustments for climate change. Following DWR's guidance document (DWR, 2018), climate adjustments were made to simulated evapotranspiration, precipitation, and surface water levels and delivery model input files using the 2070 central tendency climate change model, refer to **Figure 5-10**.
- The third future scenario uses the anticipated land use change and sea level rise based on repeated hydrology (no climate change) and sea level rise adjustments based on DWR's guidance documentation. Sea level rise is only applied to model elements in the northern surface water body areas that are below sea level, refer to **Figure 5-11**.
- The fourth future scenario combines all three changes; land use change to accommodate urban growth, climate change (using the 2070 central tendency), and sea level rise, refer to **Figure 5-12**.
- The fifth and sixth future scenarios incorporate the anticipated land use change as well as two extreme climate change models, using climate adjustments for evapotranspiration, precipitation, and surface water levels and delivery model input files. The two scenarios were developed to test the effects of 1) the 2070 wetter with moderate warming climate scenario, and 2) the 2070 drier with extreme warming climate scenario, refer to **Figure 5-13**, and **Figure 5-14**, respectively.

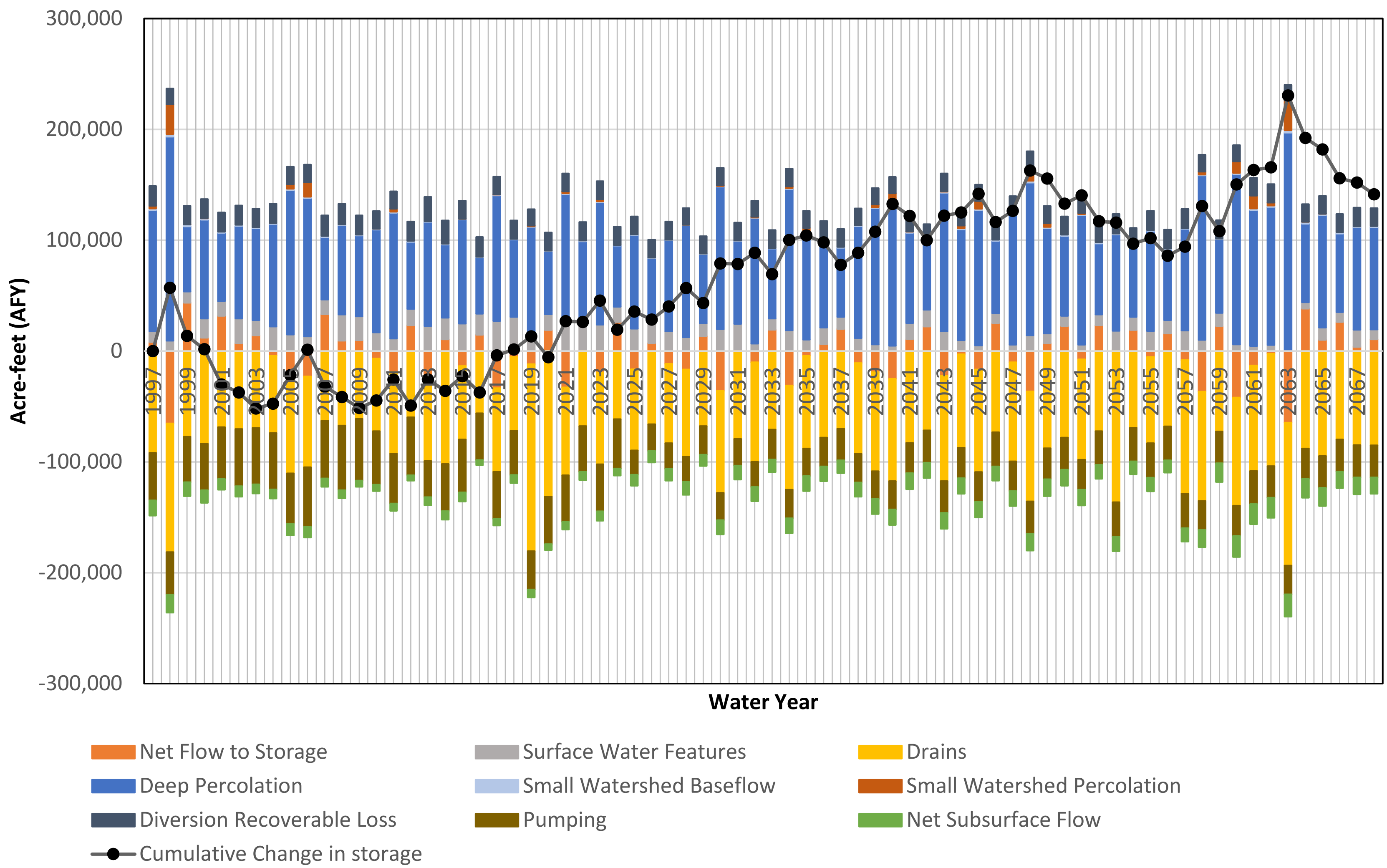
Projected water demand, surface water supply, and metered urban pumping were based on previously developed amounts presented in **Section 4**, **Table 4-5**. ECCSim was used to estimate agricultural and urban demands based on population growth and land use changes and estimated groundwater pumping that would be necessary to meet demands that anticipated surface water deliveries were unable to supply. Hydrology was repeated (or adjusted for climate change) using existing base period model inputs from the historic period of 1954 to 2003. Water year types and patterns of preceding water year types were developed to repeat base period hydrology for the 50-year time period and applying those hydrology values to the future period of 2019-2068 (**Table 5-16**).

**Table 5-16. Future Scenario Water Year Types for Repeated and Adjusted Hydrology**

| Future Scenario Water Year | Assigned Historic Simulated Water Year | DWR Reference Year for Adjusted Hydrology | Projected Water Year Type[16] |
|---|---|---|---|
| **2019** | 2011 | 1954 | W |
| **2020** | 2012 | 1955 | D |
| **2021** | 2017 | 1956 | W |
| **2022** | 2018 | 1957 | BN |
| **2023** | 2017 | 1958 | W |
| **2024** | 2012 | 1959 | D |
| **2025** | 2013 | 1960 | C |
| **2026** | 2014 | 1961 | C |
| **2027** | 2009 | 1962 | BN |
| **2028** | 2010 | 1963 | AN |
| **2029** | 2012 | 1964 | D |
| **2030** | 2017 | 1965 | W |
| **2031** | 2018 | 1966 | BN |
| **2032** | 2011 | 1967 | W |
| **2033** | 2012 | 1968 | D |
| **2034** | 2017 | 1969 | W |
| **2035** | 2010 | 1970 | AN |
| **2036** | 2009 | 1971 | BN |
| **2037** | 2012 | 1972 | D |
| **2038** | 2010 | 1973 | AN |
| **2039** | 2011 | 1974 | W |
| **2040** | 2011 | 1975 | W |
| **2041** | 2013 | 1976 | C |
| **2042** | 2014 | 1977 | C |
| **2043** | 2017 | 1978 | W |
| **2044** | 2010 | 1979 | AN |
| **2045** | 2011 | 1980 | W |
| **2046** | 2012 | 1981 | D |
| **2047** | 2011 | 1982 | W |

[16] W indicates “wet”, AN indicates “above normal”, BN indicates “below normal”, D indicates “dry”, and C indicates “critical.”

| Future Scenario Water Year | Assigned Historic Simulated Water Year | DWR Reference Year for Adjusted Hydrology | Projected Water Year Type[16] |
|---|---|---|---|
| **2048** | 2017 | 1983 | W |
| **2049** | 2010 | 1984 | AN |
| **2050** | 2001 | 1985 | D |
| **2051** | 2011 | 1986 | W |
| **2052** | 2007 | 1987 | C |
| **2053** | 2008 | 1988 | C |
| **2054** | 2007 | 1989 | C |
| **2055** | 2008 | 1990 | C |
| **2056** | 2007 | 1991 | C |
| **2057** | 2008 | 1992 | C |
| **2058** | 2005 | 1993 | W |
| **2059** | 1994 | 1994 | C |
| **2060** | 1995 | 1995 | W |
| **2061** | 1996 | 1996 | W |
| **2062** | 1997 | 1997 | W |
| **2063** | 1998 | 1998 | W |
| **2064** | 1999 | 1999 | AN |
| **2065** | 2000 | 2000 | AN |
| **2066** | 2001 | 2001 | D |
| **2067** | 2002 | 2002 | D |
| **2068** | 2003 | 2003 | BN |

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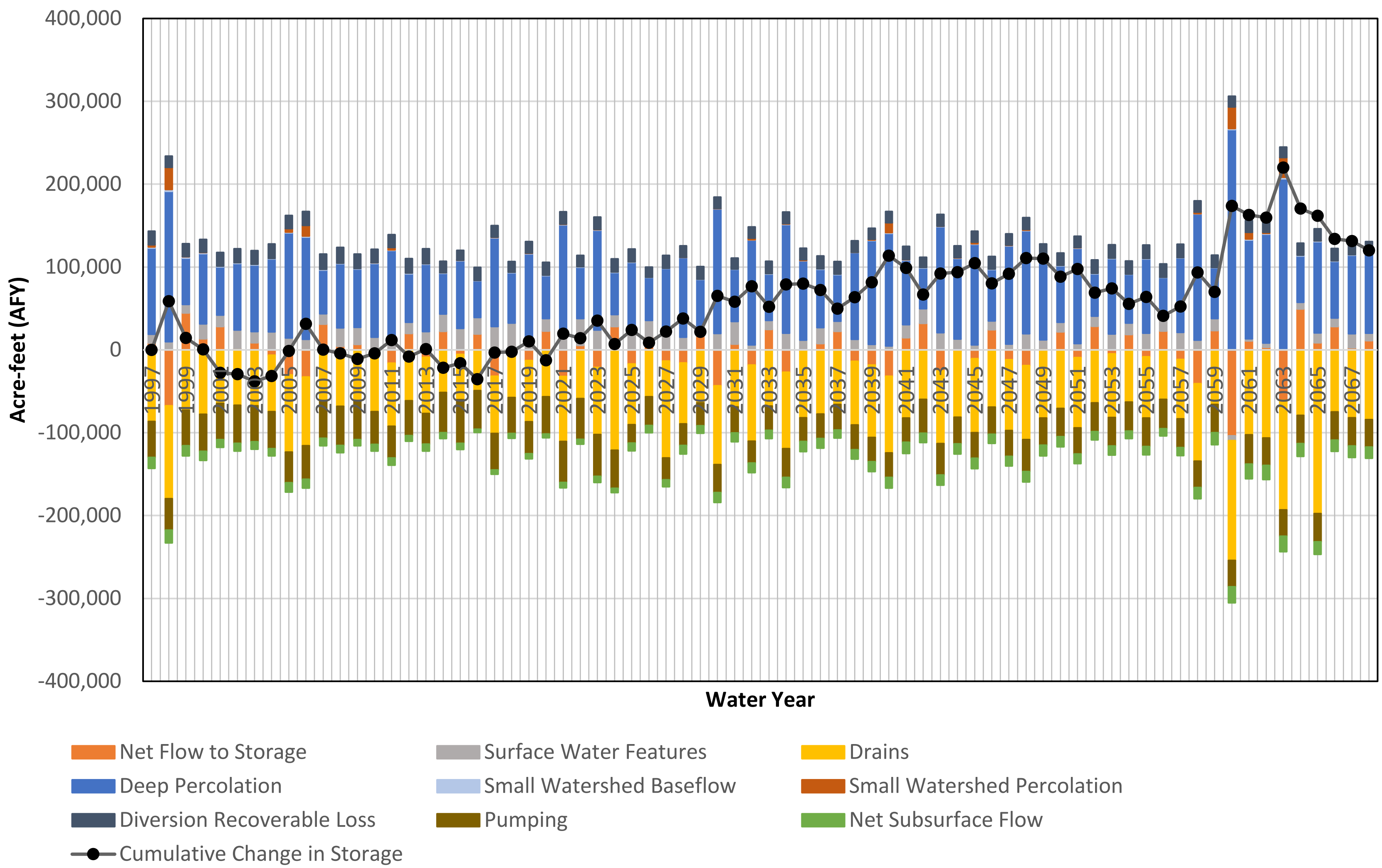
**Groundwater Budget for East Contra Costa Subbasin Future Land Use Scenario (1997-2068)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-9**

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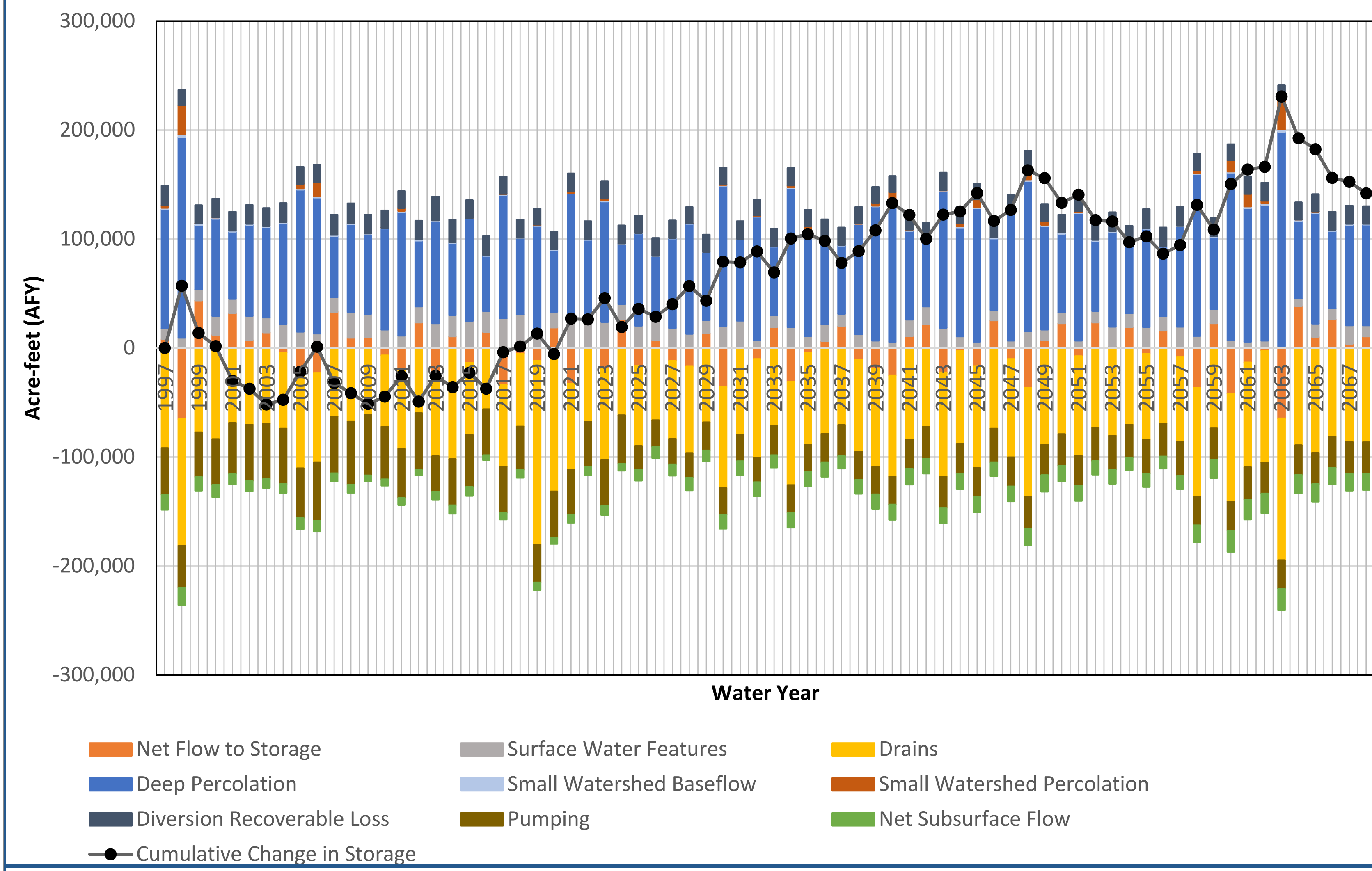
**Groundwater Budget for East Contra Costa Subbasin**
**Future Land Use and Climate Change Scenario (1997-2068)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-10**

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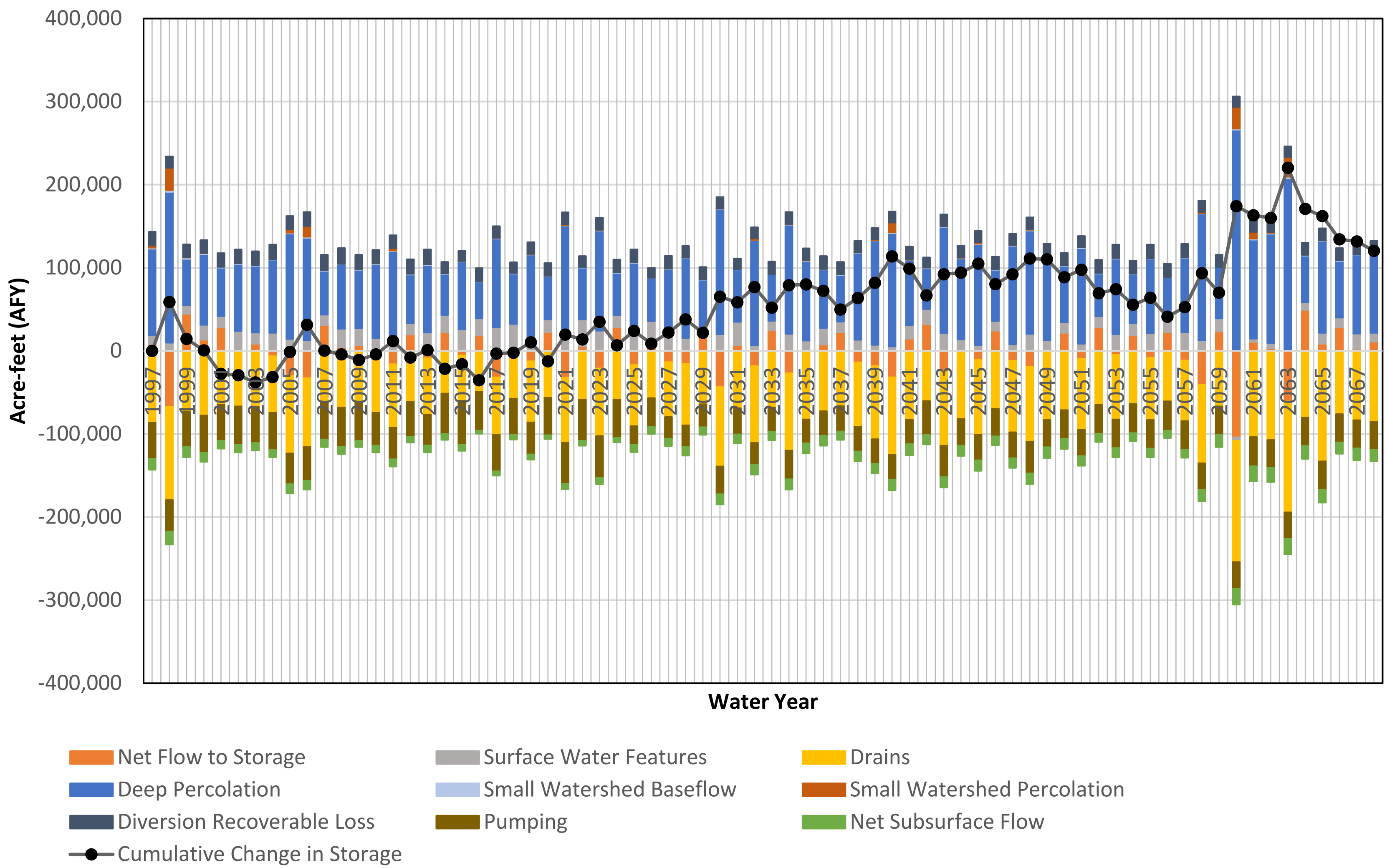
**Groundwater Budget for East Contra Costa Subbasin**
**Future Land Use and Sea Level Rise Scenario (1997-2068)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-11**

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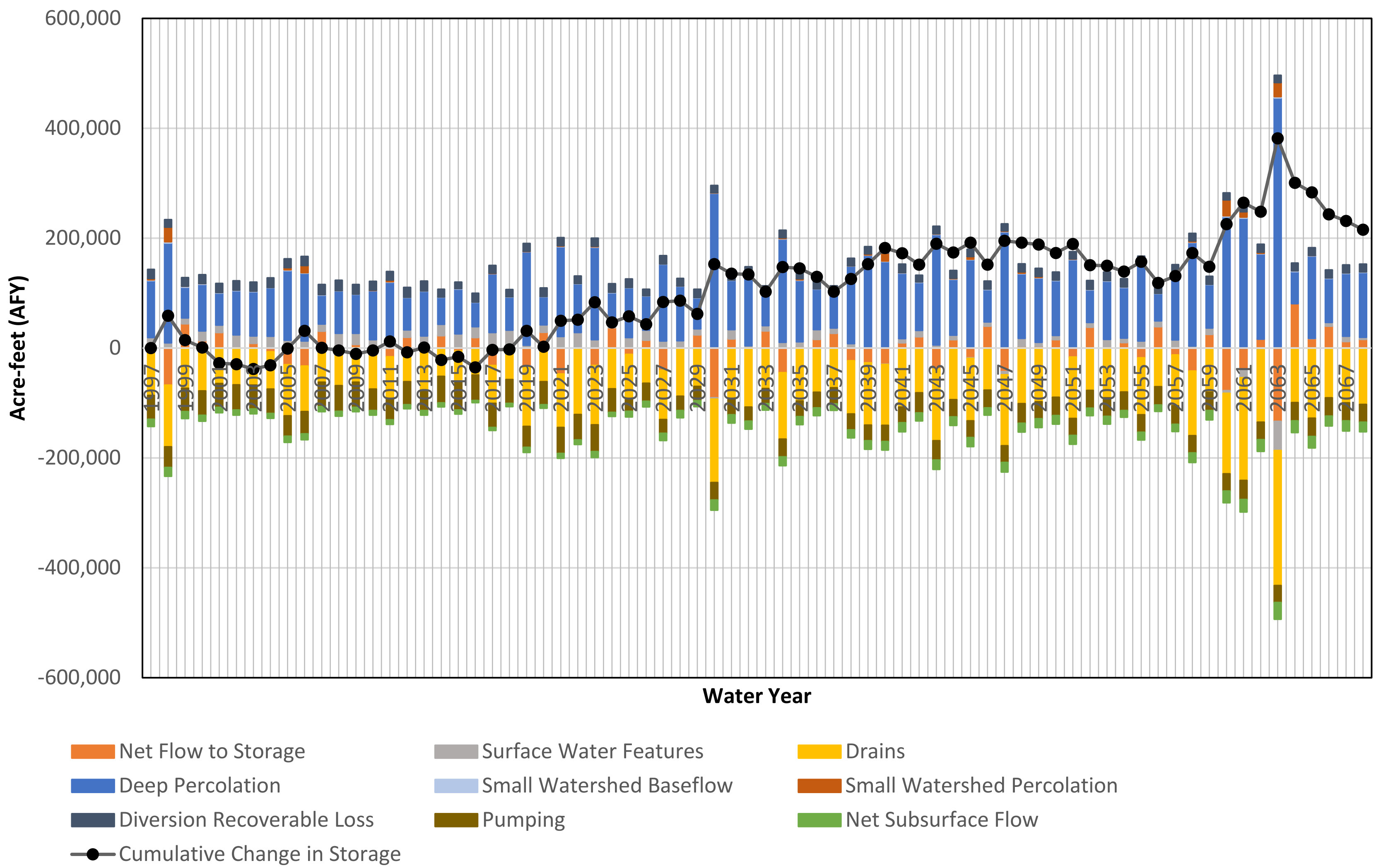
**Groundwater Budget for East Contra Costa Subbasin**
**Future Land Use, Climate Change, and Sea Level Rise Scenario (1997-2068)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-12**

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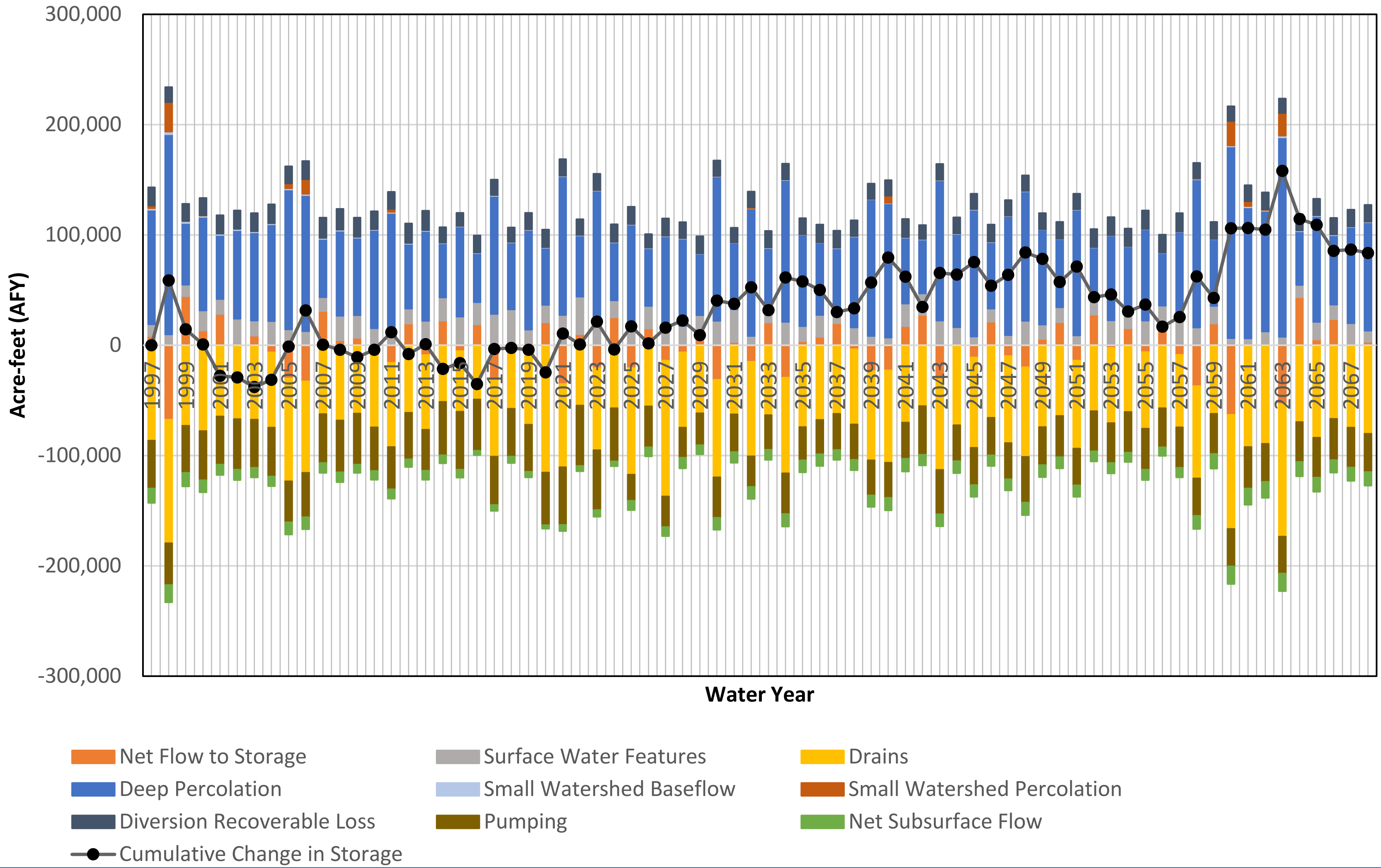
**Groundwater Budget for East Contra Costa Subbasin Future Land Use and Climate Change (Wet) Scenario (1997-2068)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-13**

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**Groundwater Budget for East Contra Costa Subbasin Future Land Use and Climate Change (Dry) Scenario (1997-2068)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-14**

### 5.6.10 Water Budget Summaries for Future Scenarios

The average simulated land and water use budget components are presented in **Table 5-17** for the four 50-year future scenarios and the model Base Period. The simulated root zone water budget components are presented in **Table 5-18**, and the simulated average groundwater budget components are presented in **Table 5-19**. These tables indicate that land use changes have the most impact on water budget components relative to the Base Period. The future land use change (urban growth), climate change, and sea level rise result in changes in the water budget as follows:

- Groundwater pumping is lower on average during the future scenarios due to less agricultural demand as urban growth replaces agricultural land.
- There are less surface water contributions to groundwater, but more water leaving the groundwater systems via drains in the future scenarios compared to the baseline scenario.
- There is slightly more precipitation during the climate change scenarios, which reduces the amount of applied water for agricultural and outdoor landscaping urban demands.
- Sea level rise has very little impact to the groundwater budget, causing a slight decrease in the amount of groundwater exiting the system through drains; increasing the contribution of surface water to groundwater; no major changes to groundwater storage or subsurface lateral flow result from this scenario of sea level rise.

**Table 5-17. Simulated Average Future Land and Water Use Budget Components (Units in Acre-Feet per Year, AFY)**

| Land And Water Use Budget Flow Component | Base Period (Wy 1997-2018) | Future Land Use Scenario (Wy 2019-2068) | Future Land Use and Climate Change Scenario (Wy 2019-2068) | Future Land Use and Sea Level Rise Scenario (Wy 2019-2068) | Future Land Use, Climate Change, And Sea Level Rise (Wy 2019-2068) | Future Land Use and Wet Climate Change Scenario (Wy 2019-2068) | Future Land Use and Dry Climate Change Scenario (Wy 2019-2068) |
|---|---|---|---|---|---|---|---|
| **Ag. Supply Requirement** | 162,135 | 133,678 | 152,255 | 133,678 | 151,626 | 146,011 | 161,986 |
| **Ag. Pumping** | 35,742 | 14,627 | 12,832 | 14,627 | 12,829 | 11,488 | 13,120 |
| **Ag. Deliveries** | 126,223 | 117,735 | 110,862 | 117,735 | 110,236 | 108,385 | 120,305 |
| **Ag. Demand Shortage** | 170 | 1,315 | 28,561 | 1,315 | 28,561 | 26,138 | 28,561 |
| **Urban Supply Requirement** | 28,268 | 35,543 | 35,543 | 35,543 | 35,543 | 35,543 | 35,543 |
| **Urban Pumping** | 8,449 | 14,339 | 21,124 | 14,339 | 21,124 | 21,111 | 21,124 |
| **Urban Deliveries** | 19,352 | 22,759 | 15,843 | 22,759 | 15,843 | 15,883 | 15,843 |
| **Urban Water Demand Shortage** | 468 | -1,554 | -1,424 | -1,554 | -1,424 | -1,450 | -1,424 |

**Table 5-18. Simulated Average Root Zone Budget Components (Area in acres, Flows in AFY)**

| Root Zone Budget Flow Component | Base Period (Wy 1997-2018) | Water Year 2015 | Future Land Use Scenario (Wy 2019-2068) | Future Land Use and Climate Change Scenario (Wy 2019-2068) | Future Land Use and Sea Level Rise Scenario (Wy 2019-2068) | Future Land Use, Climate Change, And Sea Level Rise Scenario (Wy 2019-2068) | Future Land Use and Wet Climate Change Scenario (Wy 2019-2068) | Future Land Use and Dry Climate Change Scenario (Wy 2019-2068) |
|---|---|---|---|---|---|---|---|---|
| **Agricultural Land Use Area (acres)** | 48,057 | 41,329 | 36,171 | 36,171 | 36,171 | 36,171 | 36,171 | 36,171 |
| **Ag. Precipitation (+)** | 55,998 | 42,671 | 43,681 | 46,131 | 43,681 | 46,131 | 57,301 | 40,900 |
| **Ag. Applied Water (+)** | 161,965 | 166,759 | 132,363 | 123,694 | 132,363 | 123,065 | 119,872 | 129,561 |
| **Ag. ET (-)** | 170,998 | 163,801 | 137,764 | 134,522 | 137,764 | 133,841 | 131,369 | 137,784 |
| **Ag. Percolation (-)** | 47,182 | 46,733 | 38,275 | 35,302 | 38,275 | 35,354 | 45,803 | 32,678 |
| **Urban Land Use Area (acres)** | 20,045 | 22,585 | 36,038 | 36,038 | 36,038 | 36,038 | 36,038 | 36,038 |
| **Urban Precipitation (+)** | 22,929 | 24,714 | 43,088 | 45,517 | 43,088 | 45,517 | 58,384 | 40,416 |
| **Urban Applied Water (Landscaping) (+)** | 27,800 | 25,660 | 37,098 | 36,967 | 37,098 | 36,967 | 36,993 | 36,558 |
| **Urban ET (-)** | 19,516 | 18,676 | 31,714 | 31,638 | 31,714 | 31,638 | 31,823 | 30,143 |
| **Urban Percolation (-)** | 31,539 | 32,463 | 48,654 | 51,029 | 48,654 | 51,029 | 63,737 | 47,014 |

| Root Zone Budget Flow Component | Base Period (Wy 1997-2018) | Water Year 2015 | Future Land Use Scenario (Wy 2019-2068) | Future Land Use and Climate Change Scenario (Wy 2019-2068) | Future Land Use and Sea Level Rise Scenario (Wy 2019-2068) | Future Land Use, Climate Change, And Sea Level Rise (Wy 2019-2068) | Future Land Use and Wet Climate Change Scenario (Wy 2019-2068) | Future Land Use and Dry Climate Change Scenario (Wy 2019-2068) |
|---|---|---|---|---|---|---|---|---|
| **Native & Riparian Veg. Land Use Area (acres)** | 41,048 | 45,236 | 36,942 | 36,942 | 36,942 | 36,942 | 36,942 | 36,942 |
| **Native & Riparian Veg. Precipitation (+)** | 46,290 | 46,561 | 44,317 | 46,669 | 44,317 | 46,669 | 58,689 | 41,146 |
| **Native & Riparian Veg. ET (-)** | 37,142 | 35,228 | 35,783 | 36,255 | 35,783 | 36,255 | 39,236 | 32,700 |
| **Sum of Native & Riparian Veg. Percolation (-)** | 9,042 | 11,194 | 8,535 | 10,414 | 8,535 | 10,414 | 19,454 | 8,447 |

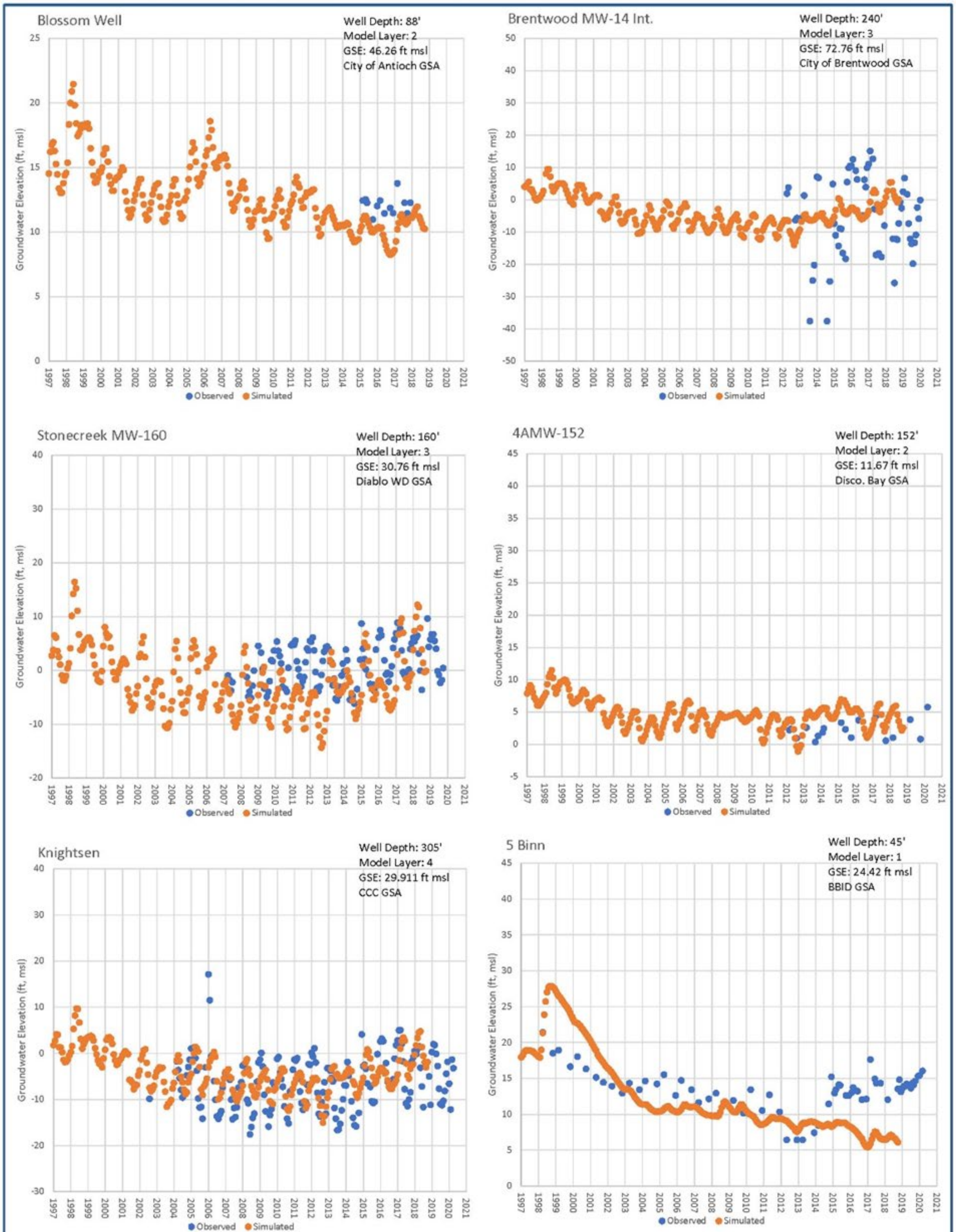
**Table 5-19. Simulated Average Groundwater Budget Component Flows (Units in Acre-Feet per Year, AFY)**

| Groundwater Budget Flow Component | Base Period (Wy 1997-2018) | Water Year 2015 | Future Land Use Scenario (Wy 2019-2068) | Future Land Use and Climate Change Scenario (Wy 2019-2068) | Future Land Use and Sea Level Rise Scenario (Wy 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (Wy 2019-2068) | Future Land Use and Wet Climate Change Scenario (Wy 2019-2068) | Future Land Use and Dry Climate Change Scenario (Wy 2019-2068) |
|---|---|---|---|---|---|---|---|---|
| **Drains** | -74,833 | -87,732 | -87,732 | -84,026 | -86,521 | -81,068 | -103,007 | -75,807 |
| **Surface Water Features** | 17,773 | 12,517 | 12,517 | 13,859 | 13,300 | 14,644 | 6,880 | 16,148 |
| **Deep Percolation** | 90,069 | 95,701 | 95,701 | 97,002 | 95,702 | 97,054 | 129,520 | 88,301 |
| **Small Watershed Baseflow** | 976 | 880 | 880 | 647 | 880 | 647 | 787 | 452 |
| **Small Watershed Percolation** | 2,260 | 2,051 | 2,051 | 1,645 | 2,051 | 1,645 | 2,124 | 1,132 |
| **Diversion Recoverable Loss** | 17,253 | 15,965 | 15,965 | 14,398 | 15,965 | 14,327 | 14,121 | 14,774 |
| **Pumping** | -46,455 | -28,966 | -28,966 | -33,956 | -28,966 | -33,952 | -32,599 | -36,106 |
| **Net Subsurface Flow** | -8,500 | -12,975 | -12,975 | -11,423 | -12,985 | -11,432 | -14,847 | -10,013 |
| **Net Storage Change** | 66 | 2,799 | 2,799 | 2,451 | 2,807 | 2,457 | 4,360 | 1,721 |

## 5.7 Model Calibration and Uncertainty

The ECCSim model was calibrated to match measured groundwater levels at various monitoring locations and depths throughout the model domain and Subbasin area. Due to the engineered nature of surface water features in this area and therefore their simulation, calibration using surface water elevations and flows were not performed. Matching simulated groundwater levels to actual observed groundwater levels in specific wells with known depths is a useful measure of the appropriateness of the model to be used as a tool for determining sustainability under various stresses. Thirty-three wells were used to calibrate the model. Most wells were calibrated to match measured water levels within 10 feet. Many wells were calibrated to match with even less uncertainty. Some wells have better matches than others, and attempts were made to adjust aquifer parameters to accommodate better matches on a regional scale. Local changes to aquifer parameters just to improve those results were avoided; rather, the best assessment of hydrogeologic conditions was made leaving the opportunity for future data acquisition to update the model and possibly improve calibration in those areas.

The full set of simulated and observed groundwater levels for all calibration wells is provided in the model report found in **Appendix 5a**. A subset of these calibration plots are provided here (**Figure 5-15**) to illustrate favorable matches throughout the model domain both vertically and laterally. Another plot that shows the scatter plot of measured versus simulated groundwater levels using all measurements over the entire simulation period (**Figure 5-16**).

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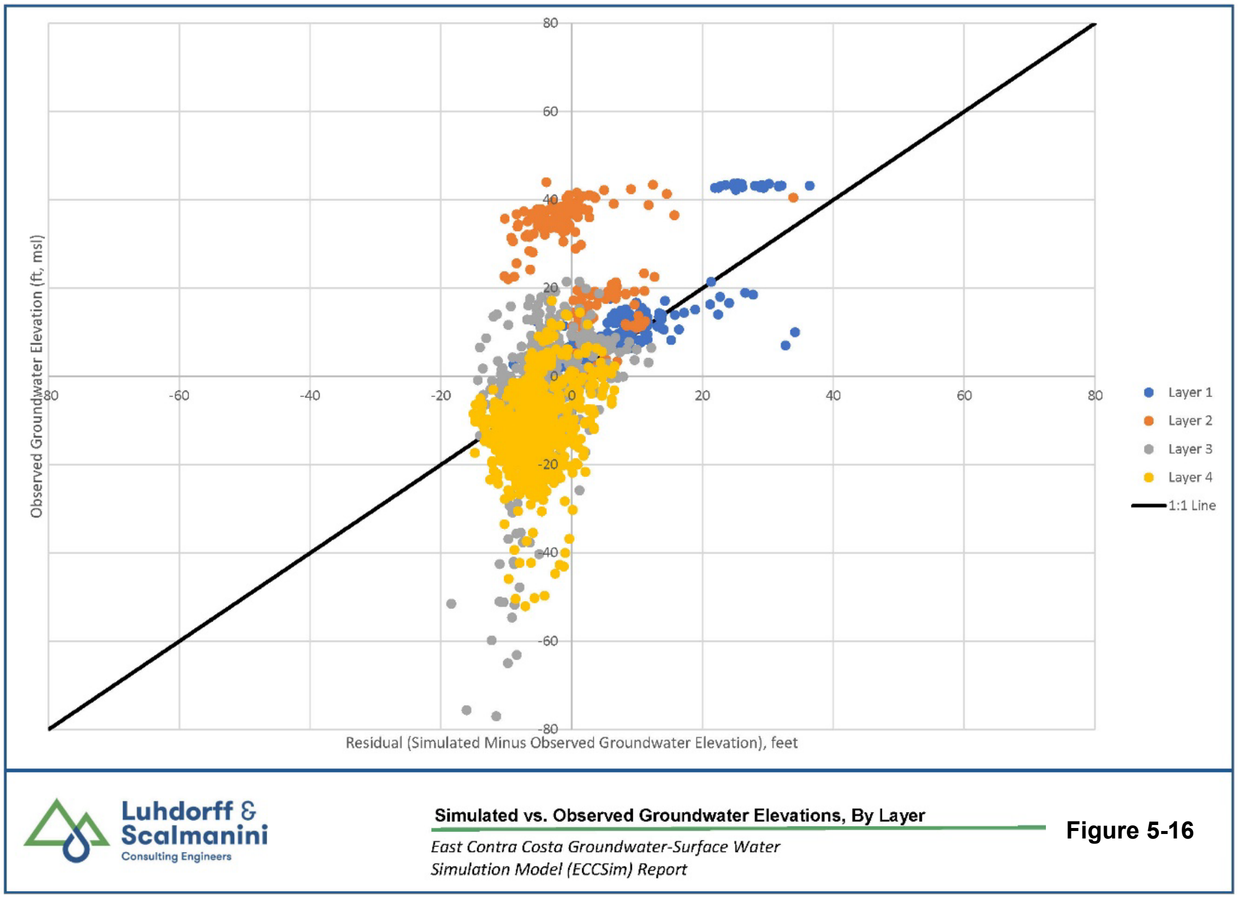
**Subset of Calibration Plots from ECCSim**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-15**




Simulated vs. Observed Groundwater Elevations, By Layer

Figure 5-16

### 5.7.1 Verification of Shallow Zone Results

- Examination of DuPont site data as requested by DWD (TBD)

## 5.8 Sensitivity Analysis (TBD)

- Development and explanation of model sensitivity runs for the integrated hydrologic model in order to help determine sustainable yield.
- Testing the hydraulic connectivity between layers during a high pumping scenario (the sustainable yield model run) by decreasing the vertical hydraulic conductivity.
- Results of sensitivity runs.

## 5.9 Sustainable Yield Scenario

In order to estimate the sustainable yield of the ECC Subbasin, the future land use change scenario was utilized with the ECCSim tool. Surface water diversions were reduced and substituted with increased groundwater extraction. This trial-and-error process was repeated until the following negative impacts occurred in relation to the historical baseline:

- The average change in storage indicated aquifer depletion;
- The surface water contributions to groundwater indicated stream depletion;
- The gradient for subsurface lateral flow changed such that flow out of the Subbasin reversed with flow into the ECC Subbasin from neighboring subbasins.

With regard to surface water interactions, it is possible to identify the range of stream depletion that has been occurring in the past and use those quantities to identify a significant change in the sustainability scenario. This does not necessarily mean that a change from the historic baseline represents undesirable results, only that greater pumping is offset by a contribution from the stream depletion source that is outside the historic range. The range of historical surface water contribution to the ECC Subbasin in the Base Period was estimated at between: 9,481 to 30,852 AFY. Here, a positive value indicates a contribution to groundwater storage from stream surface water sources.

Similar to the stream depletion factor, the range of historic simulated annual flow to other basins, or subsurface lateral flow, is between -4,664 to -15,817 AFY. Here, a negative value indicates flow out of the ECC Subbasin. To estimate sustainable yield, the average surface water contribution water budget component and subsurface lateral flow attempted to be within the range of approximate simulated historic values.

The quantification of cumulative change in storage combined with the criteria for surface water contribution and subsurface lateral flow, allow for a better understanding of what levels of groundwater pumping amounts could result in adverse effects such as storage depletion. Average annual groundwater pumping in the model Base Period accounts was approximately 46,500 AFY.

As a perspective on historic and current basin conditions, this annual average pumping rate has occurred with no apparent undesirable results as defined under SGMA. In fact, the Subbasin relies heavily on drains to remove excess groundwater which is a function of the Delta setting in which land is largely near sea level, groundwater is encountered at shallow depths, sometimes only a few feet, and streams and rivers are hydraulically connected to the aquifer system. Reducing the surface water deliveries and increasing groundwater pumping allows the basin to be stressed in a manner that alters the historic balance in the water budget components.

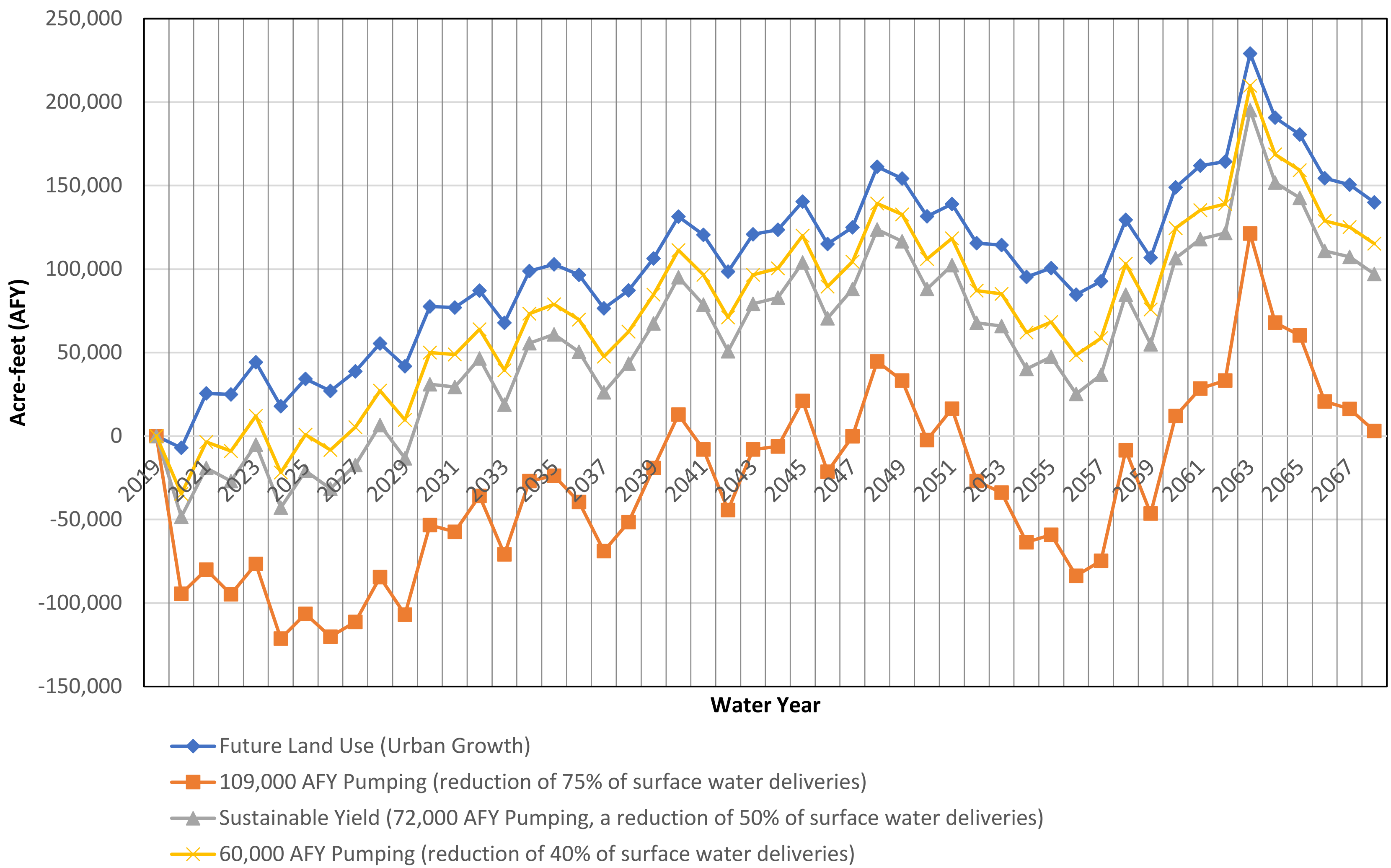
**Table 5-20** shows average groundwater budget components for a subset of the sustainable yield model runs used to develop an estimate of sustainable yield, using groundwater budget terms within the range of values seen during the Base Period. The cumulative change in storage is plotted for selected sustainable yield scenario runs to test the Increased pumping to levels to aquifer storage depletion or replenishment (**Figure 5-17**). The sustainable yield value of 72,000 AFY satisfies the criteria for not negatively impacting surface water features or altering flow patterns between neighboring subbasins, but still results in aquifer replenishment over time. Sustained pumping of 72,000 AFY will result in slightly less reliance on drains, while maintaining a cumulative change in storage above zero without depleting surface water or negatively impacting neighboring subbasins.

### 5.9.1 ECC Subbasin Sustainable Yield

In summary, the sustainable yield for the ECC Subbasin is approximately 72,000 AFY. This amount of groundwater extraction does not result in storage depletion, does not result in surface water depletion beyond levels seen in the model Base Period, reduces the drain outflow, and reduces reliance on surface water deliveries. At higher levels of pumping, the modeling indicates the potential to increase streamflow depletion and inter-basin flow beyond historical baselines. Like the Base Period scenario, a chronic decline in groundwater storage was not a factor in the sustainable yield threshold. The margin between the average pumping rate in the subbasin during the base period (46,455 AFY) and the quantified sustainable yield of 72,000 AFY provides an ability to meet short-term surface water supply shortages in dry to critically dry years through increased groundwater pumping. This margin is a hallmark of effective conjunctive use of surface water and groundwater resources which is based on the fact that surface water and groundwater resources vary in availability, quality, and costs. In the ECC Subbasin, the margin between sustainable yield and average pumping provides a storage buffer in critically dry years. Some GSAs have implemented groundwater exchanges (East Contra Costa Irrigation District) and supplemental groundwater capacity (Diablo Water District). These and similar programs can mitigate impacts to overall water supply in not only dry and critically dry periods, but also as a result of unforeseen climate change consequences.

**Table 5-20. Average Simulated Groundwater Budget Components Used to Develop the Sustainable Yield of the ECC Subbasin**

| Groundwater Budget Flow Component | Base Period (Wy 1997-2018) | Water Year 2015 | Minimum Annual Base Period Value | Maximum Base Period Value | Future Land Use Scenario (Wy 2019-2068) | Sustainable Yield Run: Reduce Sw Deliveries By 75% | Sustainable Yield Run: Reduce Sw Deliveries By 50% | Sustainable Yield Run: Reduce SW Deliveries By 45% | Sustainable Yield Run: Reduce SW Deliveries By 40% |
|---|---|---|---|---|---|---|---|---|---|
| Drains | -74,833 | -66,415 | -116,071 | -56,081 | -87,732 | -34,458 | -56,883 | -59,623 | -61,157 |
| Surface Water Features | 17,773 | 24,787 | 9,481 | 30,852 | 12,517 | 26,851 | 19,167 | 18,096 | 17,081 |
| Deep Percolation | 90,069 | 93,960 | 50,799 | 184,027 | 95,701 | 95,567 | 95,982 | 96,023 | 96,057 |
| Small Watershed Baseflow | 976 | 572 | 498 | 2,320 | 880 | 880 | 880 | 880 | 880 |
| Small Watershed Percolation | 2,260 | 0 | 0 | 26,702 | 2,051 | 2,051 | 2,051 | 2,051 | 2,051 |
| Diversion Recoverable Loss | 17,253 | 16,452 | 14,255 | 21,747 | 15,965 | 6,879 | 11,132 | 11,824 | 12,490 |
| Pumping | -46,455 | -47,640 | -58,251 | -32,504 | -28,966 | -109,353 | -71,992 | -65,915 | -60,064 |
| Net Subsurface Flow | -8,500 | -8,290 | -15,817 | -4,664 | -12,975 | 8,313 | -3,658 | -5,189 | -6,594 |
| Net Storage Change | 66 | 13,411 | -43,556 | 65,310 | 2,799 | 63 | 1,940 | 2,130 | 2,303 |

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**Simulated Cumulative Change in Groundwater Storage for Sustainable Yield Development**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-17**

## 5.10 GSA Area Water Budget Results

The seven GSAs that comprise the ECC Subbasin have their own water budgets as simulated using the ECCSim tool. The average groundwater budget terms are quantified for each GSA for the model Base Period (water years 1997-2018) in **Table 5-21**. The average simulated groundwater budget components are illustrated graphically in **Figure 5-18**.

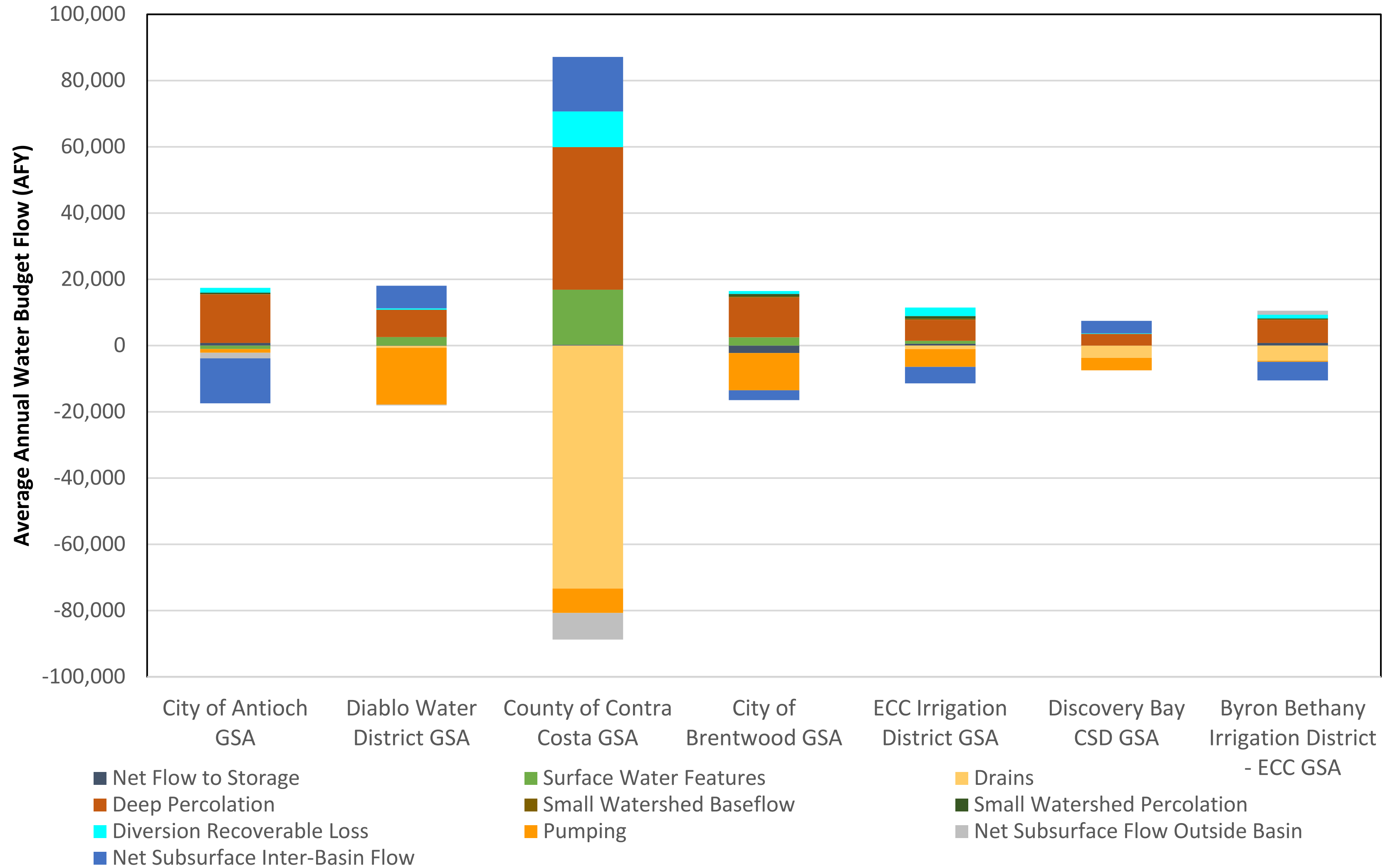
The projected water budgets for GSA areas were determined for the four 50-year water budget scenarios:

- future land use scenario (repeated hydrology);
- future land use plus climate change scenario (using 2070 central tendency climate change adjustments, the 2070 wet climate change adjustments, and the 2070 dry climate change adjustments);
- future land use plus sea level rise scenario; and
- future land use plus climate change and sea level rise scenario.

Simulated groundwater budget components are presented below in **Table 5-22**.

**Table 5-21. Simulated Groundwater Budget Components for GSAs in the ECC Subbasin for Base Period, WY 1997-2018 (Units are in Acre-Feet per Year, AFY)**

| GSAS | Net Storage Change | Drains | Surface Water Features | Deep Percolation | Small Watershed Baseflow | Small Watershed Percolation | Diversion Recoverable Loss | Pumping | Net Subsurface Flow Outside Basin | Net Subsurface Inter-Basin Flow |
|---|---|---|---|---|---|---|---|---|---|---|
| City of Antioch GSA | -785 | 0 | -1,036 | 14,663 | 129 | 406 | 1,472 | -1,152 | -1,647 | -13,621 |
| Diablo Water District GSA | 86 | -559 | 2,572 | 8,151 | 0 | 82 | 423 | -17,216 | -208 | 6,836 |
| County of Contra Costa GSA | -210 | -73,302 | 16,665 | 43,071 | 0 | 0 | 10,699 | -7,408 | -8,021 | 16,533 |
| City of Brentwood GSA | 2,276 | 0 | 2,478 | 12,036 | 330 | 741 | 915 | -11,226 | 0 | -2,999 |
| ECC Irrigation District GSA | -524 | -1,083 | 900 | 6,363 | 348 | 773 | 2,536 | -5,370 | 0 | -4,991 |
| Discovery Bay CSD GSA | -9 | -3,735 | 0 | 3,540 | 0 | 0 | 111 | -3,747 | 0 | 3,822 |
| Byron Bethany Irrigation District - ECC GSA | -806 | -4,582 | 0 | 6,994 | 168 | 258 | 1,096 | -334 | 1,196 | -5,580 |

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**Average Water Budget Components During the Historical Calibration Period (1997-2018)**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 5-18**

### Table 5-22. Simulated Future Scenario Groundwater Budgets for Individual GSAs

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **City of Antioch GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario[17] (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change[18], and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | -785 | 142 | 171 | 142 | 171 |
| **Drains** | 0 | 0 | 0 | 0 | 0 |
| **Surface Water Features** | -1,036 | -1,920 | -1,833 | -1,923 | -1,836 |
| **Deep Percolation** | 14,663 | 14,914 | 15,630 | 14,914 | 15,630 |
| **Small Watershed Baseflow** | 129 | 99 | 76 | 99 | 76 |
| **Small Watershed Percolation** | 406 | 327 | 279 | 327 | 279 |
| **Diversion Recoverable Loss** | 1,472 | 1,322 | 1,313 | 1,322 | 1,313 |
| **Pumping** | -1,152 | -255 | -278 | -255 | -278 |
| **Net Subsurface Flow Outside Basin** | -1,647 | -3,261 | -2,864 | -3,259 | -2,863 |
| **Net Subsurface Inter-Basin Flow** | -13,621 | -11,084 | -12,152 | -11,083 | -12,150 |

[17] 2070 Central Tendency Climate Change Scenario
[18] 2070 Central Tendency Climate Change Scenario

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **Diablo Water District GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | 86 | 176 | 151 | 176 | 151 |
| **Drains** | -559 | -2,495 | -2,255 | -2,492 | -2,262 |
| **Surface Water Features** | 2,572 | -321 | 389 | -338 | 372 |
| **Deep Percolation** | 8,151 | 10,224 | 10,881 | 10,224 | 10,881 |
| **Small Watershed Baseflow** | 0 | 0 | 0 | 0 | 0 |
| **Small Watershed Percolation** | 82 | 42 | 70 | 42 | 70 |
| **Diversion Recoverable Loss** | 423 | 404 | 398 | 404 | 398 |
| **Pumping** | -17,216 | -6,141 | -6,465 | -6,141 | -6,465 |
| **Net Subsurface Flow Outside Basin** | -208 | -677 | -613 | -675 | -612 |
| **Net Subsurface Inter-Basin Flow** | 6,836 | -861 | -2,255 | -847 | -2,233 |

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **County of Contra Costa GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | -210 | 90 | 115 | 99 | 124 |
| **Drains** | -73,302 | -80,933 | -76,509 | -79,771 | -73,513 |
| **Surface Water Features** | 16,665 | 14,906 | 15,740 | 15,721 | 16,556 |
| **Deep Percolation** | 43,071 | 42,783 | 40,623 | 42,784 | 40,624 |
| **Small Watershed Baseflow** | 0 | 0 | 0 | 0 | 0 |
| **Small Watershed Percolation** | 0 | 0 | 0 | 0 | 0 |
| **Diversion Recoverable Loss** | 10,699 | 10,399 | 9,373 | 10,399 | 9,373 |
| **Pumping** | -7,408 | -10,137 | -7,693 | -10,137 | -7,693 |
| **Net Subsurface Flow Outside Basin** | -8,021 | -11,880 | -11,567 | -11,892 | -11,619 |
| **Net Subsurface Inter-Basin Flow** | 16,533 | 29,466 | 25,726 | 29,449 | 25,691 |

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **City of Brentwood GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | 2,276 | 2,078 | 1,728 | 2,079 | 1,729 |
| **Drains** | 0 | 0 | 0 | 0 | 0 |
| **Surface Water Features** | 2,478 | 1,982 | 2,035 | 1,982 | 2,035 |
| **Deep Percolation** | 12,036 | 14,213 | 14,738 | 14,213 | 14,738 |
| **Small Watershed Baseflow** | 330 | 278 | 199 | 278 | 199 |
| **Small Watershed Percolation** | 741 | 604 | 475 | 604 | 475 |
| **Diversion Recoverable Loss** | 915 | 902 | 117 | 902 | 117 |
| **Pumping** | -11,226 | -4,605 | -11,592 | -4,605 | -11,592 |
| **Net Subsurface Flow Outside Basin** | 0 | 0 | 0 | 0 | 0 |
| **Net Subsurface Inter-Basin Flow** | -2,999 | -11,295 | -4,245 | -11,294 | -4,244 |

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **ECCID GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | -524 | 116 | 48 | 116 | 48 |
| **Drains** | -1,083 | -1,512 | -1,696 | -1,513 | -1,698 |
| **Surface Water Features** | 900 | 666 | 740 | 666 | 740 |
| **Deep Percolation** | 6,363 | 5,337 | 5,988 | 5,337 | 5,988 |
| **Small Watershed Baseflow** | 348 | 332 | 241 | 332 | 241 |
| **Small Watershed Percolation** | 773 | 924 | 607 | 924 | 607 |
| **Diversion Recoverable Loss** | 2,536 | 2,106 | 2,284 | 2,106 | 2,284 |
| **Pumping** | -5,370 | -794 | -869 | -794 | -869 |
| **Net Subsurface Flow Outside Basin** | 0 | 0 | 0 | 0 | 0 |
| **Net Subsurface Inter-Basin Flow** | -4,991 | -6,942 | -7,246 | -6,941 | -7,245 |

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **Discovery Bay CSD GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | -9 | 14 | 17 | 14 | 17 |
| **Drains** | -3,735 | -4,969 | -5,268 | -4,969 | -5,267 |
| **Surface Water Features** | 0 | 0 | 0 | 0 | 0 |
| **Deep Percolation** | 3,540 | 5,743 | 6,149 | 5,743 | 6,149 |
| **Small Watershed Baseflow** | 0 | 0 | 0 | 0 | 0 |
| **Small Watershed Percolation** | 0 | 0 | 0 | 0 | 0 |
| **Diversion Recoverable Loss** | 111 | 1 | 1 | 1 | 1 |
| **Pumping** | -3,747 | -6,626 | -6,626 | -6,626 | -6,626 |
| **Net Subsurface Flow Outside Basin** | 0 | 0 | 0 | 0 | 0 |
| **Net Subsurface Inter-Basin Flow** | 3,822 | 5,866 | 5,761 | 5,866 | 5,760 |

| GSA Groundwater Budget Component Flows Summary | | | | | |
|---|---|---|---|---|---|
| **Byron Bethany Irrigation District - ECC GSA** | | | | | |
| | Base Period (WY 1997-2018) | Future Land Use Scenario (WY 2019-2068) | Future Land Use and Climate Change Scenario (WY 2019-2068) | Future Land Use and Sea Level Rise Scenario (WY 2019-2068) | Future Land Use, Climate Change, and Sea Level Rise (WY 2019-2068) |
| **Net Storage Change** | -806 | 194 | 232 | 194 | 230 |
| **Drains** | -4,582 | -4,220 | -4,764 | -4,220 | -4,747 |
| **Surface Water Features** | 0 | 0 | 0 | 0 | 0 |
| **Deep Percolation** | 6,994 | 7,399 | 8,223 | 7,399 | 8,273 |
| **Small Watershed Baseflow** | 168 | 171 | 131 | 171 | 131 |
| **Small Watershed Percolation** | 258 | 154 | 214 | 154 | 214 |
| **Diversion Recoverable Loss** | 1,096 | 831 | 912 | 831 | 841 |
| **Pumping** | -334 | -407 | -433 | -407 | -429 |
| **Net Subsurface Flow Outside Basin** | 1,196 | 1,475 | 1,598 | 1,475 | 1,599 |
| **Net Subsurface Inter-Basin Flow** | -5,580 | -5,149 | -5,589 | -5,149 | -5,579 |

## 5.11 Model Documentation

**Appendix 5a** contains model documentation and complete scenario results.

## 5.12 References

California Department of Water Resources (DWR). December 2016. Guidance Document for the Sustainable Management of Groundwater: Modeling.

California Department of Water Resources (DWR). December 2016. Guidance Document for the Sustainable Management of Groundwater: Water Budget.

California Department of Water Resources (DWR). July 2018. Sustainable Groundwater Management Program: Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development.

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California Department of Water Resources (DWR). July 2018. Sustainable Groundwater Management Program: Resource Guide DWR-Provided Climate Change Data and Guidance for Use During Groundwater Sustainability Plan Development.

## SECTION 6 CONTENTS

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# 6. MONITORING NETWORK AND DATA MANAGEMENT SYSTEM

SGMA regulations require that each GSP develop a monitoring network to collect data of sufficient accuracy and quantity to evaluate changing conditions and trends in groundwater and related surface water, as well as to provide representative information about groundwater conditions. The monitoring network and associated data shall be used to demonstrate that the basin is sustainably managed. SGMA also requires that monitoring networks specifically target the six sustainability indicators[1] either directly or indirectly through a proxy monitoring parameter. The six sustainability indicators are: chronic lowering of groundwater levels, reduction in groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface water. This section describes the monitoring networks, monitoring protocols, data management system, and data reporting requirements for the ECC Subbasin GSP.

The ECC Subbasin monitoring networks shall be assessed every five years. Through these assessments, needed changes and/or data gaps may be identified. The GSAs shall adaptively manage and modify the monitoring networks, projects, management actions, and/or interim milestones to achieve the sustainability objectives for the Subbasin. This process is intended to conform to Monitoring Networks and Identification of Data Gaps, Best Management Practices, (DWR, 2016).

## 6.1. Monitoring Network Objectives (CCR § 354.34, § 354.38)

In accordance with GSP Regulations, monitoring networks shall be developed to produce a data set of sufficient accuracy, measurement frequency, and spatial distribution to characterize groundwater and related surface water conditions in the plan area and to evaluate conditions through implementation of the GSP all with the purpose of sustainable groundwater management. The monitoring network shall accomplish the following (GSP Reg. § 354.34(b)(1)-(4)):

*(1) Demonstrate progress towards achieving measurable objectives described in the GSP.*

*(2) Monitor impacts to the beneficial uses and users of groundwater.*

*(3) Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.*

*(4) Quantify annual changes in water budget components.*

The ECC GSP monitoring network is designed to meet the above regulatory requirements through implementation of monitoring described in this section. As discussed in this section, designated monitoring sites throughout the Subbasin, with appropriate monitoring protocols and measurement frequency, will provide a means to quantify current and future hydrogeological conditions of the ECC Subbasin, as well as within individual GSA jurisdictions.

[1] Sustainability indicator in SGMA refers to “any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results…” (DWR, BMP, 2016)

## 6.2. Monitoring Networks

Under SGMA, monitoring networks shall be established for each of six sustainability indicators as applicable. The six sustainability indicators are: chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface water. The groundwater level monitoring network will act as a proxy for the groundwater storage sustainability indicator. Existing groundwater, surface water and subsidence monitoring programs conducted by DWR, SWCRB, DDW, USGS and UNAVCO, are described in **Section 2.2**. In addition to these programs, five ECC GSAs (City of Brentwood, BBID, TODB and DWD, and ECCID) have independent groundwater monitoring programs. These existing programs are integrated into the GSP monitoring program where applicable to the monitoring objectives. **Table 6-1**, below, summarizes the sustainability indicators and related monitoring in the ECC GSP.

**Table 6-1. Sustainability Indicators and Applicable Representative Monitoring Network**

| Sustainability Indicator | Representative Monitoring Network | Proxy Network |
|---|---|---|
| **Chronic Lowering of Groundwater Levels** | Groundwater Levels | NA |
| **Reduction of Groundwater Storage** | See Proxy | Groundwater Levels |
| **Seawater Intrusion** | Groundwater Quality | NA |
| **Degraded Groundwater Quality** | Groundwater Quality | NA |
| **Land Subsidence** | PBO Station | Groundwater Levels |
| **Surface Water Depletion due to Groundwater Pumping** | Stream Flow | Groundwater Levels |

NA = Not Applicable

### 6.2.1. Basin-Wide and Representative Monitoring Networks

The GSP monitoring program includes basin-wide and representative networks. The basin-wide network provides a broad source of relevant data by which to evaluate conditions in the Subbasin. The representative network is a subset of the basin-wide network for which minimum thresholds and measurable objectives shall be defined in accordance with *CCR §354.36 (a)* (see **Section 7** of this GSP). For each monitoring network (i.e., basin-wide, and representative monitoring site), the following information is discussed below: the site locations, spatial density, monitoring frequency, monitoring protocols, data gaps, and a plan to fill the data gaps.

### 6.2.2. Groundwater Level Monitoring Network

Groundwater level monitoring is a fundamental component of data collection for sustainable groundwater management. Groundwater level data from a network of groundwater monitoring wells serve to show groundwater occurrence, flow direction, hydraulic gradients between principal aquifers, and interaction between groundwater and surface water features (*CCR §354.34 (C)*). Each GSA has dedicated monitoring wells in its area of jurisdiction. GSA monitoring wells have existing historical records dating to the 1950s (e.g., ECCID monitoring network for shallow groundwater). The various GSA networks were initially coordinated through the State CASGEM program in 2013. The basin-wide and representative groundwater level networks are summarized below and enumerated in **Table 6-2**:

- **Basin-wide Monitoring Network** - The basin-wide monitoring network for groundwater level evaluation provides a broad dataset for basin evaluation.
- **Representative Monitoring Network** - A subset of basin-wide monitoring wells is selected to monitor sustainability indicators in the Subbasin and to demonstrate sustainable management in accordance with defined minimum thresholds and measurable objectives for the chronic lowering of groundwater levels sustainability indicator.

**Table 6-2. GSA Groundwater Level Monitoring Network**

| GSA | Number of Wells | | | |
|---|---|---|---|---|
| | Basin-Wide Network | | | Representative Network |
| | Existing | New | Total | |
| **BBID** | 5 | | 5 | 1 |
| **City of Antioch** | | 3 | 3 | 2 |
| **City of Brentwood** | 6 | | 6 | 2 |
| **Contra Costa County** | | 2 | 2 | 1 |
| **Diablo Water District** | 10 | 2 | 12 | 3 |
| **Town of Discovery Bay** | 9 | 2 | 11 | 2 |
| **ECCID** | 16 | | 16 | 1 |
| **Total** | **46** | **9** | **55** | **12** |

Note: multiple completion monitoring wells are counted as separate wells for each depth.

#### 6.2.2.1. Basin-wide Groundwater Level Monitoring Network

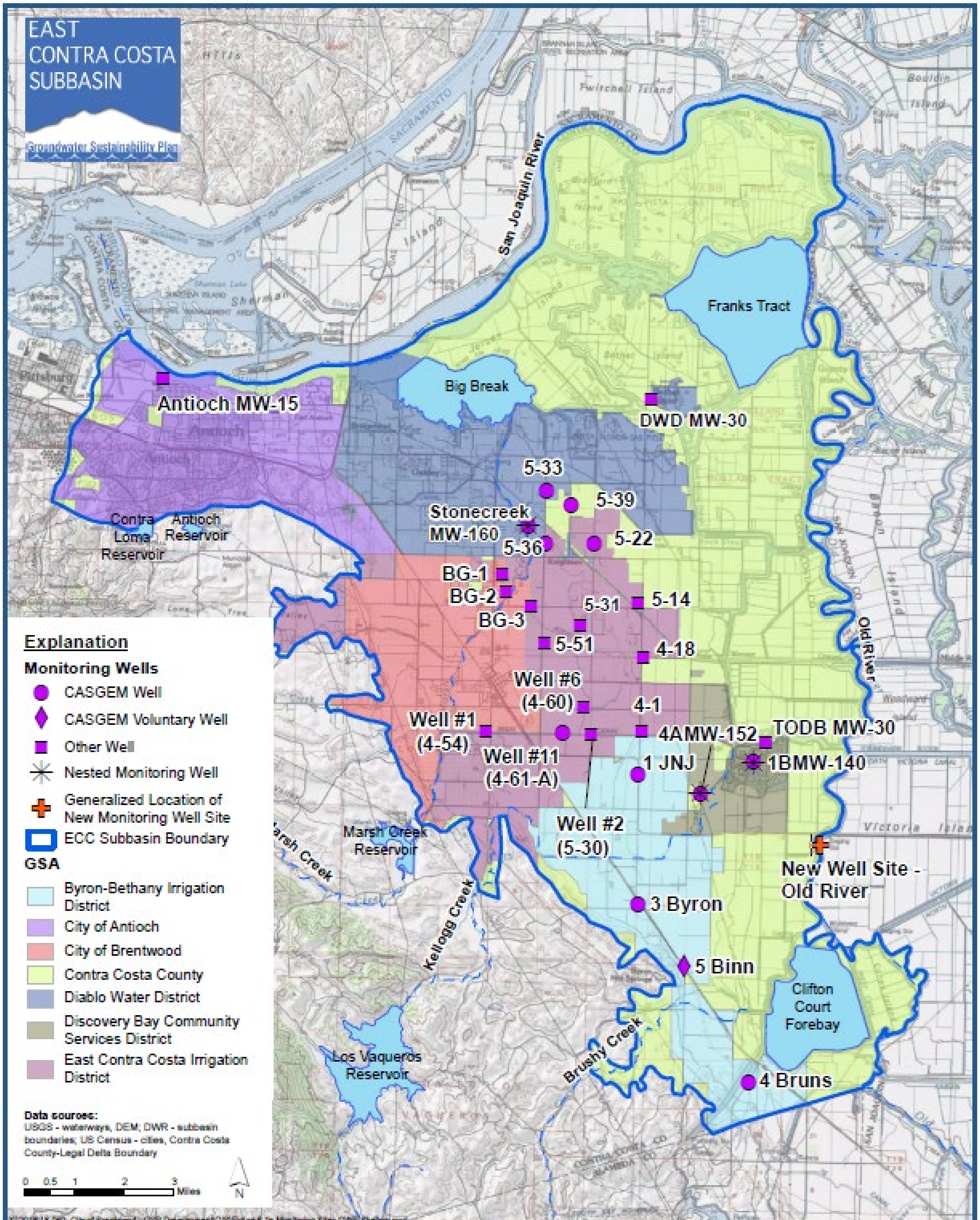
As indicated in **Table 6-2**, 55 wells are included in the basin-wide monitoring network. Well selection criteria included the following:

1. Are representative of groundwater level conditions in the Subbasin and provide monitoring in the two principal aquifers in the Subbasin: Shallow Zone and Deep Zone.
2. GSAs are committed to semiannual monitoring and are typically part of an existing monitoring program.
3. A historical data record exists.

Well locations for the basin-wide groundwater level monitoring network are shown on **Figures 6-1a** and **6-1b**. **Figure 6-1a** show wells that monitor the Shallow Zone aquifer and **Figure 6-1b** shows wells that monitor the Deep Zone. These principal aquifers are described under Basin Setting **Section 3.2.5** and reflect the vertical discretization of groundwater occurrence in the ECC Subbasin.

**Figures 6-1a** and **6-1b** include new wells to be installed as part of the GSP implementation. These wells are intended to fill data gaps and are discussed in **Section 6.2.3**.

Details of the monitoring network are provided in **Table 6-3** including name, owner, coordinates, reference point elevation (RPE), and perforation depths. Of the 55 basin-wide monitoring wells, 31 are perforated in the Shallow Zone and 19 wells are perforated in the Deep Zone. In addition, 14 nested (two or more casings within the same borehole) or multi-completion, monitoring wells located at 6 different sites are in the network (**Figure 6-1b**). CASGEM wells form a substantial part of monitoring network with 26 wells from this program. With a few exceptions, basin-wide network wells are dedicated groundwater monitoring wells with known construction features and screened only in the designated aquifer zone. Wells that are perforated through both the shallow and deep aquifer zones are not included in the monitoring network nor are wells with unknown construction features. The exceptions to this are three composite wells listed in **Table 6-3** and show on **Figure 6-1b** that are included to improve groundwater level contouring in areas lacking well control.

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**Basin-wide Groundwater Level Monitoring Network - Shallow Zone**

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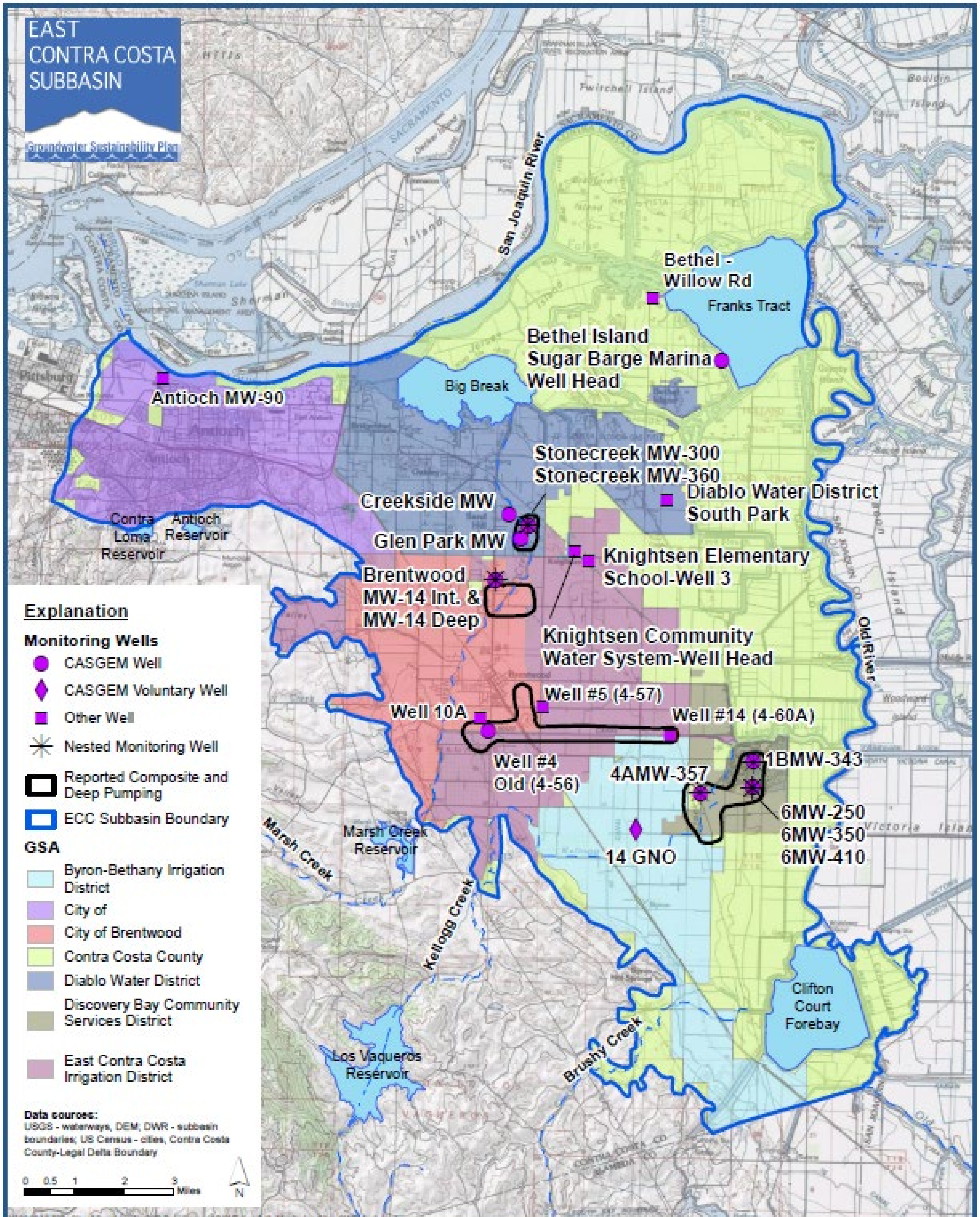
**Figure 6-1a**

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**Basin-wide Groundwater Level Monitoring Network-Deep Zone**

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*Contra Costa County, California*

**Figure 6-1b**

**Table 6-3. Basin-wide and Representative Groundwater Level Monitoring**

| Local Well Name | Well Owner/GSA | Latitude | Longitude | Reference Point Elevation (ft) | Perforation Depths (ft bgs) | CASGEM Well | Frequency | Representative Well |
|---|---|---|---|---|---|---|---|---|
| **Shallow Zone Wells** | | | | | | | | |
| Antioch MW-15[‡] | Antioch | 38.018901 | -121.819755 | 4.12 | 5-15 | No | daily* | X |
| Antioch MW-30[‡] | Antioch | 38.018887 | -121.819753 | 4.12 | 20-30 | No | daily* | |
| 1 JNJ | BBID | 37.906128 | -121.6419204 | 26.63 | 105-120 | Yes | monthly | |
| 3 Byron | BBID | 37.8684118 | -121.6412186 | 32.28 | 50-70 | Yes | monthly | |
| 4 Bruns | BBID | 37.8168913 | -121.5991577 | 35.87 | 45-65 | Yes | monthly | |
| 5 Binn | BBID | 37.8506993 | -121.6238007 | 24.42 | 45 (TD) | Yes-Voluntary | monthly | X |
| New Well | CCC/CCWD | | | | | No | daily* | X |
| New Well | CCC/CCWD | | | | | No | daily* | |
| BG-1 | CofB | 37.9638969 | -121.6933943 | 71.22 | 40-55 | No | monthly | |
| BG-2 | CofB | 37.9589412 | -121.6917498 | 62.09 | 22.5-37.5 | No | monthly | X |
| BG-3 | CofB | 37.9546062 | -121.6824842 | 55.6 | 20-35 | No | monthly | |
| DWD MW-15[‡] | DWD | 38.015495 | -121.639343 | 7.31 | 5-15 | No | daily* | |
| DWD MW-30[‡] | DWD | 38.015531 | -121.639343 | 7.26 | 20-30 | No | daily* | X |
| Stonecreek MW-160 | DWD | 37.978122 | -121.683968 | 30.76 | 100-110, 140-150 | Yes | monthly? | |
| 4-1 | ECCID | 37.91888889 | -121.6408333 | 13 | 0-10 | No | semi-annual | |
| 4-18 | ECCID | 37.94027778 | -121.6408333 | 24.6 | NA | No | semi-annual | |
| 5-14 | ECCID | 37.96527778 | -121.6455556 | 18.7 | NA | No | semi-annual | |
| 5-22 | ECCID | 37.97305556 | -121.6594444 | 17.2 | 0-10 | Yes | semi-annual | |
| 5-31 | ECCID | 37.94944444 | -121.6641667 | 45.5 | 0-10 | No | semi-annual | |
| 5-33 | ECCID | 37.98833333 | -121.6775 | 13.3 | 0.01 - 20 | Yes | monthly | |
| 5-36 | ECCID | 37.97277778 | -121.6775 | 27.4 | 0-10 | Yes | monthly | |
| 5-39 | ECCID | 37.98444444 | -121.6683333 | 12.5 | 0.01 - 20 | Yes | monthly | |
| 5-51 | ECCID | 37.95777778 | -121.6777778 | 54.1 | 0-11 | No | semi-annual | |
| Well #1 (4-54) | ECCID | 37.91805556 | -121.6983333 | 85.9 | 85-165 | No | monthly | |
| Well # 2 (5-30) | ECCID | 37.91777778 | -121.6594444 | 40.3 | 0-30 | No | monthly | |
| Well #6 (4-60) | ECCID | 37.92555556 | -121.6625 | 49.5 | 30-50 | No | monthly | |
| Well #11 (4-61-A) | ECCID | 37.91777778 | -121.67 | 55.5 | 50-100 | Yes | monthly | X |
| TODB MW-15 | TODB | | | | 5-15 | No | daily* | |
| TODB MW-30 | TODB | | | | 20-30 | No | daily* | X |
| 1BMW-140 | TODB | 37.9102996 | -121.5993985 | 4.31 | 100-130 | Yes | semi-annual | |
| 4AMW-152 | TODB | 37.9009991 | -121.6187989 | 11.67 | 122-142 | Yes | | |

| Local Well Name | Well Owner/GSA | Latitude | Longitude | Reference Point Elevation (ft) | Perforation Depths (ft bgs) | CASGEM Well | Frequency | Representative Well |
|---|---|---|---|---|---|---|---|---|
| **Deep Zone Wells** | | | | | | | | |
| Antioch MW-90‡ | Antioch | 38.01887 | -121.819748 | 4.77 | 78-88 | No | daily* | X |
| 14 GNO | BBID | 37.889861 | -121.642331 | 30.32 | 207-212, 229-238, 244-253, 273-279, 349-356 | Yes - Voluntary | monthly | |
| Brentwood MW-14 Deep | CofB | 37.9620001 | -121.6957004 | 72.76 | 284-315 | Yes | monthly | |
| Brentwood MW-14 Int. | CofB | 37.9620001 | -121.6957004 | 72.76 | 200-210, 220-230 | Yes | monthly | X |
| Bethel-Willow Rd | DWD | 38.045117 | -121.639464 | 4.69 | 230-260 | No | semi-annual | X |
| Creekside MW | DWD | 37.9812138 | -121.6911215 | 29.54 | 230-240 | Yes | monthly | |
| Diablo Water District-South Park | DWD | 37.9860934 | -121.6330831 | -3.5 | 204-264, 284-299 | No | monthly | |
| Glen Park MW | DWD | 37.9740743 | -121.6866247 | 35.54 | 220-230, 260-290 | Yes | monthly | |
| Stonecreek MW-300 | DWD | 37.978122 | -121.683968 | 30.47 | 230-240, 280-290 | Yes | monthly | X |
| Stonecreek MW-360 | DWD | 37.978122 | -121.683968 | 30.7 | 340-350 | Yes | monthly | |
| Knightsen Community Water System-Well Head | DWD | 37.9709328 | -121.6667157 | 29.911 | 235-255, 275-295 | No | monthly | |
| Knightsen Elementary School-Well 3 | DWD | 37.9679868 | -121.6613267 | 29.59 | 395-415 | No | monthly | |
| Bethel Island (Sugar Barge Marina-Well Head) | DWD | 38.027155 | -121.613661 | -6 | 317-333 | Yes | monthly | |
| Well #14 (4-60A) | ECCID | 37.92526 | -121.67739 | 55.5 | 200-330 | No | monthly | |
| 1BMW-343 | TODB | 37.9102996 | -121.5993985 | 4.38 | 270-289, 309-338 | Yes | daily | |
| 4AMW-357 | TODB | 37.9009991 | -121.6187989 | 11.54 | 307-347 | Yes | daily | X |
| 6MW-250 | TODB | 37.9028008 | -121.5994988 | 6.6 | 200-210, 230-240 | Yes | daily | |
| 6MW-350 | TODB | 37.9028008 | -121.5994988 | 6.6 | 280-290, 330-340 | Yes | daily | |
| 6MW-410 | TODB | 37.9028008 | -121.5994988 | 6.54 | 390-400 | Yes | semi-annual | |
| **Composite Wells** | | | | | | | | |
| Well 10A | CofB | 37.92166667 | -121.7008333 | 91.85 | 52-72, 135-182 | No | monthly | |
| Well #4 Old (4-56) | ECCID | 37.9178 | -121.697222 | 83.8 | 68-125, 175-195 | Yes | monthly | |
| Well #5 (4-57) | ECCID | 37.92526 | -121.67722 | 60.9 | 115-125, 170-175, 195-200, 220-245, 270-290 | No | monthly | |

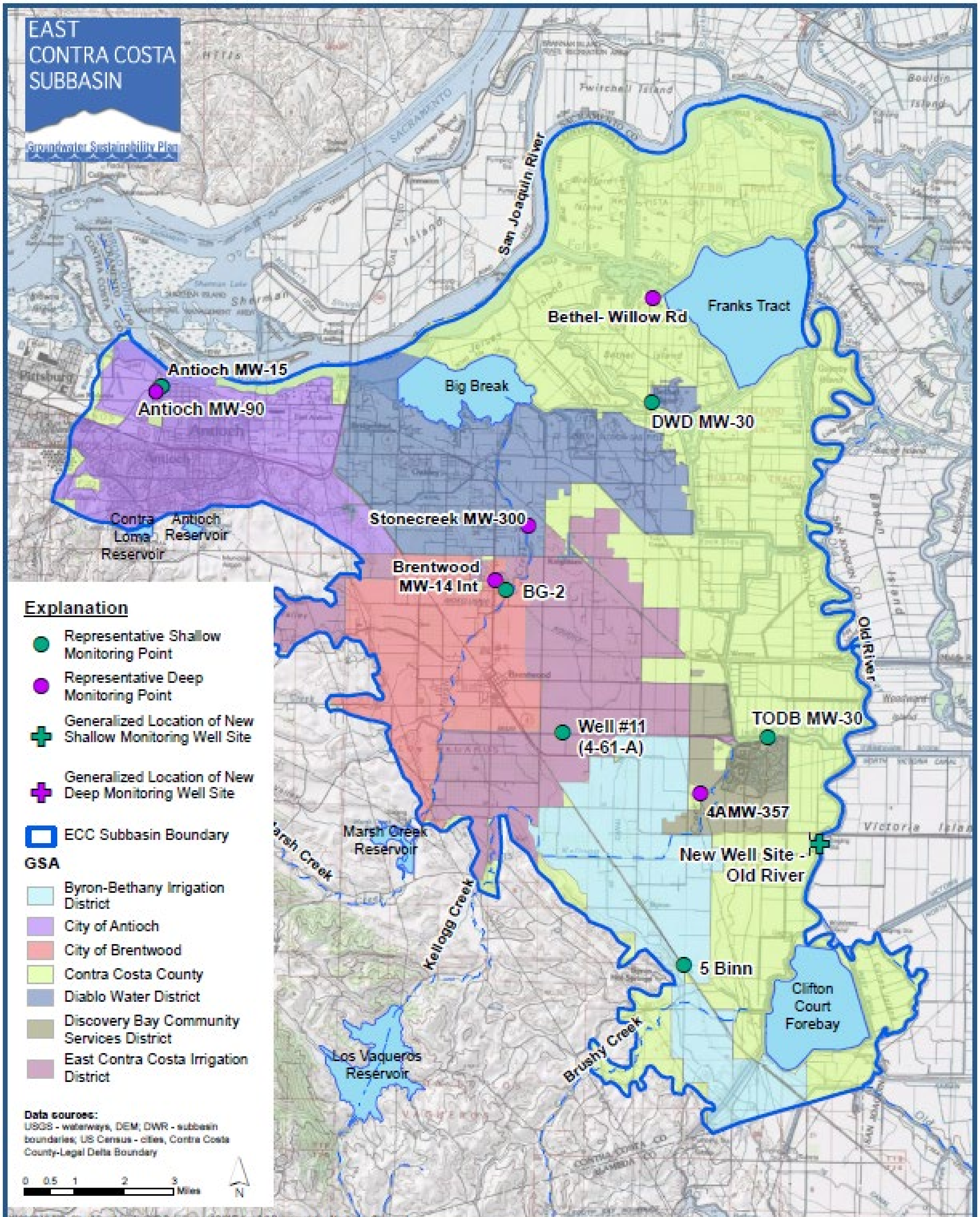
Blue indicates New Monitoring Well

‡Well installed August 2021

* New wells will be fitted with a SCADA system that will record water level measurements at least daily.

A subset of wells in the basin-wide groundwater level monitoring network was selected for the representative groundwater level monitoring network. The representative wells are intended to represent regional conditions with respect to chronic lowering of groundwater levels (sustainability indicator) and for which minimum thresholds and measurable objectives are defined. The representative monitoring wells for groundwater levels are shown on **Figure 6-2** for the Shallow Zone and Deep Zone, respectively. **Table 6-3** identifies the representative monitoring wells which are a subset of the basin-wide wells. The representative monitoring wells were selected based on the following criteria:

a. Show long term, regional trends (good historical record).
b. Dedicated monitoring wells (no production wells).
c. Known well construction features (construction date, well depth, perforation depths).
d. Monitored monthly or continuously (i.e., with transducers and data loggers).
e. Good horizontal and vertical spatial distribution.
f. Greater number for high pumping areas (i.e., representative of conditions in vicinity of high municipal and agricultural pumpage).
g. Professional judgment used where more than one suitable well is present.
h. Include areas of domestic wells and disadvantaged communities.

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**Representative Groundwater Level Monitoring Network**

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*Contra Costa County, California*

**Figure 6-2**

#### 6.2.2.2. Spatial Density of Groundwater Level Monitoring Network

The ECC Subbasin monitoring networks have a well density that exceeds recommended practices contained in Monitoring Networks and Identification of Data Gaps, Best Management Practices, (DWR, 2016). This BMP states that "the network should contain an adequate number of wells to observe the overall static conditions and the specific project effects." It also states that there is no rule for the density of monitoring points but does provide a table of existing references (see **Table 6-4**, below**)** that lists density of monitoring wells per hundred square miles with ranges between 0.2 to 10 monitoring wells per 100 square miles. Given a maximum estimated ECC Subbasin groundwater pumping of approximately 14,000 af in the drought year of 2009 (12,700 af metered and 1,100 af unmetered), this converts to 8,300 acre-feet/year per 100 square miles resulting in about 2 monitoring wells per 100 square miles per the Hopkins (1984) guidance.

**Table 6-4. Groundwater Level Monitoring Well Density Considerations[2]**

| Reference | Monitoring Well Density (wells per 100 miles$^2$) |
|---|---|
| Heath (1976) | 0.2 - 10 |
| Sophocleous (1983) | 6.3 |
| Hopkins (1984)<br>Basins pumping more than 10,000 acre-feet/year per 100 miles$^2$ | 4.0 |
| Basins pumping between 1,000 and 10,000 acre-feet/year per 100 miles$^2$ | 2.0 |
| Basins pumping between 250 and 1,000 acre-feet/year per 100 miles$^2$ | 1.0 |
| Basins pumping between 100 and 250 acre-feet/year per 100 miles$^2$ | 0.7 |

For a subbasin area of approximately 168 square miles and with 55 basin-wide monitoring wells and 12 representative monitoring network wells, the ECC basin-wide and representative monitoring well densities are 33 wells per 100 square miles and 7 wells per 100 square miles, respectively (see **Table 6-5**, below). These well densities exceed the Sophocleous and Hopkins recommendations and exceed or falls within the Heath recommendations in the BMP technical guidance represented in **Table 6-4**, above.

[2] Table 6-4 is a reproduction of Table 1 in the DWR BMP Monitoring *Networks and Identification of Data Gaps*.

**Table 6-5. ECC Subbasin Groundwater Level Monitoring Networks Density**

| Monitoring Network | No. of Wells | Well Density (Wells per 100 square miles$^2$) |
|---|---|---|
| Basin-wide Monitoring Network | 55 | 33 |
| Representative Monitoring Network | 12 | 7 |

#### 6.2.2.3. Frequency and Timing of Groundwater Level Monitoring

Groundwater elevation measurements will be made at a minimum of semi-annually to capture seasonal high and seasonal low levels. Historic groundwater monitoring data indicate that seasonal high elevations occur in winter to spring months (February-April) and seasonal low elevations occur in the fall (September-October). **Table 6-3** includes the frequency of monitoring for each well in the basin-wide network. Historically through the present, chronic lowering of groundwater levels has not been observed in the ECC Subbasin; however, if conditions change in the future, the semi-annual monitoring frequency will be reevaluated to ensure that monitoring of this sustainability indicator complies with SGMA regulations.

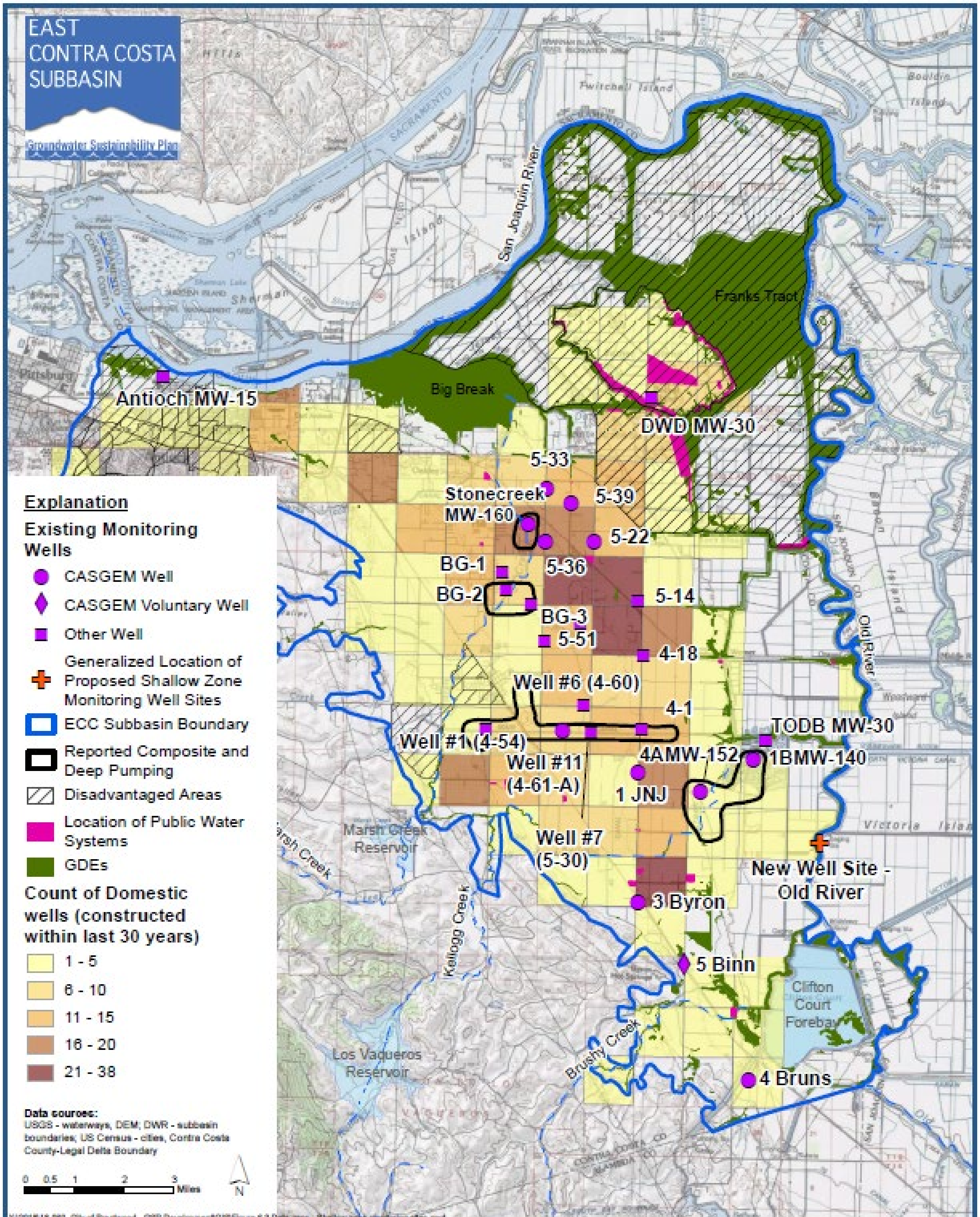
#### 6.2.2.4. Groundwater Level Data Gaps

The existing ECC groundwater level monitoring network is sufficient to monitor areas near the major municipal pumping. However, data gaps were identified in areas where groundwater pumping is limited to only domestic and small water systems. Additional Shallow Zone wells will be installed to accomplish the following objectives:

- Increase density of groundwater level monitoring wells.
- Provide information on surface water and groundwater interaction and conditions near groundwater dependent ecosystems (GDEs).
- Provide information on boundary conditions.
- Ensure that long-term monitoring results are consistent and reliable.
- Improve understanding of impact of groundwater management to beneficial users.
- Improve characterization of groundwater flow regimes.

#### 6.2.2.5. Plan to Fill Groundwater Level Data Gaps

The installation and instrumentation of 9 Shallow Zone groundwater level monitoring wells at four sites are planned as part of the preparation of this GSP and will be implemented under a Proposition 68 grant from DWR. **Figure 6-3** shows the new monitoring wells and existing Shallow Zone monitoring network in relation to other beneficial users of groundwater in the ECC Subbasin: Disadvantaged Areas, small public water systems, GDEs, and de minimis users (domestic well owners). These beneficial users were considered in siting the new monitoring wells. **Figure 6-1b** shows the deep monitoring well network in relation to the one new deep zone monitoring well location (Antioch) and areas of larger-scale pumping by municipal and agricultural users. The following **Table 6-6** lists the data gaps filled by each new well. The new monitoring wells will increase the density of the groundwater level monitoring network and enhance coverage of groundwater level data. It is recognized that additional data gaps may become evident during and after GSP implementation. As supported by data from the monitoring networks, such data gaps will be filled to ensure sustainable management of the Subbasin.

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**Data Gap - Shallow Zone Groundwater Level Monitoring Network**

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*Contra Costa County, California*

**Figure 6-3**

**Table 6-6. Proposed New Monitoring Wells to Fill Data Gaps**

| Data Gap | Antioch[1] Shallow/Deep | Bethel Island[2] Shallow | TODB[3] Shallow | CCC/CCWD Shallow |
|---|---|---|---|---|
| **Climate Change: Monitor Sea Level Rise, Increase in Chloride/TDS** | x | x | | |
| **Expand Shallow Zone Network** | x | x | x | x |
| **Expand Deep Zone Network** | x | | | |
| **Groundwater Quality** | x (esp. Cl and TDS) | x (esp. Cl and TDS) | x | x |
| **Near GDEs and Monitors for Shallow Groundwater/Surface Water Interaction.** | x | x | x | x |
| **Located near Small Public Water Systems and Domestic Wells** | x | x | | |
| **Located near Disadvantaged Areas** | x | x | | |
| **Adjacent to Municipal Well Pumping** | | | x | |
| **Subbasin Boundary Conditions** | x | x | | x |
| **Construction: Perforations (ft bgs)** | 10-15, 20-30, 85-95 | 5-10, 20-30 | 10-15, 20-30 | 5-15, 25-35 |

1. City of Antioch does not pump groundwater for municipal supply. Domestic supply source is surface water only.
2. Bethel Island is served by public water systems and domestic wells.
3. TODB pumps only groundwater for municipal supply.

### 6.2.3. Groundwater Quality Monitoring Network

The groundwater quality monitoring network includes municipal production wells that report groundwater quality as regulated by the State Division of Drinking Water under Drinking Water Programs. The objectives of the groundwater quality monitoring program for the ECC Subbasin include the following:

- Evaluate and determined a baseline of groundwater quality conditions in both Shallow Zone and Deep Zone aquifers in the Subbasin and in areas of higher groundwater use.
- Assess changes and trends in groundwater quality (seasonal, short- and long-term trends).
- Incorporate existing groundwater quality monitoring programs (i.e., monitoring of Public Water Systems under the state Drinking Water Programs).
- Provide means to assess groundwater quality impacts to beneficial uses and users including but not limited to effects on primary and secondary drinking water standards for domestic users, crop suitability for agricultural users, and groundwater dependent ecosystems.

- Identify natural (e.g., climate change) and anthropogenic factors that affect groundwater quality including the potential for mobilization of contamination through groundwater flow patterns that may be altered by sustainable management activities.

This section describes the basin-wide and representative monitoring networks, monitoring frequency, spatial density, and monitoring protocols for the degraded groundwater quality sustainability indicator. The monitoring networks are enumerated in **Table 6-7**, below. As discussed in **Section 7**, only representative monitoring wells are used to determine compliance with minimum thresholds or measurable objectives for the degraded water quality sustainability indicator.

**Table 6-7. GSA Groundwater Quality Monitoring Network**

| GSA | Number of Wells | | | | |
|---|---|---|---|---|---|
| | Basin-Wide Network | | | | Total Representative Monitoring Network |
| | Existing Monitoring Wells | New Monitoring Wells | Production Wells | Total Basin-Wide | |
| **BBID** | | | | | |
| **City of Antioch** | | 2 | | 2 | 2 |
| **City of Brentwood** | 1 | | 8 | 9 | 3 |
| **Contra Costa County/CCWD** | | 1 | | 1 | 1 |
| **Diablo Water District** | 1 | 1 | 2 | 4 | 3 |
| **Town of Discovery Bay** | | 1 | 5 | 6 | 2 |
| **ECCID** | | | | | |
| **Total** | 2 | 5 | 15 | 22 | 11 |

Note: Multiple completion monitoring wells are counted as separate wells for each depth.

### 6.2.3.1. Basin-wide Groundwater Quality Monitoring Network

The Basin-wide groundwater quality monitoring network is summarized in **Table 6-7**. Details of the basin-wide monitoring network are provided in **Table 6-8** including well name, owner, perforation depths, and monitoring frequency. The wells are grouped according to aquifer zone (Shallow Zone and Deep Zone). The network consists of consists of 22 wells of which 5 are completed in the Shallow Zone and 17 in the Deep Zone. The Shallow Zone and Deep Zone well locations are shown on **Figure 6-4**.

Other agencies track groundwater contamination including GeoTracker (online resource). **Section 3.3.6** discusses the groundwater contamination sites in the ECC Subbasin and **Appendix 3h** lists the 35 open sites and the 105 closed sites in the Subbasin. The lists and locations will be updated to identify any changes in plume movement

**Table 6-8. Basin-wide and Representative Groundwater Quality Monitoring Network**

| Local Well Name | Owner/ GSA | Perforation | Data: First Date | Data: Last Date | Frequency | Seawater Intrusion Monitoring Network | Representative Monitoring Wells |
|---|---|---|---|---|---|---|---|
| **Shallow Zone** | | | | | | | |
| BG-1 | Brentwood | 40-55 | 2/17/2008 | 2/15/2015 | Annual[1] | | x |
| Antioch MW-15‡ | Antioch | 5-15 | | | Annual[1] | x | x |
| DWD MW-30‡ | DWD | 20-30 | | | Annual[1] | x | x |
| TODB MW-30 | TODB | 20-30 | | | Annual[1] | x | x |
| New Well Old River 1 of 2 | CCC/CCWD | | | | Annual[1] | x | x |
| **Deep Zone** | | | | | | | |
| Antioch MW-90‡ | Antioch | 78-88 | | | Annual[1] | | x |
| City of Brentwood-Well 06 | Brentwood | 250-300 | 8/16/1990 | 8/7/2019 | Variable[2] | | |
| City of Brentwood-Well 07 | Brentwood | 265-295 | 5/5/1988 | 5/6/2019 | Variable[2] | | |
| City of Brentwood-Well 08 | Brentwood | 225-315 | 6/14/1993 | 5/6/2019 | Variable[2] | | |
| City of Brentwood-Well 09 | Brentwood | 210-230 | 7/19/2004 | 6/1/2016 | Variable[2] | | |
| City of Brentwood-Well 12 | Brentwood | 350-380, 430-450 | 12/18/1997 | 6/1/2016 | Variable[2] | | |
| City of Brentwood-Well 13 | Brentwood | 350-380, 430-480 | 12/17/1997 | 5/9/2019 | Variable[2] | | x |
| City of Brentwood-Well 14 | Brentwood | 285-315 | 11/3/2000 | 5/9/2019 | Variable[2] | | x |
| City of Brentwood-Well 15 | Brentwood | 239-259 289-324 | 7/26/2006 | 12/9/2019 | Variable[2] | | |
| Glen Park Well | DWD | 230-245, 260-300 | 5/4/2004 | 6/19/2019 | Variable[2] | | x |
| Stonecreek Well | DWD | 220-295 | 5/10/2010 | 6/19/2019 | Variable[2] | | |

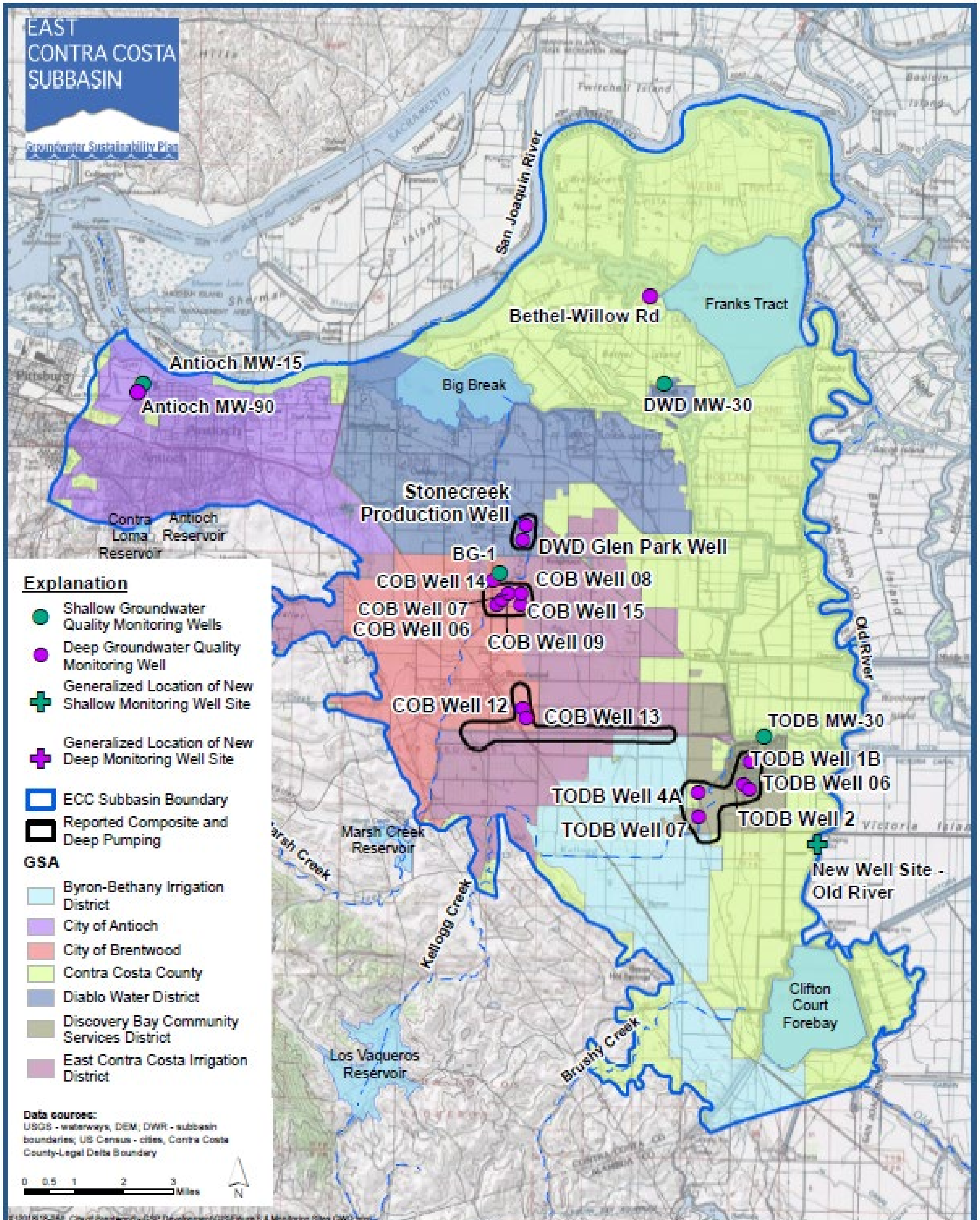
| Local Well Name | Owner/ GSA | Perforation | Data: First Date | Data: Last Date | Frequency | Seawater Intrusion Monitoring Network | Representative Monitoring Wells |
|---|---|---|---|---|---|---|---|
| Bethel-Willow Rd | DWD | 230-260 | | | Annual[1] | | x |
| Town of Discovery Bay Well 1B | TODB | 271-289, 308-340 | 3/28/1995 | 5/23/2019 | Variable[2] | | |
| Town of Discovery Bay Well 2 | TODB | 245-335 | 11/19/1986 | 5/23/2019 | Variable[2] | | |
| Town of Discovery Bay Well 4A | TODB | 307-347 | 8/1/1996 | 5/23/2019 | Variable[2] | | x |
| Town of Discovery Bay-Well 06 | TODB | 270-295, 305-350 | 8/24/2009 | 5/23/2019 | Variable[2] | | |
| Town of Discovery Bay-Well 07 | TODB | 282-292 | 7/30/2015 | 7/9/2019 | Variable[2] | | |

Blue indicates New Monitoring Well

‡ Well installed August 2021

1. Sampling frequency is annual for first five years at which time it will be evaluated and potentially changed to align with typical compliance monitoring (e.g., 3 or 5 years depending on constituent).

2. Variable as per current compliance monitoring under state drinking water programs.

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**Basin-wide Groundwater Quality Monitoring Network**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 6-4**

#### 6.2.3.2. Representative Groundwater Quality Monitoring Network

The representative monitoring network for the Shallow Zone is the same as the Basin-wide monitoring network (see **Figure 6-4**). The Deep Zone representative monitoring network is a subset of the Basin-wide Monitoring Network and consists of 4 existing wells in the zones of municipal pumping plus one new well (Antioch) and an existing deep well on Bethel Island (DWD) that are both areas of data gaps discussed under groundwater level monitoring (see **Figure 6-5**). **Table 6-8** lists features of the representative monitoring wells in both Shallow Zone and Deep Zone aquifers. For the Deep Zone, the selected representative wells in areas of high production are municipal wells that are completed solely in the deep aquifer zone and for which historical and ongoing water quality testing data are available.

#### 6.2.3.3. Spatial Density, Frequency, and Data Gaps of Groundwater Quality Monitoring Network

Monitoring wells are distributed in both principal aquifer zones in the ECC Subbasin. Monitoring in the Deep Zone aquifer is focused on areas of highest groundwater production plus data gap areas in Antioch and on Bethel Island (see **Figure 6-5**). Sampling frequency will be consistent with typical compliance monitoring for municipal wells to provide sufficient data to evaluate groundwater quality trends over time in each aquifer zone. No additional monitoring wells are required at this time and the network will be reevaluated for the 5-year report. The groundwater quality monitoring network may be expanded if any of the following occurs: changes to groundwater quality restricting beneficial use, increase in groundwater development and/or shifts in pumping patterns, or if there is a change in groundwater management actions or projects. In such cases, the need to adapt monitoring frequency and/or sites shall be determined from the monitoring record.

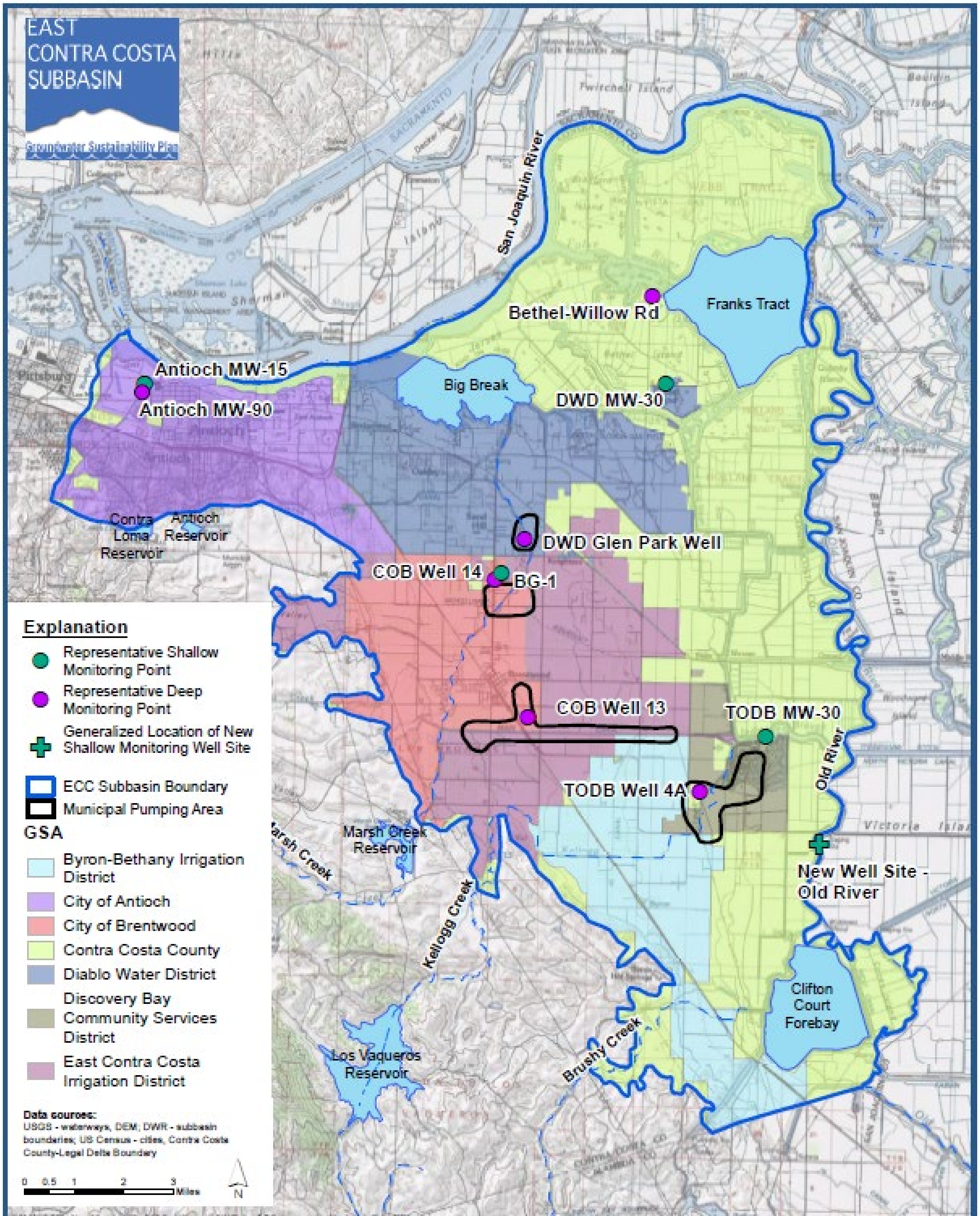
### 6.2.4. Seawater Intrusion Monitoring Network

The seawater intrusion monitoring network is designed to address a mechanism by which Delta baywater migrates into shallow groundwater (see discussion in **Section 3.3.4**). The potential for intrusion of saline water into the shallow zone may be exacerbated by sea level rise. These intrusion mechanisms could impact groundwater sustainability if saline water in the Shallow Zone migrated vertically into the Deep Zone supply source. At present, there is no evidence that saline intrusion from Delta baywaters has occurred or adversely affected groundwater resources in the ECC Subbasin.

The sustainability indicator for Seawater Intrusion (baywater for this Subbasin) is evaluated using a chloride concentration map that will include a new dedicated Shallow Zone monitoring wells that will act as sentinels for baywater intrusion and degradation. **Table 6-8** lists the Shallow and Deep Zone Wells used to monitor chloride concentration and **Figure 6-5** shows the locations of these wells. There is currently no Shallow Zone chloride concentration contour map since the four new monitoring well results are not yet available to provide the necessary well control. However, **Figure 3-16d** shows the average chloride (2008 to 2018) concentration in all Shallow Zone and Deep Zone wells.

Seawater Intrusion Monitoring Protocols are the same as for those used for groundwater quality (**Appendix 6a**). Chloride concentration contour intervals will be based on the ranges of recorded values, well control, and analytic considerations.

Seawater Intrusion Monitoring Data Gap: Currently there is no historic seawater intrusion in the Subbasin. The four new shallow monitoring well pairs will serve as sentinels and inform on the need for expanded monitoring at other locations. As data is collected and analyzed and if conditions change, additional wells can be installed with consideration of spatial and vertical control.

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**Representative Groundwater Quality Monitoring Network**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

Figure 6-5

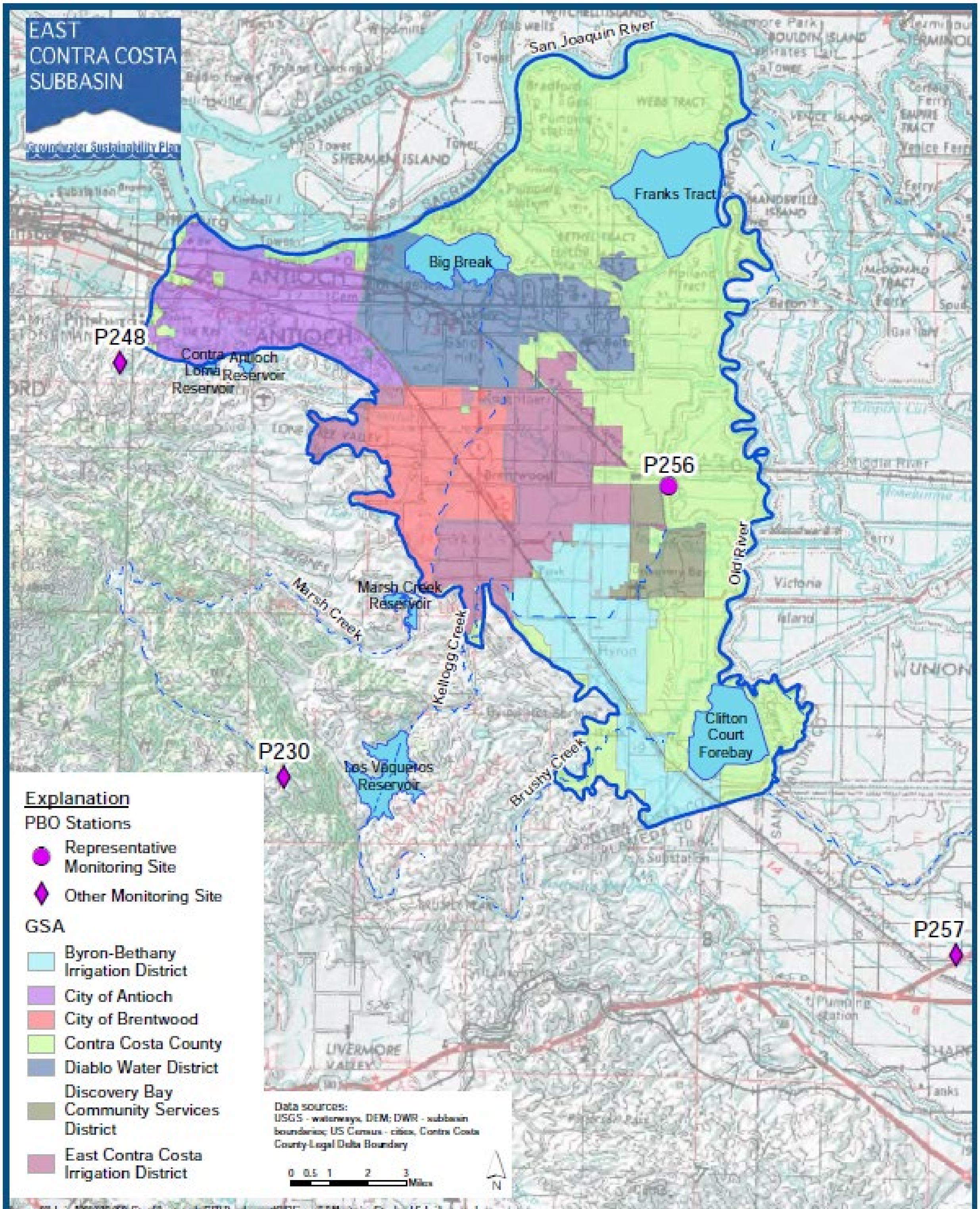
### 6.2.5. Land Subsidence Monitoring Network

The ECC Subbasin is not a locus for inelastic land subsidence due to groundwater extraction. This is a result of stable historic groundwater levels and lack of subsurface lithologies that would be susceptible to subsidence. However, the sustainability indicator for land subsidence will be monitored through an existing network as discussed below.

The existing land subsidence monitoring network applicable to the ECC Subbasin is comprised of four Plate Boundary Observatory (PBO) (see **Figure 6-6**) Stations. Details about the PBO network are presented in **Section 3.3.7**. PBO Station 256 is located within the ECC Subbasin and three others, P230, P248 and P257, are located in the same region but outside the Subbasin boundary. DWR has also published Interferometric Synthetic Aperture Radar (InSAR) results in partnership with the European Space Agency's Sentinel-1A satellite with the data processed by TRE ALTAMIRA[3]. These data present measurements of vertical ground surface displacement between two different dates. InSAR mapping of land surface elevation is particularly useful for complementing high spatial and temporal resolution data at CGPS station locations with observations of land subsidence over a large area for highlighting locations where change is occurring.

The representative monitoring network consists of Station 256 (P256). While land subsidence network spatial density recommendations are not provided in DWR technical guidance documents, the use of data from P256 is considered sufficient based on the lack of historical subsidence and lack of lithologies generally associated with subsidence caused by pumping. InSAR has been made available for the Subbasin and will provide coverage for the entire Subbasin and be used to compare results from the Station 256. In addition, the groundwater level monitoring will serve as a proxy to assess the sufficiency of the subsidence monitoring networks. Data from PBO Station 256 and InSAR will be reviewed annually. The land subsidence networks will be evaluated as part of the 5-year update and if there is evidence of subsidence at that time, additional monitoring will be considered.

[3] https://gis.water.ca.gov/arcgisimg/rest/services/SAR

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Land Subsidence Monitoring Network

Figure 6-6

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

### 6.2.6. Interconnected Surface Water Monitoring Network

The Monitoring Networks and Identification of Data Gaps BPM (DWR, 2016) states that an interconnected surface water and groundwater network should include stream gages and groundwater level monitoring in areas where there is a known surface water groundwater connection. These data are then used to estimate depletions.

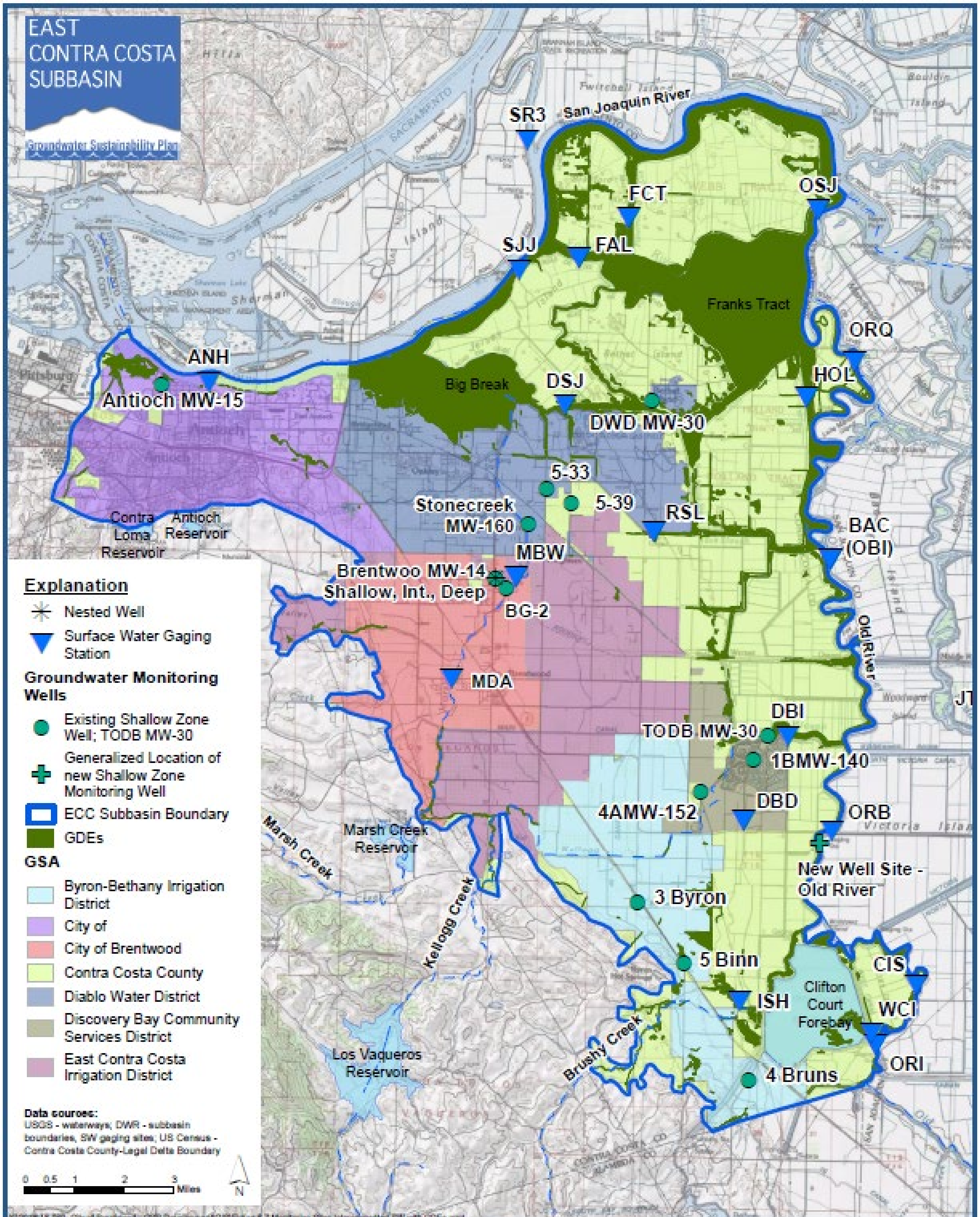
The interconnected surface water monitoring network for the ECC Subbasin consists of a subset of 15 Shallow Zone groundwater level monitoring network wells that are located adjacent to creeks, rivers and GDEs along with existing surface water flow monitoring stations (see **Figure 6-7** and **Table 6-9**). There are 19 surface water monitoring sites in the Subbasin or in the vicinity of the Subbasin boundary. These stations are independently or jointly operated by Contra Costa County Flood Control and Water Conservation District, DWR, and USGS. Most of the surface water monitoring stations at locations adjacent to the San Joaquin River, Old River, Middle River, Marsh Creek, and water conveying canals. Flow data collected at these stations (stage and/or flow rate) are publicly available. There is a range of historical data associated with these stations providing an ability to develop historical baselines to compare with future monitoring results.

A representative monitoring network is not necessary because the groundwater level monitoring network serves as a proxy for depletion of interconnected surface water. Surface water monitoring protocols are established by the monitoring entity (DWR and USGS in most cases). Spatial density for interconnected surface water monitoring networks is not specified in the Monitoring Networks and Identification of Data Gaps BMP (DWR, 2016), the incorporation of the active stations is considered sufficient for GSP implementation based on professional judgement. The special coverage for this initial GSP will be evaluated in the 5-year GSP update.

Currently there is an incomplete understanding of the interconnected surface water systems in the Subbasin. This is expected to be remedied through installation of shallow multiple completion monitoring wells (eight wells at four sites as part of this GSP) and future monitoring efforts related to this GSP.

#### 6.2.6.1. Groundwater Dependent Ecosystem Monitoring

GSP Regulations do not require the monitoring of GDEs in a GSP, however, GDEs must be properly identified within the Plan area utilizing data available from DWR, as specified in GSP Regulation §353.2, or the best information available to the Agency. The subbasin will annually review remote sensing to monitor the health of GDEs. Landsat imagery is available at a resolution of 30 meters every 16 days, from which long-term temporal trends of vegetation metrics can be assessed on The Nature Conservatory's (TNC) GDE Pulse web app, allowing users to infer the relationships between groundwater levels, precipitation, and GDE vegetation metrics. As detailed on the GDE Pulse website, the methods in which TNC processed the satellite data results in a geospatial representation of the Normalized Derived Vegetation Index (NDVI) to estimate vegetation greenness and Normalized Derived Moisture Index (NDMI) to estimate vegetation moisture. TNC provides the average NDVI and NDMI for all Landsat pixels, masked to spatial data from the iGDE database, to present the average and trend geospatial layers representing positive and negative trends in the two-vegetation metrics.

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**Interconnected Surface Water Monitoring Network**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 6-7**

### Table 6-9. Basin-wide Interconnected Surface Water Monitoring Network

| Station Name | CDEC Code | Monitoring Entity | Monitoring Frequency |
|---|---|---|---|
| **San Joaquin River at Antioch** | ANH | CA Dept of Water Resources | Hourly |
| **Bacon Island at Old River** | BAC | CA Dept of Water Resources | Hourly |
| **Old River at Coney Island** | CIS | CA Dept of Water Resources | 15 minutes |
| **Discovery Bay at Discovery Bay Blvd** | DBD | CA Dept of Water Resources | Hourly |
| **Discovery Bay at Indian Slough** | DBI | CA Dept of Water Resources | Hourly |
| **Dutch Slough At Jersey Island** | DSJ | US Geological Survey | 15 minutes |
| **False River Near Oakley** | FAL | US Geological Survey and CA Dept of Water Resources | 15 minutes |
| **Fishermans Cut** | FCT | CA Dept of Water Resources | 15 minutes |
| **Holland Cut Near Bethel Island** | HOL | US Geological Survey and CA Dept of Water Resources | Hourly |
| **Italian Slough Headwater Nr Byron** | ISH | CA Dept of Water Resources | 15 minutes |
| **Marsh Creek at Brentwood** | MBW | Contra Costa County Flood Control and Water Conservation District | 15 minutes |
| **Marsh Creek at Dainty Blvd** | MDA | Contra Costa County Flood Control and Water Conservation District | 15 minutes |
| **Old River at Bacon Island (USGS)** | OBI[4] | US Geological Survey and CA Dept of Water Resources | Hourly |
| **Old River at Byron** | ORB | CA Dept of Water Resources | 15 minutes |
| **Old River at Clifton Court Intake** | ORI | CA Dept of Water Resources | 15 minutes |
| **Old River at Quimbly Is Near Bethel Is** | ORQ | US Geological Survey and CA Dept of Water Resources | 15 minutes |
| **Old River at Franks Tract Near Terminus** | OSJ | US Geological Survey and CA Dept of Water Resources | hourly |
| **Rock Slough Abv Contra Costa Canal** | RSL | CA Dept of Water Resources | 15 minutes |
| **San Joaquin River at Jersey Point (USGS)** | SJJ | US Geological Survey | 15 minutes |
| **Three Mile Slough at San Joaquin River** | SR3 | CA Dept of Water Resources | 15 minutes |
| **West Canal at Clifton Court Intake** | WCI | CA Dept of Water Resources | 15 minutes |

[4] Same as Bacon Island at Old River (BAC).

## 6.3. Protocols for Data Collection and Monitoring (§ 352.2)

The GSP monitoring protocols are consistent with the Groundwater Monitoring Protocols, Standards, and Sites Best Management Practice (DWR, 2016). The recommended monitoring protocols were adapted based on experience of the ECC GSAs with the final protocols meeting or exceeding the recommendations in the BMP guidance document.

Monitoring protocols for groundwater pumping were not given in the BMP document but accounting for groundwater pumping is an important part of managing sustainability in the ECC Subbasin. Therefore, monitoring protocols for measuring groundwater pumping are included in this GSP.

The monitoring protocols that are described in **Appendix 6a** will provide the necessary data to track minimum thresholds and measurable objectives for each sustainability indicator. The monitoring protocols established here are to be reviewed in 5 years as a part of periodic review of the GSP. The following protocols shall be employed at all monitoring sites:

- Document basic information for each monitoring point: a unique identifier, a description of the site location, geographical coordinates, elevation, date established, access instructions, and type(s) of data to be collected.
    - *A modification log shall be to be kept in order to track all modifications to the monitoring site.*
- Locations shall be reported in geographical coordinates to a minimum accuracy of 30 feet or relative to the North American Datum of 1983 (NAD83).
- Reference point elevations shall be measured in feet to an accuracy of at least 0.5 feet relative to the North American Vertical Datum of 1988 (NAVD 88).

## 6.4. Data Gaps

The ECC Subbasin monitoring networks consists of groundwater monitoring wells, stream gages and subsidence monitoring stations. The networks will be integrated into the GSP to monitor hydrological conditions for six SGMA sustainability indicators.

The number of groundwater monitoring wells in the ECC Subbasin networks exceeds the minimum number of wells recommended in the DWR BMP technical guidance. As per the method developed by Hopkins (1984) and included in the BMP, a basin that pumps groundwater between 1,000 and 10,000 AFY per 100 square miles should have two monitoring wells. The ECC Subbasin has four monitoring wells and a maximum historical annual groundwater pumpage of approximately 14,000 AF (12,700 af metered and 1,100 af non-metered). When prorated to the Subbasin area of 168 square miles, pumpage is 8,300 af and the number of wells is 2.4 per 100 square miles thus satisfying the Hopkins (1984) criterion for a basin that pumps between 1,000 and 10,000 AFY per 100 square miles.

Groundwater pumping and usage vary between the seven GSAs in the ECC Subbasin. As a result, the monitoring network was designed to provide a higher density of monitoring sites in areas where groundwater pumping is high, while providing a sufficient spatial coverage throughout the Subbasin. The monitoring schedule for each sustainability indicator was developed to utilize existing monitoring programs while ensuring that relevant seasonal, short-term, and long-term trends are captured. The monitoring sites meet the standards described in GSP Regulations § 352.4.

The rationales for selection of groundwater monitoring wells were their construction (penetrate only one aquifer zone), location relative to the Subbasin boundary, groundwater pumping wells and surface water features, being affiliated with current monitoring programs, and availability of historical data. Subsidence and surface water monitoring stations were selected based on their locations and availability of data. Data gaps have been initially evaluated and filled with new monitoring wells to be installed prior to implementation of the GSP. To the extent that other data gaps become evident through evaluation of hydrologic conditions and have the potential to impair sustainable groundwater management, additional wells shall be proposed and assessed to add to the networks.

### 6.4.1. Well Inventory Data Gap

To date, there have been no comprehensive efforts or procedures instituted to inventory active production wells in the ECC Subbasin. With the implementation of this GSP, a well inventory program shall be created with completion targeted for the 5-year Plan update. The well inventory will be developed as a tool to better understand how management of the Subbasin affects groundwater users should adverse impacts occur.

The process of creating a well inventory will be coordinated with the Contra Costa County Environmental Health Division which is the permitting agency for new wells in the ECC Subbasin. A procedure for sharing information on all new wells constructed under the County's permitting authority with the ECC Subbasin Data Management System shall be developed. The well inventory system will track various parameters including the following:

- Well location and GIS coordinates
- Date installed
- Permit number (County)
- Well Drillers Report number (DWR)
- Depth of well
- Well diameter
- Depths of perforations
- Use (domestic, industrial, commercial, agricultural, other)

A method to incorporate wells constructed prior to the new data exchange system is implemented will be evaluated with the objective that the DMS substantially accounts for active wells that serves sustainable management goal of the Subbasin as detailed in **Section 7**, **Sustainable Management Criteria**.

## 6.5. Ongoing Monitoring Network Evaluation

Monitoring network of the ECC GSP was established based on the ability to adequately monitor each sustainability indicator while utilizing all available monitoring sites. Each 5-year update of the GSP will include an analysis of the existing monitoring network and its ability to accurately characterize conditions and achieve sustainability. One data gap that has been currently identified is the monitoring of interconnected surface water, and it will be addressed before the next GSP update.

The monitoring network will be evaluated and potentially updated under any of the following conditions before a 5-year update:

- Exceedance of minimum threshold of a sustainability indicator.
- Highly variable spatial or temporal conditions that are inconsistent with historical baselines and the hydrogeological conceptual model.
- Adverse impacts to beneficial uses and users of groundwater.
- Determination of potential adverse effects on the ability of an adjacent basin to implement a GSP or impede achievement of sustainability goals in that basin.

## 6.6. Groundwater Data Management

The GSAs in the ECC Subbasin will measure the groundwater levels of wells according to the monitoring protocols set forth in the GSP **Appendix 6a**. Water level data will be submitted to a designated GSA or directly to a database manager for the GSP.

Groundwater quality samples will be collected by GSAs and sent for analysis by a certified laboratory per local practice. Quantitative testing results shall be submitted either to the designated GSA or directly to the GSP database manager. The database manager will annually transmit to the GSAs hydrographs for wells, analytical plots, brief overview of data and field reports.

Groundwater levels of the wells that are in the CASGEM network are typically collected in mid-March and mid-October of each year. All semi-annual data is sent to the database manager for review and uploading to the DWR website by March 31 (spring data) and October 31 (fall data). The database manager will upload the data according to procedures specified by DWR. In accordance with GSP Regulation §354.4, copies of monitoring data stored in the DMS shall be included in annual reports and submitted electronically on forms provided by DWR. The ECC GSAs have established guidelines to ensure that data are managed according to permissions granted by each well owner and/or as relating to applicable permit conditions.

## 6.7. Data Management System (§ 352.6)

In accordance with GSP Regulation § 352.6, the ECC Subbasin Data Management System (DMS) has been developed to incorporate existing and new data related to groundwater resources in the Subbasin. Site-specific information for monitoring points (identification, owner, location, construction details, measurement types, measurement method, measurement frequency, affiliated monitoring programs, permission, and other comments) and time series data shall be securely stored and backed-up in the DMS. The DMS is also capable of processing data and producing reports to meet the reporting requirements under GSP implementation. The current DMS platform is Microsoft Access and the database manager can control the access to data by DMS users.

## 6.8. Data Use and Disclosure

Some wells in the monitoring network are privately-owned. Monitoring and data reporting associated with those wells are conducted with the permission of well owners. Exact location information of private wells will be redacted from submittals, while water level and quality data will be published with the well owner's permission. Groundwater quality of public supply wells will be publicly available.

## 6.9. Data Submittals

Monitoring data will be submitted to DWR in electronic formats utilizing the forms provided by the DWR (GSP Reg. § 353.4).

## 6.10. Reporting

Annual reporting and periodic evaluation for the ECC GSP monitoring networks are detailed in **Section 9**.

## 6.11. References

California Department of Water Resources (DWR). December 2016. Guidance Document for the Sustainable Management of Groundwater: Monitoring Networks and Identification of Data Gaps, Best Management Practice.

## SECTION 7 CONTENTS

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## APPENDICES

# 7. SUSTAINABLE MANAGEMENT CRITERIA

Sustainable groundwater management is the management and use of groundwater in a manner that can be maintained for the next 50 years without causing undesirable results[1]. The avoidance of undesirable results is critical to the success of a Groundwater Sustainability Plan (GSP). Management of the basin through this GSP will be conducted using the best available science and it will be periodically updated through an adaptive process in response to various factors including climate change.

Consistent with the principles described above, the East Contra Costa (ECC) GSP has tailored sustainable management criteria (SMC) specific to the conditions found in the ECC Subbasin. The development and implementation of these SMCs, (e.g., sustainability goal, undesirable results, minimum thresholds, and measurable objectives[2]) ensures the continued sustainability of groundwater resources in the ECC Subbasin by committing the seven overlying GSAs to future management actions.

This section defines sustainable management criteria for the ECC Subbasin including the data and methods used in their development and how they relate to beneficial uses and users of groundwater. The SMC are based on current available data and analyses of the basin setting and groundwater conditions as detailed in (**Section 3)**.

GSP regulations require that sustainable management criteria be developed for each sustainability indicator (note that the seawater intrusion indicator is characterized in the ECC Subbasin as significant and unreasonable intrusion of Delta and Bay waters):

- Chronic lowering of groundwater Levels
- Reduction of storage (ECC Subbasin GSP uses proxy of groundwater levels)
- Seawater intrusion
- Degraded water quality
- Land subsidence
- Depletion of interconnected surface water (ECC Subbasin GSP uses proxy of groundwater levels)

The Department of Water Resources prepared a Best Management Practice document[3] to assist GSAs in developing SMC and that defines the terminology used in the section. **Figure 7-1** illustrates the relationship between sustainability indicators, minimum thresholds, and undesirable results. For reference during the review process only,

[1] California Water Code 10721 (v) and (r)
[2] 23 CCR Groundwater Sustainability Plans § 354.22 et seq.
[3] BMP 6 Sustainable Management Criteria Best Management Practice https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents

**Figure 7-1. Relationship between Sustainability Indicators, Minimum Thresholds, and Undesirable Results**

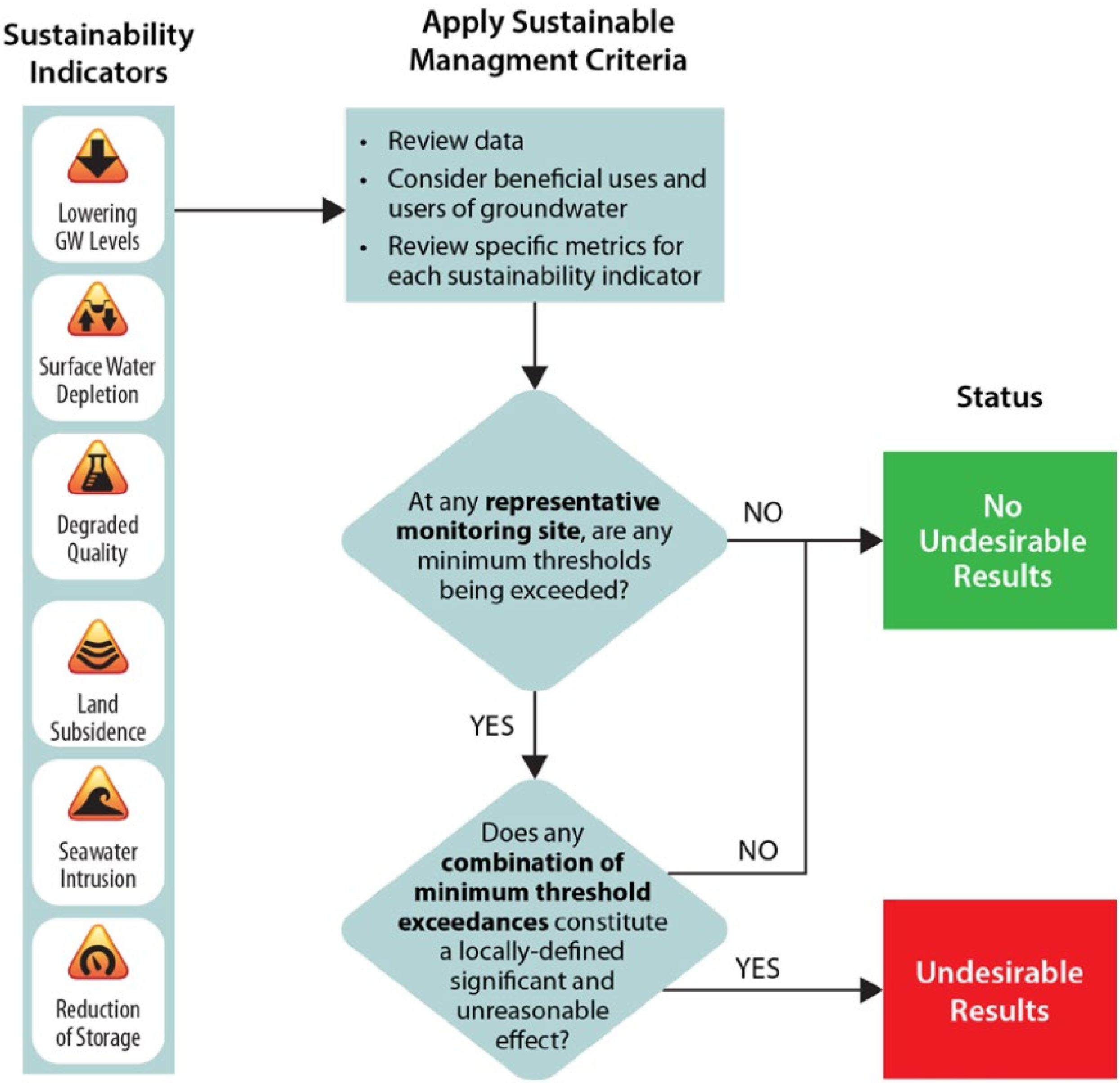
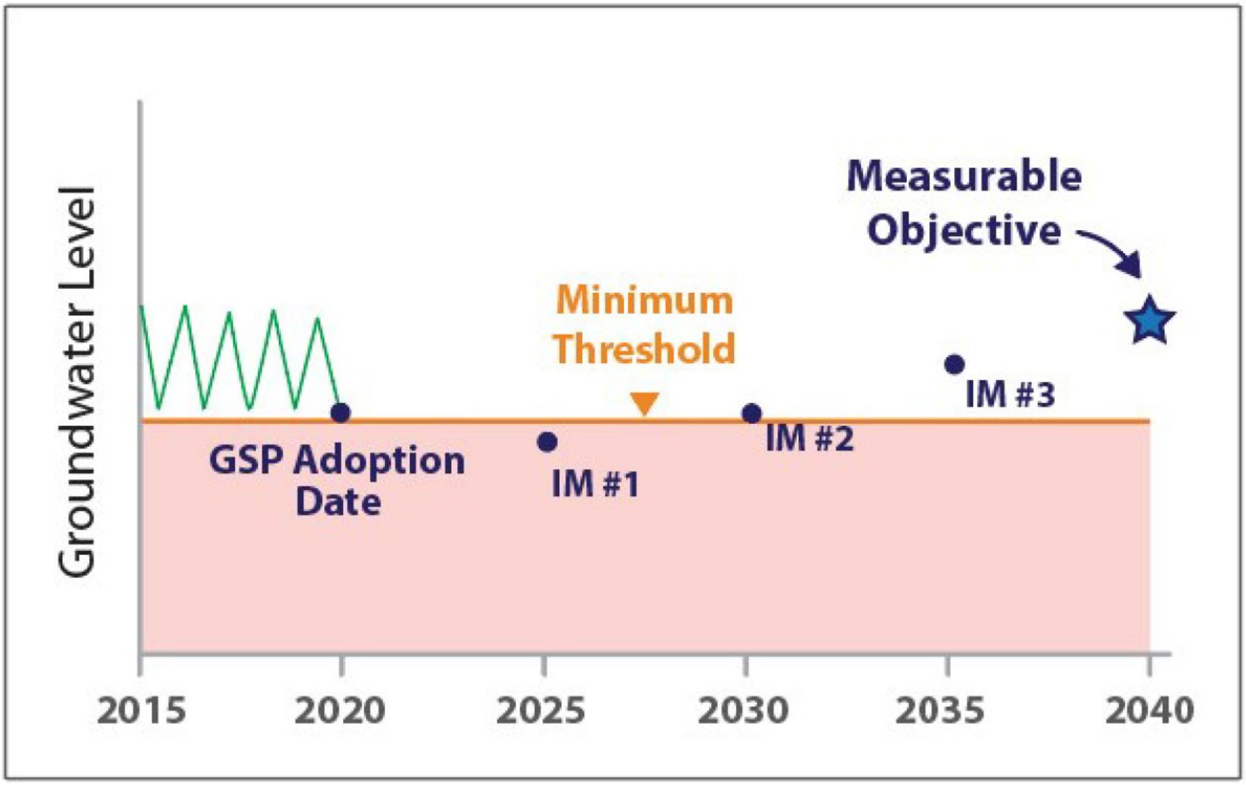


**Figure 7-2. Sustainability Management Criteria Example-Groundwater Levels**




The SMC developed for the ECC Subbasin were coordinated by the seven overlying GSAs, (City of Antioch and Brentwood, Byron Bethany Irrigation District, Contra Costa County, Diablo Water District, East Contra Costa Irrigation District, Town of Discovery Bay) and CCWD via an agreement to prepare a single GSP. SMC development was informed by hydrologic and hydrogeologic analyses leading to the ECC Hydrogeologic Conceptual Model presented in **Section 3**, **Basin Setting**. The process for establishing SMC included:

- GSA Working Group meetings.
- Public meetings on GSP development that introduced stakeholders to SMC.
- Additional public meetings on proposed methodologies to establish minimum thresholds and measurable objectives to receive additional public input.
- Public surveys to receive additional stakeholder input.
- Review of public input on preliminary SMC methodologies with GSA staff/technical experts.
- Preparation of a Draft GSP for public review and comment.
- Establishing and modifying minimum thresholds, measurable objectives, and definition of undesirable results based on feedback from public meetings, public/stakeholder review of the Draft GSP, and input from GSA staff/technical experts.

## 7.2. ECC Sustainability Goal

### 7.2.1. Goal Description

The ECC Subbasin is not experiencing undesirable results as defined under SGMA. The sustainability goal for the ECC Subbasin GSP is to manage the groundwater Subbasin to:

- Protect and maintain safe and reliable sources of groundwater for all beneficial uses and users.
- Ensure current and future groundwater demands account for changing groundwater conditions due to climate change.
- Establish and protect sustainable yield for the Subbasin by achieving measurable objectives set forth in this GSP in accordance with implementation and planning periods[4].
- Avoid undesirable results defined under SGMA.

The GSAs in the ECC Subbasin will manage the Subbasin under a single GSP. The GSAs and other water agencies have cooperatively engaged in water supply issues in the Subbasin including Integrated Regional Water Management plans, groundwater management plans, and California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring. Through coordinating agreements, the GSAs will continue to manage the ECC Subbasin while retaining groundwater management authority within their respective jurisdictions.

The following principles are incorporated into the GSP to guide implementation of the sustainability goal:

- Continued public outreach to all interested parties and stakeholders with transparency in all planning, evaluations, and findings regarding groundwater management activities.
- Adaptively manage the ECC monitoring networks, by expansion and/or modification, based on periodic evaluations to ensure a comprehensive understanding of basin hydrogeology and mechanisms that affect groundwater sustainability.
- Prioritize environmental justice and groundwater dependent ecosystems as beneficial uses.
- Protect the groundwater supply of potentially underrepresented communities such as disadvantaged communities (DACs).
- View the use and protection of groundwater as an integral part of long-term water management strategies for the Subbasin.
- Protect and maintain sufficient groundwater storage to provide operational flexibility for all water year types and with consideration of climate change.
- Acknowledge that within the ECC Subbasin there are criteria and solutions that are regionally appropriate by each GSA jurisdiction.

[4] As defined under SGMA, the GSP implementation period is 20 years. The planning and implementation horizon is a 50-year time period over which the GSAs determine that plans and measures will be implemented to ensure that the basin or subbasin is operated within its sustainable yield.

- Continued cooperative water resources management by GSAs and other water agencies through updated MOUs or other agreements to ensure that all activities needed to maintain sustainability are identified, funded, and implemented.

### 7.2.2. Historical, Existing and Potential Future Conditions of Undesirable Results

Groundwater conditions in the ECC Subbasin exhibit stability and sustainability. Historic and current use of the groundwater basin show no signs of chronic lowering of groundwater levels, reduction of groundwater storage, land subsidence, sea water intrusion, degraded water quality or depletion of interconnected surface water. Nonetheless, future potential undesirable results for each sustainability indicator were identified as required under GSP regulations. This was accomplished through a Sustainable Management Criteria survey, public meetings, and input from the GSP Working Group.

**Table 7-1** illustrates the historical, existing, and potential future conditions of undesirable results for the six sustainability indicators in the ECC Subbasin.

**Table 7-1. Summary of Undesirable Results Applicable to the Plan Area**

| Sustainability Indicator | Historical Period | Existing Conditions | Future Conditions with GSP Implementation |
|---|---|---|---|
| **Chronic Lowering of Groundwater Levels** | No | No | No |
| **Reduction of Groundwater Storage** | No | No | No |
| **Land Subsidence** | No | No | No |
| **Seawater Intrusion** | No | No | No |
| **Degraded Water Quality** | No | No | No |
| **Depletion of Interconnected Surface Water** | No | No | No |

### 7.2.3. Measures to be Implemented

Projects and management actions that have been completed or are planned to be implemented over the 20-year GSP implementation period (2022 through 2042) are discussed in (**Section 8**). These measures are developed to ensure that the ECC Subbasin will continue to be managed sustainably during GSP implementation and throughout the 50-year planning and implementation horizon.

### 7.2.4. Explanation of How the Sustainability Goal will be Achieved

Undesirable results have not occurred historically and are not present in the ECC Subbasin. Furthermore, analyses of current monitoring data do not indicate undesirable results for the 20-year GSP implementation period. The GSAs will continue to work collaboratively and coordinate with other water supply entities, implement various projects and management actions to strengthen overall water supply reliability in the region that would have direct and indirect positive effects on groundwater sustainability.

The following projects and management actions, detailed in (**Section 8),** will be implemented to continue sustainability in the ECC Subbasin.

#### 7.2.4.1. Projects

1. City of Antioch Brackish Water Desalination Project
2. Northeast Antioch Annexation Water and Sewer Facility Installation
3. City of Brentwood Non-Potable Storage Facility and Non-Potable Water Distribution
4. City of Brentwood Citywide Non-Potable Water Distribution System
5. Diablo Water District Treatment and Reuse of Alternative Water Supplies
6. ECCID-CCWD Dry-Year Water Sales

#### 7.2.4.2. Management Actions

The proposed management actions in this GSP will be implemented by individual GSAs based on need and applicability. The management actions are consistent with authorities granted to GSAs through SGMA legislation and GSP regulations. Implementation of any action will be in coordination and consistent with the Contra Costa County well permitting process and regulations. Consistent with SGMA, these potential actions do not apply to de minimis extractors[5].

1. Well spacing control to mitigate potential impacts to existing wells
2. Oversight of well construction features such as completion intervals and seal depths to protect water quality and quantity using best management practices for the site conditions
3. Well metering, monitoring, and reporting to ensure accurate well and pumping data are provided to the GSAs
4. Pumping limits to protect existing supplies and avoid undesirable results
5. Pumping fees for implementing management actions

The projects and management actions will ensure that the ECC Subbasin is managed sustainably through the regulatory planning and implementation horizons.

## 7.3. ECC Sustainability Indicators

Each of the six sustainability indicators is defined by the following: undesirable results, minimum thresholds, and measurable objectives for the ECC Subbasin. The definitions of the sustainability indicators allow the GSAs, the State and the public to evaluate future conditions of the ECC Subbasin to ensure its managed sustainably and achieves the GSP sustainability goal.

The categories of groundwater use in the ECC Subbasin are:

[5] "De minimis extractor" means a person who extracts, for domestic purposes, two acre-feet or less per year. Section 10721, Water Code

- Agriculture
- Commercial
- Domestic Supply (Public Water Systems)
    - Small water system (2 to 199 connections)
    - Municipal supply (more than 200 connections)
- Industrial (may include process water)
- Environmental
    - Groundwater dependent ecosystems (see **Basin Setting**, **Section 3**, **Figures 3-26a and b**)
    - Other habitat protection including stream restoration projects

### 7.3.1. Chronic Lowering of Groundwater Levels

#### 7.3.1.1. Undesirable Results

Chronic lowering of groundwater levels is absent from the ECC Subbasin. However, the potential of chronic lowering of groundwater levels in ECC Subbasin is an undesirable result as defined in California Water Code Section 10721(x)(1):

> *"Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods."*

#### 7.3.1.2. Criteria to Define Undesirable Results

SGMA requires each GSP to consider the consequences of undesirable results even if they have not occurred historically or are projected to occur in the future. The ECC GSP defines significant and unreasonable chronic lowering of groundwater levels as:

- Unreasonable reduction or loss of water well capacity that cannot be mitigated, applies to:
    - Agricultural wells
    - Commercial
    - Domestic supply wells
        - Municipal supply wells
        - Small water system wells
        - Private domestic wells
    - Industrial wells
- Adverse economic impacts and burdens on local agricultural and commercial enterprises
- Adverse economic impacts to existing well owners resulting in the need to: lower a well pump ("chasing the water"), to replace a pump, and/or to deepen or replace a well

- Loss of water source due to drop in water levels (wells going "dry")
- Cause sustained water level impacts to neighboring wells (well pumping interference)
- Lack of prioritization of health and human safety over uses such as landscape irrigation
- Interference with other sustainability indicators

As indicated in the Water Code, water level declines in a drought, which may temporarily induce any of the above results, are not considered unsustainable if water levels recover in intervening non-drought periods.

Implementing the ECC GSP projects and/or management actions will prevent the chronic lowering of groundwater.

#### 7.3.1.3. Potential Causes of Undesirable Results

There is no evidence that groundwater levels are chronically declining in the ECC Subbasin, and they are not expected to do so in the future. However, SGMA regulations require the GSP to identify future conditions (over 50 years) that may lead to chronically declining water levels, and they could include the following:

- Significantly worse hydrologic conditions than currently projected under climate change scenarios (see **Section 5**).
- Regulatory changes in streamflow requirements imposed by the SWRCB that reduce long standing surface-water rights and supplies.
- Expansion of pumping in place of existing surface water supply source. Expansion of pumping may induce localized drawdowns and groundwater level declines.
- Changes in the historical management of the Delta and salinity control point.

The above hypothetical causes are considered unlikely under projected land and water uses and the cooperative regional water supply coordination among GSAs and other agencies. In addition, factors such as climate change and sea level rise are included in the ECC Subbasin groundwater budget as described in (**Section 5)**.

#### 7.3.1.4. Potential Effects of Undesirable Results

A potential effect for the chronic lowering of Shallow Zone groundwater levels is the potential impact to domestic well owners whose wells may go dry and decrease shallow water available to groundwater dependent ecosystems. These changes could impact property values, quality of life, and environment in the ECC Subbasin. Changes in groundwater levels in the Deep Zone where pumping for large systems serving municipalities occurs could impact groundwater supply reliability and increase costs for consumers throughout the Subbasin.

#### 7.3.1.5. Minimum Thresholds

Section 354.28(c)(1) of the SGMA regulations states:

> *"The minimum threshold for chronic lowering of groundwater levels shall be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results."*

Groundwater elevation data collected from existing and new groundwater monitoring wells, known as Representative Monitoring Site (RMSs), are used to measure the level of groundwater in the ECC Subbasin. Future groundwater level measurements will be evaluated against the defined minimum thresholds to ensure chronic lowering of groundwater levels does not occur. (**Figure 6-2 in Section 6)** shows the location of the RMSs in the ECC Subbasin and **Table 7-2**, below, lists the minimum thresholds at each RMS. **Appendix 7a** includes hydrographs of historical groundwater levels with minimum thresholds and measurable objectives for chronic lowering of groundwater levels.

The minimum thresholds for the chronic lowering of groundwater levels are informed by the Subbasin water budget quantified in (**Section 5)** using a groundwater flow model. Modeling scenarios were designed to quantify sustainable groundwater yield by successively reducing surface water deliveries and increasing pumping to the point that one or more sustainability indicators were adversely affected. These scenarios indicated that sustainable yield in the ECC Subbasin is likely constrained by changes in subsurface outflow to other subbasins and stream depletion. At the same time, groundwater levels and storage were not adversely affected. This is attributed to the direct connections to recharge sources tied to the Delta.

Based on the modeling results, minimum thresholds for chronic lowering of groundwater levels are quantified using the lowest historical water levels observed in a well plus 10 feet. If the MT in any well is exceeded over three consecutive years, indicating a trend, and do not recover in normal to wet years, undesirable results would be evaluated in terms of affects related to sustainable management activities. Since groundwater levels in the ECC Subbasin have been stable historically through the present and are projected to remain that way in the future, this is a conservative approach that will be adapted as additional groundwater level data and experience is accumulated. The modeling tool developed in (**Section 5)** provides additional support for the conservative nature of this approach.

**Table 7-2. Minimum Threshold, Measurable Objectives, and Interim Milestones for Chronic Lowering of Groundwater Levels**

| Representative Monitoring Site (RMS) | Well Owner/ GSA | Well Depth (ft bgs) | Perforation Depths (ft bgs) | Minimum Threshold | Measurable Objective and Interim Milestones |
|---|---|---|---|---|---|
| | | | | Groundwater Elevation (feet from mean sea level) | |
| **Shallow Zone Wells** | | | | | |
| **Antioch MW-15**‡ | Antioch | 15 | 5-15 | -9 | 0.6 |
| **5 Binn** | BBID | 45 | 45 (TD) | -4 | 16 |
| **New Well** | CCWD | | | | |
| **BG-2** | COB | 37.5 | 22.5-37.5 | 32 | 44 |
| **DWD MW-30**‡ | DWD | 15 | 5-15 | -9 | 1 |
| **Well #11 (4-61-A)** | ECCID | 100 | 50-100 | 12 | 40 |
| **TODB MW-30** | TODB | 30 | | | |
| **Deep Zone Wells** | | | | | |
| **Antioch MW-90**‡ | Antioch | 90 | 75-85 | -11 | -1 |
| **Brentwood MW-14 Int.** | COB | 240 | 200-210, 220-230 | -48 | 16 |
| **Bethel-Willow Rd** | DWD | 260 | 230-260 | -15 | -3 |
| **Stonecreek MW-300** | DWD | 300 | 230-240, 280-290 | -37 | -1.7 |
| **4AMW-357** | TODB | 357 | 307-347 | -107 | -21 |

Notes: Blue indicates New Monitoring Well, sustainability indicators will be set at the depth measured when the wells are installed.

‡ Well installed August 2021, MT and MO presented are interim until more data is available.

### 7.3.1.6. Information and Criteria Relied Upon to Establish the Minimum Threshold

Information used to establish the minimum threshold for the chronic lowering of groundwater levels includes:

1. Historical groundwater elevations from basin-wide monitoring wells in the ECC Subbasin.
2. Depths and locations of existing wells.
3. Current and historical groundwater elevation contour maps.
4. Modeling scenario for basin sustainable yield including climate change.
5. Other Information from GSAs and interested parties regarding significant and unreasonable conditions.

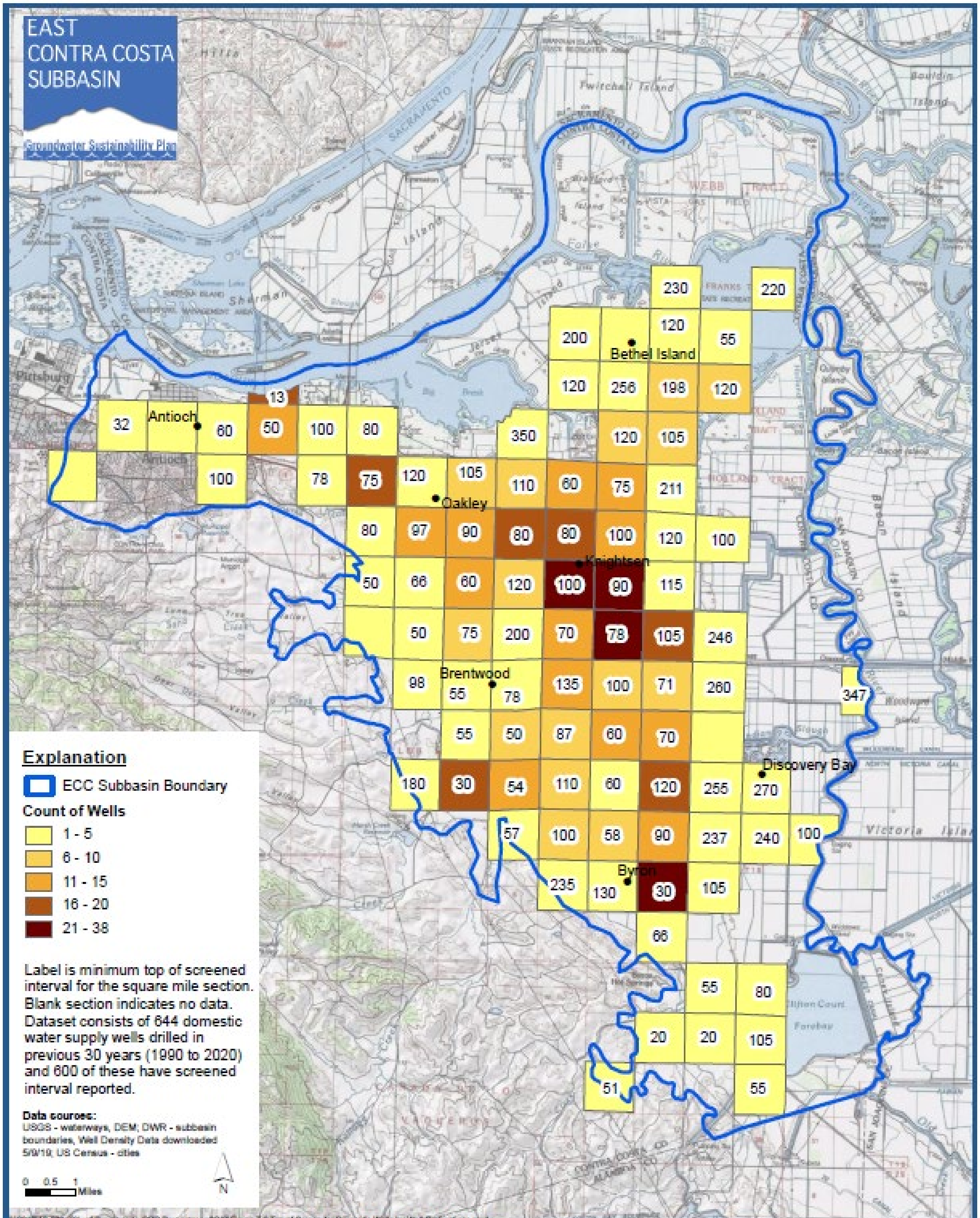
The minimum thresholds for chronic lowering of groundwater levels at each RMS is set at an elevation, when evaluated collectively, that could produce undesirable results in the ECC Subbasin. They are the following:

1. The minimum threshold for each RMS is set at a level for which the sustainable yield is exceeded based on groundwater flow model scenario (see **Section 5**).
2. Where chronic level declines do not exceed the sustainable yield, but otherwise cause undesirable results as described in this GSP.
3. For domestic wells, a minimum threshold which indicates that the $10^{th}$ percentile of this category experiences a drop below the top perforations within the section where the RMS is located. This is considered protective of the water supply sustainability because it considers the most sensitive conditions of well operations.

Minimum thresholds were tentatively set for the four new monitoring well sites based on modeling results and professional judgement. Measurable objectives are also tentative and were set at the initial water levels measured in the wells. As additional data is available; these values may be revised.

The ECC Subbasin has not experienced chronic water level declines in the past. The initial MTs in this GSP may be considered as preliminary values which may change based on monitoring and annual reporting of groundwater conditions. Groundwater levels after the droughts of 2007-09 and 2013-16 recovered without even temporary undesirable results. This was due to multiple factors including water conservation and the diversification of supply sources (i.e., available surface water).

Information on domestic wells installed in the past 30 years and for which perforation intervals were listed was downloaded from DWR's Well Completion Report Map Application (DWR, 2019) dataset. **Figure 7-3** shows the number of wells (color coded) and the shallowest well perforations (numeric value in each square). There is a wide range of completion interval for this category of well with the shallowest perforations indicating that some wells pump, at least partially, from the Shallow Zone, while the deeper perforations target only the Deep Zone. Wells completed in the Shallow Zone are generally isolated from pumping in the Deep Zone, where most pumping occurs in the Subbasin, by confining zones that prevent propagation of impacts vertically. Wells that pump solely in the Shallow Zone will ultimately be protected through the MTs and MOs being developed through expansion of shallow monitoring throughout the Subbasin. The Deep Zone wells will be protected through the MTs and MOs assigned to the RMS in **Table 7-2**.

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**Top of Screen for Domestic Wells by Well Perforations**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 7-3**

#### 7.3.1.7. The Relationship of Minimum Thresholds for Other Sustainability Indicators

In accordance with the DWR Sustainable Management Criteria BMP (2017), the GSP must describe:

1. The relationship between each sustainability indicator's minimum threshold (how or why the MTs are the same or different).
2. The relationship between MTs for other sustainability indicators (e.g., how the water level minimum threshold would not trigger an undesirable result for land subsidence).

All sustainability indicators are intrinsically related and SGMA requires an assessment that a particular MT does not result in an undesirable result arising in another sustainability indicator. The minimum thresholds for chronic lowering of groundwater are established to avoid undesirable results for the remaining sustainability indicators, as described below.

- **Reduction in Groundwater Storage**. The groundwater level minimum thresholds are set with consideration that temporary exceedances during drought do not reflect an undesirable result if water levels recover in non-drought periods. The measurable objectives, which represent the anticipated long-term average groundwater levels, are not expected to result in significant or unreasonable change in groundwater storage based on historical conditions in the Subbasin.
- **Subsidence**. A significant and unreasonable condition for land subsidence is permanent (inelastic) subsidence that damages infrastructure as caused by compaction of clay-rich sediments in response to declining groundwater levels. No such subsidence has been recorded in the ECC Subbasin nor are geologic conditions susceptible to inelastic compaction present as represented in the hydrogeologic conceptual model of the Subbasin. Therefore, groundwater elevation minimum thresholds for subsidence in the ECC Subbasin are not initially being set. However, the GSP monitoring plan includes regular evaluation of groundwater levels, Plate Boundary Observation data, and potential infrastructure impacts within GSA jurisdictions will be conducted and reported.
- **Seawater Intrusion**. The groundwater level minimum threshold for shallow groundwater levels, will be protective of baywater intrusion in the Shallow Zone by avoiding downward vertical flow gradient that might otherwise induce saline water to migrate to water supply aquifers.
- **Degraded Water Quality**. A significant and unreasonable condition of degraded water quality is exceeding regulatory limits for constituents of concern in wells due to actions proposed in the GSP Water quality could be affected by chronic lowering of water levels through three processes.
    - Lowering groundwater levels could cause changes in groundwater flow gradients that result in commingling of poor-quality groundwater with supply sources.
    - Lowering groundwater levels could change groundwater gradients and cause poor quality groundwater from contaminant plumes to migrate to wells not previously impacted.
    - Potential projects consisting of surface water recharge through the vadose zone to the water table. Such projects have the potential to flush constituents of concern (e.g., TDS and nitrates) from the vadose zone to the water table. There may be a temporary increase in higher constituent concentrations prior to eventual dilution and reduction in these constituents.

At present, no such recharge projects are planned. However, the monitoring program developed for this GSP will be evaluated periodically to adapt to the GSP projects.

- **Depletion of interconnected surface waters**. It is recognized that shallow groundwater and surface water are interconnected in the delta region including portions of the ECC Subbasin. Changes in groundwater elevation could impact GDE areas as a result in decreased outflow of fresh groundwater due to chronic water level declines.

#### 7.3.1.8. How the MT was Selected to Avoid Causing Undesirable Results in Adjacent Basins

The groundwater level minimum thresholds for the chronic lowering of groundwater levels established for the ECC Subbasin are expected to be protective of adjacent subbasins as there are no apparent direct connections between Deep Zone aquifers used for water supply in those basins. Further, the Delta provides a hydrologic buffer between the Solano, Eastern San Joaquin, and Tracy Subbasins such that Shallow Zone influences are not expected to propagate. The Pittsburg Plain Subbasin borders the City of Antioch between which there is either a groundwater divide or barrier to cross flow. New monitoring wells being installed in Antioch will provide more data on the relationship between the two subbasins. The modeling tool will be used to assess subsurface movement in and out of the subbasins to assess future changes and potential adverse conditions at the shared boundaries of those subbasins.

#### 7.3.1.9. How the MT may Affect the Interests of Beneficial Uses and Users of Groundwater

Groundwater level minimum thresholds for the chronic lowering of groundwater levels may affect beneficial uses, users, and land uses in the Subbasin. RMS sites were selected to provide a basis for evaluating changes and impacts to the different uses and users of water wells throughout the Subbasin.

**Rural residential land uses and users**. The chronic lowering of groundwater level MT protects most domestic users of groundwater by considering the depths to which wells are completed and protection of reasonable operating margins for available pumping drawdown. A comparison of a hypothetical MT water surface was developed by interpolating MT values between RMS wells to potential domestic well locations based on DWR WCR data where construction in known. The precise locations and construction of wells that are currently active in the Subbasin is not known and some older WCRs may be associated with wells that are no longer active. If this hypothetical condition occurred with all wells experiencing the MT, less than 5% of the domestic wells in the Subbasin have the potential to go dry; i.e., the well would experience less than 10 feet of saturated screen. This comparison is highly conservative given the inclusion of wells that are 50 years old and that newer wells are likely not completed solely in the Shallow Zone. The proposed well inventory program discussed in Section 6 will aid the GSAs in refining the MT to maximize protection for this kind of user.

**Agricultural land uses and users**. Similar to rural residential uses and users, chronic lowering of groundwater level MTs are intended to protect agricultural users and their ability to meet existing and projected demands through typical well and pumping configurations (e.g., depths, perforation intervals, pumping lifts).

**Urban land uses and users**. The chronic lowering of groundwater level MTs are set so that existing and projected water demands can be met through typical well and pumping configurations (e.g., depths, perforation intervals, pumping lifts).

**Environmental uses and users**. Environmental uses include groundwater dependent ecosystems for which data gaps have been identified and new monitoring installations planned. Initially, a baseline shall be established to provide a basis for identifying effects of chronic lowering of groundwater and setting protective MTs.

#### 7.3.1.10. How the MT Relates to the Federal, State, or Local Standards

There are no applicable federal, state, or local standards for MTs related to chronic lowering of groundwater levels in the plan setting.

#### 7.3.1.11. How each MT will be Quantitatively Measured

The groundwater level minimum thresholds for the chronic lowering of groundwater levels will be directly and quantitatively measured at each RMS. Groundwater level monitoring will be conducted in accordance with the monitoring plan and protocols outlined in (**Section 6)** and will meet the requirements of the technical and reporting standards included in the SGMA regulations. The current representative monitoring network includes seven Shallow Zone wells and five Deep Zone wells.

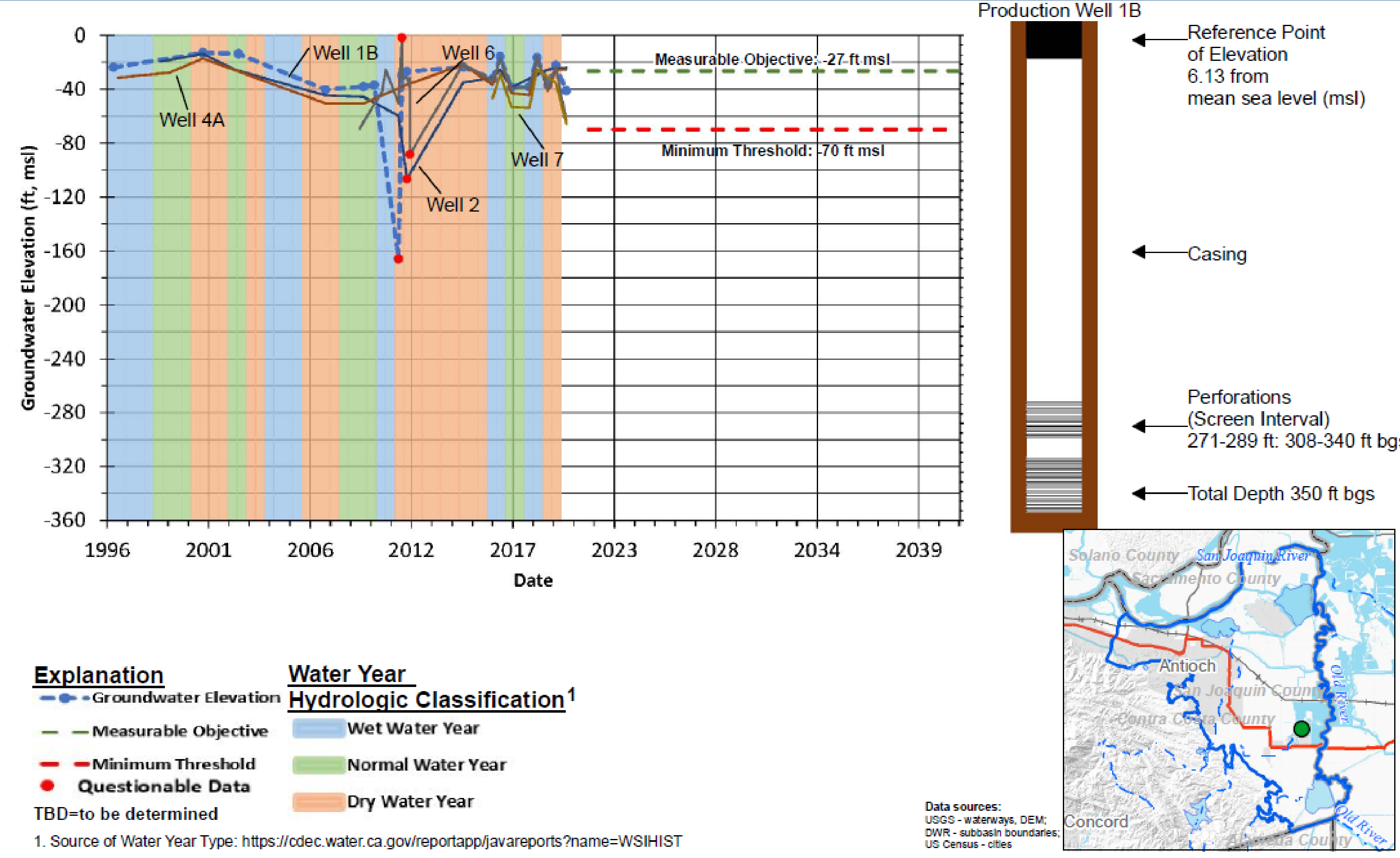
#### 7.3.1.12. Measurable Objectives and Interim Milestones

Measurable objectives (MO) for the chronic lowering of groundwater levels are quantitative goals that reflect the Subbasin's desired groundwater conditions and goal to achieve sustainability within 20 years. It is set above the minimum threshold to allow a zone of operational flexibility that allows for drought, climate change, conjunctive use operations, and other groundwater management actions.

The measurable objective for chronic lowering of groundwater levels is the average spring elevation of groundwater at the RMS and its vicinity. Years in which drought caused temporary decline in water levels were excluded as outliers due to other causes (e.g., questionable field measurement). An example of setting MOs is illustrated for the RMS at the Town of Discovery Bay (**Figure 7-4**) in which measurements in Deep Zone production wells are shown with data from the RMS, which has a shorter period of record. In this situation, the MO at the RMS is informed by historical data from nearby wells of which the RMS is intended to be representative. The MOs for the Shallow and Deep Zone existing wells determined in this manner are listed in **(Table 7-2)** and are denoted on hydrographs in **Appendix 7a**.

Measurable objectives are preliminary for new Shallow and Deep Zone RMSs installed in summer 2021. MOs for these new Shallow and Deep Zone wells will be set at the water level measured at the time the well was drilled. However, as additional data is accumulated, the MOs may be adjusted.

Interim milestones are defined in five-year increments at each RMS to track progress toward meeting the sustainability goal. With the ECC Subbasin currently meeting the sustainability goal, the measurable milestones coincide with the measurable objective for this indicator (**Table 7-2**). Every five years the interim milestones will be reevaluated in the GSP review to confirm that management of the Subbasin satisfies the GSP sustainability goal.

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**Measurable Objectives and Minimum Thresholds- TODB Production Wells**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 7-4**

### 7.3.2. Reduction in Groundwater Storage

#### 7.3.2.1. Undesirable Results

As described in this GSP, the current and historical groundwater use in the ECC is free from undesirable results for groundwater storage. Additionally, modeling indicates that undesirable results are not anticipated to occur during the planning and implementation horizon. Stable groundwater levels from 1993 to 2019 indicate that historical pumping in the Subbasin has not depleted useable storage[6].

The sustainable yield of the Subbasin is the total volume of groundwater that can be withdrawn on an average annual basis without leading to a long-term reduction in useable groundwater storage or interfering with other sustainability indicators. **Section 5**, **Water Budget** quantifies sustainable yield of the Subbasin at 72,000 AF/year using the groundwater flow model developed for sustainable management. The modeling tool will be used, refined, and updated as needed, to quantify sustainable yield to avoid significant and unreasonable reductions in groundwater storage.

An undesirable result occurs when available groundwater storage is depleted to the degree that current uses and users are unable to meet groundwater demand.

#### 7.3.2.2. Criteria to Define Undesirable Results

SGMA requires each GSP to consider the consequences of undesirable results even if they have not occurred historically or are projected to occur in the future. The undesirable result for the reduction in groundwater storage are the same as previously described for chronic lowering of groundwater levels, which act as a proxy for the groundwater storage sustainability indicator. In addition, significant and unreasonable changes in groundwater storage from implementing sustainable management policies, projects, or actions would occur if they caused any of the following:

- Reduction in groundwater storage that restricts the quantity of supply to satisfy existing beneficial use or harms an existing category of groundwater user.
- Any long-term reduction in available drawdown for pump operating margins that adversely affects available capacity or supply.
- Degraded water quality as a result of changed groundwater flow conditions.
- Interference with other sustainability indicators.

[6] Useable storage is that volume of groundwater that may be extracted within the constraints of a balanced water budget.

#### 7.3.2.3. Potential Causes of Undesirable Results

The ECC Subbasin has experienced no long-term reduction in groundwater storage due to pumpage or other imbalance in the water budget. Although unlikely, hypothetical conditions that may lead to a reduction in groundwater storage include the following:

- Prolonged drought. An extensive drought greater than planned for may cause increased pumping of groundwater and a reduction of groundwater storage to a significant and unreasonable level.
- Regulatory changes in streamflow requirements imposed by the SWRCB that reduce long standing surface-water rights and supplies.
- Expansion of pumping and reduced surface water use.

The above hypothetical causes are considered unlikely under projected land and water use estimates even when the effects of climate change and sea level rise are considered (see **Section 5**).

#### 7.3.2.4. Potential Effects of Undesirable Results

The reduction of groundwater storage in the Shallow Zone (e.g., lowering of shallow zone groundwater levels) could potentially impact domestic well owners whose wells may go dry, decrease shallow water available to GDEs, and induce baywater intrusion causing degraded groundwater quality. These changes could impact property values, quality of life, and environment in the ECC Subbasin. Changes in groundwater storage in the Deep Zone, which provides the main source of water supply in the Subbasin, could impact groundwater supply reliability, and increase costs for users and consumers.

#### 7.3.2.5. Minimum Thresholds

SGMA Regulations (§354.36(b)(1)) allow GSAs to use groundwater elevation as a proxy for any sustainability indicator provided there is sufficient correlation between groundwater levels and the other metric (Sustainable Management Criteria BMP, 2017). This GSP uses chronic lowering of groundwater levels as a proxy for reduction in groundwater storage. As cited previously, useable storage, or sustainable yield, is estimated at 72,000 AFY. The ECC GSP groundwater flow model was used to determine the maximum sustainable yield and set groundwater elevation minimum thresholds (MT). As a proxy, the MTs for groundwater levels are protective of groundwater storage and beneficial uses and users in the Subbasin.

#### 7.3.2.6. Measurable Objectives and Interim Milestones

The measurable objectives and interim milestones for the reduction in groundwater storage sustainability indicator are the same as for the chronic lowering of groundwater levels.

### 7.3.3. Seawater Intrusion

There is no evidence of seawater intrusion in the ECC Subbasin at present or in the past. However, potential mechanisms for saline baywater intrusion may be triggered as a result of sea-level rise, unsustainable levels of pumping, or changes in Bay-Delta water quality and flow requirements by the state Water Board. In recognition of these potential mechanisms, the seawater intrusion sustainability indicator is incorporated into the ECC Subbasin GSP.

#### 7.3.3.1. Undesirable Results

Significant and unreasonable changes related to seawater intrusion as a result of implementing sustainable management policies, projects or actions could occur if they induce any of the following:

- Changes in baseline water quality that cause significant and unreasonable impacts on groundwater supply for beneficial users in the Subbasin.
- Changes in baseline water quality at any location which indicate new pathways or mechanisms of degradation of any freshwater source that adversely impacts existing beneficial uses and users.
- Changes in baseline water quality that adversely interfere with other sustainability indicators.

A data gap for monitoring the interface between baywater and shallow groundwater was identified in **Section 6** and will be filled by the installation of monitoring wells at multiple sites in the second half of 2021.

#### 7.3.3.2. Criteria to Define Undesirable Results

SGMA requires each GSP to consider the consequences of undesirable results even if they have not occurred historically or are projected to occur in the future. Undesirable results for seawater intrusion would occur if inland migration of saline baywater adversely reduces groundwater availability through degraded water quality. The potential degradation of water quality will be monitored by groundwater chloride concentrations as previously discussed in **Section 3.3.4**. The criterion for potential undesirable results for this indicator is as follows:

> *An undesirable result may be present if a bayside monitoring well has a chloride concentration above 250 mg/L over three consecutive years and is causally related to groundwater sustainable management in the Subbasin.*

An increasing trend in chloride concentration may indicate that saline baywater is advancing inland and represents an undesirable result for the seawater intrusion Indicator. None of the wells listed in **Table 7-4** have chloride concentrations that exceed 250 mg/L.

A chloride isocontour shall be developed as more data is collected.

#### 7.3.3.3. Potential Causes of Undesirable Results

Conditions that may lead to an undesirable result for seawater intrusion include the following:

- Sea level rise and saline baywater migrating into the Shallow Zone and vertically to the Deep Zone where the majority of pumping occurs.
- In combination with the above, changes in water quality and flow requirements by the state Water Board under the Bay-Delta Plan[7].

Periodic evaluations using the ECC Subbasin groundwater flow model will also be used to assess the potential causes and onset of undesirable results for this indicator (see model description in **Section 5**).

[7] https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/ Accessed June 29, 2021

#### 7.3.3.4. Potential Effects of Undesirable Results

Baywater intrusion into the ECC Subbasin could cause the groundwater supply to become more saline and impact the use of groundwater for domestic, municipal, and agricultural purposes. Historically, there have been no limitations on the primary groundwater supply source (the Deep Aquifer Zone) due to elevated chloride concentration. The state's upper maximum contaminant level chloride concentration is 500 mg/L[8]. The potential effects of undesirable results for seawater intrusion are:

- Reduced available supply requiring users to replace wells or seek alternative sources of supply.
- Cause economic hardships on domestic wells users, many of which reside in DACs, to install water treatment or seek alternative sources.
- Added costs to systems serving municipalities to install treatment systems or seek alternate sources.
- Reduced groundwater quantity and quality for agricultural supply.
- Adverse effects to groundwater dependent ecosystems due to changes in freshwater quantity (e.g., outflow) and/or quality.
- Adverse effects on property values for landowners that rely on groundwater for domestic and agricultural supply.

#### 7.3.3.5. Minimum Thresholds

Section §354.28(c)(3) of the Code of Regulations states:

> *"The minimum threshold for seawater intrusion shall be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results."*

GSP regulations require that the minimum threshold for seawater intrusion be determined from a chloride isocontour line. In order to construct the isocontour, chloride concentrations at multiple monitoring locations are required. At present, Shallow Zone well chloride concentration data along the San Joaquin River is sparse and a chloride isocontour cannot be constructed. With the installation and sampling of new monitoring wells in 2021, a chloride isocontour will be developed as a basis for long-term monitoring for the seawater intrusion indicator. Consistent with other indicators in the ECC Subbasin, the initial isocontour is expected to be used as a minimum threshold until a more definitive value is determined. The expanded dataset from filling the Shallow Zone data gaps will be presented in the initial annual report in April 2022.

Based on the Subbasin HCM (see **Section 3**), the Shallow Zone would be impacted first if baywater salinity increases. Nevertheless, the Deep Zone RMSs will also be monitored for chloride and the interim seawater intrusion minimum threshold chloride concentration for any Shallow Zone or Deep Zone well is set at 250 mg/L which is the recommended level Secondary Maximum Contaminant Level (SMCL). This is based on the observation that the majority of wells in the Subbasin have chloride concentrations near this level and any significant increase may be indicative of a degradation mechanism such as seawater intrusion. As

[8] California secondary maximum contaminant level-upper limit for aesthetics (taste and color).

data from the new monitoring wells are collected, this interim approach will be modified and ultimately be replaced through isocontour maps for both aquifer zones.

#### 7.3.3.6. Information and Criteria Relied Upon to Establish the Minimum Threshold

GSP Regulations (CCR 2016) require the following information when setting the seawater intrusion minimum threshold at a chloride isocontour:

- Section §354.28(c)(3)(A): Maps and cross-sections of the chloride concentration isocontour that define the minimum threshold and measurable objective for each principal aquifer.
- Section §354.28(c)(3)(B): A description of how seawater intrusion minimum threshold considers the effects of current and projected sea levels.

Due to the data gap in Shallow Zone wells and chloride concentration data, a chloride concentration map for Shallow Zone and Deep Zone wells developed in **Section 3, Figure 3-16d** in lieu of a chloride concentration isocontou**r**. A chloride isocontour will be developed through the addition of the new monitoring wells to fill data gaps as discussed in **Section 6** and will be included with the submittal of the first annual report in April 2022. The groundwater flow model will be used to evaluate the potential impact of sea level rise on this indicator by assessing flow gradients along the margins of the Subbasin and the Bay-Delta water bodies. In addition, a groundwater transport model project is proposed in **Section 8** to further evaluate water quality degradation mechanisms in the ECC Subbasin.

#### 7.3.3.7. The Relationship of Minimum Thresholds for Other Sustainability Indicators

The minimum thresholds for seawater intrusion are established to avoid undesirable results for the remaining sustainability indicators, as described below.

- **Chronic lowering of groundwater levels, Reduction in Groundwater Storage, Subsidence, Depletion of interconnected surface waters.** The minimum threshold for seawater intrusion is not associated with mechanisms or processes that would impact the minimum thresholds for these sustainability indicators.
- **Degraded Water Quality**. The minimum threshold for seawater intrusion is the same as for degraded water quality (250 mg/L chloride concentration) and will not cause an exceedance of groundwater quality minimum thresholds.

#### 7.3.3.8. How the MT was Selected to Avoid Causing Undesirable Results in Adjacent Basins

Adoption of the seawater intrusion minimum threshold is expected to be protective of adjacent subbasins by monitoring mechanisms that may also arise in those regions. The hydrogeologic setting for the Shallow Zone in the ECC Subbasin is sufficiently separate from aquifers in the Solano, Eastern San Joaquin, and Tracy Subbasins such that if intrusion arises due to ECC sustainable management activities, it would not be expected to propagate to those areas.

The Pittsburg Plain Subbasin borders the City of Antioch and is separated by either a groundwater divide or barrier to cross flow. New monitoring wells being installed in Antioch will provide more data on the relationship between the two subbasins.

The groundwater flow model will be used to assess subsurface movement in and out of the ECC Subbasin and to assess future changes and potential adverse conditions at the shared boundaries with those subbasins.

#### 7.3.3.9. How the MT may Affect the Interests of Beneficial Uses and Users of Groundwater

The minimum threshold for seawater intrusion is not expected to affect beneficial uses, users, or land uses in the Subbasin as it preserves existing water quality and seeks to protect future degradation.

#### 7.3.3.10. How the MT Relates to the Federal, State, or Local Standards

There are no federal, state, or local standards for seawater intrusion that are applicable to the ECC Subbasin. However, the GSP accounts for the fact that there are state and federal standards for chloride concentration which is monitored as an indicator for seawater intrusion mechanisms.

#### 7.3.3.11. How Each MT Will be Quantitatively Measured

Chloride concentrations are quantitatively measured in groundwater samples collected from the ECC GSP seawater intrusion monitoring network. **Figure 3-16d** presents the average chloride concentration for post-2008 measurements in Shallow and Deep Zone wells. It shows that most concentrations are below 250 mg/L. The symbols are color coded by aquifer to denote the aquifer zone. Noting that seawater has a total dissolved mineral content of 35,000 mg/L and a chloride concentration on the order of 19,000 mg/L, the groundwater monitoring data for the ECC Subbasin indicate that there is no inland saline intrusion of sea water into groundwater at any location).

The minimum threshold for the Subbasin is set at a chloride concentration of 250 mg/L because average native chloride concentrations in groundwater are typically less than this value (see **Figure 3-16a**). Any trend of increasing chloride concentration in the RMSs, or migration of a chloride isocontour inland (when the Shallow Zone data gap is filled), will be interpreted as a possible indication that saline baywater is moving inland. An assessment would then be made to determine 1) if bay water salinity has the potential at any location to elevate groundwater chloride concentrations, 2) whether a gradient for inland migration exists, and 3) whether any local groundwater management activity induced conditions to change. While any future intrusion process is expected to be slow (e.g., on the order of years), chloride concentration monitoring using 250 mg/L as a trigger for examining possible links to sustainable management in the Subbasin would be protective of groundwater resources.

#### 7.3.3.12. Measurable Objectives and Interim Milestones

Measurable objectives for seawater intrusion are the desired conditions for the ECC Subbasin and are based on maintaining the current native chloride concentration in the Subbasin. The measurable objectives for each RMS are the average chloride concentrations from 2013 to 2017. **Table 7-4** presents the measurable objectives for each RMS. If an RMS does not have groundwater quality data during this period, the cells are left blank and will be populated when data is collected.

If chloride concentrations trend upward above the measurable objective, but below the minimum threshold, verification measures regarding links to groundwater management as described in the preceding section will be triggered.

Since the chloride concentration in the Subbasin is currently stable and above minimum thresholds for all RMSs, the interim milestones are set at the same values as the measurable objectives shown in **Table 7-4**. No changes in quality are expected as a result of implementing projects and management actions described in **Section 8**.

### 7.3.4. Degraded Water Quality

#### 7.3.4.1. Undesirable Results

Significant and unreasonable changes in groundwater quality as a result of implementing sustainable management policies, projects, or other actions could occur if they cause any of the following:

- Increases in concentrations of key groundwater quality constituents above drinking water maximum contaminant limits (MCLs) that reduce groundwater availability for domestic, agricultural, municipal, or environmental beneficial uses.
- Changes in water quality that cause economic burdens placed on users to treat or replace sources of groundwater supply including but not limited to increased treatment costs to mitigate elevated mineral content such as hardness.
- Adverse impacts to agricultural crop production, yield, and/or quality.
- Migration of contaminants to domestic or agricultural sources of supply, including but not limited to unregulated discharges of hazardous substances, and from oil and gas wells.
- Movement or increases in currently unregulated chemical constituents that adversely impact beneficial uses and users (e.g., DACs and environmental users) of groundwater.

Overall, groundwater quality is satisfactory for the various beneficial uses in the ECC Subbasin. Some parts of the Subbasin experience naturally elevated TDS and chloride that are near or exceed the recommended SMCL indicating a higher baseline for these constituents. Elevated nitrate concentrations occur in shallow wells near Brentwood with concentrations exceeding the MCL attributable to past agricultural practices. Arsenic is generally less than the MCL and boron concentrations are naturally elevated in most wells. Water hardness varies and in some cases adds financial burdens on users needing to use water softeners. For municipalities, TDS and hardness may lead to customer dissatisfaction and limit the ability to blend groundwater with treated surface water under conjunctive use[9]. In order to meeting customer water hardness expectations municipalities may be required to install expensive water treatment systems.

#### 7.3.4.2. Criteria to Define Undesirable Results

SGMA requires each GSP to consider the consequences of undesirable results even if they have not occurred historically or are projected to occur in the future. Any RMS that exceeds any state drinking water standard during GSP implementation because of groundwater management activities, would constitute an undesirable result for the degradation of groundwater quality.

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[9] Conjunctive use is the coordinated and planned management of both surface and groundwater resources in order to maximize the efficient use of both resources.
https://water.ca.gov/Water-Basics/Glossary Accessed August 2021.

#### 7.3.4.3. Potential Causes of Undesirable Results

Overall, groundwater quality is satisfactory for the various beneficial uses in the ECC Subbasin. However, potential causes of degraded groundwater quality may include the following:

- **Changes in groundwater gradients**- Changes to the location or rates of pumping could result in mobilization and vertical migration of certain constituents from the Shallow Zone to the Deep Zone including saline water and anthropogenic sources of contamination or natural constituents of concern.
- **Changes in groundwater pumping patterns-** Changes in location and rates of pumping may alter and increase contributions from zones containing higher dissolved minerals including hardness.
- **Groundwater recharge projects**–Use of recharge basins could cause localized groundwater mounding resulting in altered flow directions and potential movement of water quality constituents towards wells in concentrations that exceed water quality standards. Also, recharge of poor-quality water that exceeds the MCL or SMCL.

#### 7.3.4.4. Potential Effects of Undesirable Results

The potential effects of undesirable results for degradation of water quality are the same as described above for seawater intrusion.

#### 7.3.4.5. Minimum Thresholds

SGMA regulations guide the setting of the minimum threshold for degraded water quality as follows:

- The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined to be of concern for the basin.

The minimum thresholds for degraded groundwater quality in the ECC Subbasin were selected to avoid undesirable results induced as a result of implementing sustainable management policies, projects or actions. The minimum threshold at a given RMS in the ECC Subbasin is:

- The three-year running average exceedance of an MCL for a key monitoring constituent.

#### 7.3.4.6. Information Used and Methodology

The information used to establish the degraded groundwater quality minimum threshold includes:

- Historical groundwater quality from basin-wide monitoring wells in the ECC Subbasin.
- Depths and locations of existing wells.
- Federal and state drinking water quality standards.
- Information from interested parties of significant and unreasonable conditions.

Federal and state drinking water quality standards will be used to define degraded groundwater quality minimum thresholds.

### 7.3.4.7. Degraded Groundwater Quality Minimum Thresholds

Minimum thresholds were set to represent conditions considered just above conditions that could cause undesirable results in the ECC Subbasin as discussed in (**Section 3). Table 7-3** lists the constituents of concern, the reason for concern, and the drinking water standard/minimum threshold.

**Table 7-3. Constituents of Concern for Groundwater Quality Minimum Threshold**

| Constituent of Concern | Reason for Concern | Minimum Threshold |
|---|---|---|
| **Total dissolved solids** | Naturally Elevated; may be associated with higher hardness | 1,000 mg/L[1] |
| **Chloride** | Baywater Intrusion/Naturally Elevated | 500 mg/L[1] |
| **Nitrate as nitrogen** | Agriculture and Septic Systems | 10 mg/L[2] |
| **Arsenic** | Naturally Elevated | 10 ug/L[2] |
| **Boron** | Naturally Elevated | 5,000 ug/L[3] |
| **Mercury** | Mercury Mine Upstream | 2 ug/L[2] |

1. California Secondary Maximum Contaminant Level (SMCL)
2. California Primary Maximum Contaminant Level (SMCL)
3. US EPA Health Advisory for non-cancer health effect.

The TDS minimum threshold of 1,000 mg/L is generally protective for domestic and agricultural uses. TDS is secondary standard established for aesthetic purposes such as taste, odor, and color and not based on public health concerns. Note: public water system threshold of 500 mg/L for TDS.

Groundwater contains numerous naturally occurring minerals that vary throughout the ECC Subbasin. While groundwater quality is generally favorable with respect to primary drinking water quality constituents, some areas have elevated total dissolved minerals, hardness, and some secondary constituents which may affect domestic and agricultural uses. The GSP is intended to avoid degradation of water quality as a result of implementing sustainable management policies, projects or actions. For example, projects that affect pumping patterns resulting in movement and mixing of groundwater sources that adversely affect certain users. The GSP does not mitigate groundwater quality in the Subbasin that is naturally occurring during the historical baseline."

### 7.3.4.8. The Relationship of Minimum Thresholds between Like and Different Sustainability Indicators

All sustainability indicators are intrinsically related and SGMA requires an assessment that a particular MT does not result in an undesirable result arising in another sustainability indicator. There is a minor influence on other sustainability indicators due to the potential degradation of groundwater quality. However, minimum thresholds were set to avoid undesirable results for other sustainability indicators as described below:

- **Chronic lowering of groundwater levels and groundwater storage**. Recharge projects implemented to mitigate lower water levels and storage must use sources that do not exceed any of the groundwater quality minimum thresholds.
- **Other sustainability indicators (seawater intrusion, subsidence, and depletion of interconnected surface water).** The groundwater quality minimum threshold is not associated with mechanisms or processes that would impact other minimum thresholds.

#### 7.3.4.9. How the MT was Selected to Avoid Causing Undesirable Results in Adjacent Basins

The anticipated effect of the degraded groundwater quality minimum thresholds on each of the neighboring basins is the following:

**Tracy Subbasin (medium priority), Eastern San Joaquin Subbasin (critically-over drafted), Solano Subbasin (medium priority**). Minimum thresholds are set to protect groundwater quality. Any interaction, such as outflow to another basin, would not induce undesirable results in those areas. The interpreted groundwater flow direction in the ECC Subbasin is generally to the Delta and outflow to the ocean further reducing the likelihood of causing impacts to the surrounding basins.

**Pittsburgh Plain Basin (low priority)**. There is no interpreted direct hydraulic connection with the Pittsburg Plain Basin. The City of Antioch borders the Pittsburg Plain Basin and does not pump groundwater, primarily due to poor native water quality. The ECC Subbasin degraded groundwater quality minimum threshold is protective of groundwater quality and would otherwise not induce undesirable results in that basin.

#### 7.3.4.10. How the MT May Affect the Interests of Beneficial Uses and Users of Groundwater

Degraded groundwater quality minimum thresholds are not expected to have negative effects on beneficial uses, users, or land uses in the Subbasin as described:

- **Rural residential land uses and users**. The groundwater quality minimum thresholds protect domestic users of groundwater including individual well owners, small water systems, and DACs by applying drinking water standards.
- **Agricultural land uses and users**. The groundwater quality minimum thresholds protect agricultural users by applying drinking water standards which exceed generally acceptable irrigation quality.
- **Urban land uses and users**. The groundwater quality minimum thresholds protect municipal supplies by applying the same drinking water standards required under state permits.
- **Ecological land uses and users**. The groundwater quality minimum thresholds protect groundwater dependent ecosystems by employing standards that maintain current or existing conditions and preventing future degradation.

#### 7.3.4.11. How the MT Relates to the Federal, State, or Local Standards

The MTs for water quality degradation are based on federal, state, and local regulations for groundwater source protection and drinking water quality standards.

#### 7.3.4.12. How Each MT Will be Quantitatively Measured

The minimum threshold for degraded groundwater quality will be directly and quantitatively measured in accordance with the monitoring plan and protocols outlined in **Section 6** and will meet the requirements of the technical and reporting standards under SGMA regulations. The current representative monitoring network includes five Shallow Zone wells and six Deep Zone wells that are either designated monitoring wells or public supply wells.

#### 7.3.4.13. Measurable Objectives and Interim Milestones

Measurable objectives for degraded groundwater quality are the desired conditions for the Subbasin and are based on maintaining the current water quality in the Subbasin. The measurable objectives for each RMS are the average concentrations (2013 to 2017) for each constituent of concern for each RMS (**Figure 6-5**). **Table 7-4** presents the measurable objectives for each RMS. If a RMS does not have groundwater quality data during this period, the cells are left blank, and it will be calculated after five years of data collection.

Since the groundwater quality in the Subbasin is currently sustainable and above minimum thresholds for all RMSs (**Figure 6-5**), the interim milestones are set at the same values as the measurable objectives shown in **Table 7-4**. No changes in quality are expected from projects and management actions implemented to achieve sustainability.

**Table 7-4. Minimum Thresholds, Measurable Objectives, and Interim Milestones for Degradation of Groundwater Quality**

| Zone | Well Name | As (ug/L) | B (ug/L) | Cl (mg/L) | Hg (ug/L) | $NO_3$ as N (mg/L) | TDS (mg/L) |
|---|---|---|---|---|---|---|---|
| **Minimum Threshold** | | **10** | **5,000** | **250** | **2** | **10** | **1,000** |
| **Shallow Zone** | BG-1 | 2.7 | 230 | 210 | 0.01 | 27 | 890 |
| | Antioch MW-15 | | | | | | |
| | DWD MW-15 | | | | | | |
| | TODB MW 15 | | | | | | |
| | Unknown | | | | | | |
| **Deep Zone** | Antioch MW-100 | | | | | | |
| | City of Brentwood Well 13 | 2.0 | 1,800 | 92 | 1.00 | 2.5 | 540 |
| | City of Brentwood Well 14 | 3.2 | 1,150 | 180 | 1.00 | 4.1 | 970 |
| | Glen Park Well | 2.3 | 1,300[1] | 100 | 1.00 | 1.2 | 690 |
| | Bethel-Willow Rd | | | | | | |
| | Town of Discovery Bay Well 4A | 2.5 | 2,200 | 100 | 0.51 | 0.25 | 600 |

Notes: Blue shading indicates New Monitoring Well; Measurable objectives and interim milestones will be set at the concentrations from the initial results.

Interim Milestones are the same as Measurable Objectives (e.g., the average concentrations [2013 to 2017]).

[1]Average Concertation between 2006-2007

## 7.3.5. Land Subsidence

### 7.3.5.1. Undesirable Results

Land subsidence associated with groundwater pumping is a result of dewatering, or "mining" groundwater, from fine-grained geologic materials such as clay. The inelastic nature of this mechanism results in permanent deformation of the land surface and compaction of geologic formations. The potential undesirable results for this type of land subsidence are:

- Impacts to infrastructure such as damage to roads and structures, reduced capacity of water conveyances, and increased vulnerability to flooding.

There is no historic evidence of land subsidence related to groundwater pumping in the ECC Subbasin, in part or wholly due to the lack of formations which are susceptible to subsidence mechanisms[10]. This sustainability indicator will be assessed using existing independent monitoring at a UNAVCO Plate Boundary Observatory (PBO) station (see **Sections 3 and 6**). In addition, groundwater level and interferometric synthetic aperture radar (InSAR) measurements will be used to support analysis of the PBO data as discussed below.

#### 7.3.5.2. Criteria to Define Undesirable Results

SGMA requires each GSP to consider the consequences of undesirable results even if they have not occurred historically or are projected to occur in the future. For this sustainability indicator, undesirable results occur when inelastic land subsidence due to groundwater extraction results in significant and unreasonable impacts to roads and structures, water conveyances, and flood control facilities.

#### 7.3.5.3. Potential Causes of Undesirable Results

A potential cause of undesirable results for the land subsidence sustainability indicator is the following:

- **Increased pumping in susceptible areas** – Compressible clays of sufficient volume which are susceptible to dewatering and compaction due to groundwater pumping have not been identified under the present hydrogeologic conceptualization of the Subbasin. Expansion of pumping into new areas where geologic formations susceptible to compaction mechanisms are present, may result in subsidence that has not been observed historically in the Subbasin.

#### 7.3.5.4. Potential Effects of Undesirable Results

The undesirable result for land subsidence includes impacts to infrastructure. The potential effects of undesirable results for this indicator would be the following:

- Damage to water conveyance facilities and flood control facilities.
- Reduced capacity of surface water delivery systems that in turn leads to increased groundwater demand.
- Adverse effects to property values.
- Economic burdens to mitigate damage.

#### 7.3.5.5. Minimum Thresholds

Land subsidence induced by groundwater pumping has not been observed in the ECC Subbasin including through recent state-wide drought periods (2007-2009 and 2012-2016). Despite the lack of historical land subsidence, minimum thresholds and measurable objectives are established to guide sustainable management response should land subsidence occur.

[10] While land subsidence associated with groundwater pumping has not occurred historically, another type of subsidence due to exposure of peat soils in reclaimed lands in the Delta has occurred to a significant degree.

Section 354.28(c)(5) of the SGMA regulations state that “The minimum threshold for land subsidence shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.”

A minimum threshold is based on data from the UNAVCO P256 Plate Boundary Observatory station described in (**Section 3)** and presented in (**Figure 3-22)**. Two other sources of information, groundwater elevations and InSAR measurements, will be used for verification of associations with groundwater pumping and management in the Subbasin.

A minimum threshold of 1 inch land surface elevation outside the historical elastic range over a three-year period as exhibited by monitoring data at the UNAVCO site P256. Deviations from this minimum threshold over three or more consecutive years may indicate the onset of an inelastic component of subsidence. The historic elastic range is approximately 0.8 inches observed between 2005 to 2016 (see **Figure 3-22**). Exceedance of this minimum threshold would not necessarily result in undesirable results; however, since land subsidence associated with groundwater pumping may occur over many years even after pumping stresses are reduced, it is desired to identify mechanisms and implement sustainability measures to ensure that significant and unreasonable impacts do not arise over time.

#### 7.3.5.6. Information and Criteria Relied Upon to Establish the Minimum Threshold

Information used to establish minimum threshold for land subsidence includes:

1. Historical subsidence measurements from P256 UNAVCO station.
2. Current and historical groundwater elevation in wells.
3. Modeling scenario results of future groundwater level conditions
4. InSAR measurement surveys.

The minimum threshold for subsidence is set to detect the onset of conditions that could potentially lead to undesirable results in the ECC Subbasin as follows.

In addition to the PBO station monitoring data, groundwater elevation data and InSAR measurements[11] will be reviewed to determine whether any inelastic component of land subsidence, should it occur, is related to groundwater pumping. This includes review of minimum thresholds for chronic groundwater decline. If the MT for land subsidence is exceeded for three consecutive years and an associated with groundwater pumping is verified, new adaptive management measurements will be developed and detailed in the subsequent plan update report.

[11] InSAR surveys have only been recently conducted in the ECC Subbasin area. **Figure 3-22** shows survey results for the period June 2015 to June 2019

#### 7.3.5.7. The Relationship of Minimum Thresholds between Like and Different Sustainability Indicators

All sustainability indicators are intrinsically related and SGMA requires an assessment that a particular MT does not result in an undesirable result arising in another sustainability indicator. In the ECC Subbasin, the conservative nature of the land subsidence minimum threshold would have little or no impact to the other minimum thresholds.

- **Chronic lowering of groundwater levels**. The land subsidence minimum threshold will not result in significant and unreasonable lowering of groundwater elevations. However, declining groundwater elevations may have causal association with land subsidence.
- **Reduction in Groundwater Storage**. The land subsidence minimum threshold will not result in significant and unreasonable change in useable groundwater storage.
- **Seawater Intrusion**. The land subsidence minimum threshold will not cause an increase in baywater intrusion in the Subbasin.
- **Degraded Water Quality**. The land subsidence minimum threshold will not result in significant and unreasonable changes in groundwater quality.
- **Depletion of interconnected surface waters**. The land subsidence minimum threshold will not result in significant and unreasonable changes in groundwater elevations and will not impact depletion of interconnected surface waters.

#### 7.3.5.8. How the MT was Selected to Avoid Causing Undesirable Results in Adjacent Basins

There are four adjacent basins to the ECC Subbasin:

- Pittsburg Plain Basin
- Solano Subbasin
- Eastern San Joaquin Subbasin
- Tracy Subbasin

The land subsidence minimum threshold induced by groundwater pumping was set to prevent significant and unreasonable land subsidence that damages infrastructure in the ECC Subbasin. No impacts to the adjacent basins are expected because 1) subsidence due to groundwater withdrawal has not occurred historically in the ECC Subbasin and 2) groundwater demand is projected to be stable or decrease in the future. In addition, the MT for land subsidence is sufficiently conservative to avoid adverse impacts from propagating outside the Subbasin.

#### 7.3.5.9. How the MT May Affect the Interests of Beneficial Uses and Users of Groundwater

The subsidence minimum thresholds are set to prevent inelastic subsidence that could impact infrastructure. Currently there is no inelastic subsidence occurring in the ECC Subbasin that impacts any beneficial user and the MT is sufficiently conservative to avoid impacts by subsidence and permit adaptive mitigation measures to be implemented if it occurs.

#### 7.3.5.10. How the MT Relates to the Federal, State, or Local Standards

There are no federal, state, or local standards for land subsidence.

#### 7.3.5.11. How Each MT Will be Quantitatively Measured

Minimum thresholds are based on UNAVCO data for site P256 and measurements of groundwater levels as described in **Section 6**.

#### 7.3.5.12. Measurable Objectives and Interim Milestones

The measurable objectives and interim milestones are based on the elastic range of historically observed land deformation at the UNAVCO P256 station. The measurable objective and interim milestones for P256 is set at the average seasonal elastic movement (0.6 inch vertical) as shown in (**Figure 3-22**). Deviations from this measurable objective over three or more years may indicate the onset of an inelastic component of subsidence as discussed above.

### 7.3.6. Depletions of Interconnected Surface Waters

As described in **Section 3.3.8,** the majority of the ECC Subbasin may have interconnected surface water and groundwater through the Shallow Zone. In the Subbasin setting, the major surface water conveyances are the San Joaquin River and Old River. These conveyances are influenced by two major water supply projects, the California State Water Project and the federal Central Valley Project. Through the Bay-Delta Plan, the state Water Board sets regulations for water quality and flow to protect both environmental and water supply concerns in the region. Thus, shallow groundwater and surface water interconnections are not controlled locally or by the ECC Subbasin GSAs.

The hydraulic connections between groundwater and surface water have not been definitively characterized. New shallow monitoring wells are being installed as part of this GSP at locations on the San Joaquin River and Old River, and immediately upstream of the San Joaquin and Sacramento confluence in Antioch. This expanded Shallow Zone monitoring network, plus two existing shallow wells on western creeks, will be used to characterize the nature of surface water-groundwater connections and to assess the surface water depletion sustainability indicator in relation to local groundwater management as instituted in the ECC Subbasin GSP. Groundwater level monitoring adjacent to streams will be used with existing stream gages to show the spatial and temporal relationships between groundwater and surface water heads.

The groundwater flow model described in **Section 5** will be used as a comparative tool to provide initial estimates of the limits of groundwater pumping in the Subbasin which could cause undesirable results for stream depletion. This provides an interim basis for setting minimum thresholds and measurable objectives which can then be refined using data from the expanded Shallow Zone and surface water monitoring networks.

#### 7.3.6.1. Undesirable Results

There is no evidence of past or present significant and unreasonable depletions of surface water as a result of groundwater use in the ECC Subbasin. Major rivers and streams that have a hydraulic connection to the groundwater system are the San Joaquin River and Old River. Managed conveyances (i.e., conveyances for irrigation water, drainage, and flood control) are generally not considered in the analysis of depletions. Creeks, including Marsh Creek, are considered important aspects of the environmental setting and the Shallow Zone monitoring network is designed to assess the presence of depletion mechanisms for these features (see **Section 6**).

#### 7.3.6.2. Criteria to Define Undesirable Results

SGMA requires each GSP to consider the consequences of undesirable results even if they have not occurred historically or are projected to occur in the future. Significant and unreasonable depletions of interconnected surface waters in the Subbasin are defined as:

- Depletions that result in reductions in flow or stage of major rivers and streams that are hydrologically connected to groundwater in the Subbasin and which cause significant and unreasonable impacts on beneficial uses and users of surface water and the environment.

The relationship between shallow groundwater levels and potential impacts on species and habit will be evaluated as data are collected from the expanded Shallow Zone monitoring network discussed in **Section 6**.

#### 7.3.6.3. Potential Causes of Undesirable Results

Potential causes of depletion of interconnected surface water include the following:

- New large-scale pumping or diversions from shallow wells.
- New localized pumping from Deep Zone wells in locations that are vertically connected to the Shallow Zone and surface water.
- Interception or reduction of natural patterns of groundwater discharge to surface water.

#### 7.3.6.4. Potential Effects of Undesirable Results

Depletions of interconnected surface water could result in:

- Reduction in flows that negatively impact aquatic species and groundwater dependent ecosystems.
- Reduced flows within rivers and streams that adversely impact diversions for agricultural or urban users.
- Increased costs to mitigate impacts.

#### 7.3.6.5. Minimum Thresholds

Section 354.28(c)(6) of the SGMA regulations states:

> *"The minimum threshold or depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results."*

The rate and volume of flow in and out of surface water have been initially quantified through water budget modeling scenarios in **Section 5**. For the Base Period 1997 to 2018, the average annual groundwater inflow attributed to all surface water features was 18,560 AFY and ranged from 10,135 to 31,887 AFY. High values occurred during dry years and the low values during wet years.

For sustainable yield scenarios, groundwater pumping at higher than historical levels were simulated to assess potential impacts to the interconnected surface water indicator. The historical average annual pumping in the ECC Subbasin during the Base Period was approximately 46,455 AFY. Annual pumping ranged between a high of approximately 58,250 and a low of 32,500 AF in dry and wet years, respectively. In the sustainable yield scenarios, surface water deliveries were reduced by 40, 45, 50, and 75 percent. This resulted in greater groundwater pumping to meet various demands. Relative to the Base Period average, these four scenarios resulted in 30, 42, 55, and 135 percent more groundwater pumping. With regard to sustainability indicators, the contribution to the water budget from surface water features (i.e., depletion) in the 75-percent surface water reduction scenario was nearly 10,000 AFY more than the Base Period average (approximately 26,850 versus 17,770 AFY). Net subsurface flow between adjoining groundwater basins also changed significantly for the highest surface water reduction scenario. Instead of average outflow of -8,500 AFY in the Base Period, this scenario resulted in about 8,300 AFY inflow.

From the modeling, it was seen that up to 50 percent reductions in surface water deliveries, there were no significant changes in water budget components that might induce undesirable results. At the more conservative 75-percent reduction scenario, undesirable results may be triggered for the interconnected surface water sustainability indicator. While no conclusion was drawn as to whether this scenario actually would lead to significant and unreasonable results, the results indicate that changes in basin management that result in sustained pumping in all water years at more than twice the historical average (i.e., 135 percent) would be required to induce a major changes in surface water depletion.

Based on the groundwater flow model results, a conservative interim minimum threshold for depletion of interconnected surface water is set at a value corresponding to 45 percent reduction in surface water deliveries. In this scenario, sustained basin-wide pumping would be 42 percent greater than the historic Base Period average, or 66,000 AFY. While this leads to a moderate increase in average contribution from surface water bodies in the subbasin water budget (about 18,100 AFY versus 17,800 AFY), it serves as conservative threshold at which closer examination of undesirable results could be undertaken if more groundwater use is projected in the future.

Greater precision and accuracy for the minimum threshold for this sustainability indicator may be achieved by using Shallow Zone groundwater levels as a proxy. This proxy would be complemented by the stream stage monitoring network described in **Section 6**. GSP regulations allow GSAs to use groundwater levels as a proxy metric for any sustainability indicator if the GSP demonstrates there is significant correlation between groundwater levels and the depletions of interconnected surface water. The relationship between the ECC Subbasin GSP groundwater flow model results and measured groundwater level data will serve as a basis for determining the effectiveness of a groundwater level proxy. Since no apparent surface water depletions are evident in the Subbasin, future projects and management actions shall be evaluated through comparative modeling scenarios and with monitoring data to assess potential mechanisms for the onset of undesirable rates of surface water depletion.

#### 7.3.6.6. Information and Criteria Relied Upon to Establish the Minimum Threshold

Water budget modeling scenarios presented in **Section 5** are used to inform potential hydraulic mechanisms that could indicate significant and unreasonable results for this indicator. As data are developed, groundwater level minimum thresholds may be used as a proxy with data from the expanded Shallow Zone groundwater monitoring network and informed by the ECC groundwater flow model.

#### 7.3.6.7. How the MT May Affect the Interests of Beneficial Uses and Users of Groundwater

The interconnected surface water minimum thresholds are set to avoid effects on beneficial users and land uses in the Subbasin:

- Domestic and agricultural well owners: Currently there are no reported shallow groundwater level declines in the Subbasin and none are expected by employing a minimum threshold for this indicator.
- Urban land uses and users: No changes are expected since no changes to shallow groundwater are expected.
- Environmental land uses and users. The minimum threshold is set to protect GDEs near streams where there is a connection to shallow groundwater.

#### 7.3.6.8. The Relationship of Minimum Thresholds for Other Sustainability Indicators

The minimum thresholds for the depletions of interconnected surface waters are established to avoid undesirable results for other sustainability indicators, as described below.

- **Chronic Lowering of Groundwater Levels and Reduction in Groundwater Storage.** Modeling scenarios indicate that the minimum threshold for interconnected surface water depletions would not trigger chronic declines in water levels or storage.
- **Land Subsidence.** Since the minimum threshold for interconnected surface water depletions would not trigger chronic declines in water levels, land subsidence would not be induced.
- **Seawater Intrusion and Degraded Water Quality.** The minimum threshold for the depletions of interconnected surface waters may be linked to these indicators as they may be affected by induced movement of surface water into the groundwater system at higher pumping volumes. However, the MT is sufficiently conservative that if pumping increased to the threshold, significant impacts are not expected to occur. Rather, the MT is set as a trigger to further assess the presence of mechanisms that might lead to undesirable results.

#### 7.3.6.9. How the MT was Selected to Avoid Causing Undesirable Results in Adjacent Basins

Adjacent basins are linked through their proximity and possible similar connections to the Bay-Delta ecosystem. The minimum threshold for the interconnected surface water sustainability indicator is conservatively based on comparative model scenarios that consider the entire Subbasin water budget including flows to and from other basins. The modeling results indicate that for a scenario of 135 percent increased pumping compared to the Base Period, significant changes in inter-basin flow to balance the ECC water budget could occur. It was concluded that setting an interim MT at 42 percent more pumping relative to the Base Period average, the potential impacts would be less than significant and allow the GSAs to conduct further modeling and  monitoring to determine how and where impacts might occur if the pumping rates were projected to continue rising beyond that level. Using the ECC groundwater flow model to continually update the water budget will enable the ECC GSAs to identify needs for management changes to avoid adverse impacts to adjoining basins.

### 7.3.6.10. How the MT Relates to the Federal, State, or Local Standards

There are no federal, state, or local standards for depletion of interconnected surface water. However, depletion of interconnected surface water has the potential to conflict with the state Water Board Bay-Delta Plan and, as such, the GSAs will consider any future updates to the plan and how such updates may affect sustainable groundwater management in the ECC Subbasin, particularly with respect to the Shallow Zone.

### 7.3.6.11. How Each MT Will be Quantitatively Measured

Groundwater flow modeling suggests a link to increased pumping and stream depletion over baseline levels. The flow model relies on quantitative groundwater level data as measured in the basin-wide and representative monitoring networks. The use of the model to assess this sustainability indicator may be complemented or replaced by proxy groundwater level measurements.

### 7.3.6.12. Measurable Objectives

The measurable objectives and interim milestones for depletions of interconnected surface water sustainability indicator are set at the average annual groundwater pumping during the Base Period 1997 to 2018, or 46,455 AFY. In dry years, pumping increased to 58,250 AFY in the Base Period, still well below the 42-percent pumping increase used to define the MT.

## 7.4. References

California Department of Water Resources (DWR). November 2017. Draft Guidance Document for the Sustainable Management of Groundwater: Sustainable Management of Groundwater, Best Management Practice.

California Department of Water Resources (DWR). Well Completion Report Map Application. 2019. https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37. Accessed May 2019.

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# 8. PROJECTS AND MANAGEMENT ACTIONS (§ 354.44)

As established in **Section 7**, groundwater conditions in the ECC Subbasin exhibit stability and sustainability. The technical analysis of groundwater conditions shows through historic and current use of the Subbasin no signs of chronic lowering of groundwater levels, reduction of groundwater storage, land subsidence, sea water intrusion, degraded water quality or depletion of interconnected surface water. The Subbasin Sustainability Goal broadly includes maintaining safe and reliable access to groundwater, assessing and managing groundwater in the future under climate change, protecting the sustainable yield, and continuing to avoid undesirable results of groundwater extraction as defined by Subbasin stakeholders.

Projects and management actions (PMAs) were developed to achieve the ECC Subbasin sustainability goal by 2042 and avoid undesirable results over the GSP planning and implementation horizon. Given the current and projected stability and sustainability of groundwater in the ECC Subbasin, PMAs are developed with the goal of maintaining sustainable groundwater conditions. PMAs include a suite of targeted PMAs that the GSAs may develop and implement, if needed under future conditions. The GSP also includes some PMAs that are expected to be implemented (or are already being implemented) by individual GSAs in the Subbasin to maintain sustainability.

ECC Subbasin GSAs have identified a range of PMAs. Projects generally refer to structural programs, including, for example, direct and in-lieu recharge utilization of recycled water, and other capital improvement projects. In contrast, management actions are typically non-structural programs or policies that do not require a substantial capital outlay and are intended to incentivize reductions in groundwater pumping when needed.

ECC Subbasin PMAs are described in accordance with 23 California Code of Regulations (CCR) §354.44. Because the ECC Subbasin is currently and projected to be sustainable over the implementation and planning horizon (i.e., no onset of undesirable results), PMAs are not expected to be essential for sustainability. However, future conditions are uncertain and PMAs are viewed as enhancing management capabilities and will be implemented on an as-needed basis. It is anticipated that PMAs would be targeted at specific regions that may emerge in the future as potential areas of concern.

Projects included in the GSP include infrastructure to provide in-lieu recharge, improve water quality, and increase use of recycled wastewater. Projects are either ongoing, under construction, or in the planning stage and are expected to help maintain sustainable conditions in the Subbasin and mitigate potential future problems. The estimated groundwater recharge benefit and capital cost of each project is shown. Project cost information is limited for many projects because a detailed feasibility assessment has not been completed. Other projects have cost estimates that were developed several years ago and may not reflect current conditions. To the extent possible, project costs are adjusted and reported on a consistent basis. GSAs and other agencies in the Subbasin will further develop projects during the GSP implementation period and refine estimated costs.

Management actions are options available to the GSAs if groundwater conditions begin to trend below Measurable Objectives (MO) or approach Minimum Thresholds (MT). Some GSAs may implement management actions proactively as a local policy. However, this appears unlikely based on current and projected groundwater modeling for the Subbasin (**Section 7**). Management actions in the GSP include oversight of well construction features, metering, and demand management. Management actions have more concise descriptions because they generally do not require outside approval or infrastructure and are part of authorities granted to GSAs under SGMA legislation. Benefits and costs will mostly depend on necessity and the extent of the area or areas which would require the action.

In accordance with CCR §354.44(b)(9), GSAs will identify sources of funding to cover project development, capital, and operating costs, including but not limited to, groundwater extraction fees, increasing water rates, grants, low interest loans, and other assessments. The exact funding mechanism will vary by project and the legal authority of each GSA (or project proponent). A general description of how each GSA expects to cover costs is presented after the description of each project.

Individual GSAs or other water agencies in the Subbasin will manage the permitting and other specific implementation oversight for its own projects. The ECC GSAs have an obligation to ensure groundwater sustainability in the Subbasin, however, they are not the primary regulator of land use, water quality, or environmental project compliance. The individual GSAs will be responsible for implementing projects and management actions in accordance with applicable statutes and regulations, and in coordination with other local, state, and federal authorities that may have permitting and regulatory authority over PMAs.

GSAs will notify the public and other agencies of the planned or ongoing implementation of PMAs through the communication channels identified for each project (23 CCR §354.44(b)(1)(B)). Noticing will occur as projects are being considered for implementation, and as future projects are implemented. Noticing will inform the public and other agencies that the GSA is considering or has implemented the PMA and will provide a description of the actions that will be taken.

PMAs are categorized and presented in this chapter according to the current status of implementation and development. This is consistent with the adaptive approach to PMA implementation and with development of PMAs based on the best available data and science (per 23 CCR §354.44(c)). This chapter also acknowledges ongoing investments made by GSAs and other agencies in the Subbasin (including prior to the passage of SGMA), such as projects that were identified and moved forward under regional water management planning efforts.

The PMA categories described in this chapter include:

- Completed Projects and Management Actions are PMAs that the GSA or other project proponents have implemented that will support sustainable groundwater management in the Subbasin. In accordance with 23 CCR §354.44(a) these are PMAs that would allow GSAs to achieve the sustainability goal for the ECC Subbasin and avoid minimum thresholds defined in this GSP under future, changing conditions.
- Under Construction Projects and Management Actions are PMAs that are being implemented and will support sustainable groundwater management in the Subbasin. In accordance with 23 CCR

§354.44(a) these are PMAs that would allow GSAs to achieve the sustainability goal for the Subbasin and avoid minimum thresholds defined in this GSP under future, changing conditions.

- Planned Projects and Management Actions are PMAs that are expected to be implemented and support sustainable groundwater management in the Subbasin. These may have been studied by the project proponent, or in earlier regional water planning documents, but most project design, costs, and planning work has yet to be completed.

- Conceptual Projects and Management Actions are PMAs that are being discussed as potential options to be implanted only as needed in any areas of the Subbasin facing deleterious groundwater conditions. This is not expected in the Subbasin as a whole, but these PMAs may be considered in specific areas facing unforeseen unsustainable conditions due to, for example, prolonged drought or supply disruption.

**Table 8-1** summarizes the PMAs, type, and expected benefits to measurable objectives in the Subbasin. Most proposed PMAs are expected to benefit groundwater levels and groundwater storage, whether through direct or in-lieu groundwater recharge, management of water supplies, or demand reduction. Projects that increase the overall water supply are also expected to reduce depletions of interconnected surface water. Some management actions would potentially benefit all measurable objectives if those were ultimately triggered for implementation.

**Table 8-1. Summary of ECC Projects & Management Action**

| Project/ Management Action Name | Project/ Management Action Category | Measurable Objectives Expected to Directly Benefit | | | | | |
|---|---|---|---|---|---|---|---|
| | | GW Levels | GW Storage | SW Depletion | Land Subsidence | Seawater Intrusion | Water Quality |
| Northeast Antioch Annexation Water and Sewer Facility Installation | Completed | X | X | | | | X |
| Non-Potable Storage Facility and Pump Station | Completed | X | X | X | | | |
| Dry-Year Water Transfer ECCID/CCWD | Completed | X | X | X | | | |
| Citywide Non-Potable Water Distribution System | Under Construction | X | X | X | | | |
| City of Antioch Brackish Water Desalination Project | Under Construction | X | X | X | | | X |

| Project/ Management Action Name | Project/ Management Action Category | Measurable Objectives Expected to Directly Benefit | | | | | |
|---|---|---|---|---|---|---|---|
| | | GW Levels | GW Storage | SW Depletion | Land Subsidence | Seawater Intrusion | Water Quality |
| Treatment and Reuse of Alternative Water Supplies | Planned | X | X | X | | | X |
| Transport Model Development | Planned | | | | | | X |
| Well Spacing Control | Conceptual | X | X | | X | | |
| Oversight of Well Construction Features | Conceptual | | | | | | X |
| Well Metering, Monitoring, and Reporting | Conceptual | X | X | X | X | | |
| Demand Management Program | Conceptual | X | X | X | X | X | X |
| Water Conservation Programs | Varied | X | X | X | X | X | X |

This rest of this chapter is structured as follows. **Section 8.1** provides a summary of projects. The three subsequent subsections describe the projects in each of the three categories. **Section 8.2** describes management actions.

## 8.1 Projects

Seven (7) projects are included in the GSP. These projects provide a benefit to water supply or water quality, and are currently completed, under construction, or planned for implementation over the next 20 years (GSP implementation period). As described above and in **Section 7**, groundwater conditions are projected to be sustainable over the GSP implementation period, even in the absence of any projects. The GSAs will continue to monitor groundwater conditions, and report on them in annual GSP reports and 5-year GSP updates. Some projects may be triggered if undesirable results are projected to occur and subsequent GSP updates would provide an implementation schedule and additional project details.

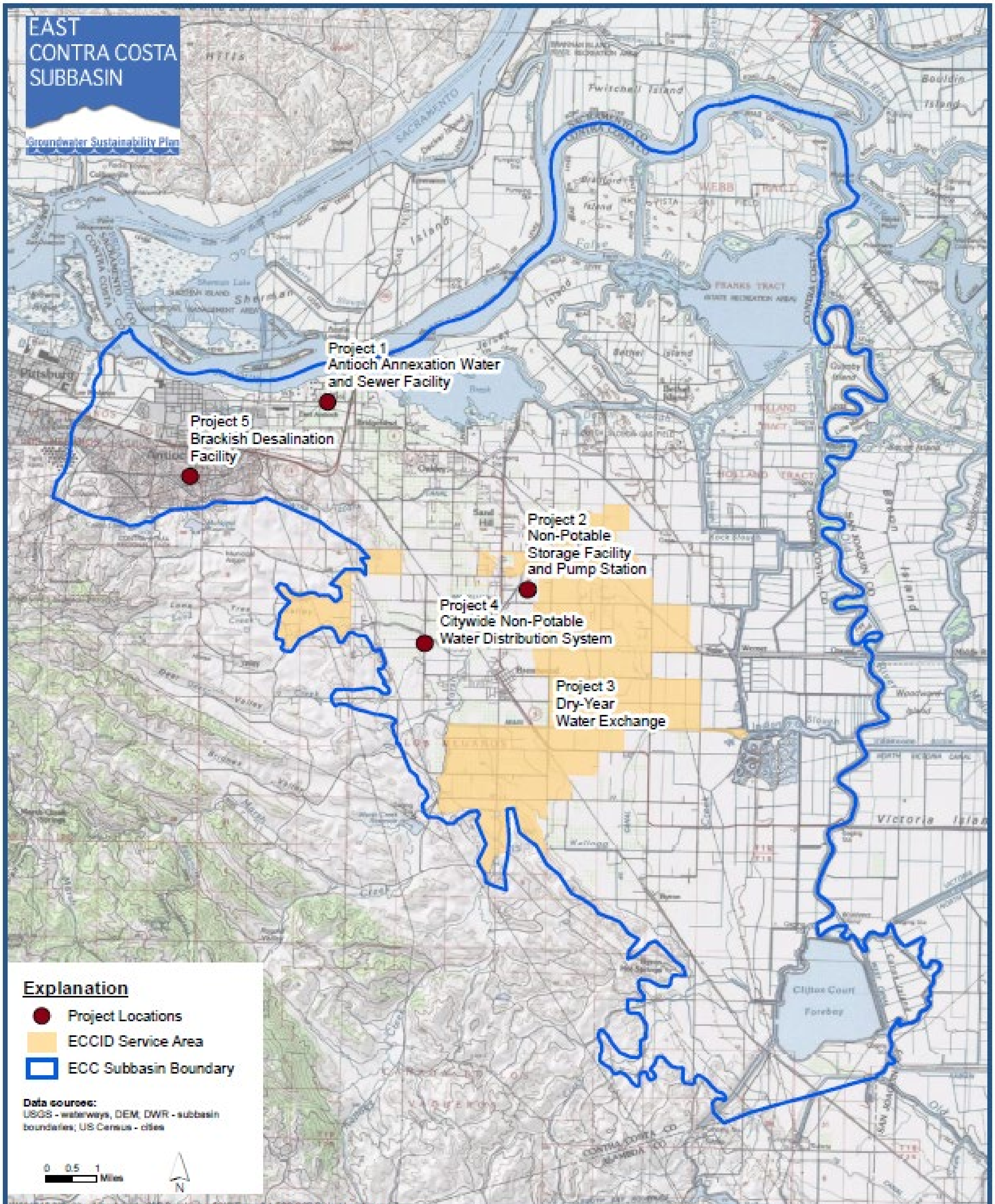
The ECC GSP Working Group used the Integrated Regional Water Management (IRWM) Plan (ECWMA 2019) to generate a preliminary list of projects that have been previously developed and evaluated by local entities in the ECC Subbasin. The GSAs then selected projects from this list that are expected support sustainable groundwater management and help maintain sustainable conditions in the Subbasin. Some projects described in this section are extensions of those detailed in the most recent IRWM Plan. Interested parties were informed and could provide feedback on the projects at a public workshop held on June 23, 2021; additional comments will be received during public review of this GSP.

### 8.1.1 Project Implementation

Projects will be administered by the project proponent (e.g., GSA). The project proponent has sole discretion to designate and implement a project in a timeframe in accordance with its funding, capability, and prioritization. No projects identified to date are considered essential for achieving the Subbasin sustainability goal because the ECC Subbasin is currently and projected to be sustainable over the implementation and planning horizon.

### 8.1.2 List of Projects

Seven possible projects to increase water supply availability and reliability in the ECC Subbasin were identified and are included in the GSP. These projects help contribute to the current and continued sustainability of the Subbasin. Projects include water recycling and water quality and are detailed in the project summaries below and in **Figure 8-1** and **Table 8-1**. **Figure 8-1** illustrates projects that are completed or under construction. **Table 8-2** lists projects which are completed, under construction, or planned.




Luhdorff & Scalmanini Consulting Engineers

ECC GSP Project Locations

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figre 8-1**

**Table 8-2. Summary of ECC GSP Projects**

| Name | Type | Proponent | MO to Benefit | Status | Completion Year[1] | Capital Cost ($) | Expected Yield[2] |
|---|---|---|---|---|---|---|---|
| Northeast Antioch Annexation Water and Sewer Facility Installation | In-Lieu Recharge / Water Quality | City of Antioch | Groundwater Levels, Groundwater Storage, Water Quality | Completed | 2020 | 4,400,000 | 8 AFY (.0007 MGD) |
| Non-Potable Storage Facility and Pump Station | In-Lieu Recharge / Recycled Water | City of Brentwood | Groundwater Levels, Groundwater Storage, Interconnected Surface Water | Completed | 2020 | 12,804,500 | 1,661 AFY (1.5 MGD) |
| Dry-Year Water Transfer ECCID/CCWD | In-Lieu Recharge | East Contra Costs ID | Groundwater Levels, Groundwater Storage, Interconnected Surface Water | Completed | 2000 | N/A | 4,000 AFY (3.5 MGD) |
| Citywide Non-Potable Water Distribution System | In-Lieu Recharge / Recycled Water | City of Brentwood | Groundwater Levels, Groundwater Storage, Interconnected Surface Water | Under construction | 2021 | 9,054,036 | 1,661 AFY (1.5 MGD) |
| City of Antioch Brackish Water Desalination Project | In-Lieu Recharge | City of Antioch | Groundwater Levels, Groundwater Storage, Interconnected Surface Water | Under construction | 2023 | 110,000,000 | 6,720 AFY (6 MGD) |
| Treatment and Reuse of Alternative Water Supplies | In-Lieu Recharge / Recycled Water | Diablo Water District | Groundwater Levels, Groundwater Storage, Interconnected Surface Water | Planned | TBD | 20,000,000 to 100,000,000 | 2,800 AFY (2.5 MGD) |
| Transport Model Development[3] | Water Quality | Diablo Water District | Water Quality | Planned | TBD | 250,000 to 500,000 | N/A |

1. SGMA's required planning implementation horizon is 50 years.
2. Represents total offset to water supply; direct benefits to groundwater will vary.
3. The Transport Model Development project is in progress.

### 8.1.3 Completed Projects

Projects in this category are completed and operating. They have either been completed recently and will have benefits not accounted for in the water budget described in **Section 5**, or they are ongoing with the capacity to expand. These projects provide in-lieu groundwater recharge benefits. The estimated cumulative benefit of these projects is 5,669 AFY.

#### 8.1.3.1 Project 1: Northeast Antioch Annexation Water and Sewer Facility Installation

| Project Summary | |
|---|---|
| Submitting GSA | City of Antioch |
| Project Type | In-Lieu Recharge / Water Quality |
| Estimated Groundwater Offset and/or Recharge | 8 AFY, Water Quality Benefits |

This project involved construction of new water and sewer facilities where there were none. Residents in this area had been relying on aging individual wells and septic tanks without access to municipal treated water or sewer services. This project provides facilities to a lower-income community, thus more equitably providing water access and protecting groundwater from potential septic tank and leach field contamination.

*Measurable Objective Expected to Benefit:*

This project, through reducing well use, helps avoid potential lowering of groundwater levels and reduction in groundwater storage. It also avoids potential water quality degradation from existing septic tanks and leach fields.

*Project Status and Timetable for Initiation and Completion:*

This project was completed in May of 2020.

*Required Permitting and Regulatory Process:*

All work was performed in City right-of-way or in areas that easements have been acquired. Permitting was required through BNSF Railroad for installation of a pipeline across its right-of-way.

*Expected Benefits and Evaluation:*

Groundwater recharge is an important part of the GSP and will be critical to maintaining long-term Subbasin sustainability. This project is anticipated to reduce 8 AFY in groundwater pumping by providing residents and businesses access to the City of Antioch water supply. Furthermore, the project is expected to benefit water quality through reduction of potential contamination. Benefits to groundwater levels and water quality will be evaluated through monitoring, as described in **Section 6***.*

*How Project Will Be Accomplished/Evaluation of Water Source:*

New pipelines provide City water to residents that were not in the system. The source of water will be the City of Antioch, which is expected to provide a reliable water supply for the annexed area.

*Legal Authority:*

GSAs, in this case the City of Antioch GSA, have the authority to plan and implement projects. The City of Antioch is a local agency established to serve water for agricultural and municipal demands.

*Estimated Costs and Plans to Meet Costs:*

The capital cost for this project is $4,400,000. Costs for this project have been met through City of Antioch and County funds.

Annual operating costs of the project are $21,500. Operating costs from the project are paid for by ratepayers.

*Circumstances for Implementation:*

A construction agreement for this work was approved by the Antioch City Council on December 11, 2018. The Notice of Completion was approved by the Antioch City Council on June 9, 2020. No further process is needed to determine the conditions which would require this project because it is already constructed.

*Notice to Public and Other Agencies*

Public noticing for this project is being done in accordance with noticing requirements and in public meetings held the City of Antioch GSA and others.

#### 8.1.3.2 Project 2: Non-Potable Storage Facility and Pump Station

| Project Summary | |
|---|---|
| Submitting GSA | City of Brentwood |
| Project Type | In-Lieu Recharge / Recycled Water |
| Estimated Groundwater Offset and/or Recharge | Up to 1,661 AFY |

The Wastewater Treatment Plant (WWTP) discharges about 2 million gallons of recycled water per day into Marsh Creek. Utilization and blending of this valuable resource are major strategic components for compliance with the requirements of the National Pollution Discharge Elimination System (NPDES) Permit. This reduces the reliance and associated treatment costs on potable water and complies with both State and City mandates on increasing recycled water usage.

The City of Brentwood is implementing steps to utilize more recycled water citywide; however, the peak daily recycled water supply (morning and evenings) does not align with the peak recycled water demand (night). The City of Brentwood needs an adequate storage facility to maximize utilization of this valuable resource. This project offsets the use of 1,661 AFY of potable water sourced in part from the Subbasin, reduces discharge to Marsh Creek, and reduces surface water diversions used for irrigation.

*Measurable Objective Expected to Benefit:*

This project, through increasing the city water supply, helps avoid potential lowering of groundwater levels, reduction in groundwater storage, and depletion of interconnected surface water.

*Project Status and Timetable for Initiation and Completion:*

This project was completed in 2020.

*Required Permitting and Regulatory Process:*

Requirements from the Central Valley Regional Water Quality Control Board, as part of the WWTP NPDES Permit, include that the City of Brentwood must expand recycled water usage and decrease discharge of treated water into Marsh Creek. Storage facility construction was completed following all required permitting and regulatory requirements.

*Expected Benefits and Evaluation:*

Recycled water is an important part of the City's water resources. Recycled water allows the City of Brentwood to conserve potable water, thereby ensuring a reliable water supply for current and future demand. This project is expected to offset 1,661 AFY in water demand.

The amount of in-lieu recharge depends on the availability of other sources, but some offset of groundwater pumping is expected. The Non-Potable Storage Facility project will improve access to recycled water supplies. Alternate water supplies will be an important component of the priorities and requirements to facilitate sustainable groundwater management and will be critical to establishing long-term groundwater sustainability. Benefits will be evaluated through volumetric measurement of recycled water added back into the system.

*How Project Will Be Accomplished/Evaluation of Water Source:*

The City's Wastewater Treatment Plant's tertiary treatment and disinfection provides recycled water for landscaping. The City of Brentwood is a producer and distributor of Title 22 tertiary recycled water for unrestricted reuse. Upon completion of the pipeline installation, recycled water will be pumped throughout the City of Brentwood for irrigation uses in lieu of potable water. Since the source of water is recycled wastewater, this is expected to be reliable even during drought periods.

*Legal Authority:*

GSAs, in this case the City of Brentwood GSA, have the authority to plan and implement projects. Unrestricted, non-potable recycled water is defined as wastewater that has been treated to tertiary standards (via filtration and disinfection) that meet Title 22 of the California Code of Regulations (California Department of Public Health, 2018). The production and distribution of recycled water is covered in the City's Master Reclamation Permit. Recycled water treated to this level can be used for all outdoor irrigation demands in a community, including parks, schools, street medians, residential front and backyard landscaping, public open space, as well as industrial uses such as cooling water.

*Estimated Costs and Plans to Meet Costs:*

The capital cost for this project was $12,804,500. The project was funded by a State Water Resources Control Board Revolving Fund "SRF" loan, so project approvals were obtained from the Regional Water Quality Control Board (RWQCB) and other affected local agencies. The SRF funding consisted of 35% from State and Federal grants and 65% from a loan that will be repaid using Wastewater Development Impact Fees and Wastewater Enterprise Funds.

Annual operating costs associated with this specific project are minor because this is an improvement on existing WWTP operations, which are already paid for by ratepayers.

*Circumstances for Implementation:*

This project was completed in 2020. The City of Brentwood has developed preliminary planning documents to identify uses for recycled wastewater at both existing and future sites. The recycled wastewater will be used for the irrigation of parks and other landscape amenities. The City of Brentwood already has constructed a portion of the recycled water distribution system and will continue to expand the system as the City of Brentwood grows. Recycled water demands are estimated to be 2,111 AF (688 MGY) at buildout. No further process is needed to determine the conditions which would require this project because it is already complete.

*Notice to Public and Other Agencies*

Public noticing for this project is being done in accordance with noticing requirements and in public meetings held by the City of Brentwood GSA and others.

#### 8.1.3.3 Project 3: Dry-year Water Transfer ECCID/CCWD

| Project Summary | |
|---|---|
| Submitting GSA | East Contra Costa Irrigation District |
| Project Type | Dry-Year Water Exchange |
| Estimated Groundwater Offset and/or Recharge | Up to 4,000 AFY |

Under this project, CCWD diverts surface water of the same quantity ECCID has pumped from groundwater sources to meet local municipal and industrial demands within the ECC Subbasin. In wet years ECCID does not pump groundwater beyond what is required for use by ECCID direct use customers. This project is ongoing and implemented on an as needed basis and could be expanded if necessary to meet water supply needs while avoiding undesirable results. This exchange benefits local domestic supply as the aquifer recovers quickly through natural recharge and aids in meeting the measurable objective of maintaining average groundwater storage through all water year types. Although surface water meets about 85 percent of the ECC Subbasin water supply, groundwater can play a key role in prolonged droughts and benefit and preserve the agricultural resources of the region. ECCID will pump additional groundwater in dry years when surface waters are in a shortage as a result of drought.

*Measurable Objective Expected to Benefit:*

This project can help to avoid lowering groundwater levels and reduction in groundwater storage through replenishment of groundwater pumped during dry water years using surface water in wet water years. It also can help avoid depletion of interconnected surface water through taking stress of surface water supplies during dry years.

*Project Status and Timetable for Initiation and Completion:*

This project was first implemented in 2000 and is ongoing. The project will be implemented in dry years under an existing agreement.

*Required Permitting and Regulatory Process:*

The dry year transfer has been permitted and approved under the following agreements:

- Contract Among the Department of Water Resources of the State of California, East Contra Costa Irrigation District, and Contra Costa Water District, 1991 (amended 2000).
- Water Sales Agreement Between the East Contra Costa Irrigation District and the Contra Costa Water District, 2000.
- DWR approved the dry year exchange in a letter dated May 22, 2003.

*Expected Benefits and Evaluation:*

This project helps ensure groundwater is made available and distributed fairly to as many users as possible in the Subbasin when needed. Although surface water meets about 85 percent of the ECC Subbasin water supply, groundwater can play a key role in prolonged droughts and benefit and preserve the agricultural resources of the region. Benefits will be evaluated through volumetric measurement of delivered water.

*How Project Will Be Accomplished/Evaluation of Water Source:*

ECCID will pump additional groundwater in dry years when surface waters are in a shortage as a result of drought. Currently a long-term agreement is in place to initiate the transfer in dry years. Implementation includes a monitoring plan that was approved by DWR. The source of water will be the ECCID which is expected to be reliable. At this time there are no exchanges scheduled. However, additional wells may be considered to improve the efficiency of the groundwater transfer as well as to allow transfers outside of the irrigation season.

*Legal Authority:*

The dry year groundwater exchange is included in the Water Sales Agreement between ECCID and CCWD, dated February 22, 2000.

*Estimated Costs and Plans to Meet Costs:*

The initial implementation costs for this project have already been met by ECCID. Ongoing and future costs of the project are expected to be minimal and would be paid for by rate payers as needed.

*Circumstances for Implementation:*

For purposes of this transfer, a shortage situation must be determined when the U.S. Bureau of Reclamation notifies the CCWD that the allocation of Central Valley Water Project (CVP) water to CCWD will be less than CCWD's requested schedule of water supply service, submitted pursuant to CCWD's CVP contract. DWR will be informed when the transfer begins and ends. Total volumes of water will be reported monthly and annually to DWR per the existing agreements and approved monitoring plan. No further process is needed to determine the conditions which would require this project because it has already been implemented.

*Notice to Public and Other Agencies*

Public noticing for this project is being done in accordance with noticing requirements and in public meetings held by the ECCID GSA and others.

### 8.1.4 Projects Under Construction

Projects in this category are currently under construction and will be operating by 2042. Both projects provide in-lieu groundwater recharge benefits. The projected cumulative supply of these projects is 8,381 AFY.

#### 8.1.4.1 Project 4: Citywide Non-Potable Water Distribution System

| Project Summary | |
|---|---|
| Submitting GSA | City of Brentwood |
| Project Type | In-Lieu Recharge / Recycled Water |
| Estimated Groundwater Offset and/or Recharge | Up to 1,661 AFY |

This project consists of the expansion of the reclaimed (non-potable) water distribution system throughout the City to provide reclaimed water for irrigation of golf courses, parks, parkways, medians, and other applicable uses. There are parks and public landscaping that are currently irrigated using potable water. By converting to non-potable water usage, the City can save on potable water supply. This project will deliver an additional 1,661 AFY produced by its treatment plant and offset the use of potable water sourced in part from the Subbasin.

*Measurable Objective Expected to Benefit:*

This project, through increasing the city water supply, helps avoid potential lowering of groundwater levels, reduction in groundwater storage, and depletion of interconnected surface water.

*Project Status and Timetable for Initiation and Completion:*

This project is currently under construction. This project began February 16, 2021 and is on schedule to be completed by November 2021.

*Required Permitting and Regulatory Process:*

This project requires the installation of non-potable water main lines throughout various portions of Brentwood. The project is being funded by a State Water Resources Control Board Revolving Fund "SRF" loan, so project approvals were obtained from the Regional Water Quality Control Board (RWQCB) and other affected local agencies.

*Expected Benefits and Evaluation:*

Recycled water is an important part of the City's water resources. Recycled water allows the City to conserve potable water, thereby ensuring a reliable water supply for current and future demand. The Non-Potable Water Distribution System project will expand the non-potable water distribution system and improve access to recycled water supplies. This project will create an additional 1,661 AFY in total water supply and offset groundwater pumping and dependence on surface water. Developing alternative water supplies is an important component of the requirements to achieve sustainable groundwater management and will be critical to maintaining long-term groundwater sustainability. Benefits will be evaluated through volumetric measurement of recycled water added back into the system.

*How Project Will Be Accomplished/Evaluation of Water Source:*

The City's Wastewater Treatment Plant's tertiary treatment and disinfection provides recycled water for landscaping. The City is a producer and distributor of Title 22 tertiary recycled water for unrestricted reuse. Upon completion of the pipeline installation, recycled water will be pumped throughout the City of Brentwood for irrigation uses in lieu of potable water. Since the source of water is recycled wastewater, this is expected to be reliable even during drought periods.

*Legal Authority:*

GSAs, in this case the City of Brentwood GSA, have the authority to plan and implement projects. Unrestricted, non-potable recycled water is defined as wastewater that has been treated to tertiary standards (via filtration and disinfection) that meet Title 22 of the California Code of Regulations (California Department of Public Health, 2018). The production and distribution of recycled water is covered in the City's Master Reclamation Permit. Recycled water treated to this level can be used for all outdoor irrigation demands in a community, including parks, school grounds, street medians, residential landscaping, public open space, as well as industrial uses such as cooling water.

*Estimated Costs and Plans to Meet Costs:*

The estimated capital cost for this project is $9,054,036. The State approved an agreement with the City for utilization of the SRF to fund the City's Recycled Water Project, which included the Citywide Non-Potable Water Distribution System project. The loan agreement also provides for a portion to be funded with grants from both Proposition 1 and Proposition 13. The final loan amount will be dependent upon final project costs, with the loan portion of the agreement to be repaid from Wastewater Enterprise and Wastewater Development Impact Fee funds over 30 years.

Annual operating costs associated with this expansion project are minor because this is an improvement on existing City of Brentwood non-potable water system infrastructure, with operations already paid for by ratepayers.

*Circumstances for Implementation:*

The Brentwood City Council approved this project in August 2020. This project began on February 16, 2021. The City of Brentwood has developed preliminary planning documents to identify uses for recycled wastewater at both existing and future sites. The recycled wastewater will be used for the irrigation of parks and landscape amenities. The City of Brentwood already has constructed a portion of the recycled water distribution system and will continue to expand the system as the City grows. Recycled water demands are estimated to be 2,111 AF (688 MGY) at buildout. There is no process for determining the conditions which would require this project because it is already underway.

*Notice to Public and Other Agencies*

Public noticing for this project is being done in accordance with noticing requirements and in public meetings held the City of Brentwood GSA and others.

### 8.1.4.2 Project 5: City of Antioch Brackish Water Desalination Project

| Project Summary | |
|---|---|
| Submitting GSA | City of Antioch |
| Project Type | In-Lieu Recharge |
| Estimated Groundwater Offset and/or Recharge | Up to 6,720 AFY |

This project improves water supply reliability by providing the production of up to 6 MGD of drinkable water utilizing high salinity water from the San Joaquin River that was previously untreatable via conventional treatment methods.

*Measurable Objective Expected to Benefit:*

This project, through increasing water supply, helps avoid potential lowering of groundwater levels, reduction in groundwater storage, and depletion of interconnected surface water.

*Project Status and Timetable for Initiation and Completion:*

Construction for this project began following a construction agreement for this work approved by the Antioch City Council on December 15, 2020. The project is currently under construction and expected to be completed in 2023.

*Required Permitting and Regulatory Process:*

This project includes the construction of a new intake from the San Joaquin River, modification to an existing water treatment plant, installation of approximately 4.5 miles of pipeline, and the introduction of brine in the discharge stream at the location of the wastewater treatment facility. The work will require permits from National Marine Fisheries Services (NMFS), California Department of Fish and Wildlife (DFW), Regional Water Quality Control Board (RWQCB), U.S. Army Corps of Engineers (USACE), State Department of Transportation (Caltrans), and Union Pacific Railroad (UPRR). All permits for this project have been obtained.

*Expected Benefits and Evaluation:*

Water supply reliability is a critical component of the GSP and will be important in maintaining the sustainability of the Subbasin. This project will introduce up to 6 MGD of new drinking water into the region, equivalent to providing water for 27,000 people per day[1]. This water will be produced from high salinity source water from the San Joaquin River that is currently unusable, utilizing conventional treatment methods. The benefits will be evaluated based on volumetric measurement of the amount of treated water put into the system.

*How Project Will Be Accomplished/Evaluation of Water Source:*

The City of Antioch will continue to use its pre-1914 water rights to pump water from the San Joaquin River. The river pump station is currently permitted to pump up to 16 MGD from the river. As a pre-1914 right, this supply will be highly reliable.

[1] In 2016 the Legislative Analyst's Office estimates that the average residential water use was 85 gallons per person per day. The average number of people per household is 2.5 (average number of people per household in the United States from 1960 to 2019).

*Legal Authority:*

GSAs, in this case the City of Antioch GSA, have the authority to plan and implement projects. The City of Antioch will continue to use its pre-1914 water rights to pump water from the San Joaquin River. Construction of the new facilities will occur on existing City right-of-way or with new easements which have been acquired.

*Estimated Costs and Plans to Meet Costs:*

The estimated capital costs for this project total $110,000,000. **Table 8-3** summarizes the funding sources for the project.

Estimated annual operating costs of the project are between $2,100,000 and $4,000,000, depending on annual rainfall. Operating costs from the project will be paid for by ratepayers.

**Table 8-3. City of Antioch Brackish Water Desalination Project Funding Sources**

| Source | Amount ($) |
|---|---|
| California Department of Water Resources Desalination Grant | 10,000,000 |
| State Water Resources Control Board Drinking Water Revolving Loan Fund Award | 56,000,000 |
| California Department of Water Resources Settlement Agreement Funds | 27,000,000 |
| City of Antioch Water Enterprise Funds | 17,000,000 |

*Circumstances for Implementation:*

A construction agreement for this work was approved by the Antioch City Council on December 15, 2020. The project is already underway and does not require any new conditions or approvals.

*Notice to Public and Other Agencies*

Public noticing and public meetings for this project have complied with all noticing requirements followed by the City of Antioch GSA and other participating agencies.

### 8.1.5 Planned Projects

Projects in this category are planned and are expected to be completed and operating by 2042. One project provides in-lieu groundwater recharge benefits, and the other provides water quality benefits. The projected cumulative supply of these projects is 2,800 AFY.

#### 8.1.5.1 Project 6: Treatment and Reuse of Alternative Water Supplies

| Project Summary | |
|---|---|
| Submitting GSA | Diablo Water District |
| Project Type | In-Lieu Recharge / Recycled Water |
| Estimated Groundwater Offset and/or Recharge | Up to 2,800 AFY |

This project will offset current and future groundwater pumping. Through the introduction of recycled water for future park and public landscaping areas, future groundwater pumping in these areas is reduced. Additionally, through aquifer storage and recovery via indirect potable reuse, a drought-resilient water supply will be created to help limit groundwater drawdown during periods of drought.

*Measurable Objective Expected to Benefit:*

This project, by increasing water supply, will help to avoid potential lowering of groundwater levels, reduction in groundwater storage, and depletion of interconnected surface water.

*Project Status and Timetable for Initiation and Completion:*

The feasibility study phase is complete, and the project will move into the planning phase in late 2021. The timeline for initiation and completion is still under development, pending the final plan. It is anticipated to take between 5 and 10 years from the beginning of project construction to completion.

*Required Permitting and Regulatory Process:*

This project will require a CEQA review and permit from the SWRCB. Additional requirements may include County Well Permits, and City/County encroachment permits.

*Expected Benefits and Evaluation:*

This project will create up to 2,800 AFY reduction in future estimated aquifer extraction through availability of recycled water. This likely will increase as flows to the sanitary district increase due to regional growth. The yield will be evaluated through volumetric monitoring of recycled water delivered for parks and landscape use. Developing alternative water supplies is an important component of maintaining long-term groundwater sustainability.

*How Project Will Be Accomplished/Evaluation of Water Source:*

Currently, the GSA is in initial discussions with the sanitary district regarding funding, organization structure, responsibilities, etc. Each agency has created an ad hoc committee to assess ideas and bring to their full Boards for evaluation. Since the source of water would be recycled wastewater, this is expected to be reliable even during drought periods.

*Legal Authority:*

GSAs, in this case the Diablo Water District GSA, have the authority to plan and implement projects. Unrestricted, non-potable recycled water is defined as wastewater that has been treated to tertiary standards (via filtration and disinfection) that meet Title 22 of the California Code of Regulations (California Department of Public Health, 2018). This project may also involve the creation of a Joint Powers Agreement between DWD and Ironhouse Sanitary District (ISD).

*Estimated Costs and Plans to Meet Costs:*

The estimated capital costs for this project are expected to fall between $20 and $100 Million. A more precise estimate and the proposed method to cover this cost will be determined during the planning phase of the project, which will begin in late 2021.

*Circumstances for Implementation:*

This is a future action approved by both the sanitary board and the Diablo Water District Board. The project will be implemented following completion of the East Cypress Corridor. The decision to move forward will depend on confirmation of water supply availability from the project and desire to move forward from the stakeholders. Water supply availability and stakeholder desire will be determined during the planning phase. Unsustainable changes in aquifer conditions, while not expected, would accelerate the implementation of this project. Aquifer conditions will be monitored as described in **Section 6**.

*Notice to Public and Other Agencies*

Public noticing for this project is being done in accordance with noticing requirements and in public meetings held by the Diablo Water District GSA and others.

#### 8.1.5.2 Project 7: Transport Model Development

| Project Summary | |
|---|---|
| Submitting GSA | Diablo Water District |
| Project Type | Water Quality |
| Estimated Groundwater Offset and/or Recharge | N/A, Water Quality Benefits |

This project will address the water quality measurable objective by expanding the existing surface water/groundwater flow model to include a solute transport component. The development of a solute transport component will complement the existing ECCSim modeling work completed for the GSP by allowing the simulation of the transport of chemicals within the East Contra Costa Subbasin. This will improve the understanding of the movement of water and constituents under various flow regimes including climate change, sea level rise, and changes in groundwater use. The current ECCSim platform does not directly support inclusion of a transport component, so this project would involve converting the IWFM model platform inputs to a MODFLOW platform, with various improvements necessary to facilitate solute transport. Particle tracking would be incorporated into the new MODFLOW model for the ECC Subbasin after sufficient refinement of lateral and vertical discretization, calibration, development of climate change and sea level rise scenarios, and various additional future groundwater pumping regimes. The new flow and transport model would allow ECC to determine how chemicals could potentially be mobilized as a result of additional groundwater development, in order to avoid degradation of groundwater quality. This project would require converting the current ECCSim model to the MODFLOW platform and would include a detailed report, including maps, figures, charts, and tables describing the development of the model. This also would include developing the solute transport component and documenting the results of the modeling effort.

*Measurable Objective Expected to Benefit:*

This project will help to avoid degraded water quality concerns.

*Project Status:*

This project is currently in the planning phase. The timeline for implementation is still under development. It is anticipated to take about a year to complete.

*Required Permitting and Regulatory Process:*

No permits will be required for this project.

*Expected Benefits and Evaluation:*

The new model will increase the understanding about movement of poor-quality water within the Subbasin under various hydrologic conditions including climate change and sea level rise. This also will enhance the water quality monitoring described in **Section 6**.

*How Project Will Be Accomplished/Evaluation of Water Source:*

The project is currently in initial discussions with GSAs regarding funding, organizational structure, and responsibilities.

*Legal Authority:*

GSAs have the authority to plan and implement projects.

*Estimated Costs and Plans to Meet Costs:*

The estimated costs for this project are $250,000 to $500,000. The plans to cover these costs are currently under development.

*Circumstances for Implementation:*

This project would be implemented by the ECC Working Group. Implementation would begin when agreement about funding and potential grant money is secured. Water supply availability, political desire, and aquifer conditions are all motivating the desire to develop a transport model.

*Notice to Public and Other Agencies*

Public noticing for this project is being done in accordance with noticing requirements and in public meetings held the Diablo Water District GSA and others.

## 8.2 Management Actions

Management actions are activities that GSAs may implement locally to achieve or maintain groundwater sustainability. These management actions are all "planned" and therefore are currently in the conceptual phase. GSAs will consider these management actions to address possible future threats to groundwater sustainability on an as-needed basis in potential areas of concern. They generally do not require outside approval or infrastructure and are part of the authorities granted to GSAs under SGMA legislation.

As established in **Section 7**, groundwater conditions in the ECC Subbasin exhibit stability and sustainability. Basin-wide management actions are not currently proposed for GSP implementation, but future actions may be instituted by GSAs to address local concerns if they arise during the implementation and planning horizon. Some GSAs may implement management actions proactively as a local policy. If undesirable results occur or are projected to occur during the GSP implementation period, subsequent GSP updates will identify additional management actions and provide an implementation schedule as needed.

### 8.2.1 Potential Management Actions

The GSAs may elect to implement one or more potential management actions for maintaining sustainability in the Subbasin (or portion thereof). **Table 8-4** lists the potential management actions included in this GSP. Generally, these management actions are not applicable to de minimis well users[2]. De minimis well users are discussed further in **Section 8.2.1.1**. Management actions include well spacing control, oversight of well construction, reporting, and a potential demand management program. These potential management actions fall within the powers and authorities of GSAs under SGMA.

[2] "De minimis extractor" means a person who extracts, for domestic purposes, two acre-feet or less per year. Section 10721, Water Code

**Table 8-4. Summary of Potential Management Actions**

| Name | Type | MO to Benefit | Status |
|---|---|---|---|
| Well Spacing Control | Demand Management | Groundwater Levels, Groundwater Storage, Land Subsidence | Concept |
| Oversight of Well Construction Features | Water Quality | Water Quality | Concept |
| Well Metering, Monitoring, and Reporting | Improved Data / Demand Management | Groundwater Levels, Groundwater Storage, Interconnected Surface Water, Land Subsidence | Concept |
| Demand Management Program | Demand Management | All | Concept |
| State Programs for Domestic Well Users | Well Data | Groundwater Levels, Groundwater Quality | Concept |

Not listed under **Table 8-4** are potential advocacy and engagement with other lead agencies that oversee activities that can have an impact on groundwater sustainability. Of particular concern expressed by the public and some GSAs is the risk posed by hazardous substances and oil and gas drilling. The presence of contamination and oil and gas activity in the ECC Subbasin are cited in **Section 3.3.6**. Although GSAs do not have authorities under SGMA to regulate such activities, they may seek to advise applicable agencies of potential risks to sustainability posed by projects and permitting actions. The basis for such engagement may include the subbasin hydrogeologic conceptualization which can provide a more current and robust risk assessment with respect to threats to groundwater.

The next two subsections discuss non-applicability to de minimis users, and coordination with Contra Costa County which would be needed with these actions. The subsections following those summarize the potential management actions.

#### 8.2.1.1 Non-Applicability to De Minimis Users

Management actions related to wells are generally not applicable to de minimis users. Primary exceptions may be made when certain well standards are needed to ensure source protection for the de minimis user and other users. A GSA may therefore impose standards for seal and intake depths where such standards are needed to avoid water quality degradation and are consistent with the sustainability goal and the sustainable management criteria detailed in **Section 7**.

Where applicable, GSAs may seek to develop options to quantify groundwater pumping by de minimis users, including self-certification. This measure is strictly to provide better accuracy for projecting impacts and sustainability and is not intended to infringe on privacy or place any financial or other burden on this category of user. Information will be included in the GSP Data Management System described in **Section 6**.

#### 8.2.1.2 Coordination with Contra Costa County

Implementation of any management action pertaining to new wells, excluding de minimis users, shall be coordinated with Contra Costa County. A management action that pertains to existing wells, such as a requirement to install a meter, would not involve County coordination but would be undertaken by a GSA in accordance with authorities and powers granted under SGMA.

With regard to new wells, the County Environmental Health Division is the permitting authority for well siting (plot plan) and construction inspection. The latter includes a final surface inspection of the completed well. Coordination between the County permitting division and GSAs is recognized as a requirement for implementing future GSP management actions related to wells. If needed to ensure sustainability, existing well owners may be required to conform to well management actions such as metering or pumping limitations. These existing well owners may be identified through county records as part of the well inventory data gap discussed in **Section 6**.

Since each GSA may implement a variety of requirements for new wells as a function of individual sustainable management responsibilities, the permitting process cannot anticipate every possible requirement that may be imposed by the GSAs. Nor is it expected that the County will inspect and regulate conformance to any GSA requirement for all permit applications. Rather, this GSP envisions that an administrative process be developed under which the County would notify well applicants of their responsibility to contact the appropriate GSA for local requirements involving siting, construction, and use of new wells. It would be the GSA's responsibility to provide information on local requirements and a point of contact to ensure that well owners have a clear understanding of the purpose and execution of a requirement. The GSA, at its discretion, may perform inspections as it deems necessary to certify compliance with a particular requirement.

Presently, the County permit process includes discretionary requirements only for additional water analyses and pump testing. The coordination with GSA requirements would require, as applicable, that a permit application identify any local GSA requirements and provide the certification at completion that such requirements were met. Measures such as ongoing reporting of pumped volumes would be the responsibility of the well owner. Any follow-up inspections or enforcement of a measure would be the responsibility of the GSA.

This GSP recognizes that its management actions must be consistent with and subject to County authorities and responsibilities as the well permitting agency in the Plan area. It is expected that the process will be developed over two to three years commencing with implementation of the GSP in January 2022.

#### 8.2.1.3 Management Action 1: Well Spacing Control

As determined by a GSA, well spacing control may be imposed to prevent a new well from causing a significant reduction in the production of any existing well in the vicinity. Sufficient well spacing, defined as the distance between the proposed new well and existing wells, would be required to mitigate the impacts of pumping interference (water level drawdown) induced by operation of the prospective new well to a less-than-significant degree. Determination of a significant impact shall be made by the GSA on a case-by-case basis considering, but not limited to, the number of wells potentially affected, the estimated effect on existing well production and cost, and the types and uses of the affected wells (e.g., domestic, agricultural, and industrial). The GSAs will seek to prioritize protection of disadvantaged communities, rural domestic wells, agricultural uses, and environmental resources consistent with the Sustainable Management Criteria set forth in this GSP (see **Section 7**).

*Measurable Objective Expected to Benefit*

This management action would help to avoid lowering of groundwater levels, reduction in groundwater storage, and land subsidence by preventing significant drawdown.

*Management Action Status:*

This management action is currently conceptual and may be employed as needed by one or more GSAs.

*Required Permitting and Regulatory Process:*

No additional permitting would be required. Contra Costa County will notify new well permit applicants to identify and comply with the requirements of the applicable local GSA.

*Expected Benefits and Evaluation:*

The expected benefit is a reduction in groundwater level drawdown. Quantification of interference impacts may be made through direct measurements (well testing), calculations using applicable well hydraulic methods employed in groundwater science, or groundwater flow modeling. These methods shall use aquifer parameters consistent with the basin Hydrogeologic Conceptual Model described in **Section 3** and incorporate flow rate and pumping duration as proposed by the well applicant.

*How Management Action Will Be Accomplished:*

If a determination that interference would result in a significant deleterious impact on the capacity of an existing well or wells, the well permit applicant may propose an alternate location that reduces the impact to a less than significant degree. The impact assessment and degree of significance may depend on numerous factors and shall be determined on a case-by-case basis by the GSA.

*Legal Authority:*

GSAs have the authority to plan and implement management actions. Each GSA in the Subbasin has the authority to implement and enforce this management action if needed based on aquifer conditions.

*Estimated Costs and Plans to Meet Costs:*

Since this management action is in the conceptual phase, specific costs are not yet determined. The costs would be associated with the number of new well permit applications in the Subbasin if the action is implemented.

*Circumstances for Implementation:*

Groundwater conditions are projected to remain at sustainable levels into the future under GSP implementation as described in **Section 7**. This management action may be implemented and would be monitored and quantified with respect to groundwater levels, as needed, if sustainable groundwater levels cannot be maintained in any areas of the Subbasin during GSP implementation. This will be determined by the methods described in **Section 6**.

*Notice to Public and Other Agencies*

Public noticing for this management action would be done in accordance with noticing requirements and in public meetings held by the GSA or GSAs which elect to implement this management action. Additionally, Contra Costa County will notify new well permit applicants to identify and comply with the requirements of their GSA.

#### 8.2.1.4 Management Action 2: Oversight of Well Construction Features

A GSA may impose requirements for well construction to ensure that a new well does not induce adverse impacts to water quality and availability. Such requirements may include specifying depths for well seals and intake screens to avoid commingling of zones with differing water quality where such commingling may lead to degradation of the water supply. A GSA may also institute construction standards that exceed local and state requirements where it has been determined that such standards are needed to protect water quality for conditions in the GSA plan area.

*Measurable Objective Expected to Benefit*

This management action would help to avoid degraded water quality concerns through more locally targeted well construction requirements.

*Management Action Status:*

This management action is currently conceptual and may be employed as needed by one or more GSAs.

*Required Permitting and Regulatory Process:*

No additional permitting would be required. Contra Costa County will notify new well permit applicants to identify and comply with the requirements of the applicable local GSA.

*Expected Benefits and Evaluation:*

The expected benefit is the protection of water quality. Water quality will be monitored using the methods described in **Section 6**.

*How Management Action Will Be Accomplished:*

The GSA or GSAs which elect to implement this management action would work with the County well permitting office to ensure new well permit holders are aware of construction requirements. The GSAs will also establish and/or develop with the County a process for inspecting well construction activities and ensuring requirements are met.

*Legal Authority:*

GSAs have the authority to plan and implement management actions. Each GSA in the Subbasin has the authority to implement and enforce this management action if needed based on aquifer conditions.

*Estimated Costs and Plans to Meet Costs:*

Since this management action is in the conceptual phase, specific costs are not yet determined. The costs would be associated with the number of new well permits sought in the Subbasin if the action is implemented.

*Circumstances for Implementation:*

Groundwater conditions are projected to remain at sustainable levels into the future under GSP implementation, as described in **Section 7**. This management action may be implemented and would be monitored and quantified with respect to water quality, as needed, if sustainable conditions are not maintained in any areas of the Subbasin during initial GSP implementation. This will be determined by the methods described in **Section 6**.

*Notice to Public and Other Agencies*

Public noticing for this management action would be done in accordance with noticing requirements and in public meetings held by the GSA or GSAs which elect to implement this management action, if needed. Additionally, Contra Costa County will notify existing and new well permit applicants to identify and comply with the requirements of their GSA.

#### 8.2.1.5 Management Action 3: Well Metering, Monitoring, and Reporting

A fundamental requirement for sustainable groundwater management is quantification of a water budget and continual updating of predictive tools, such as groundwater flow models, used to assess water supply availability under future water demands, land-use changes, climate change, and sea level rise. To meet this need, a GSA may impose metering, monitoring, and reporting requirements for new and existing wells.

*Measurable Objective Expected to Benefit*

By providing better data on water budgets, this management action would help to avoid the potential lowering of groundwater levels, reduction in groundwater storage, depletion of interconnected surface water, and land subsidence.

*Management Action Status:*

This management action is currently conceptual and may be employed as needed by one or more GSAs.

*Required Permitting and Regulatory Process:*

No additional permitting would be required. Contra Costa County will notify new well permit applicants to identify and comply with the requirements of the applicable local GSA. Implementation of this management action for existing wells (i.e., after a well is constructed under a County permit) shall be done by the GSA in accordance with its authorities and powers under SGMA.

*Expected Benefits and Evaluation:*

The expected benefit is more accurate estimation of groundwater extraction in the Subbasin. This will enhance the planned monitoring programs described in **Section 6**.

*How Management Action Will Be Accomplished:*

The GSA or GSAs which elect to enforce this management action would work with the County well permitting office to ensure new and existing well permit holders are aware of monitoring and reporting requirements. The GSAs would also establish a process for inspecting and ensuring that monitoring and reporting requirements are met, and/or work with the County to establish a process.

*Legal Authority:*

GSAs have the authority to plan and implement management actions. Each GSA in the Subbasin has the authority to implement and enforce this management action if needed based on aquifer conditions.

*Estimated Costs and Plans to Meet Costs:*

Since this management action is in the conceptual phase, specific costs are not yet determined. The costs would be associated with the number of wells located in the area or areas requiring this management action.

*Circumstances for Implementation:*

Groundwater conditions are projected to remain at sustainable levels into the future under GSP implementation, as described in **Section 7**. This management action may be implemented and would be monitored and quantified with respect to groundwater conditions, as needed, if sustainable conditions are not maintained in any areas of the Subbasin during initial GSP implementation. This will be determined by the methods described in **Section 6**. Some GSAs may implement metering and reporting of existing and new wells proactively as a local policy.

*Notice to Public and Other Agencies*

Public noticing for this management action would be done in accordance with noticing requirements and in public meetings held by the GSA or GSAs which elect to implement this management action, if needed. Additionally, Contra Costa County will notify new well permit applicants to identify and comply with the requirements of their GSA.

#### 8.2.1.6 Management Action 4: Demand Management Program

The planned PMAs described in this Section will be pursued by the ECC Subbasin GSAs to maintain sustainable groundwater conditions. The GSAs have also included a potential demand management program to avoid undesirable results as a “backstop” to other PMAs. Events that may trigger this management action include, but are not limited to severe, prolonged drought conditions resulting in groundwater levels approaching MT or MO in specific parts of the Subbasin; other PMAs are not achieving the expected level of benefits; or new information about projected future conditions show that sustainability objectives will not be met.

Demand management broadly refers to any water management activity that reduces the consumptive use of water. To be effective for purposes of sustainable groundwater management, demand management must result in a reduction in net groundwater pumping (pumping net of recharge). Activities that, for example, reduce canal seepage or reduce deep percolation from irrigation will not be effective.

They may decrease quantity of water diverted or applied but they also reduce recharge to usable groundwater, so do not improve the net pumping from the aquifer.

For purposes here, a demand management action is one that incentivizes, enables, or possibly requires water users to reduce their consumptive use, but does not dictate exactly how users have to do it. Agricultural users can respond to demand management by changing to lower water-using crops, water-stressing crops (providing less water than the crop would normally consume for full yield), reducing evaporation losses, and reducing irrigated acreage. Urban users can respond to demand management through lower water-using landscapes, reducing evaporative losses, or reducing landscape requiring irrigation.

The ECC member water agencies have a range of options for implementing demand management, if required. These would only be included as part of GSP implementation as needed in any areas where sustainable groundwater conditions are not maintained. Through reducing overall water demand, this action would potentially provide a benefit to all measurable objectives.

General types of demand management programs include:

- **Allocation**. An allocation may be directly coupled with pumping limits. Under an allocation, the different sources of groundwater are quantified and allocated to individual parcels, wells, or entities (such as, for example, farming operations). By defining the quantities of groundwater available to individuals, this can incentivize reductions in use and development of new recharge opportunities. An allocation is a rigid method for implementing demand management. It effectively limits water use on a well, parcel, or operation basis. This could require idling land or switching crop or landscape on lands that have insufficient allocation to meet irrigation demand, which imposes costs on water users (e.g., growers). There are ways to increase the flexibility of allocations to reduce the costs of demand management. For example, the allocation could be defined as an average over a period of time rather than a fixed amount every year, or users could be allowed to carry over unused allocation into the next year.
- **Allocation + Water Market**. An allocation that is less than historical water use can be coupled with a water market. A groundwater market is another way to increase the flexibility of an allocation to reduce costs of demand management. A market is an institution that allows willing buyers and sellers to exchange groundwater allocation ("credits"). More broadly, a market creates a means to exchange allocation with another groundwater user, whether for a single season or using a multi-year trade. Willing sellers trade a part of their allocation to willing buyers in exchange for a payment that the seller expects will exceed the return he/she would have earned from using the water for irrigation. This additional flexibility reduces the cost to the GSA's users of achieving demand reduction under an allocation. Development of a water market institution is a complex process that encompasses more than defining the groundwater allocation. This investigation would be initiated by the GSAs in the future, if needed.
- **Land Repurposing**. Land repurposing programs are more targeted than an allocation or market program but maintain flexibility for participants by its voluntary nature. Such a program would provide a financial incentive to willing participants for their currently irrigated lands to be repurposed into other, non-irrigated uses. Programs can focus on short-term drought conditions,

or they can provide multi-year reductions in demand if that is needed under some conditions. For longer-term programs, lands can be repurposed to achieve other multi-benefit objectives - for example, to create habitat corridors or to support local endangered species.

- **Other financial incentives**. Demand management can also be achieved through a range of other financial incentives. This could include positive financial incentives to reduce consumptive groundwater use. It could also include groundwater extraction fees that disincentivize groundwater use.

*Measurable Objective Expected to Benefit*

Depending on how the demand management program is structured, it has the potential to benefit all measurable objectives in the ECC Subbasin.

*Management Action Status:*

This management action is currently conceptual and would only be employed as needed by one or more GSAs.

*Required Permitting and Regulatory Process:*

No additional permitting would be required.

*Expected Benefits and Evaluation:*

The expected benefit is preventing lowering of groundwater levels and reduction in groundwater storage, where and when this may be needed. Water quality and other benefits may also be present depending on the specific program deployed. These will be monitored as described in **Section 6**.

*How Management Action Will Be Accomplished:*

The GSA or GSAs that elect to implement a demand management program would first initiate a study for the program design. This would include assessing program goals, incentives, and potential program structure. It would also involve substantial stakeholder outreach and engagement. Program design would include an assessment of the economic impacts of alternative demand management strategies to identify ways to minimize costs to individuals, businesses, and the regional economy in affected areas.

*Legal Authority:*

GSAs have the authority to plan and implement management actions. Each GSA in the Subbasin has the authority to implement and enforce this management action if needed based on aquifer conditions.

*Estimated Costs and Plans to Meet Costs:*

Since this management action is in the conceptual phase, specific costs are not yet determined. Costs would be assessed as part of the demand management program design.

*Circumstances for Implementation:*

Groundwater conditions are projected to remain at sustainable levels into the future under GSP implementation, as described in **Section 7**. This management action would be implemented and would be monitored and quantified with respect to groundwater conditions, as needed, if and only if sustainable conditions are not maintained in any areas of the Subbasin during GSP implementation. This will be determined by the methods described in **Section 6**.

*Notice to Public and Other Agencies*

Public noticing for this management action would be done in accordance with noticing requirements and in public meetings held by the GSA or GSAs which elect to implement this management action, if needed. Additionally, and as appropriate depending on the structure of the program, Contra Costa County will notify new well permit applicants to identify and comply with the requirements of their GSA.

#### 8.2.1.7 Management Action 5: State Programs for Domestic Well Users

A GSA may engage existing and developing state programs to monitor and strengthen resiliency of domestic well users including DACs and vulnerable populations that use groundwater. They are located at the following links:

- https://mydrywell.water.ca.gov/report/shortage_resources
- https://mydrywell.water.ca.gov/report/
- https://water.ca.gov/Programs/Groundwater-Management/Drinking-Water-Principles

*Measurable Objective Expected to Benefit*

This management action would help to identify significant and unreasonable impacts from lowering of groundwater levels, reduction in groundwater storage, and degradation of groundwater quality.

*Management Action Status:*

This management action is currently conceptual and will be employed by one or more GSAs to enhance outreach and information exchange with key groundwater users in the basin.

*Required Permitting and Regulatory Process:*

No additional permitting would be required.

*Expected Benefits and Evaluation:*

The expected benefit is reporting of groundwater level drawdown and degradation of groundwater quality. These programs may be expanded in the future and would be incorporated into Annual Reports.

*How Management Action Will Be Accomplished:*

GSAs will notify their constituency that these programs are available.

*Legal Authority:*

GSAs have the authority to plan and implement management actions. Each GSA in the Subbasin has the authority to provide the information in this management action if needed desired.

*Estimated Costs and Plans to Meet Costs:*

No costs are expected at this time.

*Circumstances for Implementation:*

If constituents are concerned about sustainability and protection of drinking water, GSAs would seek to facilitate participation in these state programs

*Notice to Public and Other Agencies*

Public noticing for this management action would be done in accordance with noticing requirements and in public meetings held by the GSA or GSAs which elect to implement this management action.

### 8.2.2 Other Water Conservation Actions

The ECC member water agencies have a full range of existing water conservation policies and programs promoting efficient water use. Like the other management actions listed, these would be included as part of GSP implementation as needed in any areas where sustainable groundwater conditions are not maintained. The various conservation efforts proposed by different GSAs and other agencies could provide benefits to all measurable objectives, as needed. Some of these actions are ongoing or have been implemented previously, while others are in the conceptual or planning phase. Additional permitting should not be required for any of these actions, and the County will notify new well permit applicants to identify and comply with the requirements of their GSA. Benefits to groundwater levels would be monitored using the methods described in **Section 6.** Specific costs have not been established for actions in the conceptual phase. For those that are planned or already implemented, costs beyond what the agencies already incur should be minimal.

Groundwater conditions are projected to remain at sustainable levels into the future under GSP implementation, as described in **Section 7**. However, if sustainable levels are not maintained in any areas of the Subbasin during initial GSP implementation, management actions may be implemented and their effects would be monitored and quantified with respect to groundwater conditions, as needed. This will be determined by the methods described in **Section 6**. Public noticing for these actions would be done in accordance with noticing requirements and in public meetings held by the GSA or GSAs which elect to implement the actions as part of the GSP, if needed. Additionally, Contra Costa County will notify new well permit applicants to identify and comply with the requirements of their GSA.

**Table 8-5** summarizes key water conservation efforts listed by GSA in corresponding Urban Water Management Plans and Agricultural Water Management Plans. Plans include those listed for the City of Antioch, City of Brentwood, Diablo Water District, Town of Discovery Bay Community Services District, BBID, and CCWD. While CCWD is not a GSA, the District has several water conservation plans.

**Table 8-5. Summary of Water Conservation Programs Listed in Urban Water Management Plans and Agricultural Water Management Plans**

| Programs | City of Antioch[1] | City of Brent-wood[1] | Diablo Water District[2] | Discovery Bay[3] | BBID[4] | CCWD[5] |
|---|---|---|---|---|---|---|
| Water Waste Prevention Ordinances | X | X | X | X | X | X |
| Metering | X | X | X | X | X | X |
| Conservation Pricing | X | X | X | X | X | X |
| Public Education and Outreach | X | X | X | X | X | X |
| Programs to Assess Management Distribution System Real Loss | X | X | X | X | X | X |
| Water Conservation Program and Coordination Staffing Support | X | X | X | X | X | X |
| Increasing Water Order Flexibility | | | | | X | |
| Providing for Availability of Water Management Services | | | | | X | X |
| Rebates for Lawn Replacements | | | | | | X |

1. Brown and Caldwell (2021)
2. CDM Smith (2021)
3. LSCE (2021)
4. CH2M (2017)
5. CCWD (2021)

## 8.3 References

Brown and Caldwell. 2021. Final 2020 Urban Water Management Plan. Prepared for City of Antioch. May 2021.

Brown and Caldwell. 2021. Draft 2020 Urban Water Management Plan. Prepared for City of Brentwood. May 2021.

Contra Costa Water District. 2021. Draft 2020 Urban Water Management Plan. April 2021.

CDM Smith (CDM). 2021. Draft 2020 Diablo Water District Urban Water Management Plan. May 2020.

CH2M.2017.Byron Bethany Irrigation District Agricultural Water Management Plan. Prepared for Byron Bethany Irrigation District. October 2017.

East County Water Management Association. 2019. East Contra Costa County Integrated Regional Water Management Plan, Update 2019. March 2019

Legislative Analyst's Office (LAO). 2017. Residential Water Use TRENDS AND Implications for Conservation Policy. https://lao.ca.gov/Publications/Report/3611#top.Accessed June 2021.

Luhdorff and Scalmanini, Consulting Engineers. 2021. Draft 2020 Urban Water Management Plan Town of Discovery Bay Community Services District. March 2021.

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## APPENDICES

# 9 PLAN IMPLEMENTATION

This section outlines the schedule and costs to implement the Groundwater Sustainability Plan (GSP) over the first five years and discusses implementation effects in accordance with GSP regulations, CCR §354.6(e) and §354.8(f)(3), in addition to the annual and 5-year evaluation reporting in accordance with GSP regulations CCR §356.2 and §356.4. The implementation plan is based on the hydrogeologic conceptual model of the East Contra Costa Subbasin (Subbasin) (**Section 3**), current and projected water demands (**Section 4**), and the projected water budget (**Section 5**). Estimated costs are developed to meet GSP regulations and to implement PMAs under **Section 8**. Costs include annual and 5-year reports as required under GSP regulations (CCR §356.2 and §356.4).

To achieve the Subbasin sustainability goal by 2042 and avoid undesirable results through 2072 as required by SGMA and the GSP regulations, a range of Projects and Management Actions (PMAs) will be developed and implemented by the GSAs. **Section 8** describes each PMA, gross benefit, project capital and operating costs, and how it will be implemented. This section describes:

- Costs for GSAs to administer GSP activities (not including the project-specific costs described in **Section 8**), as required by CCR § 354.6(e).
- Financing approaches.
- Timeline for implementing all GSA PMAs between 2022 and 2042.
- Monitoring and reporting, including the contents of annual reports and 5-year periodic evaluations that the GSAs must provide to DWR (CCR §356.2 and §356.4).

## 9.1 Estimate of GSP Implementation Costs

The seven GSAs and Contra Costa Water District (CCWD) are exploring whether amendments to the existing MOU, new MOU or other cooperative agreement will be used to administer and implement the ECC GSP.It is anticipated that an annual operating budget will be established that is considered for approval by each GSA. The initial development of the GSP was funded by the GSAs and CCWD with help from grant funding under Proposition 1. No fees have been charged to landowners and water users in the Subbasin. It is anticipated that funding and financing sources—including potential fees—will be developed to cover the costs of GSP implementation, development of PMAs, annual reports, and 5-year periodic evaluations of the GSP. Groundwater management fees, as authorized through SGMA, may be adopted by GSAs based on their needs and applicable to their jurisdictions only.

Implementation of the GSP includes project and management actions discussed in **Section 8** and the following:

- **GSA Administration:** Public Outreach, Legal Services, and other tasks.
- **GSP Implementation:** Implementation Agreement, Grant Writing, Internal Coordination and Meetings.
- **GSP Updates:** Addressing Comments from DWR on the GSP, Annual Reports, Periodic (5-year) Evaluations, GSP Studies.
- **Monitoring and Data Management:** Monitoring of Wells, Metering and Monitoring Water Use, DMS.
- **Contingency**

The following subsections describe these cost components in greater detail and the estimated costs for these activities are summarized in Section 9.2. In this section, costs are not included for project development or implementation. It is anticipated that each GSA will generate revenue to cover its PMA costs using its available legal authorities.

### 9.1.1 GSA Administration

Administration may be performed through outside services, agency staff, or a combination. Administrative costs generally include record keeping, bookkeeping, continued outreach to stakeholders, legal services, government relations, and general management. GSA administration also includes project and contract management for external services for GSP implementation and technical studies for PMAs. It is anticipated that some administrative tasks will have a lead GSA.

#### 9.1.1.1 Public Outreach

Each GSA will conduct public outreach and engagement to provide timely information to stakeholders regarding GSP progress and Subbasin conditions. A GSP Working Group will meet regularly to inform participating agencies and the public regarding implementation activities and reporting. Any changes in administration and management will be conducted through a public process in which stakeholders will be engaged for input into the decision-making process.

The GSP Working Group will routinely meet at a regular frequency to be determined through the implementation agreement to implement the GSP. The Working Group will provide information to the public about GSP implementation and the status of groundwater sustainability in the Subbasin. The GSP website[1] will be maintained as a communication tool for posting updated groundwater level time series graphs, reports, meeting information, technical updates and data analyses. Other outreach starting in 2022 includes an electronic newsletter, board notifications, and inter- and intra-Subbasin coordination.

Most GSAs have included public outreach costs under general GSA Administration, however, others include public outreach as part of GSP Implementation costs. Therefore, GSP implementation costs vary across GSAs for public outreach activities (**Section 9.1.2**).

#### 9.1.1.2 Legal Services

The ECC Working Group currently receives in-kind legal services from Contra Costa County on an as-needed basis. If legal services are needed on issues requiring specific expertise in groundwater, SGMA compliance, or other specialized matters, the ECC Working group may engage outside counsel. Costs for such services are not currently anticipated and are not included in the current budget estimates. Any legal costs would be authorized separately by the GSP Working Group on an as-needed basis. GSA legal services costs included in the GSP are for general legal review and retainers.

[1] https://www.eccc-irwm.org/about-sgma

### 9.1.2 GSP Implementation

The GSAs will be responsible for GSP implementation. The GSAs implementing the ECC Subbasin GSP anticipate this will involve substantial coordination across GSAs for technical tasks. For example, many planned PMAs require coordination between one or more GSAs. The overall Subbasin sustainability depends on continued coordination, planning, and evaluation of groundwater conditions.

The lead GSA, or GSAs, for each implementation task will keep the other GSAs informed through periodic updates to stakeholders, the public, the GSP Working Group, and any other ad-hoc committees.

#### 9.1.2.1 Implementation Agreement

The GSAs and CCWD will enter into a joint implementation agreement after the GSP is approved by DWR. Cost sharing to fund GSP implementation, as described in this section, will be part of the joint agreement.

#### 9.1.2.2 Grant Writing

DWR and other agencies may release solicitation packages for grants to assist medium priority subbasins in funding PMA development and GSP implementation. The GSP Working Group will review future grant solicitations from DWR and other state and federal agencies and be responsible for grant writing and submission. The Working Group may engage outside services to assist in grant writing. It is anticipated that the GSAs may also engage outside services to implement grant activities (e.g., development of planned PMAs).

#### 9.1.2.3 Internal Coordination and Meetings

The GSP Working Group will meet at a regular frequency to be determined through the Implementation agreement to implement the GSP. GSAs will regularly hold board meetings, committee meetings, and other public meetings throughout the year to discuss updates and ongoing initiatives.

### 9.1.3 GSP Updates

In addition to finalizing the GSP, GSP regulations require submittal of annual reports and 5-year GSP assessment reports to DWR. The elements of these reports shall comply with DWR technical guidance and requirements and be made available to the public.

#### 9.1.3.1 Response to DWR Comments on the ECC GSP

As applicable, responses or revisions to the GSP based on DWR review comments will be made and authorized through the GSP Working Group.

#### 9.1.3.2 Annual Reports

Annual reports will be submitted to DWR starting on April 1, 2022. The contents of the report are detailed in **Section 9.5** below. Annual reports will be available to ECC Subbasin stakeholders on the ECC GSP website. The reports may be prepared by a technical consultant, agency staff designated by the GSP Working Group, or a combination of the two. The estimated cost of the annual report is presented in **Table 9-1** based on typical rates for technical consulting services. GSAs expect that annual reports will also require inter- and intra-GSA coordination as well as stakeholder outreach.

**Table 9-1. ECC GSP Estimated Joint Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **Community Outreach & Education** | \$10,000 to \$25,000 | \$10,000 to \$25,000 | \$10,000 to \$25,000 | \$10,000 to \$25,000 | \$10,000 to \$25,000 |
| **Monitoring and Data Management** | \$45,000 | \$45,000 | \$45,000 | \$45,000 | \$45,000 |
| **GSP Updates**[1] | \$33,000 to \$50,000 | \$33,000 to \$50,000 | \$48,000 to \$65,000 | \$48,000 to \$65,000 | \$140,000 to \$500,000 |
| **Grant Writing** | \$25,000 | \$25,000 | \$25,000 | \$25,000 | \$25,000 |
| **Contingency** | \$11,300 to \$14,500 | \$11,300 to \$14,500 | \$12,800 to \$16,000 | \$12,800 to \$16,000 | \$22,000 to \$59,500 |
| **Total** | \$124,300 to \$159,500 | \$124,300 to \$159,500 | \$140,800 to \$176,000 | \$140,800 to \$176,000 | \$242,000 to \$654,500 |

1. Annual reports and 5-Year Update.

### 9.1.3.3 Periodic (5-year) Assessments

Periodic (5-year) GSP assessment reports will be submitted to DWR starting in 2027. The GSAs will evaluate the GSP at least every five years to assess whether GSP implementation is achieving the sustainability goal for the Subbasin. The contents for this report are detailed in **Section 9.5** below. The estimated cost of the 5-year evaluations is presented in **Table 9-1** based on typical rates for technical consulting services. In contrast to the annual report, this report requires additional evaluation of sustainability conditions, objectives, monitoring, and documentation of new information that is available since the last update to the GSP. It may also include substantial updates to the GSP, if monitoring of groundwater conditions show that the GSP is not achieving the sustainability goal. GSAs expect that periodic evaluations will also require significant inter- and intra-GSA coordination and stakeholder outreach.

### 9.1.3.4 GSP Studies

GSP implementation will require various planning, technical, and economic/financial studies. These are additional costs that are not covered by the cost of specific PMAs (see **Section 8**). For example, this may include planning studies for proposed PMAs and studies to assess and allocate PMA and GSP implementation costs. GSAs will also need to continue to monitor PMAs to assess their benefit, update implementation, and coordinate with stakeholders and other GSAs. This may include modifying PMAs to ensure the Subbasin meets its sustainability objectives. These reports and analyses may be prepared by a technical consultant, agency staff designated by the GSP Working Group, or a combination of the two.

##### *9.1.3.4.1 Planning Studies*

GSAs may develop planning studies to integrate the GSP with other regional water management efforts, monitor Subbasin conditions, and update the GSP to ensure that the Subbasin continues to meet all sustainability objectives. GSAs will continue to evaluate Subbasin conditions and may adjust short- and long-term Subbasin planning efforts accordingly. Other planning studies may include evaluating projects and developing other programs to support sustainable management.

##### *9.1.3.4.2 Technical Evaluations*

Annual and 5-year reports will require additional technical analysis. GSAs will continue to monitor data pertaining to sustainability indicators in the Subbasin to document progress toward sustainability objectives. Additional monitoring wells may be installed in an adaptive process, and GSAs will evaluate and report groundwater conditions, water use, and change in groundwater storage as required by DWR. GSAs will continue to evaluate data gaps and implement programs to improve data quality and applicability.

##### *9.1.3.4.3 Economic/Financial Analyses*

GSAs may develop economic and fiscal studies to support implementation of PMAs and the overall GSP. This may include feasibility assessments for proposed projects, or to support development of grant applications. Other financial analyses may include rate studies and supporting technical analysis required to implement fees or assessments to cover costs. GSAs would engage legal and technical experts to help develop the required studies.

### 9.1.4 Monitoring and Data Management

Monitoring of the six sustainability indicators as described in **Sections 6** and **7** shall be performed as part of the GSP implementation. **Section 6** identifies the monitoring networks for the ECC GSP and **Section 7** describes the management criteria for SGMA sustainability indicators. The ECC GSP monitoring networks incorporate existing monitoring conducted by the GSAs and other agencies. The GSAs will continue their individual monitoring programs as outlined in **Section 6** to satisfy the requirements under the GSP. The ECC GSP does not fund these individual monitoring efforts and these costs are not included in the overall cost to implement the GSP.

#### 9.1.4.1 Monitoring of Wells

Monitoring and well maintenance costs reported in Section 9.2 include four new well installations that are required to fill data gaps discussed in Section 6. Additionally, appendix 9a gives a detailed table of monitoring costs of the new wells.

#### 9.1.4.2 Metering and Monitoring Water Use

Some GSAs may introduce a program to meter and monitor groundwater pumping. Costs reported by the GSAs would be associated with direct costs to the individual GSA. The capital and operating costs associated with the flow meters and monitoring equipment will be determined at the time of adoption by the GSA. Costs may be borne by the well owner or another entity other than the GSA or could be funded under future grant opportunities from state or federal sources.

#### 9.1.4.3 Data Management System

Data from the various monitoring sources is included in the DMS discussed in **Section 6**. The DMS will be updated with monitoring network data and will be used to prepare reports made publicly available on the ECC GSP website. The DMS will be used for analysis and will be presented in various forms to enhance interpretation and to demonstrate basin conditions with respect to sustainability indicators. As required by DWR, certain data will be uploaded to the SGMA portal twice per year.

#### 9.1.4.4 Well Inventory Program

As discussed in **Section 6**, a well inventory program shall be created to be completed by the first 5-year GSP evaluation and report. The well inventory will be developed as a tool to better understand how GSP implementation is affecting groundwater sustainability in the Subbasin.

The process of creating a well inventory will be coordinated with the Contra Costa County which is the permitting agency for new wells in the ECC Subbasin. A procedure for sharing information on all new wells constructed under the County's permitting authority with the ECC Subbasin Data Management System shall be developed. The well inventory system will track various parameters including:

- Well location (physical address) and GIS coordinates
- Date installed
- Permit number (County)
- Well Drillers Report number (DWR)
- Depth of well
- Well diameter
- Depths of perforations
- Use (domestic, industrial, commercial, agricultural, other)

A method to incorporate wells constructed prior to implementation of the new data exchange system will be evaluated with the objective that the DMS substantially accounts for active wells in the Subbasin to serve the sustainable management goals as detailed in **Section 7.**

### 9.1.5 Contingency

An additional GSA contingency cost is included for planning purposes. This may include actions needed to respond to critically dry years or if Subbasin conditions start trending towards minimum threshold levels in any area. The GSA budgets include a 10-percent annual contingency to account for unanticipated expenses (see **Table 9-1**). This is in addition to other contingency costs identified and reported by some GSAs.

## 9.2 GSA Implementation Costs

This section summarizes GSP implementation activities and estimated budgets for the first five years of GSP implementation. This does not include PMAs that are discussed in **Section 8**. The estimated 5-year budget for total GSA implementation costs is between $2.4 and $3.0 million. The estimated annual cost is between $450,000 and $480,000 for most years and could be in excess of $1 million during years when 5-year evaluations and reports are prepared. There also are expected to be additional costs in 2024 and 2025 to address DWR review comments. GSA implementation costs will be paid for through contributions from the member GSAs and CCWD under a cost-sharing arrangement to be developed following GSP adoption. Annual costs for individual GSAs will vary and generally be higher in years when 5-year evaluations and reports are prepared.

There are two components of GSA Implementation costs in the ECC Subbasin: joint implementation costs, which will be shared by the member GSAs, and individual costs for each of the GSAs. Joint implementation costs are summarized in **Table 9-1**. Details are available in **Appendix 9a**. These costs generally are for services provided to complete necessary tasks associated with implementation, including outreach, monitoring, data management, reporting and grant writing. Cost sharing between the GSAs will be determined prior to execution of the joint implementation agreement. There are some uncertainties regarding the joint costs, particularly for the costs to prepare the 5-year evaluation and reports. Therefore, ranges are reported for many of the joint cost categories and totals in **Table 9-1**.

**Table 9-2** summarizes the estimated total of individual GSA implementation costs across all GSAs (and CCWD) by year. This is followed by subsections summarizing costs by agency. All costs are preliminary estimates based on the information available as of GSP development. GSAs will evaluate funding needs, opportunities, and update budget projections periodically.

**Table 9-2. ECC GSP Estimated Total of Individual GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $118,550 | $111,772 | $112,003 | $112,245 | $122,829 |
| **GSP Implementation** | $71,539 | $71,836 | $72,145 | $72,467 | $88,450 |
| **GSP Updates** | $19,516 | $19,598 | $19,683 | $19,771 | $43,363 |
| **Monitoring and Implementation** | $62,015 | $62,015 | $62,015 | $62,015 | $62,015 |
| **Contingency** | $48,362 | $47,722 | $47,785 | $47,850 | $57,866 |
| **Total** | **$319,982** | **$312,943** | **$313,631** | **$314,348** | **$374,523** |

Other costs borne by each of the GSAs are presented in the following subsections. These costs reflect local needs and engagement that are unique to each agency's area and may change based on future assessment of conditions in the subbasin.

### 9.2.1 Byron-Bethany Irrigation District GSA

The Byron-Bethany Irrigation District GSA (BBID) estimates that annual implementation costs will be approximately $47,860 per year over the next five years (**Table 9-3**). GSA Administration includes public outreach and legal services. GSP Implementation includes public outreach, internal coordination, committee meetings, and board meetings. GSP Updates includes GSP document review. Monitoring and Implementation covers well monitoring, metering water use, and DMS costs. Contingency includes GSP management and legal services. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs do not include project-specific costs, described in **Section 8**, nor costs to build and operate additional PMAs that may be required if the GSA determines that its sustainability objectives are not being met.

BBID will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options. **Section 9.3** provides a general description of how BBID and other GSAs may recover GSP implementation costs.

**Table 9-3. BBID GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $22,000 | $22,000 | $22,000 | $22,000 | $22,000 |
| **GSP Implementation** | $11,920 | $11,920 | $11,920 | $11,920 | $11,920 |
| **GSP Updates** | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 |
| **Monitoring and Implementation** | $2,950 | $2,950 | $2,950 | $2,950 | $2,950 |
| **Contingency** | $9,987 | $9,987 | $9,987 | $9,987 | $9,987 |
| **Total** | **$47,857** | **$47,857** | **$47,857** | **$47,857** | **$47,857** |

### 9.2.2 City of Antioch GSA

The City of Antioch GSA estimates that annual implementation costs will be approximately $17,600 per year over the next five years (**Table 9-4**). GSA Administration includes public outreach and legal services. GSP Implementation includes public outreach, internal coordination, committee meetings, and board meetings. Monitoring and Implementation covers well monitoring, metering water use, and DMS costs. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs do not include PMA-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the GSA determines that its sustainability objectives are not being met.

The City of Antioch GSA will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options. **Section 9.3** provides a general description of how City of Antioch GSA and other GSAs may recover GSP implementation costs.

**Table 9-4. City of Antioch GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $4,500 | $4,500 | $4,500 | $4,500 | $4,500 |
| **GSP Implementation** | $8,000 | $8,000 | $8,000 | $8,000 | $8,000 |
| **Monitoring and Implementation** | $3,500 | $3,500 | $3,500 | $3,500 | $3,500 |
| **Contingency** | $1,600 | $1,600 | $1,600 | $1,600 | $1,600 |
| **Total** | **$17,600** | **$17,600** | **$17,600** | **$17,600** | **$17,600** |

### 9.2.3 City of Brentwood GSA

The City of Brentwood GSA estimates that annual implementation costs will be approximately $13,500 per year over the next five years (**Table 9-5**). GSA Administration includes public outreach and legal services. GSP Implementation includes public outreach. Monitoring and Implementation covers well monitoring. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs do not include project-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the GSA determines that its sustainability objectives are not being met.

The City of Brentwood GSA will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options. **Section 9.3** provides a general description of how the City of Brentwood GSA and other GSAs may recover GSP implementation costs.

**Table 9-5. City of Brentwood GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $6,130 | $6,130 | $6,130 | $6,130 | $6,130 |
| **GSP Implementation** | $3,065 | $3,065 | $3,065 | $3,065 | $3,065 |
| **Monitoring and Implementation** | $3,065 | $3,065 | $3,065 | $3,065 | $3,065 |
| **Contingency** | $1,226 | $1,226 | $1,226 | $1,226 | $1,226 |
| **Total** | **$13,486** | **$13,486** | **$13,486** | **$13,486** | **$13,486** |

### 9.2.4 Contra Costa Water District

CCWD, although not a GSA, will be active in GSP implementation and will therefore incur associated costs. CCWD estimates that annual implementation costs will be approximately $7,000 per year over the next five years (**Table 9-6**). GSA Administration includes public outreach. GSP Implementation includes internal coordination, committee meetings, and board meetings. GSP Updates include GSP document review. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs do not include project-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the CCWD determines that its sustainability objectives are not being met.

CCWD will recover GSP implementation costs through grants and local revenues that are yet to be determined. CCWD is currently evaluating options. **Section 9.3** provides a general description of how CCWD and the GSAs may recover GSP implementation costs.

**Table 9-6. CCWD Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $1,257 | $1,295 | $1,333 | $1,373 | $1,415 |
| **GSP Implementation** | $3,769 | $3,882 | $3,998 | $4,118 | $4,242 |
| **GSP Updates** | $966 | $995 | $1,025 | $1,055 | $1,087 |
| **Contingency** | $599 | $617 | $636 | $655 | $674 |
| **Total** | **$6,591** | **$6,789** | **$6,992** | **$7,201** | **$7,418** |

### 9.2.5 County of Contra Costa GSA

The County of Contra Costa GSA estimates that annual implementation costs will be approximately $33,000 per year over the next five years (**Table 9-7**). Annual costs are projected to be higher when a 5-year evaluation and report is prepared. GSA Administration includes public outreach and legal services. GSP Implementation includes public outreach, internal coordination, committee meetings, and board meetings. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs do not include PMA-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the GSA determines that its sustainability objectives are not being met.

The County of Contra Costa GSA will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options. **Section 9.3** provides a general description of how the County of Contra Costa GSA and other GSAs may recover GSP implementation costs.

**Table 9-7. County of Contra Costa GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $13,988 | $6,988 | $6,988 | $6,988 | $15,317 |
| **GSP Implementation** | $18,610 | $18,610 | $18,610 | $18,610 | $25,256 |
| **Contingency** | $3,260 | $2,560 | $2,560 | $2,560 | $4,057 |
| **Total** | **$35,858** | **$28,158** | **$28,158** | **$28,158** | **$44,630** |

### 9.2.6 Diablo Water District GSA

DWD estimates that annual implementation costs will be approximately $140,400 per year over the next five years (**Table 9-8**) and $164,650 in 2026 when the 5-year evaluation and report will be prepared. GSA Administration includes public outreach, legal services, and staff time. GSP Implementation includes public outreach, internal coordination, committee meetings, and board meetings. GSP Updates include GSP document review, which will be higher in years when a 5-year assessment is prepared. Monitoring and Implementation covers well monitoring, metering water use, and DMS costs. Contingency includes GSP management and legal services, plus a 10-percent annual contingency to account for unanticipated expenses. These costs do not include project-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the GSA determines that its sustainability objectives are not being met.

DWD will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options under its current legal authorities. **Section 9.3** provides a general description of how DWD and other GSAs may recover GSP implementation costs.

**Table 9-8. DWD GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $60,000 | $60,000 | $60,000 | $60,000 | $60,000 |
| **GSP Implementation** | $10,500 | $10,500 | $10,500 | $10,500 | $10,500 |
| **GSP Updates** | $7,500 | $7,500 | $7,500 | $7,500 | $25,000 |
| **Monitoring and Implementation** | $36,000 | $36,000 | $36,000 | $36,000 | $36,000 |
| **Contingency** | $26,400 | $26,400 | $26,400 | $26,400 | $33,150 |
| **Total** | **$140,400** | **$140,400** | **$140,400** | **$140,400** | **$164,650** |

### 9.2.7 Discovery Bay Community Services District GSA

The Discovery Bay Community Services District GSA estimates that annual implementation costs will be approximately $10,000 per year over the next five years (**Table 9-9**). GSA Administration includes public outreach and legal services. GSP Implementation includes public outreach, internal coordination, committee meetings, and board meetings. GSP Updates includes GSP document review. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs do not include project-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the GSA determines that its sustainability objectives are not being met.

Discovery Bay Community Services District GSA will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options. **Section 9.3** provides a general description of how Discovery Bay Community Services District GSA and other GSAs may recover GSP implementation costs.

**Table 9-9. Discovery Bay Community Services District GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $3,675 | $3,859 | $4,052 | $4,254 | $4,467 |
| **GSP Implementation** | $3,675 | $3,859 | $4,052 | $4,254 | $4,467 |
| **GSP Updates** | $1,050 | $1,103 | $1,158 | $1,216 | $1,276 |
| **Contingency** | $840 | $882 | $926 | $972 | $1,021 |
| **Total** | **$9,240** | **$9,703** | **$10,188** | **$10,696** | **$11,231** |

### 9.2.8 East Contra Costa Irrigation District GSA

The East Contra Costa Irrigation District GSA (ECCID) estimates that annual implementation costs will be approximately $49,000 per year over the next five years (**Table 9-10**), and $67,650 in FY 2026 when the 5-year evaluation and report will be prepared. GSA Administration includes public outreach and legal services. GSP Implementation includes public outreach, internal coordination, committee meetings, and board meetings. GSP Updates includes GSP document review. The budget also includes a 10-percent annual contingency to account for unanticipated expenses. These costs are all expected to be higher in 2026 when the 5-year evaluation and report will be prepared. Monitoring and Implementation covers well monitoring, metering water use, and DMS costs. These costs do not include PMA-specific costs, described in **Section 8**, nor costs to build and operate additional projects or management actions that may be required if the GSA determines that its sustainability objectives are not being met.

ECC ID will recover GSP implementation costs through grants and local revenues that are yet to be determined. The GSA is currently evaluating options. **Section 9.3** provides a general description of how the ECC ID and other GSAs may recover GSP implementation costs.

**Table 9-10. ECCID GSA Implementation Costs**

| Cost Category | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|
| **GSA Administration** | $7,000 | $7,000 | $7,000 | $7,000 | $9,000 |
| **GSP Implementation** | $12,000 | $12,000 | $12,000 | $12,000 | $21,000 |
| **GSP Updates** | $9,000 | $9,000 | $9,000 | $9,000 | $15,000 |
| **Monitoring and Implementation** | $16,500 | $16,500 | $16,500 | $16,500 | $16,500 |
| **Contingency** | $4,450 | $4,450 | $4,450 | $4,450 | $6,150 |
| **Total** | **$48,950** | **$48,950** | **$48,950** | **$48,950** | **$67,650** |

## 9.3 GSP Funding and Financing

Administering the GSP and monitoring and reporting progress is projected to cost approximately $360,000 per year on average across all Subbasin GSAs and CCWD. Costs are projected to be higher during years in which a 5-year periodic evaluation and report is prepared, and slightly lower during other years when an annual report is prepared. This does not include the capital and annual operating cost of PMAs (see **Section 8**).

Covering the costs of PMAs and general GSP implementation requires evaluating both financing and funding sources. Financing relates to identifying sources of capital (typically bonds and bank loans) to pay for project capital expenses. Funding relates to sources of money required to cover capital repayment (pay back the debt financed projects) as well as project O&M, GSA administration, and other annual expenses.

The agencies in the ECC Subbasin have the powers and authority to impose fees and assessments and may pursue other financing sources for capital projects and funding sources for repayment of debt, operations, and other ongoing expenses. The GSAs also have explicit fee authorities under SGMA legislation (Water Code §10730 and §10730.2). **Table 9-11** summarizes potential financing and funding sources that may be used by GSAs for GSP implementation. Individual GSAs will create their own funding and financing plans to address their portion for the cost share, considering the options available to them.

**Table 9-11. Potential Funding and Financing Sources for GSP Implementation**

| Capital Financing | Considerations |
|---|---|
| State (DWR) Grants (Prop. 68 and future bonds) | Solicitations are typically targeted to general types of projects and specific benefits that are in the State's interest |
| US Bureau of Reclamation WaterSmart Grants | Project-specific funding that can support planning studies (e.g., water market strategy grants) |
| Other targeted potential grant programs (e.g., AB 252) | Potential for multi-benefit projects |
| Local bond issuance | Local borrowing based on agency authority |
| Private borrowing | Current low interest rate environment may make these options attractive |
| State or Federal low interest loans | This could include future bond funded loan programs |
| **Funding Sources** | **Considerations** |
| Fee – General | General options for legal authority pre- and post-GSP development: Prop. 26, Prop. 218, Water Code §10730, Water Code §10730.2 |
| Regulatory Fee | Typically, pre-GSP fee that is related to regulatory cost. Prop. 26 and Water Code §10730 |
| Service Fee | Related to cost of service. Prop 218 and Water Code §10730.2. Subject to majority protest vote |
| Special Tax | Subject to 2/3 majority approval vote |
| Special Benefit | Special benefit assessment subject to majority protest vote |

The ECC Subbasin has been successful in pursuing past grant funding (e.g., Sustainable Groundwater Planning Grant programs). The GSAs will pursue grant opportunities to fund this GSP implementation and local infrastructure projects. The initial funding for GSP implementation will be provided by the seven GSAs and CCWD through a joint agreement.

GSA annual budgets will be reviewed, revised if needed, and approved by the GSAs based on interpreted basin conditions, past actual expenditures, and the immediate future needs. The budget will be adjusted over time as the GSP implementation costs are better understood through sustainable management activities and guidance from DWR on the submitted GSP and subsequent reporting.

## 9.4 Schedule for Implementation

The GSP implementation schedule allows time for GSAs to develop and implement PMAs and meet all sustainability objectives by 2042. While some sustainability projects began immediately after SGMA became law and are already contributing to Subbasin goals, the GSAs will begin implementing all other planned GSP activities by 2022. Many PMAs will be implemented adaptively on an as-needed basis as explained in **Section 8**.

A general implementation schedule showing the major tasks and estimated timeline during the 20 years of GSP implementation is provided in **Figure 9-1**. This includes key implementation tasks, projects that are either completed or currently under construction, and required reporting. Projects in the planning phase and management actions detailed in **Section 8** are not included because these are going to be implemented on as needed basis, and likely would not occur if the Subbasin continues to exhibit stable and sustainable conditions.

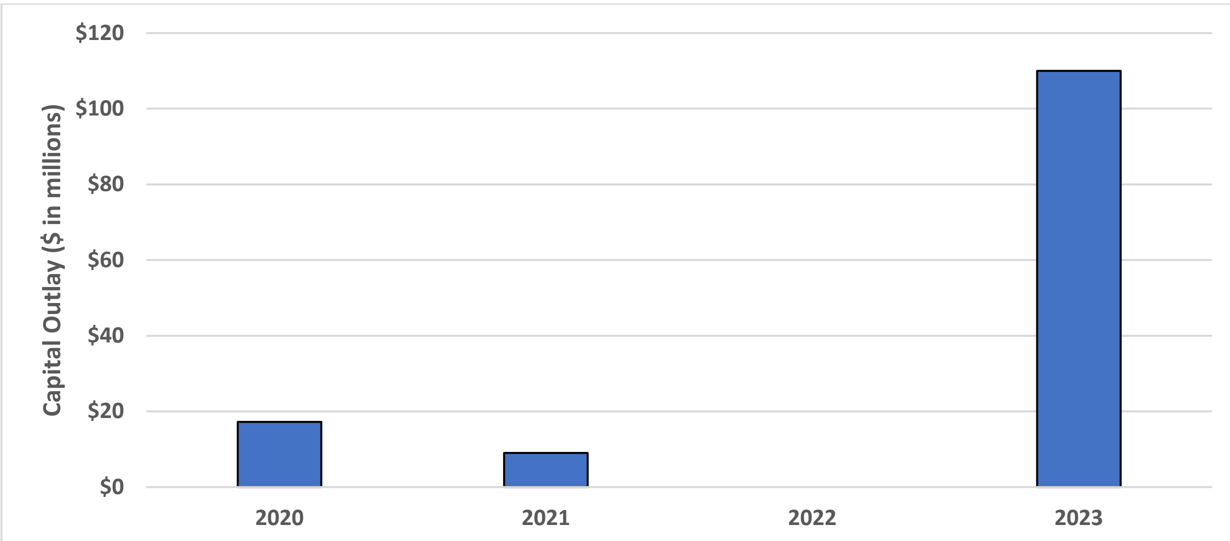
**Figure 9-1. General Schedule of 20-year ECC GSP Plan Implementation**

| Task Name | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Plan Implementation** | | | | | | | | | | | | | | | | | | | | | |
| GSP Submittal to DWR | x | | | | | | | | | | | | | | | | | | | | |
| Joint Implementation Agreement | | | x | | | | | | | | | | | | | | | | | | |
| Outreach and Communication | | | | | | | | | | | | | | | | | | | | | |
| Monitoring and DMS | | | | | | | | | | | | | | | | | | | | | |
| **Projects (Completed or Under Construction)** | | | | | | | | | | | | | | | | | | | | | |
| NE Antioch Annexation | | | | | | | | | | | | | | | | | | | | | |
| Non-Potable Storage and Pump Station | | | | | | | | | | | | | | | | | | | | | |
| Dry-Year Water Transfer | | | | | | | | | | | | | | | | | | | | | |
| Brentwood Non-Potable Distribution | | | | | | | | | | | | | | | | | | | | | |
| Antioch Brackish Water Desalination | | | | | | | | | | | | | | | | | | | | | |
| **GSP Reporting** | | | | | | | | | | | | | | | | | | | | | |
| Annual Reports | x | x | x | x | x | | x | x | x | x | | x | x | x | x | | x | x | x | x | |
| 5-year GSP Evaluation Reports | | | | | | x | | | | | x | | | | | x | | | | | x |

| | |
|---|---|
| x | Indicates a submittal. |
| | Indicates ongoing event. |

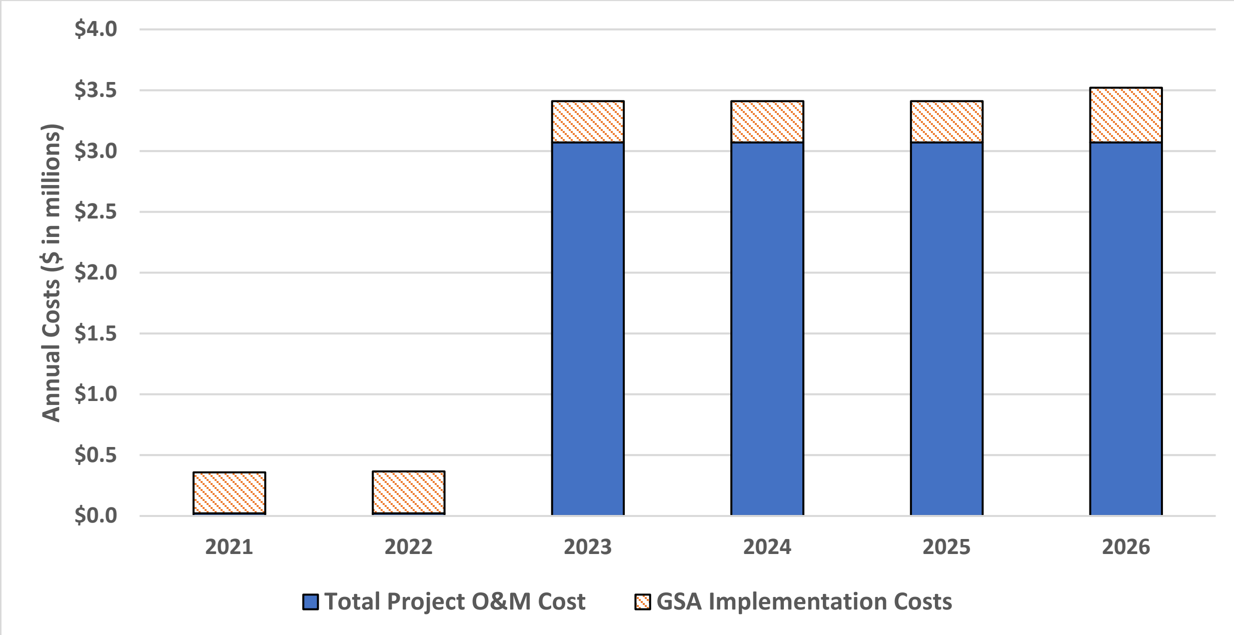
The capital cost of each project and management action is summarized and discussed in more detail in **Section 8**. **Figure 9-2** illustrates the capital outlay required to implement all of the PMAs specified in the GSP that are completed or are under construction. The figure indicates the year that the projects would be completed and begin operation, not when all the capital cost would be incurred. The total capital cost of all these projects equals approximately $136 million. These capital costs do not include the cost of management actions which would be implemented on an as-needed basis.

**Figure 9-2. ECC Subbasin Estimated Capital Outlay for Projects**




As projects are implemented, GSAs will incur annual operation and maintenance (O&M) costs. **Figure 9-2** illustrates the estimated annual O&M costs (in current dollars) for all GSP projects described in **Section 8** and the GSA annual costs described in **Section 9.2**. Average annual operating costs for projects increase from $21,500 per year in 2022 to over $3 million per year in 2023 when the City of Antioch Brackish Water Desalination Project is expected to go online. Project costs will be refined by GSAs as the GSP is implemented. GSA costs total about $0.3 million per year from 2021 to 2025 and over $0.4 million in 2026 when a 5-year evaluation and report is prepared.

**Figure 9-3. ECC Subbasin Estimated Annual Costs for Project O&M and GSA Implementation**




## 9.5 Initial and Subsequent Annual Reporting

Pursuant to CCR §356.2, an annual report shall be submitted to DWR each year by April 1 following adoption of a GSP. The first ECC Subbasin GSP Annual Report is due April 1, 2022 and will cover the period October 1, 2019 through September 30, 2021 and will be annually thereafter. DWR has provided forms and instructions for submitting the materials electronically through the DWR online reporting system[2]. The GSP Annual Report contains both a narrative description and data in DWR provided templates.

The following subsections provide an overview of the basic contents for the Annual Report.

### 9.5.1 General Information (§356.2(a))

General information includes an executive summary discussing any significant findings or recommendations from the reporting period. Additionally, it will include a map showing the Subbasin and GSA boundaries.

[2] https://sgma.water.ca.gov/portal/#gsp

### 9.5.2 Subbasin Conditions (§356.2(b))

The subbasin conditions section of the annual report will provide an update on groundwater and surface water conditions in the Subbasin. This will include:

- Groundwater Elevation:
  - Groundwater elevation contour maps by aquifer zone to depict the seasonal high (winter/spring) and seasonal low (late summer/fall).
  - Groundwater elevation hydrographs which illustrate water-year type and incorporate historical data.
- Groundwater Extraction:
  - A table summarizing groundwater extractions by GSAs, estimates of groundwater use by sector (urban, agricultural, industrial, managed wetlands, managed recharge, and native vegetation), measurement method (direct or estimated), and accuracy of the measurements.
  - A map of the general location and quantities of groundwater extractions.
- Surface Water Supply:
- Surface water volume supplied by water source type (e.g., Central Valley Project, State Water Project, Colorado River Project, local supplies, local imported supplies, recycled water, desalination, and others).
- Total Water Use:
- Total water use by source and water use sector.
- Changes in Groundwater Storage:
  - Map of the change in groundwater storage for each principal aquifer in the Subbasin.
  - A graph of historical to the present period showing water-year type, groundwater use, annual change in groundwater storage, and the cumulative change in groundwater storage for the Subbasin.

### 9.5.3 Plan Implementation Progress (§356.2(c))

The annual report will include a statement of the progress of the GSP implementation with milestones, significant updates or changes, implementation schedule, and implementation tasks and costs which will be reviewed, discussed, and updated as necessary.

### 9.5.4 GSP Annual Report Module

All parts of the ECC GSP Annual Report are uploaded through the SGMA Portal consisting of the following parts:

- Part A. Groundwater Extractions excel file: volume extracted by water use sector (e.g., urban, industrial, agricultural, managed wetlands, managed recharge, native vegetation, and other).
- Part B. Groundwater Extraction Methods excel file: volume extracted by methods (e.g., meters, electrical records, land use, groundwater model, or other).
- Part C. Surface Water Supply excel file: water supply volume by water source type (e.g., Central Valley Project, State Water Project, Colorado River Project, local supplies, local imported supplies, recycled water, desalination, and other).

- Part D. Total Water Use excel file: total water use volume by water use sector and by water source type.
- Part E. Change in Storage.
- Part F. Monitoring Network Module: information updated as needed.
- Part G. GSP Annual Report PDF and GSP Annual Report Elements Guide Template: upload the GSP Annual Report pdf and populate the Elements Guide template.
- Part H. GSP Annual Report Submittal.

## 9.6 Periodic (5-Year) Evaluation and Reporting

The GSP will be evaluated every five years in accordance with CCR §356.4, with interim evaluations made in response to significant hydrologic changes or exceedances of minimum thresholds as discussed above. The periodic evaluation will be provided to DWR and shall include elements of the annual reports, GSP implementation progress, and progress toward meeting the sustainability goal of the Subbasin. The periodic evaluations will be available to interested parties and the public through the DWR website.

The following subsections summarize what will be included in the periodic evaluation and report.

### 9.6.1 Sustainability Evaluation (§356.4(a) - §356.4(d))

An evaluation and description of current groundwater conditions will be included for each applicable sustainability indicator relative to the measurable objectives, interim milestones, minimum thresholds, and undesirable results. A summary of interim milestones and measurable objectives will be included, along with an evaluation of groundwater elevations in relation to minimum thresholds. If any minimum thresholds are found to be exceeded, the GSAs will investigate probable causes and implement actions to correct conditions, as warranted. However, exceedance of a minimum threshold does not automatically trigger corrective action, as the exceedance may be due to factors beyond the control of the GSA. As established in **Section 7**, groundwater conditions in the ECC Subbasin exhibit stability and sustainability, so this scenario is unlikely.

Projects described in **Section 8** will be evaluated to determine their implementation status, success, and progress toward reaching the GSP sustainability goal. If projects or management actions are not performing as expected, and in the unexpected case that sustainable conditions are not maintained in the Subbasin, the update will describe steps the GSAs will take to implement additional projects or demand management. Any changes to the implementation schedule of PMAs will be described in the periodic evaluation.

Elements of the GSP will be evaluated for any potential reconsiderations or revisions, which will be proposed in the periodic evaluation. The sustainability indicators will be evaluated for undesirable results, and minimum thresholds and measurable objectives will be reconsidered with revisions proposed, if necessary. Evaluation will include the progress of the GSP toward meeting the sustainability goal and interim milestones. If conditions become worse than projected because any projects or management actions are not implemented according to the specified timeline, the deviation from the original plan will be documented and to the extent possible, corrective actions will be taken to speed implementation if necessary.

Each periodic evaluation will include an assessment of the basin setting in relation to any significant or unanticipated changes or new information that may have developed during the evaluation period. Also, land uses and economic conditions will change in ways that cannot be anticipated at this time. As such, it may be necessary to revise the GSP to account for these changes. The elements of the GSP including the basin setting, management areas, undesirable results, minimum thresholds, and measurable objectives will be reconsidered by the GSAs during the periodic evaluations. Any proposed revisions will be documented in the periodic evaluation.

### 9.6.2 Monitoring Network Description (§356.4(e))

A description of the established ECC Subbasin Monitoring Network will be provided in the periodic evaluation and will include a description of potential data gaps, areas within the basin that are represented by data that does not meet the Data and Reporting Standards set by SGMA, and an assessment of the monitoring network functionality. If necessary, the evaluation will include actions necessary to improve the monitoring network, identification of data gaps, a program to acquire additional data sources (and the timing of such), and a plan to install new data collection facilities.

### 9.6.3 New Information (§356.4(f))

GSAs will continuously monitor Subbasin conditions, and the DMS will allow GSAs to identify additional data gaps and implement procedures to secure additional data. Land use and economic incentives for farming and other water uses in the Subbasin will continue to change as the GSP is implemented. GSAs expect that new information about groundwater conditions, PMAs, and sustainability objectives will continue to be available. Any significant, new information that has been developed since GSP adoption, amendment or the last periodic evaluation will be discussed, and will indicate whether new information warrants changes to any aspect of the GSP, including the basin setting, measurable objectives, minimum thresholds, or undesirable results.

### 9.6.4 GSA Actions ((§356.4(g) - §356.4(h))

The evaluation will include a description of any relevant actions taken by the GSAs since the last periodic or 5-year assessment including any regulations or ordinances related to the GSP, development of new PMAs, substantial changes in land use, and other actions impacting the implementation of the GSP. Within their allowed authorities, GSAs are evaluating new regulations or ordinances that could be implemented to help maintain sustainable conditions in the Subbasin. The 5-year periodic evaluation will include a summary of state laws and regulations, or local ordinances related to the GSP that have been implemented since the previous periodic evaluation and address how these may require updates to the GSP.

Enforcement or legal actions taken by the GSAs in relation to the GSP will be summarized along with how such actions support sustainability in the Subbasin. The effect on any aspect of the GSP, including the basin setting, measurable objectives, minimum thresholds, or undesirable results will be described.

### 9.6.5 Plan Amendments, Coordination, and Other Information (§356.4(i) - §356.4(k))

The evaluation will include a description of any completed or proposed Amendments to the GSP. This will also include a summary of amendments that are being considered or developed at that time. Any changes to the basin setting, measurable objectives, minimum thresholds, or undesirable results will be described.

Any changes to the GSA coordination agreement, or other Subbasin coordination agreements will be documented and summarized. If necessary, a description of the coordination of GSAs within the Subbasin, coordination between hydrologically connected subbasins, and land use agencies will be presented.

The Periodic Evaluation will include any other appropriate and relevant information pursuant to SGMA, GSP Implementation, and DWR review. The first 5-year GSP update and evaluation of sustainable management are due in 2027.

## SECTION 10 CONTENTS



## LIST OF TABLES



## APPENDICES

Appendix 10a Summary List of Public Meetings and Outreach

Appendix 10b Summary of Public Comments on the Draft ECC GSP and Responses

Appendix 10c ECC Subbasin Communications Plan

# 10. NOTICE AND COMMUNICATION (§ 354.10)

The ECC Subbasin is governed by seven Groundwater Sustainability Agencies (GSAs) with the active participation of the Contra Costa Water District (**Figure 1-2**). As public agencies, each offers public engagement as part of their decision-making processes. A Memorandum of Understanding guided the development of this East Contra Costa (ECC) Groundwater Sustainability Plan (GSP). As part of this effort an agency Working Group and a Communications Committee were formed to advise the GSP development. The ECC GSP Working Group will continue to meet, at minimum, quarterly during GSP implementation.

## 10.1 Description of Beneficial Uses and Users of Groundwater in the Basin

The Water Code Section 10723.2 requires the GSAs to consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing the GSP. These interests include, but are not limited to, the following:

1. Holders of overlying groundwater rights, including:
    a. Agricultural users, including farmers, ranchers, and dairy professionals.
    b. Domestic well owners.
2. Municipal well operators.
3. Public water systems.
4. Local land use planning agencies.
5. Environmental users of groundwater.
6. Surface water users where there is a hydrologic connection between surface and groundwater bodies.
7. The federal government, including, but not limited to, the military and managers of federal lands.
8. California Native American tribes.
9. Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.
    a. Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of the ECC Subbasin.

### 10.1.1 Interest Groups

The ECC Working Group considered each type of interested parties named by SGMA to determine if they were represented in the Subbasin and to include them in the outreach for the GSP.

Agricultural Users: In 2015, agriculture was the primary land use covering 41 percent of the Subbasin. The agricultural sector is primarily served by surface water provided by BBID and ECCID and individual water rights to divert surface water on the delta islands. Both BBID and ECCID are members of the ECC GSP Working Group. Their service areas make up 37 percent of the agricultural land use.

Domestic Well Users: Private residential well owners are estimated to pump approximately 600 afy (**Table 4-2**) from the Subbasin. Private well owner water use is primarily for residential, landscape, and some small-scale farming and livestock. To be considered a de minimis user, one well can pump up to two afy. Private well owner interests are represented by the GSAs that include de minimis users in their area.

Small Water Systems: About 22 small water systems as described in **Section 2.1.1.3** use approximately 500 af (**Table 4-2**) of groundwater pumped every year from the Subbasin. The small public water systems in the Subbasin are represented by Contra Costa County and by the individual GSAs where the systems are located.

Large Public and Municipal Well Operators: As discussed in more detail in **Section 2.1.1.3**, there are four public water systems (PWS) in the Subbasin: The City of Brentwood (a municipal well operator), Diablo Water District, and the Town of Discovery Bay. The City of Antioch is the fourth municipal PWS, but it does not supply groundwater to customers. Most of the water supplied by the City of Brentwood and Diablo Water District is surface water. The Town of Discovery Bay supply is entirely groundwater. The ECC Working Group includes representatives from the City of Antioch and all three of the systems that use groundwater.

Local Land Use Agencies: Four entities in the ECC Subbasin have land use authority: Contra Costa County, the City of Antioch, the City of Brentwood, and the City of Oakley (water provided by DWD). All four entities (DWD for Oakley) are GSAs and participate in the ECC Subbasin Working Group.

Environmental Users: The Subbasin has a generous supply of surface water due to the Bay-Delta setting and includes creeks and streams that are connected to shallow groundwater. The creeks, streams, and shallow groundwater discharge to the Bay-Delta. Environmental users of groundwater include species and habitat reliant on instream flows, wetlands and GDEs. GDEs are mapped in **Figures 3-26a and 3-26b** in **Section 3.3.9**. All vegetative species in the ECC Subbasin are listed in **Table 3-4**. Critical habitat for species in the ECC Subbasin is shown on **Figure 3-27**. Groups interested in environmental restoration of habitats and species within the Subbasin (e.g., Friends of Marsh Creek and DWR that manages Dutch Slough tidal marsh restoration) were called and/or emailed requesting input on the draft sections of this GSP.

Surface Water Users with a Connection to Groundwater: The Subbasin includes several streams that are connected to groundwater in some of their reaches. Marsh Creek is connected to groundwater in part of its watershed, but surface water and groundwater use are limited to individual private users along the creek. Many properties along the creek are served by the City of Brentwood Public Works.

Federal Government: Federal lands in the Subbasin include two small parcels in the City of Antioch (**Figure 2-3**) and are represented by the City of Antioch GSA.

California Native American tribes: There are no tribal lands within the Subbasin (see **Section 2.1.1.4**). However, the GSAs formally contacted the Native American Heritage Commission[1] to verify any potential interests. Additional targeted outreach was made to tribes or tribal representatives with a potential interest due to historic use of subbasin lands for gathering and other traditional practices.

Disadvantaged Communities: The disadvantaged areas (DAs) are described in **Section 2.3.2**. The total DAs population in the Subbasin is approximately 35,600 (**Table 2-5**). All DAs are served by small water systems, municipal water, or individual domestic wells (**Figures 2-13a and 2-13b**). SGMA has limited authority with regards to water quality improvements related to drinking water beneficial uses. Despite these limitations, GSAs represent the interests of the DAs (e.g., the City of Antioch, DWD, Contra Costa County,

[1] Native American Heritage Commission, 1550 Harbor Blvd., Ste. 100, West Sacramento, CA 95691, (916) 373-3710.

and the City of Brentwood). The interests of the DAs are reflected in the sustainability goal and sustainable management criteria described in **Section 7**.

Entities Monitoring and Reporting Groundwater Elevations: The ECC GSP Working Group members are the main entities that monitor groundwater elevations and conduct testing of groundwater quality in the Subbasin (see **Section 2.2.1**). Groundwater contamination sites report groundwater levels and water quality testing results through requirements set forth by other regulatory agencies and can be accessed via GeoTracker.

### 10.1.2 ECC GSP Advisory Groups

The ECC GSP Working Group was established in 2015 after SGMA legislation was passed. The members are GSA representatives plus a representative from CCWD that meet monthly to coordinate GSP development. **Figure 1-2** provides the management structure.

In September 2018, the ECC GSP Working Group applied for and received facilitation support services (FSS) from DWR. These services are provided by STANTEC through January of 2022. FSS provides assistance from professional facilitators to encourage active involvement of diverse social, cultural, and economic interests and consider all beneficial uses and users of groundwater when developing and implementing GSPs. An ECC GSP Communication Committee was created to target public input required by GSP regulations.

## 10.2 List of Public Meetings Where the GSP was Discussed

During the development of this GSP, public meetings were held and noticed on the ECC GSP website. Notifications were sent via email to the interested parties and via newspaper ads. **Table 10-1** lists the public meetings where the GSP was discussed from June 2019 to August 2021.

Opportunities for written comment were separately publicized and noticed, see below.

### 10.2.1 Informational Public Meetings on ECC GSP

**Appendix 10a** provides the complete list of outreach and communication for the ECC Subbasin and **Table 10-1** provides a summary list of public information meetings and outreach on development of the the draft  ECC Subbasin GSP.

**Table 10-1. List of Public Information Meetings and Outreach on the Draft ECC Subbasin GSP**

| Format | Date | Detail | Participation | Purpose |
|---|---|---|---|---|
| **Public Meetings** | July 9, 2020<br>June 23, 2021<br>September 14, 2021 | Online/Virtual<br>Online/Virtual (recorded)<br>Online/Virtual | 33<br>47<br>??| 1. Review SGMA and Sections 1&2<br>2. Review Secs 3-9<br>3. Review entire GSP |
| **Postcard Mailings** | September 2018<br>August 2021 | Postcard to public water systems and local agencies | 120 of 153 | 1. Basin Boundary Modification Support & SGMA<br>2. GSP public comment period |
| **Surveys on ECC GSP Website** | Dec. 7, 2018<br>May 2020 to Oct0ber 2021 | On-line survey for individual GSP Sections and entire GSP | Outreach Assessment =21<br>Chapter comments =28 | Learn about GSPs<br>Provided for public comment |
| **Email Listserv** | 300 emails were mailed to interested parties prior to each public meeting | Notifications to interested parties list | 900 emails | Notification of Sections available for review and comment and for public meeting announcements. |
| **Public Board Meetings** | January 2015 to August 2021 | 36 GSA public Board meetings | | ECC GSP updates |
| **ECC GSP Working Group Meetings** | June 2017 to August 2021 | Total of 45 monthly meetings | Varied | Plan GSP Development |
| **ECC GSP Communications Committee Meetings** | 2019 to 2021 | Total of 15 separate meetings | varied | Plan public outreach |
| **Website** | August 2019 to present | https://www.eccc-irwm.org/about-sgma | 2019:205 views<br>2020: 506 views<br>2021: 620 views (to 8/3/21) | Update on GSP Development |
| **Monthly Newsletter** | September 2020 to January 2022 | 1 page pdf posted on ECC GSP Website and distributed to GSAs | To GSAs and posted on Website | Update on GSP Development |
| **Public Meeting Notice** | Prior to each public workshop | Newspaper advertising | Circulation to approximately 210,000 homes | Public Notice |

### 10.2.2 Outreach Presentations to Community Groups

Municipal Advisory Councils (MAC) in the unincorporated County within the ECC groundwater basin are the Bethel Island Municipal Improvement District, the Byron Municipal Advisory Council, and the Knightsen Town Advisory Council. Each MAC meets regularly to advise the County of Board of Supervisors on discretionary land use projects, among other things. The County GSA emailed the draft GSP to individual members of each MAC above and presented the draft GSP on the following dates:

- Knightsen Town Advisory Council-September 14, 2021
- Byron Municipal Advisory Council-September 28, 2021
- Bethel Island Municipal Improvement District-October 12, 2021

## 10.3 Comments on the GSP and a Summary of Responses

**Appendix 10b** provides the comments on the GSP and a summary of responses.

## 10.4 Decision-Making Process

On May 9, 2017, the ECC GSAs and CCWD entered into a Memorandum of Understanding (MOU) for the development of a single GSP for the ECC Subbasin and agreed to collaborate to ensure sustainable groundwater management for the subbasin, manage the groundwater subbasin as efficiently as practicable balancing the financial resources of the agencies with the principles of effective and safe groundwater management, while retaining groundwater management authority within their respective jurisdictions. Minor amendments were approved in the MOU on November 16, 2017, and April 13, 2020. By agreement of the GSAs and CCWD, the ECC GSP becomes effective when all parties adopt the GSP for the entire Subbasin. Under SGMA, each GSA Board is responsible to approve the GSP; the entire GSP will be submitted to DWR on or before January 31, 2022.

The ECC Working Group directed the consultant Luhdorff & Scalmanini Consulting Engineers (LSCE) to fulfill the requirements of SGMA. LSCE provided the Working Group with draft GSP Sections, budgets, and other work products as required to complete the GSP. As described in detail below, public involvement of all beneficial users was sought from the start, and their input and feedback are included in the decision-making process for the GSP.

## 10.5 Opportunities for Public Engagement and How Public Input and Response was Used

The ECC stakeholders and the public were notified and encouraged to participate in the development of the GSP as outlined in the *ECC Subbasin Communications Plan* (**Appendix 10c**). The DWR FSS Program provided assistance to complete this task. Actions to engage the public are identified below, and **Table 10-1** provides a summary of public engagement opportunities.

ECC GSP Website: The ECC GSP website at https://www.eccc-irwm.org/about-sgma has been active since August 2019 and is continually maintained with current and updated documents that comprise the parts of the GSP. Contact information is presented for stakeholders to communicate with the ECC GSAs and the public can be added to the ECC GSP mailing list to receive updates on upcoming events. Meeting information with agendas and summary notes are posted regularly along with technical reports and educational materials. During GSP implementation the website will continue to be active and provide quarterly updates.

<u>East County Times and the Brentwood Press</u>:

<u>ECC GSP Monthly Newsletter</u>: Provides monthly updates on the progress of the GSP, posted to the ECC GSP website.

<u>GSA Board Meetings</u>: ECC GSAs Board meetings where the ECC GSP was discussed presented information to the respective GSA Boards and the public.

<u>Public Workshops</u>: Informational meetings to provide the public with SGMA information and the GSP process (**Table 10-1**).

<u>Public Outreach on Draft ECC Sections</u>: Draft sections of the GSP were posted for public comment as they became available (see **Table 10-2** below) along with two public meetings with Q&A sessions (July 2020 and June 2021). The surveys for each section were "live" and available for public comment through August 2021.

**Table 10-2. Public Comment Period for each GSP Section**

| GSP Section | Public Comment Period |
|---|---|
| 1. Introduction to East Contra Costa GSP | April to July 2020 |
| 2. Plan Area | |
| 3. Basin Setting | 10/30/2020 to 1/15/2021 |
| 4. Historical, Current, and Projected Water Supply | 11/2020 to 1/15/2021 |
| 5. Water Budget | Aug 9 to Aug 23 2021 |
| 6. Monitoring Network, Data Management System and Reporting | 4/8/2021 to 5/3/2021 |
| 7. Sustainable Management Criteria (SMC) | 7/16 to 8/16/2021 |
| 8. Projects and Management Actions (PMA) | |
| 9. Plan Implementation | |
| 10. Notice and Communications | |

<u>Public Outreach on the Entire Draft ECC Subbasin GSP</u>: The complete draft ECC Subbasin GSP was available for the month of September 2021 for public comment, this included one public meeting with Q&A in September 2021.

<u>Postcard Mailers</u>: Two postcard mailers to about 94 interested parties (public water systems and local agencies) to engage this group (2018) about the basin boundary modification and SGMA.

<u>Surveys</u>: Each Draft Section of the ECC Subbasin GSP when posted to the ECC GSP website included a survey for interested parties to express their needs and concerns. 29 people responded.

<u>Existing Outreach</u>: GSAs use existing outreach networks to provide regular updates about the GSP development. This includes information through bill inserts, newsletters, and presentations to their boards.

## 10.6 Encouraging Active Involvement

As discussed in **Sections 10.2** and **10.5**, the outreach and education process are important to develop a comprehensive GSP, and the ECC Working Group has prioritized involvement by interested parties in the GSP effort. The following strategies were developed to encourage stakeholder engagement:

- Conduct a comprehensive outreach and education process that facilitates development of a GSP that meets SGMA requirements.
- Keep the stakeholders informed by providing timely and accurate information.
- Provide opportunities for interested parties to provide input during the planning process.
- Provide opportunities for input during every step of the GSP process.
- Update the outreach process throughout the GSP process as needed.
- Multiple opportunities were provided for stakeholders to review and comment on each of the sections as they were being developed (**Table 10-2**).

## 10.7 Informing the Public on GSP Implementation Progress

The draft GSP was posted to the ECC GSP website on September 1, 2021 and was available for a 30-day public review and comment period. A public meeting was held on September 14, 2021 to provide an overview of the GSP content and an opportunity for stakeholder feedback and comments about the GSP. These comments will be taken into consideration and incorporated into a final version of the GSP that will be adopted by each of the seven GSA Board of Directors before submitting to DWR by the deadline of January 31, 2022. Stakeholders will be given an additional 60-day comment period through DWR's SGMA portal at https://sgma.water.ca.gov/portal/gsp/status following the submittal. Comments will be posted to DWR's website prior to the evaluation and approval by DWR.

The ECC GSP Working Group will continue to meet to guide the GSP implementation process through ongoing monitoring and sustainable groundwater management. The adopted Communication and Engagement Plan will guide future outreach during the GSP implementation process.

## 10.8 Interbasin Coordination

A list of interbasin coordination meetings with neighboring subbasins is below:

- Tracy Subbasin-February 12, 2020, and September 30, 2020
- Solano Subbasin (LSCE technical consultant for both ECC and Solano Subbasins)
- Eastern San Joaquin Subbasin

# APPENDICES

**Appendix 7b- Comparison of Domestic Wells and Depth to Minimum Threshold**

**Appendix 9a- East Contra Costa Groundwater Sustainability Plan Implementation Budget**

**Appendix 10a- Summary List of Public Meetings and Outreach**

**Appendix 10b- ECC GSP Summary of Public Comments on the Draft ECC GSP and Responses**

**Appendix 10c- East Contra Costa Subbasin Communications Plan**

# APPENDIX 1a

**Definitions and Key Terms (CWC 10721 and 23 CCR 351)**

## TERMS AND DEFINITIONS

“Working Group” refers to representatives of seven GSAs in the East Contra Costa Subbasin (City of Antioch, City of Brentwood, Byron-Bethany Irrigation District, Contra Costa County, Diablo Water District, Discovery Bay Community Services District, and East Contra Costa Irrigation District) plus a representative from Contra Costa Water District (an equal partner and financial contributor) that meet monthly to coordinate GSP development.

### Cited from: Section 10733.2, Water Code

“Agency” refers to a groundwater sustainability agency as defined in the Act.

“Agricultural water management plan” refers to a plan adopted pursuant to the Agricultural Water Management Planning Act as described in Part 2.8 of Division 6 of the Water Code, commencing with Section 10800 et seq.

“Alternative” refers to an alternative to a Plan described in Water Code Section 10733.6.

“Annual report” refers to the report required by Water Code Section 10728.

“Baseline” or “baseline conditions” refer to historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin.

“Basin” means a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Water Code 10722 et seq.

“Basin setting” refers to the information about the physical setting, characteristics, and current conditions of the basin as described by the Agency in the hydrogeologic conceptual model, the groundwater conditions, and the water budget, pursuant to Subarticle 2 of Article 5.

“Best available science” refers to the use of sufficient and credible information and data, specific to the decision being made and the time frame available for making that decision, that is consistent with scientific and engineering professional standards of practice.

“Best management practice” refers to a practice, or combination of practices, that are designed to achieve sustainable groundwater management and have been determined to be technologically and economically effective, practicable, and based on best available science.

“Board” refers to the State Water Resources Control Board.

“CASGEM” refers to the California Statewide Groundwater Elevation Monitoring Program developed by the Department pursuant to Water Code Section 10920 et seq., or as amended.

“Data gap” refers to a lack of information that significantly affects the understanding of the basin setting or evaluation of the efficacy of Plan implementation and could limit the ability to assess whether a basin is being sustainably managed.

“Groundwater dependent ecosystem” refers to ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface.

"Groundwater flow" refers to the volume and direction of groundwater movement into, out of, or throughout a basin.

"Interconnected surface water" refers to surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.

"Interested parties" refers to persons and entities on the list of interested persons established by the Agency pursuant to Water Code Section 10723.4.

"Interim milestone" refers to a target value representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan.

"Management area" refers to an area within a basin for which the Plan may identify different minimum thresholds, measurable objectives, monitoring, or projects and management actions based on differences in water use sector, water source type, geology, aquifer characteristics, or other factors.

"Measurable objectives" refer to specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin.

"Minimum threshold" refers to a numeric value for each sustainability indicator used to define undesirable results.

"NAD83" refers to the North American Datum of 1983 computed by the National Geodetic Survey, or as modified.

"NAVD88" refers to the North American Vertical Datum of 1988 computed by the National Geodetic Survey, or as modified.

"Plain language" means language that the intended audience can readily understand and use because that language is concise, well-organized, uses simple vocabulary, avoids excessive acronyms and technical language, and follows other best practices of plain language writing.

"Plan" refers to a groundwater sustainability plan as defined in the Act.

"Plan implementation" refers to an Agency's exercise of the powers and authorities described in the Act, which commences after an Agency adopts and submits a Plan or Alternative to the Department and begins exercising such powers and authorities.

"Plan manager" is an employee or authorized representative of an Agency, or Agencies, appointed through a coordination agreement or other agreement, who has been delegated management authority for submitting the Plan and serving as the point of contact between the Agency and the Department.

"Principal aquifers" refer to aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems.

"Reference point" refers to a permanent, stationary and readily identifiable mark or point on a well, such as the top of casing, from which groundwater level measurements are taken, or other monitoring site.

"Representative monitoring" refers to a monitoring site within a broader network of sites that typifies one or more conditions within the basin or an area of the basin.

"Seasonal high" refers to the highest annual static groundwater elevation that is typically measured in the Spring and associated with stable aquifer conditions following a period of lowest annual groundwater demand.

"Seasonal low" refers to the lowest annual static groundwater elevation that is typically measured in the Summer or Fall, and associated with a period of stable aquifer conditions following a period of highest annual groundwater demand.

"Seawater intrusion" refers to the advancement of seawater into a groundwater supply that results in degradation of water quality in the basin, and includes seawater from any source.

"Statutory deadline" refers to the date by which an Agency must be managing a basin pursuant to an adopted Plan, as described in Water Code Sections 10720.7 or 10722.4.

"Sustainability indicator" refers to any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results, as described in Water Code Section 10721(x).

"Uncertainty" refers to a lack of understanding of the basin setting that significantly affects an Agency's ability to develop sustainable management criteria and appropriate projects and management actions in a Plan, or to evaluate the efficacy of Plan implementation, and therefore may limit the ability to assess whether a basin is being sustainably managed.

"Urban water management plan" refers to a plan adopted pursuant to the Urban Water Management Planning Act as described in Part 2.6 of Division 6 of the Water Code, commencing with Section 10610 et seq.

"Water source type" represents the source from which water is derived to meet the applied beneficial uses, including groundwater, recycled water, reused water, and surface water sources identified as Central Valley Project, the State Water Project, the Colorado River Project, local supplies, and local imported supplies.

"Water use sector" refers to categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation.

"Water year" refers to the period from October 1 through the following September 30, inclusive, as defined in the Act.

"Water year type" refers to the classification provided by the Department to assess the amount of annual precipitation in a basin.

### Cited from: PART 2.74. Sustainable Groundwater Management [10720 - 10737.8] - CHAPTER 2. Definitions [10721- 10721.]

"Adjudication action" means an action filed in the superior or federal district court to determine the rights to extract groundwater from a basin or store water within a basin, including, but not limited to, actions to quiet title respecting rights to extract or store groundwater or an action brought to impose a physical solution on a basin.

"Basin" means a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Chapter 3 (commencing with Section 10722).

"Bulletin 118" means the department's report entitled "California's Groundwater: Bulletin 118" updated in 2003, as it may be subsequently updated or revised in accordance with Section 12924.

"Coordination agreement" means a legal agreement adopted between two or more groundwater sustainability agencies that provides the basis for coordinating multiple agencies or groundwater sustainability plans within a basin pursuant to this part.

"De minimis extractor" means a person who extracts, for domestic purposes, two acre-feet or less per year.

"Governing body" means the legislative body of a groundwater sustainability agency.

"Groundwater" means water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water that flows in known and definite channels unless included pursuant to Section 10722.5.

"Groundwater extraction facility" means a device or method for extracting groundwater from within a basin.

"Groundwater recharge" or "recharge" means the augmentation of groundwater, by natural or artificial means.

"Groundwater sustainability agency" means one or more local agencies that implement the provisions of this part. For purposes of imposing fees pursuant to Chapter 8 (commencing with Section 10730) or taking action to enforce a groundwater sustainability plan, "groundwater sustainability agency" also means each local agency comprising the groundwater sustainability agency if the plan authorizes separate agency action.

"Groundwater sustainability plan" or "plan" means a plan of a groundwater sustainability agency proposed or adopted pursuant to this part.

"Groundwater sustainability program" means a coordinated and ongoing activity undertaken to benefit a basin, pursuant to a groundwater sustainability plan.

"In-lieu use" means the use of surface water by persons that could otherwise extract groundwater in order to leave groundwater in the basin.

"Local agency" means a local public agency that has water supply, water management, or land use responsibilities within a groundwater basin.

"Operator" means a person operating a groundwater extraction facility. The owner of a groundwater extraction facility shall be conclusively presumed to be the operator unless a satisfactory showing is made to the governing Home Bill Information California Law Publications Other Resources My Subscriptions My Favorites body of the groundwater sustainability agency that the groundwater extraction facility actually is operated by some other person.

"Owner" means a person owning a groundwater extraction facility or an interest in a groundwater extraction facility other than a lien to secure the payment of a debt or other obligation.

"Personal information" has the same meaning as defined in Section 1798.3 of the Civil Code.

"Planning and implementation horizon" means a 50-year time period over which a groundwater sustainability agency determines that plans and measures will be implemented in a basin to ensure that the basin is operated within its sustainable yield.

"Public water system" has the same meaning as defined in Section 116275 of the Health and Safety Code.

"Recharge area" means the area that supplies water to an aquifer in a groundwater basin.

"Sustainability goal" means the existence and implementation of one or more groundwater sustainability plans that achieve sustainable groundwater management by identifying and causing the implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield.

"Sustainable groundwater management" means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.

"Sustainable yield" means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.

"Undesirable result" means one or more of the following effects caused by groundwater conditions occurring throughout the basin:

(1) Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.
(2) Significant and unreasonable reduction of groundwater storage.
(3) Significant and unreasonable seawater intrusion.
(4) Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.
(5) Significant and unreasonable land subsidence that substantially interferes with surface land uses.
(6) Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

"Water budget" means an accounting of the total groundwater and surface water entering and leaving a basin including the changes in the amount of water stored.

"Watermaster" means a watermaster appointed by a court or pursuant to other law.

"Water year" means the period from October 1 through the following September 30, inclusive.

"Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

# APPENDIX 1b

**Amended and Restated Memorandum of Understanding, Development of a Groundwater Sustainability Plan for the East Contra Costa Subbasin**

# AMENDED AND RESTATED
## MEMORANDUM OF UNDERSTANDING

**Development of a Groundwater Sustainability Plan**

**for the East Contra Costa Subbasin, (DWR Basin 5-22.19, San Joaquin Valley)**

This Amended and Restated Memorandum of Understanding for the Development of a Groundwater Sustainability Plan for the East Contra Costa Subbasin, (DWR Basin 5-22.19, San Joaquin Valley) ("**MOU**") is entered into and effective this 13th day of April, 2020 ("**Effective Date**") by and among the City of Antioch ("**Antioch**"), City of Brentwood ("**Brentwood**"), Byron-Bethany Irrigation District ("**BBID**"), Contra Costa Water District ("**CCWD**"), Contra Costa County ("**County**"), Diablo Water District ("**DWD**"), East Contra Costa Irrigation District ("**ECCID**"), and Discovery Bay Community Services District ("**Discovery Bay**"). Each of the foregoing parties to this MOU is sometimes referred to herein as a "**Party**" and are collectively sometimes referred to as the "**Parties**."

Recitals

A. In September 2014, the California Legislature enacted the Sustainable Groundwater Management Act of 2014 ("**SGMA**"), which established a statewide framework for the sustainable management of groundwater resources. That framework focuses on granting new authorities and responsibility to local agencies while holding those agencies accountable. The framework also provides for state intervention where a local agency fails to develop a groundwater sustainability plan in a timely manner.

B. The East Contra Costa Subbasin ("**Basin**") is referred to as DWR Basin 5-22.19, San Joaquin Valley, and is shown on the map attached hereto as Exhibit A and incorporated herein by reference as if set forth in full. The Basin is located in eastern Contra Costa County. The Parties collectively overlie all of the Basin.

C. Under SGMA, one or more local agencies may form a groundwater sustainability agency ("**GSA**"), by memorandum of agreement, joint exercise of powers agreement, or other agreement. (Wat. Code, §§ 10723(a), 10723.6.) The Parties desire for each Party to be the GSA within all or a portion of that Party's boundary. The Parties further desire to develop a governance structure for the Basin to be considered during development of the groundwater sustainability plan (a "**GSP**") for the Basin (the "**Basin GSP**"). The Parties further desire to resolve areas of jurisdictional overlap so that no two Parties serve as GSAs over the same area. The purpose of this MOU is to coordinate the Parties' activities related to each Party becoming a GSA, development of the Basin GSP, and each Party's future consideration of whether to adopt the Basin GSP.

D. The Parties wish to collaborate in an effort to ensure sustainable groundwater management for the Basin, manage the groundwater basin as efficiently as practicable balancing the financial resources of the agencies with the principles of effective and safe groundwater management, while retaining groundwater management authority within their respective jurisdictions. The Parties desire to share responsibility for Basin management under SGMA. The Parties recognize that the key to success in this effort will be the coordination of activities under SGMA, and the collaborative development of the Basin GSP, which each Party may consider adopting and implementing within its GSA management area.

E. The Basin has been designated by the California Department of Water Resources ("**DWR**") as a medium-priority groundwater basin, which, under the terms of SGMA, means that the Parties must submit a Basin GSP to DWR by January 31, 2022.

F. This MOU amends and restates the original Memorandum of Understanding, dated May 9, 2017, and as amended on November 16, 2017. This MOU also recognizes changes that reflect DWR's determination that, for purposes of SGMA, the Basin is separate and distinct from other portions of the Tracy Subbasin located in San Joaquin and Alameda Counties. The Basin is located entirely within Contra Costa County. The Parties wish to memorialize and restate their commitments by means of this MOU.

Understandings

1. *Term.* The term of this MOU begins on the Effective Date, which shall occur upon execution of this MOU by all eight of the parties, and this MOU shall remain in full force and effect until the earliest of the following events: (i) January 31, 2022, (ii) the date upon which the Parties submit a Basin GSP to DWR, or (iii) the date upon which the Parties then party to the MOU execute a document jointly terminating the provisions of this MOU. An individual Party's obligations under this MOU terminate when the Party withdraws from the MOU in accordance with Section 4.

2. *Development of the GSP*

a. *Parties to Become GSAs.* Each Party, except Contra Costa Water District, agrees to take the necessary actions to become the GSA for all or a portion of that area of the East CC Basin that it overlies, as shown on Exhibit A, attached hereto, no later than April 1, 2017, or shortly thereafter. The Parties shall jointly submit the Parties' individual elections to become GSAs and this MOU to DWR prior to April 1, 2017, or shortly thereafter. The Parties further agree to develop a governance structure for the Basin to be considered during development of the Basin GSP

b. *Single GSP*. The Parties will collaborate to develop a single Basin GSP that, at a minimum, satisfies the GSP requirements in the SGMA and the regulations promulgated under the SGMA. The Basin GSP must include an analysis of implementation costs and revenue sources, and must include an analysis of governance structure options. The Basin GSP shall be drafted in a manner that preserves, and does not purport to supersede, the land use authority of each city or county, or the statutory authority of each special district, that is a party to this MOU. The Basin GSP must include provisions for consultation between a GSA and any public agency that the GSA overlaps before the GSA takes any action that may relate to that public agency's exercise of its statutory authority. Unless the Parties later agree otherwise, it is intended that the Basin GSP will be implemented by each Party within its respective GSA management area, and that the Parties will coordinate their implementation of the Basin GSP.

c. *Overlap Areas.* Solely for the purpose of complying with the SGMA requirement that GSA management areas not overlap, the Parties agree that there are no overlapping GSA management areas, as shown on Exhibit A. This MOU does not purport to limit any Party's legal authority to utilize and deliver groundwater or surface water throughout its jurisdictional boundary (as may be amended from time-to-time), which may include area outside of a Party's management area shown on Exhibit A.

d. *Cooperation of Efforts*. The Parties will designate staff who will endeavor to meet monthly or more frequently if necessary to develop the terms of the Basin GSP in an expeditious manner.

e. *Contracting with Consultant & Cost Share Among the Parties.*

*(1) Contracting with Consultant.*

A. Contract for the Preparation of the GSP. Brentwood, acting on behalf of the other Parties, shall promptly enter into an agreement with Luhdorff and Scalmanini ("**Consultant**") for the preparation of the Basin GSP.

B. Annual Budgets and Scopes of Work. Not later than each February 15, Brentwood shall obtain a proposed budget and scope from Consultant for services during the upcoming fiscal year. Brentwood shall promptly provide the proposed budget and scope to the other Parties and shall give the other Parties until each March 15 to review the proposed budget and scope, and provide written comments to Brentwood. Such comments shall include each Party's determination as to whether it is willing to pay its share of the cost of such work, as identified in Paragraph 2(e)(2). If, after each March 15, no Party has indicated in writing that it is unwilling to pay its share of the cost of such work, the Consultant's budget and scope for the upcoming fiscal year shall be deemed approved and Brentwood shall take such actions as may be necessary to cause Consultant to perform the services included in that budget and scope of work. In the event that one or more Parties object to the proposed budget and scope of work, the Parties shall promptly meet and confer to determine an appropriate course of action.

C. Payments by Parties to Brentwood. Brentwood shall, upon receipt of Consultant's monthly invoices, pay Consultant for services rendered during the previous month. Brentwood will promptly provide invoices to the other Parties identifying their shares of the cost of the previous month's work and such other Parties shall pay said invoices within 45 days of receipt.

*(2)* *Cost-Share for Basin GSP*. The costs associated with developing the Basin GSP ("**GSP Costs**"), including but not limited to, any local cost-shares required by state or federal grants, will be shared equally among the Parties.

A. In-Kind Services Provided by County. The County, at its sole discretion, may satisfy its share of GSP Costs by providing in-kind services, which may include but may not be limited to mapping, graphics, and database management services. The County will provide written notice to the other Parties by the March 15 immediately preceding the fiscal year stating either that the County will pay its share of GSP Costs in the fiscal year, or that the County will provide in-kind services in lieu of paying its share of GSP Costs in the fiscal year. In the case of payments to Consultant or other vendors where the County wishes to substitute in-kind services for direct payments, Brentwood shall allocate such invoices equally among the Parties other than the County. Notwithstanding anything to the contrary contained herein, no Party shall be obligated to pay the County for the value of any in-kind services provided by the County, and the value of any in-kind services provided by the County shall only act as a credit towards the County's share of GSP Costs, as more particularly described in 2(e)(2)(B).

B. Annual Accounting. Brentwood shall prepare an annual accounting by October 1 that shows all GSP Costs for the previous fiscal year and that identifies in-kind services provided by the County and the County's calculation of the value of those in-kind services. By July 30th following the end of a fiscal year, the County will provide

Brentwood an accounting of the County's in-kind services during the prior fiscal year, and any carry-over value of in-kind services provided during any fiscal years preceding the prior fiscal year. The value of the County's in-kind services will be calculated based on (1) the then-current fully-burdened hourly rates for County staff time, benefits, and overhead, and (2) the County's actual costs for any materials or supplies required to provide the in-kind services.

i. Upon written notice to the other Parties no later than 15 days after receiving Brentwood's annual accounting, any Party other than the County may dispute the County's calculation of the value of the in-kind services that the County provided during the fiscal year for which the accounting is prepared, but no Party may challenge the value of in-kind services that were carried over from any fiscal year preceding the fiscal year for which the accounting is prepared. In the event that one or more Parties provide notice of a dispute under this subparagraph, the Parties shall promptly meet and confer in an effort to resolve the dispute to the satisfaction of all Parties. The County's obligation to make any payments to other Parties under Paragraph 2(e)(2)(B)(ii) shall be tolled until the County receives, from each disputing Party, written notice that the dispute has been resolved to the disputing Party's satisfaction.

ii. Except as expressly provided in Paragraph 2(e)(2)(B)(i), in the event that Brentwood's annual accounting shows that the value of the in-kind services provided by the County during the fiscal year for which the accounting is prepared, plus any carry-over value for in-kind services provided in any preceding fiscal years, is less than the individual contributions of the other Parties during the fiscal year for which the annual accounting is prepared, the County shall provide, by the November 30 following receipt of the annual accounting, payments to each of the other Parties sufficient to equalize the values of the

Parties' contributions during the fiscal year for which the accounting is prepared. In the event that Brentwood's annual accounting shows that the value of the in-kind services provided by the County during the fiscal year for which the accounting is prepared, plus any carry-over value for in-kind services provided in any preceding fiscal years, is greater than the individual contributions of the other Parties, Brentwood shall credit the County with the difference and carry over that excess contribution to be credited towards the value of the County's in-kind services provided in the subsequent fiscal year.

f. *Approval of the GSP*. The Parties agree that the Basin GSP will become effective for each Party when all of the Parties adopt the Basin GSP.

3. *Savings Provisions.* This MOU shall not operate to validate or invalidate, modify or affect any Party's water rights or any Party's obligations under any agreement, contract or memorandum of understanding/agreement entered into prior to the effective date of this MOU. Nothing in this MOU shall operate to convey any new right to groundwater to any Party. Each Party to this MOU reserves any and all claims and causes of action respecting its water rights and/or any agreement, contract or memorandum of understanding/agreement; any and all defenses against any water rights claims or claims under any agreement, contract or memorandum of understanding/agreement.

4. *Withdrawal*. Any Party shall have the ability to withdraw from this MOU by providing sixty (60) days written notice of its intention to withdraw. Said notice shall be given to each of the other Parties.

a. A Party shall not be fiscally liable for expenditures following its withdrawal from this MOU, provided that the Party provides written notice at least sixty (60) days prior to the effective date of the withdrawal. A withdrawal shall not terminate, or relieve the withdrawing Party from, any express contractual obligation to another Party to this MOU or to any third party incurred or encumbered prior to the withdrawal.

b. In the event of a Party's withdrawal, this MOU shall continue in full force and effect among the remaining Parties. Further, a Party's withdrawal from this MOU does not, without further action by that Party, have any effect on the withdrawing Party's decision to be a GSA. A withdrawing Party shall coordinate the development of its groundwater sustainability plan with the other Parties to this MOU.

5. *CEQA*. Nothing in this MOU commits any Party to undertake any future discretionary actions referenced in this MOU, including but not limited to electing to become a GSA and adopting the Basin GSP. Each Party, as a lead agency under the California Environmental Quality Act ("**CEQA**"), shall be responsible for complying with all obligations under CEQA that may apply to the Party's future discretionary actions pursuant to this MOU, including electing to become a GSA and adopting the Basin GSP.

6. *Books and Records.* Each Party shall have access to and the right to examine any of the other Party's pertinent books, documents, papers or other records (including, without limitation, records contained on electronic media) relating to the performance of that Party's obligations pursuant to this Agreement, *providing that* nothing in this paragraph shall be construed to operate as a waiver of any applicable privilege and *provided further* that nothing in this paragraph shall be construed to give either Party rights to inspect the other Party's records in excess of the rights contained in the California Public Records Act.

7. *General Provisions*

a. *Authority*. Each signatory of this MOU represents that s/he is authorized to execute this MOU on behalf of the Party for which s/he signs. Each Party represents that it has legal authority to enter into this MOU and to perform all obligations under this MOU.

b. *Amendment*. This MOU may be amended or modified only by a written instrument executed by each of the Parties to this MOU.

c. *Jurisdiction and Venue*. This MOU shall be governed by and construed in accordance with the laws of the State of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this MOU shall be brought and maintained to the extent allowed by law in the County of Contra Costa, California.

d. *Headings*. The paragraph headings used in this MOU are intended for convenience only and shall not be used in interpreting this MOU or in determining any of the rights or obligations of the Parties to this MOU.

e. *Construction and Interpretation*. This MOU has been arrived at through negotiations and each Party has had a full and fair opportunity to revise the terms of this MOU. As a result, the normal rule of construction that any ambiguities are to be resolved against the drafting Party shall not apply in the construction or interpretation of this MOU.

f. *Entire Agreement*. This MOU constitutes the entire agreement of the Parties with respect to the subject matter of this MOU and supersedes any prior oral or written agreement, understanding, or representation relating to the subject matter of this MOU.

g. *Partial Invalidity*. If, after the date of execution of this MOU, any provision of this MOU is held to be illegal, invalid, or unenforceable under present or future laws effective during the term of this MOU, such provision shall be fully severable. However, in lieu thereof, there shall be added a provision as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

h. *Waivers*. Waiver of any breach or default hereunder shall not constitute a continuing waiver or a waiver of any subsequent breach either of the same or of another provision of this MOU and forbearance to enforce one or more of the remedies provided in this MOU shall not be deemed to be a waiver of that remedy.

i. *Necessary Actions*. Each Party agrees to execute and deliver additional documents and instruments and to take any additional actions as may be reasonably required to carry out the purposes of this MOU.

j. *Compliance with Law*. In performing their respective obligations under this MOU, the Parties shall comply with and conform to all applicable laws, rules, regulations, and ordinances.

k. *Liability*. Each Party agrees to indemnify and hold every other Party to the Agreement, and their officers, agents and employees, free and harmless from any costs or liability imposed upon any other Party, officers, agents, or employees arising out of any acts or omissions of its own officers, agents or employees.

l. *Third Party Beneficiaries*. This MOU shall not create any right or interest in any non-Party or in any member of the public as a third party beneficiary.

m. *Counterparts*. This MOU may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute but one and the same instrument.

n. *Notices*. All notices, requests, demands or other communications required or permitted under this MOU shall be in writing unless provided otherwise in this MOU and shall be deemed to have been duly given and received on: (i) the date of service if served personally or served by electronic mail or facsimile transmission on the Party to whom notice is to be given at the address(es) provided below, (ii) on the first day after mailing, if mailed by Federal Express, U.S. Express Mail, or other similar overnight courier service, postage prepaid, and addressed as provided below, or (iii) on the third day after mailing if mailed to the Party to whom notice is to be given by first class mail, registered or certified, postage prepaid, addressed as follows:

**City of Antioch**
City Manager
P.O. Box 5007
Antioch, CA 94531-5007
Telephone: (925) 779-7011
Facsimile: (925) 779-7003

**City of Brentwood**
City Manager
150 City Park Way
Brentwood, CA 94513
Phone: (925) 516-5400
Fax: (925) 516-5441

**Byron Bethany Irrigation District**
General Manager
7995 Bruns Road
Byron, CA 94514-1625
Telephone: (209) 835-0375
Facsimile: (209) 835-2869

**Contra Costa Water District**
General Manager
Contra Costa Water District
P. O. Box H20
Concord, CA 94524
Phone (925) 688-8032
Fax (925) 688-8197

**Contra Costa County**
Director, Department of Conservation and Development
30 Muir Road
Martinez, CA 94553
Phone (925) 674-7866

**Diablo Water District**
Attn: General Manager
P.O. Box 127
87 Carol Lane
Oakley, CA 94561
Phone: (925) 625-3798
Fax: (925) 625-0814

**East Contra Costa Irrigation District**
General Manager
1711 Sellers Avenue
Brentwood, CA 94513
Phone: (925) 634-3544
Fax: (925) 634-0897

**Discovery Bay Community Services District**
C/O: General Manager
1800 Willow Lake Road
Discovery Bay, CA 94505-9376
Telephone: (925) 634-1131
Facsimile: (925) 513-2705

*8.* Signatures. The Following signatures attest each Party's agreement hereto.

**[Remainder of page left blank. Signatures on next pages.]**

**CITY OF ANTIOCH**

By: ______________________________ Date: 2/21/2020

Rowland E. Bernal Jr., City Manager

APPROVED AS TO FORM:

By: ______________________________ Date: 2/21/2020

Thomas Lloyd Smith, City Attorney

**CITY OF BRENTWOOD**

By: ______________________________ Date: ____________________

Tim Y. Ogden, City Manager

APPROVED AS TO FORM:

By: ______________________________ Date: ____________________

Damien Brower, City Attorney

**BYRON BETHANY IRRIGATION DISTRICT**

By: ______________________________ Date: ____________________

Rick Gilmore, General Manager

**CONTRA COSTA WATER DISTRICT**

By: ______________________________ Date: ____________________

Stephen J. Welch, General Manager

**CITY OF ANTIOCH**

By: ________________________________ Date: ____________________

Rowland E. Bernal Jr., City Manager

APPROVED AS TO FORM:

By: ________________________________ Date: ____________________

Thomas Lloyd Smith, City Attorney

**CITY OF BRENTWOOD**

By: ________________________________ Date: 3/10/20

Tim Y. Ogden, City Manager

APPROVED AS TO FORM:

By: ________________________________ Date: 3-7-20

Damien Brower, City Attorney

**BYRON BETHANY IRRIGATION DISTRICT**

By: ________________________________ Date: ____________________

Rick Gilmore, General Manager

**CONTRA COSTA WATER DISTRICT**

By: ________________________________ Date: ____________________

Stephen J. Welch, General Manager

**CITY OF ANTIOCH**

By: ______________________________ Date: ____________________

Rowland E. Bernal Jr., City Manager

APPROVED AS TO FORM:

By: ______________________________ Date: ____________________

Thomas Lloyd Smith, City Attorney

**CITY OF BRENTWOOD**

By: ______________________________ Date: ____________________

Tim Y. Ogden, City Manager

APPROVED AS TO FORM:

By: ______________________________ Date: ____________________

Damien Brower, City Attorney

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By: ______________________________ Date:04/6/2020________________

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**CONTRA COSTA WATER DISTRICT**

By: ______________________________ Date: ____________________

Stephen J. Welch, General Manager

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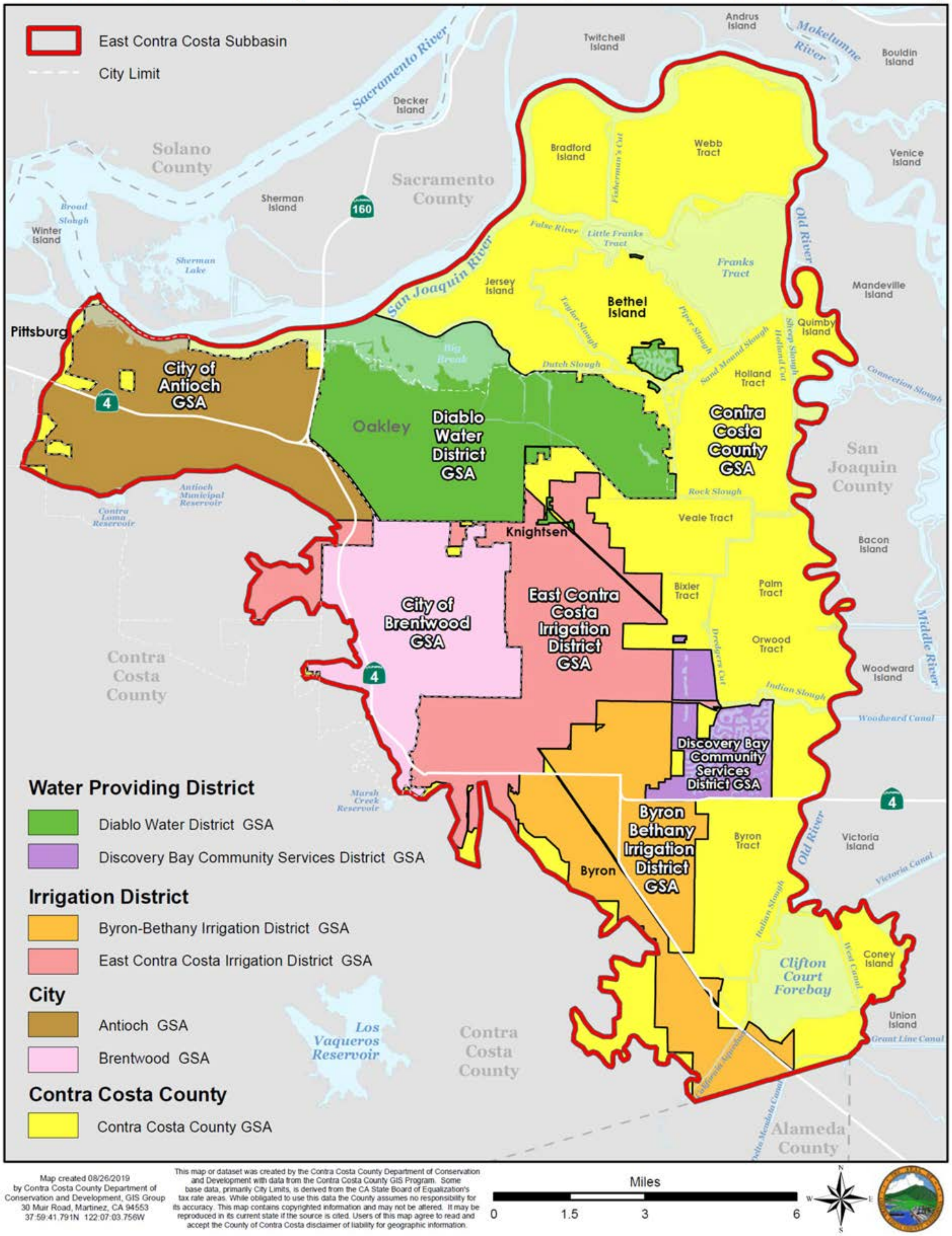
**EXHIBIT A**

Groundwater Sustainability Agencies in the East Contra Costa Subbasin (5-022.19)



# APPENDIX 3a

**Investigation of Ground-water Resources in East Contra Costa Area, 1999**

# Investigation of Ground-Water Resources in the East Contra Costa Area

March 1999

# Investigation of Ground-Water Resources

# in the East Contra Costa Area


prepared by

Luhdorff and Scalmanini
Consulting Engineers
Woodland, California


March 1999

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# I. Introduction

**Purpose**

An investigation was authorized by five east county public agencies in August 1998 to develop a greater understanding about ground-water resources in a portion of eastern Contra Costa County. The participating agencies were the Contra Costa County Water Agency, Contra Costa Sanitation District No. 19 (now Discovery Bay Community Services District), the City of Brentwood, Diablo Water District, and the East Contra Costa Irrigation District. The study area was generally defined as the region encompassing Brentwood and the East Contra Costa Irrigation District, extending to Byron to the south, Oakley to the north, and Discovery Bay to the east. The investigation focused on gathering existing information and organizing it in a manner in which it could be interpreted and analyzed to answer a set of basic questions concerning ground water.

This report documents the results of the subject investigation. Besides the discussion of results contained in the text, the final work product of the investigation includes eight geologic cross sections depicting the distribution of aquifer units throughout the study area, hydrographs showing the fluctuations of ground-water levels over time, water level contour maps, and various graphs and maps of water quality constituents. All of these figures and graphs are included as exhibits to this report.

**Scope**

The scope of the investigation was posed as a set of basic questions about ground water within the study area:

- What is the areal extent of the ground-water system in the study area? How is the aquifer system vertically divided and distributed?

- Is the ground-water system in the study area hydraulically connected to that in Discovery Bay to the east or Oakley to the north?

- What are the characteristics of the ground-water system in terms of quantity and quality of water?

- How is ground water recharged? How does ground water discharge, or flow out of the area?

- Is the ground-water system overdrafted?

- Can more ground water be developed? How much? Where?

These questions represent significant issues facing public agencies throughout California with respect to managing existing resources and planning for future needs. In the east Contra Costa County study area, ground water has been used for various purposes for decades. However, no previous studies have addressed these questions to the extent that even a conceptual answer to the question concerning overdraft has been documented. In particular, there are no maps, cross sections, or descriptions of aquifer units containing ground water that have been historically targeted for domestic, municipal, or agricultural water supply purposes. In addition, there has been no basis for determining or predicting how incremental increases in ground-water pumping might affect the basin in the future. Finally, with regard to scope, this investigation was intended to address the questions cited above on a regional scale and assumed that, at least to some degree, the ground-water system would be found to be interconnected across boundaries of multiple water entities in the east county area.

**Methods**

The methods used in the investigation relied on existing information and data. This included material provided by various water entities within the study area, other information found through literature searches, and data obtained through the State Department of Water Resources and Division of Oil and Gas. The information sought for the investigation included anything related to ground water and consisted primarily of well data contained in drillers' reports, i.e., descriptions of aquifer materials encountered while drilling wells. Other useful well data included measurements of ground-water levels over time, results of ground-water quality tests, and well yields or production capacities.

Multiple tools were used to depict ground-water conditions in the study area and included:

*Geologic Cross Sections* - Cross sections were used to delineate and interpret the distribution and extent of aquifer materials throughout the study area.  Aquifer materials were identified from drillers reports, geophysical surveys (electrical logs, or E-logs), as well as surveys conducted in oil and gas exploratory boreholes.  Eight cross sections were constructed to correlate the occurrence of aquifer units throughout the study area and provide a depiction of horizontal and vertical distribution of these materials.

*Water Level Hydrographs* - Hydrographs depicting water levels in wells over time were used to illustrate historical conditions in the ground-water system.  Distinguishing trends were noted and used to interpret climatic influences versus possible impacts of pumping activities.

*Water Level Contour Maps* - Water level contour maps were constructed to show the relative elevation of ground water throughout the study area.  The maps illustrate the ground-water flow directions, and can be interpreted to define gradients for ground-water flow.  Maps were constructed representing various points in time to interpret flow patterns on a seasonal basis, changes due to extremes in climatic conditions (e.g., drought periods), and changes due to influences of urbanization.

*Depth-to-Water Contour Maps* - Depth-to-Water contour maps were constructed to show the proximity of ground water to the ground surface and to illustrate depth-to-water changes over time within the study area.

*Water Quality Maps and Graphs* - Ground-water quality constituents were mapped and plotted in various forms to delineate and interpret distribution and trends in overall water quality.

**Findings**

In brief, the significant findings of the investigation include:

- There are four ground-water regions within the study area; those regions are distinguished by the manner in which aquifer materials were distributed and deposited.

- Ground-water conditions in the western part of the study area (the vicinity of Brentwood) are distinct from the eastern region (the vicinity of Discovery Bay as well as northward to Oakley) as a result of depositional history.

- For most of the study area, the extent of aquifer materials capable of yielding quantities of water suitable for municipal and/or agricultural purposes is to depths of 400 feet.

- There is no apparent overdraft of the main ground-water system, suggesting that historical extraction patterns have not exceeded the safe yield of the basin with respect to ground-water levels and storage.

- There have been no significant changes in the direction and rate of movement of ground-water within the study area since the late 1950's.

- Data was found to be limiting for the purposes of defining patterns and factors influencing ground-water quality. However, total dissolved solids (TDS) and nitrate concentrations were found to be significant water quality factors throughout much of the study area. Discovery Bay is notable for relatively better water quality in terms of lower TDS and very low nitrate concentration.

With respect to future needs, east county agencies with interests in ground-water resources would benefit from a program aimed at ongoing monitoring of ground-water conditions to avoid adverse impacts to the quantity and quality as a result of any future changes (e.g., increased pumpage) in historical use patterns. Such monitoring can be incrementally implemented with ongoing pumping plus any additions to pumpage which might be undertaken by one ore more of the local agencies.

The following chapters discuss the basis for the findings cited above. In Chapter IV, Conclusions, specific recommendations are provided with regard to instituting a ground-water monitoring program which is considered especially important for management of ground-water resources in the east County area.

# II. Geology and Hydrogeology

## Introduction

This chapter presents the results of a detailed analysis and interpretation of subsurface conditions throughout the study area based primarily on information contained in well drillers' reports. Three work products were produced in conjunction with this part of the ground-water investigation and are referred to below in the discussions of geologic setting and hydrogeology. The first work product is the project Base Map on which the study area is delineated through annotations of geologic and hydrogeologic features. The second is the project Well Map on which all the wells found and used to interpret the geologic setting are located. The third is a series of eight geologic cross sections which depict subsurface conditions throughout the study area. The location of the cross sections are delineated on the Base Map. The maps and cross sections appear at the end of this report.

The discussion of the geologic setting is presented below to establish the background necessary to develop the subsequent description and interpretation of hydrogeology. Here, hydrogeology refers to how the geology of the study area is related to the occurrence of ground water. Ultimately, the interpretation of geologic setting and the hydrogeology of the study area is used to form distinct depositional models of four regions within the study area which are depicted on the Base Map. These regions are the Alluvial Plain (e.g., the greater Brentwood area), the Fluvial Plain (e.g., the area around Discovery Bay), the Delta Islands, and the Marginal Delta Dunes (e.g,. Oakley and vicinity). These regions have distinguishing subsurface characteristics which are derived from their geologic history.

The depositional models are significant because they provide a basis for describing and predicting the occurrence and characteristics of ground water. Since this investigation is concerned with the beneficial use of ground water, i.e., as a water supply resource, the depositional models may be used to guide ground-water resource development and exploration. The cross sections are particularly suited for defining the horizontal and vertical extent and distribution of aquifer materials which might be targeted as ground-water supply sources. On a small scale, such models may prove useful in explaining such matters of interest as variations in well yields, water quality, and mutual pumping interference. On a larger scale, the models can serve to describe regional patterns of recharge and ground-water flow direction.

References pertaining to the discussion of the geologic setting are listed in Chapter V. It is notable that there were no useful references found regarding hydrogeology and the occurrence of ground water for the East Contra Costa study area. Thus, the material contained in this section and throughout this report is new and represents a basis for future studies and modeling, exploration efforts, water supply development, or any other activities which require some initial description of the hydrogeology of the project area.

**Geologic Setting**

The East Contra Costa County study area occurs on the western side of the northern San Joaquin Valley portion of the Great Valley province of California. West of the study area lies the lower foothills of the Diablo Mountains of the Coast Range province. At the north in the study area, the Sacramento and San Joaquin Rivers combine in the Delta and drain westward into the San Francisco Bay region.

Surficial geology of the area is shown on the two regional geologic maps for the Sacramento and San Francisco-San Jose quadrangles (Wagner and others, 1981; Wagner and others, 1990). In the Coast Ranges, the geology consists of strongly deformed (faulted and folded) Mesozoic (pre-63 million years ago) marine sedimentary rocks of the Franciscan Complex and Great Valley Sequence. Along the northeastern edge of the Coast Range occur slightly less deformed, Tertiary (Eocene to Miocene, 55 to 5 million years) marine sedimentary rocks. The marine rocks of sandstones, shales, and mudstones trend northwest/southeast and dip, or slope, steeply to the north/northeast. These rocks are exposed in low hills from Deer Valley north to near Antioch, and southeast of Marsh Creek Reservoir. The Tertiary marine rocks extend east beneath the San Joaquin Valley with increasing depths to several thousand feet. These rocks contain saline water from their marine deposition and natural gas accumulations which are exploited in numerous gas fields in the area.

Detailed surface geologic maps of the Coast Range in this area include Davis and Goldman (1958), Brabb and others (1971), and Dibblee (1980 a, b, c). Subsurface characterization of the marine rocks beneath the San Joaquin Valley are contained in oil and gas field summaries produced by the California Division of Oil & Gas (1982), and Theskenand and Adams (1995). General geologic descriptions and histories of these marine rocks are contained in Bartow (1991), and Bertoldi and others (1991). Because of their marine origin, well consolidated nature, and saline water, the Mesozoic and Tertiary marine rocks are not a source of fresh ground water in the study area.

Overlying the Tertiary marine rocks is a sequence of late Tertiary (Pliocene 5.3 to 1.6 million years) and Quaternary (Pleistocene 1.6 to 0.6 million years) non-marine sedimentary deposits. Surface exposures of these Plio-Pleistocene deposits are limited to an area south of Antioch to Oakley, and a small area south of Brentwood. These beds dip moderately to the east to northeast and extend eastward below the San Joaquin Valley. The nature of these Plio-Pleistocene deposits is poorly known in the study area. Subsurface information is limited to a few deep water well boreholes and oil and gas exploratory test holes. It is believed that these deposits occur below about 400 feet to depths of 1,500 to 2,000 feet below the San Joaquin River. Westward, the sequence thins and rises to near the surface overlying the Tertiary marine rocks of the Coast Range. These deposits seem to be dominated by fine-grained clays, silts, and mudstones with few sand beds. Water quality from electrical logs is difficult to interpret, but appears to become brackish with depth in the few sands encountered.

Pleistocene to Holocene (600,000 years to present) alluvium overlies all of the older geologic units. These deposits are largely unconsolidated beds of gravel, sand, silts, and clays becoming weakly consolidated with increasing age and burial depth. These units were deposited by surface stream systems and contain fresh ground water and represent sources for extraction by water wells. Surface geologic mapping of the youngest units have used various names and subdivisions, largely based on soil characteristics (Welch, 1977), topographic position (Helley and others, 1979), and depositional environments (Atwater, 1982).

In the subsurface, separation of the alluvium is difficult because of similar lithologic character and its poorly stratified nature. At best, correlation of sand and gravel beds of the alluvium is locally possible based on relative elevation and lateral extent and the use of water well drillers' reports. The fine-grained silts and clay beds are generally so massive, thick, and homogenous that stratigraphic correlation is not possible. The alluvium thickens from a few tens of feet in the west to about 300 feet beneath Brentwood, and then generally thickens to about 400 feet beneath Old River. Sand and gravel beds tend to be thin and discontinuous in the west, and thin to pinch-out east of Brentwood. Beneath the river floor to the east, is a sequence of thicker more laterally extensive beds of sand and gravel deposited by the river within flood plain silts and clays. Description of the sand and gravel beds and their distribution in the study area are discussed in subsequent sections.

## Hydrogeology

Ground water studies or hydrogeologic studies in the area are relatively limited. Regional studies of the thickness of the Tertiary-Quaternary non-marine sedimentary deposits were made by Page (1974), and attempts were also made to evaluate the depth to base of fresh water by California State Water Project Authority (1956), and Berkstresser (1973). Regional studies of the Sacramento-San Joaquin Valley ground water basin include Bertoldi and others (1991), Page (1986), and Williamson and others (1989). The U.S. Geological Survey compiled water quality information which covers the area in a series of reports (Keeter 1980; Sorenson 1981; and Fogelman 1982). However, detailed hydrogeologic studies of east Contra Costa County examining aquifer nature and characteristics are virtually non-existent.

Because of the lack of detailed hydrogeologic study of the subject East County area, a search of water well drillers' reports on file at Department of Water Resources (DWR) was made. The area encompassed eastern Contra Costa County from about two miles west of Oakley, through the Delta Islands to just east of the county line, and extended south through Brentwood to about two miles south of Byron (see Base Map). Between 400 and 500 well logs were collected and the wells were located on topographic base maps based on each report's description. The wells were classified into depth zones of 100 foot intervals and are color coded on the Well Map. The vast majority of wells are less than 300 feet deep, with only a few wells (or boreholes) extending to greater depths. The wells also tend to be clustered in areas of suburban development where municipal water supply systems are not present. These areas are north of Brentwood towards Oakley, east of Oakley, and areas along the edges of the Delta Islands. Outside of these areas, well density is relatively low, generally only a few are located per square mile. The eastern area along the San Joaquin River flood plain has very low well density, with areas of few or no wells present. Outside of Byron, the southern area also has very low well density.

Municipal supply wells are located in Brentwood, Oakley, Discovery Bay, and small service areas in the Delta. Agricultural/irrigation wells are scattered across the area. It is likely that many more domestic and some irrigation wells exist in the area, but do not have water well drillers' reports on file with DWR.

Lithologic descriptions on drillers' reports are subjective, with the quality of the information provided in them dependent upon the experience, attention, and diligence of the multitude of drillers who have drilled in the region over the years. A more quantitative evaluation of subsurface lithologies is possible from geophysical borehole surveys (electrical logs) run by professional well logging services. A search of DWR files, LSCE's in-house files, and water agency files was also made for electrical logs. A few dozen electrical logs were found as a result of this effort, mostly in the Brentwood and Discovery Bay areas. The electrical logs provide the most precise delineation of aquifer units and for that purpose are considered a primary tool.

Because of the lack of deep well control (over 500 feet) over most of the study area, a search of Division of Oil and Gas files was made to review electrical logs from the numerous oil and gas exploratory test holes in the area. About 200 oil and gas test hole files were reviewed. Many of these test holes were associated with the natural gas fields near Brentwood and north to the Delta. Scattered wildcat test holes (outside of the gas fields) were found across the study area with the lowest density in the southern portion of the study area. Most of the oil and gas electrical logs begin at depths of 800 to 1,000 feet, below the surface casing which is installed to protect fresh ground water in accordance with Division of Oil and Gas regulations. A few older test holes, pre-1960, extend to shallower depths, and in a few cases to the surface. The electrical logs were reviewed and notes made of depth of surface casing, lithologic character (clays and sands), and nature of water quality (saline, brackish, fresh). Most of the oil and gas electrical logs showed that the geologic material below 800 feet is dominated by fine-grained (clay and shale) deposits and some sandy zones with indications of saline or brackish water present. The base of fresh water was more difficult to determine, but seemed to correspond with published information. In general, the lack of suitable aquifers (sand and gravels) below 800 feet and their geophysical responses indicate that deep fresh water bearing aquifers do not exist in the area. One exception to this was found in a few oil and gas geophysical logs in the far northeast, outside the study area in San Joaquin County, where some fresh water aquifers in the 1,000 to 2,500 feet horizon were indicated. These may represent Tertiary non-marine deposits which were sourced from the Sierra Nevada. These deposits appear to pinch-out rapidly westward into finer-grained deposits and do not extend beneath the study area. A similar pattern has been seen in southern Sacramento County in the Elk Grove area.

**Geologic Cross Sections** - In order to evaluate subsurface geologic conditions and relationships, a series of geologic cross sections was constructed as shown on the Base Map. Five cross sections were constructed in an east-west direction extending from the western foothills of the Coast Range out to the east Contra Costa County line (Cross Sections 1-5). Three additional cross sections were drawn in a north-south direction from the Delta to south of Byron (Cross Sections A-C). Because of the few wells extending to depths below 300 feet and areas of low well density, information from electrical logs found at the Division of Oil and Gas was added to the cross sections to show the uppermost extent of deep well control.

Review of these cross sections shows some general patterns in the occurrence and character of sand and gravel aquifers. Four regions having distinguishing characteristics were found and are delineated on the project Base Map. First, from about Lone Tree Road to south of Brentwood, extending about five miles east of the Coast Range foothills, exists the Alluvial Plain region consisting of eastward thickening deposits overlying Tertiary marine rocks. Most of the sand and gravel beds are located in the shallowest portion of these deposits. Near the foothills, the sand and gravel beds are about 100 feet or less in thickness, deepening to about 300 feet below Brentwood. These deposits are believed to be the Quaternary alluvium overlying the finer-grained Plio-Pleistocene non-marine deposits which extend to the base of fresh water or Tertiary marine rocks. The sand and gravel beds in the alluvium are largely thin bedded (less than 10 feet) and discontinuous laterally (Cross Sections 1, 2, 3, A, and B). Locally there are areas where several thin to thick sand beds exist in sequence (Cross Sections 1, 2, 3, and A). East of Brentwood, the number of sand and gravel beds appear to decrease, and bed thickness also decreases (Cross Sections 1, 2, and 3). This decrease in sand bed content can be seen by comparing Cross Sections A and B south of Cross Section 3. About one mile east of Brentwood, Cross Section B shows that most wells encounter mostly silt and clay with only a few thin, fine sand beds south of Cross Section 2. This pattern of low sand bed content extends south through Byron (see Cross Section B).

A second region, Fluvial Plain, occurs to the east below the San Joaquin Valley floor. In this area, the sand and gravel beds appear to be thicker (20 to 30 feet) and more laterally extensive (Cross Sections 1, 2, and 3). These beds seem to correlate well in a north-south direction from Discovery Bay to Rock Slough (Cross Section C; north to about Cross Section 4). Westward, these beds seem to pinch out rapidly and disappear away from the river channels (Cross Sections 1, 2, and 3). The cross sections also show that below depths of 400 feet, a barren zone of few sand and gravel beds exist to at least 800 feet in depth (Cross Sections 1 and C).

North of the Alluvial and Fluvial Plain regions occur two additional regions. The Delta Islands region swings in an arcurate westward direction (Cross Sections 4, 5, A, B, and C). In this area, more numerous thick, fine sand and gravel beds exist and appear to correlate moderately well. Details of the western end of this area beneath Jersey Island is limited by low well density (Cross Section A). Again, at depths below 400 feet, few sand beds are encountered to depths of at least 800 feet (Cross Sections B and C). Evidence of shallow saline or brackish water may be present in the shallow sand beds below the Delta Islands.

The fourth region, Marginal Delta Dune, exists north of Lone Tree Road extending north to the edge of the Delta and westward beneath Oakley towards Antioch. This region has thick, fine sand beds beneath the northeastern and northern areas which correlate moderately well (Cross Sections 5, A, B, and C). In this region, a surficial deposit of Aeolian dune sands occurs, and some of the thicker subsurface fine sands may represent older buried dune fields, which were fed from the Delta Island area sand deposits. Towards the Coast Range, the area has fewer thin sand beds and the western portion, west of Oakley towards Antioch, seems to lack thick sand beds, although well density is very low.

**Net Sand Thickness** - In conjunction with generalized characteristics derived from the cross sections, sand bed distribution across the entire area was assessed by computing net sand thickness in 100 foot intervals for all wells reviewed. Overlay work maps were generated in 100 foot intervals with well locations color coded to depict net sand thickness. Mapping was performed for the 0-100, 100-200, and 200-300 foot depth ranges. Beneath the Fluvial Plain, the net sand thickness maps show sand thickness of 30 feet or more per hundred feet. The thicknesses are composed of 1 or 2 thick sand beds (20 to 30 feet) which correlate well laterally. To the west, the sand thickness rapidly decreases. In the 0-100 foot interval net sand thickness is low, less than 10 to 20 feet.

In the Delta Islands, net sand thickness appears to thicken northward from about 30 feet to 60 feet and more per hundred feet beneath Bethel Island. This pattern appeared on all of the net sand thickness work maps. The number and thicknesses of the sand beds appear to increase as net thickness increases. To the west below Jersey Island, low well density does not allow accurate evaluation of sand bed thicknesses to be made.

In the Marginal Delta Dune area, net sand thickness appears to be on the order of 30 to 60 feet per hundred feet. The number of sand beds appears to increase, although bed thickness is variable from thin to thick. Local areas of thick net sand thickness appear to occur, possibly related to stream or distributary channels.

In the Alluvial Plain, net sand thickness is generally low, less than 20 feet per hundred, and occurs in several thin beds on all maps. However, local pockets or bands of thicker net sand (30 to 40 feet per hundred feet) occur at various depths. These pockets consist of several thin (10 to 20 foot) beds overlying each other, and may represent stream channel deposits. The work maps also showed the general decrease of sand beds westward towards the Fluvial Plain. Finally, along the western edge of the maps, the bottom of the alluvium is reflected by the increasing depth eastward at which pre-alluvium deposits are encountered.

The net sand evaluation added appreciably to the development of the depositional models described below. The effort to use them as a tool may be useful for other future purposes such as modeling. However, the work maps were not advanced to a final work product and are not included in this report.

**Depositional Model of Alluvium**

Based on the review of drillers' logs, electrical logs, geologic cross sections, and net sand thickness analysis, a general model of depositional environments responsible for the configuration and character of the sedimentary deposits across the area was developed. The depositional model describes the physical processes which formed the deposits and caused the areal and physical characteristics in different areas. The depositional model is divided into subareas based upon sedimentary characteristics formed by different depositional processes. The model is delineated as four regions on the Base Map.

**Fluvial Plain** - Along the floor of the San Joaquin Valley, a zone of well-defined, thick-bedded (20 to 30 feet) sands and gravels occurs. These few beds appear to occur at distinct levels or depths separated by intervening clay to silt beds, and extend northward in fairly well defined sequences. The sand and gravel beds were probably deposited in stream channels which migrated laterally through time, and are confined within and overlain by flood-plain clay and silt deposits. The setting was probably similar to that which occurs today with northward flowing river channels, distributaries, and sloughs across floodplains of overbank areas. The deposits extend to depths of about 350 feet, below which occur largely fine-grained silts and clays.

**Delta Islands** - North of the Fluvial Plain region is the Delta Islands area (see Base Map). Sand and gravel beds correlate to the Fluvial Plain, but net sand thicknesses and number of beds appear to increase northward. Net sand thickness increases to 60 feet or more per hundred feet beneath much of the Delta Island areas. To the west where well control is limited, the nature of the Delta area is not well documented. The sand beds appear to be somewhat finer-grained than the fluvial plain, with fewer reports of gravel materials. As in other areas, the sand beds exist to depths of about 300 to 350 feet, below which few sands are encountered.

The depositional environment for the Delta Islands is interpreted as multiple stream channels meandering between islands. Channels would be active with through-flowing waters, then abandoned as new channels developed. Possibly slower stream flow and tidal fluctuations allowed thicker, fine-grained sand deposits to form.

**Marginal Delta Dunes** - Southwest of the Delta Islands region, an area is defined by numerous thin to thick sand beds as the Marginal Delta Dunes region. Net sand thicknesses are generally greater than 30 feet of sand per hundred feet. The sand beds tend to be similar to the Delta Island area, generally finer-grained sands, but thinner individual beds. Locally, areas of thicker sand beds occur.

The depositional environment is envisioned to be a mixture of delta fluvial distributary channels and possibly aeolian dune fields. Between Oakley and northern Brentwood, a surface deposit of rolling gentle hills of relic sand dunes occur. These sand dunes are believed to have been generated by strong winds blowing sand off the delta margins. Some of the deeper sand beds across the Marginal Delta Dunes area are suspected to be similar older dune fields.

**Alluvial Plain** - South of the Marginal Delta Dune area and west of the Fluvial Plain is the final depositional environment, the Alluvial Plain. This area is characterized by thin sand and gravel beds which correlate poorly between wells. Net sand thicknesses are generally low, less than 20 feet of sand per hundred feet, and generally occurring as several beds. Locally, pockets or bands of thicker sand and gravel beds occur where slightly thicker beds may occur.

The depositional environment for the Alluvial Plain region is one of small streams draining eastward from the Coast Range foothills to the west. Flood flows of these streams spread out from the hills depositing fine-grained deposits, possibly as mud flows with high sediment content. Stream flows deposited thicker sand and gravel beds which tended to stack upon each other causing the thicker bands of sand beds. The Alluvial Plain deposits thin westward to pinch-out against the Coastal Range foothills. These deposits appear to thicken to about 300 to 350 feet eastward. The sand and gravel beds appear to decrease eastward, so the eastern half of the alluvial plain is dominated by silts and clays. These distal alluvial plain deposits probably interbed with floodplain deposits from the adjacent Fluvial Plain region. The thicker stream deposited sand and gravel bands extend eastward until the sands either pinch out or have not been reached by wells. In the north, the stream deposits appear to reach into the Marginal Delta Dunes area and blends into the sand beds that are present there.

**Antioch and Byron Areas** - These two areas could only be briefly examined due to lack of well control. The Antioch area appears to be a small alluvial plain area with thin sand beds. Possibly, the Plio-Pleistocene non-marine deposits occur at shallow depths and the alluvium is thin in this area. More extensive study towards Antioch would be required to evaluate the area. The Byron area also appears to have few thin sand beds of small alluvial plain area marginal to the greater Fluvial Plain region where fine-grained deposits appear to dominate.

**Depositional Model of Plio-Pleistocene Non-Marine Deposits**

As reported in the literature and seen on the cross sections, below the alluvium occur poorly defined Plio-Pleistocene deposits. These non-marine deposits appear to thicken eastward from exposure areas to thicknesses of 1,500 to 2,000 feet below the San Joaquin River. Limited borehole data indicates that these deposits are mostly fine-grained silt, clays and mudstones with few sand beds. Electrical logs indicate that fresh to brackish water quality exists in these deposits, although it is difficult to determine because of their fine grained nature.

Regional geologic studies (Bartow, 1991; and Bertoldi and others, 1991) have shown that Miocene marine deposition occurred in the area as shown by the Tertiary marine rocks exposed in the Coast Ranges. During the following Pliocene, the San Joaquin Valley drained to the south to the ocean via the Salinas Valley. The Sacramento Valley drained westward through the Delta area, and the Coast Range locally apparently had not been uplifted as yet. Deposition may have been confined to distal fluvial plains sourced from the Sierra Nevada area, such that little sand was carried into the area. Similar aged fine grained deposits are seen in southern Sacramento County, near Vacaville, and around Rio Vista reaching thicknesses of 2,000 to 2,500 feet.

In the Quaternary (mid-Pleistocene) period, the San Joaquin Valley south of Tracy was occupied by a large fresh water lake, Corcoran Lake. The study area appears to have remained in low relief, and fine-grained fluvial plain deposition continued. At about 600,000 years ago, northern San Joaquin River drainage and local Coast Range uplift began. It is suspected that this activity marked the beginning of the alluvium deposition where coarse-grained deposits were formed and carried into the area by the San Joaquin River and eroded off of the uplifting Coast Ranges.

# III.  Ground-Water Conditions

## Introduction

This chapter discusses ground-water conditions in terms of ground-water levels, which are a reflection of ground-water storage, and ground-water quality.  Throughout the study area, the primary water-bearing units for water supply purposes exist primarily  in the upper 300 to 400 feet of geologic material.  From the analyses presented in the previous chapter, there is no apparent basis for subdividing the aquifer system into subunits on a regional scale due to a lack of correlation although locally there are apparent variations in aquifer characteristics, water levels, and water quality.

The most extensive collection of historical water level and quality data was provided by the East Contra Costa Irrigation District (ECCID).  This data covered the area from Oakley in the north to south of Brentwood, and from west of Highway 4 east toward Discovery Bay.  The period of record for the ECCID data began in 1958 and provided an excellent basis to evaluate trends in water levels over time, especially during drought periods.  This data was the primary source for the generation of contour maps of equal ground-water elevation and depth-to-water, and water level hydrographs discussed below.  Ground-water quality data is also predominantly from this area but is also very limited in scope so that only a few general conclusions could be drawn with respect to questions concerning this topic.

## Ground-Water Level Hydrographs

Representative water level elevation hydrographs of wells monitored by ECCID were constructed and evaluated to assess historical trends.  A hydrograph, which is a plot of water level versus time, reflects ground-water storage over time.  The factors which affect ground-water levels and storage include seasonal and climatic changes, use patterns (e.g., municipal and agricultural pumping), and artificial and natural recharge.  A long-term or permanent decline in ground-water elevation is generally interpreted as an overdraft condition where extraction of ground water exceeds the recharge components.  Short-term water level declines may result from climatic conditions such as drought.  In this case, overdraft would not exist if water levels recover after the drought period.  In areas where ground water is extracted for various purposes, seasonal fluctuations can often be correlated to recharge during the winter period (water level rise) and pumping through spring and summer (water levels fall).  The hydrographs analyzed for this study and a well location map are included under Exhibits at the end of this report.

Ground-water level data obtained from ECCID spanned from the late 1950's and served as an excellent basis for interpreting ground-water storage over time for a significant portion of the study area.  The data indicates that water levels in the east county area have remained fairly stable with no evidence of long term or dramatic declines.  Minor shifts in water levels have occurred in two areas of the east county region. Wells located north of Lone Tree Way in Brentwood in the Marginal Delta Dune area have exhibited an upward to relatively flat trend in water levels.  The upward trend is exhibited by an increase of approximately two to five feet over the last 25 to 35 years.

Wells located in the Alluvial Plain area south of the Marginal Delta Dune area have generally exhibited either stable or slightly declining trends in water levels.  The wells which have shown a slightly decreasing trend have had a decline of two to five feet in the last 25 to 35 years, almost a mirror image of the upward trend in the Marginal Delta Dune area.  The amount of decline is not considered significant in terms of impacts to either ground-water quantity or quality in the affected area.

Climatic and seasonal water level changes are most noticeable in wells located in the western portion of ECCID's well network.  These wells commonly have seasonal or climatic water level changes of five to twenty feet.  Wells located in other areas of ECCID do not have pronounced seasonal or climatic water level changes.  These wells may be affected by proximity to the Delta whereas the wells located in the western portion of ECCID are likely influenced more by boundary effects caused by proximity to the edge of the ground-water system, i.e., the Coast Range foothills.

Long-term water level data were not found for other east County areas.  This problem could be addressed by extending the monitoring conducted by ECCID to the other regions including south of Brentwood in the Byron area,  the Oakley area, the Discovery Bay area, and east beyond the county line.   However, considering that the most significant historical ground-water extraction activities have been focused in the greater Brentwood area, it is expected that the outlying areas would not show a significant deviation from the stability reflected in the ECCID data.  In Discovery Bay, long-term monitoring of water levels of the confined unit tapped by its municipal wells would be of key importance with regard to ground-water conditions in that area.

**Ground-Water Level Contour Maps**

Regional water level contours were constructed for spring and fall of 1958, 1975, and 1991, and spring or fall of 1977, 1986, and 1996. The 1991 contour maps were augmented with data from Diablo Water District and Discovery Bay. The contour maps were used to assess historical changes in ground-water flow directions since 1958 during time periods which experienced wide variations in precipitation, e.g., during "wet" years (mid 1980's) and "dry" years (mid 1970's, late 1980's). The plots were also used to determine areas which have experienced increases in ground-water pumpage and which have little or no recorded water level data.

All the ground-water elevation contour plots show ground-water flow directions from west to east in the southern portion of the study area (Brentwood to Discovery Bay) and from southwest to northeast in the central and northern portions of the area (from Brentwood toward Holland Tract). Immediately south and southwest of Brentwood near ECCID’s Main Canal, there appears to be a flattening of ground-water elevations, possibly resulting from ground-water pumping in the vicinity (an effort should be made in the future to verify the measuring point elevations in this area as the apparent flattening of contours could be a data quality problem). This is most noticeable from 1975 through 1991, when more water level data is available in this area, and does not appear to be developing into a ground-water depression, even during drought periods (1977 and 1991). There is a lack of data south of Brentwood in 1996 and prior to 1975 to evaluate whether the flattening of ground-water levels persists before or after that time period. This area does not appear to have a dramatic affect on water levels either in the Discovery Bay area or in the Brentwood area.

The hydraulic gradient is approximately 15 feet per mile in the southern portion of the basin to 20 feet per mile in the northern portion of the basin. The hydraulic gradients have not changed significantly since 1958 with the exception of the flattening of the gradient in the area south of Brentwood since 1975.

**Depth-to-Water Contour Maps**

Depth-to-water contour maps were prepared for the same time periods as the water level elevation contours discussed above. These maps, included in the Exhibits section along with the ground-water elevation maps, can be used to assess how depth-to-water in a particular area has changed over time; they can also, for example, serve as a useful reference when assessing available drawdown for well development purposes. Unfortunately, there is a lack of historical water level data west of Highway 4, in the Oakley area, south of Brentwood to Byron, and in the Dutch Slough, Rock Slough, and Indian Slough areas; this lack of data limits the scope of depth-to-water mapping in the overall study area.

The depth-to-water maps show that ground water occurs at shallower depths from west to east. These maps are consistent with the hydrographs and elevation contour maps in that they indicate no significant changes over time nor any apparent significant impacts by historical extraction within the area for which data is available.

**Ground-Water Levels in Newer Brentwood Municipal Wells -** Although there is no extensive data on water levels in municipal wells operated by the City of Brentwood, it is known that static levels in the City's two main well fields (Wells 6, 7, and 8 near Marsh Creek and Wells 11, 12, and 13 to the south) are deeper than the shallower levels reflected in the broad ECCID data base. Static water level readings from Brentwood's wells indicate that the water level difference may be 20 to 40 feet in magnitude and is most likely caused by the municipal pumping. The City's pumping, however, has not impacted the larger regional system as reflected in the well hydrographs or water elevation contours discussed previously. At least locally, the City should be concerned with how the water level difference between the deeper completion zones of its newer municipal wells and the shallow zones might cause degradation of water quality by inducing downward movement of water quality constituents of local concern (e.g., nitrate). As development of the deepest portion of the aquifer occurs, it would be advisable to monitor the municipal wells separately to determine if a distinction of the aquifer system into shallow and deep units is appropriate.

**Ground-Water Quality**

Ground-water quality data was reviewed to assess trends and characteristics of ground water throughout the study area. Data was limited in quantity and distribution, with most concentrated in the greater Brentwood area and within the East Contra Costa Irrigation District. Water quality data is presented in a series of graphs for wells located on the study Base Map under Exhibits at the end of this report.

Ground-water quality data posted on maps include concentrations of total dissolved solids (TDS), chloride, and nitrate. As discussed below, because of the limited amount of data, the most significant finding concerning water quality variations throughout the study area is the notably better water quality in Discovery Bay as compared to other areas where data is available.

A series of graphs was also used to assess water quality characteristics for this investigation. These graphs were constructed by plotting various water quality constituents versus the depth of the well intake structure; that is, the top of the well perforations or screen. Most notably, there is a strong correlation between nitrate concentration and the depth of the intake structure, which is consistent with the generally understood concept that nitrate degradation occurs as a result of surficial influences. Other constituents also showed a relationship that suggests that water quality improves with depth as discussed below.

**Total Dissolved Solids -** Data on total dissolved solids in ground water in the study area varies widely, although it is characteristically high, up to 1,000 mg/l, in many areas (see TDS map). Discovery Bay is notable for significantly lower TDS in ground water with all measured values between 500 and 600 mg/l. As discussed further below, this information lends support to the theory that the ground-water system in that area may be hydraulically distinct from the depositional areas to the west and perhaps the north. This hydraulic distinction is not apparent from the ground-water elevation maps discussed previously because of a lack of data around Discovery Bay.

Other constituents of ground-water quality, including electrical conductivity, were plotted as a function of the depth of the well intake structure. Each of these indicates a slight trend of better water quality with depth. Considering a very strong relationship with nitrate, which is usually derived from surficial sources, it may be possible that there is some degradation in ground-water quality (besides nitrate) that is a result of the same influences. However, the preponderance of the data suggests that water quality is naturally high in TDS (up to 1,000 mg/l) and other constituents such as chloride, and that local degradation may have occurred possibly due to man-made influences.

**Nitrate -** Nitrate in ground water is widely distributed in the study area, with some values exceeding the maximum contaminant level (MCL) set by EPA for drinking water (45 mg/l as nitrate). The eastern portion of the study area is notable as having significantly lower values; the wells in Discovery Bay have no detectable nitrate present. While the occurrence of nitrate in ground water in this area has generally been attributed to agricultural influences, its occurrence is clearly limited to the upper sequences of aquifer materials as reflected in the plot of nitrate concentration versus depth of well intake structures. For the available data, nitrate concentrations decline appreciably for wells completed below 200 feet; i.e., for wells where the top of the perforations are 200 feet or more below the surface. This suggests that, in many cases, nitrate contamination may be mitigable through well design, for example, by incorporation of wells seals to 200 feet and limitation of well screens to depths below 200 feet.

**Aquifer Confinement**

The representative hydrographs and contour maps analyzed for this investigation are included at the back of the report under Exhibits. The wells monitored by ECCID are widely distributed throughout the region and are representative of the main aquifer system which occurs in the upper 300 to 400 feet below ground surface. The water level data reflects primarily conditions in the western portion of the study area, with most of that falling within the Alluvial Plain depositional region but extending into the Marginal Delta Dune region around Oakley. Considering the depositional region as well as the consistencies in data from well to well, the aquifer system appears to act locally confined. That is, there appears to be hydraulic continuity from the shallow aquifer materials to the deeper ones as reflected by the similarities in water levels from all wells.

The hypothesis of local confinement is supported by the apparent discontinuous nature of aquifer materials as reflected in the cross sections discussed in the previous chapter. Under this model, some local confinement would be expected as a result of the presence of clay beds and would affect the drawdown characteristics of wells, for example. However, these beds are not areally extensive and hydraulic equilibrium would likely be reached between shallow and deep zones when wells are inactive (e.g., in the winter). In the Brentwood area, this is consistent with the experience that well sealing can successfully mitigate nitrate degradation by preventing locally induce downward migration of shallow ground water as a result of deeper pumping.

In contrast to the apparent conditions in the Alluvial Plain, municipal wells in Discovery Bay produce from a zone which appears to be confined by an extensive layer of clay material (see Cross Sections 1 and C). The confinement of the main aquifer in the Discovery Bay area is indicated also by the difference in head between the deep zone and a shallow brackish zone which has caused some problems in operation of the municipal well facilities. These problems have been shown to be effectively mitigated by sealing the well through the brackish zone to achieve complete hydraulic isolation of both the deeper aquifer and the well structures from the brackish aquifer.

The apparent confinement of the main aquifer at Discovery Bay appears to be representative of the Fluvial Plain region. The same may not be true immediately north into the Delta Islands where the cross section interpretation seems to make confinement more difficult to correlate and there is no water level data for added support.

**Recharge Sources**

The study area consists of an aquifer system having a mix of depositional patterns as discussed in Chapter II. From the depositional models, it is not unlikely that there are different sources of recharge of the various aquifer materials which are sources of water supply. From water level data, it is clear that ground water is moving from the Coast Range foothills toward the east through the Alluvial Plain and Marginal Delta Dune regions. As discussed above, there is no clear extensive confinement of aquifer materials in these areas. In contrast, ground water developed in municipal supply wells in Discovery Bay appears to be confined and, when water quality information is considered, it is likely that there is different recharge source as well. One possibility is that the Fluvial Plain region, where Discovery Bay is located, is recharged from the south in a manner that is consistent with the depositional model discussed previously. Again, it should be noted that this is not reflected on the ground-water elevation contour maps primarily because of lack of data around Discovery Bay.

Recharge of the Delta Islands may be a combination of fluvial influences from the south but also the hydraulics of the Delta system. The lack of pronounced seasonal and climatic influences on water levels as cited previously underscores the likely significance of the Delta system with regard to recharge. The latter is especially true considering the lack of the correlatable confinement that is a characteristic of the Fluvial Plain. No other conclusions regarding recharge could be made except for those cited above mainly because of the lack of water level information outside of the ECCID area. It should be noted that in some areas, particularly to the north in the Delta Islands and

Marginal Delta Dune regions, significant increases in pumpage may have the potential to induce recharge from poor quality, or brackish, water as a result of proximity to Bay and Delta influences. The inability to assess recharge in parts of the study area underscores the need to develop a broader range of water level monitoring outside the boundaries of ECCID. In Discovery Bay particularly, where ground water is relied on for municipal water supply purposes, it would be desirable to investigate ground-water conditions in more detail to the north, south, and east to delineate flow direction and potential recharge influences.

**Basin Yield**

Historical conditions as reflected in the hydrographs and contour maps discussed above suggest that, for much of the Alluvial Plain and Marginal Delta Dune regions, where most of the historical data is available, extraction activities have not exceeded the sustainable yield of the ground-water system. Here, sustainable yield, sometimes called "safe" yield, refers to that level at which extraction has not adversely impacted ground-water conditions, e.g. levels, storage, quality, etc. As cited above, stability in ground-water levels and storage reflected in the well hydrographs and the ground-water contour maps.

Although it may be stated that the sustainable yield in much of the east County area has not been adversely impacted as reflected by the ground-water level data, less certainty exists at Discovery Bay and other areas, including Brentwood (deeper zones), because of the lack of data and/or short period of record. It is unlikely, however, that sustainable yield, as defined above, has been exceeded because of the general lack of ground-water development throughout much of these other areas. Furthermore, areas in the vicinity of the river and Delta systems have a large source of potential recharge which could offset potential adverse impacts due to increased extraction.

Sustainable yield also refers to that level at which ground-water extraction does not degrade water quality. On this matter, less is apparent based on available water quality data in the study area. It is likely that pumping on a local level in the Brentwood area, for example, induces some degradation by nitrate. However, it is also likely that some of these local influences are caused by, and can therefore be mitigated through, well design practices. On a regional scale, significant increases in pumpage could cause migration of poor quality water in some areas, particularly the Alluvial Plain region, which could degrade water quality (e.g., nitrate, TDS). In the Delta areas, increased extraction may not affect quantity, but may induce movement of shallow brackish water that would be a hazard to fresh ground-water sources. Again, these considerations further point to the need for expanded monitoring in parts of the study area to better understand local conditions beyond where historical data is concentrated.

# IV. Conclusions

## Data Quantity and Quality

Initial efforts to collect and organize information resulted in the development of a large data base of well driller's reports and ground-water levels which formed the basis for addressing the investigation objectives. Ground-water quality data was the most sparse and lacking of the primary categories of information sought for the study. As a result, some firm conclusions could be drawn with respect to the occurrence and distribution of aquifer materials, as well as historical ground-water conditions, but with limited conclusions regarding ground-water quality.

Well data in the form of driller's reports permitted construction of geologic cross sections covering the entire study area. These tools can serve various future water supply development needs including targeting depths for exploratory test holes prior to new well construction. Since there was a limited quantity of electrical logs available, which provide precise delineation of lithologies, the cross sections should be reassessed when new logs become available (from new wells).

The data did not permit quantification of how much additional pumpage might be sustained in the basin without impacting the sustainable yield. As a result, it is recommended below that any significant incremental pumpage be monitored to determine if sustainable yield is exceeded. This can be accomplished by identifying key representative wells for the purposes of tracking water levels in the form of updated hydrographs and water level contour maps. These tools will permit detection of adverse or downward trends in water levels or flow patterns; they will also allow identification of appropriate local or other corrective measures (e.g., relocation or redistribution of pumpage, augmentation of recharge, etc.).

Because of the lack of water quality data, a systematic ground-water quality sampling and testing program is also recommended to more fully assess ground-water quality in the region and to serve as a basis for future ground-water management activities.

**Hydrogeologic Regions**

Four ground-water regions were delineated in the study area which are distinguished by the manner in which aquifer materials were distributed and deposited. These include the Alluvial Plain, Fluvial Plain, Delta Islands, and the Marginal Delta Dune. For reference, the aquifer system underlying the City of Brentwood is representative of the Alluvial Plain region; the aquifer system in Discovery Bay is representative of the Fluvial Plain; Bethel Island is central to the Delta Islands regions; and Oakley is within the Marginal Delta Dunes. The western extent of the entire hydrogeologic system is at the Coast Range foothills which represent the most distinct hydrogeologic boundary in the study area.

For most of the study area, the extent of aquifer materials capable of yielding quantities of water suitable for municipal and/or agricultural purposes is to depths of 400 feet. Each region has characteristic quantities of aquifer materials (i.e., net sand thickness) that are related to depositional patterns.

The depositional models are useful for a number of purposes. For example, differences in the occurence and patterns of aquifer units, as well as ground-water quality and quantity, between the western part of the study area (represented by Brentwood) and the eastern (represented by Discovery Bay as well as the other regions) can be attributed to the natural history (i.e., geology) of the region. The distinctions between the Alluvial Plain and the Fluvial Plain likely include different recharge sources which explains some significant differences in water quality between Brentwood and Discovery Bay, for example.

**Ground-Water Conditions**

Water level hydrographs reflect seasonal fluctuations and, in some areas, climatic influences (such as drought periods) on ground water. In general, comparing conditions since the late 1950's to present, the data indicates that there is no apparent overdraft of the ground-water system, suggesting that historical extraction patterns have not exceeded the sustainable yield of the system. However, there may be localized pumping influences around Brentwood that should be investigated further. In that area, newer municipal wells which tap deeper aquifer units (below 300 feet) have apparent lower static water levels than measured in the surrounding ECCID data base.

Ground water contour maps, constructed to depict ground-water levels at various times since the late 1950's, reveal patterns and directions of ground-water flow throughout a large portion of the study area from the western edge toward Discovery Bay. The maps indicate that there have been no significant changes in movement of ground water within the study area since the late 1950's. Furthermore, there have apparently been limited, if any, adverse impacts to ground-water storage in the study area as a result historical use patterns. Impacts appear to be limited to the occurrence of elevated nitrate concentrations in shallow ground water which is likely a result of agriculture and, in some cases, possibly septic systems.

**Ground-Water Quality**

Ground-water quality data, while sparse, indicates wide variations in TDS and nitrate concentrations. Discovery Bay is notable for relatively better water quality in terms of lower TDS and no detectable nitrate concentrations when compared to areas directly to the west. This is likely attributable to the distinct depositional environments associated with the two areas, as cited previously, as well as differences in historical land use. Nitrate problems in the greater Brentwood area are likely a result of surficial influences by agricultural practices where localized infiltration has caused introduction of nitrogen to shallow ground water. Such problems are most likely best addressed through specific well design features, such as selective well completions and deep annular well seals, to hydraulically isolate the shallow zones from the target completion intervals (i.e., water zones) in supply wells.

In the northern hydrogeologic regions, shallow, poor quality water (i.e., brackish) may exist as a result of influence by the Bay in the Delta over geologic time. The extend of this problem can be identified through exploration tools such as electrical logs and may be mitigated through well design. The known shallow brackish zone at Discovery Bay is considered anomalous in that the fluvial depositional model does not suggest a source of the poor quality water.

## Ground-Water Exploration and Development Potential

Based on the geologic evaluation and cross sections, some general conclusions may be drawn regarding future ground-water exploration and development in the study area. In general, exploration should be confined to depths above about 400 feet except within a mile or two of the Coast Range Foothills where depths of exploration would be even shallower. Most alluvium sand and gravels beds occur above about 350 feet depth. Some thin sand or sandstone beds may be found below 400 feet.

In the Fluvial Plain region, wells of relatively high yields (up to 2,200 gpm capacity) have been constructed above 400 feet in the Discovery Bay area. However, shallow and possibly deeper brackish water problems have been found which must be avoided. The better water quality (in terms of lower TDS) developed in the municipal wells in Discovery Bay, as compared to the other regions, is likely due to the existence of a separate recharge source to the south. This source is likely related to the depositional pattern of the river system.

Development of wells in the Fluvial Plain region, with characteristics similar to the Discovery Bay municipal wells, may be possible particularly north of that community. However, this area does not have a population base to warrant such development at present. It is expected that exploration below 400 feet will not encounter suitable aquifers for water supply purposes.

In the eastern Delta Islands, wells of moderate yield appear to have been constructed. From the drillers' reports, depths of 400 feet appear to be the bottom of exploration potential. Brackish or saline water quality problems, especially in shallow aquifers above 200 feet, may be found as discussed previously.

In the Marginal Delta Dunes area, limited exploration has occurred to 400 feet. Potentially moderate yielding wells may be possible, but exploration is needed to evaluate deeper aquifer potential. Potential shallow aquifer problems of brackish water may be present and should be evaluated as part of any exploration effort in that area.

In the Alluvial Plain area, local areas of thick alluvial sand and gravel above 350 feet represent the best potential for development of ground-water sources. Two areas have been identified, one to the north near City of Brentwood Wells 6, 7, and 8, and an area to the south near City Well 13. In the southern area, additional exploration to the northeast may allow mapping of the sand beds of the channel sequence.  Exploration between the north and south area is recommended to evaluate the possibility of correlation between the two areas, which may reveal a greater distribution of aquifer units suitable for ground-water extraction.

Some development of deeper aquifers below 300 feet has occurred, but has resulted in low well yields (less than 400 gpm capacity) due to poor aquifer characteristics, although good water quality was encountered (Brentwood Well 13).  In general, it is suspected that high yielding wells (1,000 gpm capacity or more) suitable for municipal or irrigation needs will only be found in the alluvium to about 300 to 350 feet in depth.  Shallow water quality has been found to be degraded by the presence of nitrate in the upper 100 to 200 feet of the alluvium zone and must be considered in well development programs.  Exploration to the east, outside of the trends of the stream channel sand zones, is not likely to be encouraging based on the results of this subsurface investigation.

The area west of Oakley towards Antioch is  poorly defined, but is suspected to be a poor ground-water supply region due to lack of alluvium deposits and possible brackish water quality problems. The Byron area shows very low exploration potential due to limited sand beds present and its apparent marginal relationship to the greater Alluvial Plain region in which Brentwood is central as well as representative.

**Recommendations**

The east County water entities are in a position to manage ground-water resources at a point in time that impacts of future development can readily be assessed for a system which has been relatively stable over several decades.  Considering the vertical extent as well as the quality of aquifer materials present in the study area, the entities should prepare to react to any adverse changes in the historical water level and flow patterns caused by changes in extraction patterns.  This need is underscored by the fact that water quality is poor in many areas (e.g., high TDS and nitrate) and the aquifer system is limited areally and vertically (i.e., to depths of about 400 feet) as reflected in the geologic cross sections constructed for this investigation.

The east County entities should be concerned with any increment of ground-water extraction that results in downward trends in water levels or shifts in flow direction.  The affected entities should consider instituting a program to monitor conditions on a periodic basis.  Since the basin extends across multiple boundaries of influence, it would be beneficial to share information in order to completely depict regional ground-water conditions.  This program should consist of:

- identification of key wells for water level monitoring and water quality testing.

- updating hydrographs for key wells on a semi-annual (spring and fall) basis.

- updating water level contour maps on a semi-annual (spring and fall) basis.

- production of an annual report which incorporates updated hydrographs, contour maps, and water quality test results; the report should highlight any significant changes in ground-water use patterns.

Such a program is conducted in many major ground-water basins in the State. The various maps and hydrographs created for this investigation can serve as initial products of an ongoing monitoring program. These products can be easily interpreted for ground-water management purposes including protection of water quality and limiting of extraction to the sustainable yield of the basin. They would also be useful with efforts to increase sustainable yield, correspondingly increasing pumpage, by management actions such as augmenting recharge and treatment of high TDS and/or nitrate-contaminated water.

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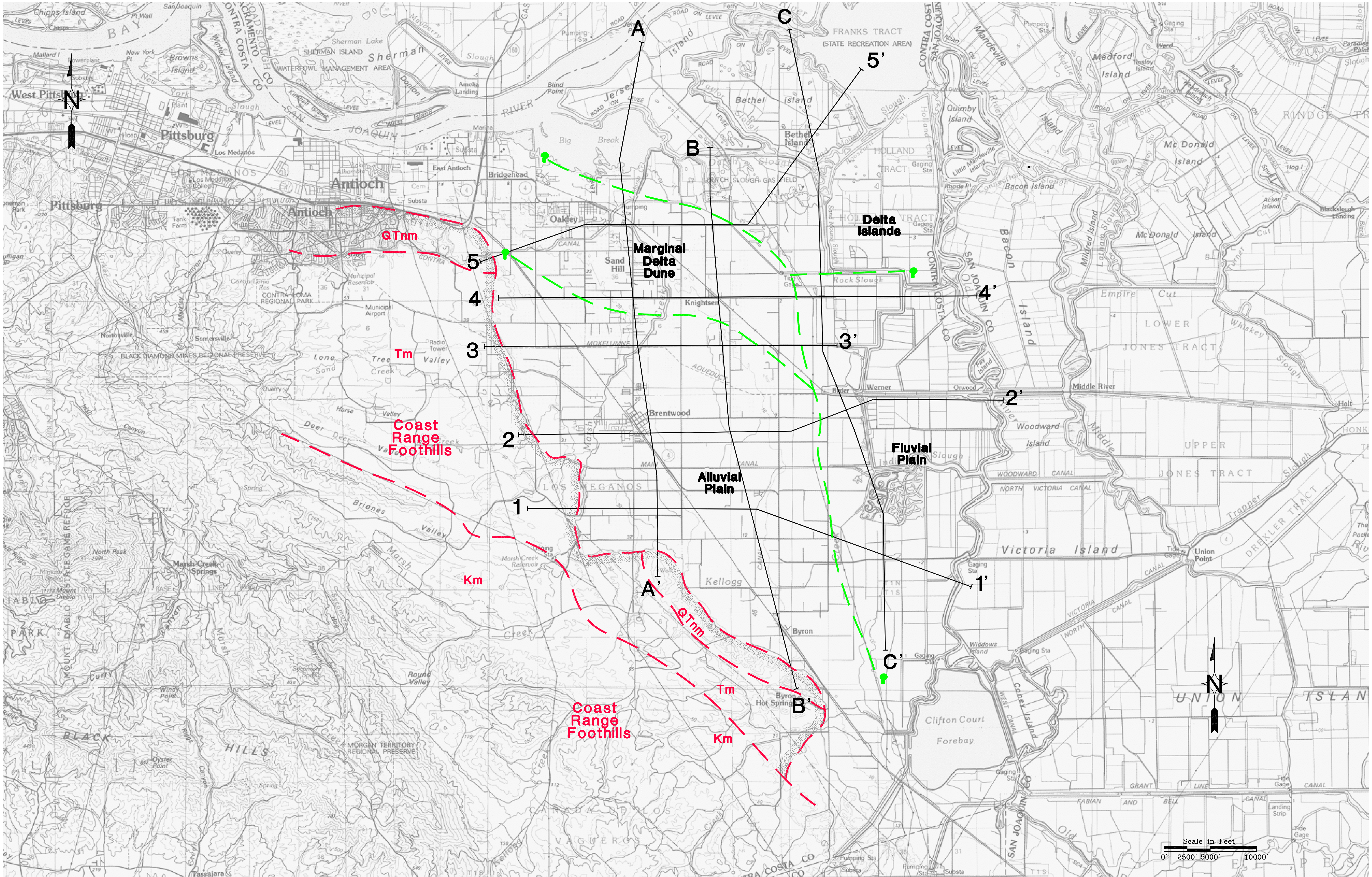
# EXHIBITS




East County Water Management Assoc./97-1-131/Basemap.dwg

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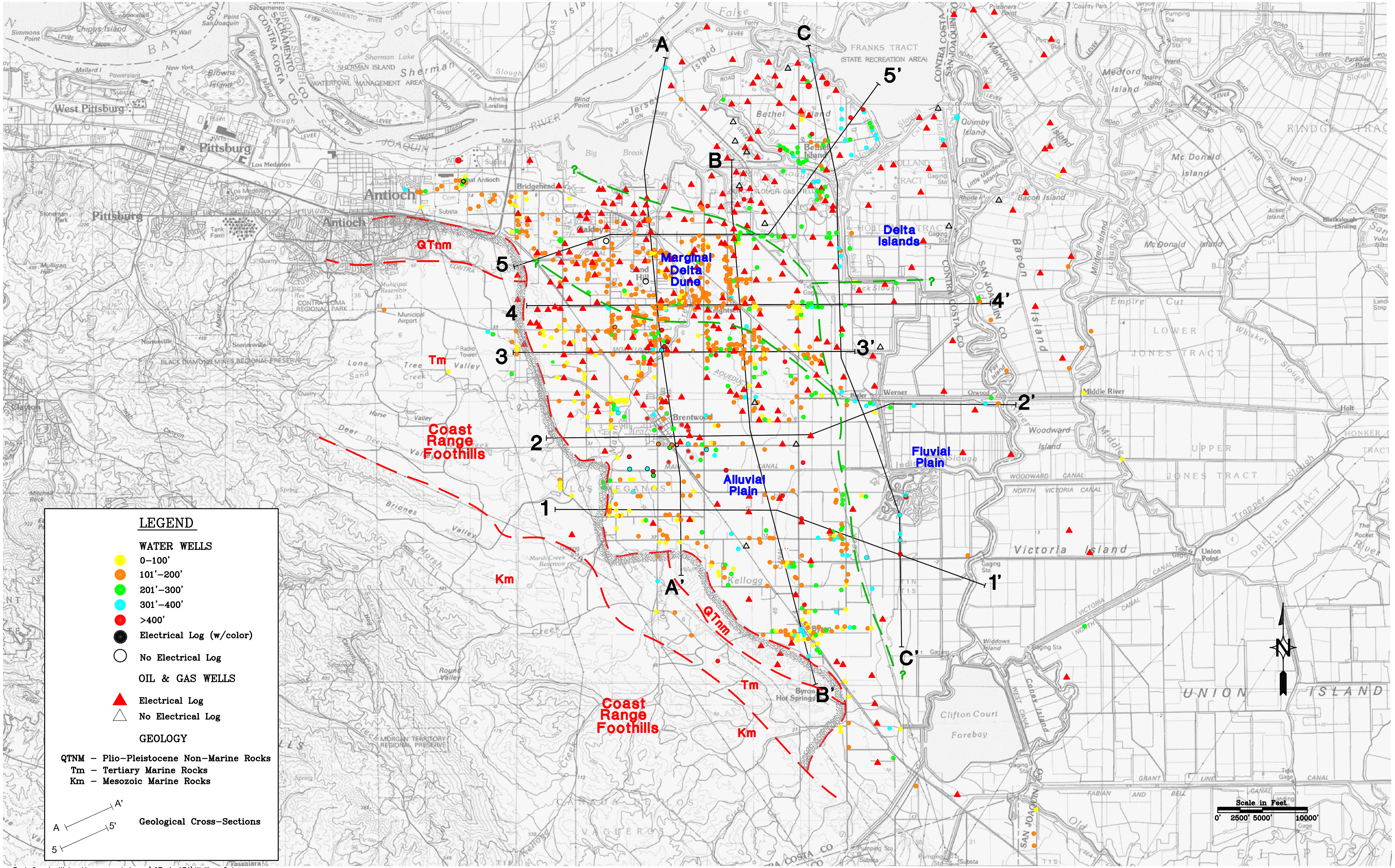
**Base Map**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc.\97-1-131\Wellbase2.dwg

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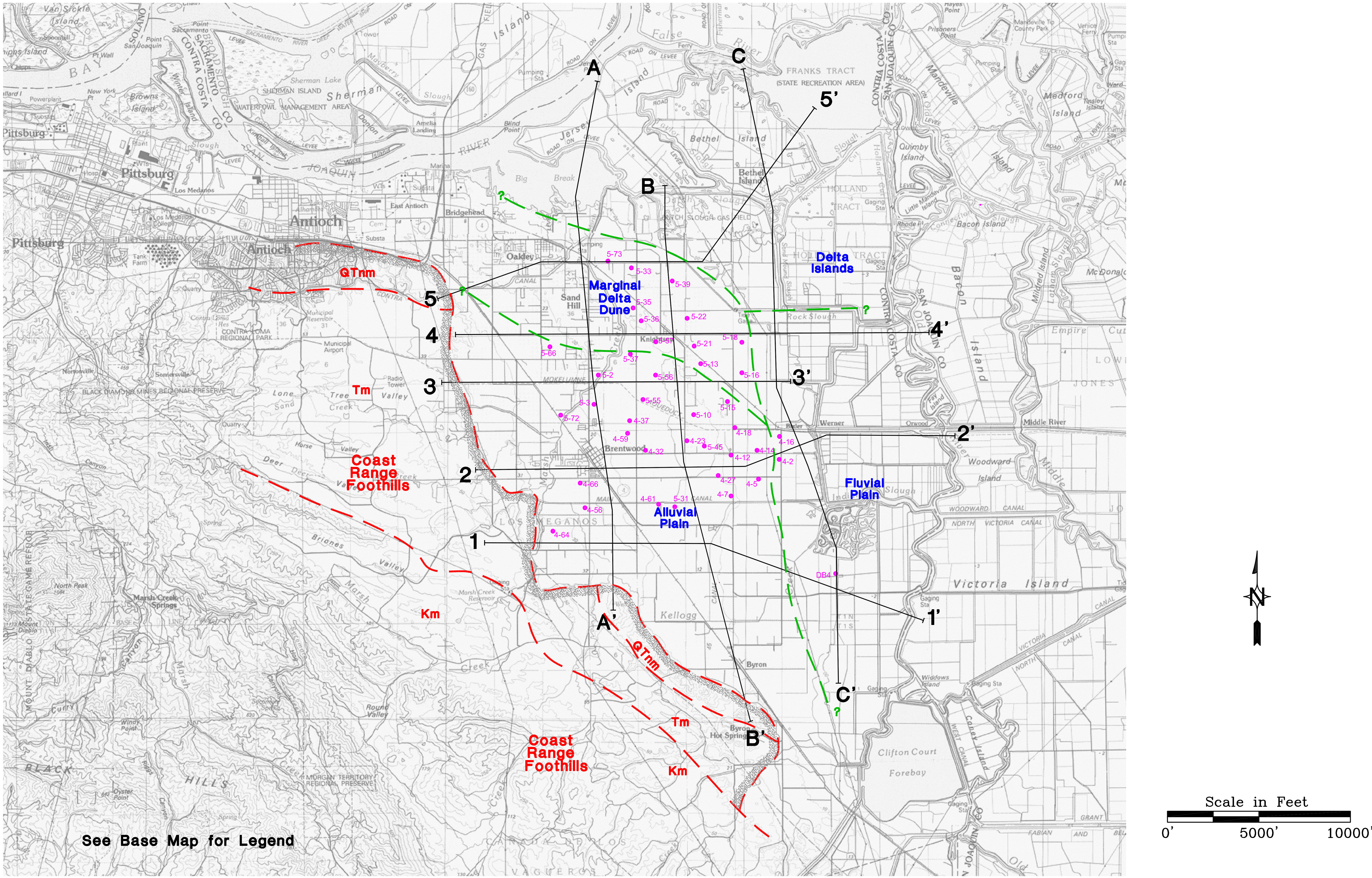
**Well Map**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Hydrobase.dwg

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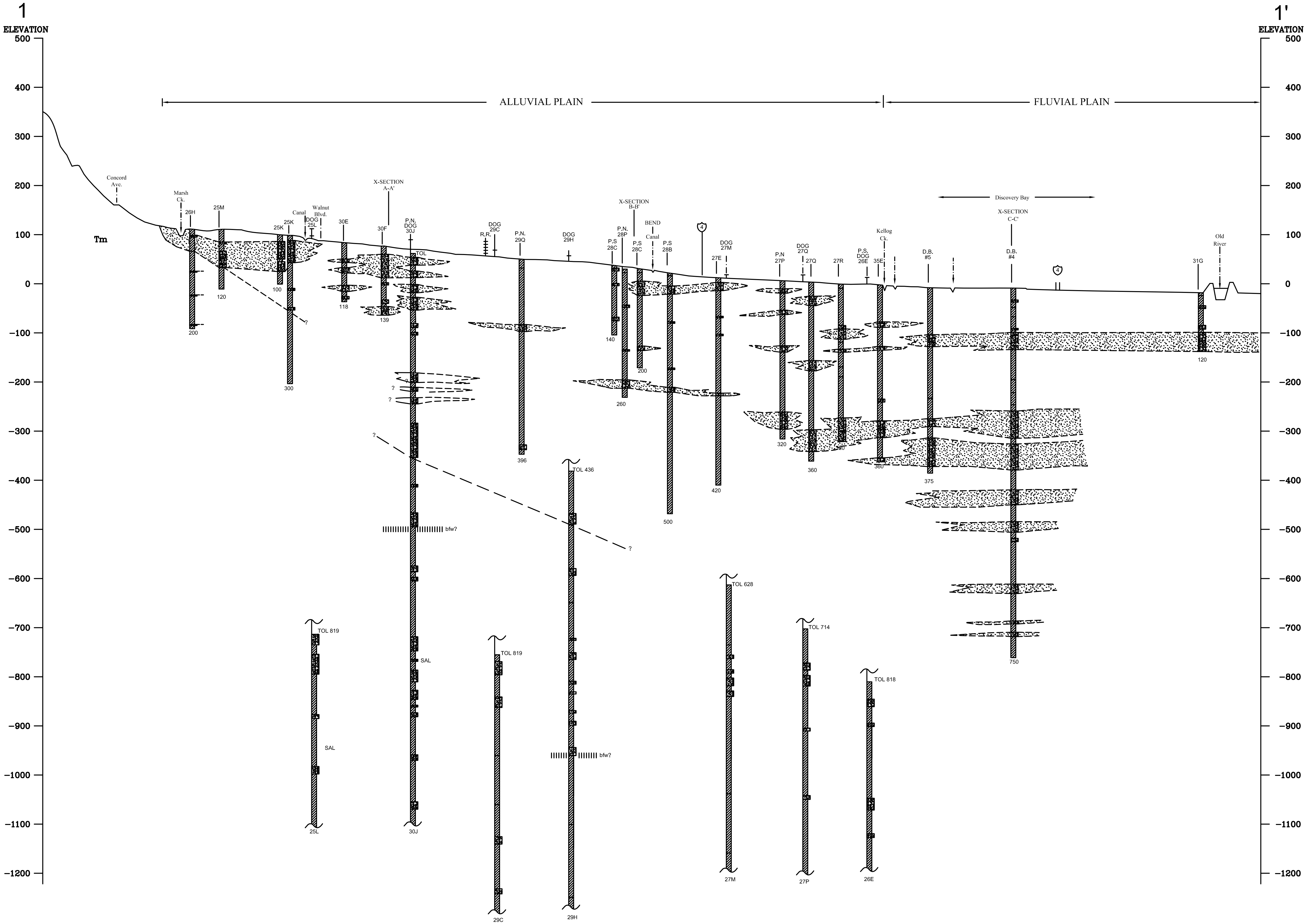
**Well Hydrograph Location Map**
**East County Water Management Association**
**Ground-Water Resources Assessment**




**LEGEND**

11P Well Identification

Clay

Sand/Gravel

300 Total Depth

NOTES: DOG=Division Oil & Gas

PROJECTED
P.N. – North
P.S. – South
P.S.E. – Southeast
P.N.W. – Northwest

QTnm = Plio Pleistocene Non–Marine Rocks
Tm = Tertiary Marine Rocks
TOL = Top of Electrical Log
brac = brackish
SAL/S = saline
bfw = base of freshwater

Scale in Feet
0' 1000' 2000' 4000'
Vertical Exag. 20X

East County Water Management Assoc./97-1-131/X-Sect1-1'.dwg

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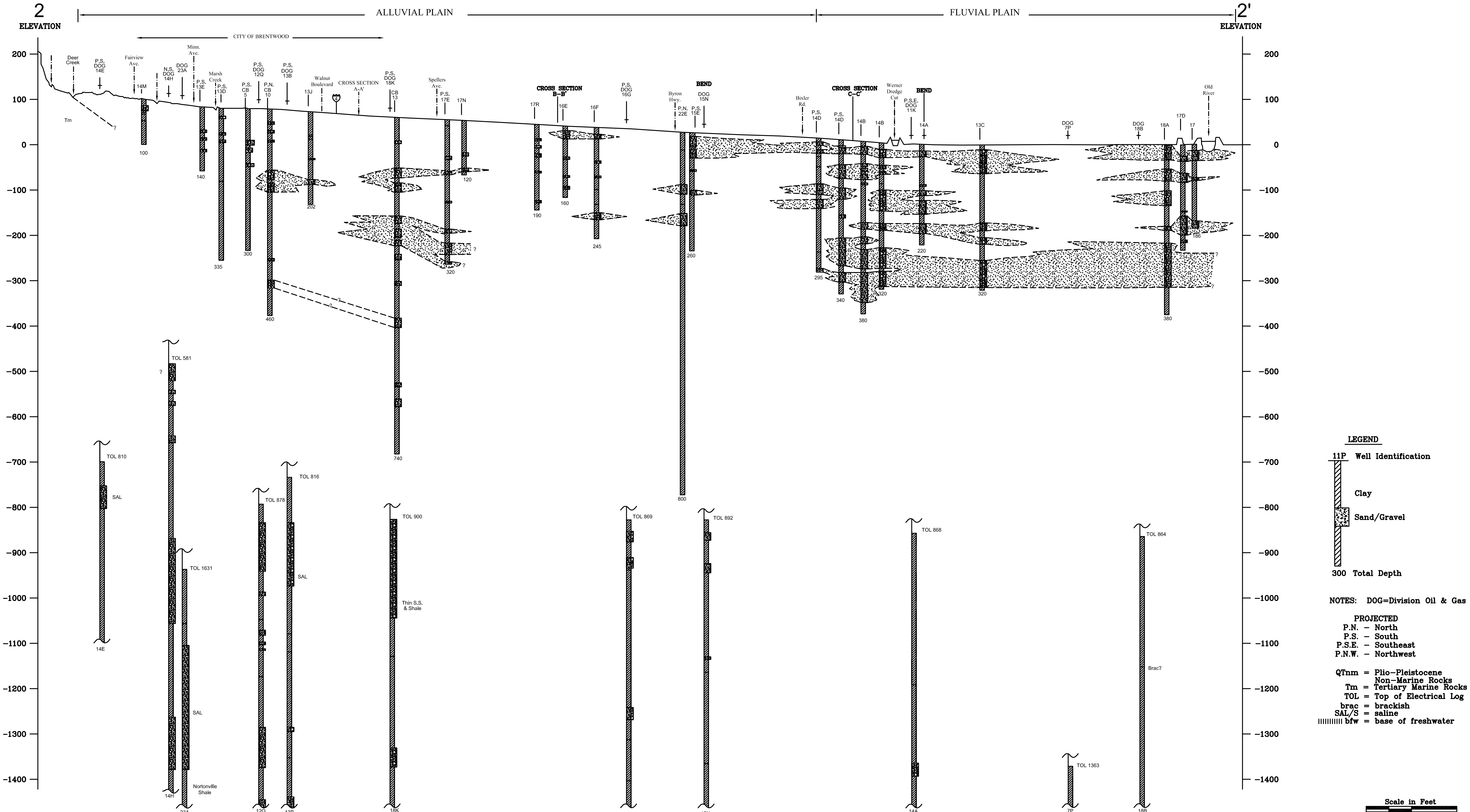
**Geologic Cross Section 1-1'**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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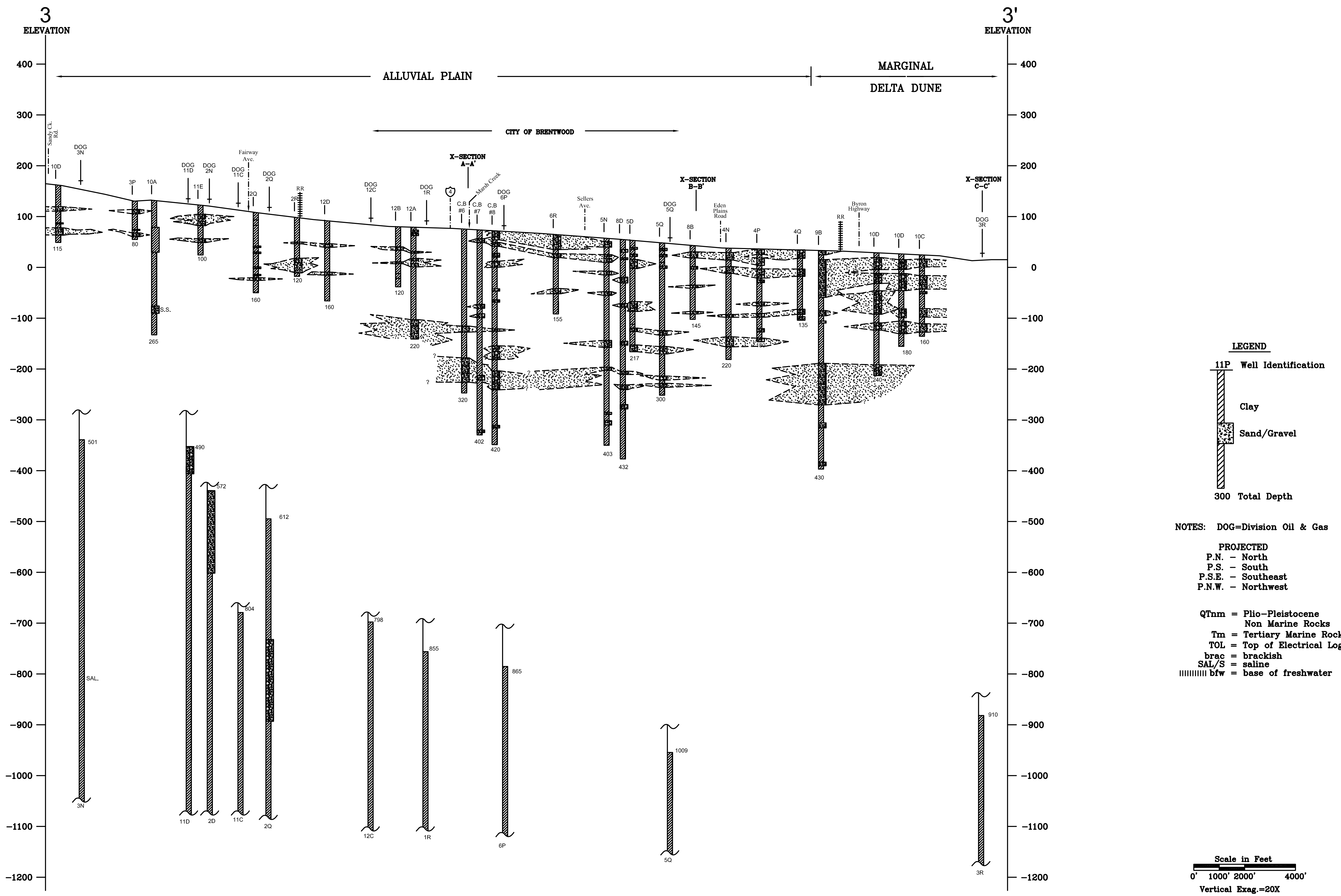
**Geologic Cross Section 2-2'**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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LUHDORFF & SCALMANINI
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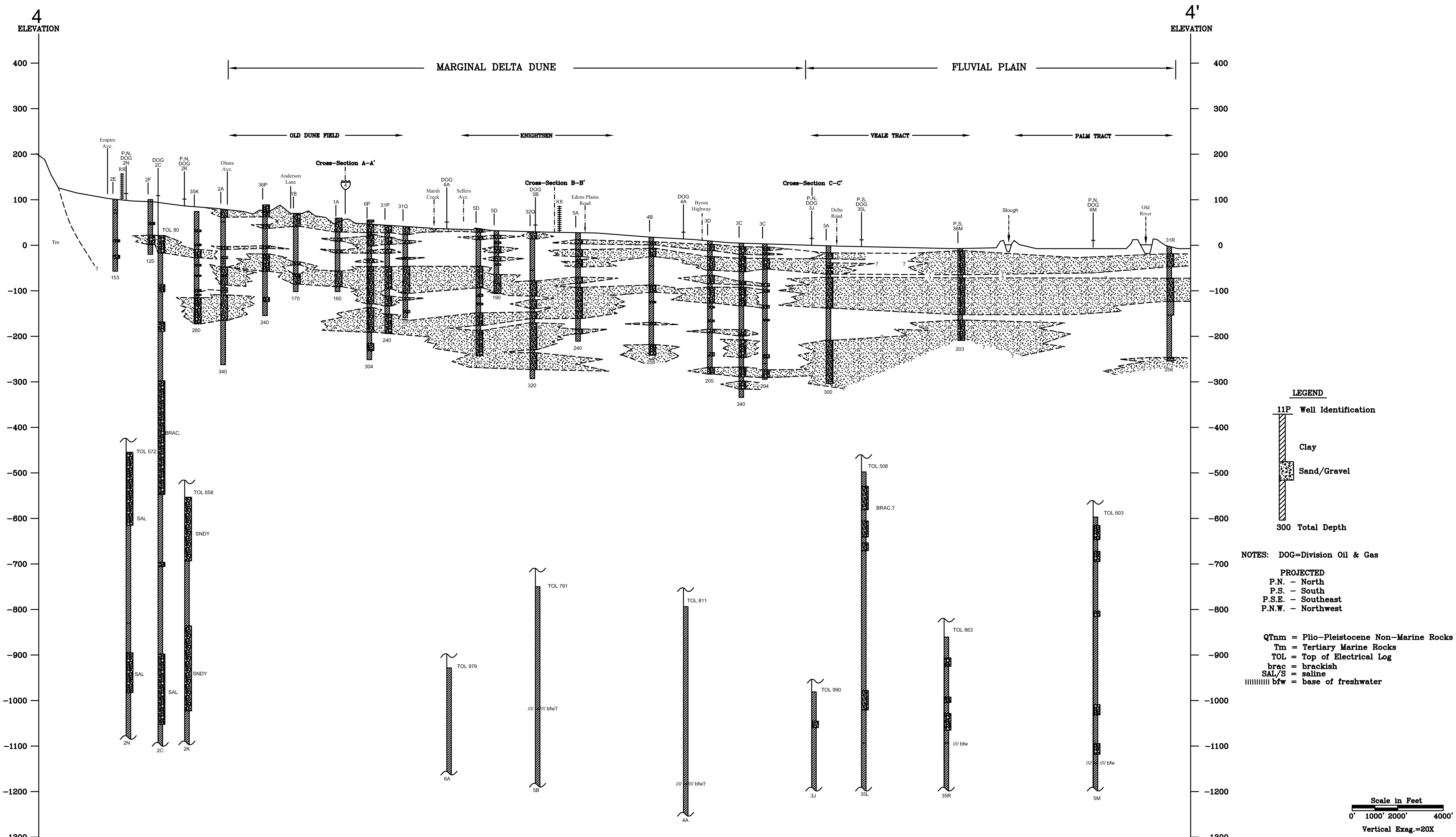
**Geologic Cross Section 3-3'**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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**Geologic Cross Section 4-4'**
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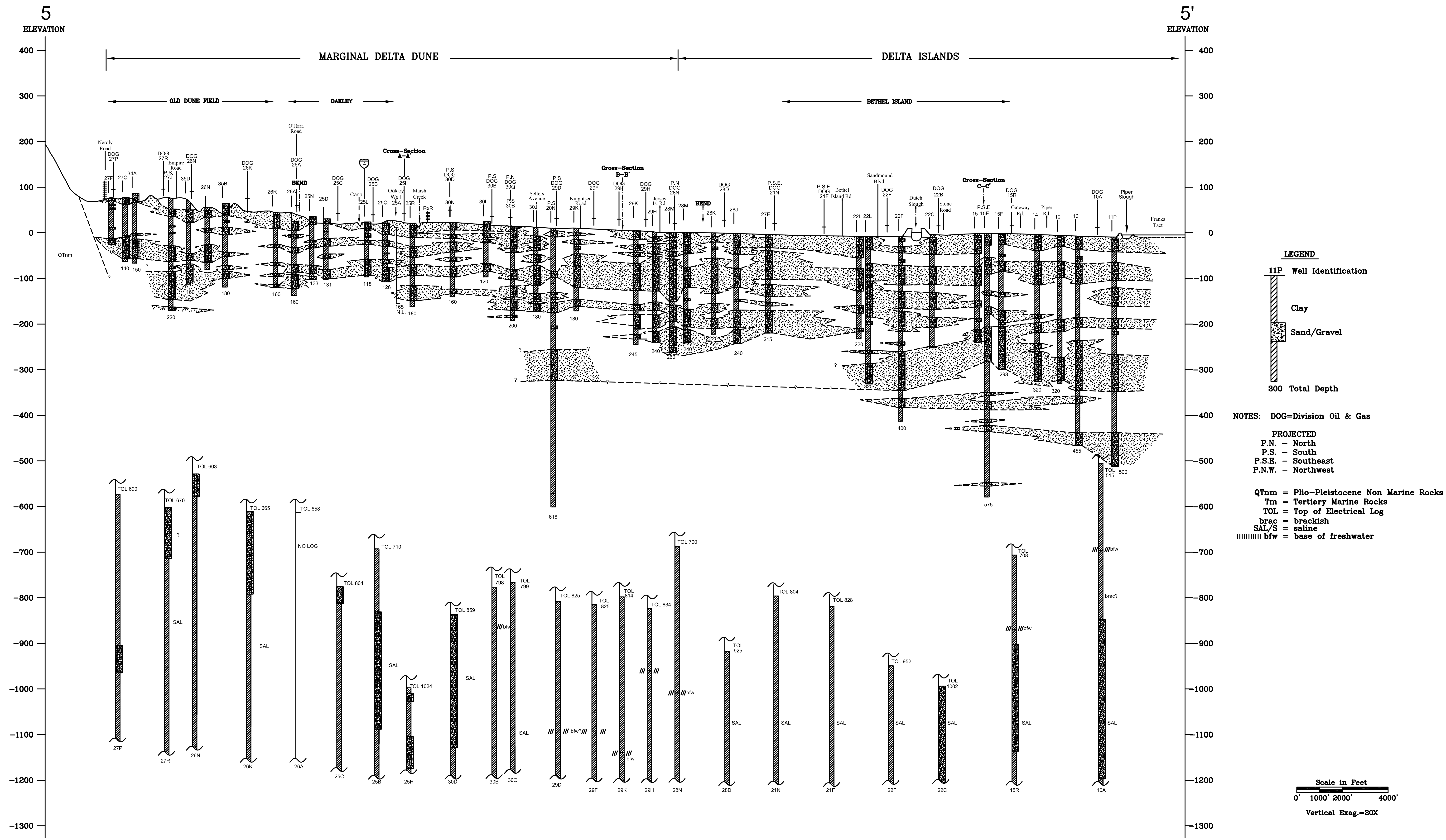
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/X-Sect5-5'.dwg

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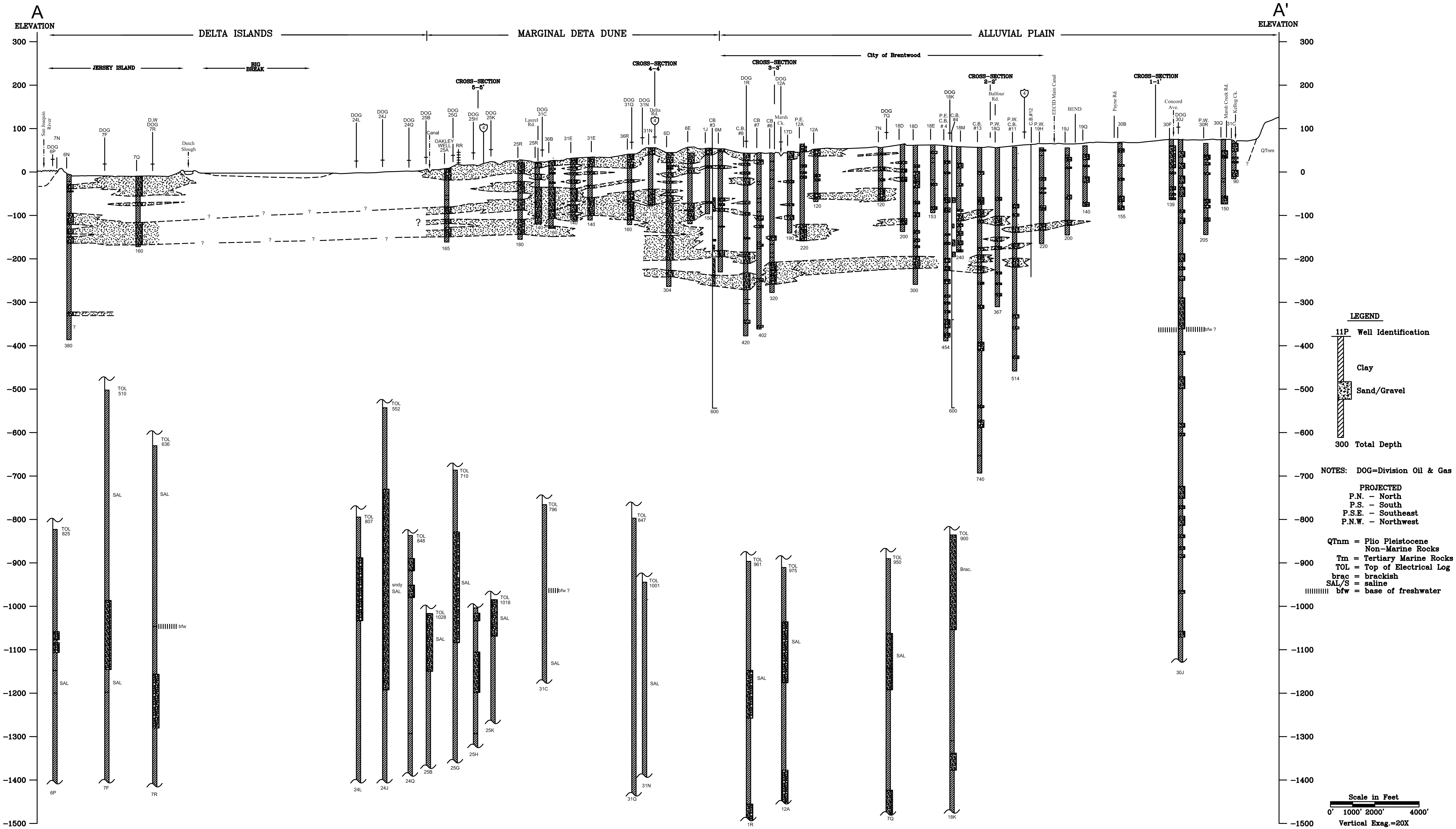
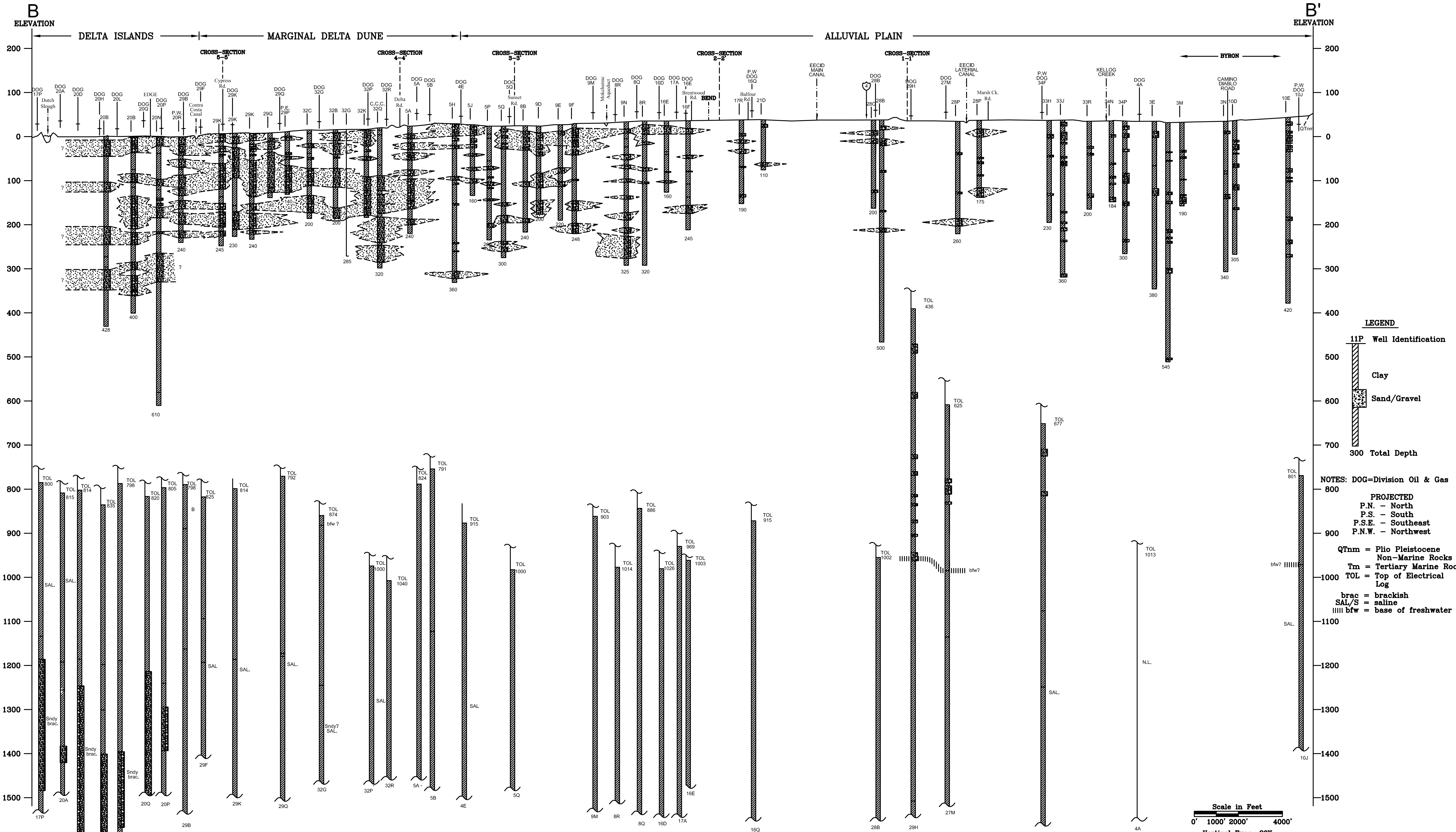
**Geologic Cross Section 5-5'**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc.\97-1-131\X-SectA-A'.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

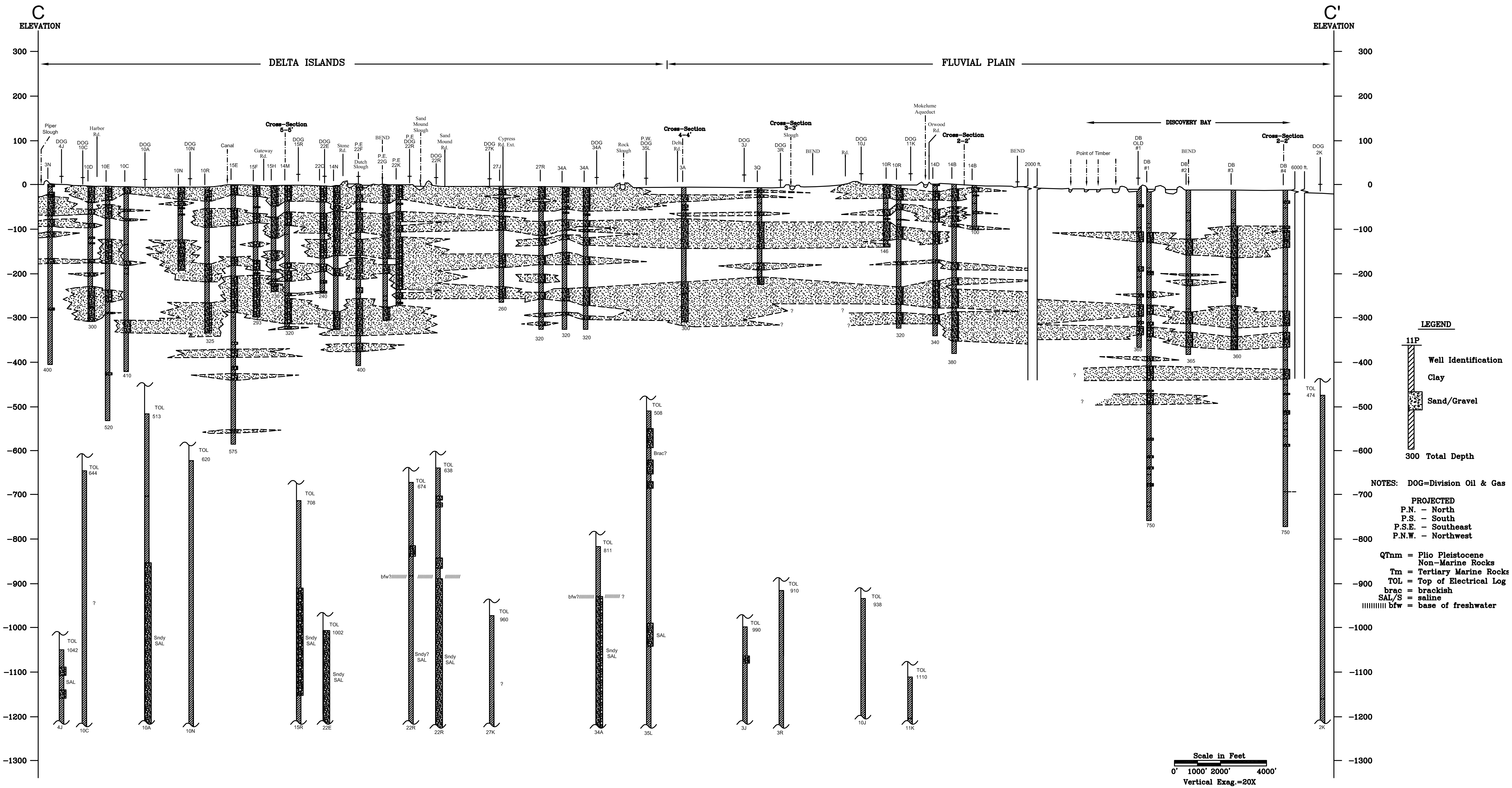
# Geologic Cross Section A-A'
## East County Water Management Association
## Ground-Water Resources Assessment




East County Water Management Assoc.\97-1-131\X-SectB-B'.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

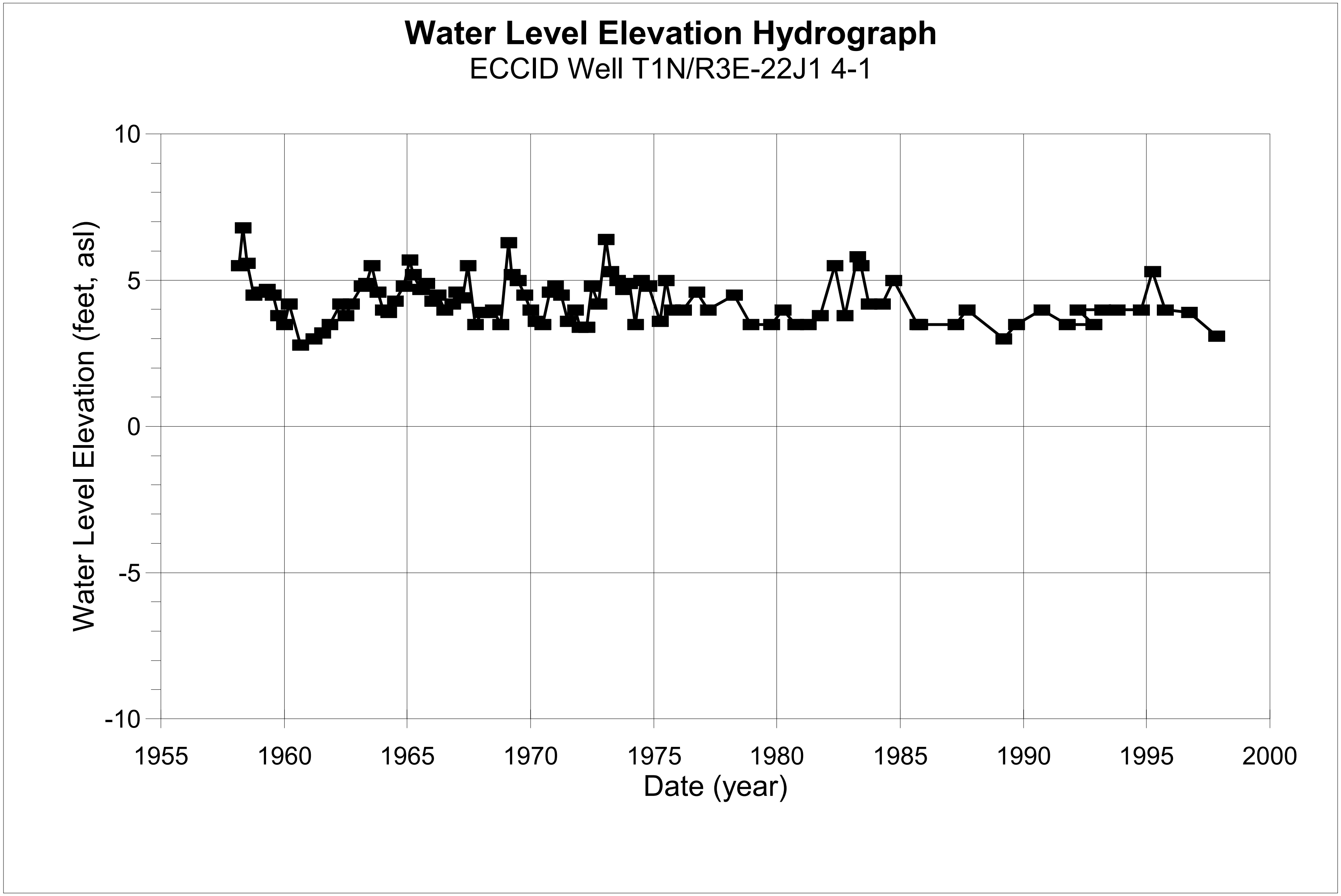
# Geologic Cross Section B-B'
## East County Water Management Association
## Ground-Water Resources Assessment




East County Water Management Assoc.\97-1-131\X-SectC-C'.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Geologic Cross-Section C-C'**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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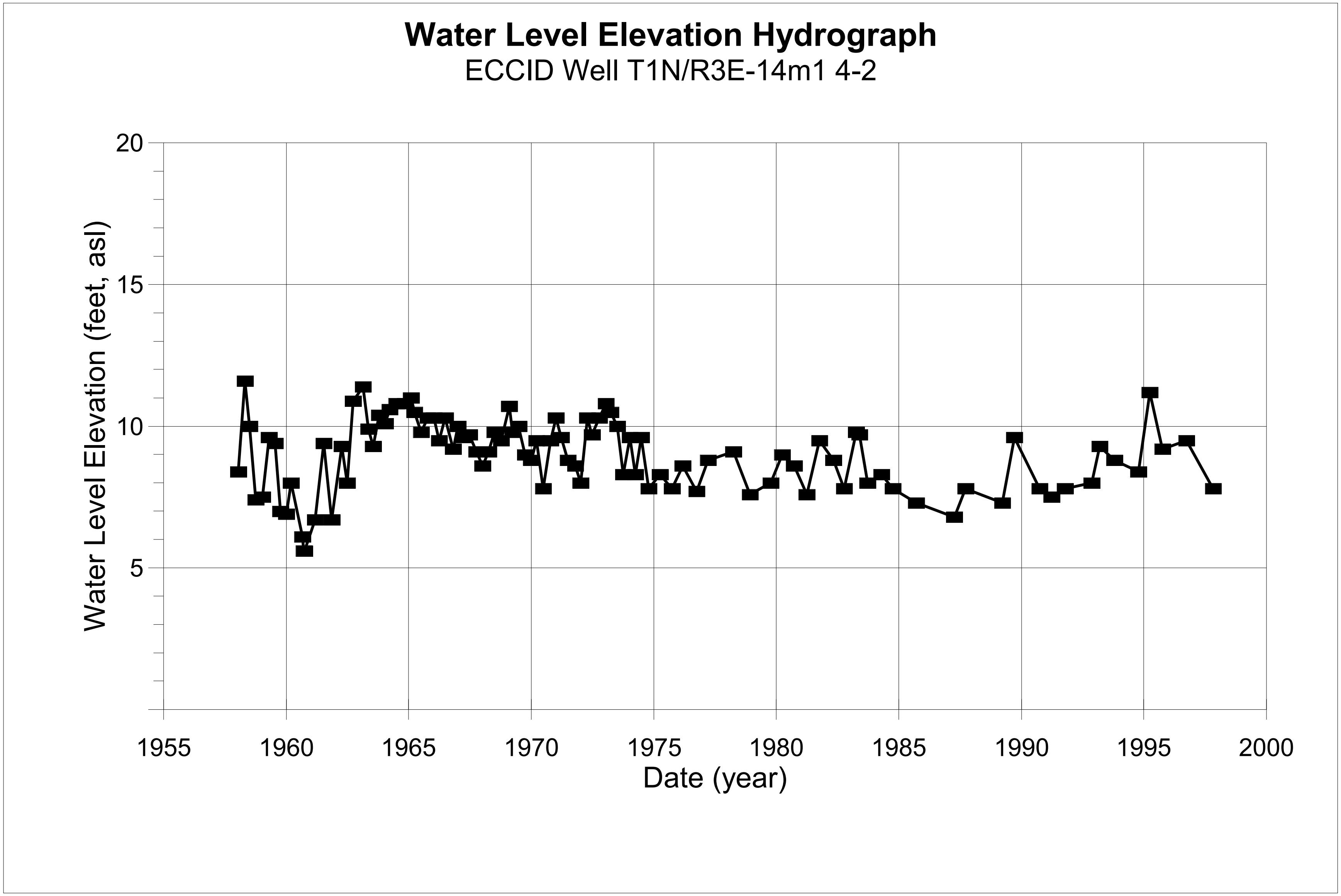


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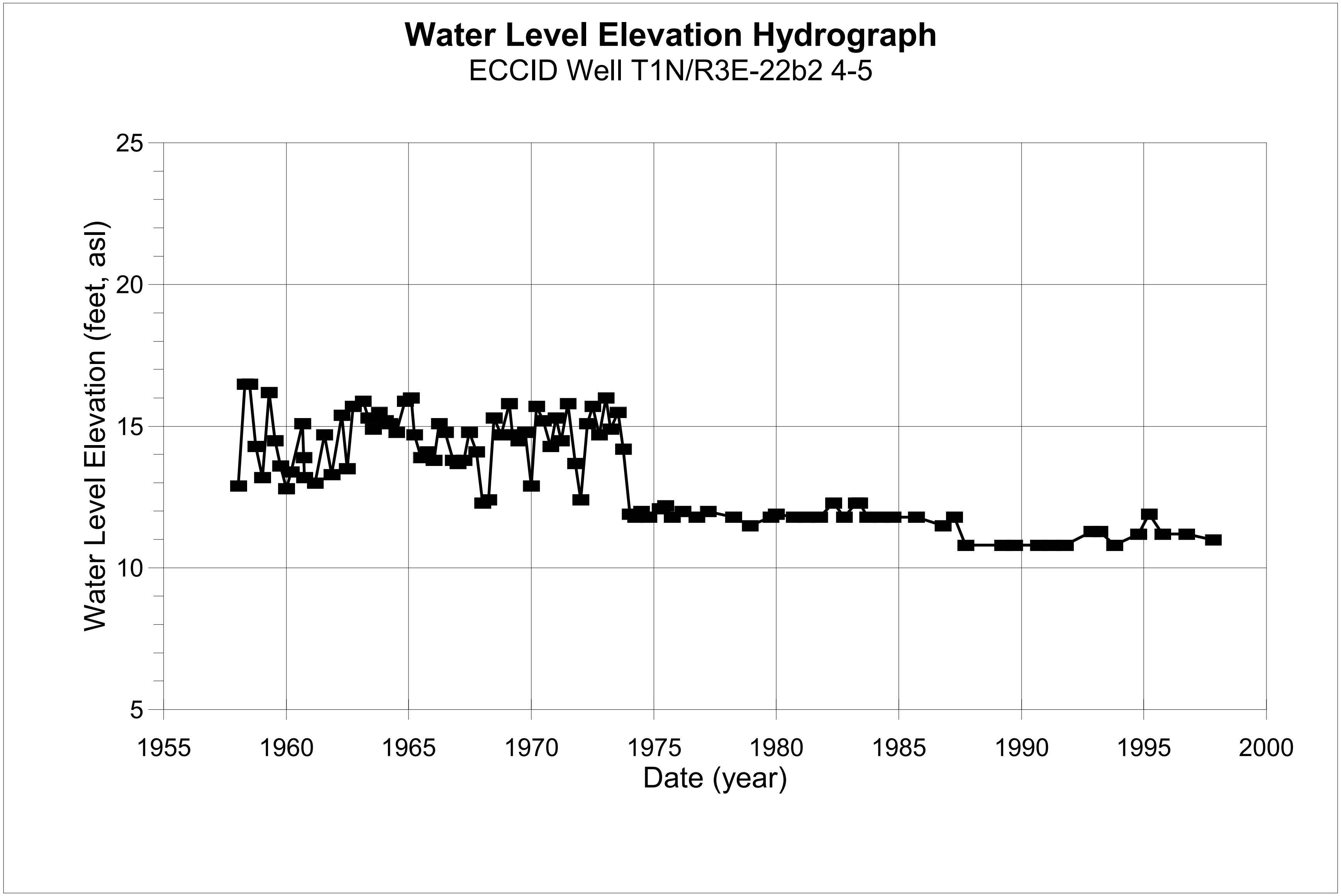


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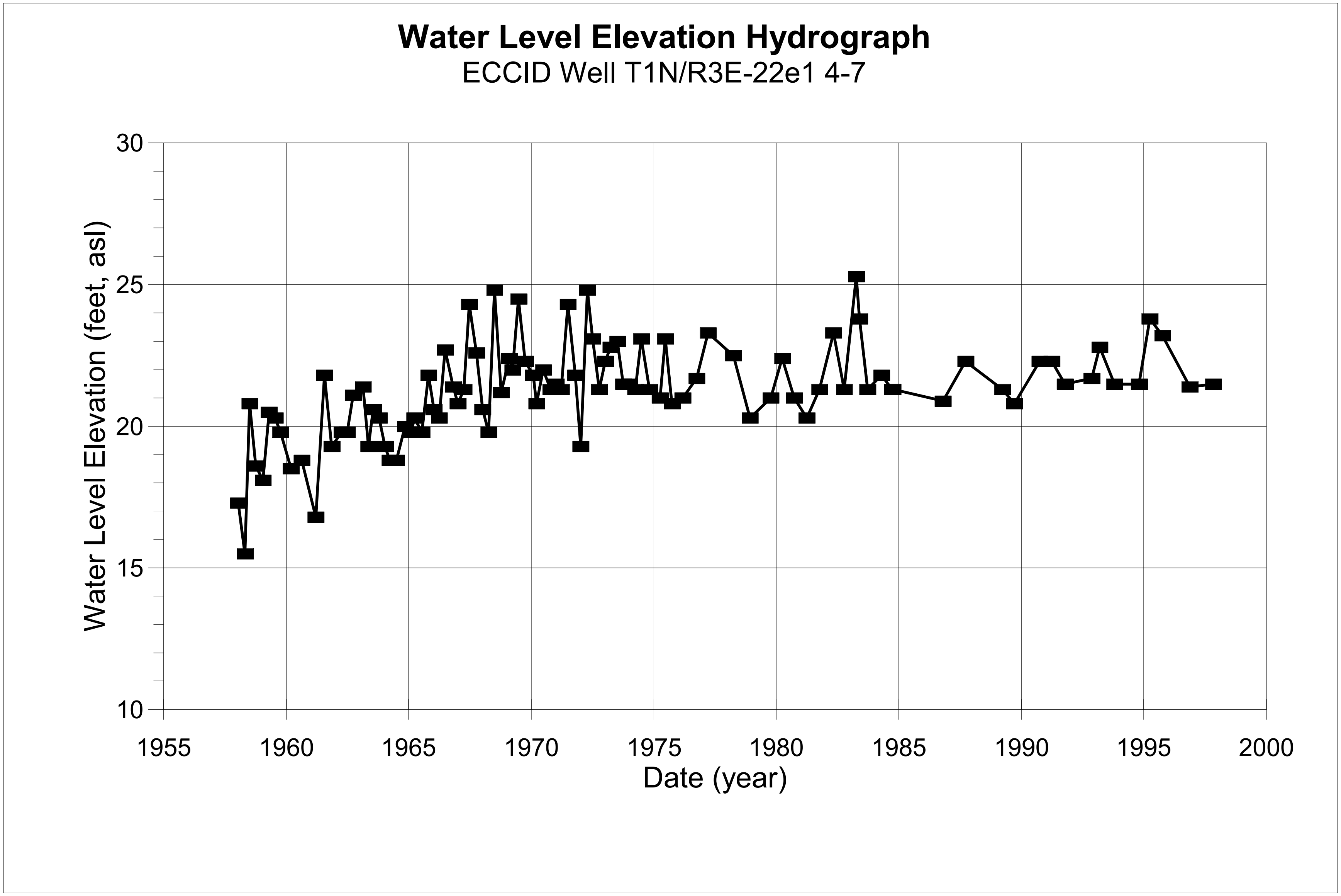


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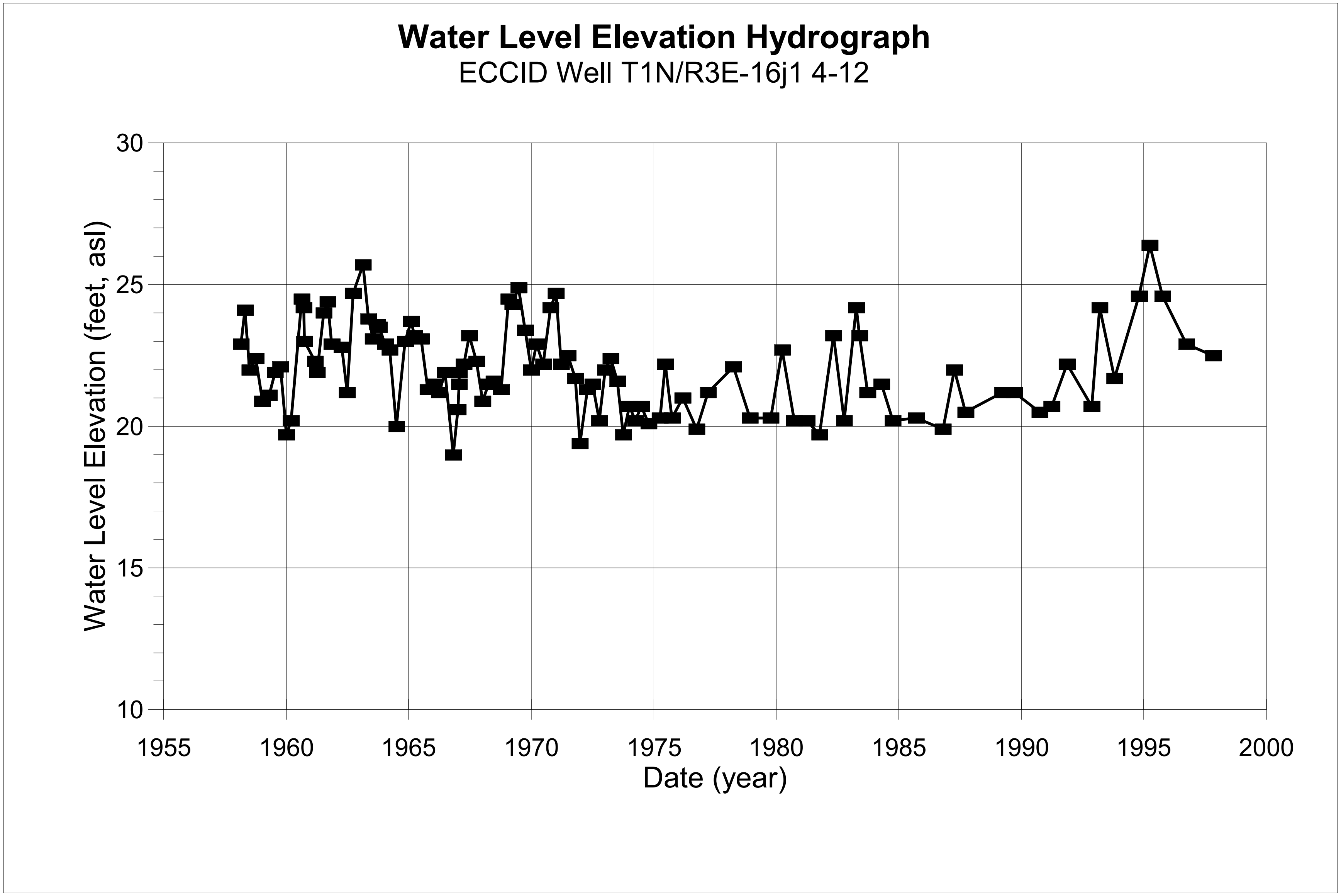


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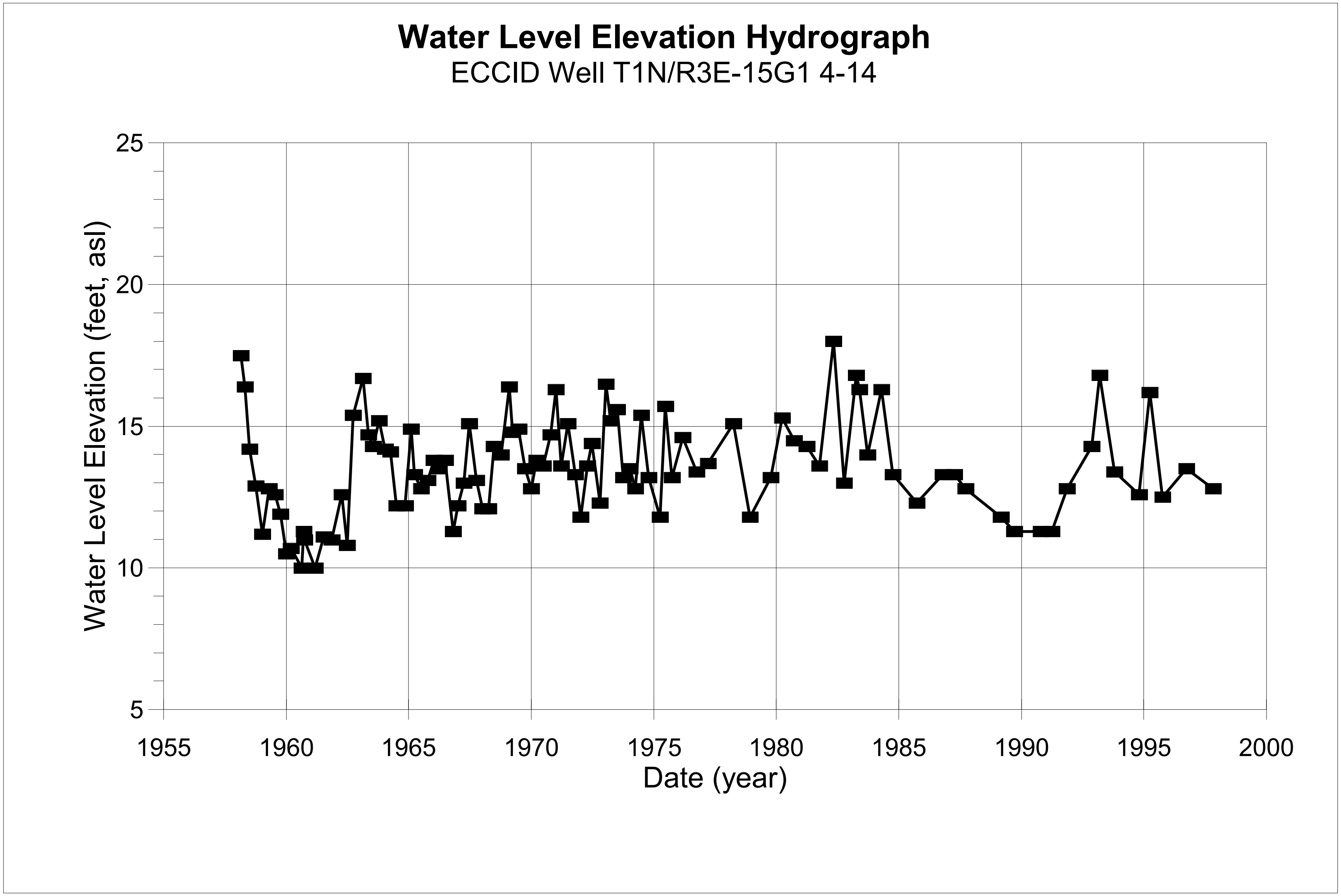


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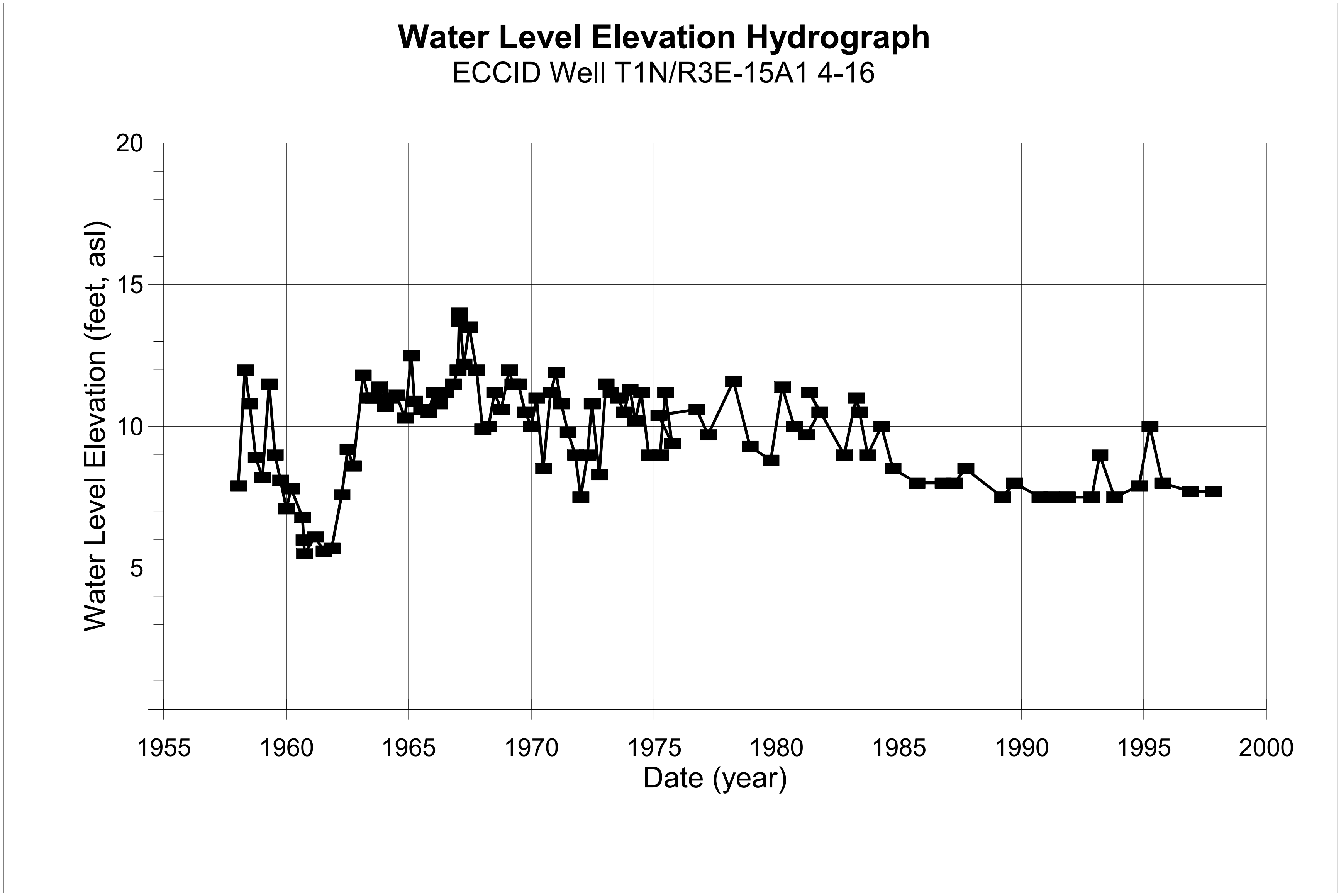


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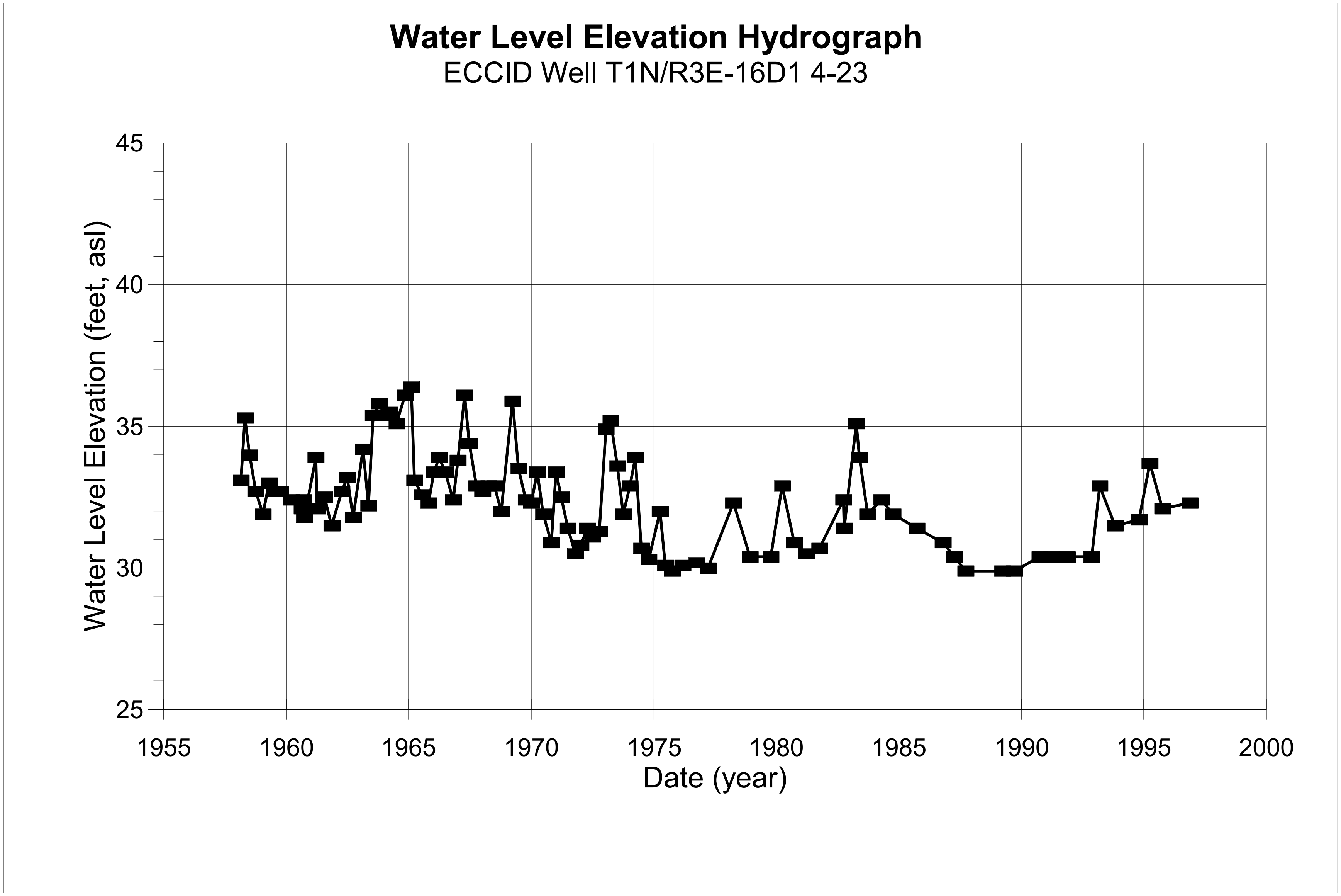


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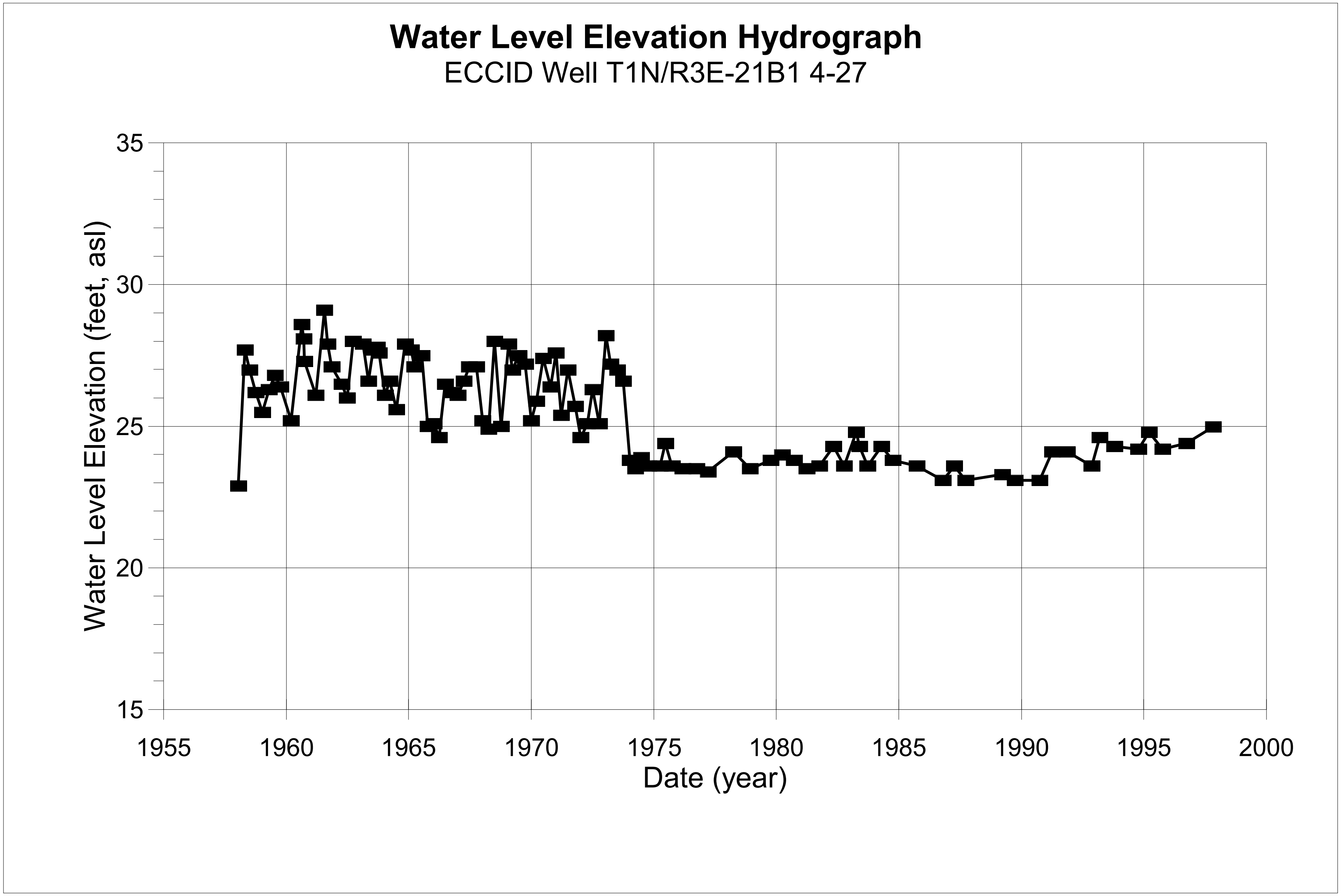


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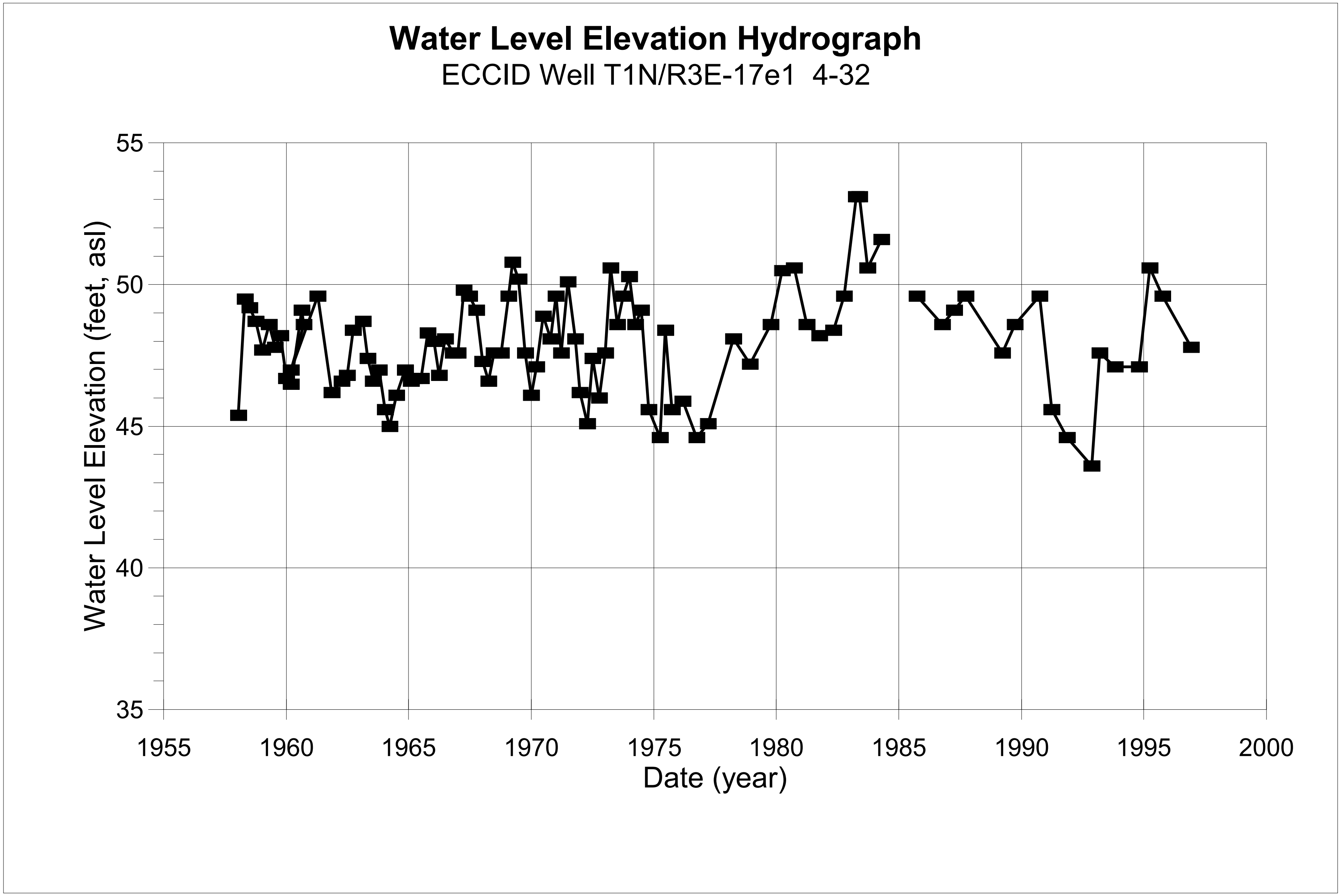


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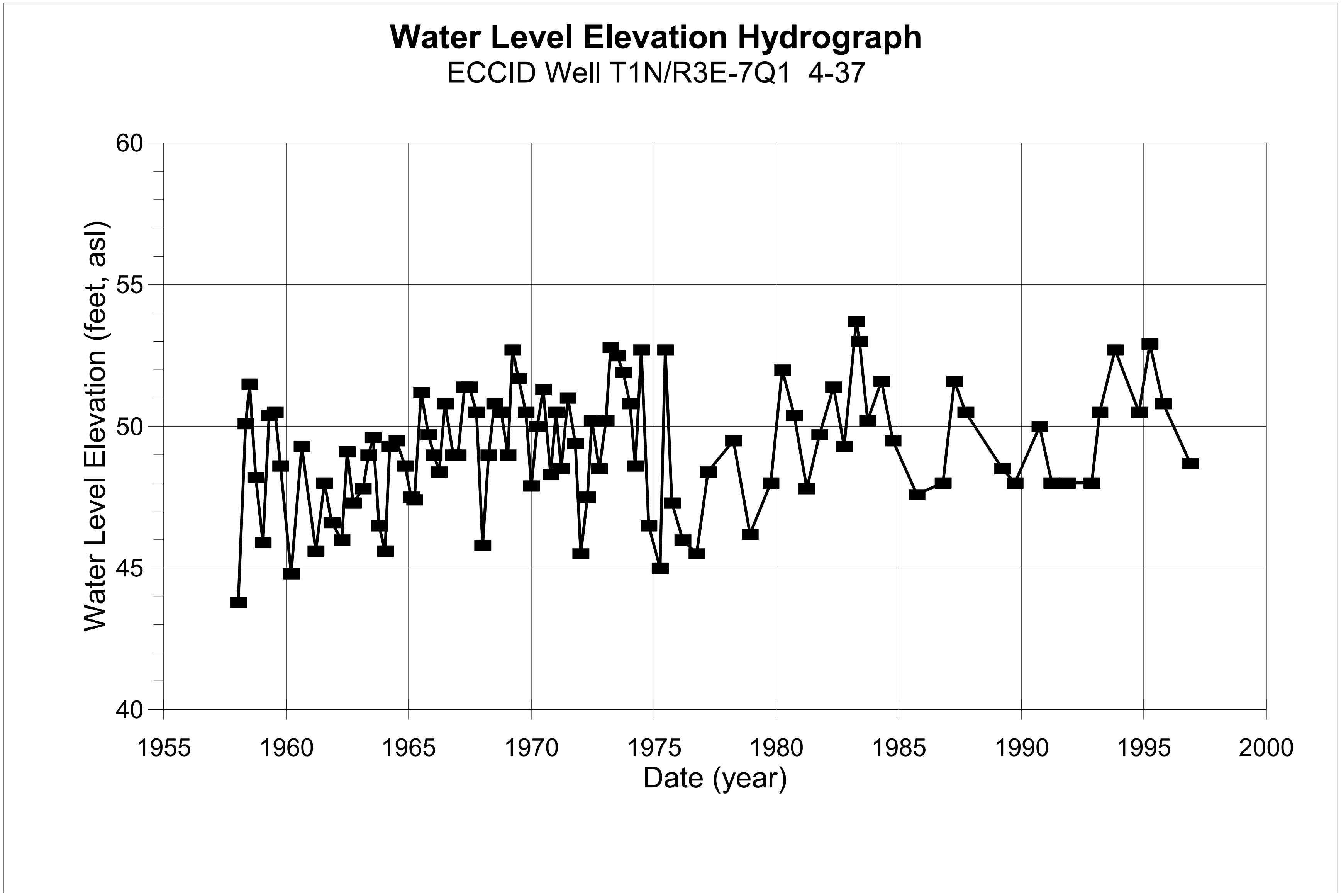


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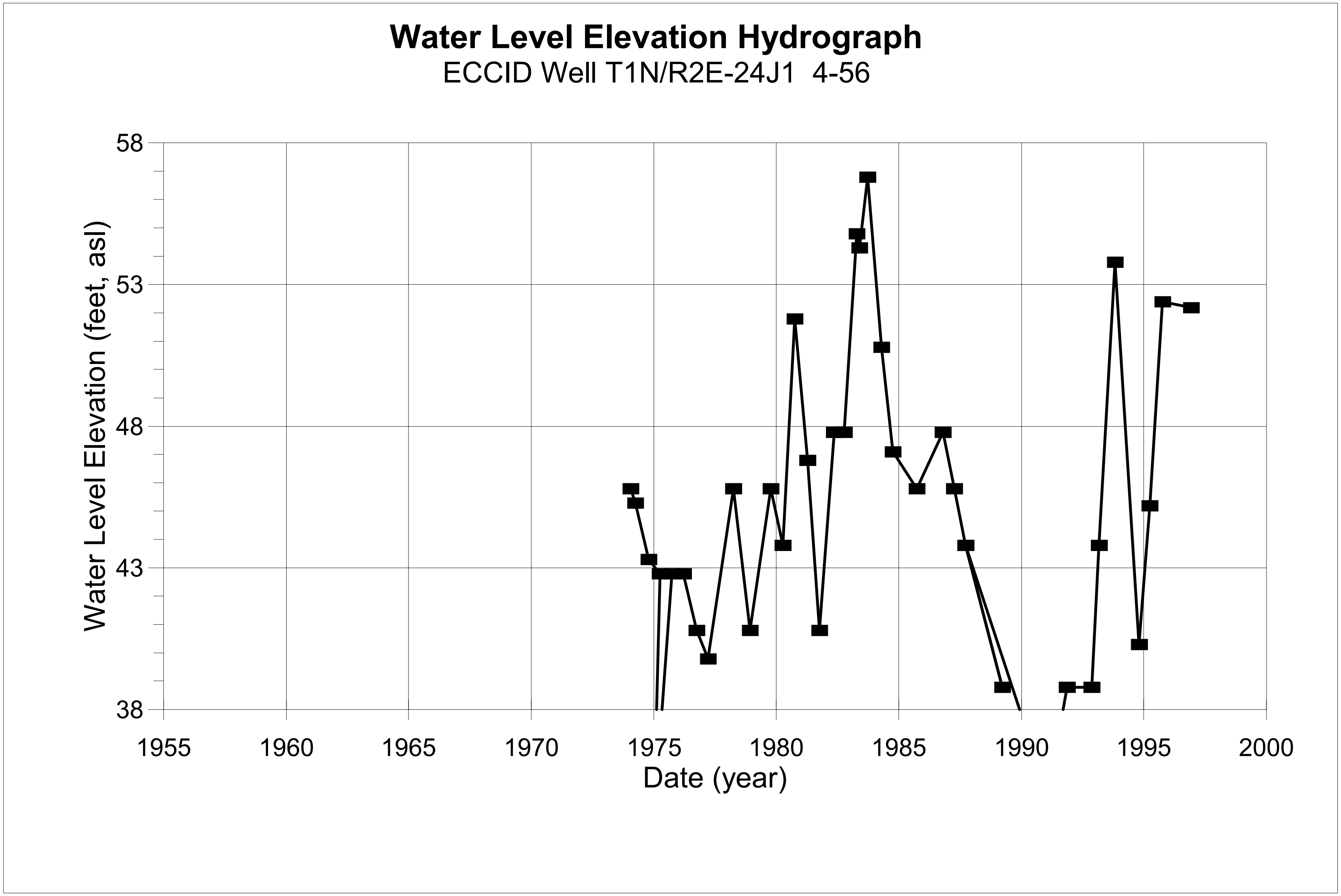


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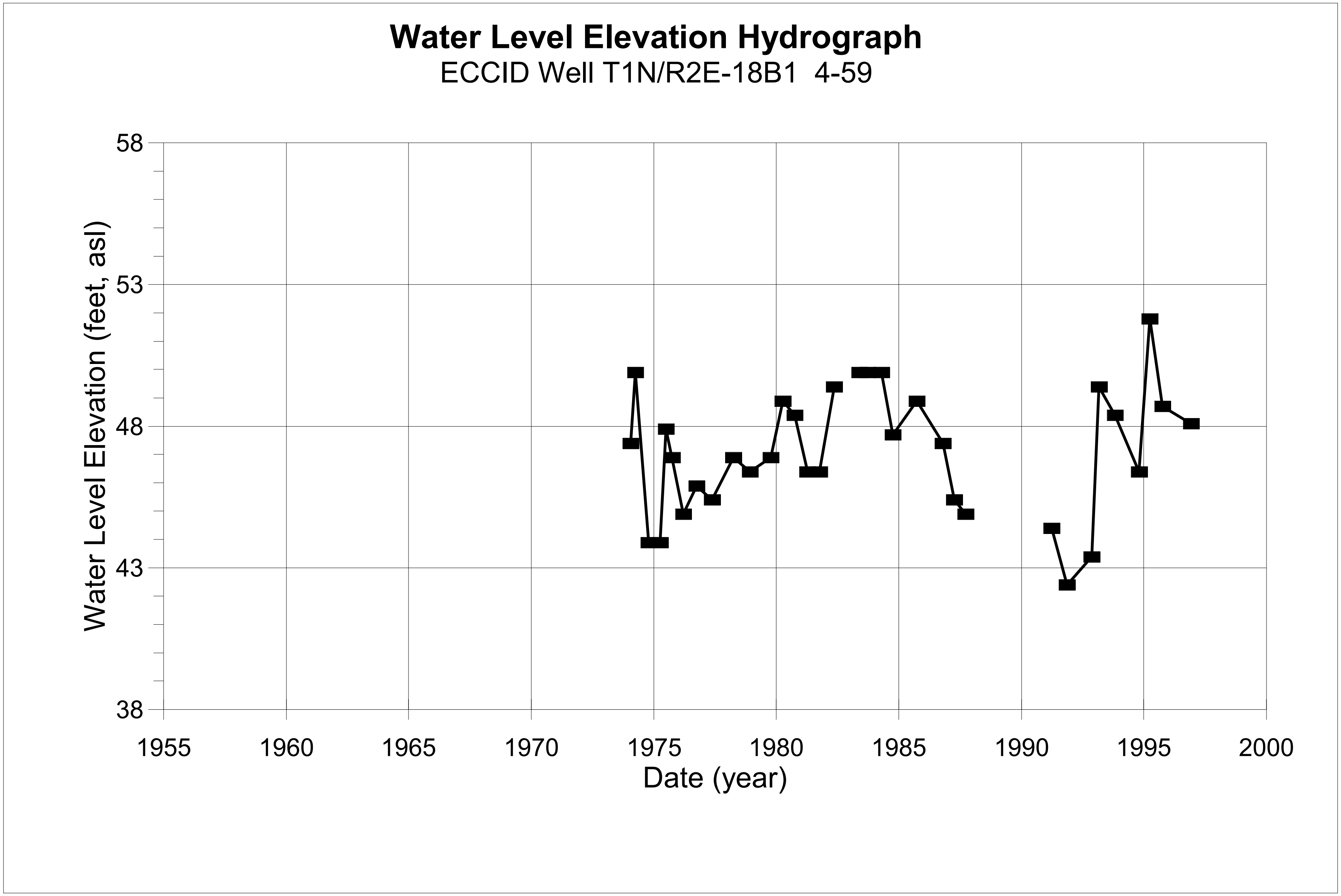


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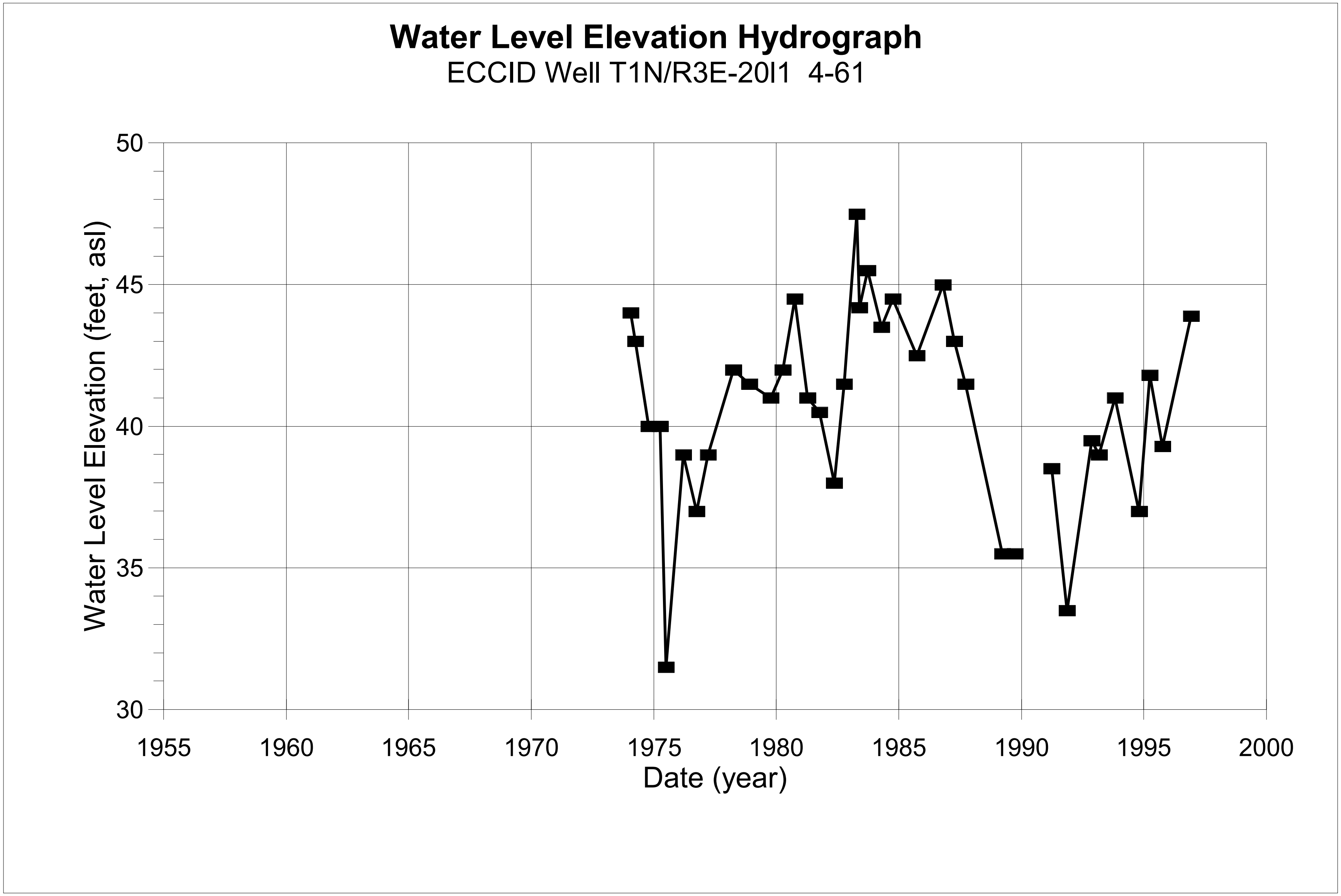


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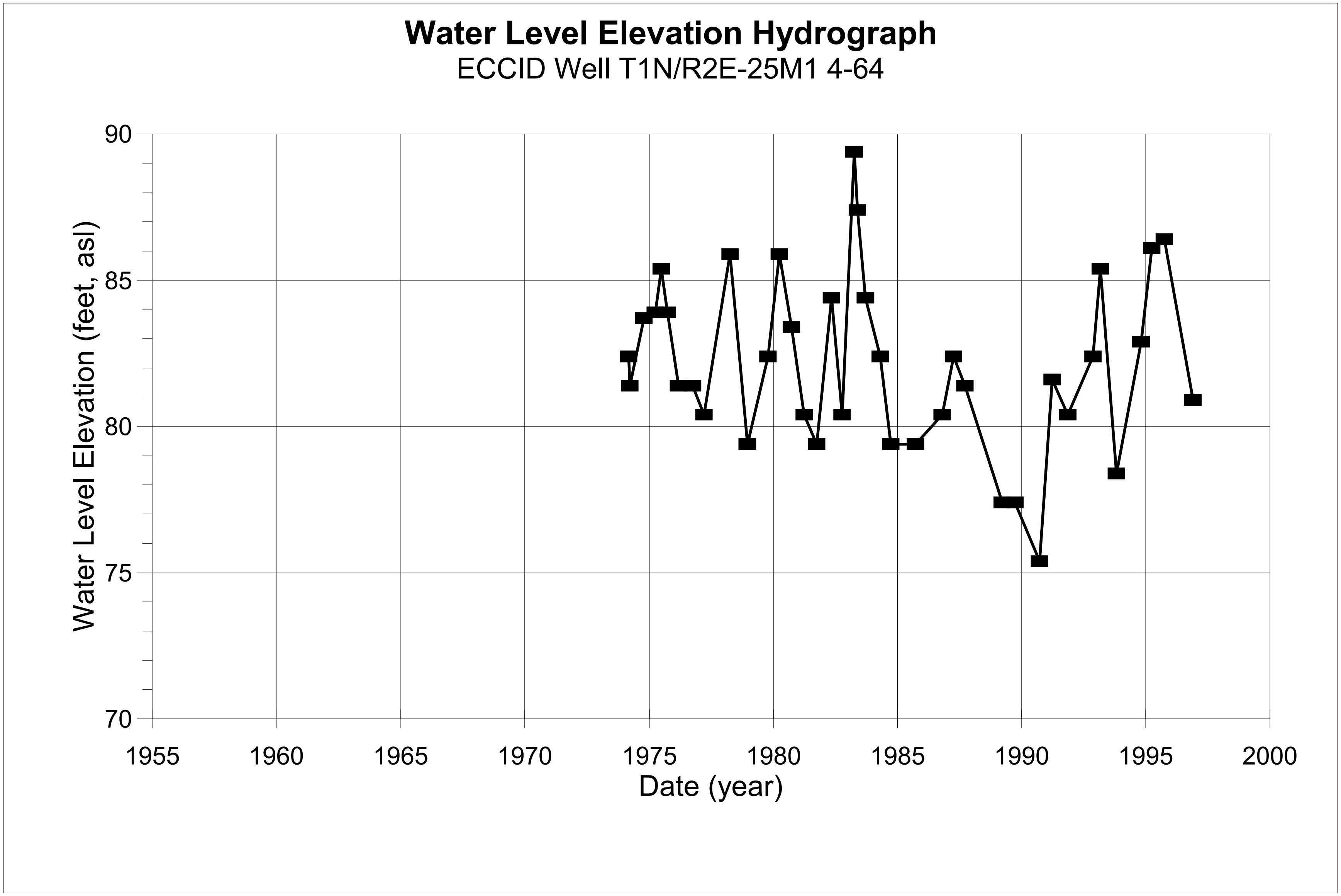


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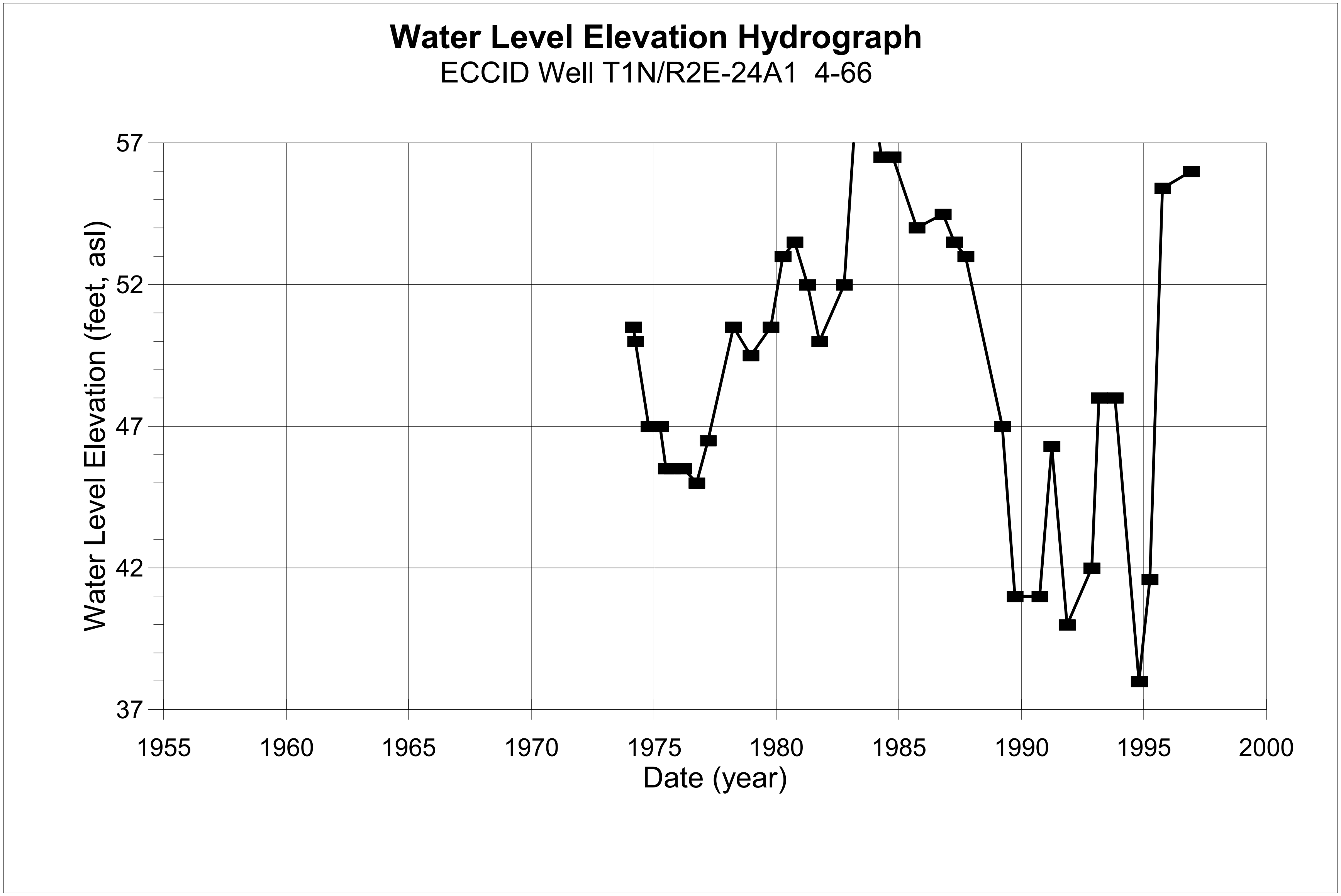


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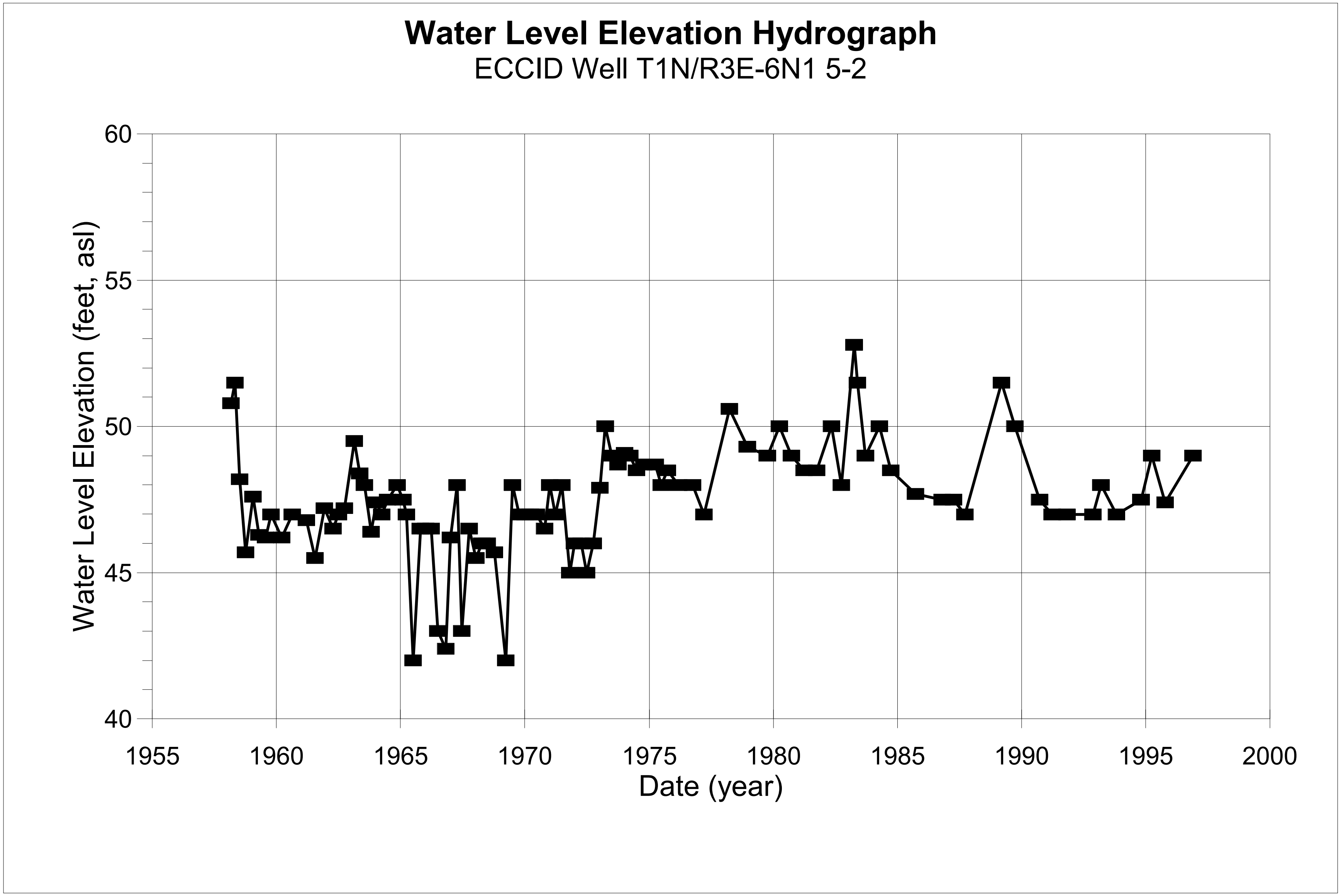


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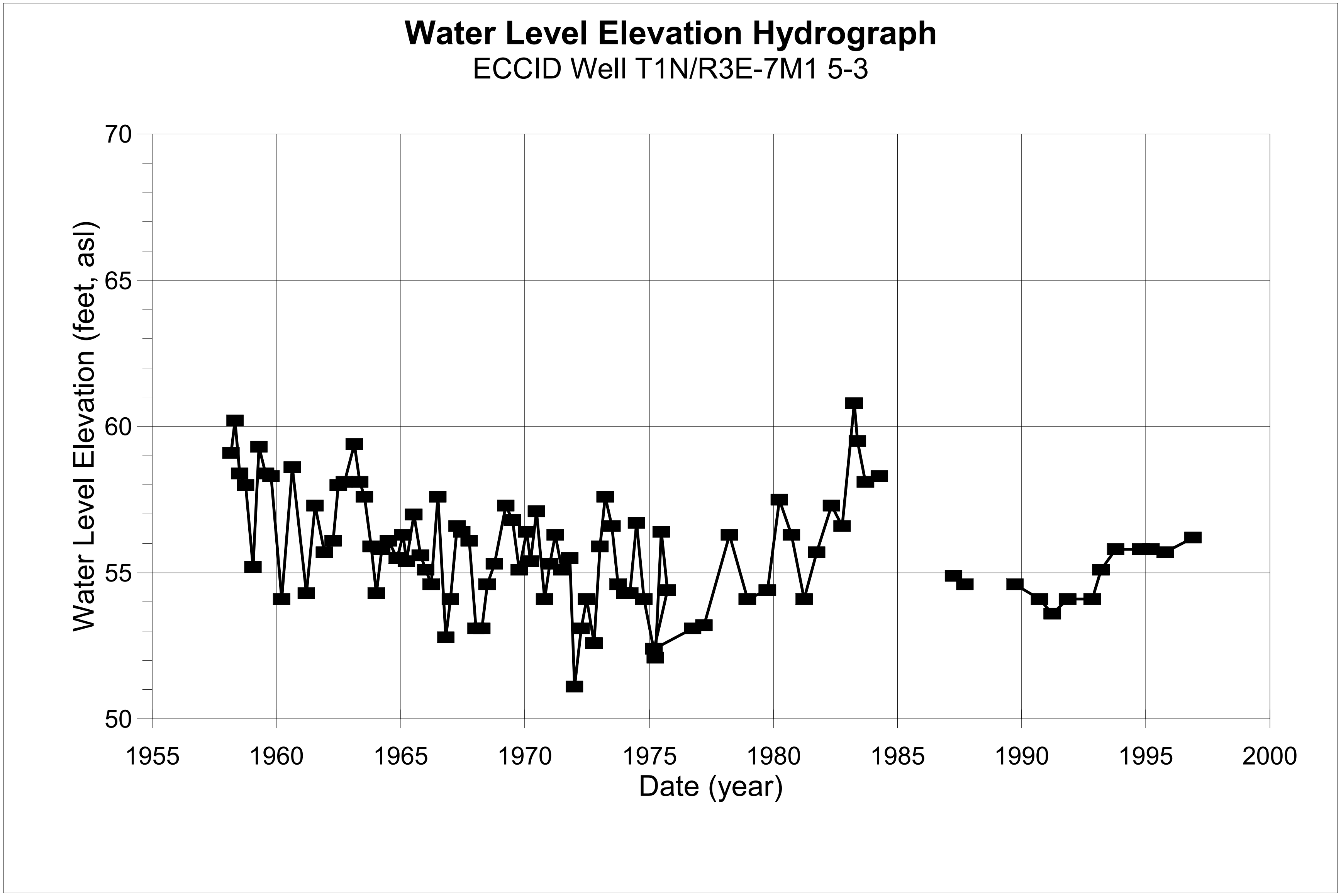


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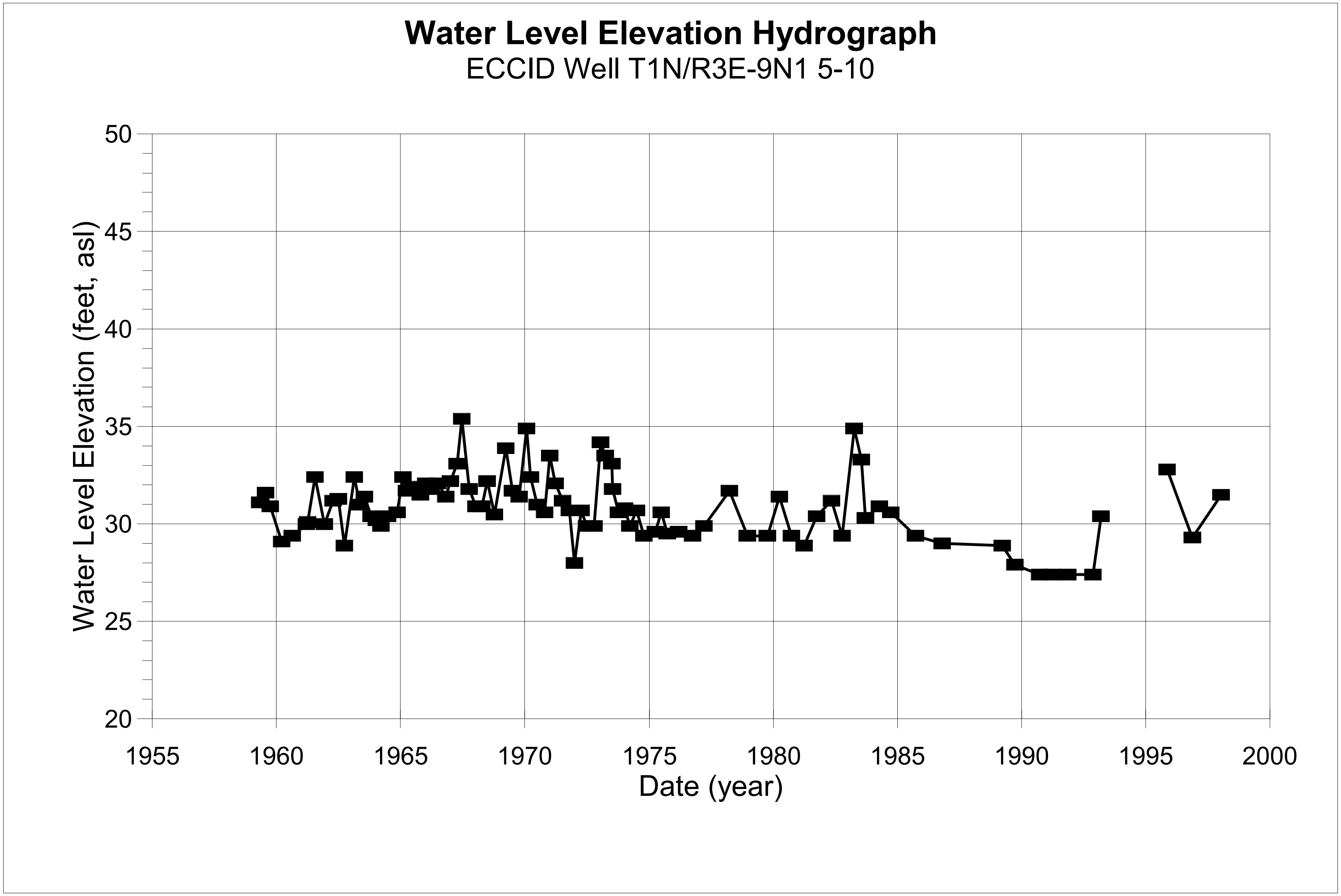


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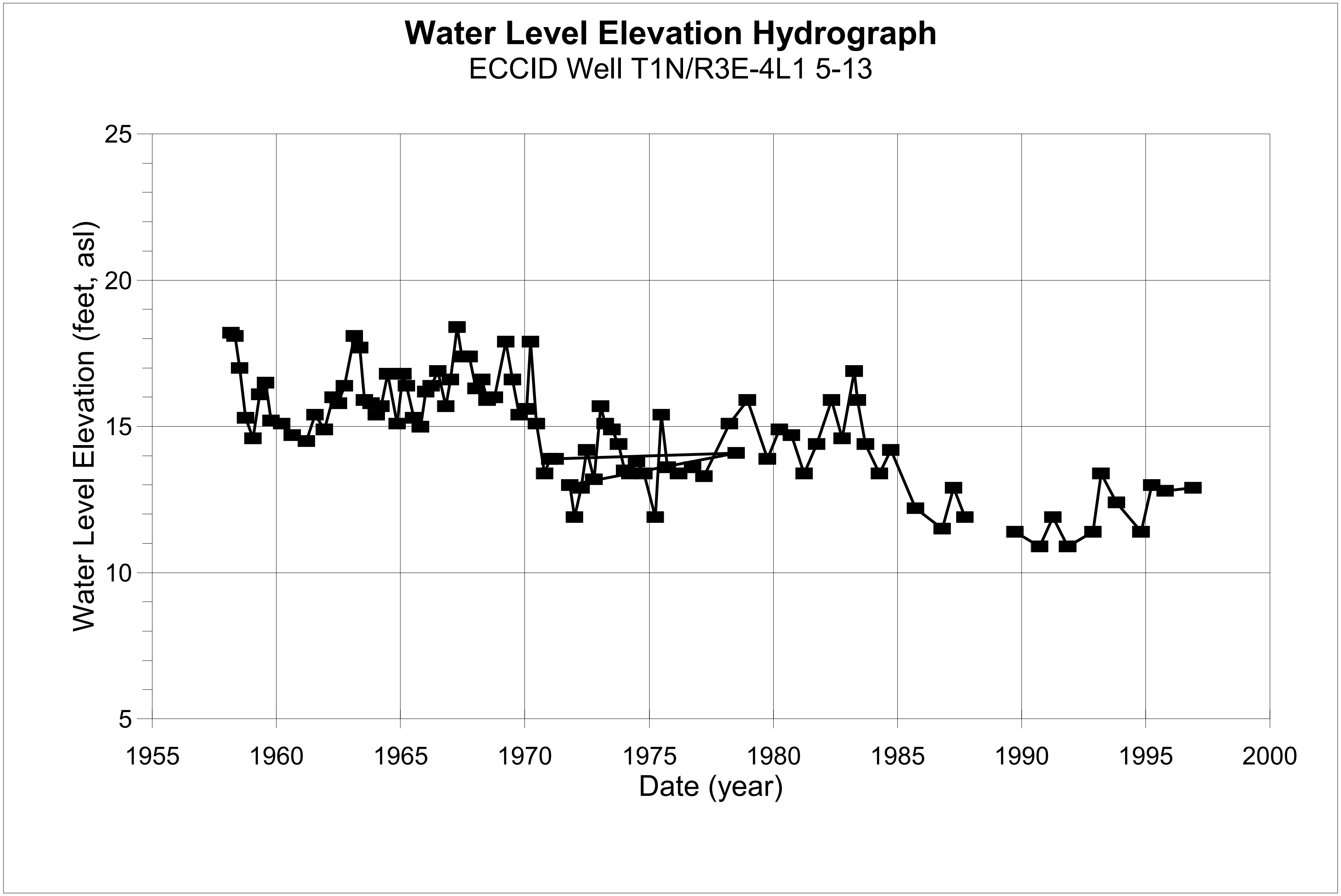


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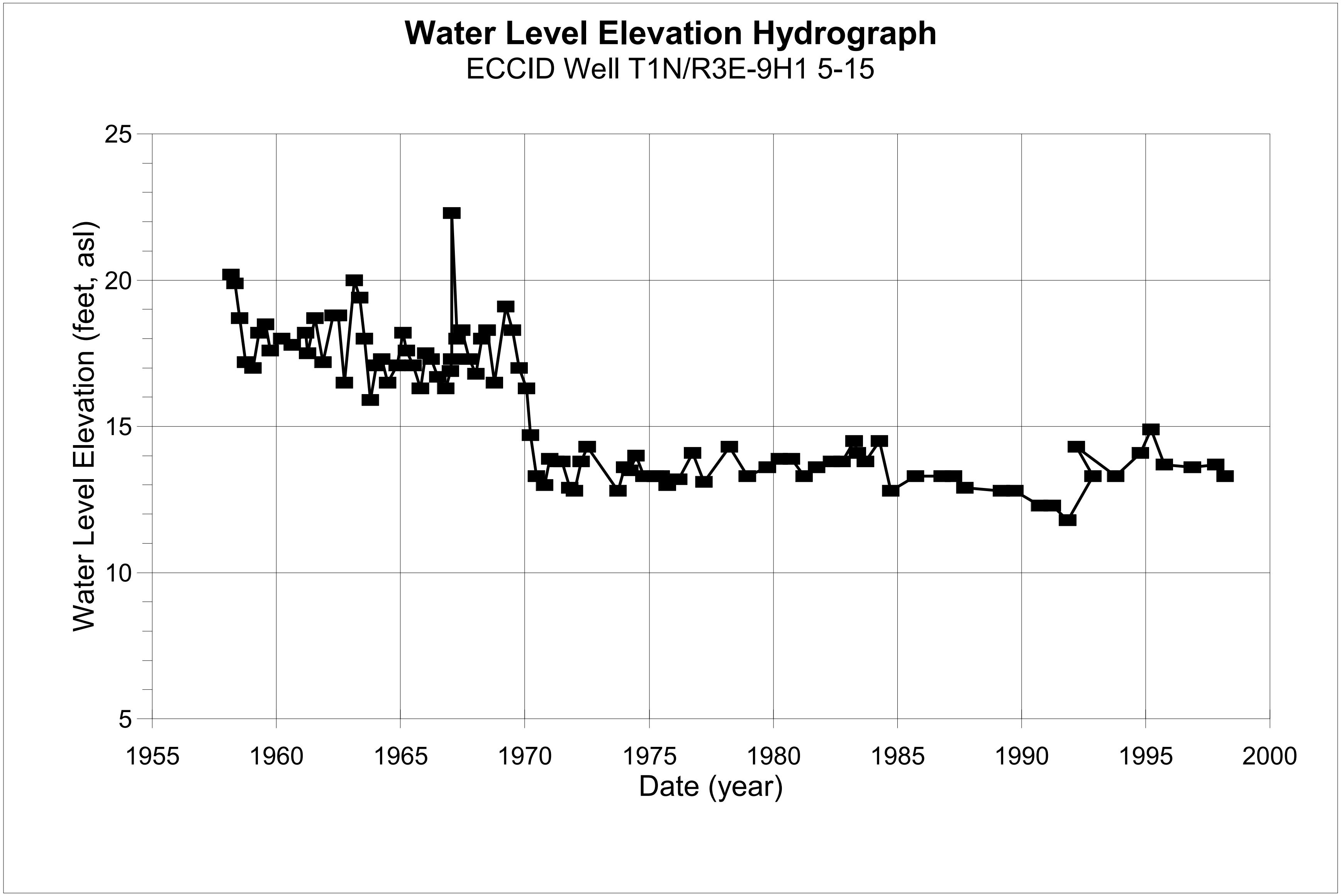


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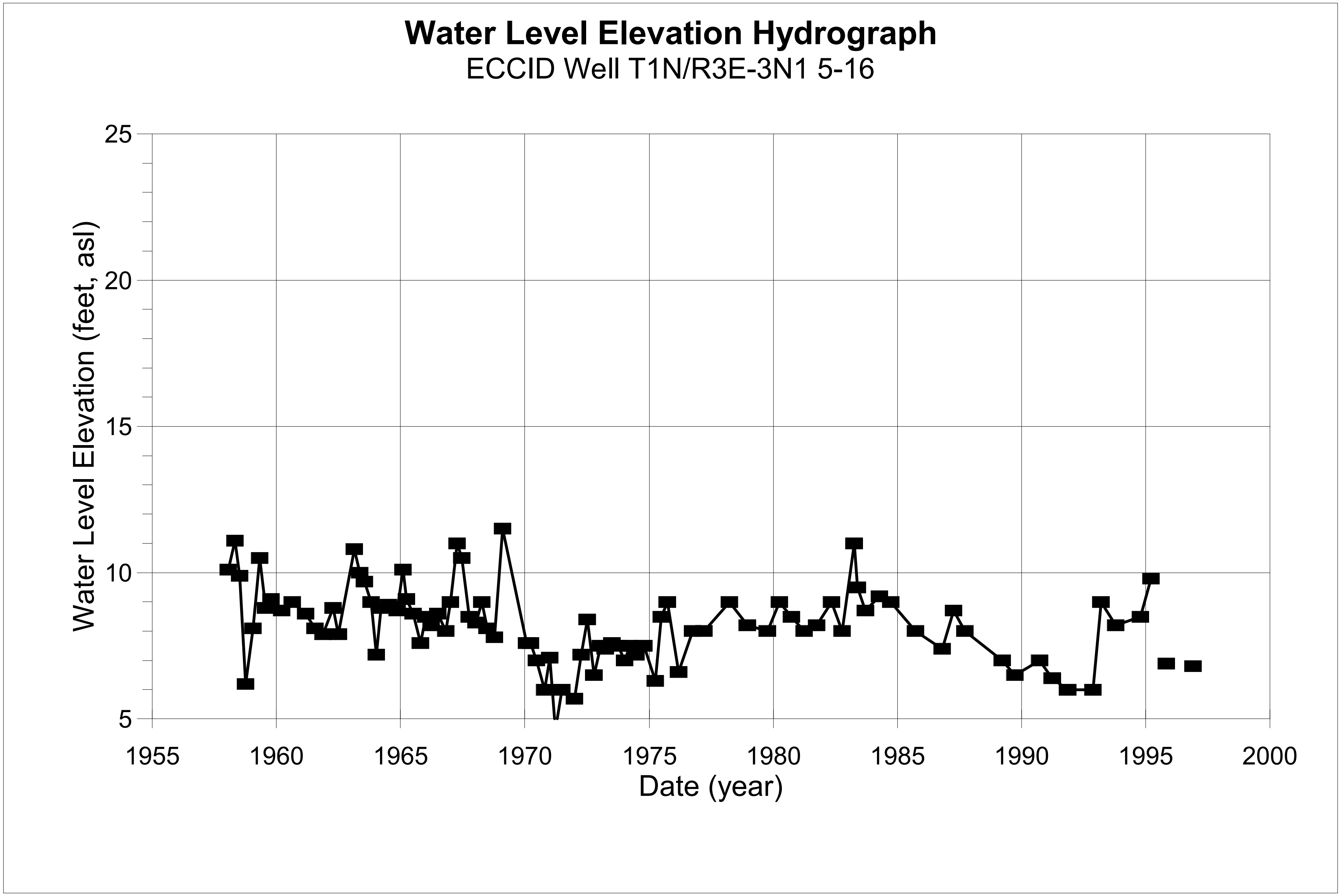


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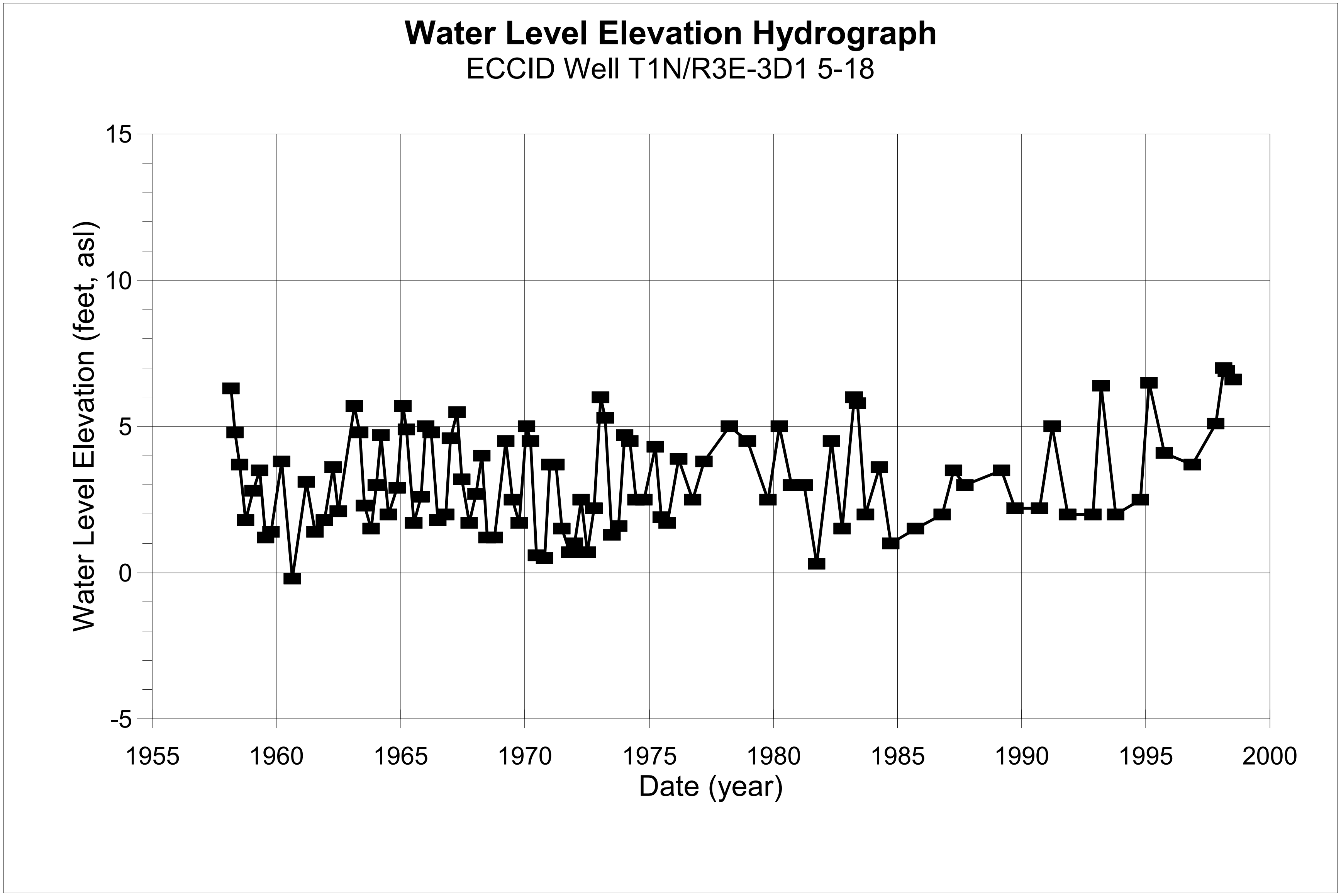


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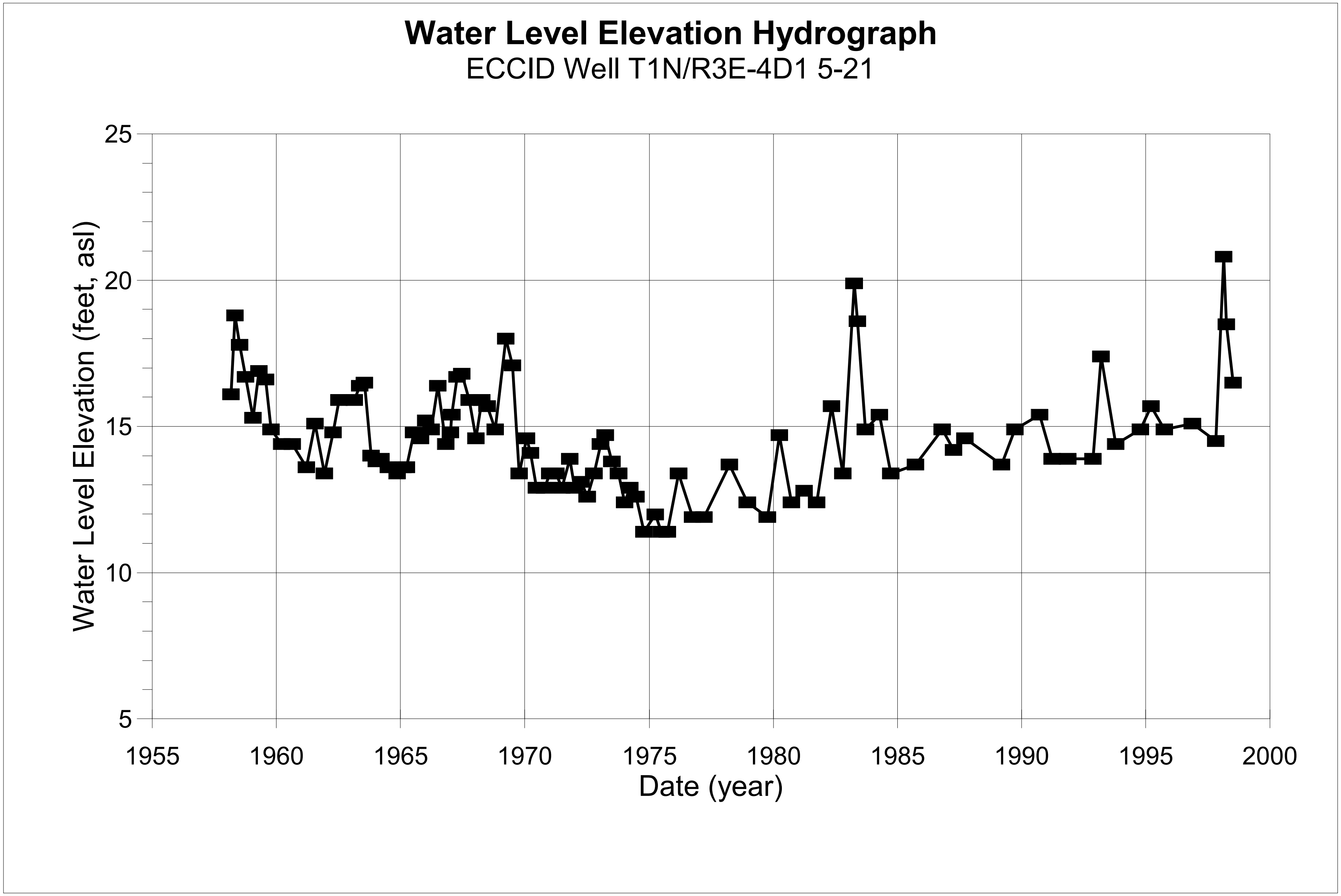


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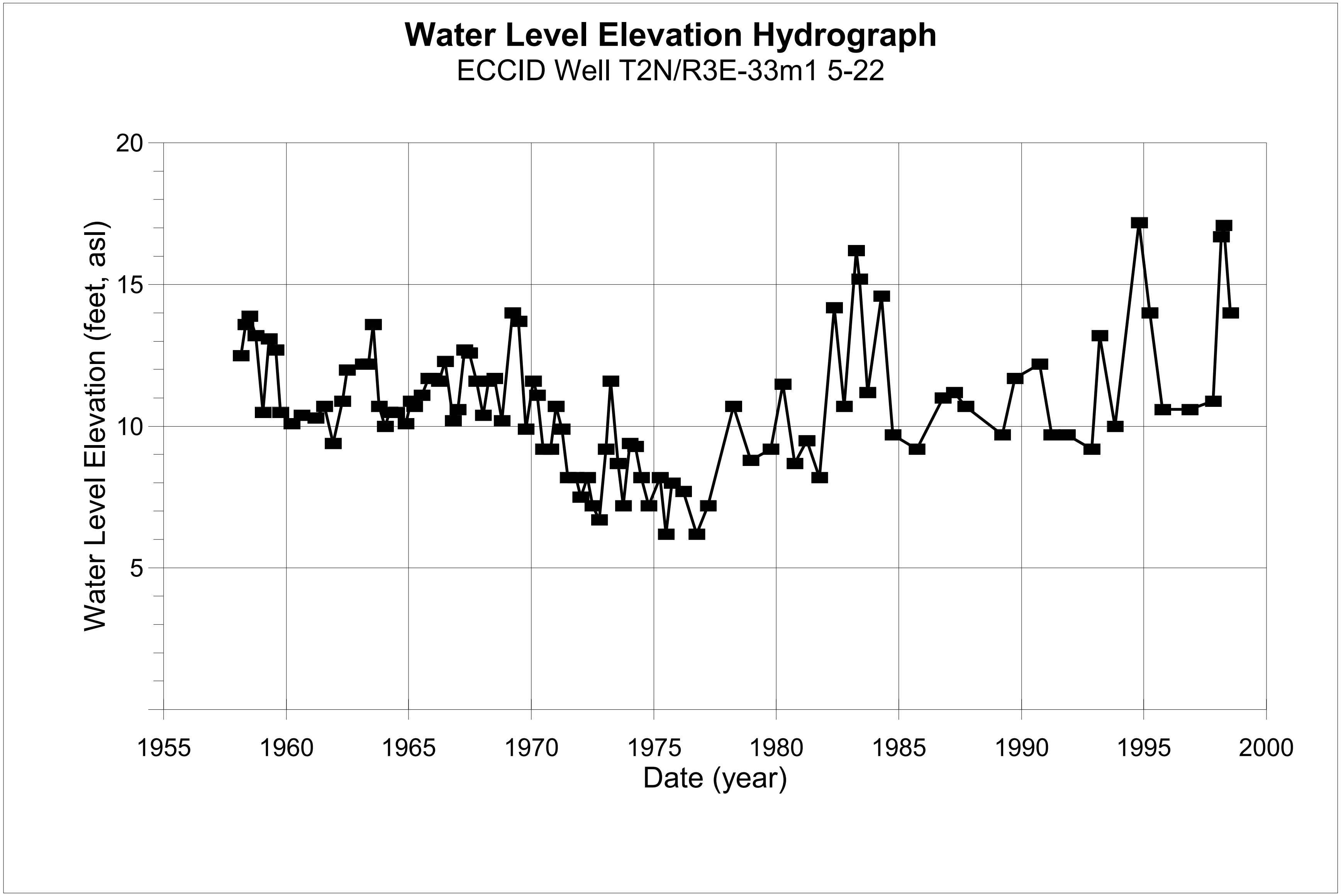


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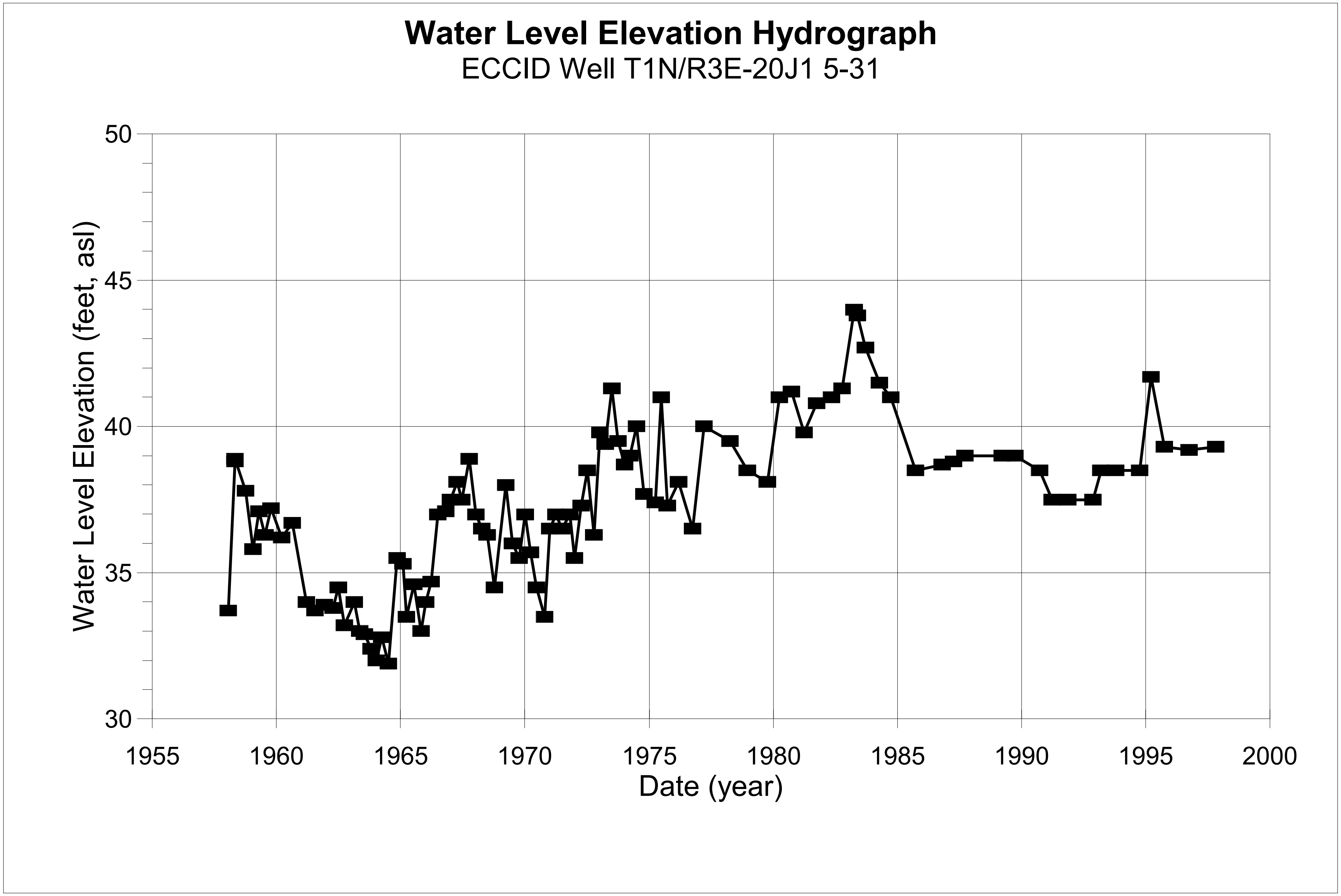


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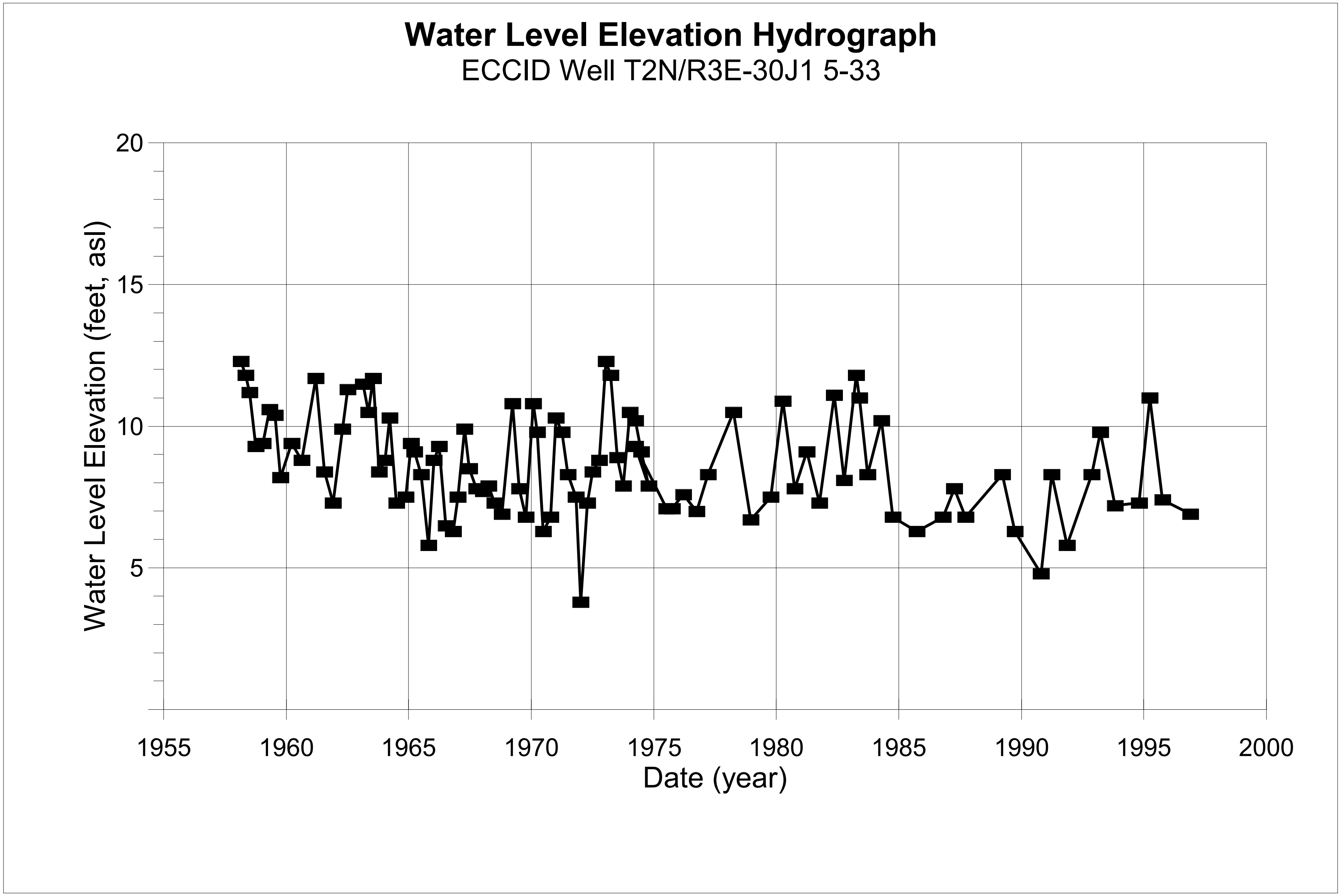


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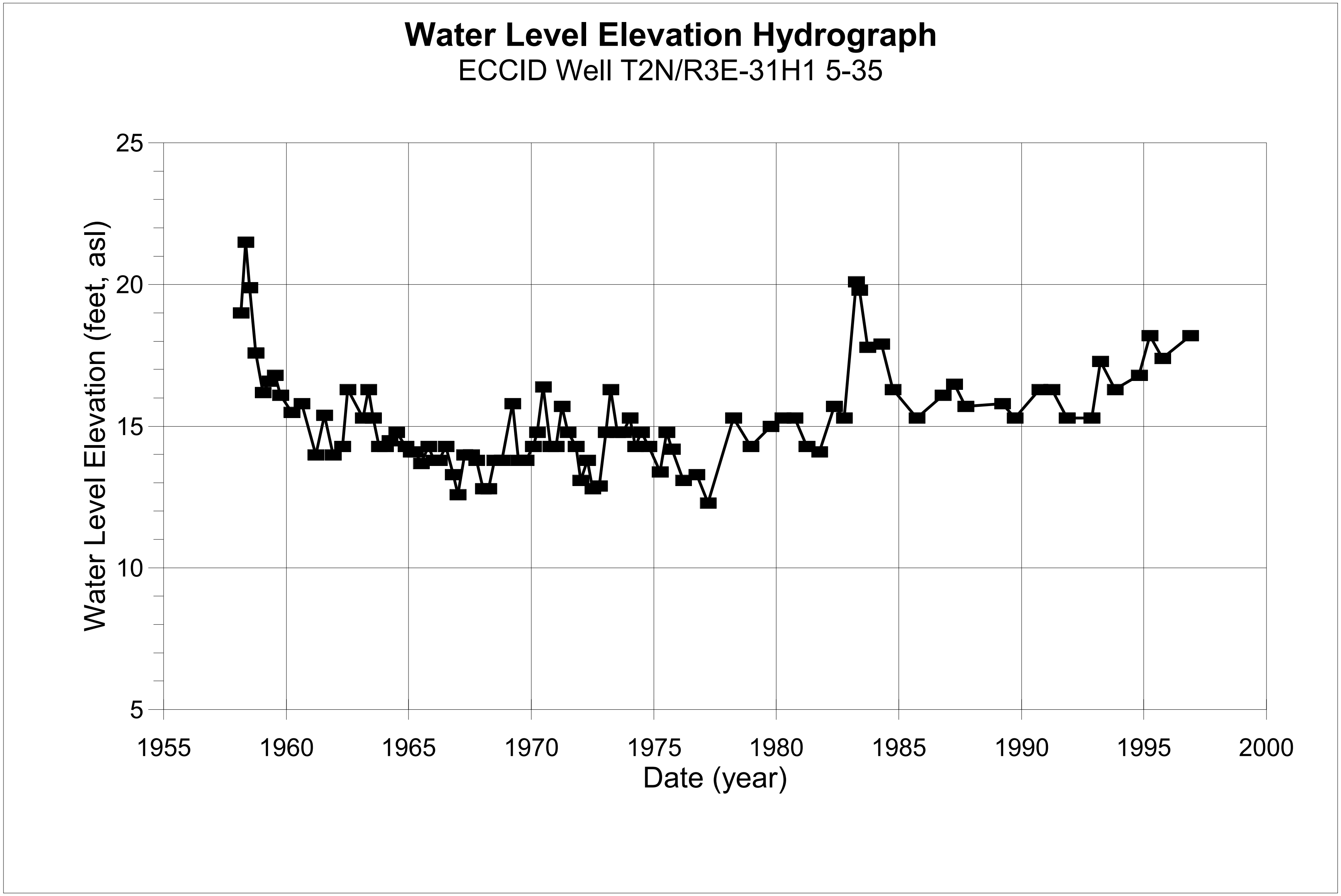


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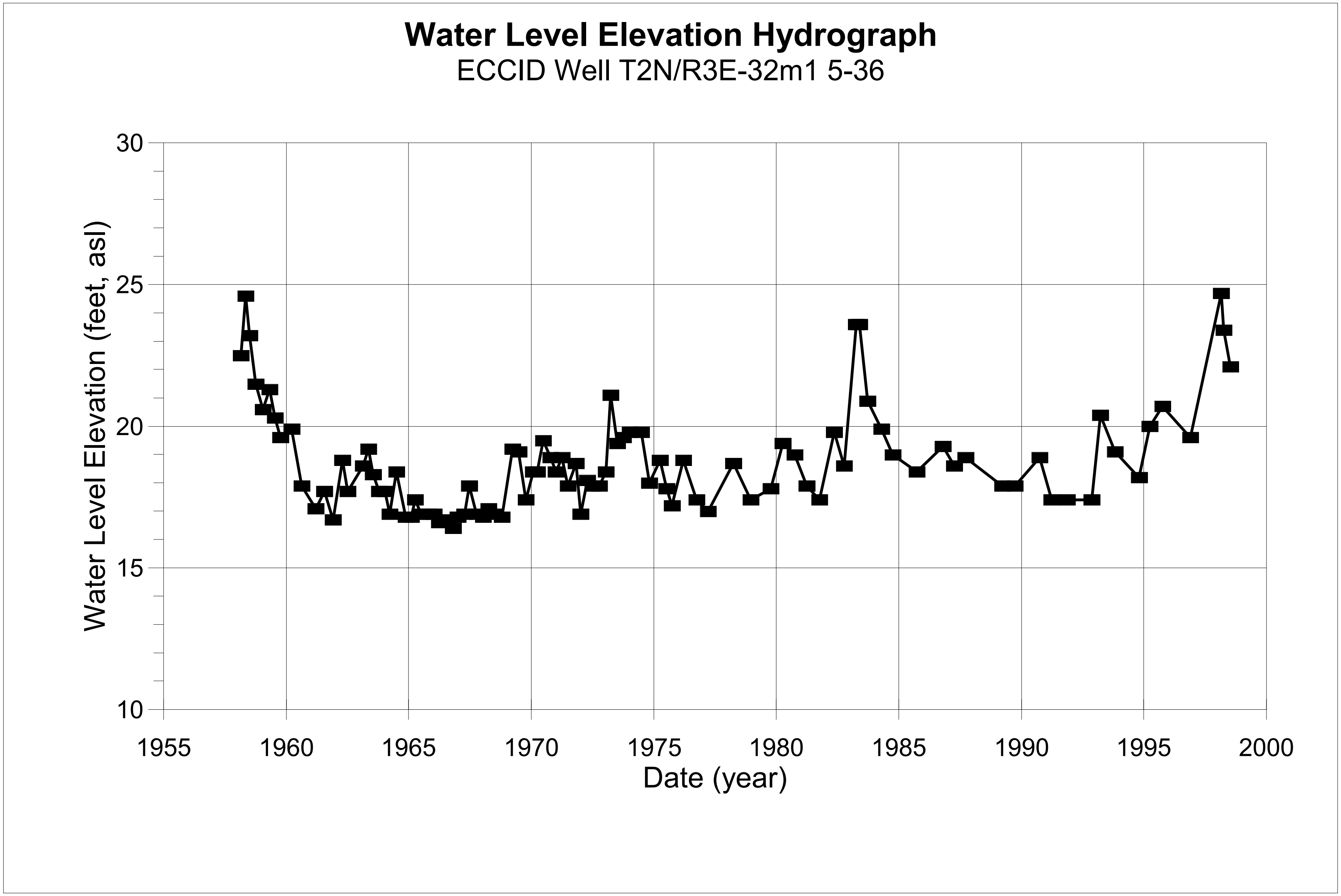


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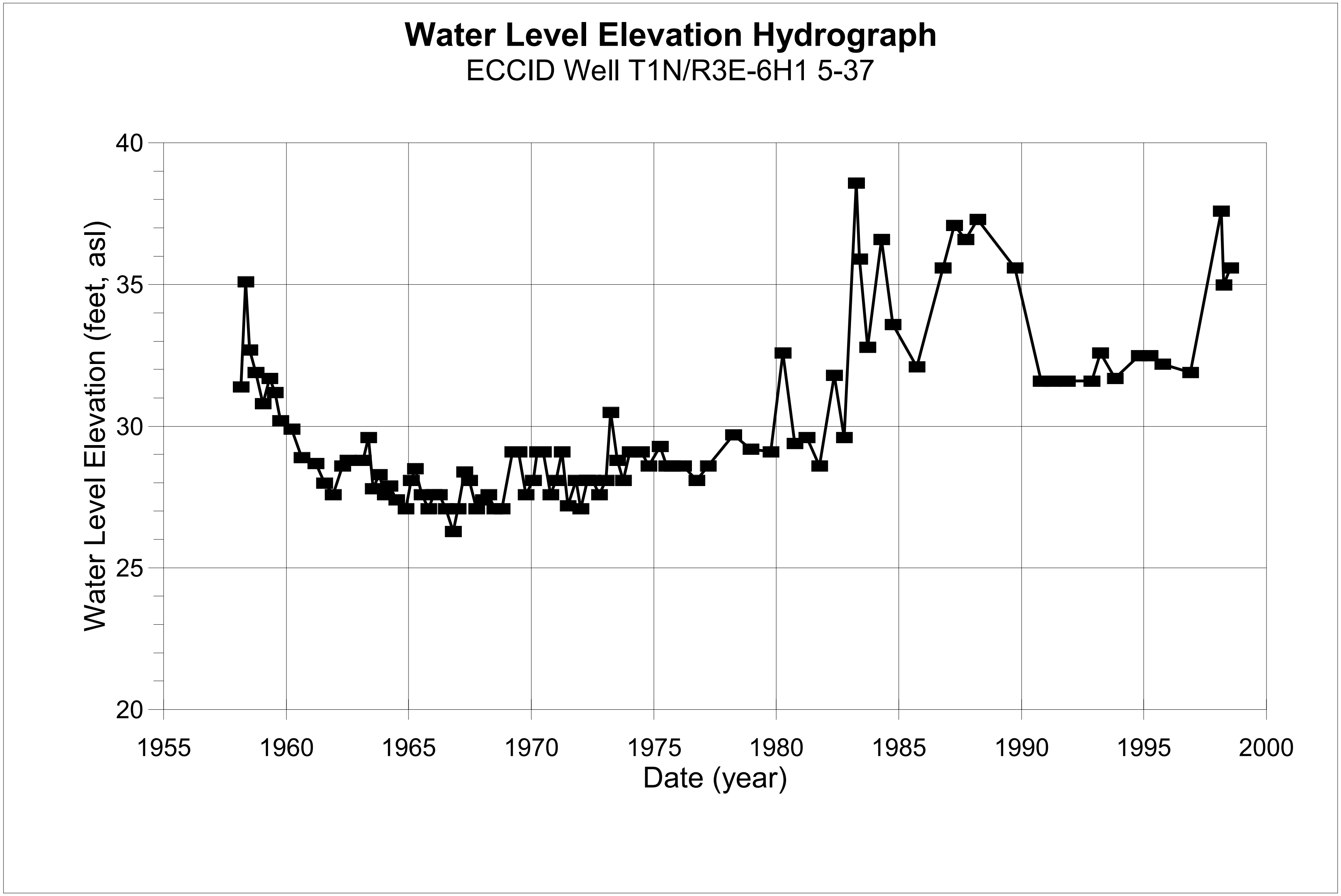


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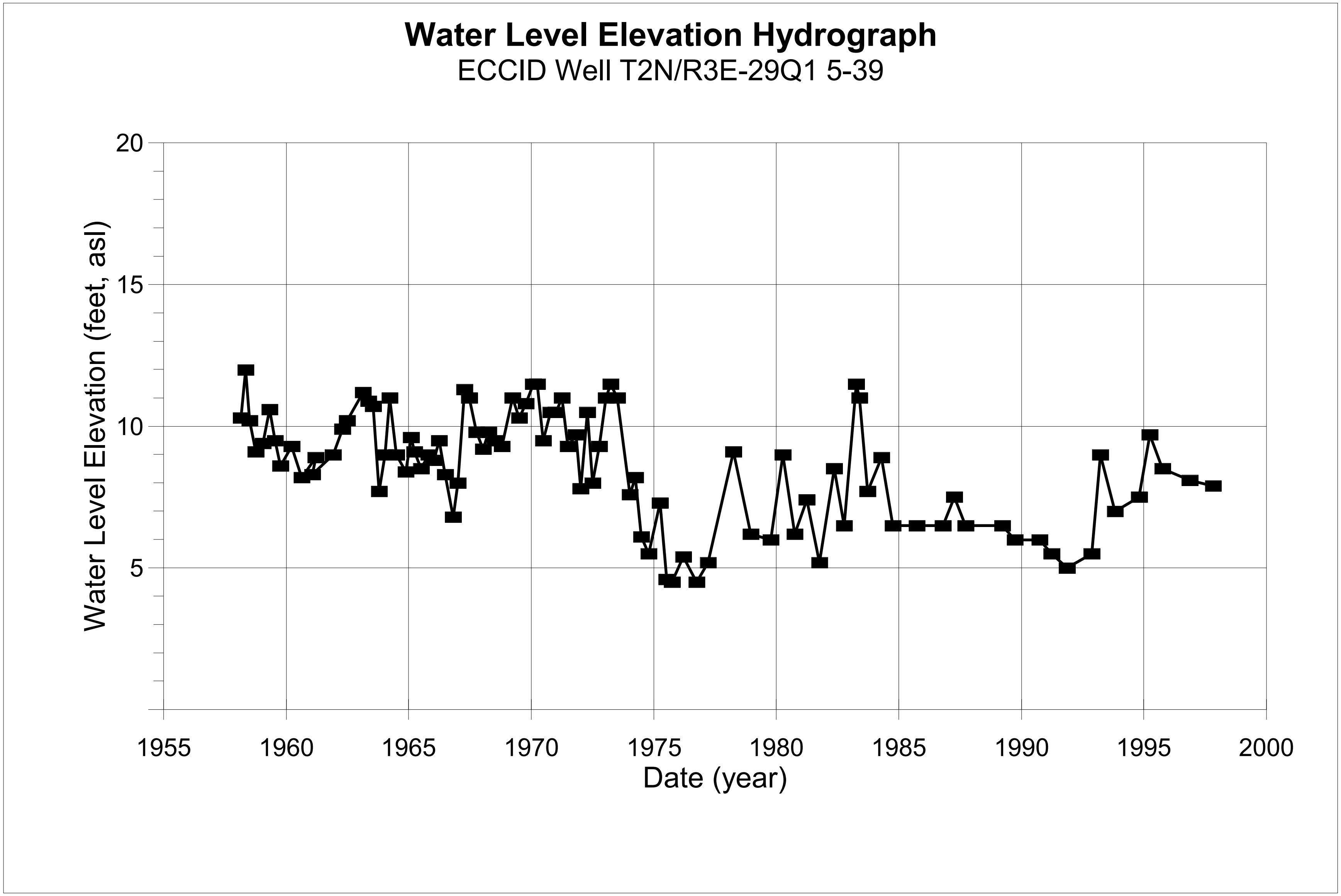


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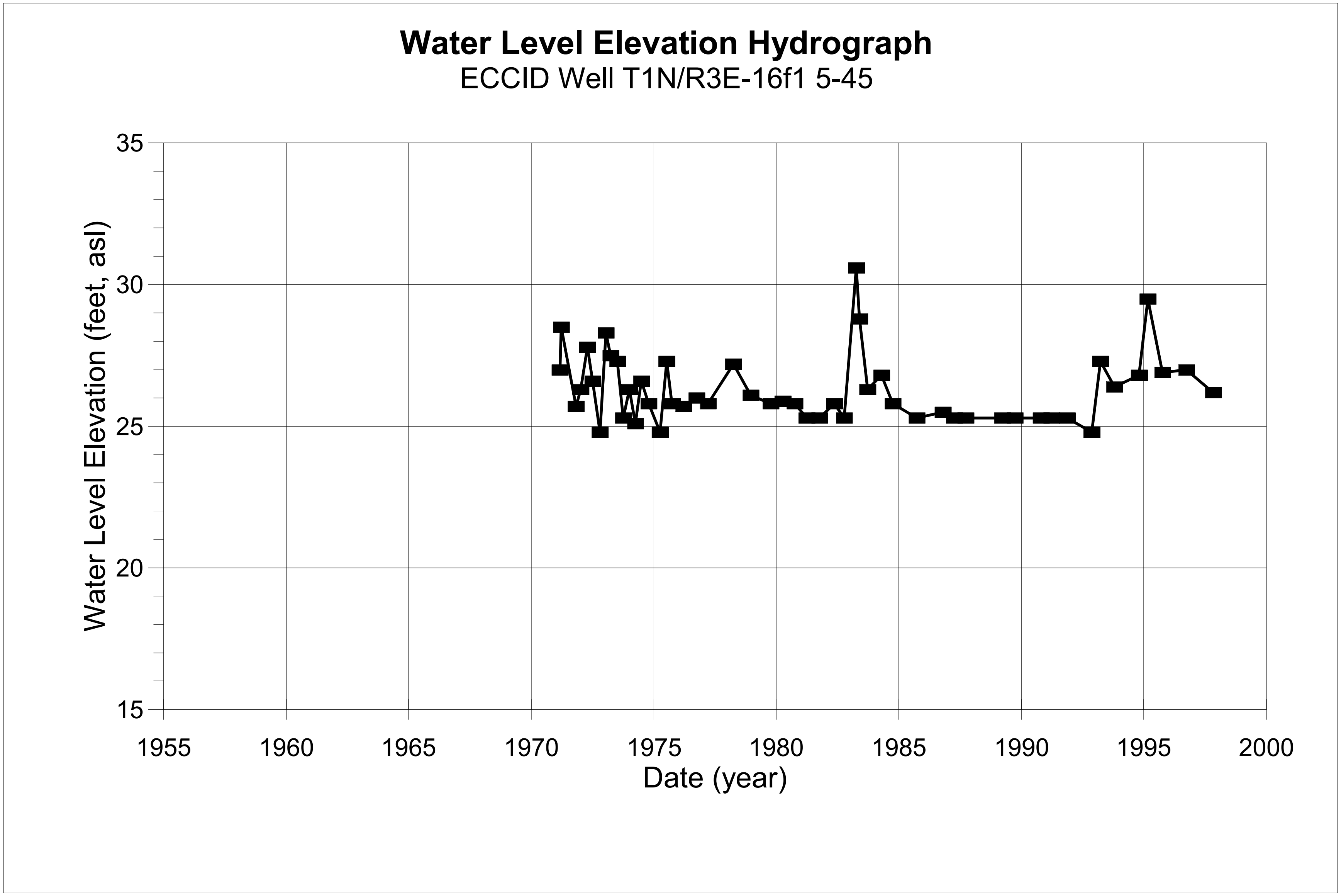


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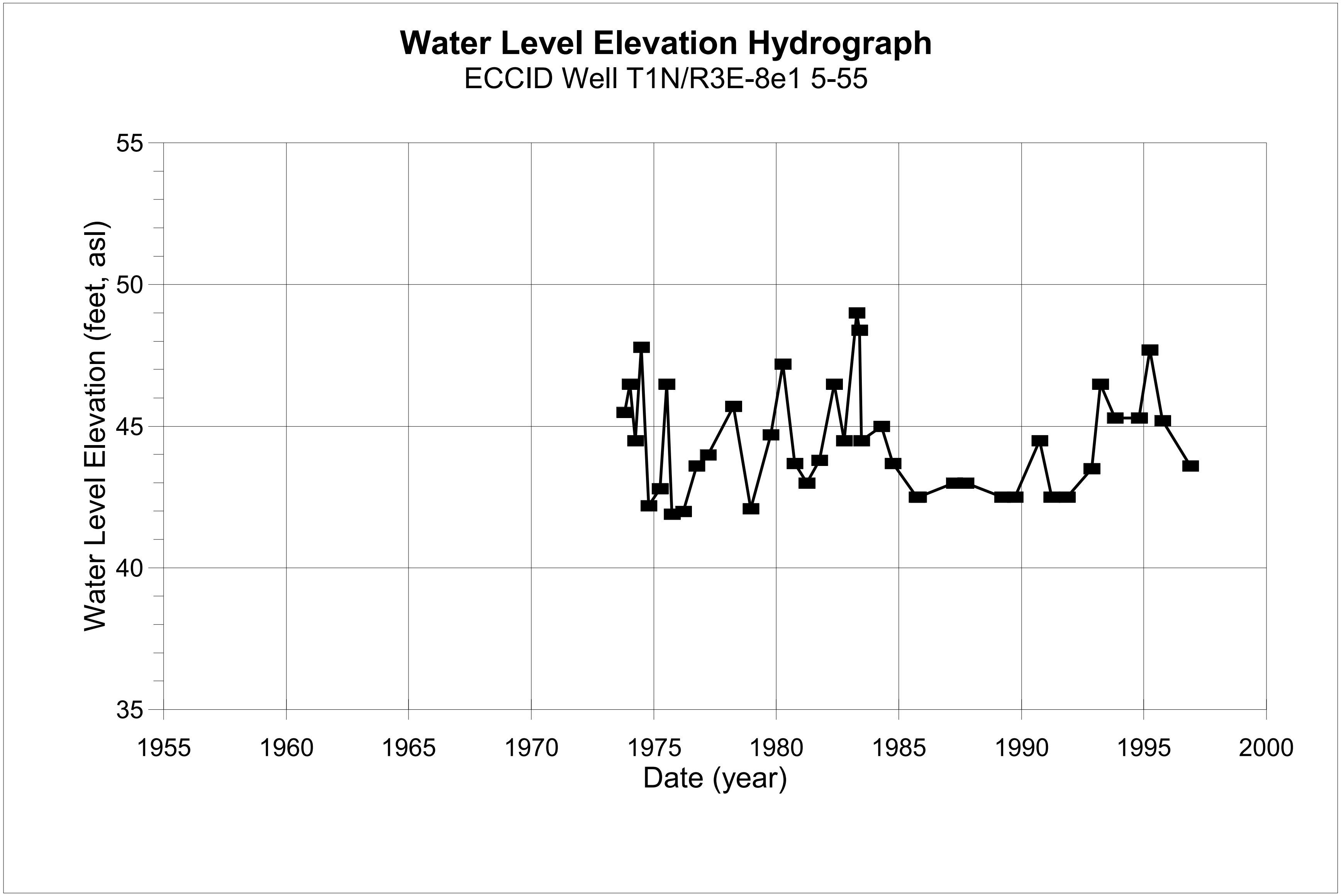


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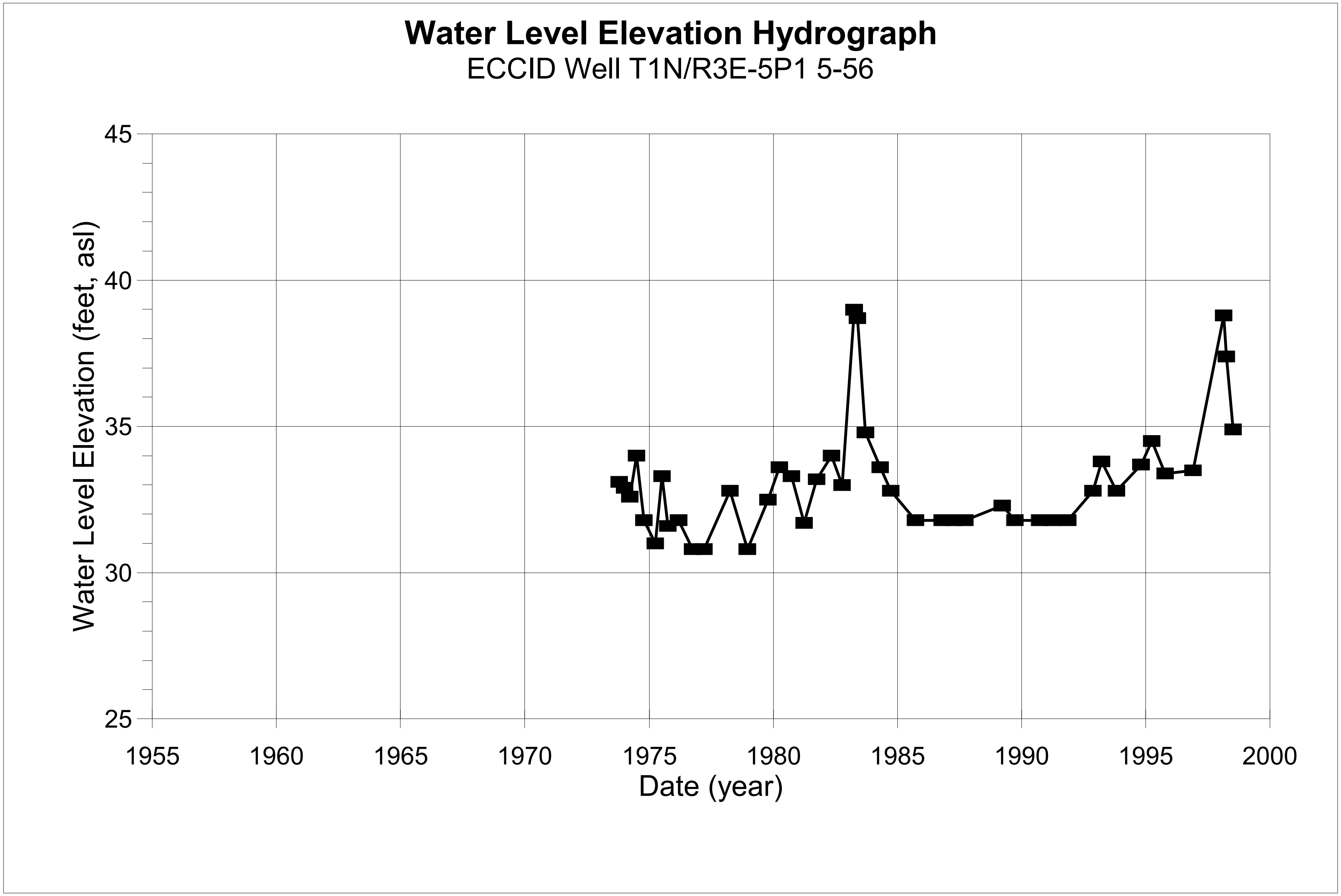


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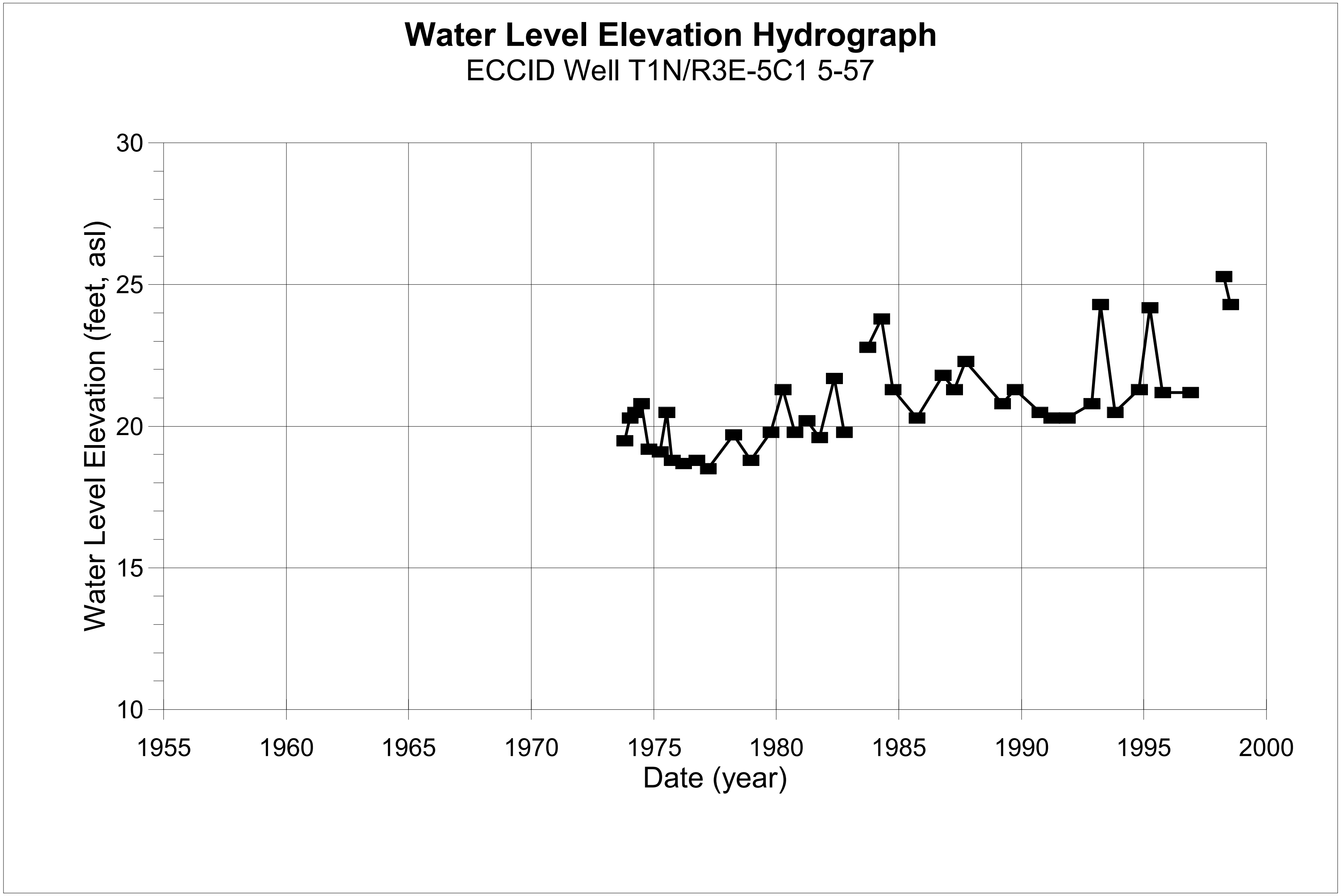


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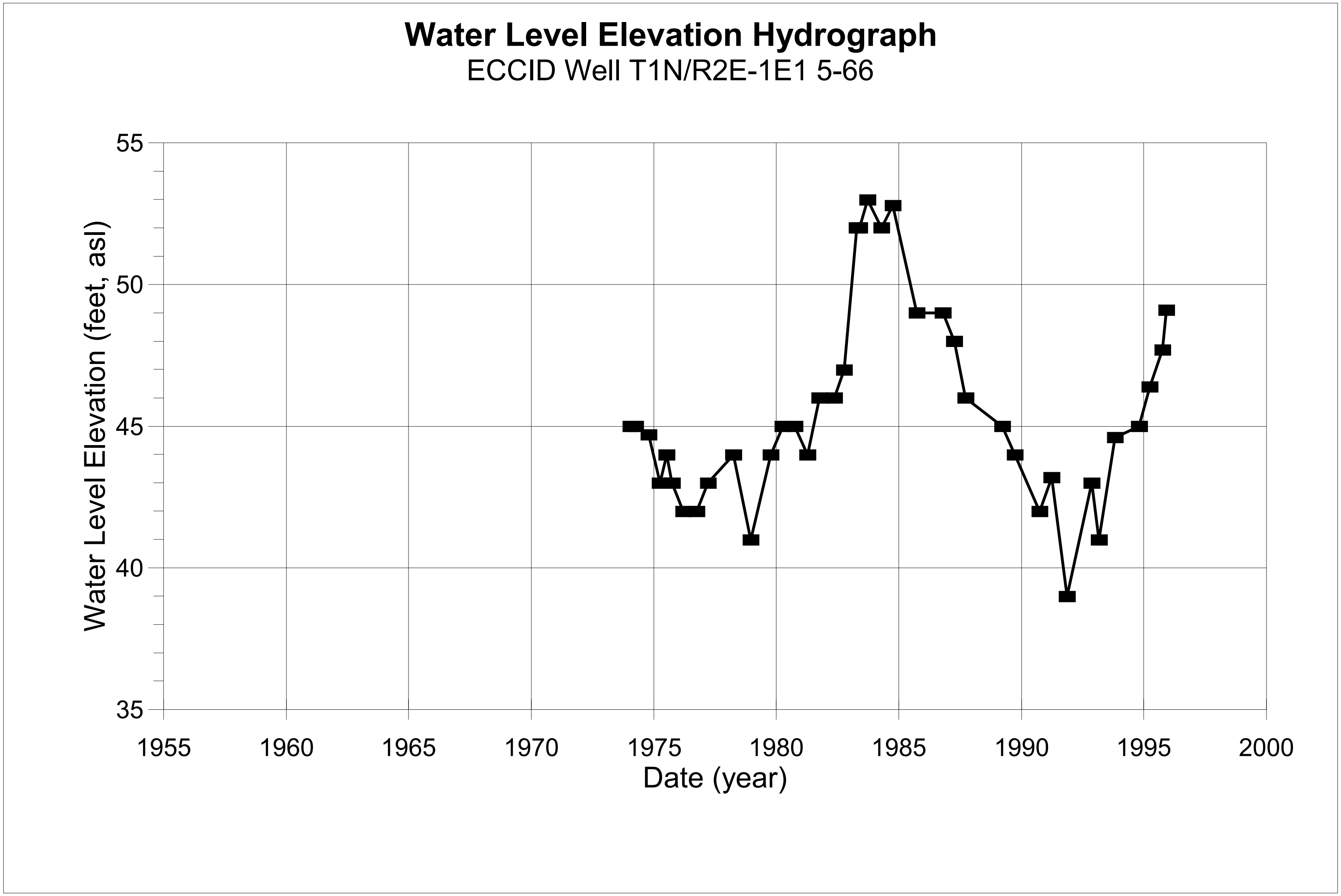


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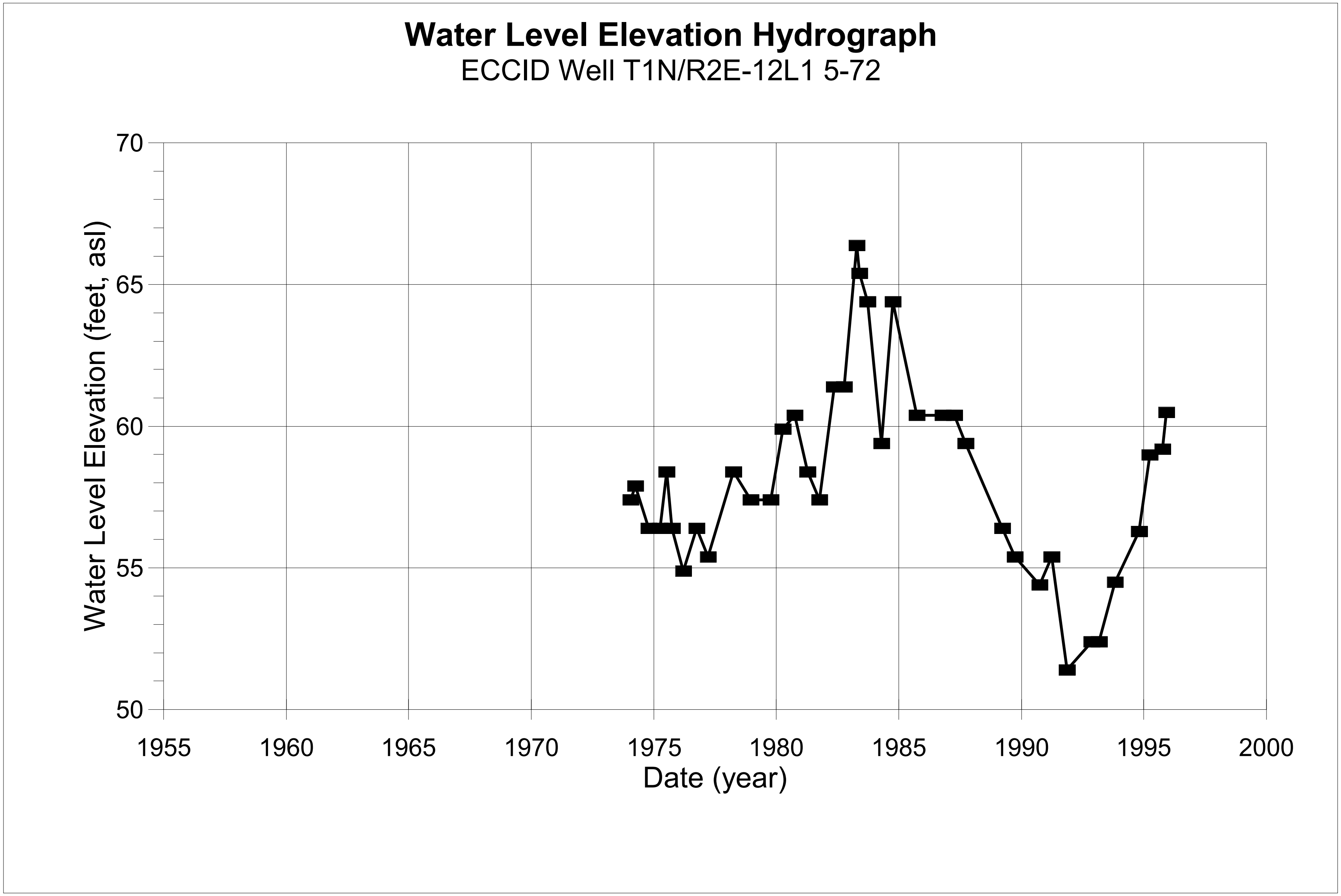


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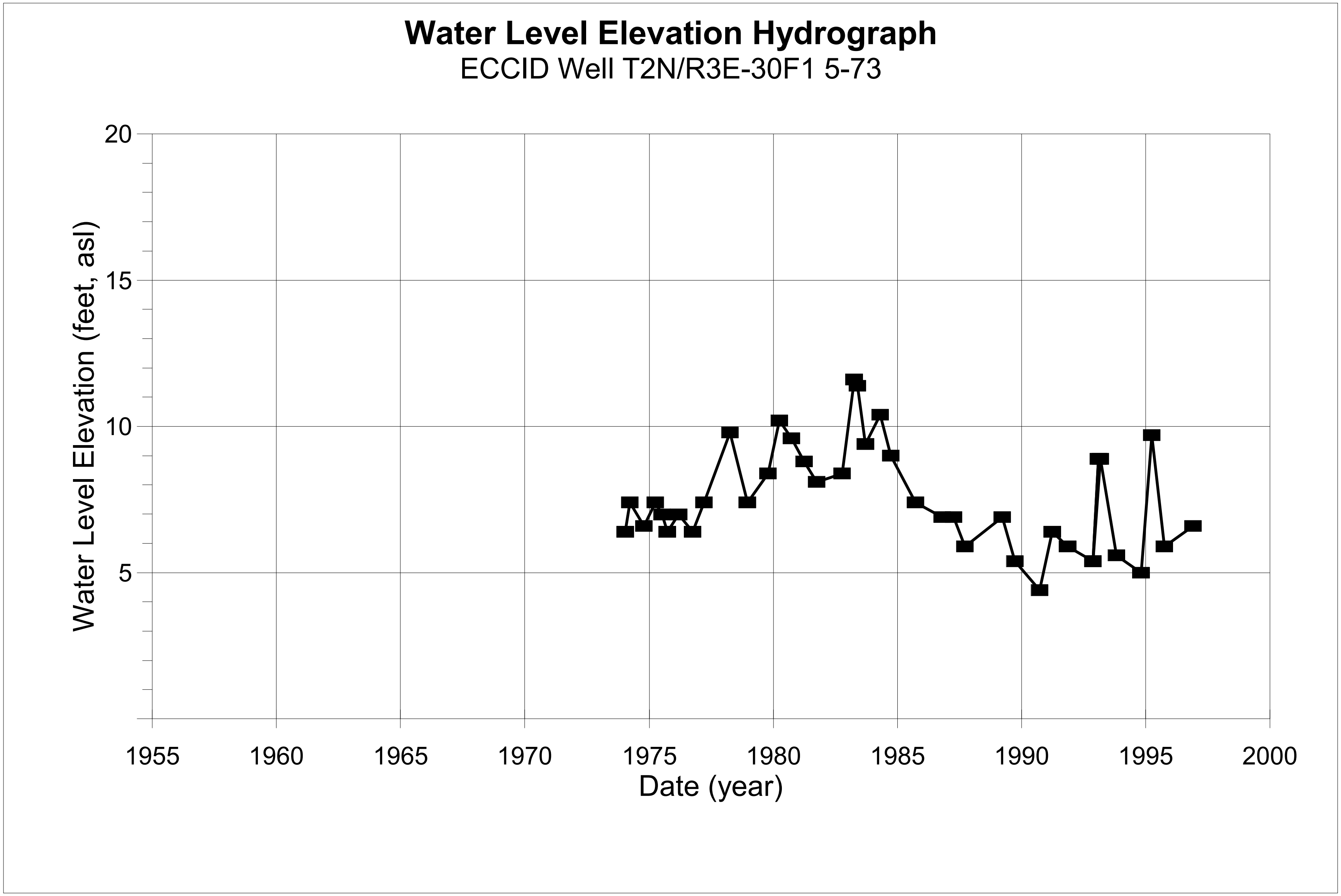


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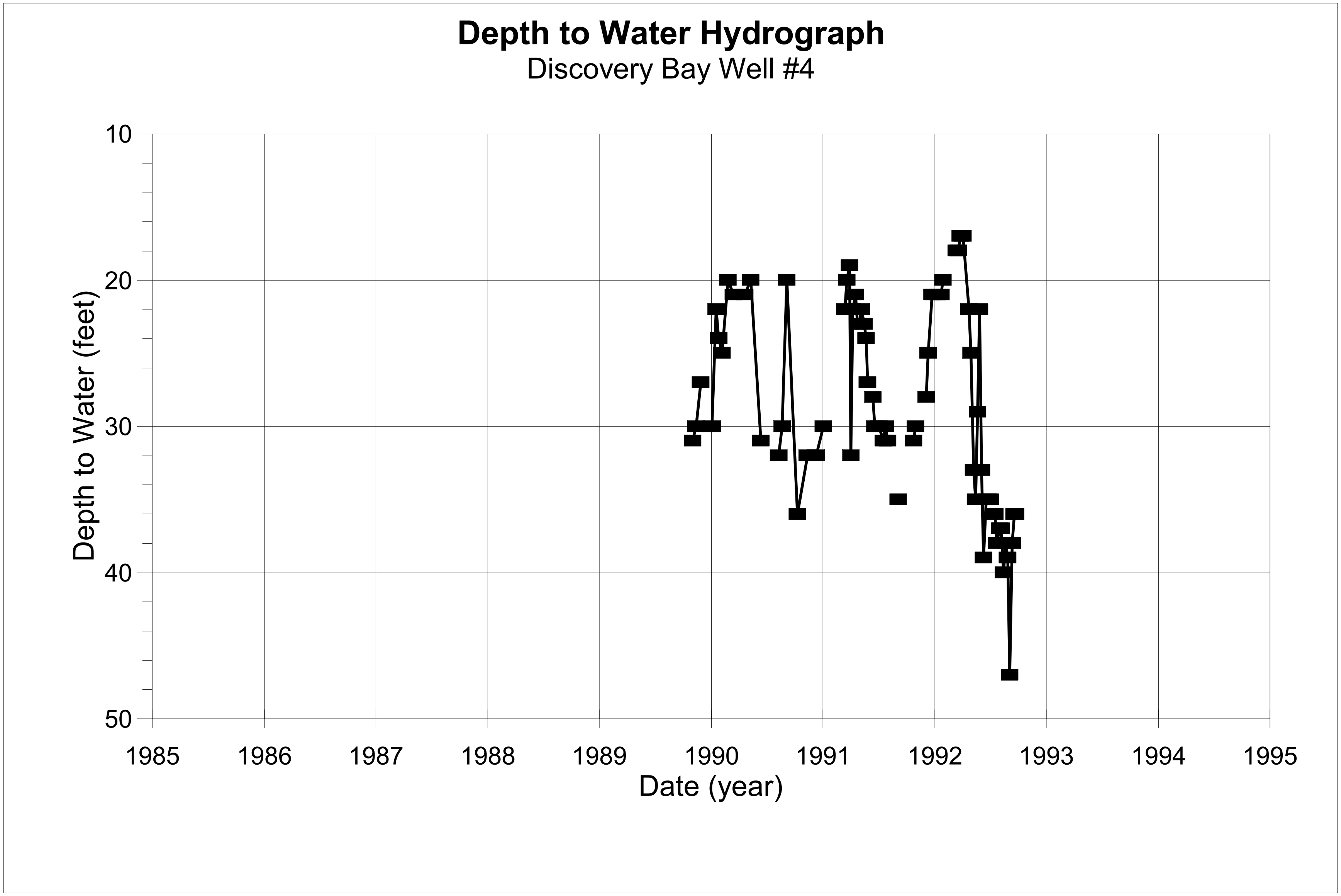


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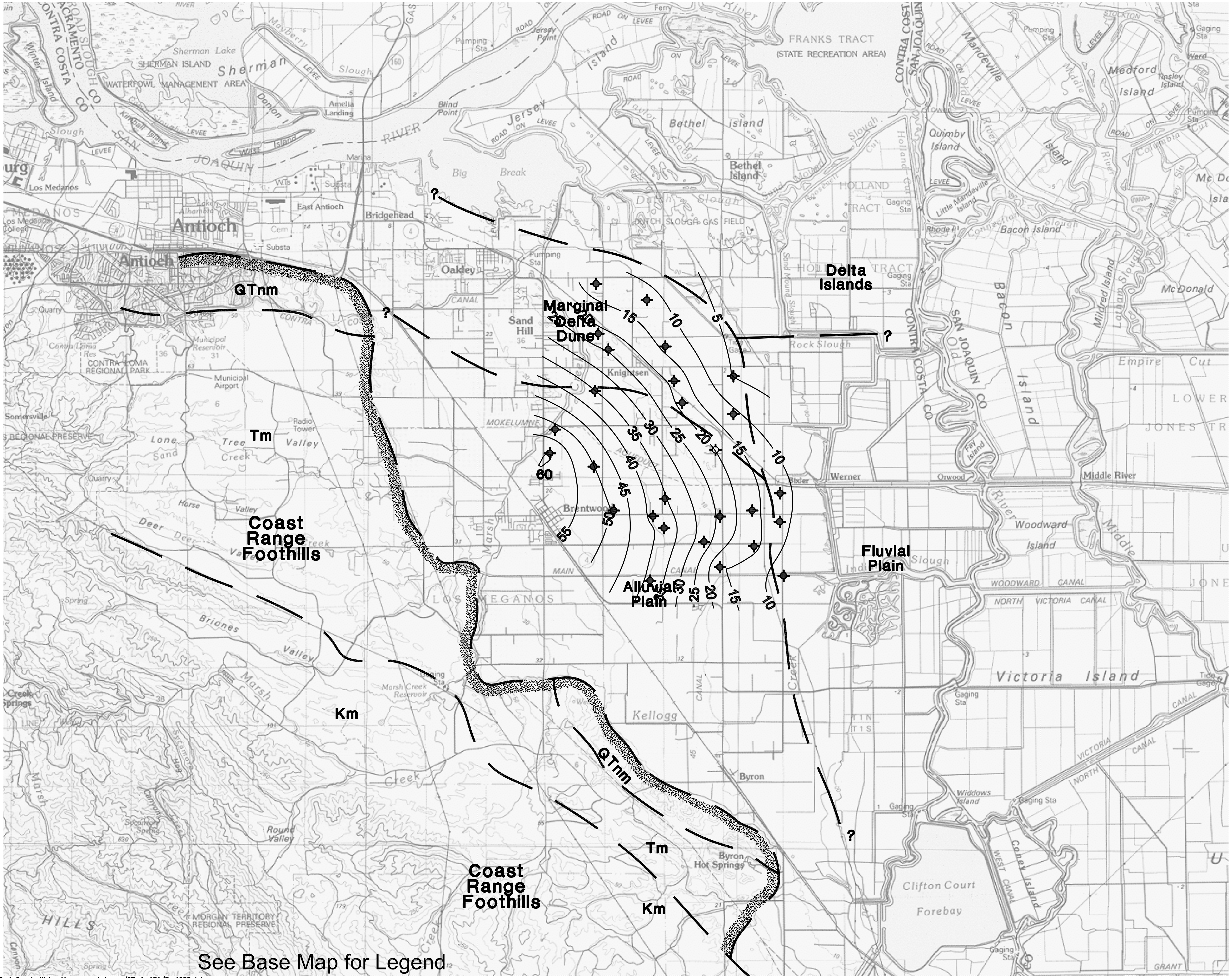



East County Water Management Assoc./97-1-131/Spr1958wl.dwg

LEGEND

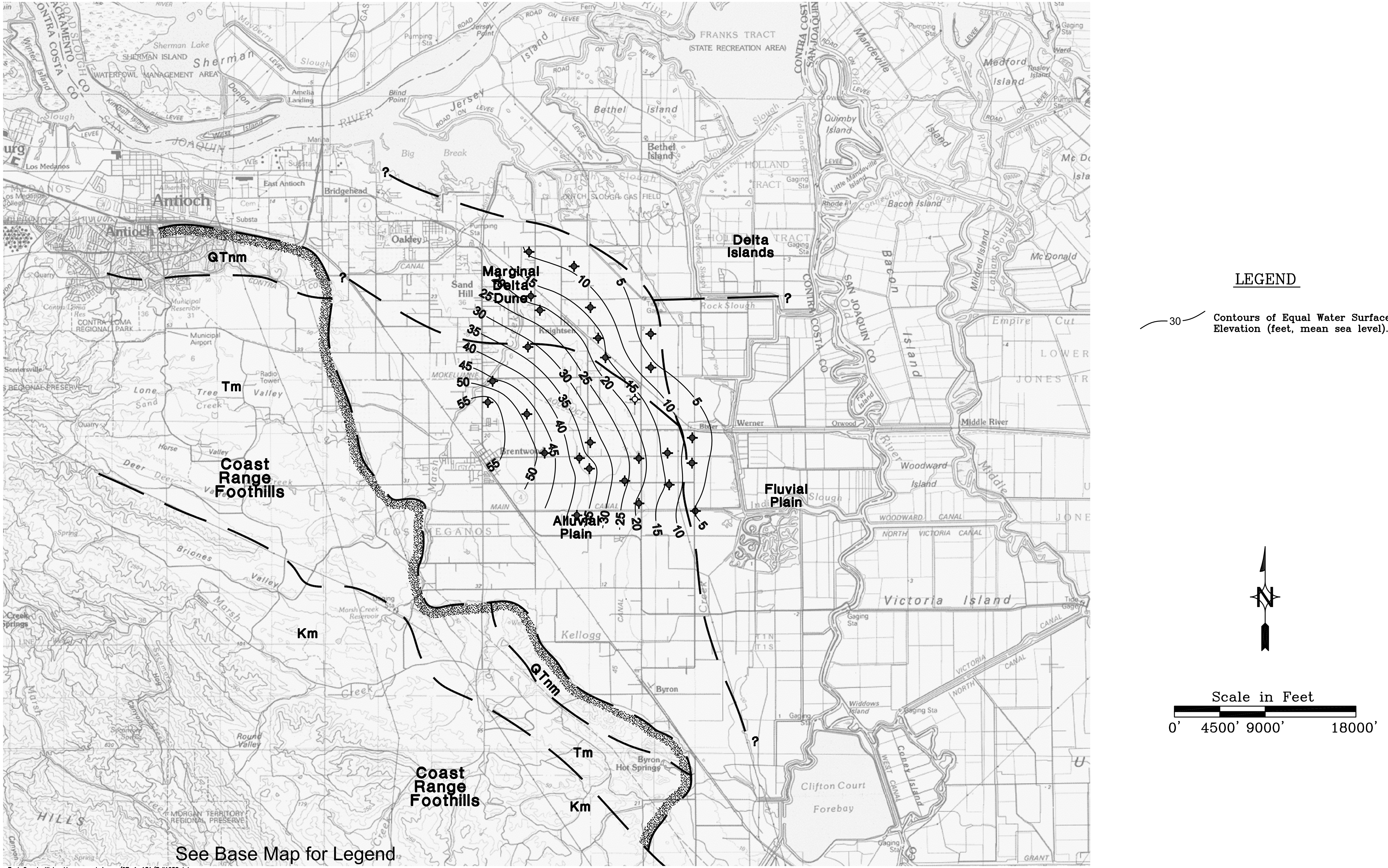
30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

Scale in Feet

0' 4500' 9000' 18000'

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

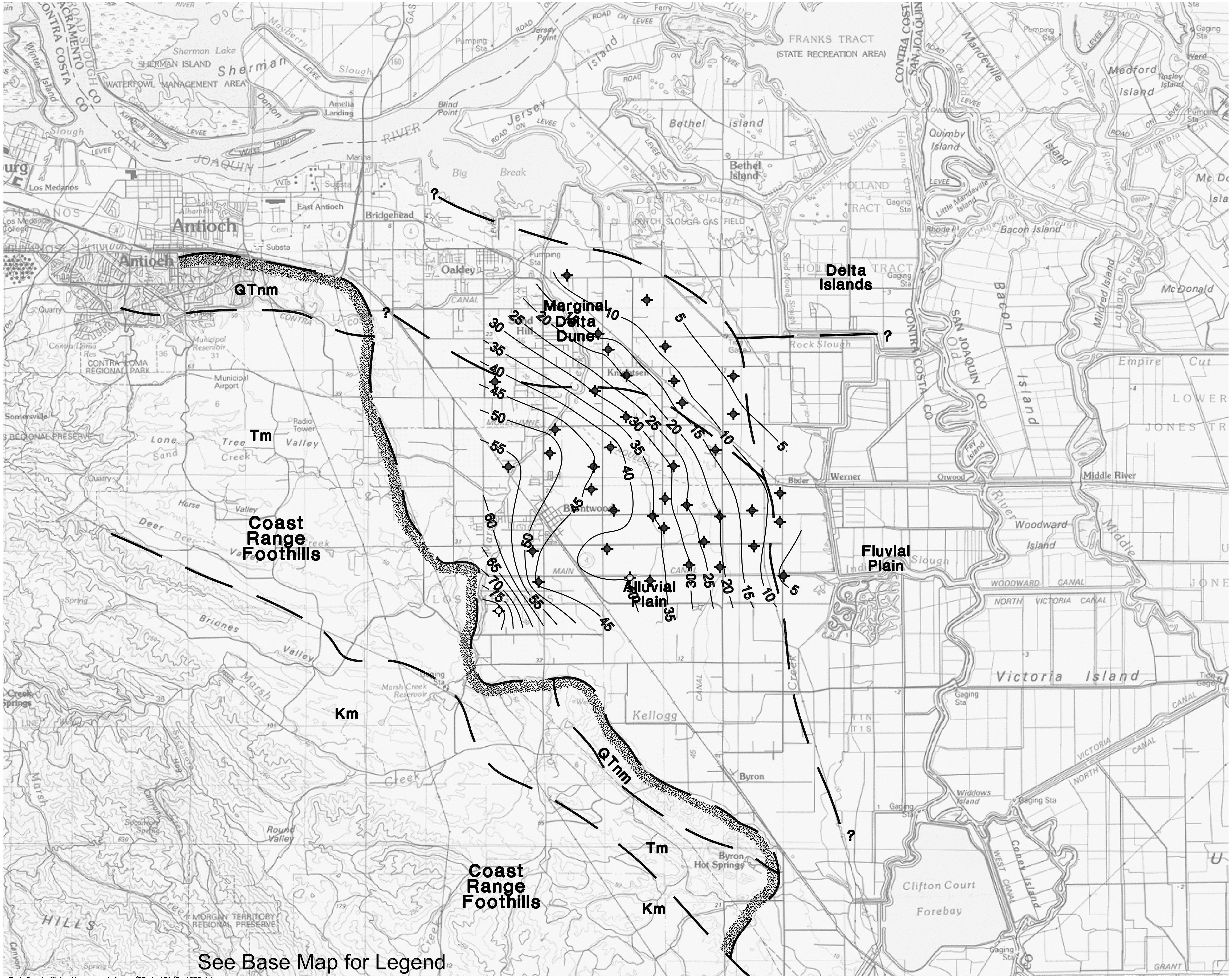
**Contours of Equal Ground-Water Elevation - Spring 1958**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Fall1958wl.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Fall 1958**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Spr1975wl.dwg

LEGEND

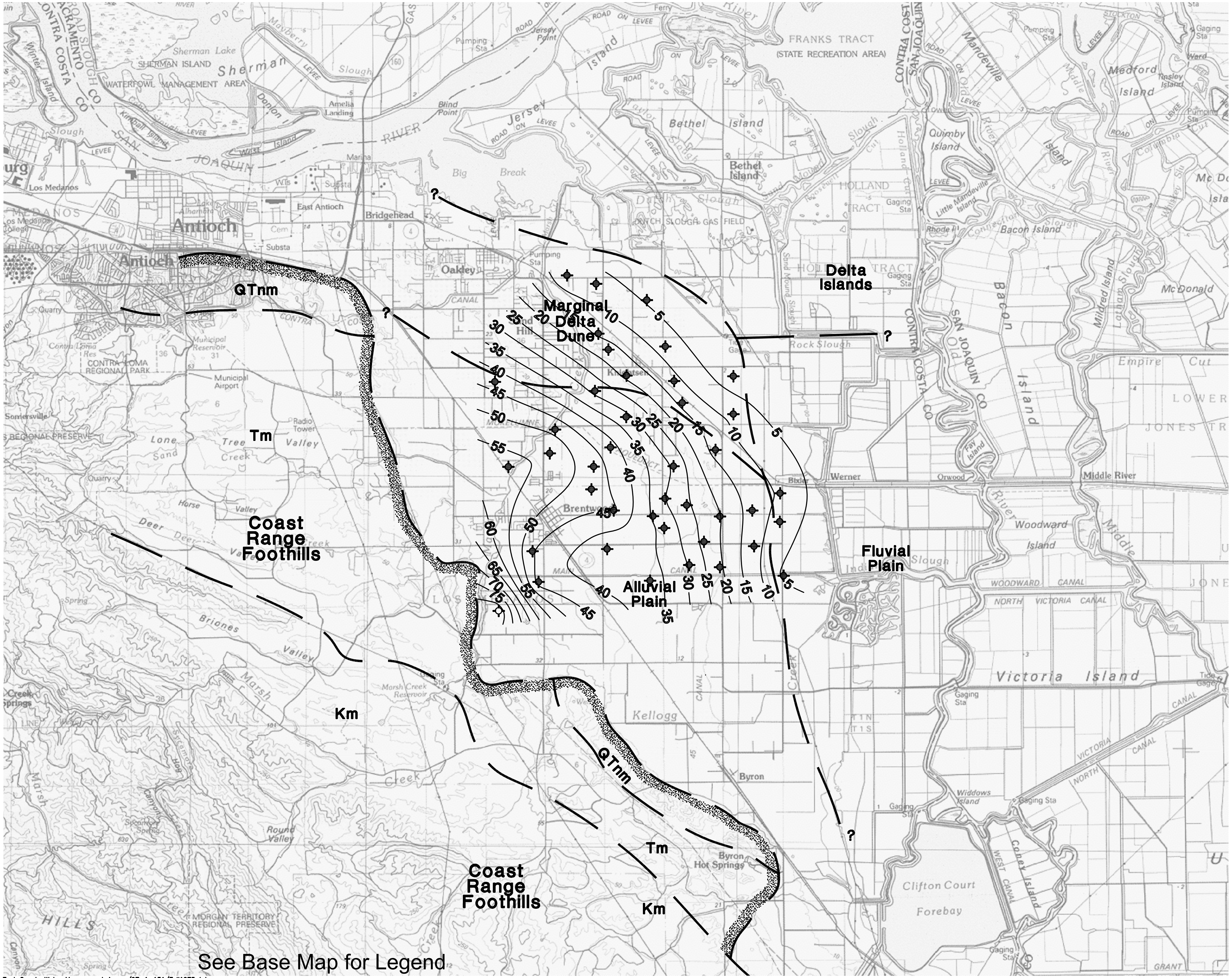
30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

N

Scale in Feet
0' 4500' 9000' 18000'

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Spring 1975**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

N

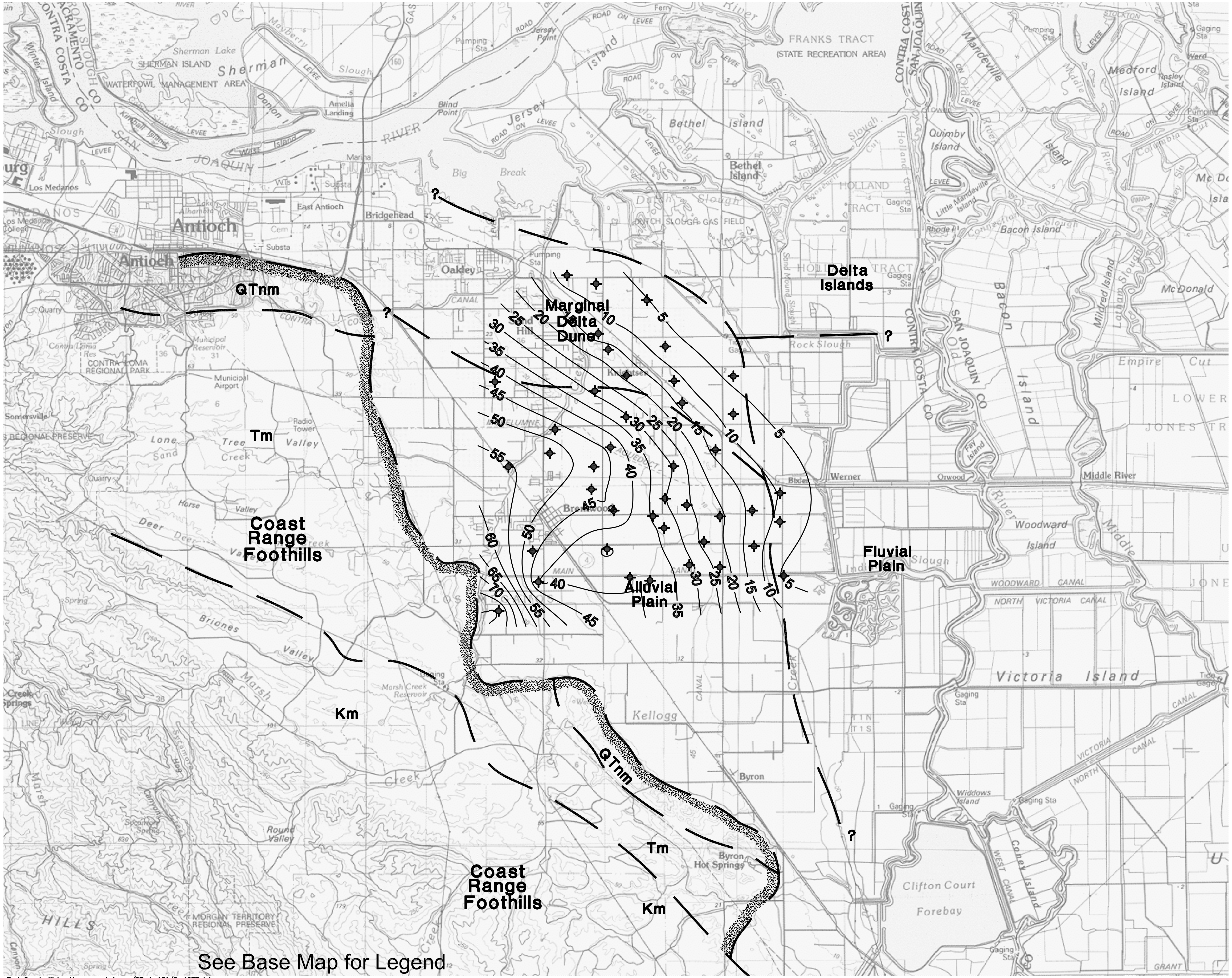
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1975wl.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Fall 1975**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

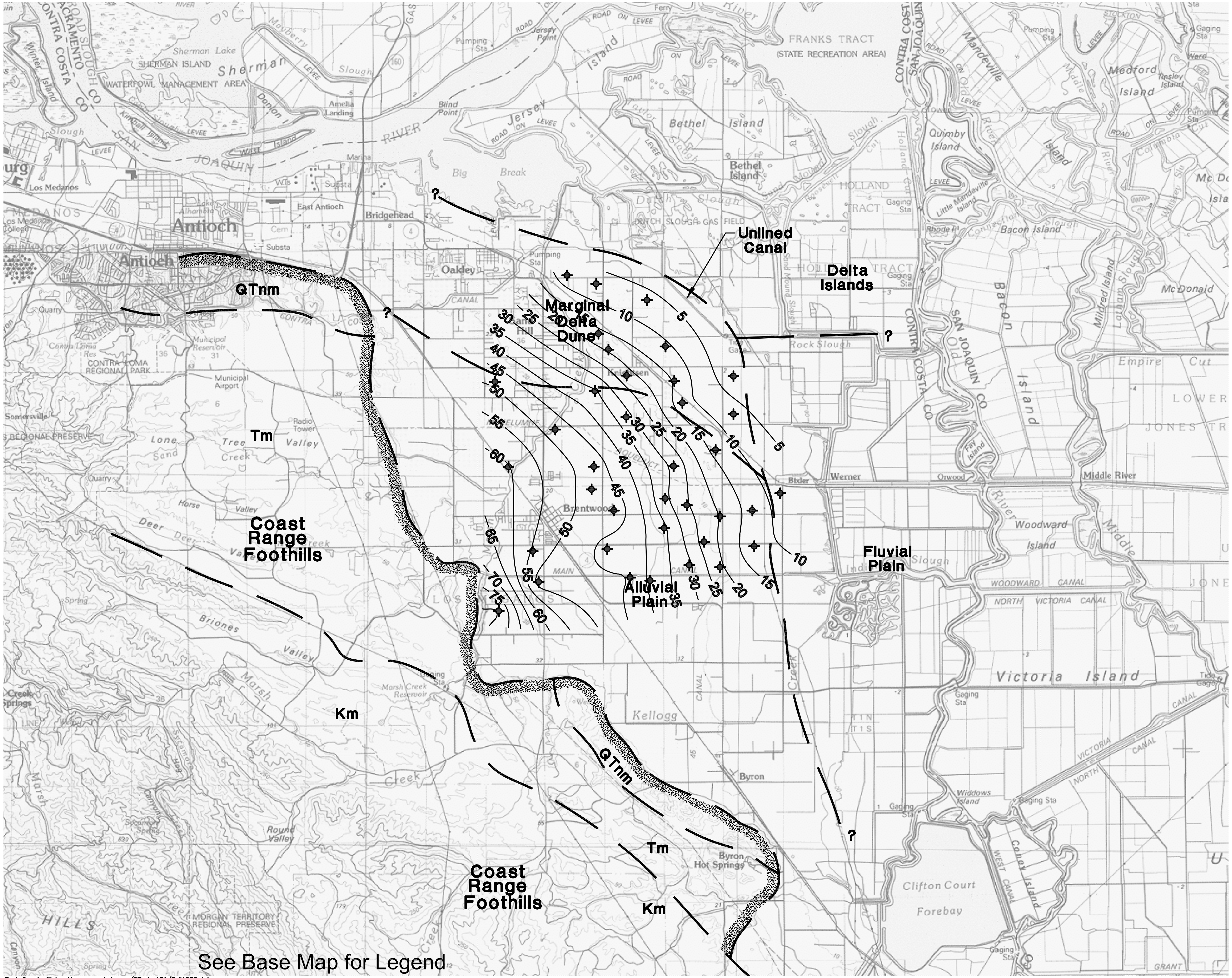
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Spr1977wl.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Spring 1977**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

N

Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1986wl.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Fall 1986**
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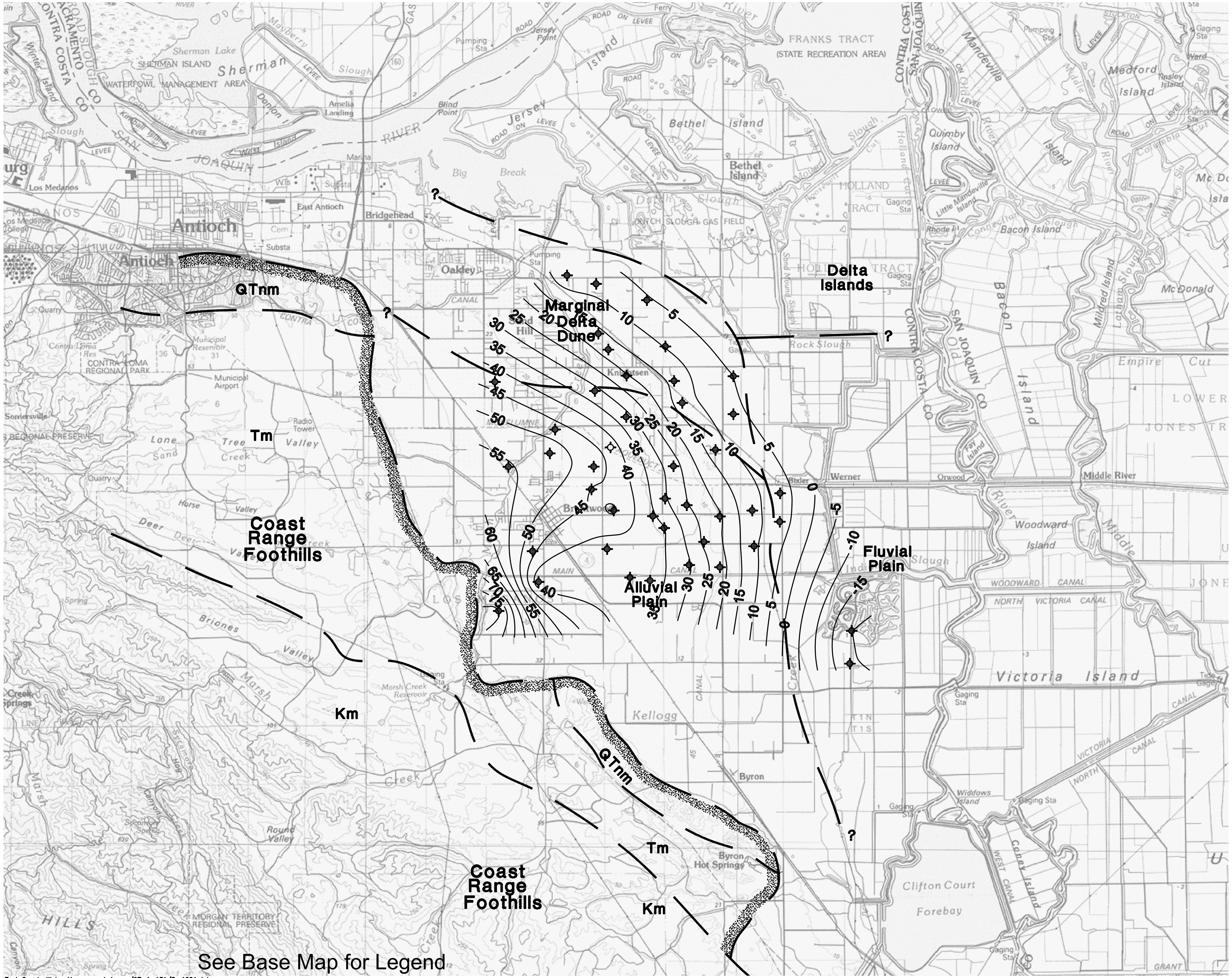
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Spr1991wl.dwg

LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

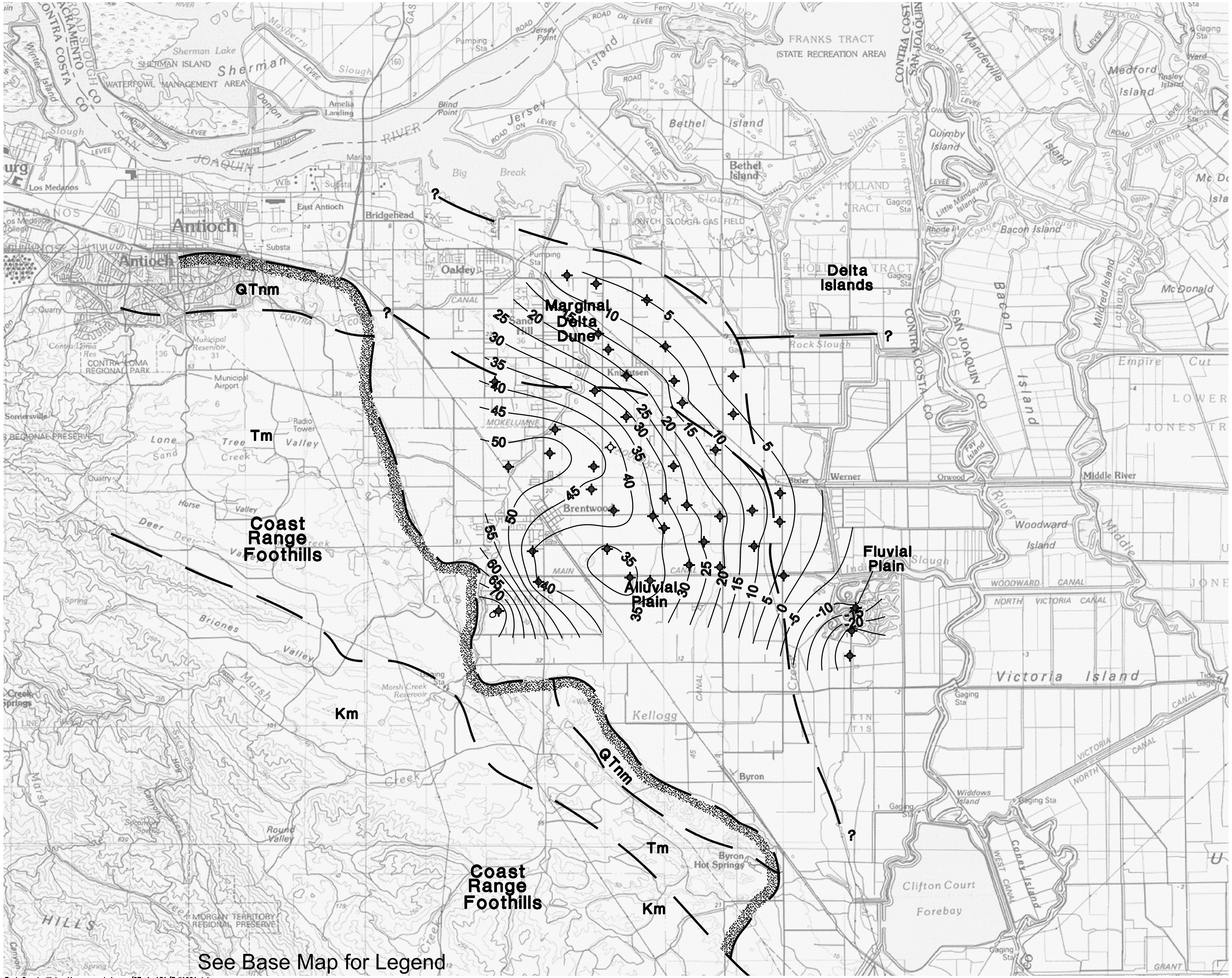
N

Scale in Feet

0' 4500' 9000' 18000'

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Spring 1991**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

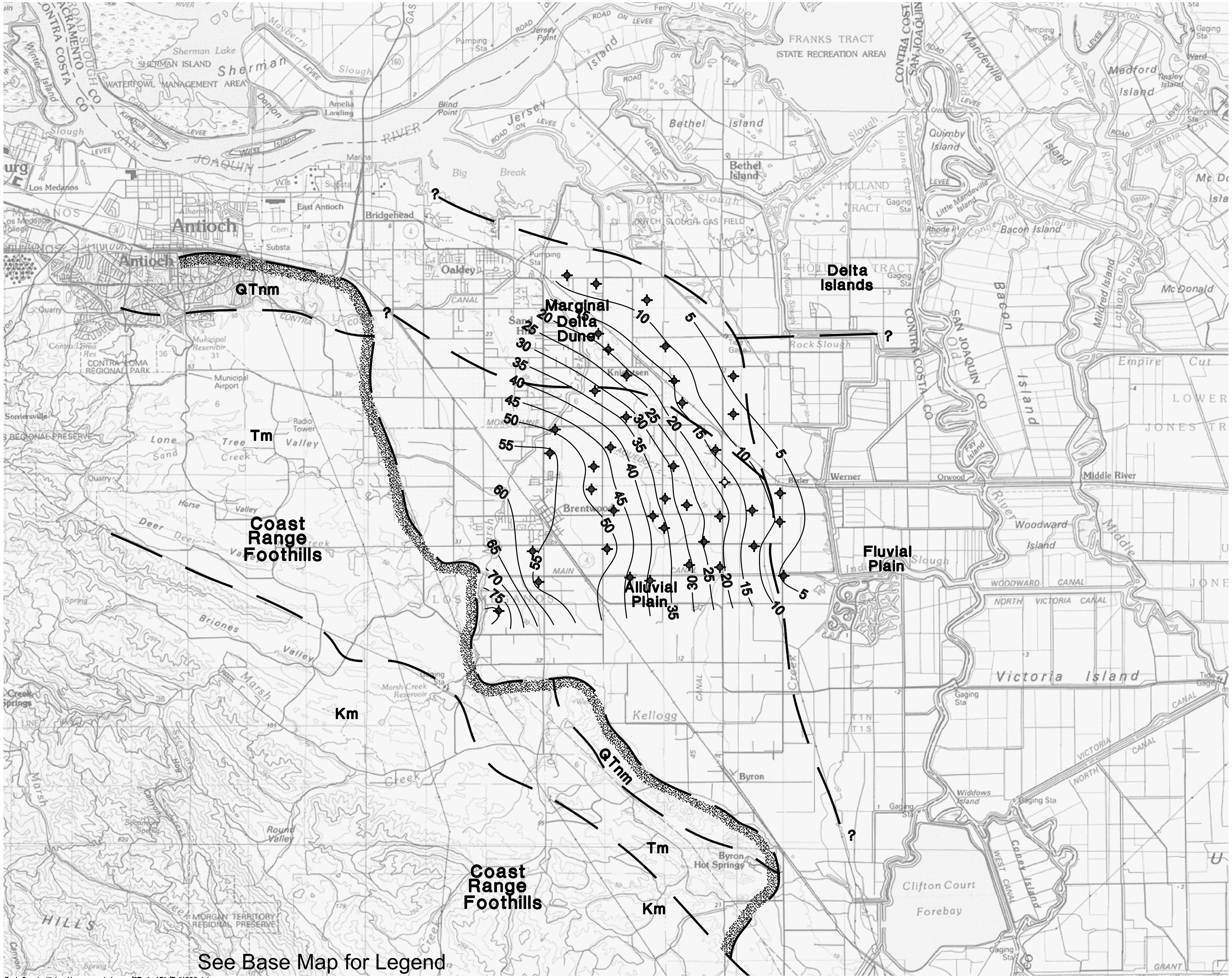
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1991wl.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Fall 1991**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

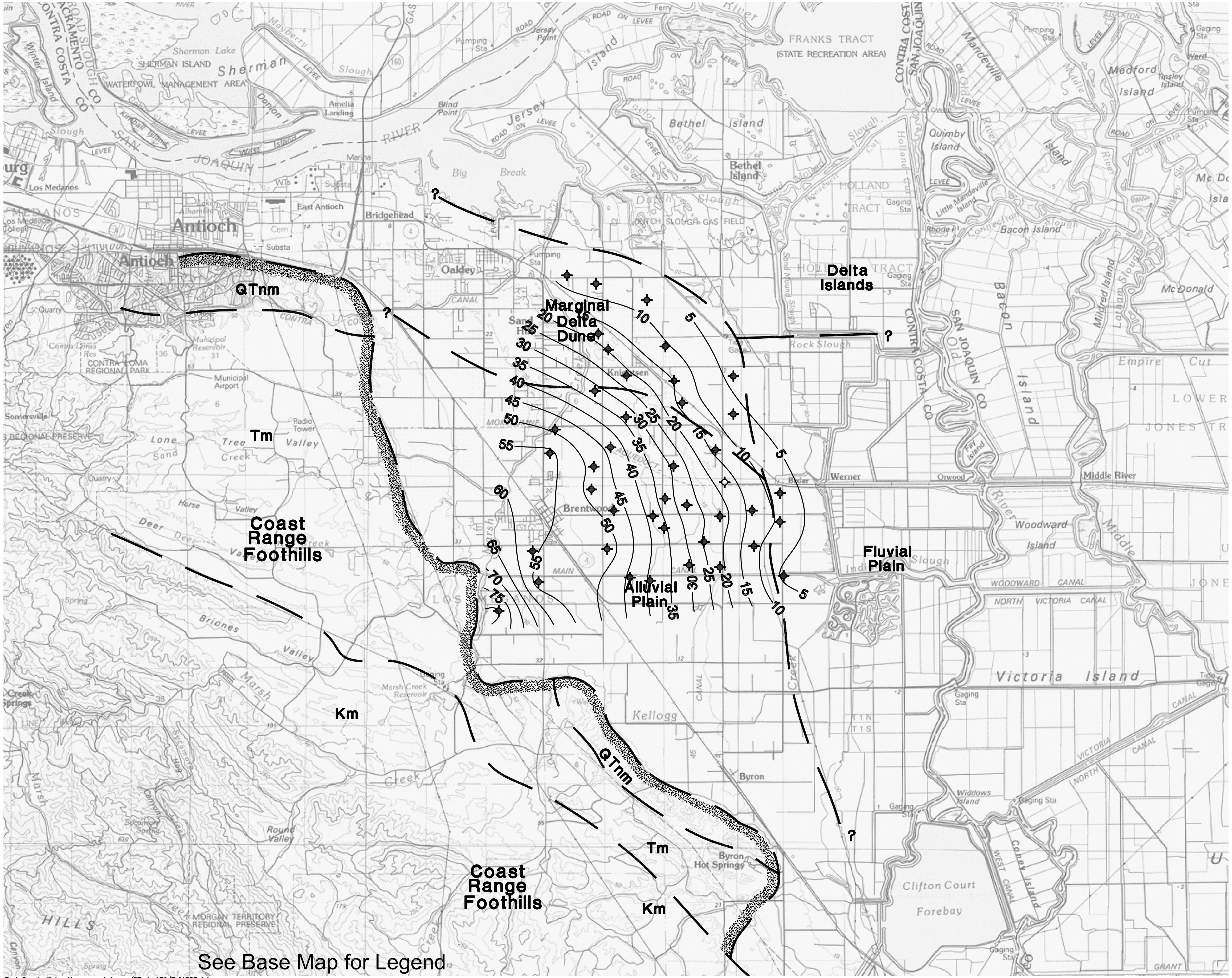
30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

Scale in Feet

0' 4500' 9000' 18000'

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Fall 1996**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

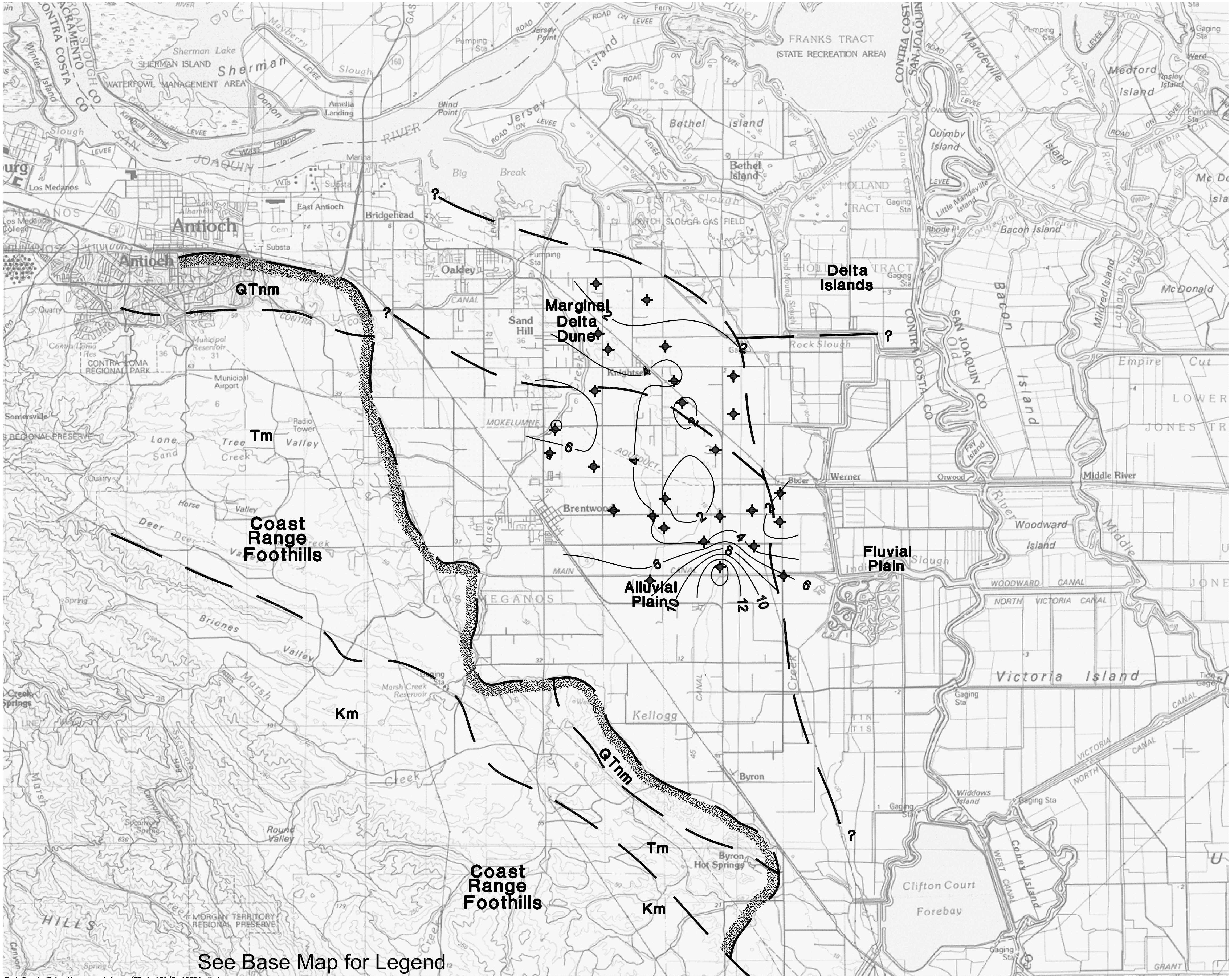
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1996wl.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Equal Ground-Water Elevation - Fall 1996**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

Contours of Depth to Water (feet).

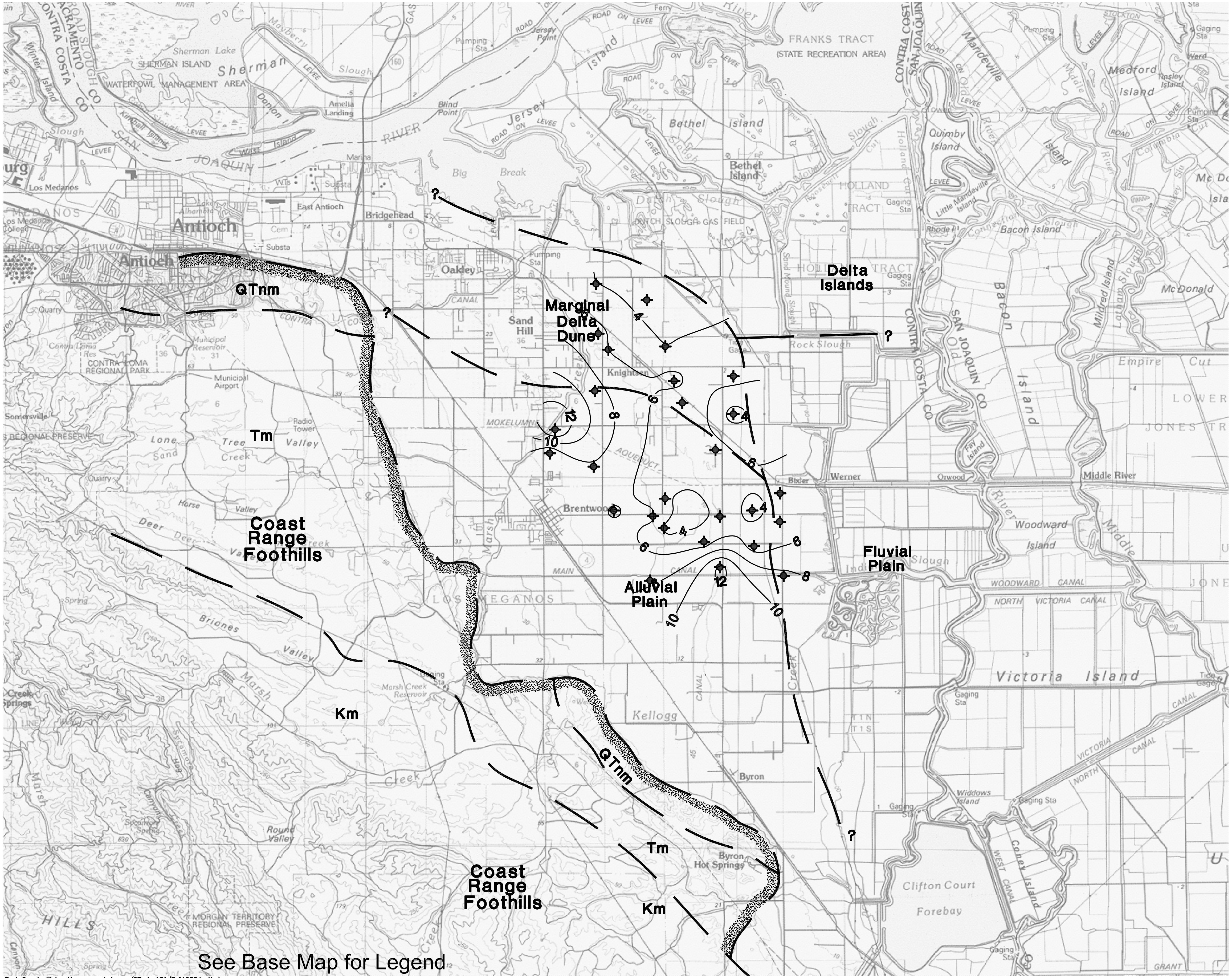
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Spr1958depth.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Depth to Water - Spring 1958**
**East County Water Management Association**
**Ground-Water Resources Assessment**




## LEGEND

10 Contours of Depth to Water (feet).

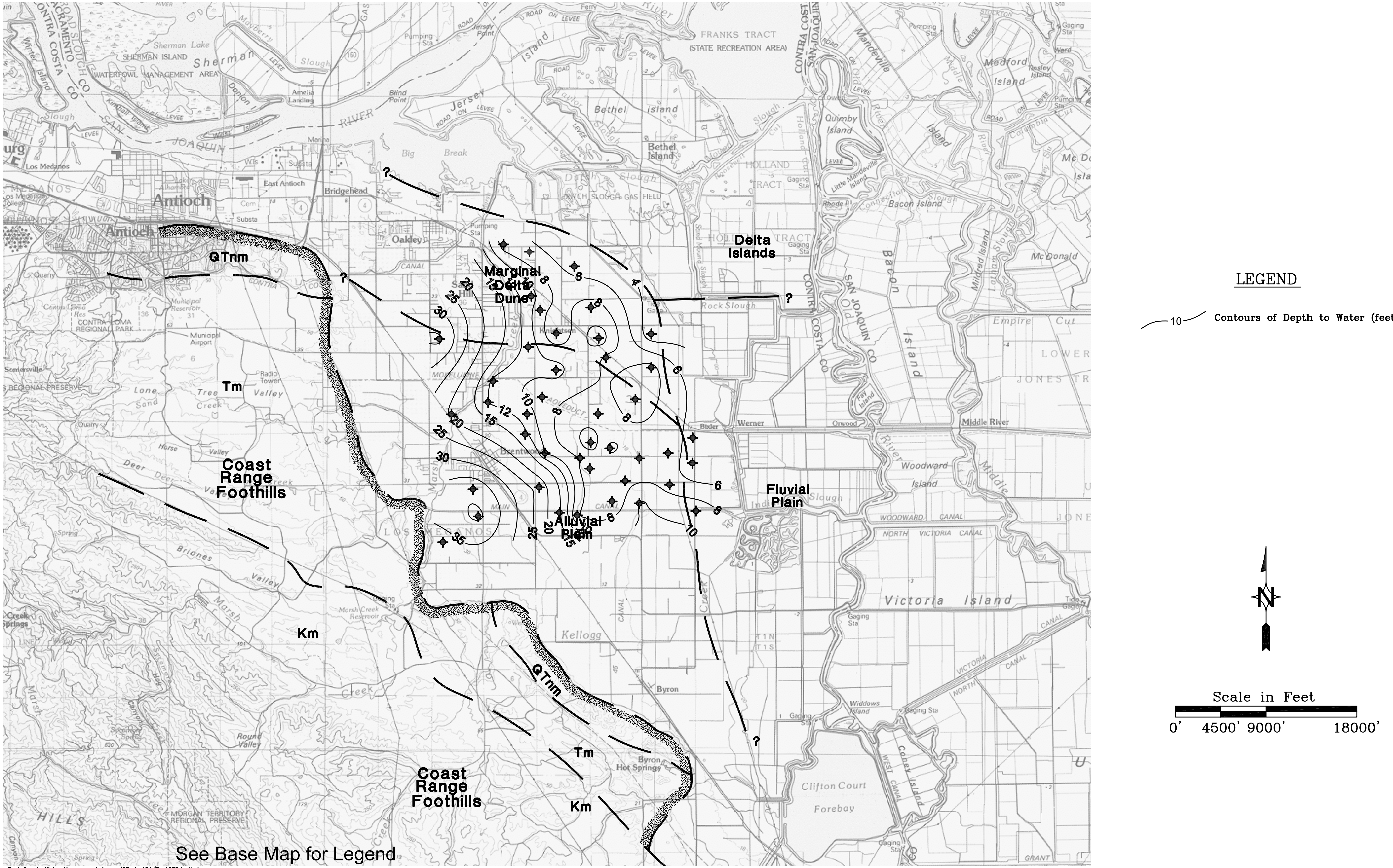
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1958depth.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Depth to Water - Fall 1958**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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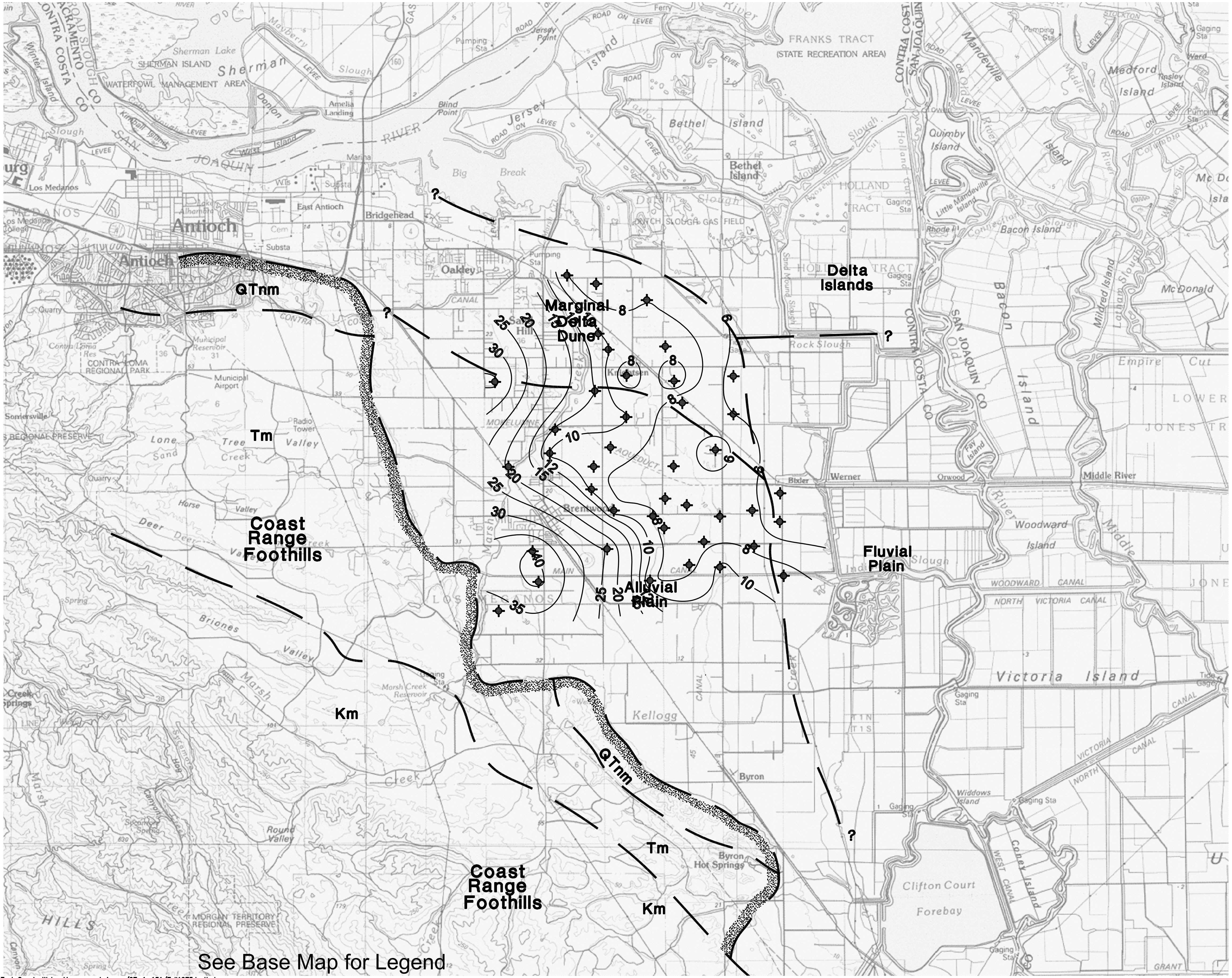
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Depth to Water - Spring 1975**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

10 — Contours of Depth to Water (feet).

N

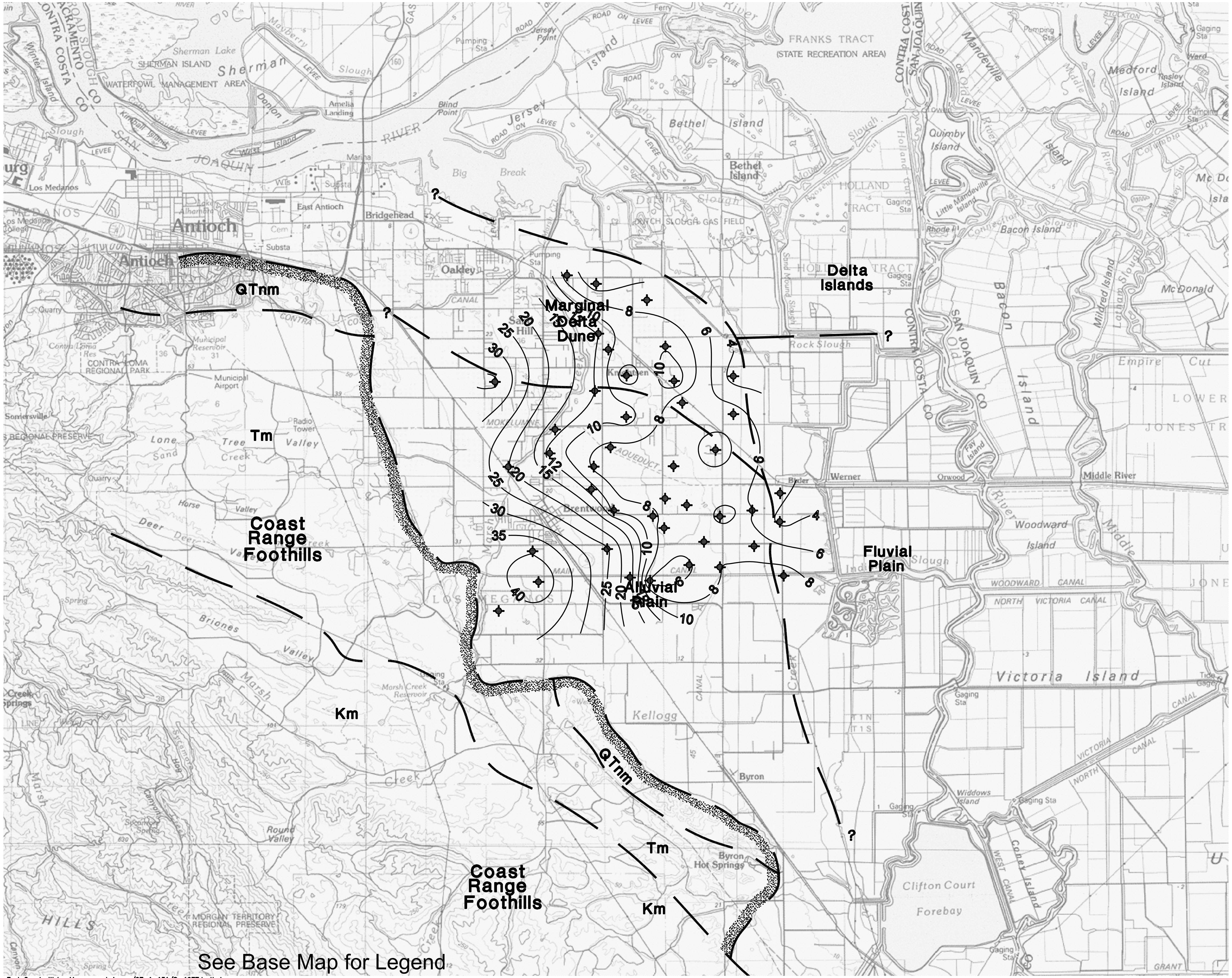
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1975depth.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Depth to Water - Fall 1975**
**East County Water Management Association**
**Ground-Water Resources Assessment**




LEGEND

10 Contours of Depth to Water (feet).

N

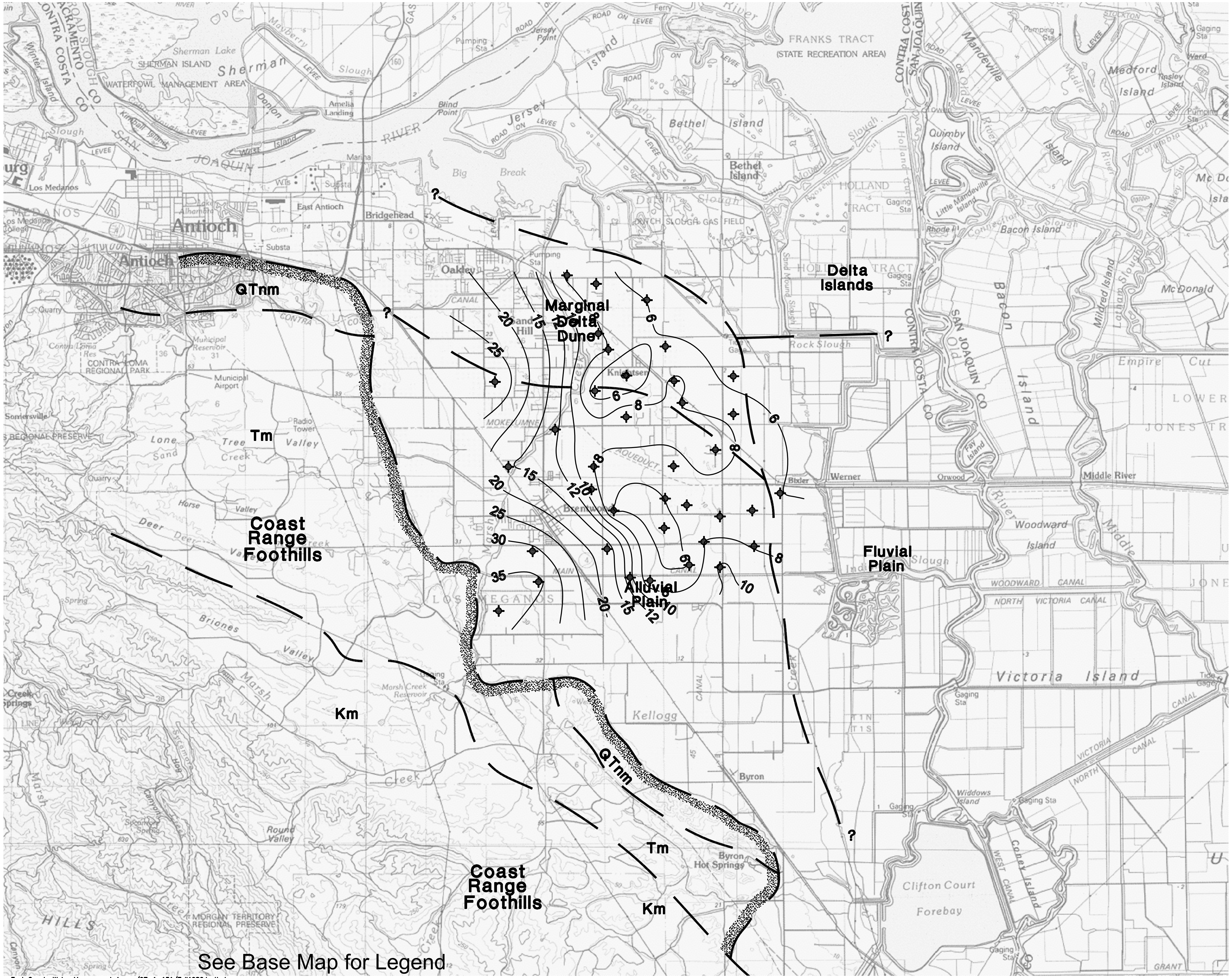
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Spr1977depth.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Depth to Water - Spring 1977**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Fall1986depth.dwg

LEGEND

10 Contours of Depth to Water (feet).

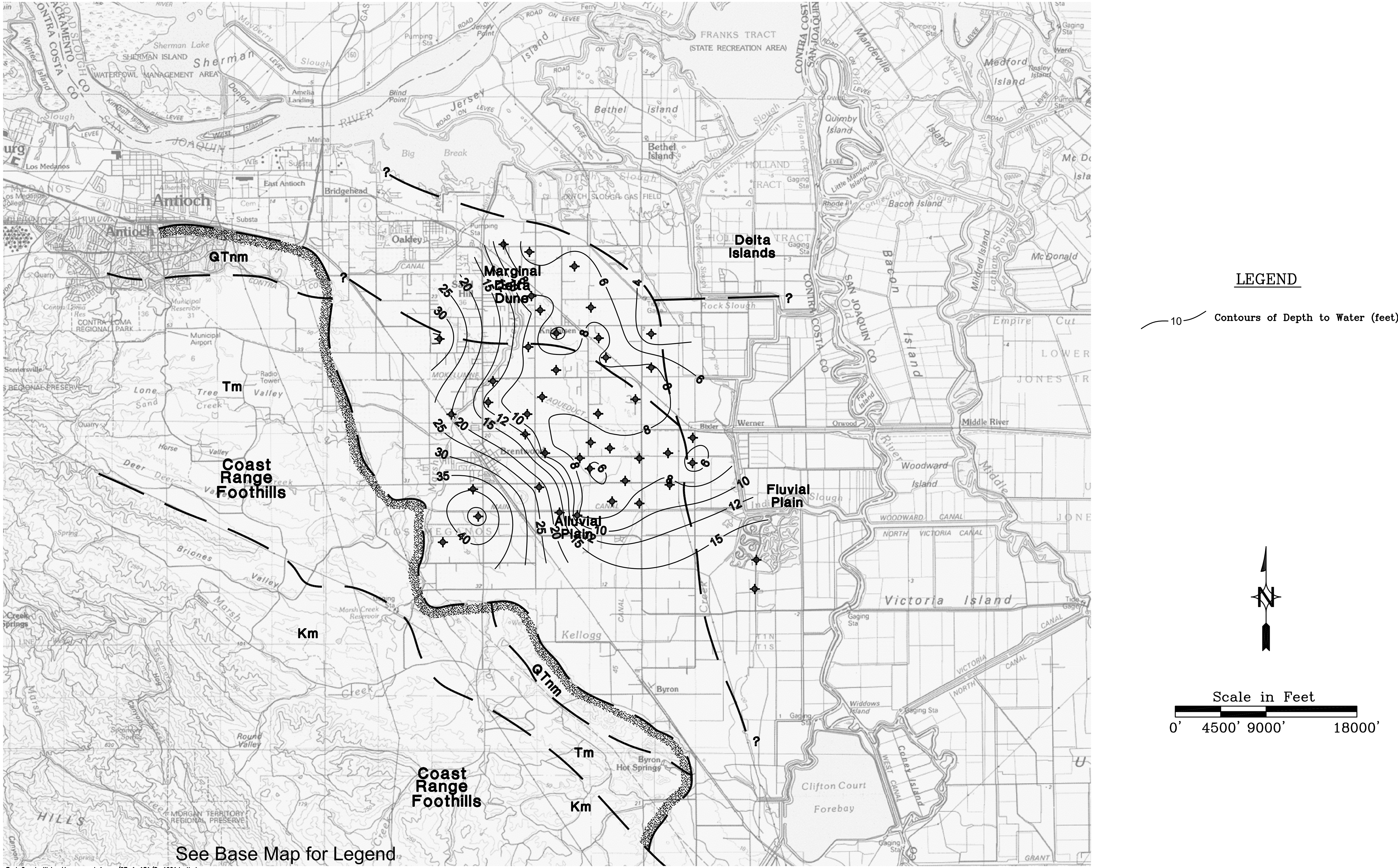
N

Scale in Feet

0' 4500' 9000' 18000'

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Depth to Water - Fall 1986**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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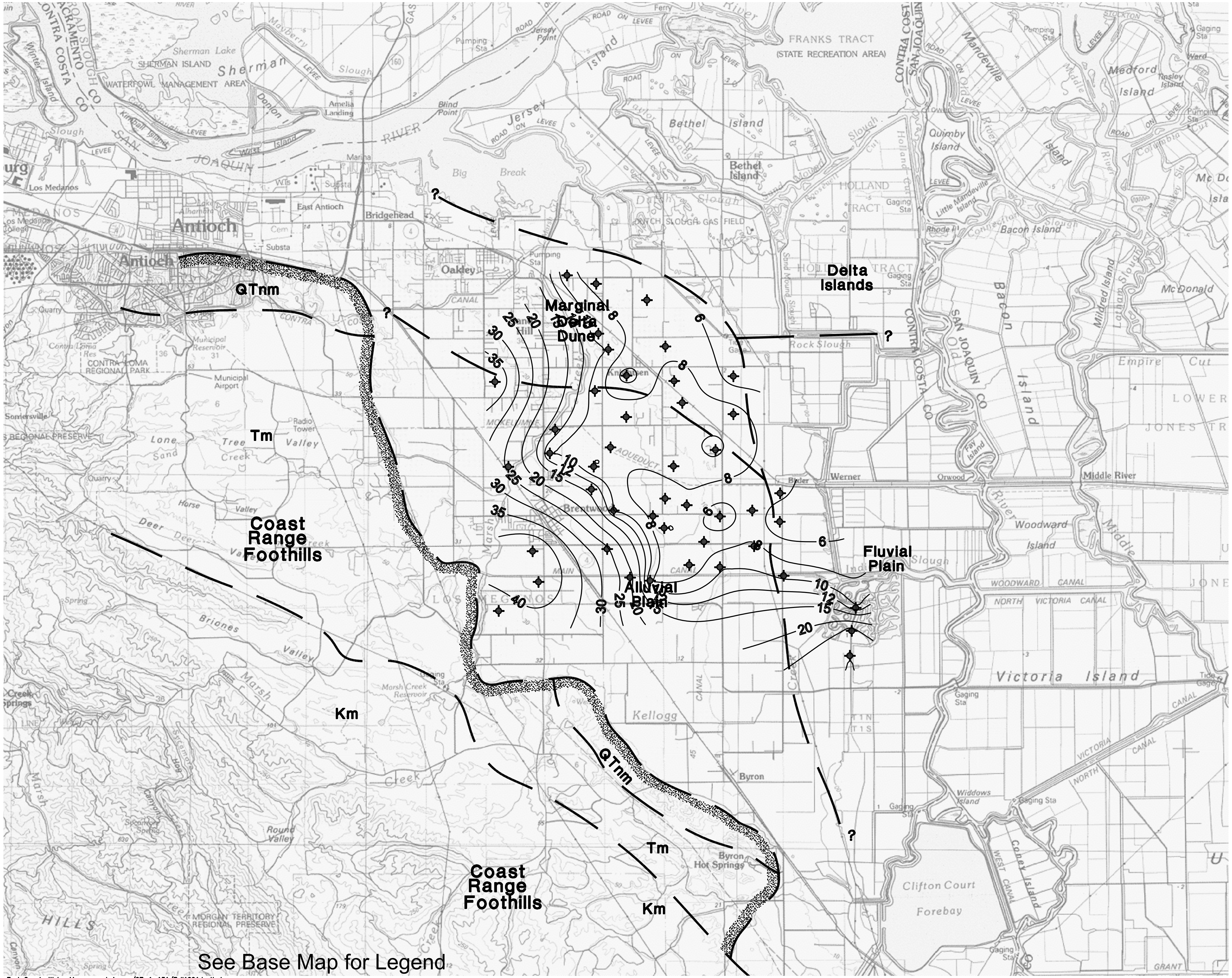
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Contours of Depth to Water - Spring 1991**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Fall1991depth.dwg

LEGEND

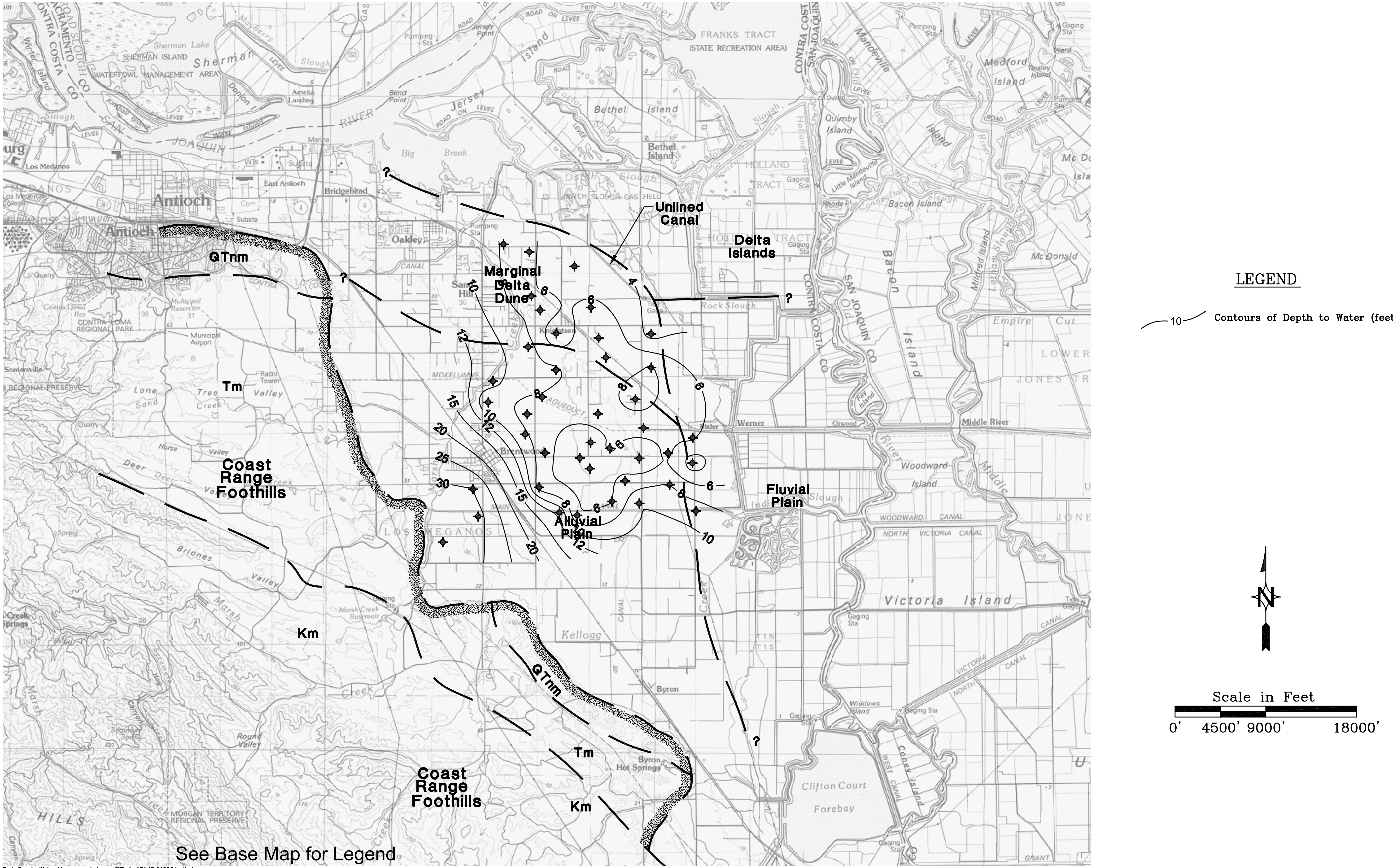
Contours of Depth to Water (feet).

Scale in Feet

0' 4500' 9000' 18000'

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

**Contours of Depth to Water - Fall 1991**
**East County Water Management Association**
**Ground-Water Resources Assessment**

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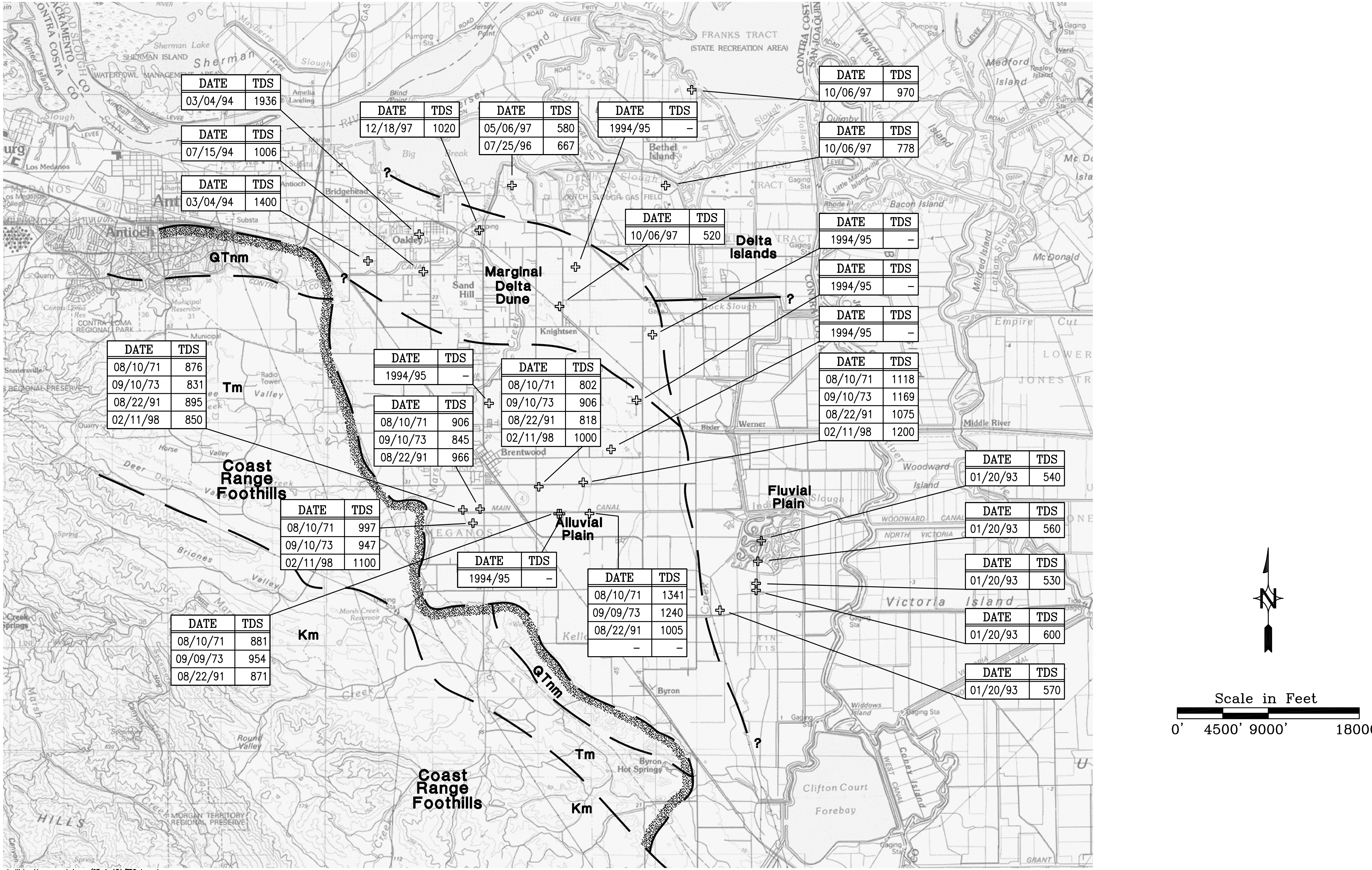
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

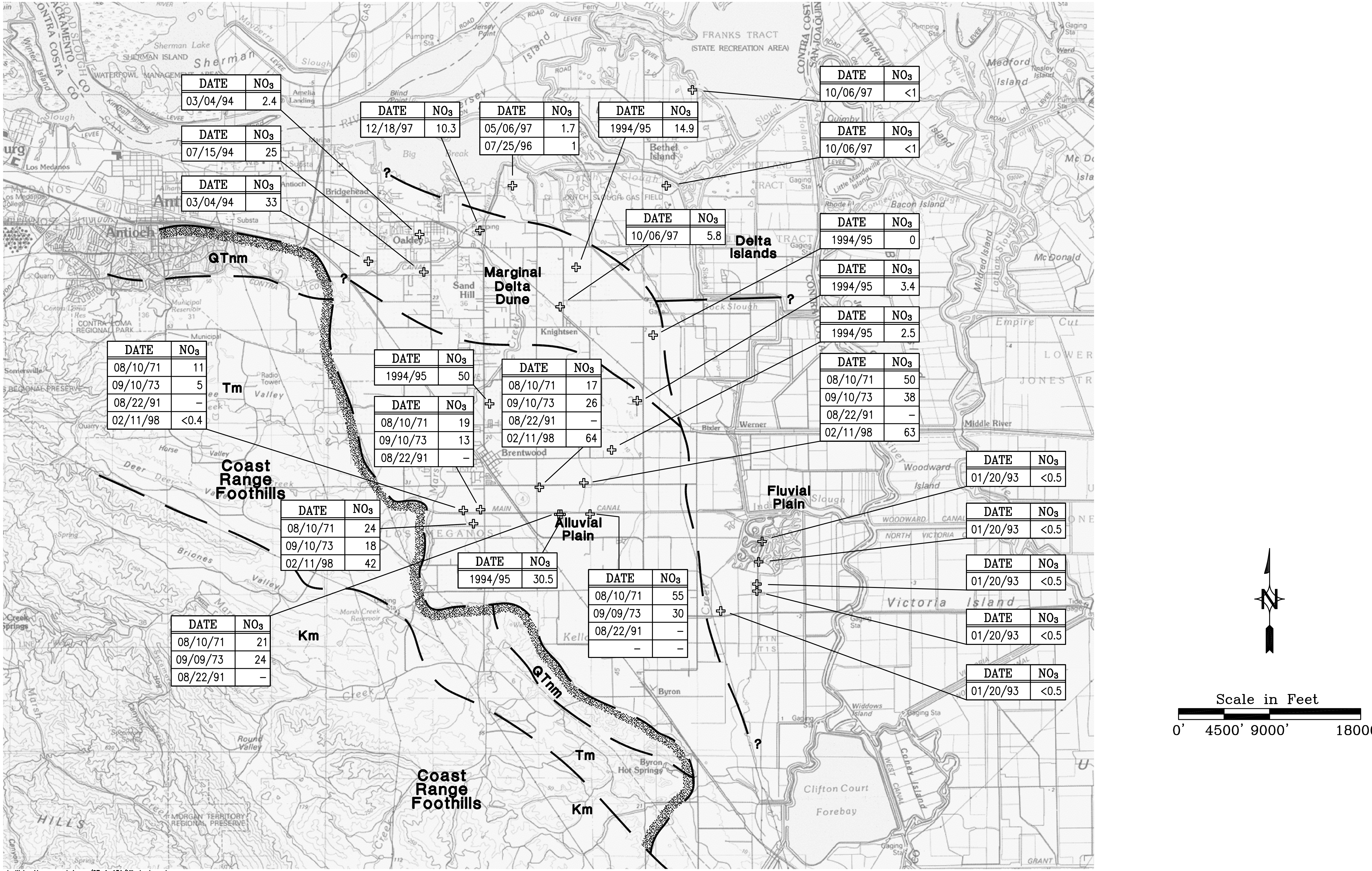
**Contours of Depth to Water - Fall 1996**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/TDS-base.dwg

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

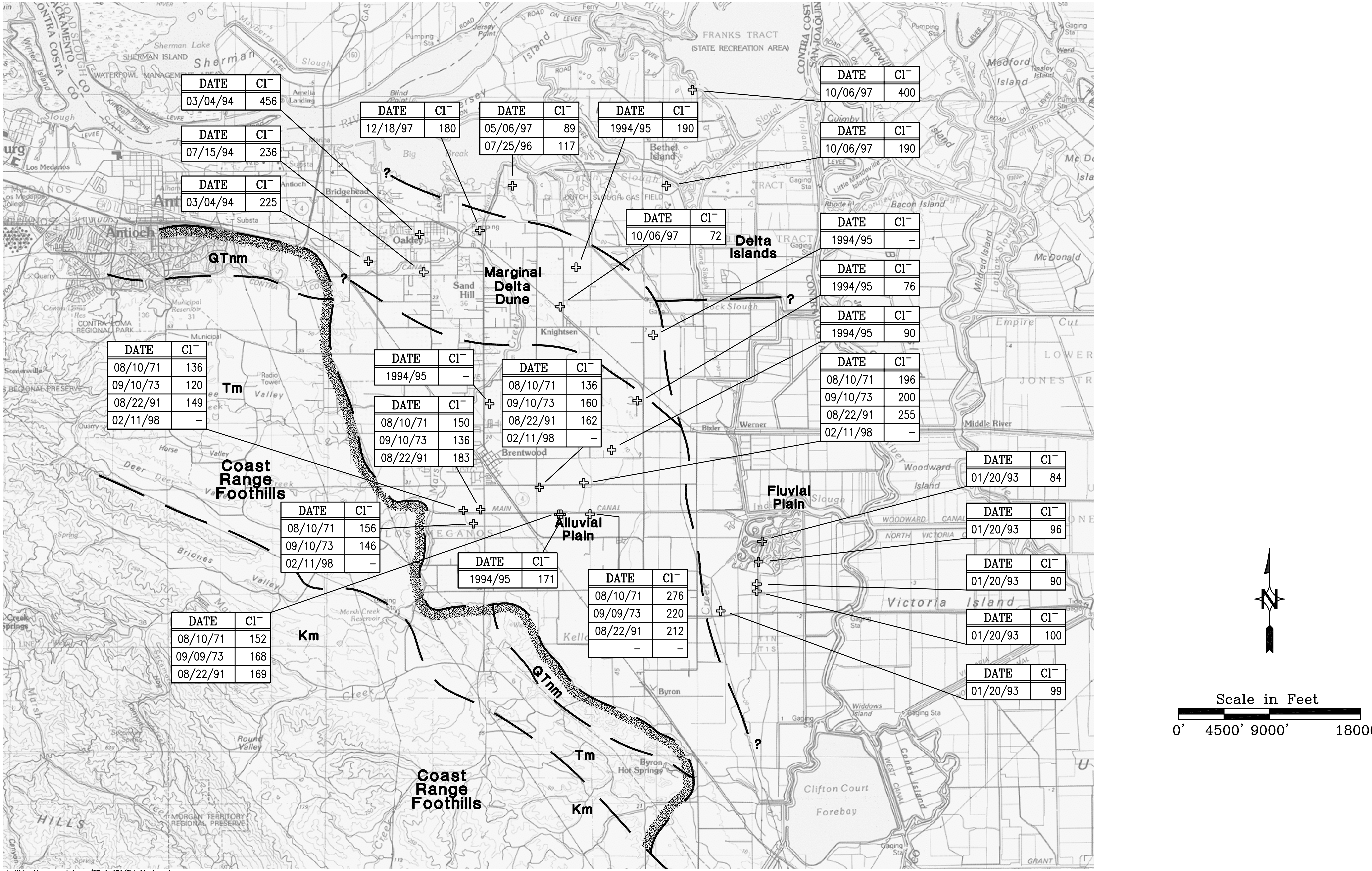
**Water Quality Data for TDS**
**East County Water Management Association**
**Ground-Water Resources Assessment**




East County Water Management Assoc./97-1-131/Nitrate-base.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Water Quality Data for Nitrate**
**East County Water Management Association**
**Ground-Water Resources Assessment**



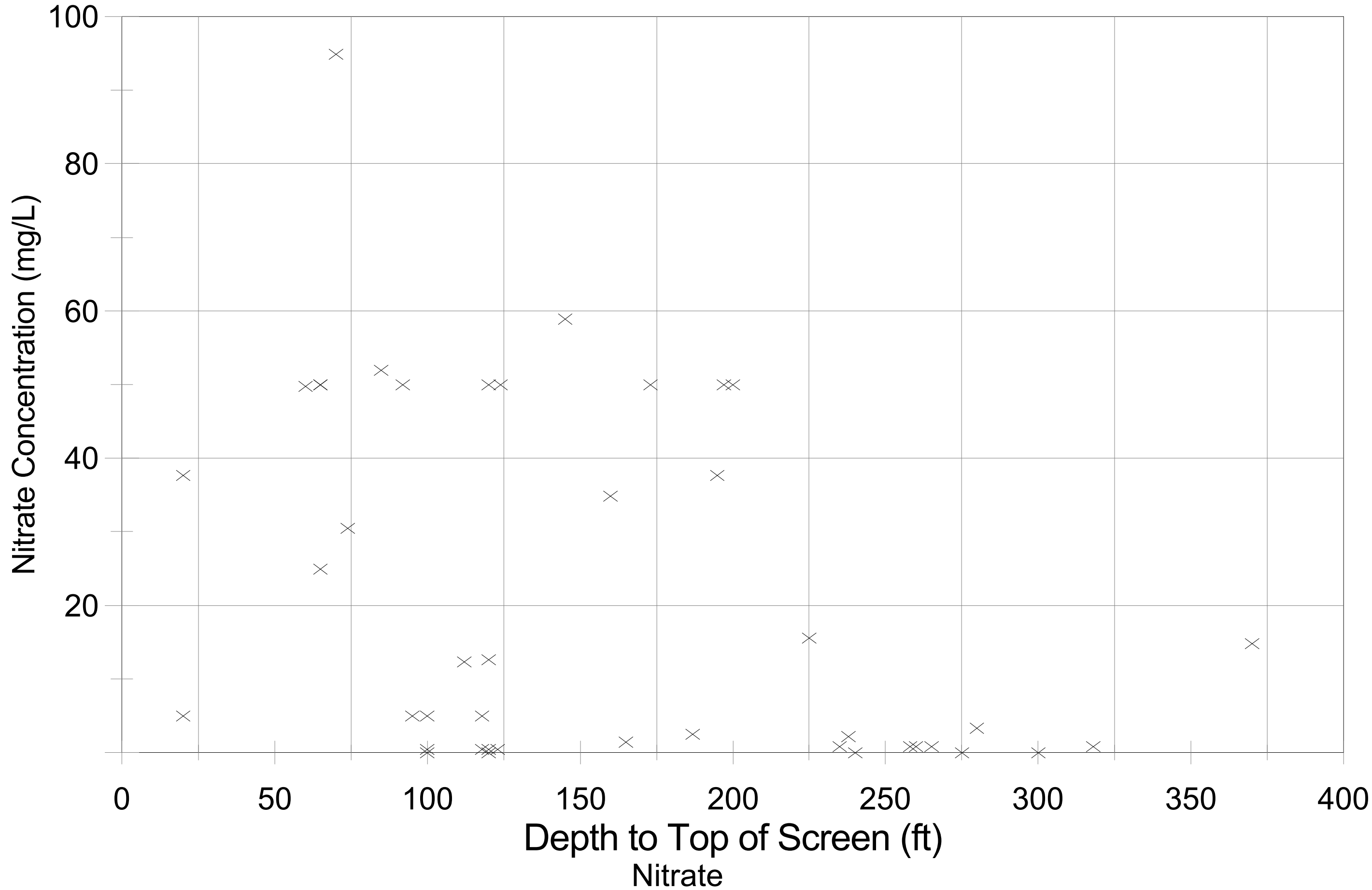

East County Water Management Assoc./97-1-131/Chloride-base.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

**Water Quality Data for Chloride**
**East County Water Management Association**
**Ground-Water Resources Assessment**

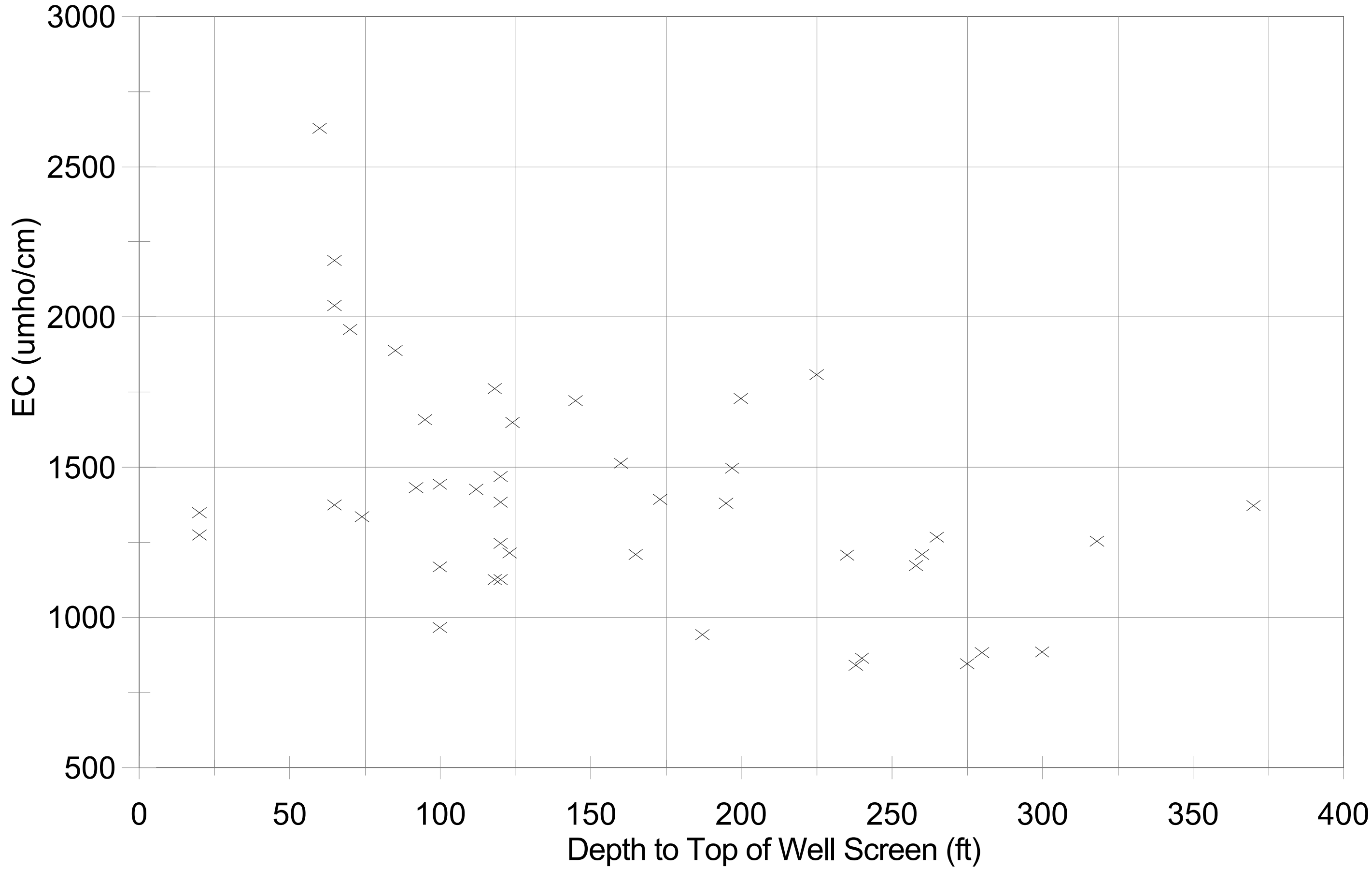
Nitrate Concentration

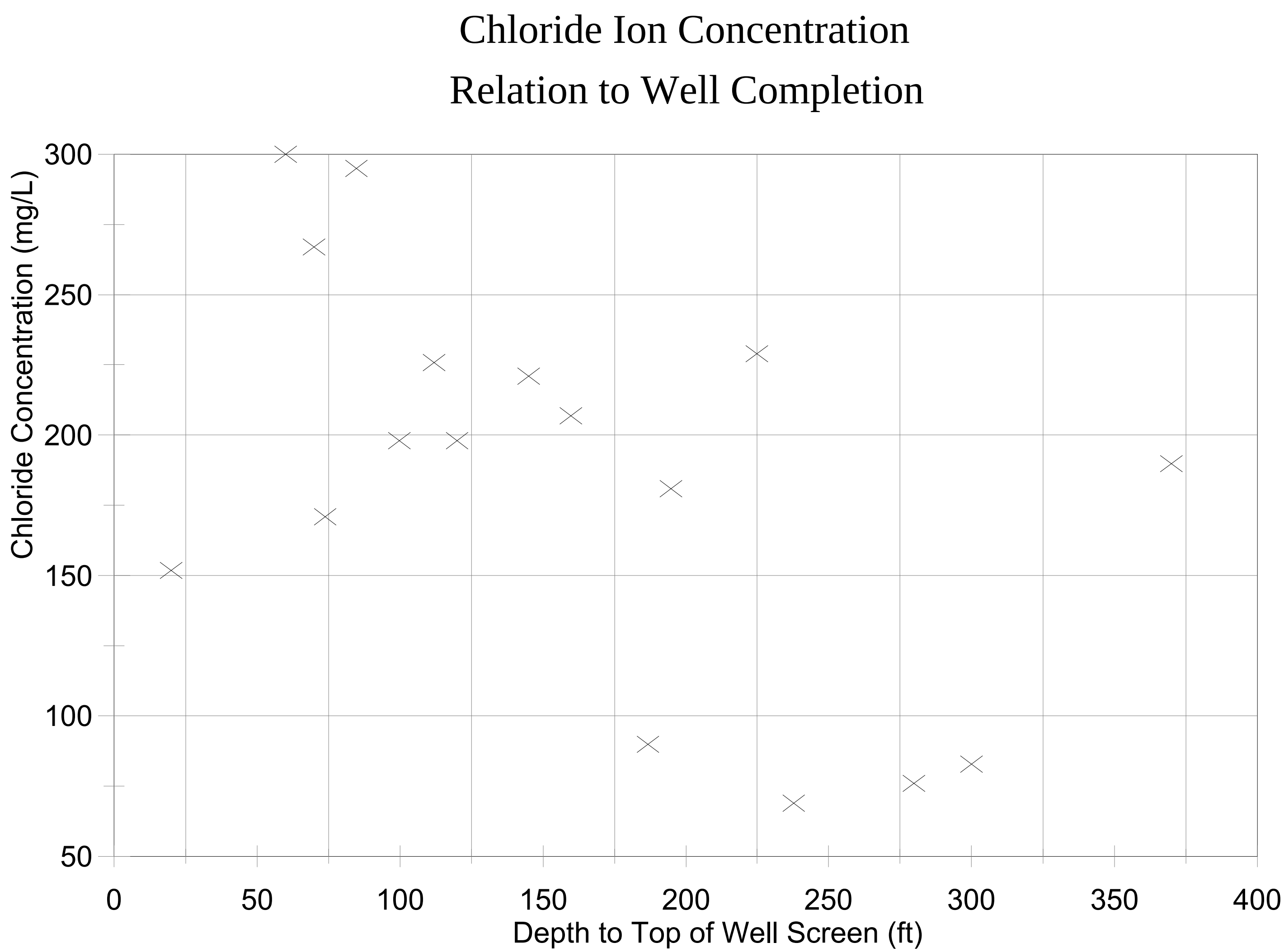
Relation to Well Completion

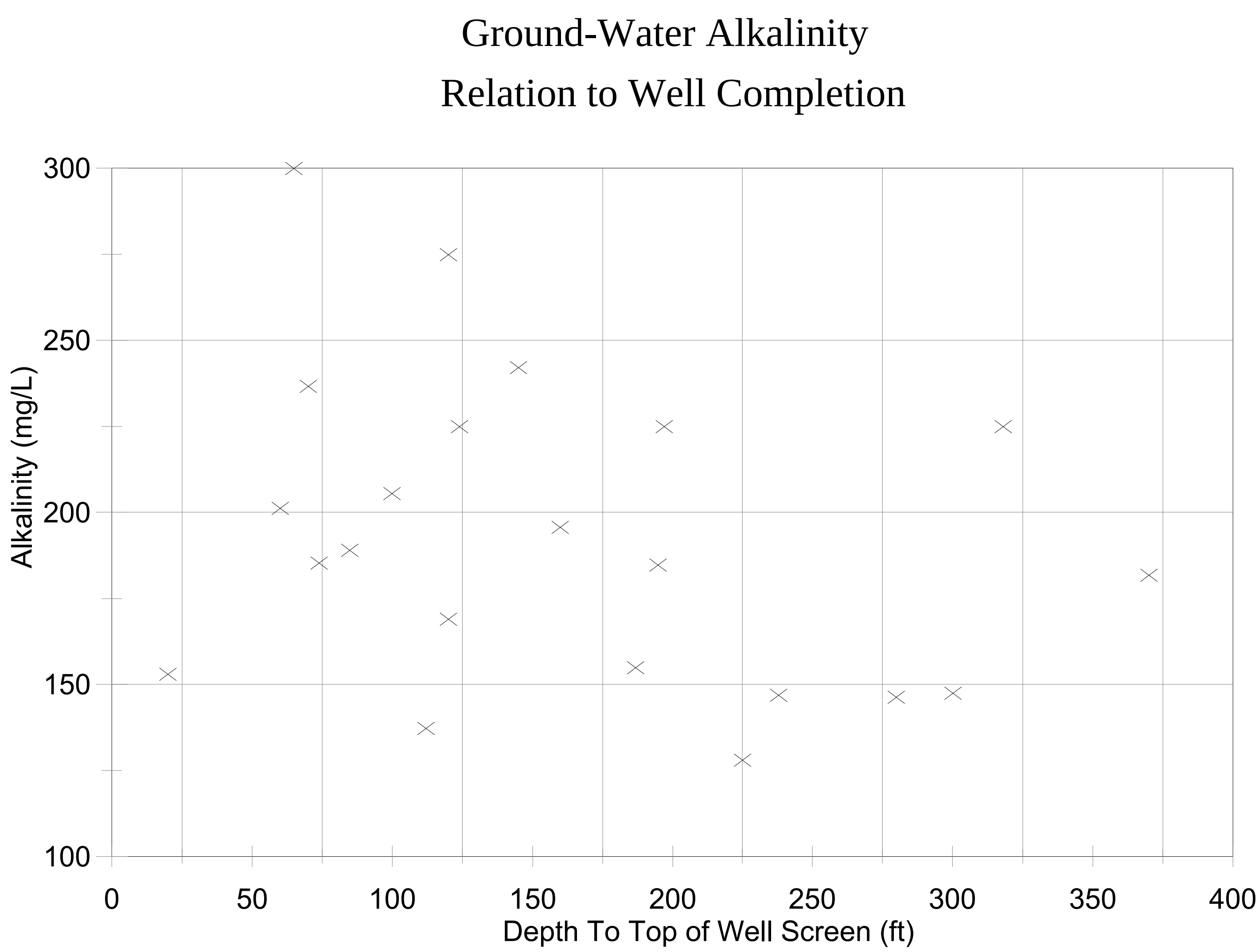


Ground-Water EC

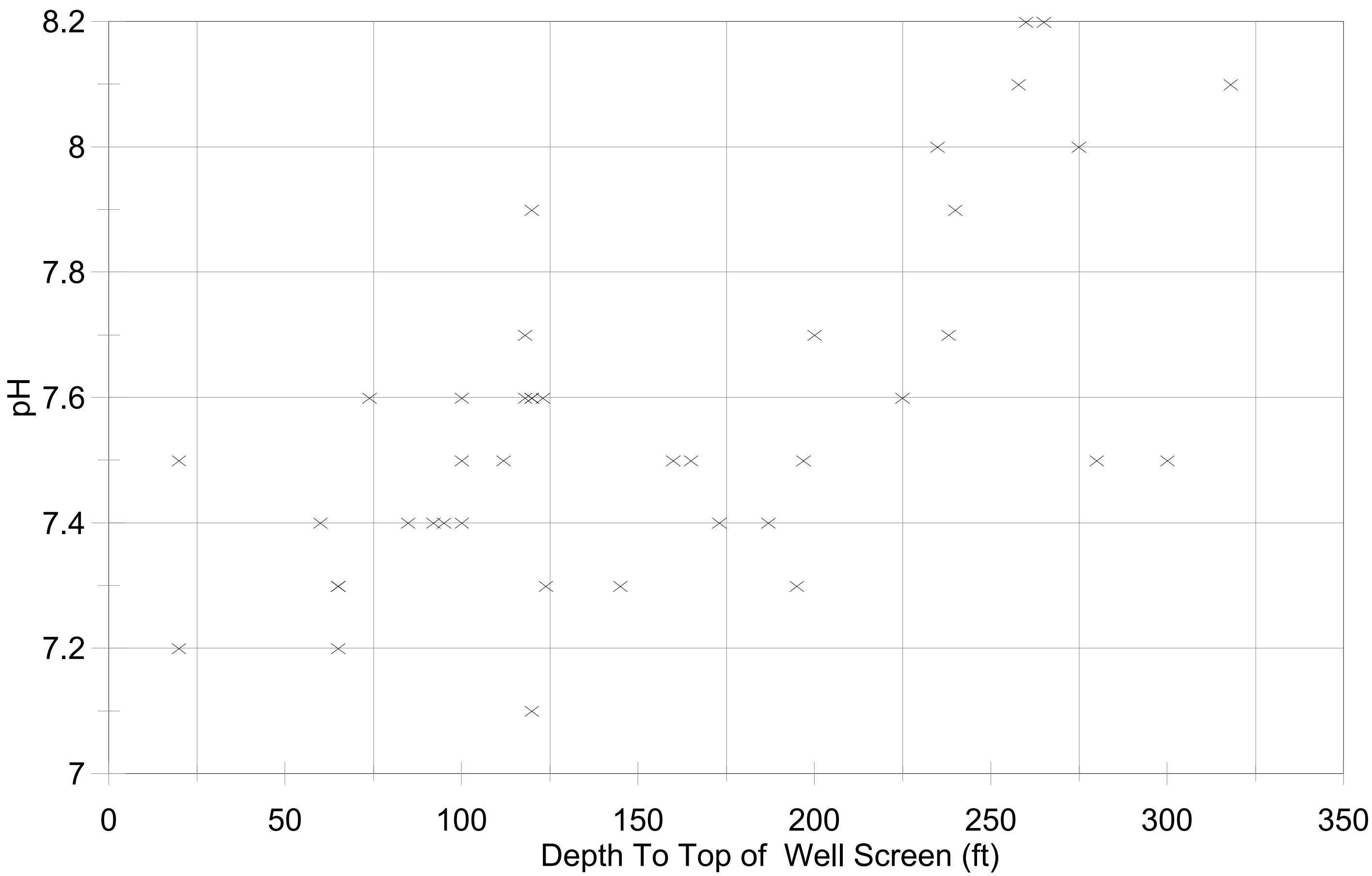
Relation to Well Completion

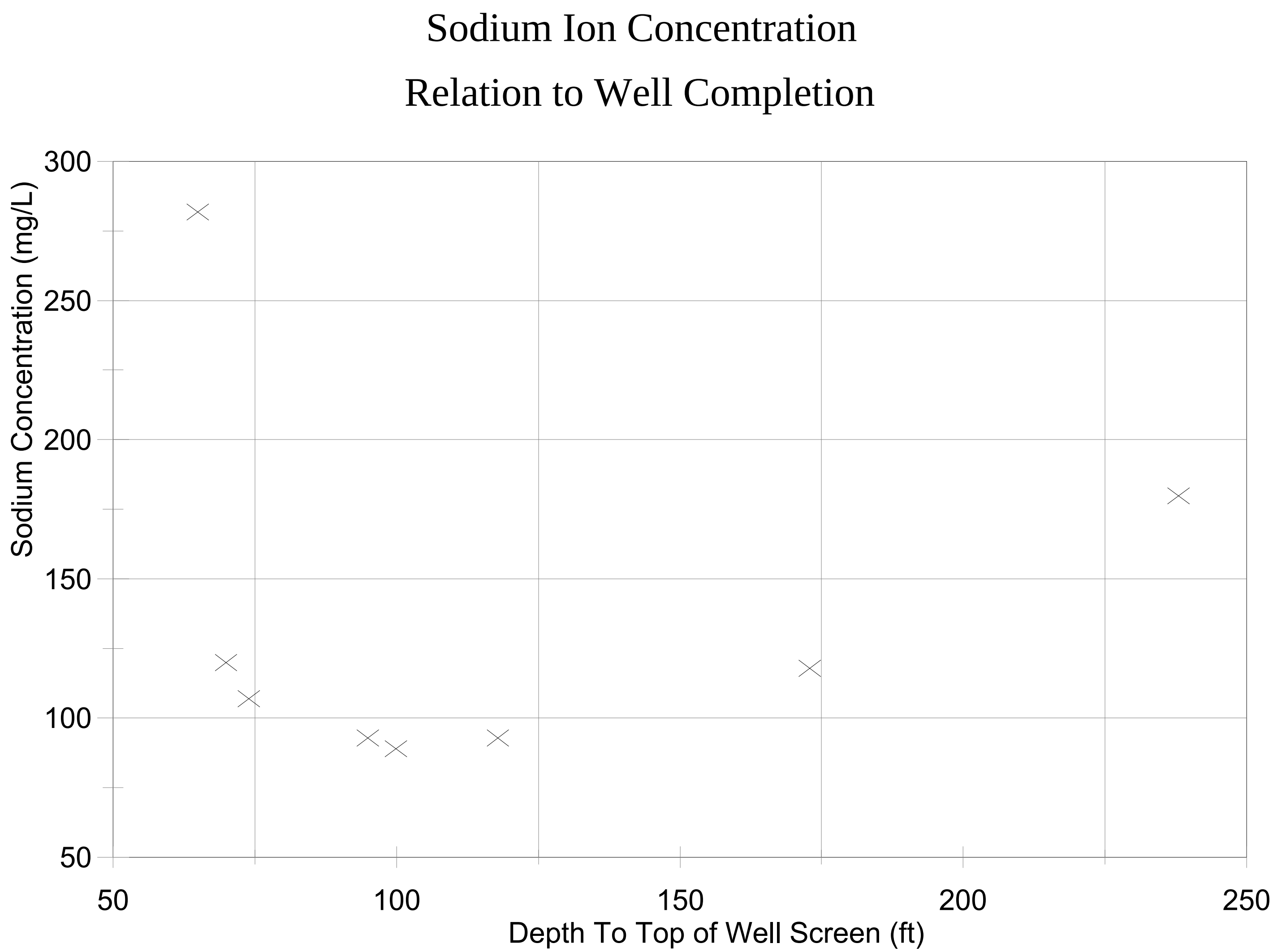



Chloride Ion Concentration
Relation to Well Completion
Chloride Concentration (mg/L)
Depth to Top of Well Screen (ft)
300
250
200
150
100
50
0
50
100
150
200
250
300
350
400


Ground-Water Alkalinity
Relation to Well Completion
300
250
200
150
100
Alkalinity (mg/L)
0
50
100
150
200
250
300
350
400
Depth To Top of Well Screen (ft)

# Ground-Water pH
## Relation to Well Completion




Sodium Ion Concentration
Relation to Well Completion
Sodium Concentration (mg/L)
300
250
200
150
100
50
50
100
150
200
250
Depth To Top of Well Screen (ft)

# APPENDIX 3b

**An Evaluation of Geological Conditions, East Contra Costa County, 2016**

# AN EVALUATION OF GEOLOGIC CONDITIONS

# EAST CONTRA COSTA COUNTY

Prepared for:

East Contra Costa County Agencies

Prepared by:

Luhdorff & Scalmanini, Consulting Engineers, Inc.

March 29, 2016

# AN EVALUATION OF GEOLOGIC CONDITIONS

# EAST CONTRA COSTA COUNTY

Prepared by:

Luhdorff & Scalmanini, Consulting Engineers, Inc.

March 28, 2016

REGISTERED GEOLOGIST
KENNETH W. UTLEY
No. 1268
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

Kenneth W. Utley

# TABLE OF CONTENTS

# 1. INTRODUCTION

This report was prepared for the following local agencies located within the eastern portion of Contra Costa County:

- Byron-Bethany Irrigation District
- City of Brentwood
- Contra Costa County
- Diablo Water District
- East Contra Costa Irrigation District
- Town of Discovery Bay

These agencies authorized and funded the work to develop a fuller understanding of the geologic setting underlying the Contra Costa County portion of the Tracy Groundwater Subbasin (DWR 5-22.15). Other cooperating agenicies included Contra Costa Water District and City of Antioch. The location of the Tracy Subbasin is shown on **Figure 1**.

The work described in this report was also undertaken to better understand differences among three subareas within the Tracy Subbasin, which are shown on **Figure 2**. The subareas are as follows:

1. The portion of the subbasin that occurs within Contra Costa County.
2. The portion of the subbasin that occurs within San Joaquin County north of Old River.
3. The portion of the subbasin that occurs within San Joaquin and Alameda counties south of Old River.

Local agencies in the Tracy Subbasin have engaged in efforts to comply with the 2014 Sustainable Groundwater Management Act (SGMA). The above subareas have been discussed among local agencies as potential boundaries for formation of Groundwater Sustainability Agencies and Groundwater Sustainability Plans. They also represent divisions in previous general water resource planning, including AB3030 Groundwater Management Plans, reflective of variations in groundwater occurrence and availability, and jurisdictional considerations. This report focuses on the geologic history of freshwater sediments from which groundwater is extracted for beneficial uses as defined and regulated under SGMA. The work is intended to provide a basis for hydrogeologic conceptualization of the subbasin and, through its design and approach, to identify connections or distinctions that will aid in the development of Groundwater Sustainability Plans. In accordance with the objectives of the funding agencies, the work was also undertaken to assess any basis for modifying the Tracy Subbasin boundaries to enable more local control over groundwater resources.

# 2. GEOLOGY

The study area for this report is the northwestern portion of the San Joaquin Valley where it merges in the Delta area with the Sacramento Valley of the larger geologic province of the Great Valley (see **Figure 3**). The study area encompasses the eastern portion of the Contra Costa County and western San Joaquin County to south of the City of Tracy. Fresh groundwater is produced for municipal, domestic, and irrigation from underlying unconsolidated alluvial fan and fluvial sedimentary deposits. Much irrigation water is also supplied by surface water from various sloughs and ditches, particularly in the eastern portion of the study area.

## 2.1 Coast Ranges Geology

West of the San Joaquin Valley lies the Coast Ranges geologic province of uplifted, older, highly deformed, and well-consolidated geologic units. The immediate range is termed the Diablo Mountains, but is subdivided here as the Mt. Diablo area north of Livermore Valley, and the southern Diablo range to the south. These areas have had a long history of sedimentary deposition, deformation, and uplift. The geologic units are a record of the plate tectonic evolution of California. The units exposed in the Mt. Diablo Mountains extend eastward below the San Joaquin valley at great depths. These units are divided into three broad categories: the Mesozoic Great Valley Sequence, the Tertiary (Paleogene) sedimentary rocks, and the late Tertiary (Neogene) sedimentary rocks. These exposures in the Diablo Mountains are shown on **Plate 1**.

Regional geologic relationships are best seen on the San Francisco-San Jose Quadrangle map (Wagner and others, 1990). Numerous more detailed geologic maps and reports cover the area. The most accessible detailed maps are by T.W. Dibble, Jr. from the Dibblee Foundation series and which were used in preparing this report. Reports summarizing the geologic history include the classic Hackel (1966), and the more recent Bartow (1991), which is the main source for this report.

## 2.2 Mesozoic Great Valley Sequence

The Mesozoic (pre-65 million years (m.y.)) Great Valley Sequence consists of deep water marine sedimentary deposits grading eastward into shallow marine and deltaic deposits. These units were deposited in the forearc basin in the convergent plate tectonic setting of the subduction of the Pacific Plate below the North American Plate. The Andes-like volcanics to the east in the Sierra Nevada area was the source of the sediment carried into the forearc basin. The Great Valley Sequence occurs in the Mt. Diablo area and the southern Diablo range, and underlies younger deposits below the San Joaquin Valley.

In the Mesozoic of the northwestern San Joaquin Valley area, a structural element formed that influenced depositional patterns for a long period of geologic time. The Stockton Fault appears to be initially a down-thrown to the south normal fault with greater thickness of the Great Valley Sequence to the south. The cause of the Stockton Fault is not clear from a tectonic framework, and different theories have been proposed (Bartow, 1991). Subsequent activity on the fault shows opposite movement as a reverse fault with down to the north relative motions.

## 2.3 Tertiary-Paleogene Sedimentary Rocks

Beginning in the early Tertiary, the plate tectonic configuration began to change as plate subduction angles altered, and the change to a transform boundary of the ultimate San Andreas Fault system began to evolve. During much of the Paleogene (about 59 to 23 m.y.), the San Joaquin Valley and Coast Ranges were dominated by alternating sequences of marine inundations of shallow marine deposits and periods of non-marine sequences (Bartow, 1991). Even during deposition of non-marine sequences, marine deposition continued north of the Stockton Fault and in the southern San Joaquin Valley.

The Paleogene sedimentary rocks are exposed on the northern edge of the Mt. Diablo area, west of the City of Brentwood (see **Plate 1**). These deposits are largely marine sandstones and shales, and their exposure pattern may reflect the Sherman Island and Midlands Faults. The units extend below the Valley floor north of the Stockton Fault.

During the Tertiary Period, the Stockton Fault assumed a down to the north reverse fault movement. On the uplifted southern side of the fault, the Paleogene sedimentary units are absent for 20 miles or more to the south (Bartow, 1985; 1991). This area is identified as the Stockton Arch where the Paleogene rocks were never deposited or removed by erosion. South of the Stockton Arch, marine conditions also continued interrupted by non-marine periods. By the end of the Paleogene, the marine conditions persisted in the south valley. Drainage from the Sierra region appears to be to the south (Bartow, 1991). Exposures of the Paleogene rocks are not present to south of the southern Diablo range, along the western San Joaquin Valley, but are present below the valley south of the Stockton Arch.

## 2.4 Late Tertiary-Neogene Units

In the Neogene, plate tectonics evolution was dominated by the northward migration of the triple junction plate boundary as the strike-slip fault system of San Andreas Fault zone formed. East of the fault zone, elements of the Coast Range were deformed and uplifted to positive elements. At times, these deformations yielded sediment into the San Joaquin Valley. The Stockton Fault movement appears to have ended in the early Neogene with total reverse offset of about 10,000 feet. The Stockton Arch may have acted as a positive element as Bartow (1991) shows the area as a divide between drainage to the Sacramento Valley to the north and to the south to the marine embayment in the San Joaquin Valley. North of the Stockton Arch, shallow marine conditions also persisted, including at times, across the Mt. Diablo area, until at least 9 m.y.

The earliest Neogene (Miocene 23 to 5.3 m.y.) units exposed along the northern edge of Mt. Diablo area are shallow marine transitioning to non-marine. Further south, exposures are more limited until a larger area wraps around south of Mt. Diablo area towards the Livermore valley (see **Plate 1**). The units tend to be predominated by sandstone to pebbly sandstones.

In the younger Neogene (Pliocene 5.3 to 2.5 m.y.), the San Andreas Fault system was well established and deformation and uplift of the Coast Range to the east was occurring. Sierra Nevada drainages appear to continue to the remaining southern San Joaquin Valley marine embayment (Bartow, 1991). The exposures of these younger Neogene units overlie the older Neogene units around the Mt. Diablo area and southern Diablo range. Where exposed, the unit is dominated by pebbly sandstone to the north and conglomerate/sandstones to the south. These appear to be sourced from the uplifted Coast Range elements and deposited by alluvial fans.

Both the older and younger Neogene units extend eastward beneath the northern San Joaquin Valley, but are poorly understood even from deep oil and gas well logs. Part of the cause of this is that the state Division of Oil and Gas field classification designates post-Paleogene units as undifferentiated non-marine units. Gas fields in western San Joaquin County indicate 3,000 to 4,000 feet of post-Paleogene units, but includes younger Quaternary units. Electric logs tend to show the Neogene units are dominated by monotonous sequence of fine-grained sediment of sandy claystones and mudstones with few sand beds. The units also appear to contain at best brackish to saline water, although it is difficult to define base of fresh water without interbedded sand beds.

By the end of the Neogene, movement along the San Andreas Fault system had isolated the southern San Joaquin marine embayment from the ocean (Bartow, 1991). The impounded water probably transformed into brackish- to fresh-water lakes. Drainage in the San Joaquin Valley continued to flow southward towards the subsiding lake basin area. Drainage from the lakes appears to have flowed from the basin across the San Andreas Fault to the Salinas Valley and Monterey Bay area. To the north of the Stockton Arch, area drainage in the Sacramento Valley appears to continue to drainage westward north of the Mt. Diablo area.

# 3. QUATERNARY GEOLOGIC HISTORY

The youngest geologic unit in the San Joaquin Valley area is the Quaternary (2.5 m.y. to present) unconsolidated sedimentary units of sand, gravel, silt and clay that cover the valley floor. Most of these deposits are probably of the longer, older Pleistocene Epoch (2.5 to 0.01 m.y.), the Great ice Age when alpine ice fields and glaciers occurred along the summit of the Sierra Nevada. High runoff and sediment yield from the Sierra Nevada appears to continue to largely drain to the lakes in southern San Joaquin Valley. Drainage out of the lakes may have persisted across the San Andreas Fault system to the Salinas valley for at least the older Pleistocene.

The plate tectonic configuration of the San Andreas Fault was well formed in the Pleistocene. The Diablo ranges continued to be uplifted as shown by the deformed Neogene units around the Mt. Diablo area (see **Plate 1**). The westward tilting of the Sierra Nevada block begun in the Pliocene also continued in the Quaternary. From these uplifted areas, smaller stream drainages formed alluvial fans off the Diablo Mountains into the valley. Larger drainages from the Sierra Nevada formed broad alluvial-fluvial plains from the east. In the center of the valley, low gradient stream channels and flood plains were formed, flowing southward to the southern lakes.

Just prior to about 600,000 years before present, a large lake termed the Corcoran Lake flooded nearly all the San Joaquin Valley northward to the Tracy area. A widespread blue lake clay was deposited across the San Joaquin Valley known as the Corcoran Clay, or E-clay. This clay has not been identified further north into the Delta area of Contra Costa County, or in the Sacramento Valley. The cause of the formation of the Corcoran Lake, and smaller subsequent lakes, is not clear. Possibilities include that the San Andreas Fault system blocked the western drainage outlet of the lakes in the south, at least for brief periods. Alternatively, higher runoff due to climatic conditions may have been the principal cause that formed the lakes.

The northern extent of the Corcoran Lake, including the deposition of the E-Clay, appears to have been in the Stockton-Tracy area. The cause of this is not clear. An alluvial fan dam across the valley (Atwater, 1986) or a structural-caused drainage divide by differential subsidence between the north and south across the Stockton Arch may explain the northernmost extent. Other possible causes could be structural blockage of the drainage out of the Sacramento Valley or regional tilting of the northern San Joaquin Valley.

It is tempting to suggest that the high base-level of the Corcoran Lake disrupted drainage patterns in the San Joaquin Valley. Possible subsequent opening of a shorter drainage pattern of the Sacramento River across the San Francisco Bay area, caused San Joaquin drainage to be diverted to the Delta area, until the drainage pattern of northward flowing San Joaquin River developed through the remainder of the Pleistocene.

# 4. GROUNDWATER HYDROLOGY

The groundwater hydrology of the northwestern San Joaquin Valley area that is the focus of this report is relatively poorly known. The reasons of this are multifold. Groundwater usage is limited to eastern Contra Costa County and the Tracy area to the south. Under most of western San Joaquin County in the Delta, few groundwater wells exist as surface water is the source for irrigation use within delta islands. Fresh groundwater aquifers are limited to relatively shallow depths of 500 to 700 feet in the Contra Costa County area, and to 1,600 feet in the Tracy area. Oil and gas electric logs indicate that at greater depths fine-grained clays and mudstones with very few sand beds occur, and contain saline to brackish water. Some saline waters at shallow depths above the fresh water bearing sands have been found along the trend of the Old River channel.

Hydrogeologic studies have tended to cover areas in the Sacramento Valley north or east of the Delta area. In the San Joaquin Valley, studies have covered areas on the west side of the valley studies have covered areas from Tracy south (Hotchkiss and Balding, 1971) and on the east side of the valley south of the Stanislaus River (Page and Balding, 1973). Even regional studies tend to have little information for the northwestern San Joaquin Valley area (Page, 1986).

Luhdorff & Scalmanini (1999) performed a study of eastern Contra Costa County groundwater for five local water agencies. The focus of the study was the uppermost 500 feet in which most water wells were completed. A depositional facies model was developed from examination of over 500 well logs that were used to assess sand bed characteristics and their extent. The facies consisted of a fluvial plain grading into a delta island area in the north. This was bound to the west by a marginal delta dunes area. An alluvial plain area extends and thins westward to the older geologic units exposed in the Mt. Diablo area. This depositional model was incorporated into an AB3030 Groundwater Management Plan covering the sphere of influence for Diablo Water District, an Environmental Impact Report for conjunctive use wells by Diablo Water District, and a water master plan for Town of Discovery Bay.

Electric logs from Oil and Gas were also examined for the nature of geologic units at greater depths. The top of the electric logs tend to be at 800 feet or greater depths. These logs generally show fine-grained geologic units with few sand beds. The depth to base of fresh water is difficult to discern in available electric logs because of the lack of sand beds. In the 1999 study of groundwater hydrology in eastern Contra Costa County, the base of fresh water was not systematically mapped. The base of freshwater has been mapped previously in the general area by Page (1971) and Berkstresser (1973).

Most groundwater studies in the westerns San Joaquin County have been centered on the Tracy area. The Tracy Regional Groundwater Management Plan (GEI, 2007) and a related hydrogeologic assessment (GEI, 2007) were reviewed for the geologic cross-sections and interpretations. These reports characterized groundwater wells in the immediate Tracy area, and additional review of these wells was not attempted for the present study.

For the present study, a systematic map of the base fresh water aquifers in the area using electric logs for oil and gas wells obtained through the state Division of Oil, Gas & Geothermal Resources website was developed (see **Plate 1**). As mentioned previously, depths to the top of most logs and the fine-grained character of the sedimentary units below 700 feet were limitations in the north. Selection of logs to review was based on the top of the log being less than 1,000 feet in depth. Base of fresh water aquifers was based on thick sand beds with high resistivity values and the character of the self-potential response on the electric logs. Deeper sandy units, probably sandy clays or mudstones, with low resistivity values and indeterminable self-potential characteristics were considered to be non-viable as aquifers.

The elevation of the base of freshwater aquifers determined from oil and gas logs were plotted on a base map (see **Plate 1**) and manually contoured. Contour lines of one hundred feet were drawn, but is variable based on well control. The resulting map is a hydrostratigraphic map based on the nature of the bed (sand and/or gravel) and containing fresh water. The determined beds at each location should not be considered, in general, as lithostratigraphic equivalent (i.e., connected to other beds in different wells across the map), or necessarily time-stratigraphic equivalent (i.e., of the same geologic age). For example, the beds defining the deepest areas on the map are probably not connected or time equivalent to beds at much shallower depths to the east or west. The resultant map represents the most detailed examination of base of fresh water in the north San Joaquin Valley study area.

### 4.1 Brentwood Area

In the Brentwood area, the depth of freshwater aquifer descends eastward from the edge of the valley. The deepest area occurs near the Contra Costa County line to -1,200 feet. Further east the depth of freshwater aquifer rises to -600 feet. Several gas fields are shown further east (see **Plate 1**) which show base of fresh water as 100 feet depth or less (California Division of Oil & Gas, April 1983). However it is not known exactly how these values were determined.

### 4.2 Tracy Area

In the Tracy area, the depth of freshwater aquifer descends eastward from the edge of the valley. A larger, deeper depression occurs beneath the City of Tracy to depths of -1,600 feet. This depression appears to bend and extend eastward roughly along the trend of the Stockton Fault (see **Plate 1**). Further east the depth of freshwater aquifer rises to -500 to -600 feet elevation. The Lathrop Gas field lists the base of freshwater at a depth of 300 feet, though the method of determination is not evident.

### 4.3 Clifton Court Area

The base of freshwater determined for the Brentwood and Tracy areas are generally are similar to published base of fresh water by Page (1971) and Berkstresser (1973). Between these two areas, is termed the Clifton Court area. Although well control is relatively sparse in this area, anomalously shallow elevations of base of freshwater occur further east. Contouring of the area shows a possible ridge-like extension eastward from the edge of the valley. Further eastward, depths of the base of freshwater decline to -800 feet to -900 feet elevation and extend eastward, then rises to the east to -600 feet elevation. The maximum low across the Clifton Court area appears to be 300 feet shallower in the Brentwood area (-1,200 feet elevation), and possibly 700 feet shallower than in the Tracy area (-1,600 feet elevation). If this interpretation of a ridge-like feature is correct, the cause is not clear. It may be a possible fault uplift or deformation on the south side of the Vernalis fault. The age of the Vernalis Fault is not well known (Bartow, 1991), but it is at least Neogene (Miocene to Pliocene?) and may be younger (Quaternary?). No surface expression has been noted to the fault and if this configuration exists, it may influence groundwater flow around the ridge, or at least impede any northwest flow from the south at depths below -400 feet elevation.

## 5. CONCLUSIONS

The geologic history of the northwestern San Joaquin Valley as described in this report provides a framework for hydrogeologic conceptualization of the Tracy Groundwater Subbasin. Key features of the geologic history are reflected in exposures of Mesozoic Great Valley Sequence, and Tertiary and late Tertiary sedimentary rocks in the Diablo Mountains. These rocks represent the western boundary of the Tracy Subbasin.

While the interpreted geologic history consists of multiple possible explanations for certain features, the rocks in the Mt. Diablo range north of Livermore Valley and the southern Diablo range reflect distinctions between the northern and southern portions of the groundwater subbasin including variations in the base of fresh water. Additionally, the apparent northern extent of the Quaternary Corcoran Lake has implications in groundwater hydrology, particularly through the occurrence of the Corcoran Clay. The Corcoran Clay is prominent as a demarcation between the primary upper and lower freshwater aquifer sequences of the San Joaquin Valley and affects vertical groundwater moment including recharge, demarcates water quality boundaries, and it is an important factor in well construction standards throughout the San Joaquin Valley. The absence of the Corcoran Clay in the Contra Costa County subarea reflects a distinction in the hydrogeology across the Tracy Subbasin that is recognized locally and should be reflected in the development of groundwater conceptualizations for the subbasin.

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Figures

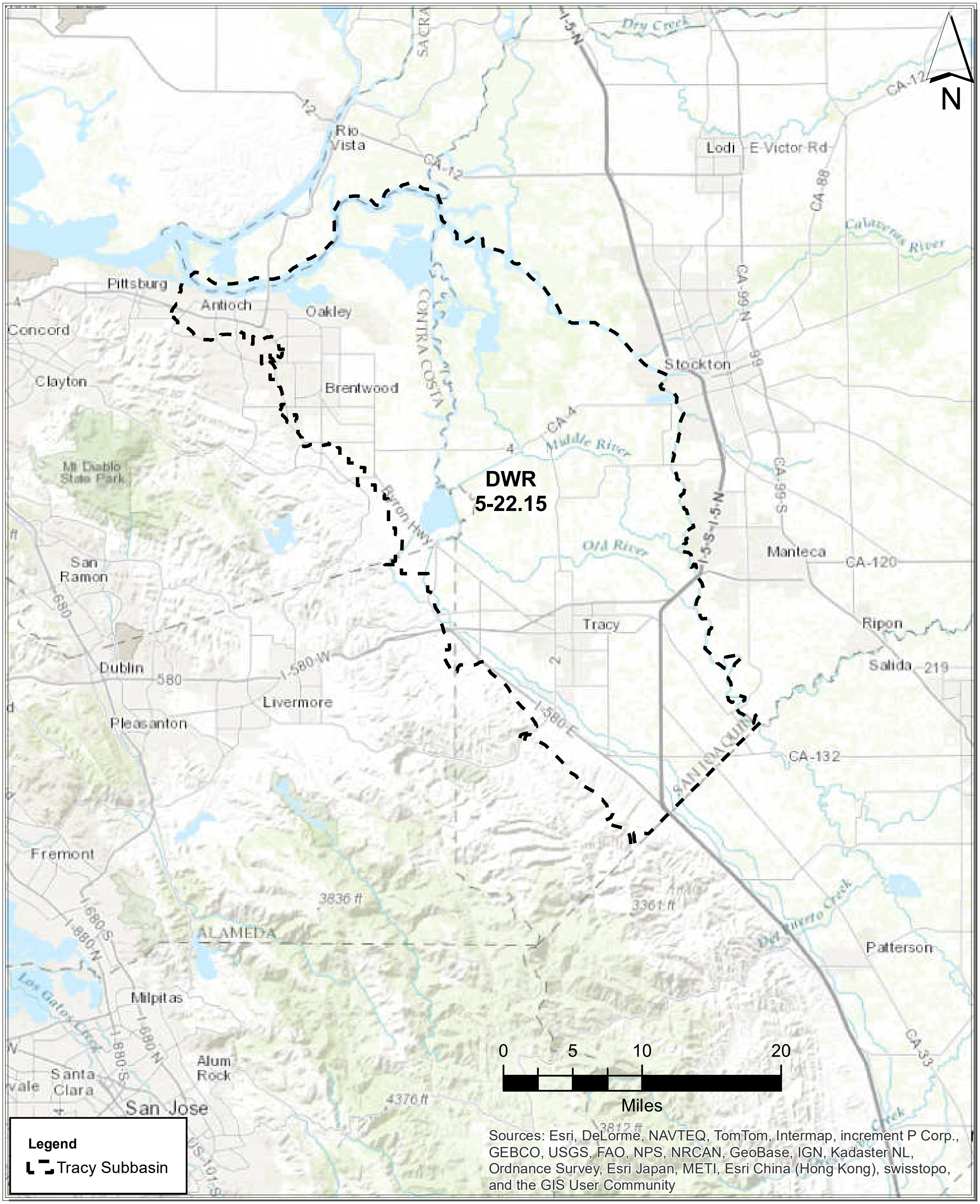


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**Figure 1**
**Location Map**
**Tracy Subbasin**

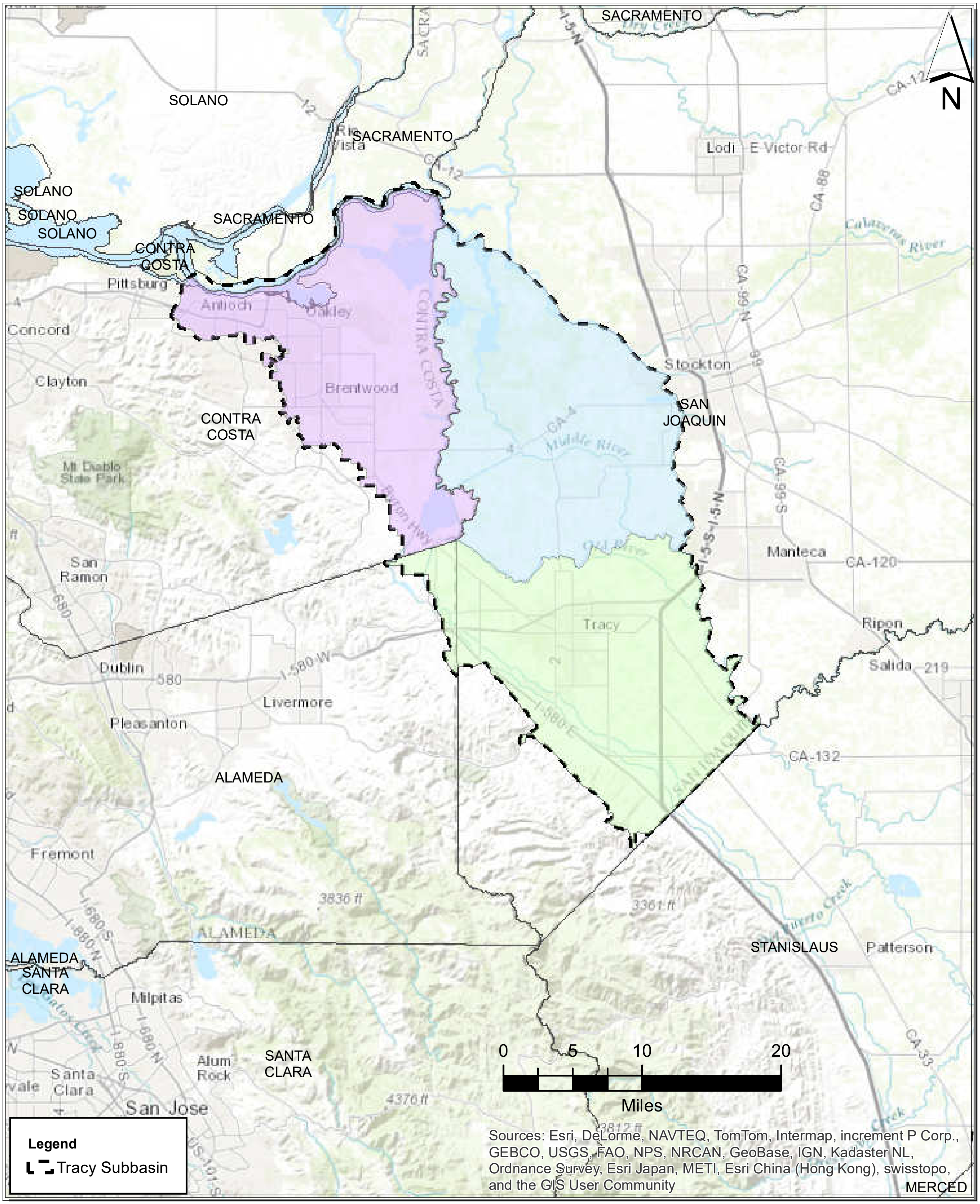


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**Figure 2**
**Location Map**
**Tracy Subbasin Subareas**

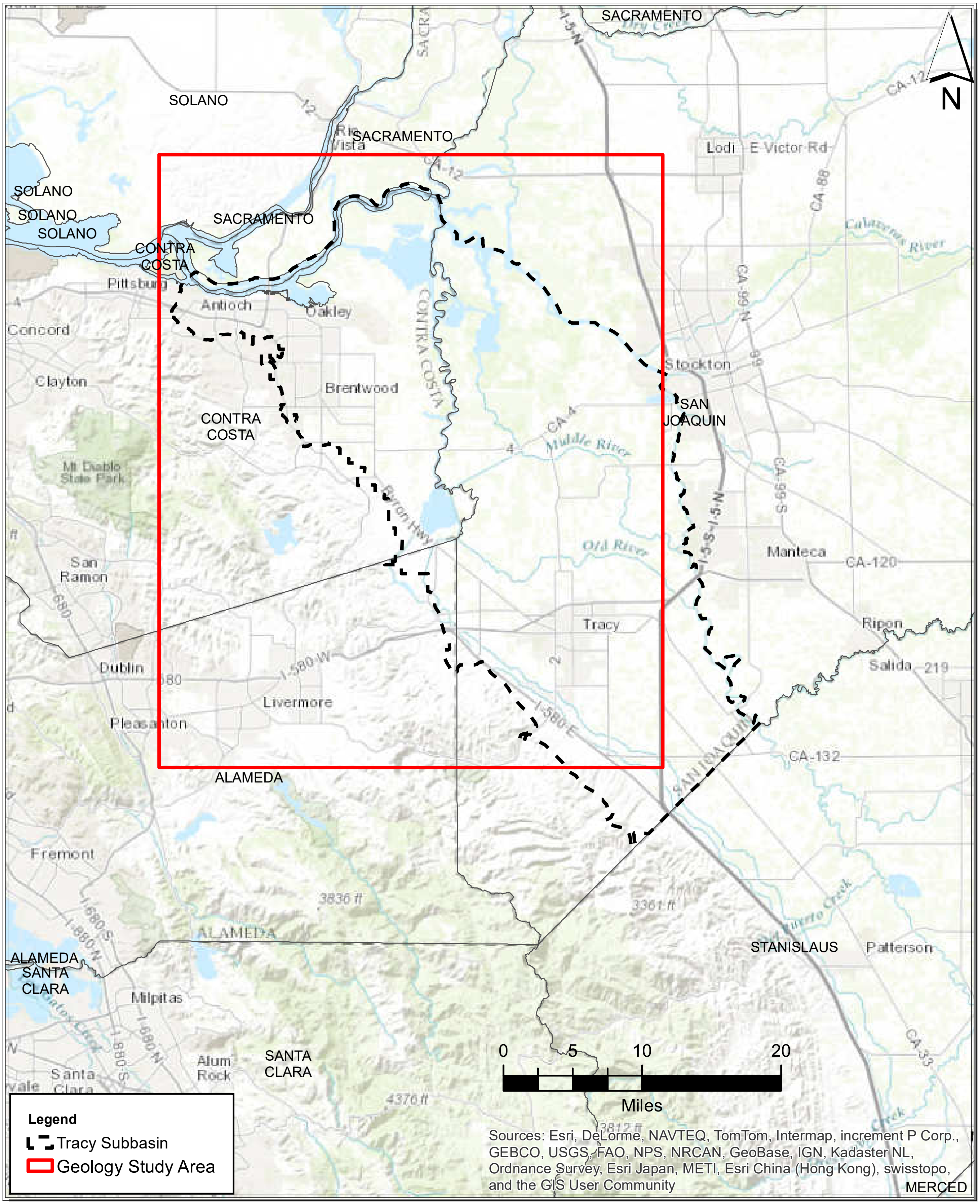


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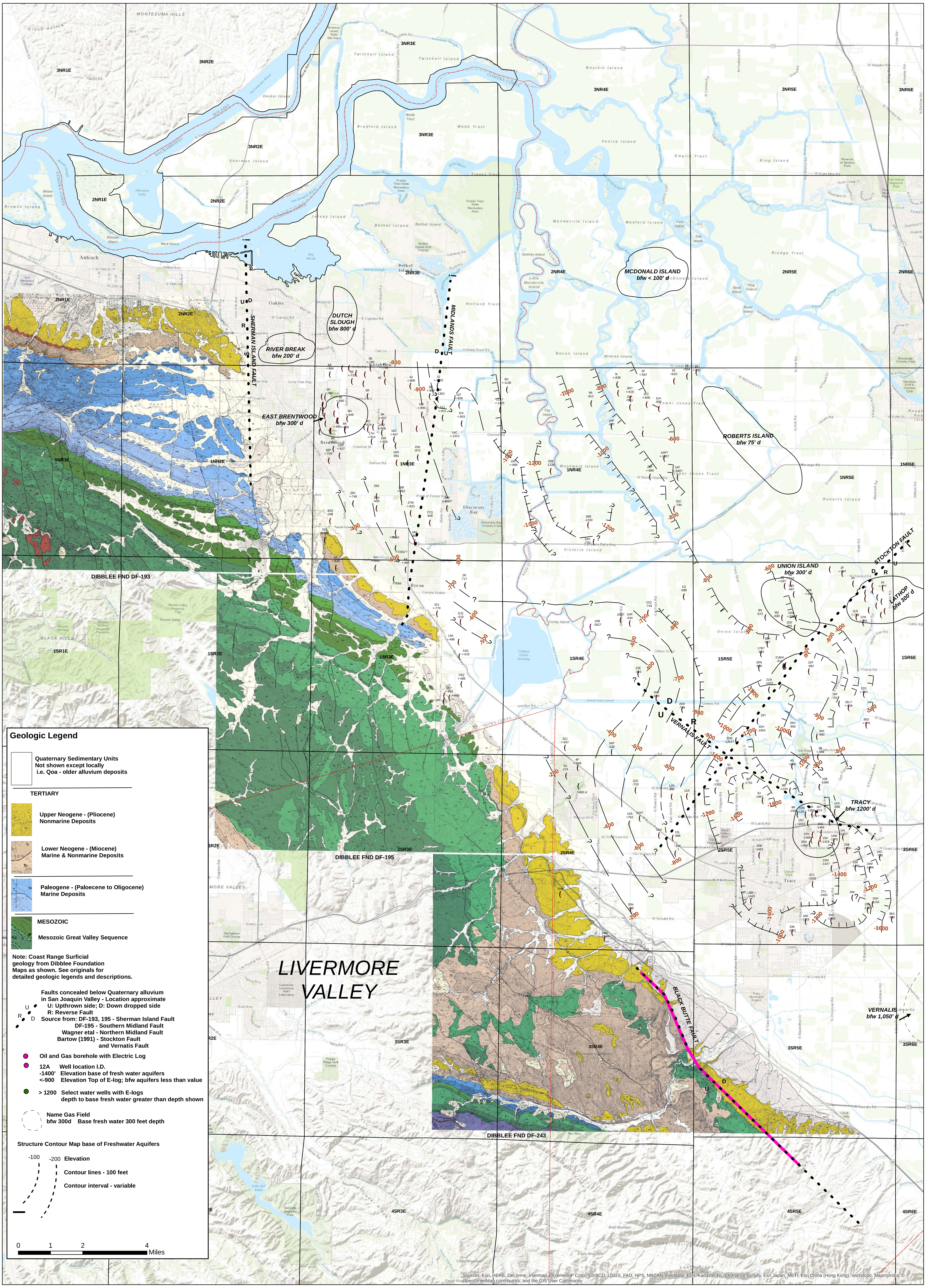
**Figure 3**
**Geology Study Area**

Plate




X:\2014 Job Files\14-126 East Contra Costa County GSP\430 Basin Boundaries - Geology\East County Oil and Gas Logs\Wells with O&G logs pulled_24x36.mxd

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# Well Location Map, Geologic Map and Base of Freshwater Aquifers Map

# APPENDIX 3c

**Well Construction Table**

## Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antioch | -- | Shallow | Blossom Well | 38.0021007 | -121.7883016 | 61.00 | 44.11 | 60-88 | 1.00 | -27.00 | 88 |
| Antioch | Monitoring | Shallow | Wilbur Deep | 38.0128991 | -121.7670016 | 61.00 | 21.86 | 101-106 | -40.00 | -45.00 | 106 |
| Antioch | Monitoring | Shallow | Wilbur Shallow | 38.0128991 | -121.7670016 | 61.00 | 21.86 | 53-81 | 8.00 | -20.00 | 81 |
| BBID | Private | Shallow | 1 JNJ | 37.906128 | -121.6419204 | 26.63 | 24.96 | 105-120 | -78.37 | -93.37 | 120 |
| BBID | -- | Shallow | 3 Byron | 37.8684118 | -121.6412186 | 32.28 | 31.25 | 50-70 | -17.72 | -37.72 | 70 |
| BBID | Private | Shallow | 4 Bruns | 37.8168913 | -121.5991577 | 35.87 | 34.43 | 45-65 | -9.13 | -29.13 | 65 |
| BBID | -- | Shallow | 5 Binn | 37.8506993 | -121.6238007 | 24.42 | 23.46 | -- | -- | -- | 45 |
| BBID | Private | Composite | 2 Casing | 37.8691565 | -121.6544579 | 45.43 | 44.88 | 71-163 | -25.57 | -117.57 | 163 |
| BBID | -- | Composite | 6 Byer | 37.8742 | -121.6398 | 31.63 | 31.23 | -- | -- | -- | 185 |
| BBID | Private | Unknown | 10 SM2 | 37.888253 | -121.650808 | 40.46 | 38.46 | -- | -- | -- | -- |
| BBID | -- | Unknown | 10A Taylor | 37.888769 | -121.6518 | 41.66 | 41.23 | -- | -- | -- | -- |
| BBID | -- | Unknown | 10C Marsh | 37.8898 | -121.648728 | 37.42 | 36.04 | -- | -- | -- | -- |
| BBID | Private | Unknown | 11 TN1 | 37.884492 | -121.650344 | 40.95 | 39.16 | -- | -- | -- | -- |
| BBID | Private | Unknown | 12 TN2 | 37.881764 | -121.671483 | 59.91 | 59.14 | -- | -- | -- | -- |
| BBID | Private | Unknown | 13 M | 37.87395 | -121.652722 | 41.07 | 40.10 | -- | -- | -- | -- |
| BBID | Private | Deep | 14 GNO | 37.889861 | -121.642331 | 30.32 | 29.22 | 207-212, 229-238, 244-253, 273-279, 349-356 | -- | -- | -- |
| BBID | Private | Unknown | 7 Hoffman 1 | 37.889672 | -121.6787208 | 74.43 | 71.01 | -- | -- | -- | -- |
| BBID | Private | Unknown | 8 Casing 2 | 37.869144 | -121.659658 | 51.00 | 49.82 | -- | -- | -- | -- |
| BBID | Private | Unknown | 9 SM1 | 37.900664 | -121.649669 | 37.85 | 35.38 | -- | -- | -- | -- |
| BBID | -- | Unknown | 9d Abreu | 37.868411 | -121.641219 | 33.38 | 32.53 | -- | -- | -- | -- |
| BBID | -- | Unknown | 9e Hagen | 37.896042 | -121.651319 | 37.86 | 36.16 | -- | -- | -- | -- |
| Brentwood | Monitoring | Shallow | BG-1 | 37.9638969 | -121.6933943 | 71.22 | 71.60 | 40-55 | 31.22 | 16.22 | 55 |
| Brentwood | Monitoring | Shallow | BG-2 | 37.9589412 | -121.6917498 | 62.09 | 62.50 | 22.5-37.5 | 39.59 | 24.59 | 38 |
| Brentwood | Monitoring | Shallow | BG-3 | 37.9546062 | -121.6824842 | 55.60 | 56.20 | 20-35 | 35.60 | 20.60 | 35 |
| Brentwood | Abandoned | Shallow | WELL 01 | 37.93 | -121.682 | -- | 61.46 | 100-132 | -99.00 | -131.00 | 132 |
| Brentwood | Monitoring | Deep | MW-14 Deep | 37.9620001 | -121.6957004 | 72.76 | 71.20 | 284-315 | -211.24 | -242.24 | 324 |
| Brentwood | Monitoring | Deep | MW-14 Int. | 37.9620001 | -121.6957004 | 72.76 | 71.20 | 200-210, 220-230 | -127.24 | -157.24 | 240 |
| Brentwood | Production | Deep | Well 06 | 37.9547875 | -121.6940894 | 58.47 | 58.51 | 250-300 | -241.53 | -291.53 | 305 |
| Brentwood | Production | Deep | Well 07 | 37.9563571 | -121.692278 | -- | 57.66 | 265-295 | -207.34 | -237.34 | 300 |
| Brentwood | Production | Deep | Well 08 | 37.957838 | -121.69167 | -- | 60.21 | 225-315 | -164.79 | -254.79 | 325 |
| Brentwood | Production | Deep | Well 09 | 37.954972 | -121.6853986 | -- | 54.58 | 210-230 | -155.42 | -175.42 | 230 |
| Brentwood | Production | Deep | Well 11 | 37.9297678 | -121.6849955 | -- | 63.74 | 255-365 | -191.26 | -301.26 | -- |
| Brentwood | Production | Deep | Well 12 | 37.9247368 | -121.6839359 | -- | 66.86 | 350-380, 430-450 | -283.14 | -383.14 | 610 |
| Brentwood | Production | Deep | Well 13 | 37.9221317 | -121.6826703 | -- | 68.35 | 350-380, 430-480 | -281.65 | -411.65 | 510 |
| Brentwood | Production | Deep | Well 14 | 37.95803502 | -121.6954421 | -- | 68.00 | 285-315 | -285.00 | -315.00 | 340 |
| Brentwood | Production | Deep | Well 15 | 37.9583661 | -121.6853304 | -- | 56.41 | 239-259,289-324 | -182.59 | -267.59 | 345 |
| Brentwood | Monitoring | Composite | MW-14 Shallow | 37.9620001 | -121.6957004 | 72.76 | 71.20 | 114-144 | -41.24 | -71.24 | 154 |
| Brentwood | Abandoned Production | Composite | WELL 02 | 37.93 | -121.682 | -- | 61.46 | 80-208 | -79.00 | -207.00 | 208 |
| Brentwood | Abandoned Production | Composite | WELL 04 | 37.93 | -121.682 | -- | 61.46 | 126-165 | -125.00 | -164.00 | 165 |
| Brentwood | Production | Composite | Well 10A | 37.92166667 | -121.7008333 | -- | 91.85 | 52-72, 135-182 | 39.85 | -90.15 | 210 |

## Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Brentwood | Production | Unknown | WELL 03 | -- | -- | -- | -- | 112-142 | -- | -- | 146 |
| Brentwood | Abandoned Production | Unknown | WELL 05 | -- | -- | -- | -- | 60-120 | -- | -- | 135 |
| Brentwood | Production | Unknown | Well 08A | -- | -- | -- | -- | 225-315 | -- | -- | 325 |
| DWD | Monitoring | Shallow | Stonecreek MW-160 | 37.978122 | -121.683968 | 30.76 | 28.99 | 100-110, 140-150 | -69.24 | -119.24 | 160 |
| DWD | Private | Deep | Bethel Island (Sugar Barge Marina-Well Head) | 38.027155 | -121.613661 | -6.00 | -3.01 | 317-333 | -323.00 | -339.00 | 333 |
| DWD | Monitoring | Deep | Creekside MW | 37.9812138 | -121.6911215 | 29.54 | 29.60 | 230-240 | -200.46 | -210.46 | 380 |
| DWD | Monitoring | Deep | Glen Park MW | 37.9740743 | -121.6866247 | 35.54 | 34.71 | 220-230, 260-290 | -184.46 | -254.46 | 300 |
| DWD | Monitoring | Deep | Stonecreek MW-300 | 37.978122 | -121.683968 | 30.47 | 28.99 | 230-240, 280-290 | -199.53 | -259.53 | 300 |
| DWD | Monitoring | Deep | Stonecreek MW-360 | 37.978122 | -121.683968 | 30.70 | 28.99 | 340-350 | -309.30 | -319.30 | 360 |
| DWD | Production | Deep | Glen Park Well | 37.973909 | -121.6850365 | 38.32 | 38.80 | 230-245, 260-300 | -191.68 | -261.68 | 315 |
| DWD | Production | Deep | South Park | 37.9860934 | -121.6330831 | -3.50 | -1.64 | 204-264, 284-299 | -207.50 | -302.50 | 323 |
| DWD | Production | Deep | Stonecreek PW | 37.9781927 | -121.6840086 | 24.00 | 28.97 | 220-295 | -196.00 | -271.00 | 305 |
| DWD | Production | Deep | KNIGHTSEN COMMUNITY WATER SYSTEM-Well Head | 37.9709328 | -121.6667157 | 29.91 | 27.36 | 235-275 | -205.09 | -245.09 | 305 |
| DWD | Production | Deep | KNIGHTSEN ELEMENTARY SCHOOL-WELL 3 | 37.9679868 | -121.6613267 | 29.59 | 27.60 | 395-415 | -365.41 | -385.41 | 415 |
| DWD | Production | Deep | Rock Island (Westside pump #2) | 37.9817757 | -121.6239122 | -5.00 | 2.90 | 240-270, 284-292 | -245.00 | -297.00 | 320 |
| DWD | Production | Composite | WELL 01 - STANDBY | 37.988 | -121.682 | -- | 16.85 | 100-170 | -99.00 | -169.00 | 170 |
| DWD | Irrigation | Composite | Knightsen School Irrigation (#2) | 37.9678611 | -121.6612623 | 29.43 | 27.62 | 167-191, 210-230 | -137.58 | -200.58 | 230 |
| DWD | Production | Unknown | Delta Mutual (east side pump) | -- | -- | -- | -- | -- | -- | -- | -- |
| DWD | Production | Unknown | Willow Park Marina | 38.0080033 | -121.6313385 | -- | 5.85 | -- | -- | -- | -- |
| Discovery Bay | Monitoring | Shallow | 1BMW-140 | 37.9102996 | -121.5993985 | 4.31 | 2.71 | 100-130 | -95.69 | -125.69 | 140 |
| Discovery Bay | Monitoring | Shallow | 4AMW-152 | 37.9009991 | -121.6187989 | 11.67 | 4.01 | 122-142 | -110.33 | -130.33 | 152 |
| Discovery Bay | Monitoring | Shallow | 7MW-115 | 37.8941889 | -121.6183417 | 11.86 | 4.71 | 95-105 | -83.14 | -93.14 | 115 |
| Discovery Bay | Monitoring | Deep | 1BMW-343 | 37.9102996 | -121.5993985 | 4.38 | 2.71 | 270-289, 309-338 | -265.62 | -333.62 | 343 |
| Discovery Bay | Monitoring | Deep | 4AMW-357 | 37.9009991 | -121.6187989 | 11.54 | 4.01 | 307-347 | -295.46 | -335.46 | 357 |
| Discovery Bay | Monitoring | Deep | 6MW-250 | 37.9028008 | -121.5994988 | 6.60 | 3.89 | 200-210, 230-240 | -193.40 | -233.40 | 250 |

**Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells**

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Discovery Bay | Monitoring | Deep | 6MW-350 | 37.9028008 | -121.5994988 | 6.60 | 3.89 | 280-290, 330-340 | -273.40 | -333.40 | 350 |
| Discovery Bay | Monitoring | Deep | 6MW-410 | 37.9028008 | -121.5994988 | 6.54 | 3.89 | 390-400 | -383.46 | -393.46 | 410 |
| Discovery Bay | Monitoring | Deep | 7MW-330 | 37.8941889 | -121.6183417 | 11.94 | 4.71 | 310-320 | -298.06 | -308.06 | 330 |
| Discovery Bay | Production | Deep | WELL 01B | 37.9102795 | -121.5994883 | 6.13 | 2.71 | 271-289, 308-340 | -264.87 | -333.87 | 350 |
| Discovery Bay | Production | Deep | WELL 02 | 37.9038164 | -121.6019194 | 9.29 | 2.62 | 245-335 | -235.71 | -325.71 | 348 |
| Discovery Bay | Production | Deep | WELL 04A | 37.9009652 | -121.6187989 | 14.82 | 108.72 | 307-347 | -292.18 | -332.18 | 357 |
| Discovery Bay | Emergency Backup | Deep | WELL 05A | 37.8904152 | -121.6155029 | 16.29 | 4.91 | 251-281, 307-347 | -234.71 | -330.71 | 357 |
| Discovery Bay | Production | Deep | WELL 06 | 37.9023176 | -121.5997724 | 8.47 | -- | 270-295, 305-350 | -261.53 | -341.53 | 360 |
| Discovery Bay | Production | Deep | WELL 07 | 37.8941889 | -121.6183417 | 7.00 | 4.71 | 282-292 | -275.00 | -285.00 | 346 |
| Discovery Bay | Inactive Production | Unknown | WELL 01 | 37.901 | -121.603 | -- | 2.41 | -- | -- | -- | -- |
| Discovery Bay | Inactive Production | Unknown | WELL 03 | 37.901 | -121.603 | -- | 2.41 | -- | -- | -- | -- |
| Discovery Bay | Inactive Production | Unknown | WELL 04 | 37.901 | -121.603 | -- | 2.41 | 307-347 | -- | -- | 357 |
| Discovery Bay | Abandoned Production | Unknown | WELL 05 | -- | -- | -- | -- | -- | -- | -- | -- |
| ECCID | Monitoring | Shallow | 4-1 | 37.92487399 | -121.6367714 | -- | 28.32 | -- | -9.13 | -29.13 | 10 |
| ECCID | Monitoring | Shallow | 4-6 | 37.92581823 | -121.665247 | -- | 53.87 | -- | -9.13 | -29.13 | 10 |
| ECCID | Monitoring | Shallow | 4-18 | 37.93988606 | -121.6398046 | -- | 24.60 | -- | -9.13 | -29.13 | 10 |
| ECCID | Monitoring | Shallow | 4-57 | 37.9260609 | -121.6785219 | -- | 60.90 | -- | -9.13 | -29.13 | 10 |
| ECCID | Monitoring | Shallow | 5-2 | 37.95444444 | -121.6941667 | 73.00 | 58.14 | -- | -- | -- | 20 |
| ECCID | Monitoring | Shallow | 5-3 | 37.91710984 | -121.6580936 | -- | 42.11 | -- | -- | -- | 10 |
| ECCID | Monitoring | Shallow | 5-14 | 37.95644057 | -121.642851 | -- | 18.70 | -- | -- | -- | 10 |
| ECCID | Monitoring | Shallow | 5-22 | 37.974141 | -121.657877 | -- | 17.20 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-33 | 37.98935 | -121.679441 | 13.30 | 13.30 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-34 | 37.98194444 | -121.6777778 | 14.00 | 18.50 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-35 | 37.977313 | -121.678539 | 24.30 | 27.34 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-36 | 37.973701 | -121.675596 | 27.40 | 27.40 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-37 | 37.963534 | -121.679699 | 40.60 | 40.60 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-38 | 37.95972044 | -121.6780277 | -- | 43.40 | -- | -- | -- | 10 |
| ECCID | Monitoring | Shallow | 5-39 | 37.985299 | -121.664114 | 12.50 | 12.50 | -- | -- | -- | 11 |
| ECCID | Monitoring | Shallow | 5-51 | 37.94391393 | -121.6771962 | -- | 54.10 | -- | -- | -- | 10 |
| ECCID | Monitoring | Shallow | 5-73 | -- | -- | -- | -- | -- | -- | -- | 11 |
| ECCID | Ag. Irrigation | Shallow | Well #1 (4-54) | 37.91819 | -121.69843 | 85.90 | 85.90 | 85-165 | 0.90 | -79.10 | 165 |
| ECCID | Ag. Irrigation | Shallow | Well #6 (4-60) | 37.92567 | -121.66253 | 49.50 | 50.30 | 30-50 | 19.50 | -0.50 | 50 |
| ECCID | Ag. Irrigation | Shallow | Well #11 (4-61-A) | 37.9178003 | -121.6700016 | 55.00 | 55.50 | 50-100 | 5.00 | -45.00 | 100 |
| ECCID | Ag. Irrigation | Shallow | Well #13 | 37.91787 | -121.68204 | 64.00 | 65.72 | 145-185 | -81.00 | -121.00 | 185 |
| ECCID | Ag. Irrigation | Composite | Well #3 (4-55) | 37.91817 | -121.70336 | 95.00 | 96.20 | 113-197, 281-365 | -16.80 | -268.80 | 365 |
| ECCID | Ag. Irrigation | Composite | Well #4 (5-62) | 37.91818 | -121.70114 | -- | 83.12 | 68-125, 175-195 | 15.12 | -111.88 | 200 |
| ECCID | Ag. Irrigation | Composite | Well #4 Old (4-56) | 37.9177987 | -121.6972999 | 87.00 | 83.80 | 68-125, 175-195 | 18.80 | -111.20 | 203 |

## Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ECCID | Ag. Irrigation | Composite | Well #5 (4-57) | 37.92526 | -121.67739 | -- | 60.90 | 115-125, 170-175, 195-200, 220-245, 270-290 | -54.10 | -229.10 | 290 |
| ECCID | Ag. Irrigation | Composite | Well #9 (4-58) | 37.91444444 | -121.7002778 | -- | 97.00 | 90-106, 118-126, 180-194 | 7.00 | -97.00 | 210 |
| ECCID | Ag. Irrigation | Composite | Well #14 | 37.91782 | -121.63033 | 26.51 | 25.82 | 200-300 | -174.18 | -274.18 | 330 |
| ECCID | Ag. Irrigation | Unknown | Well #2 (5-30) | 37.91774 | -121.65954 | 40.30 | 40.30 | -- | -- | -- | -- |
| ECCID | Monitoring | Unknown | Anderson (4.66) | 37.92416667 | -121.7 | 89.00 | 86.00 | -- | -- | -- | -- |
| DDW | Small Community System | Shallow | BALDOCCHI WATER SYSTEM-Well Head | 37.868416 | -121.641222 | -- | -- | 100-110 | -100.00 | -110.00 | -- |
| DDW | Small Community System | Deep | BEACON WEST-Well 1 | 38.046 | -121.642 | -- | 8.54 | 230-260 | -229.00 | -259.00 | 260 |
| DDW | Small Community System | Deep | KNIGHTSEN COMMUNITY WATER SYSTEM-Well Head | 37.9709328 | -121.6667157 | 29.91 | 27.36 | 235-255, 275-295 | -234.00 | -294.00 | 305 |
| DDW | Small Community System | Deep | WILLOW MOBILE HOME PARK-Well Head | 38.046 | -121.642 | -- | 8.54 | 292-332 | -283.46 | -323.46 | 410 |
| DDW | Small Community System | Deep | WILLOW PARK MARINA-East Well | 38.017 | -121.642 | -- | 7.62 | 250-310 | -242.38 | -302.38 | 400 |
| DDW | Small Community System | Deep | WILLOW PARK MARINA-West Well | 38.017 | -121.642 | -- | 7.62 | 250-310 | -242.38 | -302.38 | 340 |
| DDW | Small Community System | Composite | KNIGHTSEN ELEMENTARY SCHOOL-NORTH WELL | 37.959 | -121.642 | -- | 16.19 | 167-191, 210-230 | -166.00 | -229.00 | 230 |
| DDW | Small Community System | Composite | KNIGHTSEN ELEMENTARY SCHOOL-SOUTH WELL | 37.959 | -121.642 | -- | 16.19 | 167-191, 210-230 | -166.00 | -229.00 | 230 |
| DDW | Small Community System | Unknown | ANCHOR MARINA-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ANGLER S RANCH #3-WELL 02 | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ANGLERS SUBDIVISION 4-WELL 1 - 1696 Taylor | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |

Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | ANGLERS SUBDIVISION 4-WELL 2 - 1398 Taylor | 38.046 | -121.682 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ANGLERS SUBDIVISION 4-WELL 3 - 1698 Taylor | 38.017 | -121.682 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BAY STANDARDS-Well Head | 37.901 | -121.682 | -- | 78.76 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL BAPTIST CHURCH-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL HARBOR-WELL | 38.046 | -121.642 | -- | 8.54 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL ISLAND GOLF & RESORT-WELLHEAD | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL ISLAND LODGE-WELL 01 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL ISLAND MUTUAL WATER CO-WELL 1 | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL ISLAND MUTUAL WATER CO-WELL 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL MARKET-WELLHEAD | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BETHEL MISSIONARY BAPTIST-Well Head | 37.959 | -121.682 | -- | 49.94 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BIG OAK MOBILE HOME PARK WATER-Well Head - West well | 37.988 | -121.682 | -- | 16.85 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BIG OAK MOBILE HOME PARK WATER-Wellhead-East well | 37.988 | -121.682 | -- | 16.85 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BLAZING SADDLE BAR & GRILL-WELL 01 | -- | -- | -- | -- | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | BLUE TIP TRAILER PARK WATER-WELL HEAD | 37.959 | -121.682 | -- | 49.94 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BON GUSTOS-Bathroom Sink | 37.889643 | -121.640885 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BON GUSTOS-Well Head | 37.901 | -121.642 | -- | 28.30 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BONNIE & CLYDES SALOON-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BRENTWOOD CREEK FARM-WELL 1 - OFFICE | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BRENTWOOD CREEK FARM-WELL 2 - CAMP 1 | 37.93 | -121.603 | -- | 3.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BRENTWOOD CREEK FARM-WELL 3 - CAMP 2 | 37.93 | -121.563 | -- | 3.71 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BRENTWOOD MISSIONARY BAPTIST-Well Head | 37.93 | -121.682 | -- | 61.46 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BRIDGEHEAD CAFE-Well Head | 38.017 | -121.761 | -- | 10.04 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BRIDGEHEAD RENTALS SWS-WELL 01 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BYRON AIRPORT-Well Head | 37.843 | -121.642 | -- | 66.57 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BYRON CORNERS INC-Well Head | 37.872 | -121.642 | -- | 32.03 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BYRON INN-Well Head | 37.85032 | -121.622765 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | BYRON UNITED METHODIST-WELL HEAD | 37.959 | -121.721 | -- | 95.77 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CALIENTE ISLE WATER SYSTEM-WELLHEAD | 38.017 | -121.682 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CAMINO MOBILEHOME-WELL | 37.872 | -121.642 | -- | 32.03 | -- | -- | -- | -- |

## Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | CARSON SWIM SCHOOL-WELL HEAD | 37.959 | -121.721 | -- | 95.77 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CASA DEL RIO WATER SYSTEM-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CECCHINI WATER-WELL | 37.901 | -121.563 | -- | 4.11 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CECCHINI WATER-WELL 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CHURCH OF JESUS CHRIST-Well Head | 37.959 | -121.721 | -- | 95.77 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | COLONIA SANTA MARIA-Well Head | 37.901 | -121.682 | -- | 78.76 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | CRUISER HAVEN MARINA-Well Head | 37.93 | -121.563 | -- | 3.71 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | D ANNA YACHT CENTER-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DAVIS CAMP *CL 10/08-east well (south) | 37.959 | -121.682 | -- | 49.94 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DAVIS CAMP *CL 10/08-WELL 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DAVIS CAMP *CL 10/08-west well (north) | 37.959 | -121.682 | -- | 49.94 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DELTA KIDS CENTER *CL 2/07-Well Head | 37.959 | -121.682 | -- | 49.94 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DELTA MUTUAL WATER COMPANY-East Well | 37.988 | -121.642 | -- | -0.47 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DELTA MUTUAL WATER COMPANY-West Well | 37.988 | -121.642 | -- | -0.47 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DELTA SPORTSMAN-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | DNA PLANT WATER SYSTEM *CL04/02-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | DUTCH SLOUGH WATER WORKS-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | EBRPD BLACK DIAMOND MINES-WELL01 | 37.959 | -121.88 | -- | 856.26 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | EBRPD ROUND VALLEY WATER SYSTEM-Well Head | 37.872 | -121.761 | -- | 287.99 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | EXCELSIOR MIDDLE SCHOOL-Well Head | 37.872 | -121.642 | -- | 32.03 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | FARMERS DAUGHTER WATER SYS *CLOSED*-Well Head | 37.901 | -121.682 | -- | 78.76 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | FARRAR PARK PROPERTY OWNERS-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | FLAMINGO MOBILE MANOR-Well Head | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | FRANKS MARINA-New Well | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | FRANKS MARINA-Well Head | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | GAS N SAVE-Well Head | 37.988 | -121.682 | -- | 16.85 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | GAYLORD CONTAINER COMPANY-WELL 03 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | GENOS DELI STATION-Well Head | 37.901 | -121.642 | -- | 28.30 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | GOLDEN HILLS CHURCH-WELL 01 | -- | -- | -- | -- | -- | -- | -- | -- |

# Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | GOLF CLUB AT RODDY RANCH-WELLHEAD | 37.93 | -121.801 | -- | 475.46 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | HOLLAND RIVERSIDE MARINA-well 2 - East Well | 37.959 | -121.563 | -- | 4.77 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | HOLLAND RIVERSIDE MARINA-Well Head - West Well | 37.959 | -121.603 | -- | 2.91 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | HOLY CROSS CEMETERY-Well Head | 38.017 | -121.761 | -- | 10.04 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | HONOLULU GRILL *CL 10/07-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | JEHOVAHS WITNESSE CHURCH *CL 2/13-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | JOES ISLAND RESTAURANT-WELLHEAD | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | KNIGHTSEN COMMUNITY WATER SYSTEM-Well 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LA PALOMA HIGH SCHOOL-WELL 01 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LAST RESORT & MARINA LLC-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LIGHTHOUSE BAPTIST CHURCH-Well Head | 37.959 | -121.721 | -- | 95.77 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LINDQUIST LANDING MARINA-Well Head | 37.988 | -121.603 | -- | 3.42 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LITTORNO & PANFILI WATER SYSTEM-WELL HEAD | 38.017 | -121.761 | -- | 10.04 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LONE TREE MEDICAL & DENTAL-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | LOS VAQUEROS INTERPRETIVE CENTER-SOURCE | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LOS VAQUEROS MARINA BLDG-SOURCE | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | LUNDBORG LANDING *CL 2/09-well | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MACS OLD HOUSE-Well Head | 38.017 | -121.761 | -- | 10.04 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MARIN FOOD SPECIALTIES-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MARINA MOBILE MANOR-NEW WELL | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MARINA MOBILE MANOR-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MARINE EMPORIUM RICHARDS YACHT-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MARINER COVE MARINA-Well Head | 38.046 | -121.682 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | MARS HARBOR-WELL 01 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | NEIGHBORHOOD CHURCH-Well Head | 37.93 | -121.682 | -- | 61.46 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | NEW DOCS MARINA-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | OAKLEY MUTUAL WATER COMPANY-NORTH WELL - 4384 SANDMOUND | 37.988 | -121.642 | -- | -0.47 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | OAKLEY MUTUAL WATER COMPANY-SOUTH WELL - 4508 SANDMOUND | 37.988 | -121.642 | -- | -0.47 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | OAKLEY MUTUAL WATER COMPANY-WELL 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ORIN ALLEN YOUTH REHAB FACILITY-WELL | 37.872 | -121.642 | -- | 32.03 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ORIN ALLEN YOUTH REHAB FACILITY-Well 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ORWOOD RESORT-WELL 2 - WEST WELL | 37.93 | -121.603 | -- | 3.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | ORWOOD RESORT-WELL 3 - PICNIC AREA | 37.93 | -121.603 | -- | 3.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | PARK MARINA-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | PG & E WATER SYSTEM-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | PLEASANTIMES MUTUAL WATER CO-WELL 2 - 4520 STONE | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | PLEASANTIMES MUTUAL WATER CO-Well 1 - 4282 STONE | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | PLEASANTIMES MUTUAL WATER CO-WELL 3 - 4441 WILLOW | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | RAYNERS GROCERY SWS **CLOSED**-Well Head | -- | -- | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | RIVERVIEW MARINA SWS-Well Head | 38.017 | -121.603 | -- | -4.31 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | RIVERVIEW MOTEL-Well Head | 38.017 | -121.761 | -- | 10.04 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | RIVERVIEW WATER ASSOCIATION-WELL 1 BEACON HARBOR | 38.046 | -121.642 | -- | 8.54 | -- | -- | -- | -- |

Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DDW | Small Community System | Unknown | RIVERVIEW WATER ASSOCIATION-WELL 2 END OF WILLOW RD | 38.046 | -121.642 | -- | 8.54 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | RUSSOS MOBILE PARK-Well Head | 38.046 | -121.603 | -- | -- | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | SANDMOUND MUTUAL-3160 STONE ROAD WELL | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | SANDMOUND MUTUAL-3810 STONE ROAD WELL | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | SANDY POINT MOBILE HOME PARK-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | SANTIAGO ISLAND VILLAGE-WELL 01 | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | SUNSET HARBOR-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | TONYS FAMILY RESTAURANT-WELL HEAD | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | TUGS-Well Head | 38.017 | -121.642 | -- | 7.62 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | VILLA DE GUADALUPE-WELL | 37.901 | -121.682 | -- | 78.76 | -- | -- | -- | -- |
| DDW | Small Community System | Unknown | WILLOWEST MARINA WS-WELLHEAD | -- | -- | -- | -- | -- | -- | -- | -- |
| DWR | -- | Shallow | 01N03E17E001M | 37.9335 | -121.6747 | 55.90 | 54.87 | 113-123 | -57.10 | -67.10 | 123 |
| DWR | Observation | Shallow | 01N04E20L001M | 37.9146 | -121.5631 | -2.88 | -5.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E20P001M | 37.9122 | -121.5611 | -2.88 | -5.68 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E20P002M | 37.9143 | -121.5624 | -4.28 | -7.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E29C002M | 37.9092 | -121.5619 | -3.98 | -6.68 | -- | -- | -- | 20 |
| DWR | Monitoring | Shallow | 01N04E29D001M | 37.9125 | 0 | -6.20 | -- | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E29P001M | 37.899 | -121.5639 | -7.28 | -7.68 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E30G001M | 37.905 | -121.573 | 4.07 | -7.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E30H001M | 37.904 | -121.5715 | -2.17 | -4.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E30J001M | 37.9016 | -121.5683 | -1.97 | -4.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E31H001M | 37.8957 | -121.5652 | -4.27 | -6.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E31H002M | 37.8896 | -121.5705 | -5.17 | -7.67 | -- | -- | -- | 20 |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DWR | Observation | Shallow | 01N04E31K001M | 37.8871 | -121.5744 | -3.37 | -5.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E31Q001M | 37.8826 | -121.5755 | -3.86 | -6.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E32D002M | 37.8957 | -121.5652 | -5.27 | -7.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01N04E32E001M | 37.8916 | -121.5669 | -5.17 | -7.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06B001M | 37.88 | -121.57 | -- | -237.68 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06C001M | 37.88 | -121.574 | -- | -236.74 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06L001M | 37.8435 | -121.5801 | -3.86 | -4.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06L002M | 37.8743 | -121.5771 | -3.46 | -6.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06P002M | 37.85 | -121.58 | -4.20 | -7.00 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06Q001M | 37.8686 | -121.5751 | -3.86 | -6.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E06R001M | 37.86 | -121.575 | -- | -207.07 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E07A001M | 37.8644 | -121.571 | -1.76 | -4.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E07B001M | 37.852 | -121.57 | 5.50 | 3.00 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E07C001M | 37.8621 | -121.5796 | -4.55 | -7.65 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08A001M | 37.8641 | -121.5504 | -3.57 | -5.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08H001M | 37.8626 | -121.5535 | -2.97 | -5.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08H002M | 37.8615 | -121.5511 | -- | -198.86 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08J001M | 37.8579 | -121.5495 | -- | -195.07 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08K001M | 37.8591 | -121.5552 | 1.43 | -0.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08L001M | 37.8598 | -121.5584 | -2.96 | -6.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E08M001M | 37.8581 | -121.5651 | -2.96 | -5.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 01S04E09N001M | 37.8558 | -121.5476 | -- | -195.07 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 1S/4E 31P 5 | 37.797914 | -121.580028 | 60.00 | 60.00 | 8-23 | 52.00 | 37.00 | 24 |
| DWR | Observation | Shallow | 378435N1215801 W001 | 37.8435 | -121.5801 | -3.86 | -4.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 378500N1215800 W001 | 37.85 | -121.58 | -4.20 | -7.00 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 378621N1215796 W001 | 37.8621 | -121.5796 | -4.55 | -7.65 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 378826N1215755 W001 | 37.8826 | -121.5755 | -3.86 | -6.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 378957N1215652 W001 | 37.8957 | -121.5652 | -4.27 | -6.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | 379050N1215730 W001 | 37.905 | -121.573 | 4.07 | -7.67 | -- | -- | -- | 20 |
| DWR | -- | Shallow | BD-1 | 37.9035 | -121.5752 | -6.37 | 3.11 | 90-100 | -96.37 | -106.37 | 100 |
| DWR | -- | Shallow | BD-2 | 37.8836 | -121.5791 | -6.46 | 2.83 | 90-100 | -96.46 | -106.46 | 100 |
| DWR | -- | Shallow | BD-3 | 37.864705 | -121.579748 | -7.00 | -1.45 | 90-100 | -97.00 | -107.00 | 100 |
| DWR | Observation | Shallow | BS-4 | 37.901133 | -121.571309 | -2.99 | -5.69 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | BS-5 | 37.899263 | -121.568292 | -5.80 | -8.00 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | BS-6 | 37.896564 | -121.567668 | -5.80 | -8.00 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | VD-2 | 37.887444 | -121.570556 | -6.97 | -7.67 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | VS-10 | 37.882414 | -121.572674 | -3.76 | -6.66 | -- | -- | -- | 20 |
| DWR | Observation | Shallow | VS-3 | 37.905944 | -121.568194 | -4.18 | -6.69 | -- | -- | -- | 20 |
| DWR | -- | Unknown | 01N02E01F001M | 37.9627 | -121.7081 | -- | 73.74 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N02E03K001M | 37.9591 | -121.7401 | -- | 117.98 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N02E13H001M | 37.9338 | -121.6989 | -- | 77.86 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N02E24M001M | 37.9157 | -121.7127 | -- | 97.47 | -- | -- | -- | -- |

## Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DWR | -- | Unknown | 01N02E24R002M | 37.9121 | -121.6989 | -- | 94.16 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N02E25F001M | 37.9049 | -121.7081 | -- | 114.03 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N02E25G001M | 37.9049 | -121.7035 | -- | 105.75 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N02E26H001M | 37.9049 | -121.7172 | -- | 115.03 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E06N001M | 37.9555 | -121.6944 | -- | 60.05 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E06N002M | 37.9555 | -121.6944 | -- | 60.05 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E09E001M | 37.9482 | -121.6578 | -- | 37.18 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E13C001M | 37.9374 | -121.5983 | -- | 3.31 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E18D001M | 37.9374 | -121.6944 | -- | 70.64 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E18G001M | 37.9338 | -121.6852 | -- | 64.29 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E25C001M | 37.9085 | -121.5983 | -- | 2.71 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E26C002M | 37.9085 | -121.6166 | -- | 4.75 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E27Q003M | 37.8977 | -121.6303 | -- | 16.18 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E27R001M | 37.8977 | -121.6257 | -- | 7.85 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E28Q001M | 37.8977 | -121.6486 | -- | 35.07 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E29Q001M | 37.8977 | -121.6669 | -- | 57.11 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E30L001M | 37.9013 | -121.6898 | -- | 94.15 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E30L002M | 37.9013 | -121.6898 | -- | 94.15 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E30M001M | 37.9013 | -121.6944 | -- | 99.54 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E31C001M | 37.894 | -121.6898 | -- | 90.14 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E32C001M | 37.894 | -121.6715 | -- | 60.46 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E33J001M | 37.8868 | -121.644 | -- | 30.94 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E34A001M | 37.894 | -121.6257 | -- | 8.12 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01N03E35N001M | 37.8832 | -121.6212 | -- | 6.15 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E02N001M | 37.8688 | -121.6212 | -- | 12.97 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E02P001M | 37.8688 | -121.6166 | -- | 8.64 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03H001M | 37.876 | -121.6257 | -- | 10.84 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03M001M | 37.8741 | -121.64 | -- | 31.58 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03M002M | 37.8741 | -121.64 | -- | 31.58 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03N002M | 37.8688 | -121.6395 | -- | 32.42 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03N003M | 37.8688 | -121.6395 | -- | 32.42 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03P001M | 37.8688 | -121.6349 | -- | 26.75 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03Q001M | 37.8688 | -121.6303 | -- | 22.89 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E03Q002M | 37.8688 | -121.6303 | -- | 22.89 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E04Q001M | 37.8688 | -121.6486 | -- | 39.30 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E09A001M | 37.8651 | -121.644 | -- | 38.67 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E09A002M | 37.8651 | -121.644 | -- | 38.67 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E10C001M | 37.8651 | -121.6349 | -- | 29.29 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E10C002M | 37.8651 | -121.6349 | -- | 29.29 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E10G001M | 37.8615 | -121.6303 | -- | 26.34 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E10K001M | 37.8579 | -121.6303 | -- | 32.41 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E14D001M | 37.8507 | -121.6212 | -- | 28.62 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E14N001M | 37.8399 | -121.6212 | -- | 35.30 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E15A001M | 37.8508 | -121.6238 | -- | 32.03 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E22H001M | 37.8326 | -121.6257 | -- | 48.56 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E22H002M | 37.8326 | -121.6257 | -- | 48.56 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E23E001M | 37.8326 | -121.6212 | -- | 38.77 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S03E23J001M | 37.829 | -121.6074 | -- | 20.65 | -- | -- | -- | -- |

**Well Construction Table-East Contra Costa Subbasin, Public Supply, Agricultural Irrigation, and DWR Wells**

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DWR | -- | Unknown | 01S03E26A001M | 37.8218 | -121.6074 | -- | 59.52 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S04E09N002M | 37.8543 | -121.548 | -- | -5.14 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S04E17A001M | 37.8507 | -121.5525 | -- | -4.33 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S04E17A002M | 37.8507 | -121.5525 | -- | -4.33 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S04E17C001M | 37.8507 | -121.5617 | -- | -1.91 | -- | -- | -- | -- |
| DWR | -- | Unknown | 01S04E20K001M | 37.829 | -121.5571 | -- | 2.37 | -- | -- | -- | -- |
| DWR | -- | Unknown | 02N02E20A001M | 38.0096 | -121.7721 | -- | 40.19 | -- | -- | -- | -- |
| DWR | -- | Unknown | 02N02E36M001M | 37.9735 | -121.7127 | -- | 77.65 | -- | -- | -- | -- |
| DWR | -- | Unknown | 02N03E10D001M | 38.0385 | -121.6395 | -- | 6.65 | -- | -- | -- | -- |
| DWR | -- | Unknown | 02N03E15Q001M | 38.0133 | -121.6303 | -- | 5.17 | -- | -- | -- | -- |
| DWR | -- | Unknown | 02N03E29M001M | 37.988 | -121.6761 | -- | 14.23 | -- | -- | -- | -- |

**Abbreviations:**

DWR- Department of Water Resources
ECCID- East Contra Costa Irrigation District
ft- feet
GSA- Groundwater Sustainability Agency
BBID- Byron Bethany Irrigation Dist
bgs- below ground surface
DDW- Division of Drinking Water
DWD- Diablo Water District
msl- mean sea level
TOC- Top of Casing

## Well Construction Table-East Contra Costa Subbasin, Geotracker and USGS Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Shallow | T0601300803-STMW-3 | 38.0113647 | -121.8164043 | 18.19 | -77.29 | -- | -- | -- | 20 |
| Geotracker | -- | Unknown | SL0601327206-EW-1 | 38.0124906 | -121.8262758 | 17.09 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601327206-MW-1 | 38.0124851 | -121.8262136 | 16.99 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601327206-MW-2 | 38.0124981 | -121.826324 | 17.45 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-1 | 37.99763297 | -121.7598206 | 70.63 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-12 | 37.997267 | -121.7601833 | 53.87 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-14 | 37.9973253 | -121.7587909 | 53.71 | -97.70 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-18 | 37.9973406 | -121.7591286 | 56.44 | -97.70 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-19 | 37.9970033 | -121.7591763 | 54.70 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-2 | 37.99742985 | -121.7595953 | 70.30 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-22 | 37.9977806 | -121.7590815 | 81.87 | -97.70 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-23 | 37.9977759 | -121.7597224 | 72.46 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-25 | 37.99752224 | -121.7596478 | 70.36 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-3 | 37.99737148 | -121.7598189 | 70.24 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-4 | 37.9976908 | -121.760264 | 67.39 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-5 | 37.9983647 | -121.7599193 | 74.00 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-6 | 37.99771421 | -121.7591362 | 80.62 | -97.70 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-7 | 37.9977122 | -121.7590266 | 82.47 | -97.70 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-8 | 37.9974352 | -121.7595547 | 71.06 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94MW-9 | 37.9981846 | -121.7605201 | 73.52 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94SP-2 | 37.99748208 | -121.7596956 | 70.35 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601346154-94SP-4 | 37.99748348 | -121.7596706 | 70.68 | -100.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601394831-MW-1 | 38.00979466 | -121.7501967 | 21.78 | -103.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601394831-MW-2 | 38.00966682 | -121.7500914 | 22.58 | -103.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601394831-MW-3 | 38.00952959 | -121.7502572 | 23.00 | -103.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL0601394831-MW-4 | 38.0097062 | -121.750356 | 22.59 | -103.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-1 | 37.99799564 | -121.7092015 | 20.39 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-2 | 37.99800735 | -121.7093709 | 20.34 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-3 | 37.9980815 | -121.7093025 | 22.68 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-4 | 37.99807566 | -121.7094744 | 20.19 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-5 | 37.99806122 | -121.7091587 | 22.51 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-6 | 37.99806424 | -121.7093743 | 22.44 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7EW-7 | 37.99802921 | -121.7090872 | 22.59 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-1 | 37.9981523 | -121.7092386 | 21.51 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-10 | 37.9978009 | -121.7091346 | 24.04 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-11 | 37.9978089 | -121.709496 | 26.48 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-12 | 37.9979889 | -121.7098298 | 19.03 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-13 | 37.9981346 | -121.709828 | 17.62 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-14 | 37.9980541 | -121.7095267 | 20.31 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-2 | 37.998027 | -121.7090709 | 22.36 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-3 | 37.9979121 | -121.7091968 | 23.17 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-4 | 37.9979891 | -121.7091461 | 22.94 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-5 | 37.9980537 | -121.7092528 | 22.55 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-6 | 37.9981087 | -121.7093618 | 21.97 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-7 | 37.9982924 | -121.7092256 | 22.98 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-8 | 37.9981008 | -121.70883 | 23.79 | -98.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL186102968-7MW-9 | 37.9977945 | -121.7088098 | 22.99 | -98.45 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL20210828-903B1 | 38.02213191 | -121.8415902 | 12.56 | -59.40 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205032990-GCC-1 | 38.0154259 | -121.7733017 | 27.74 | -111.04 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205032990-GCC-2 | 38.0154017 | -121.7733006 | 27.80 | -111.04 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205032990-GCC-3 | 38.0153842 | -121.7732943 | 27.98 | -111.04 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205032990-GCC-4 | 38.0153836 | -121.773275 | 28.14 | -111.04 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | -- | Unknown | SL205032990-GPG-1 | 38.0151254 | -121.7857635 | 26.28 | -106.31 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-GPG-2 | 38.0151314 | -121.7857251 | 26.44 | -106.31 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-01 | 38.0124701 | -121.7782997 | 33.80 | -108.58 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-02 | 38.0137724 | -121.7800415 | 29.37 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-03 | 38.0143072 | -121.7798501 | 19.98 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-04 | 38.0131714 | -121.7791378 | 35.07 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-05 | 38.0135223 | -121.7795815 | 36.84 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-06 | 38.0136725 | -121.7797346 | 33.46 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-07 | 38.0135821 | -121.7803374 | 29.88 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-08 | 38.0135895 | -121.7802884 | 32.84 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-09 | 38.0141134 | -121.7801852 | 16.84 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-10 | 38.0136944 | -121.7796301 | 35.70 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-11 | 38.0141616 | -121.7801488 | 16.56 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-12 | 38.0148054 | -121.7804337 | 21.19 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-13 | 38.0140557 | -121.7806932 | 19.99 | -106.31 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-14 | 38.0148174 | -121.7778223 | 11.16 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-15 | 38.013924 | -121.7782276 | 17.78 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-16 | 38.0145546 | -121.7796335 | 21.32 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-17 | 38.0147691 | -121.7803996 | 20.48 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-18 | 38.0147754 | -121.7804429 | 21.36 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-19 | 38.0141354 | -121.7802108 | 15.83 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-20 | 38.0148596 | -121.7778279 | 11.96 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-21 | 38.0140728 | -121.7806637 | 18.96 | -106.31 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-22 | 38.0125118 | -121.7783151 | 34.52 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-23 | 38.0139487 | -121.7782341 | 17.52 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-24 | 38.014529 | -121.7796147 | 21.60 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-25 | 38.0125359 | -121.7783366 | 35.16 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-26 | 38.0125417 | -121.7797532 | 39.17 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-27 | 38.0146731 | -121.7787581 | 10.21 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-28 | 38.0147021 | -121.7787535 | 9.53 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-29 | 38.0148319 | -121.7778483 | 11.28 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-30 | 38.012557 | -121.7797589 | 38.45 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-31 | 38.0139152 | -121.780437 | 19.42 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-32 | 38.0141668 | -121.780072 | 18.22 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-33 | 38.0142447 | -121.7799241 | 19.05 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-34 | 38.0138037 | -121.7796211 | 22.05 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-35 | 38.0141958 | -121.7793729 | 22.25 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-36 | 38.0141791 | -121.7793647 | 22.45 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-37 | 38.0144931 | -121.7786015 | 11.08 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-38 | 38.0145226 | -121.7786021 | 11.42 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-39 | 38.0144936 | -121.7782188 | 13.40 | -109.18 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | SL205032990-W-40 | 38.0145758 | -121.7780404 | 13.86 | -109.18 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-11A | 37.9978322 | -121.843182 | 110.37 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-12A | 37.9978602 | -121.8425416 | 108.65 | -33.13 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-14A | 37.9983182 | -121.843986 | 107.54 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-17A | 37.9975032 | -121.8416801 | 109.02 | -33.13 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-18A | 37.9980477 | -121.8451401 | 110.59 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-19A | 37.9976307 | -121.8442498 | 111.13 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-20B | 37.9977877 | -121.8437805 | 110.28 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-21A | 37.9977883 | -121.8437416 | 110.13 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-3A | 37.9977693 | -121.8437697 | 111.75 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-5A | 37.9978408 | -121.8435181 | 109.98 | -25.74 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | SL205092993-MW-5B | 37.9977964 | -121.843548 | 109.90 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-6A | 37.9979223 | -121.8433416 | 109.56 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205092993-MW-8A | 37.9982209 | -121.843463 | 108.88 | -25.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-ORC-7 | 37.9251716 | -121.7233168 | 103.65 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-ORC-8 | 37.9250927 | -121.7232733 | 102.80 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-ORC-9A | 37.9250193 | -121.7232463 | 102.75 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-56 | 37.9250435 | -121.7235089 | 102.06 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-57 | 37.925157 | -121.7228611 | 103.32 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-58 | 37.9251558 | -121.7228858 | 103.32 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-77 | 37.9245299 | -121.7227896 | 100.59 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-78 | 37.9251789 | -121.7223146 | 101.37 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-79 | 37.9255381 | -121.7220427 | 102.01 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-81A | 37.9249892 | -121.7234247 | 103.41 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-82A | 37.9247969 | -121.7231043 | 102.26 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | SL205383009-SB-83A | 37.9250297 | -121.7228089 | 102.34 | -128.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-11 | 38.0059117 | -121.8337381 | 49.45 | 51.86 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-16A | 38.006066 | -121.8341603 | 55.09 | 53.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-16B | 38.0060518 | -121.8341719 | 55.31 | 53.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-16C | 38.0060439 | -121.8341918 | 55.19 | 53.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-17 | 38.0061868 | -121.8343704 | 54.94 | 52.82 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-22 | 38.0068195 | -121.8341197 | 50.29 | 49.89 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-22C | 38.0068368 | -121.8340992 | 50.32 | 48.79 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-23 | 38.0063707 | -121.8349983 | 55.21 | 51.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-24 | 38.0066495 | -121.8346758 | 51.88 | 50.51 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-25 | 38.0064355 | -121.8340507 | 51.54 | 51.85 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-25B | 38.0064183 | -121.8340456 | 51.63 | 51.85 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-26 | 38.0061679 | -121.8343722 | 54.95 | 53.13 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-26B | 38.0061656 | -121.8343524 | 55.05 | 53.13 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-28 | 38.006751 | -121.8338309 | 49.92 | 49.60 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-28C | 38.0067594 | -121.8338183 | 49.81 | 49.60 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-29 | 38.0058874 | -121.8334668 | 50.35 | 50.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-30A | 38.0063123 | -121.833775 | 50.73 | 51.45 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-31A | 38.0061084 | -121.8338525 | 52.54 | 52.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-32D | 38.006267 | -121.8341172 | 52.78 | 52.47 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-5A | 38.0062378 | -121.8342137 | 54.85 | 52.64 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-5B | 38.0062447 | -121.8341948 | 54.51 | 52.64 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-5C | 38.0062516 | -121.8341759 | 54.18 | 52.64 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300676-MW-6 | 38.0058298 | -121.8342566 | 52.64 | 53.40 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300676-SW-1 | 38.0061866 | -121.8339985 | 53.15 | -46.47 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300676-SW-2 | 38.0060755 | -121.8338679 | 52.98 | -46.47 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-1 | 37.9368842 | -121.6951473 | 67.54 | 71.30 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-2 | 37.9366645 | -121.6952831 | 67.95 | 71.37 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-3 | 37.9364996 | -121.6949322 | 68.34 | 71.63 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-4 | 37.9365669 | -121.6946313 | 67.96 | 71.63 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-5B | 37.9369442 | -121.6949261 | 68.95 | 71.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-6 | 37.9371071 | -121.6952278 | 67.49 | 71.04 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-7B | 37.9366314 | -121.6955414 | 69.06 | 71.63 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-8 | 37.9363032 | -121.6950244 | 68.67 | 71.96 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300744-W-9 | 37.9365957 | -121.6948036 | 67.70 | 71.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-1 | 38.0152337 | -121.8135181 | 28.00 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-2 | 38.0153519 | -121.8136577 | 22.92 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-3 | 38.0153621 | -121.8135367 | 28.05 | -79.94 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300747-MW-4 | 38.015518 | -121.8135464 | 27.45 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-5 | 38.0149805 | -121.8137153 | 27.41 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-6 | 38.0153595 | -121.8139196 | 26.55 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-7 | 38.0157416 | -121.8131942 | 28.26 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-8 | 38.0157168 | -121.8138179 | 28.16 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-MW-9 | 38.0153718 | -121.8132026 | 26.88 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-PZ-01 | 38.0153102 | -121.8135375 | 28.35 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-PZ-02 | 38.0153363 | -121.8135592 | 28.26 | -79.94 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300747-PZ-03 | 38.015332 | -121.8135202 | 28.05 | -79.94 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300756-EW100 | 37.9985656 | -121.822348 | 34.72 | -53.26 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300756-EW101 | 37.9988293 | -121.8222826 | 36.08 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-1 | 37.9983089 | -121.822326 | 34.49 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-10L | 37.99910075 | -121.8221644 | 41.26 | -60.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-10U | 37.99911189 | -121.822006 | 35.89 | -60.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-11L | 37.99889936 | -121.822009 | 39.63 | -60.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-12L | 37.99861509 | -121.8222438 | 36.83 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-2 | 37.99856964 | -121.8222751 | 37.06 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-3 | 37.9987792 | -121.8223128 | 37.10 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-4 | 37.998635 | -121.822323 | 34.96 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-5 | 37.9984517 | -121.8223656 | 35.01 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-6A | 37.99900008 | -121.8220995 | 39.89 | -60.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-7A | 37.99911244 | -121.8222631 | 41.29 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-8U | 37.99833577 | -121.8224897 | 38.16 | -53.26 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300756-MW-9U | 37.99908525 | -121.8221338 | 40.57 | -60.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-1 | 38.0156887 | -121.8194631 | 15.09 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-10 | 38.0156602 | -121.8196409 | 14.65 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-11 | 38.0156238 | -121.819455 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-12 | 38.0155174 | -121.8192871 | 15.09 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-13S | 38.0158126 | -121.8196397 | 14.94 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-14D | 38.0158058 | -121.8196407 | 14.73 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-15 | 38.0154191 | -121.8199898 | 15.03 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-16 | 38.0157683 | -121.8194752 | 14.96 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-17 | 38.0157633 | -121.8195667 | 14.77 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-2 | 38.0157465 | -121.8194856 | 14.94 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-3 | 38.0157422 | -121.819522 | 14.73 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-4 | 38.0156534 | -121.8194282 | 15.03 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-5 | 38.0155878 | -121.8194967 | 15.53 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-6 | 38.0159386 | -121.8195728 | 13.36 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-7 | 38.016145 | -121.8195537 | 12.31 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-8 | 38.015973 | -121.8198354 | 12.83 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-MW-9 | 38.0154291 | -121.8195113 | 15.27 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-1 | 38.0157792 | -121.8195718 | 15.26 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-10 | 38.0157557 | -121.8194742 | 15.44 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-2 | 38.0157798 | -121.8195533 | 15.37 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-3 | 38.0157789 | -121.8195263 | 15.38 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-4 | 38.0157789 | -121.8194934 | 15.40 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-5 | 38.0157796 | -121.8194702 | 15.38 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-6 | 38.0157589 | -121.8195716 | 15.26 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-7 | 38.0157542 | -121.8195417 | 15.32 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-8 | 38.0157552 | -121.8195261 | 15.39 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300764-SP-9 | 38.0157567 | -121.8194951 | 15.42 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-IW10 | 37.9329167 | -121.6936652 | 76.77 | -104.59 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300766-IW9 | 37.9329025 | -121.6936893 | 77.31 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW1 | 37.9327737 | -121.6939078 | 78.01 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW2 | 37.9328761 | -121.6939949 | 78.00 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW3 | 37.9330462 | -121.6937609 | 77.07 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW4 | 37.9329572 | -121.6936399 | 76.75 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW5 | 37.932885 | -121.6936264 | 76.80 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW6A | 37.9330193 | -121.6939911 | 76.97 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW6B | 37.9330156 | -121.6939972 | 77.01 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW7A | 37.9329946 | -121.693405 | 76.29 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW7B | 37.933 | -121.6934076 | 76.27 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW8A | 37.9327127 | -121.6932717 | 75.64 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW8B | 37.9327176 | -121.6932757 | 75.48 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300766-MW8C | 37.9327231 | -121.6932819 | 75.69 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-1 | 38.0027038 | -121.8391442 | 77.59 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-1R | 38.0026908 | -121.8391612 | 77.71 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-2 | 38.0025267 | -121.8394175 | 79.40 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-3 | 38.0028146 | -121.8392837 | 78.17 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-3R | 38.0028246 | -121.8393014 | 78.05 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-4 | 38.0027292 | -121.8394187 | 78.98 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-6 | 38.002802 | -121.8390101 | 77.05 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-MW-7 | 38.0026041 | -121.8390904 | 78.27 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-SVE-1 | 38.0026568 | -121.8391433 | 77.82 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-SVE-2 | 38.002691 | -121.8391301 | 77.28 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-SVE-3 | 38.0026878 | -121.8391135 | 77.20 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-SVE-4 | 38.0025936 | -121.8391033 | 78.40 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300768-SVE-5 | 38.0025832 | -121.8391162 | 78.31 | -35.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300769-MW-1 | 38.0115649 | -121.8239635 | 16.06 | -63.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300769-MW-2 | 38.0115564 | -121.8238235 | 16.09 | -63.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300769-MW-3 | 38.011849 | -121.8239908 | 15.90 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300769-P-1 | 38.0115751 | -121.8239662 | 16.29 | -63.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300769-P-2 | 38.0115773 | -121.8239467 | 16.12 | -63.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300769-P-3 | 38.0116095 | -121.8239794 | 16.78 | -63.74 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-10 | 38.0062277 | -121.8054718 | 37.82 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-11 | 38.0062759 | -121.8054357 | 37.14 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-12 | 38.0062651 | -121.8054954 | 37.60 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-2 | 38.0061569 | -121.8058571 | 38.32 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-3 | 38.0060913 | -121.8058056 | 38.55 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-4 | 38.0061433 | -121.8057191 | 39.23 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-5 | 38.0061009 | -121.8056617 | 39.15 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-6 | 38.0061827 | -121.8056382 | 38.78 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-7 | 38.0060826 | -121.8054862 | 38.12 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-8 | 38.0060316 | -121.8054712 | 38.28 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-AS-9 | 38.0061043 | -121.8054369 | 38.34 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-1 | 38.00625498 | -121.8058466 | 35.39 | 38.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-10 | 38.00620952 | -121.8061775 | 36.00 | 38.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-11 | 38.0056385 | -121.8053273 | 39.18 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-12 | 38.00596199 | -121.8050542 | 36.76 | 38.65 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-13 | 38.00625922 | -121.8050555 | 35.58 | 37.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-14 | 38.00643977 | -121.8053422 | 33.68 | 37.78 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-15 | 38.00641723 | -121.805002 | 33.33 | 37.42 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-16 | 38.00717471 | -121.8047707 | 32.15 | 36.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-17 | 38.00716902 | -121.8047858 | 32.33 | 36.37 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Desgination | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300772-MW-2 | 38.006287 | -121.8056117 | 35.67 | 38.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-3 | 38.00613724 | -121.8056524 | 36.94 | 38.85 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-4 | 38.00612698 | -121.8058486 | 35.85 | 38.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-5 | 38.00647037 | -121.805826 | 35.23 | 37.90 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-6 | 38.00645471 | -121.8055512 | 34.69 | 37.92 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-7 | 38.00624756 | -121.8054469 | 35.75 | 38.48 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-8 | 38.00606136 | -121.8054427 | 35.98 | 38.90 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-MW-9 | 38.00585883 | -121.8057234 | 36.80 | 39.43 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-RW-1 | 38.00628235 | -121.8054523 | -- | 38.16 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-10 | 38.0061222 | -121.8057912 | 38.37 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-2 | 38.0061409 | -121.8056135 | 38.75 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-3 | 38.0062802 | -121.805406 | 37.71 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-4 | 38.0062428 | -121.8054153 | 38.19 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-5 | 38.0062057 | -121.8054183 | 38.30 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-6 | 38.0061408 | -121.8054135 | 38.24 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-7 | 38.0060834 | -121.8054199 | 38.22 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-8 | 38.0060305 | -121.8054248 | 38.25 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-SVE-9 | 38.0061543 | -121.8058248 | 38.04 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-VE-1 | 38.0061417 | -121.8056109 | -- | 38.80 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300772-VE-2 | 38.00625686 | -121.8056127 | -- | 38.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-B-53 | 37.9399721 | -121.6224433 | -- | 6.85 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-B-54 | 37.9399412 | -121.6221982 | -- | 6.85 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-B-55 | 37.9399259 | -121.6220835 | -- | 6.82 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-B-56 | 37.9399323 | -121.6219097 | -- | 6.82 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-B-57 | 37.9399159 | -121.6217167 | -- | 6.86 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300775-EW-1 | 37.93957 | -121.6230904 | 15.91 | -170.96 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300775-EW-2 | 37.9395742 | -121.6228656 | 16.48 | -170.96 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300775-EW-3 | 37.9396656 | -121.6229469 | 16.26 | -170.96 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-MW-1 | 37.9395163 | -121.6233194 | 16.74 | -170.96 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-MW-2 | 37.93943 | -121.6231362 | 16.35 | -170.96 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-MW-3 | 37.939209 | -121.6231662 | 15.11 | -170.96 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-MW-4 | 37.9394298 | -121.6228674 | 15.75 | -170.96 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-MW-5 | 37.9397156 | -121.6223688 | 15.24 | -170.96 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300775-MW-6 | 37.9399769 | -121.6232528 | 15.96 | -170.96 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-CES-15 | 38.0153331 | -121.80578 | 9.54 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-CES-16 | 38.0154219 | -121.8056033 | 7.63 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-CES-17 | 38.0153086 | -121.8055106 | 6.68 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-CES-18 | 38.0152066 | -121.8056389 | 10.29 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-CES-4 | 38.0153155 | -121.8056438 | 10.24 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-KMW-10 | 38.0143818 | -121.803181 | 9.72 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-KMW-11 | 38.0151455 | -121.8055429 | 9.92 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-KMW-8 | 38.0159326 | -121.8057552 | 12.38 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-KMW-9 | 38.0149425 | -121.803307 | 7.49 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-KSG-7 | 38.0147418 | -121.8044234 | 9.72 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-KSG-8 | 38.0154645 | -121.8042903 | 9.13 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-12 | 38.0154589 | -121.8038753 | 7.07 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-2 | 38.015543 | -121.8047278 | 9.13 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-3 | 38.0154062 | -121.8055011 | 10.15 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-4 | 38.0146512 | -121.8057372 | 19.08 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-5 | 38.0156693 | -121.8054338 | 10.50 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-6 | 38.0151593 | -121.8041467 | 9.13 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300776-MW-7A | 38.0162706 | -121.8048532 | 9.51 | -92.58 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | -- | Unknown | T0601300776-SG-1 | 38.0149875 | -121.8054495 | 11.85 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-SG-10 | 38.0151492 | -121.8030763 | 7.13 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-SG-2 | 38.0155612 | -121.8047643 | 9.82 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-SG-3 | 38.0149324 | -121.8041339 | 9.18 | -91.08 | -- | -- | -- | -- |
| Geotracker | -- | Unknown | T0601300776-SG-6A | 38.0162318 | -121.8044948 | 10.09 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-1 | 38.0089854 | -121.8315545 | 41.48 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-10 | 38.0092285 | -121.8313757 | 40.58 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-11 | 38.0090482 | -121.8312883 | 38.36 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-12 | 38.0096328 | -121.8321013 | 38.63 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-2 | 38.0089225 | -121.8315566 | 41.23 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-3 | 38.0089878 | -121.8316272 | 41.68 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-4 | 38.0089695 | -121.8317001 | 41.73 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-5 | 38.0089797 | -121.8313929 | 39.68 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-6 | 38.0088569 | -121.8314387 | 40.99 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-8 | 38.0091061 | -121.8316479 | 42.31 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300780-MW-9 | 38.0091814 | -121.8315869 | 41.85 | -57.25 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-DW-1A | 38.0117949 | -121.8058731 | 17.85 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-DW-1B | 38.0117959 | -121.8058574 | 17.66 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-DW-2A | 38.0119113 | -121.8058574 | 17.56 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-DW-2B | 38.011911 | -121.8058501 | 17.50 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-1 | 38.0118321 | -121.8058495 | 17.67 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-2 | 38.011746 | -121.8059614 | 17.57 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-3 | 38.0119104 | -121.8057926 | 17.81 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-4 | 38.0120298 | -121.8058484 | 16.26 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-5 | 38.0119314 | -121.8055469 | 17.76 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-6 | 38.0120741 | -121.8053981 | 17.15 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-7 | 38.0121171 | -121.8056318 | 16.90 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-8 | 38.0118236 | -121.8059642 | 17.33 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300781-MW-9 | 38.0117861 | -121.805894 | 17.89 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-EW-1 | 37.9995969 | -121.8055167 | 46.68 | 47.17 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-EW-2 | 37.9995983 | -121.8053608 | 45.97 | 46.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-EW-3 | 37.9995676 | -121.8054139 | 45.84 | 46.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-1 | 37.9996307 | -121.8057245 | 46.85 | 48.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-10 | 37.9996463 | -121.8058044 | 47.54 | 48.76 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-11 | 37.9999907 | -121.8050581 | 48.80 | 46.67 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-12 | 37.9994011 | -121.8057835 | 45.11 | 48.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-13 | 38.000166 | -121.8054461 | 51.26 | 49.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-14 | 38.0002065 | -121.8050629 | 51.23 | 48.04 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-15 | 38.0002315 | -121.8046597 | 45.57 | 47.86 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-2 | 37.9995903 | -121.8054568 | 46.87 | 46.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-3 | 37.999989 | -121.8056984 | 49.20 | 49.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-4 | 37.9997408 | -121.80519 | 45.74 | 46.04 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-5 | 37.9995248 | -121.8050439 | 40.91 | 45.10 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-6 | 37.9993948 | -121.8053151 | 43.01 | 45.89 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-7 | 37.9996347 | -121.8055954 | 46.58 | 48.16 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-8 | 37.9999792 | -121.8050587 | 48.75 | 46.67 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300782-MW-9 | 37.9997318 | -121.8051919 | 45.54 | 46.04 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-DW-1 | 37.9338985 | -121.6947746 | 74.84 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-DW-2 | 37.9338623 | -121.6946215 | 75.24 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-DW-3 | 37.9337577 | -121.6947067 | 75.87 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-1 | 37.9339431 | -121.6945458 | 73.19 | 76.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-10 | 37.933722 | -121.6948574 | 75.58 | -115.71 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300783-MW-11 | 37.9338062 | -121.6950794 | 74.22 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-12 | 37.9339449 | -121.6952019 | 73.83 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-13 | 37.9341922 | -121.694762 | 73.44 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-2 | 37.9339136 | -121.6947852 | 73.57 | 76.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-3 | 37.9337748 | -121.6947274 | 73.85 | 76.69 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-4 | 37.9338912 | -121.6946925 | 73.44 | 76.38 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-5 | 37.9338637 | -121.6943877 | 73.11 | 76.52 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-6 | 37.933667 | -121.694518 | 74.91 | 77.00 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-7 | 37.9340007 | -121.6946443 | 72.92 | 76.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-MW-9 | 37.9336898 | -121.6946859 | 76.32 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-SVE-1 | 37.9338808 | -121.6946499 | 73.26 | 76.52 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300783-SVE-2 | 37.9338698 | -121.6946129 | 73.66 | 76.52 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300784-MW-1 | 38.00462582 | -121.7968979 | 17.20 | -90.41 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300784-MW-2 | 38.00462382 | -121.7970015 | 18.36 | -90.41 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300784-MW-3 | 38.00462582 | -121.7968979 | 18.05 | -90.41 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-MW-1 | 38.017041 | -121.8176197 | 7.60 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-MW-2 | 38.0175466 | -121.8177886 | 8.10 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-MW-3 | 38.0175677 | -121.8174347 | 7.94 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-MW-4 | 38.0168336 | -121.8177861 | 8.59 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-MW-5 | 38.0172165 | -121.8179011 | 6.66 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-MW-6 | 38.016827 | -121.8174841 | 8.50 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-TW-1 | 38.0168371 | -121.8174983 | 8.67 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-TW-2 | 38.0169581 | -121.817657 | 8.21 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-TW-3 | 38.0169435 | -121.8174682 | 8.81 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300788-TW-4 | 38.0169572 | -121.8180571 | 9.00 | -76.63 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300790-MW-1 | 38.01081896 | -121.8193194 | 18.67 | 21.47 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300790-MW-2 | 38.01108911 | -121.8193669 | 17.03 | 20.93 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300790-MW-3 | 38.01104125 | -121.81954 | 17.70 | 21.37 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300790-MW-4 | 38.01124995 | -121.8194669 | 16.79 | 20.51 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300790-MW-5 | 38.01126429 | -121.8192493 | 16.35 | 20.18 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300790-MW-6 | 38.01109116 | -121.8189549 | 16.02 | 20.48 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-BW-1 | 38.0046866 | -121.8057268 | 42.82 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-2 | 38.0046401 | -121.8054315 | 41.73 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-3 | 38.0043868 | -121.8055792 | 42.44 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-4A | 38.003852 | -121.8054135 | 41.41 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-4B | 38.0038556 | -121.8053971 | 41.36 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-5B | 38.004459 | -121.8052784 | 42.48 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-6A | 38.0047369 | -121.8048701 | 39.05 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-6B | 38.0047369 | -121.8048853 | 39.07 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-7B | 38.0046698 | -121.8057534 | 41.82 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-7BL | 38.0046456 | -121.8057491 | 41.51 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-8A | 38.0041158 | -121.8051278 | 40.99 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300800-MW-8BL | 38.0041314 | -121.8051336 | 41.08 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-1 | 37.941038 | -121.6959902 | 67.30 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-10 | 37.9411273 | -121.6964507 | 67.59 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-11 | 37.9414786 | -121.6963074 | 66.51 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-12 | 37.9414863 | -121.6951664 | 63.75 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-13 | 37.9412149 | -121.6953829 | 64.73 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-14 | 37.9408431 | -121.6960057 | 65.83 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-15D | 37.9412418 | -121.695776 | 67.45 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-16D | 37.9415004 | -121.695639 | 64.97 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-17D | 37.9408886 | -121.6960089 | 65.49 | -81.20 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300802-MW-2 | 37.9411159 | -121.6958018 | 68.28 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-3 | 37.9413126 | -121.6959225 | 66.48 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-4 | 37.9415101 | -121.6958174 | 65.60 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-5 | 37.9415103 | -121.695651 | 65.13 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-6 | 37.9414869 | -121.6954125 | 64.16 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-7 | 37.9418024 | -121.6955387 | 65.08 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-8 | 37.9410984 | -121.6963133 | 66.86 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-MW-9D | 37.9410475 | -121.6957993 | 68.30 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-OS-1 | 37.9410457 | -121.6960267 | 67.24 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-OS-2 | 37.9410882 | -121.6958212 | 68.30 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300802-OS-3 | 37.941276 | -121.6958569 | 67.04 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STAS-1 | 38.011774 | -121.8058837 | 17.98 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STEVE-13 | 38.0118588 | -121.8058973 | 17.25 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STEW-23 | 38.0116088 | -121.8061896 | 18.49 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STEW-24 | 38.0114365 | -121.8061786 | 18.68 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STEW-25 | 38.0112772 | -121.806245 | 17.86 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STEW-26 | 38.0113862 | -121.8064065 | 17.91 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-1 | 38.0115736 | -121.8061876 | 18.59 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-17 | 38.0110702 | -121.8059374 | 20.92 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-18 | 38.0118899 | -121.8059672 | 17.48 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-19 | 38.011466 | -121.8059537 | 19.05 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-2 | 38.0113018 | -121.8061832 | 18.66 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-20 | 38.0110872 | -121.806167 | 18.79 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-21 | 38.0117921 | -121.8063265 | 17.64 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-22 | 38.0115068 | -121.806571 | 17.99 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-27 | 38.0110924 | -121.8058268 | 23.13 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-28 | 38.0110321 | -121.8056538 | 24.83 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-29 | 38.0120502 | -121.806349 | 17.07 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-30 | 38.0123365 | -121.8060766 | 17.83 | -91.08 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-31 | 38.0111335 | -121.8065357 | 16.61 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-32 | 38.0112789 | -121.8066071 | 17.03 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-33 | 38.0108919 | -121.8057424 | 22.79 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-34 | 38.0112001 | -121.8050437 | 35.00 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-35 | 38.0116127 | -121.8050609 | 30.25 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-36 | 38.011544 | -121.8053608 | 37.73 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-4 | 38.0115614 | -121.8064594 | 18.35 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-5 | 38.011647 | -121.8062696 | 18.87 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-6 | 38.0114208 | -121.8064288 | 18.14 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-7 | 38.0115972 | -121.8063492 | 18.83 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMW-8 | 38.0117668 | -121.806259 | 17.61 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-10 | 38.0112875 | -121.8064219 | 17.22 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-11 | 38.0110778 | -121.8059378 | 20.82 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-12 | 38.011473 | -121.8059533 | 19.21 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-14 | 38.0117338 | -121.8061973 | 18.37 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-15 | 38.0113013 | -121.8062104 | 18.44 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-16 | 38.0110793 | -121.8061552 | 18.99 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300803-STMWD-9 | 38.0115802 | -121.8064446 | 18.62 | -88.75 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-EW-1 | 37.933947 | -121.6983042 | 78.06 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-EW-2 | 37.9340563 | -121.6980679 | 77.09 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-EW-3 | 37.9342196 | -121.698215 | 75.88 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-EW-4 | 37.9341331 | -121.6983485 | 77.15 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-EW-5 | 37.9343278 | -121.6983093 | 75.97 | -115.71 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300804-EW-6 | 37.934265 | -121.6984956 | 77.13 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-1 | 37.9339856 | -121.6983873 | 78.55 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-10 | 37.9334922 | -121.6986553 | 76.39 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-11 | 37.9344076 | -121.6987493 | 77.64 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-12 | 37.9332716 | -121.6985076 | 76.61 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-12A | 37.9332601 | -121.6984381 | 76.85 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-13 | 37.9334587 | -121.6975276 | 77.36 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-14 | 37.933498 | -121.6964006 | 75.37 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-15B | 37.9340422 | -121.6991599 | 75.91 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-16B | 37.9343563 | -121.698675 | 77.21 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-17B | 37.9340314 | -121.6984518 | 78.07 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-2A | 37.9337241 | -121.698056 | 78.11 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-3 | 37.9341415 | -121.6981199 | 76.90 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-4 | 37.9344467 | -121.6984594 | 76.44 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-5 | 37.9342927 | -121.6986578 | 77.71 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-6 | 37.9339419 | -121.6990277 | 76.80 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-6D | 37.933941 | -121.6990473 | 76.16 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-7 | 37.9344388 | -121.6974999 | 76.07 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-7D | 37.9344507 | -121.6974775 | 76.00 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-8 | 37.9345152 | -121.6966418 | 74.10 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300804-MW-9 | 37.9346687 | -121.6975854 | 76.47 | -115.71 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-IP-1 | 38.0048006 | -121.806461 | 40.81 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-IP-2 | 38.0047763 | -121.8064748 | 41.25 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-1 | 38.0047156 | -121.806184 | 41.33 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-2 | 38.0047769 | -121.806228 | 41.18 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-3 | 38.0046278 | -121.8063643 | 42.35 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-4 | 38.0050061 | -121.8061174 | 40.18 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-5 | 38.004464 | -121.8063128 | 42.36 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-5B | 38.0044643 | -121.8063393 | 41.86 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-5C | 38.0044652 | -121.8063584 | 41.93 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-MW-6 | 38.004798 | -121.8064968 | 41.16 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-OW-1 | 38.0047842 | -121.8064498 | 41.14 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-OW-2 | 38.0047805 | -121.8064347 | 41.28 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-11 | 38.0047895 | -121.8063677 | 41.05 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-12 | 38.0049592 | -121.8057025 | 39.23 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-13 | 38.004603 | -121.8060185 | 41.46 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-14 | 38.0047989 | -121.8069236 | 40.38 | -79.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-15 | 38.0050037 | -121.8067263 | 39.72 | -79.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-17 | 38.0052567 | -121.8059382 | 39.66 | -85.29 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-7 | 38.0045469 | -121.8067045 | 41.73 | -79.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300807-S-8 | 38.0047989 | -121.8066962 | 40.40 | -79.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-1 | 38.0112956 | -121.8184385 | 13.27 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-10 | 38.0116934 | -121.8183619 | 13.71 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-102 | 38.0115302 | -121.8181231 | 14.30 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-103 | 38.0115097 | -121.8180083 | 14.28 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-104 | 38.0118684 | -121.8180428 | 13.24 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-11 | 38.0110934 | -121.8184786 | 13.93 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-12 | 38.0118666 | -121.8182772 | 13.86 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-13 | 38.011868 | -121.8181249 | 13.64 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-14 | 38.0118708 | -121.817868 | 12.78 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-2 | 38.0111612 | -121.8181371 | 12.58 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-3 | 38.0113382 | -121.8180056 | 13.33 | -70.53 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601300809-MW-4 | 38.0113958 | -121.8183385 | 13.77 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-5 | 38.0114142 | -121.8181693 | 14.36 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-6 | 38.0114107 | -121.818011 | 14.00 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-7 | 38.0115183 | -121.8183359 | 14.00 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-8 | 38.0115242 | -121.8181439 | 14.53 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300809-MW-9 | 38.0114921 | -121.8180102 | 14.42 | -70.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-1 | 38.017207 | -121.752913 | 9.47 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-2 | 38.0171331 | -121.7529023 | 8.54 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-3 | 38.017163 | -121.7530978 | 8.72 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-4 | 38.0174218 | -121.7529407 | 9.59 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-5 | 38.0174601 | -121.7532544 | 8.74 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-6 | 38.0172799 | -121.7529025 | 9.65 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601300810-MW-7 | 38.0172388 | -121.7532734 | 9.18 | -104.84 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-1 | 37.9941196 | -121.8082977 | 86.87 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-2 | 37.9939988 | -121.8082726 | 87.00 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-3 | 37.9941265 | -121.8081169 | 85.45 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-4 | 37.9938456 | -121.8080293 | 86.58 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-5 | 37.993993 | -121.8081341 | 86.29 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-6 | 37.994052 | -121.8080616 | 85.36 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601306725-MW-8 | 37.9944661 | -121.8088979 | 90.60 | -70.22 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MPE-1 | 38.00379078 | -121.787085 | 37.99 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MPE-2 | 38.0037754 | -121.787005 | 37.92 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MPE-3 | 38.00378277 | -121.7869815 | 37.79 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-1 | 38.0037825 | -121.7872783 | 38.24 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-1D | 38.00376017 | -121.7869873 | 37.89 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-2 | 38.003891 | -121.7870598 | 37.19 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-2D | 38.00391916 | -121.7870492 | 36.75 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-3 | 38.0037733 | -121.7870175 | 37.98 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-3D | 38.00417987 | -121.7867559 | 31.20 | -99.23 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-4 | 38.0037847 | -121.7870444 | 37.84 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-4R | 38.00375461 | -121.7870441 | 37.76 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-5 | 38.00376206 | -121.7869392 | 37.83 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-6 | 38.00364211 | -121.7869787 | 38.55 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-7 | 38.00510029 | -121.7870266 | 38.20 | -99.23 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-8 | 38.00390386 | -121.7869723 | 37.11 | -96.14 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601325015-MW-9 | 38.00418017 | -121.7868248 | 31.71 | -99.23 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601330032-MW1 | 37.8672165 | -121.637895 | 27.35 | -132.11 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601330032-MW2 | 37.8673126 | -121.6380089 | 28.14 | -132.11 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601330032-MW3 | 37.867352 | -121.6378623 | 26.48 | -132.11 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601330032-MW4 | 37.8672745 | -121.6377914 | 26.34 | -132.11 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601341681-MW-1 | 38.0155474 | -121.8077961 | 16.40 | -85.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601341681-MW-2 | 38.0157695 | -121.8078475 | 12.24 | -85.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601341681-MW-3 | 38.0157133 | -121.8076686 | 12.85 | -85.68 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-EW1 | 37.9406647 | -121.6966186 | 66.67 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-EW2 | 37.9408713 | -121.6964843 | 68.96 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-EW3 | 37.9408789 | -121.6963383 | 68.04 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW1 | 37.9409865 | -121.6963442 | 67.73 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-10 | 37.9413084 | -121.6965237 | 67.93 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-11 | 37.9408574 | -121.6954799 | 66.75 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-12 | 37.940741 | -121.6960109 | 66.80 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-13 | 37.9415908 | -121.6946485 | 64.64 | -73.34 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-14 | 37.9399551 | -121.694452 | 65.46 | -73.34 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601343310-MW-15 | 37.940808 | -121.693002 | 63.13 | -73.34 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-16 | 37.9426677 | -121.6946332 | 64.38 | -73.34 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-17 | 37.9426195 | -121.6936784 | 62.45 | -73.34 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-18 | 37.9418714 | -121.6932068 | 61.90 | -73.34 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW2 | 37.9408115 | -121.6965066 | 69.34 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW3 | 37.9408318 | -121.696335 | 67.90 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW4 | 37.9409874 | -121.6963695 | 66.94 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-5 | 37.9407746 | -121.6965089 | 68.89 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-6 | 37.9407223 | -121.6965102 | 68.02 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-7 | 37.9409531 | -121.6963744 | 68.02 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-8 | 37.940761 | -121.6963398 | 67.30 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601343310-MW-9 | 37.9411349 | -121.6965732 | 68.58 | -81.20 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601358660-MW1 | 38.00225 | -121.74275 | 38.15 | -94.65 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601358660-MW2 | 38.00162918 | -121.7418966 | 37.28 | -94.65 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601358660-MW3 | 38.00141 | -121.74316 | 35.85 | -94.65 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601358660-MW4 | 38.00136 | -121.74373 | 35.99 | -96.28 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359254-MW-1 | 37.9345134 | -121.6920427 | 70.06 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359254-MW-2 | 37.934424 | -121.6920187 | 70.67 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359254-MW-3 | 37.9343979 | -121.6920626 | 70.89 | -104.59 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-AS-1 | 38.0004624 | -121.8063424 | 53.28 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-AS-2 | 38.0003826 | -121.8063497 | 52.74 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-AS-3 | 38.0004393 | -121.8062461 | 52.86 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-AS-4 | 38.00051 | -121.8062117 | 52.95 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-AS-5 | 38.0004667 | -121.8061782 | 52.33 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-AS-6 | 38.0005619 | -121.8061785 | 52.51 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-10 | 38.00034 | -121.8061452 | 52.47 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW11 | 38.0002488 | -121.8066484 | 53.42 | -76.07 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW12 | 37.9999553 | -121.806154 | 52.28 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-13 | 38.0006519 | -121.8039583 | 44.81 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW14 | 38.0006719 | -121.8049529 | 47.89 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-15 | 38.0011521 | -121.8049933 | 48.98 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-16 | 38.001097 | -121.8042347 | 46.91 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-4 | 38.0004963 | -121.8064013 | 53.69 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-5 | 38.0008867 | -121.8063317 | 51.12 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-6 | 38.0006217 | -121.8055473 | 50.11 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-7 | 38.0004348 | -121.8058214 | 52.47 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-8 | 38.0002484 | -121.805824 | 52.79 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-MW-9 | 38.0002058 | -121.8063305 | 52.47 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-RW-1 | 38.0005311 | -121.8063645 | 53.27 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-RW-2 | 38.0004512 | -121.8063673 | 53.44 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-RW-3 | 38.0003611 | -121.8063564 | 53.03 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-RW-4 | 38.0004463 | -121.8062016 | 52.49 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601359797-RW-5 | 38.0005447 | -121.8062075 | 52.73 | -81.54 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601376629-MW1 | 37.9015462 | -121.6027962 | 5.67 | -188.27 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601376629-MW2 | 37.9013569 | -121.6026365 | 5.02 | -188.27 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601376629-MW3 | 37.9017111 | -121.6025489 | 4.87 | -188.27 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601376629-MW4 | 37.9016078 | -121.6023867 | 4.12 | -188.27 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-1 | 38.022473 | -121.6351696 | -4.91 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-10 | 38.0225654 | -121.6354574 | -5.78 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-2 | 38.0225757 | -121.6352857 | -5.48 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-3 | 38.0225125 | -121.6354305 | -5.70 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-4 | 38.0224013 | -121.6354456 | -5.23 | -157.83 | -- | -- | -- | -- |

## Well Construction Table-East Contra Costa Subbasin, Geotracker and USGS Wells

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601378938-MW-5 | 38.0223448 | -121.6355005 | -5.41 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-6 | 38.0224618 | -121.6355097 | -5.57 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-7 | 38.0224048 | -121.6355837 | -5.42 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-8 | 38.0224904 | -121.6355946 | -5.11 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601378938-MW-9 | 38.0225315 | -121.6355573 | -5.61 | -157.83 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-1 | 38.0143284 | -121.8223385 | 14.81 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-10 | 38.0144288 | -121.8229225 | 14.20 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-11 | 38.0146595 | -121.8227285 | 14.10 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-12 | 38.0148006 | -121.8232961 | 14.15 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-13 | 38.0148774 | -121.822838 | 15.63 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-14 | 38.0149575 | -121.8222889 | 16.38 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-15 | 38.0147289 | -121.8217368 | 15.57 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-16 | 38.0143977 | -121.8221377 | 14.60 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-17 | 38.0144926 | -121.8223497 | 15.25 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-18 | 38.0144113 | -121.8223691 | 14.95 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-19 | 38.0143675 | -121.8223227 | 15.47 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-2 | 38.0144601 | -121.8223304 | 15.06 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-20 | 38.0144731 | -121.8222703 | 15.63 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-21 | 38.0144038 | -121.8222156 | 15.54 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-3 | 38.0144906 | -121.8222021 | 14.93 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-4 | 38.0143271 | -121.8222114 | 14.66 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-5 | 38.0140936 | -121.8223943 | 13.34 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-6 | 38.0145447 | -121.8224989 | 14.99 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-7 | 38.0147467 | -121.8221309 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-8 | 38.0142517 | -121.8219895 | 14.20 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-B-9 | 38.0140827 | -121.8228979 | 14.27 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-10 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-15 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-20 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-25 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-30 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-35 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-40 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-BC-1-5 | 38.0144622 | -121.8223235 | 15.28 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-MW-1 | 38.0143185 | -121.8222422 | 14.91 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-MW-2 | 38.0145542 | -121.8221808 | 14.95 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389036-MW-3 | 38.0144717 | -121.8223222 | 15.32 | -73.77 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601389417-MW-1 | 37.9901263 | -121.6677145 | 9.00 | -182.30 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391419-MW-1 | 38.016101 | -121.7494516 | 9.31 | -104.41 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391419-MW-2 | 38.0160282 | -121.749727 | 8.90 | -104.41 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391419-MW-3 | 38.016271 | -121.7497524 | 9.65 | -104.41 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-EX-1 | 38.01268769 | -121.8292119 | 29.52 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-EX-2 | 38.01269103 | -121.8292322 | 29.31 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-1 | 38.01280491 | -121.8291715 | 29.08 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-1-I | 38.01267281 | -121.8292351 | 29.38 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-2 | 38.01265159 | -121.8294185 | 29.06 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-2-I | 38.01236483 | -121.8295102 | 29.93 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-3 | 38.01279778 | -121.8293977 | 29.14 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-3-I | 38.01278438 | -121.829472 | 29.43 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-4 | 38.01273845 | -121.8295932 | 29.22 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-4-I | 38.01274235 | -121.8292256 | 29.56 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-5 | 38.01310269 | -121.8296761 | 28.52 | -61.35 | -- | -- | -- | -- |

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Geotracker | Monitoring | Unknown | T0601391420-MW-5-I | 38.01249205 | -121.8293584 | 30.07 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-6 | 38.01267481 | -121.8292231 | 29.32 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-7 | 38.01260006 | -121.828653 | 29.01 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-8 | 38.01236228 | -121.8287389 | 29.33 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T0601391420-MW-9 | 38.01266 | -121.82954 | 29.55 | -61.35 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.01 | 38.0153839 | -121.8248692 | 15.32 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.02 | 38.0153843 | -121.8247034 | 15.60 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.03 | 38.0153848 | -121.824538 | 15.64 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.04 | 38.0153139 | -121.8248692 | 14.76 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.05 | 38.0152891 | -121.8247623 | 14.97 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.06 | 38.0152439 | -121.8248197 | 14.90 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.07 | 38.0152455 | -121.8247024 | 14.86 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.08 | 38.0151986 | -121.824761 | 14.89 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.09 | 38.0152438 | -121.824763 | 14.91 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.10 | 38.0151097 | -121.8249689 | 14.86 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.11 | 38.0153347 | -121.8249879 | 14.87 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.12 | 38.0152557 | -121.8249579 | 15.05 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.13 | 38.0151759 | -121.8248509 | 14.98 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000000655-MW.14 | 38.0151362 | -121.8246593 | 15.04 | -67.49 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-B-1 | 37.925711 | -121.733845 | 123.81 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-B-2 | 37.925701 | -121.733699 | 123.24 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-B-3 | 37.925658 | -121.733912 | 123.88 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-B-4 | 37.925591 | -121.733775 | 123.89 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-MW-1 | 37.925573 | -121.733774 | 123.61 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-MW-2 | 37.92568 | -121.733619 | 126.41 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-MW-3 | 37.925613 | -121.733985 | 124.29 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-MW-4 | 37.925805 | -121.733792 | 125.46 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000002015-MW-5 | 37.925501 | -121.733773 | 124.55 | -121.19 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-1 | 37.939064 | -121.5784564 | -7.20 | -183.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-2 | 37.9390629 | -121.5778783 | -7.30 | -183.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-3 | 37.9391663 | -121.5781884 | -11.94 | -183.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-4 | 37.9391678 | -121.5779586 | -11.68 | -183.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-5 | 37.9394031 | -121.5782836 | -8.66 | -183.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-6 | 37.939404 | -121.5778654 | -9.82 | -183.53 | -- | -- | -- | -- |
| Geotracker | Monitoring | Unknown | T10000003258-MW-7 | 37.9390637 | -121.5781095 | -7.33 | -183.53 | -- | -- | -- | -- |
| USGS | -- | Shallow | USGS-375106121372201 | 37.8515927 | -121.6238399 | -- | 25.20 | -- | -- | -- | 45 |
| USGS | -- | Shallow | USGS-375202121383101 | 37.8671477 | -121.643007 | 34.00 | 34.48 | -- | -- | -- | 135 |
| USGS | -- | Shallow | USGS-375347121372201 | 37.8963137 | -121.6238404 | 8.00 | 5.25 | -- | -- | -- | 110 |
| USGS | -- | Shallow | USGS-375410121412401 | 37.9027022 | -121.6910637 | 89.00 | 92.56 | -- | -- | -- | 85 |
| USGS | -- | Shallow | USGS-375427121422601 | 37.9074242 | -121.7082863 | 107.00 | 109.99 | -- | -- | -- | 98 |
| USGS | -- | Shallow | USGS-375449121435301 | 37.9135351 | -121.7324534 | -- | 136.44 | -- | -- | -- | 60 |
| USGS | -- | Shallow | USGS-375600121402601 | 37.933257 | -121.6749527 | 55.00 | 55.34 | -- | -- | -- | 123 |
| USGS | -- | Shallow | USGS-375601121415201 | 37.9335347 | -121.6988419 | 75.00 | 78.06 | -- | -- | -- | 145 |
| USGS | -- | Shallow | USGS-375701121392901 | 37.9502011 | -121.6591193 | -- | 36.17 | -- | -- | -- | 60 |
| USGS | -- | Shallow | USGS-375738121441501 | 37.9604783 | -121.7385648 | 124.00 | 114.99 | -- | -- | -- | 80 |
| USGS | -- | Shallow | USGS-375753121422801 | 37.9646449 | -121.7088422 | 70.00 | 72.39 | -- | -- | -- | 133 |
| USGS | -- | Shallow | USGS-375831121424001 | 37.9752002 | -121.7121757 | 75.00 | 77.41 | -- | -- | -- | 130 |
| USGS | -- | Shallow | USGS-375916121403401 | 37.9877 | -121.6771754 | 6.00 | 15.45 | -- | -- | -- | 88 |
| USGS | -- | Shallow | USGS-380012121461101 | 38.0032549 | -121.770788 | 44.00 | 51.43 | -- | -- | -- | 95 |
| USGS | -- | Shallow | USGS-380016121454501 | 38.004366 | -121.7635656 | 60.00 | 53.51 | -- | -- | -- | 140 |
| USGS | -- | Shallow | USGS-380017121443201 | 38.0047222 | -121.7416667 | 29.00 | 29.68 | -- | -- | -- | 82 |
| USGS | -- | Shallow | USGS-380017121455901 | 38.0046437 | -121.7674546 | 51.00 | 47.33 | -- | -- | -- | 120 |

**Well Construction Table-East Contra Costa Subbasin, Geotracker and USGS Wells**

| Owner/GSA/ Monitoring Agency | Well Type | Zone Designation | Well Name | Latitude | Longitude | TOC Elev. (ft msl) | Ground Surface Elevation | Screen Interval (ft bgs) | Top of Screen Interval (ft msl) | Bottom of Screen Interval (ft msl) | Well Depth (ft bgs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| USGS | -- | Shallow | USGS-380019121464601 | 38.0051992 | -121.7805105 | -- | 49.28 | -- | -- | -- | 93 |
| USGS | -- | Shallow | USGS-380020121443901 | 38.0054771 | -121.7452318 | 26.00 | 25.82 | -- | -- | -- | 66 |
| USGS | -- | Shallow | USGS-380025121471101 | 38.0118657 | -121.7710659 | -- | 32.36 | -- | -- | -- | 78 |
| USGS | -- | Shallow | USGS-380043121461201 | 38.0132546 | -121.7702326 | 28.00 | 27.96 | -- | -- | -- | 67 |
| USGS | -- | Shallow | USGS-380048121470701 | 38.0151994 | -121.6288418 | 5.00 | 8.03 | -- | -- | -- | 165 |
| USGS | -- | Deep | USGS-375437121355601 | 37.9102023 | -121.5999513 | -- | 3.00 | -- | -- | -- | 355 |
| USGS | -- | Deep | USGS-375600121410901 | 37.933257 | -121.6868973 | -- | 66.06 | -- | -- | -- | 230 |
| USGS | -- | Deep | USGS-380019121473401 | 38.0051992 | -121.7938443 | -- | 18.95 | -- | -- | -- | 190 |
| USGS | -- | Deep | USGS-380024121490801 | 38.006588 | -121.8199562 | 27.00 | 24.59 | -- | -- | -- | 124 |
| USGS | -- | Deep | USGS-380024121490803 | 38.0068659 | -121.7874552 | 17.00 | 15.95 | -- | -- | -- | 140 |
| USGS | -- | Deep | USGS-380048121460901 | 38.0132545 | -121.7863441 | -- | 31.63 | -- | -- | -- | 500 |
| USGS | -- | Deep | USGS-380055121374001 | 38.0171433 | -121.8032891 | -- | 5.14 | -- | -- | -- | 176 |
| USGS | -- | Deep | USGS-380102121480801 | 38.0382542 | -121.6368976 | -- | 2.59 | -- | -- | -- | 258 |
| USGS | -- | Deep | USGS-380218121380901 | 38.006588 | -121.8199562 | 26.00 | 24.59 | -- | -- | -- | 130 |
| USGS | -- | Composite | USGS-375228121382001 | 37.8743698 | -121.6399515 | -- | 32.22 | -- | -- | -- | 185 |
| USGS | -- | Composite | USGS-375619121353001 | 37.9385349 | -121.5927293 | -13.00 | 3.71 | -- | -- | -- | 176 |
| USGS | -- | Unknown | USGS-380024121471501 | 38.0065881 | -121.7885663 | -- | 8.96 | -- | -- | -- | -- |

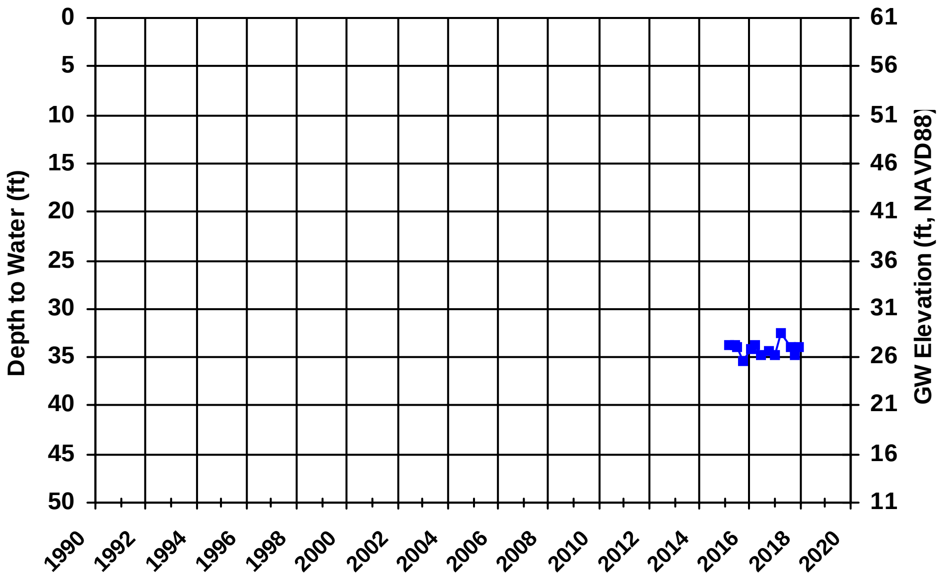
**Abbreviations:**

ft- feet
GSA- Groundwater Sustainability Agency
bgs- below ground surface
msl- mean sea level
TOC- Top of Casing
USGS-United States Geological Survey

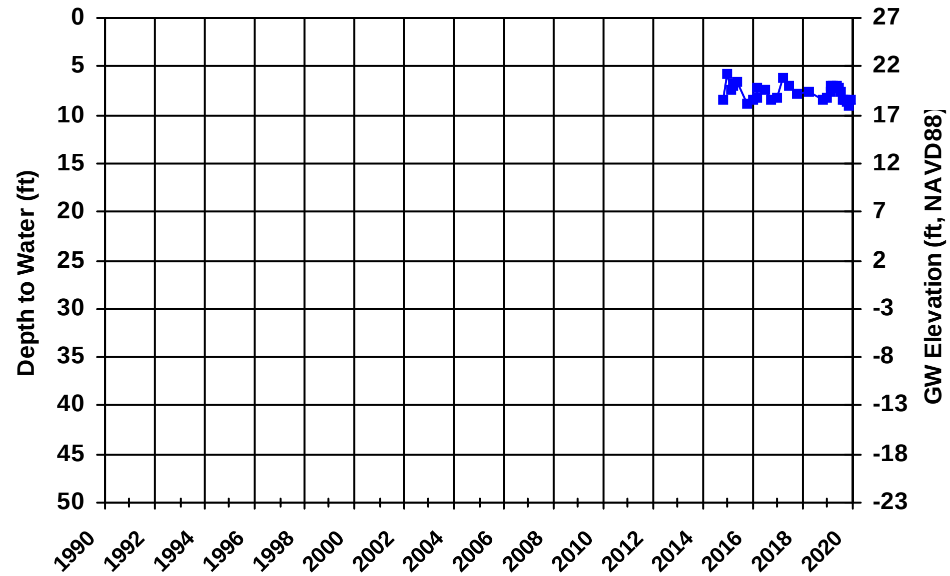
# APPENDIX 3d

**Groundwater Level Hydrographs**

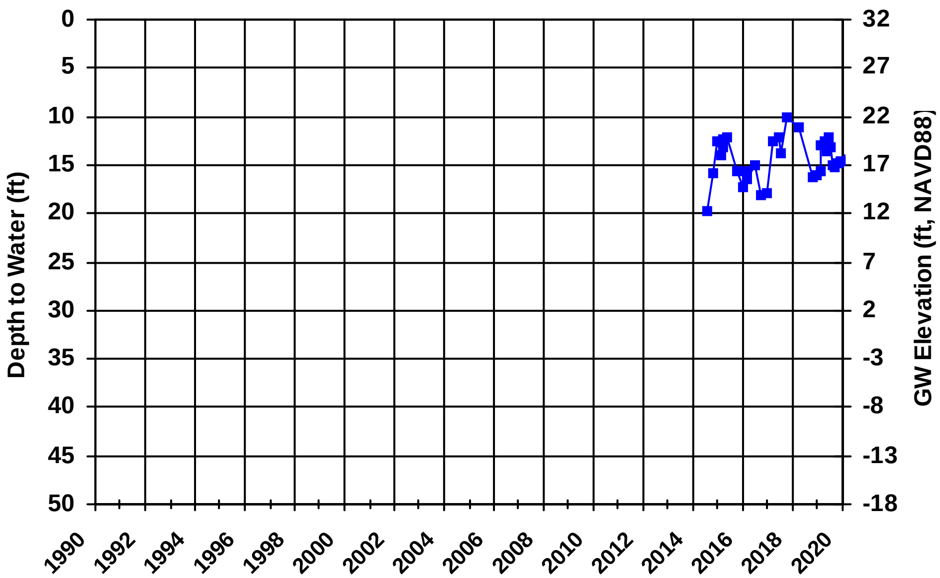
WellID: Blossom Well
Zone: Shallow
Owner: Antioch | Perf Int (ft): 60-88 | Well Depth (ft): 88



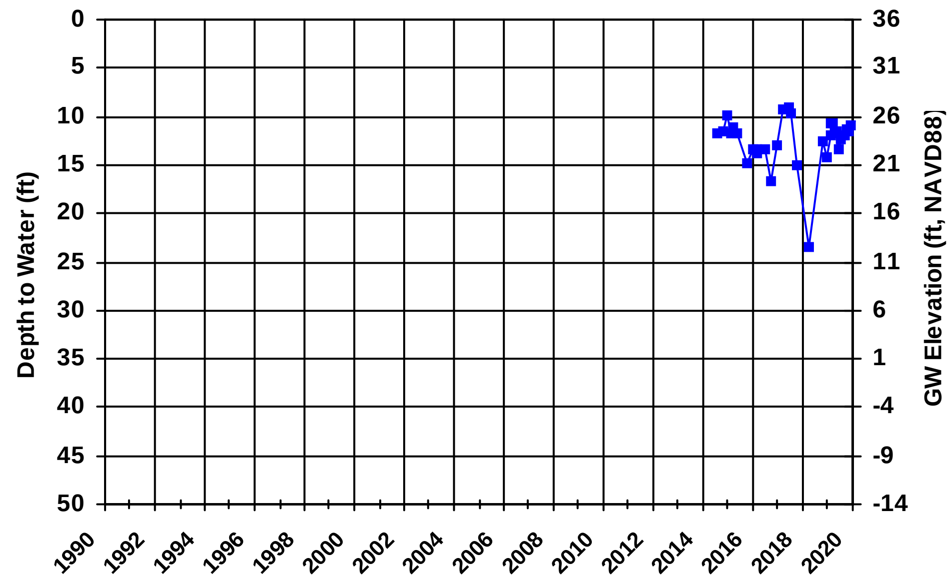

WellID: 1 JNJ
Zone: Shallow
Owner: BBID | Perf Int (ft): 105-120 | Well Depth (ft): 120




WellID: 3 Byron
Zone: Shallow
Owner: BBID | Perf Int (ft): 50-70 | Well Depth (ft): 70

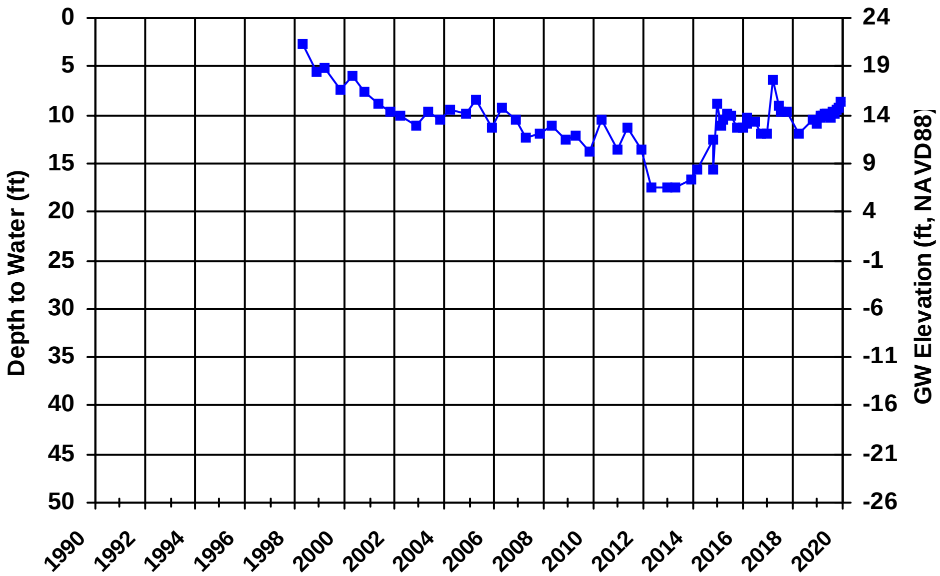



WellID: 4 Bruns
Zone: Shallow
Owner: BBID | Perf Int (ft): 45-65 | Well Depth (ft): 65

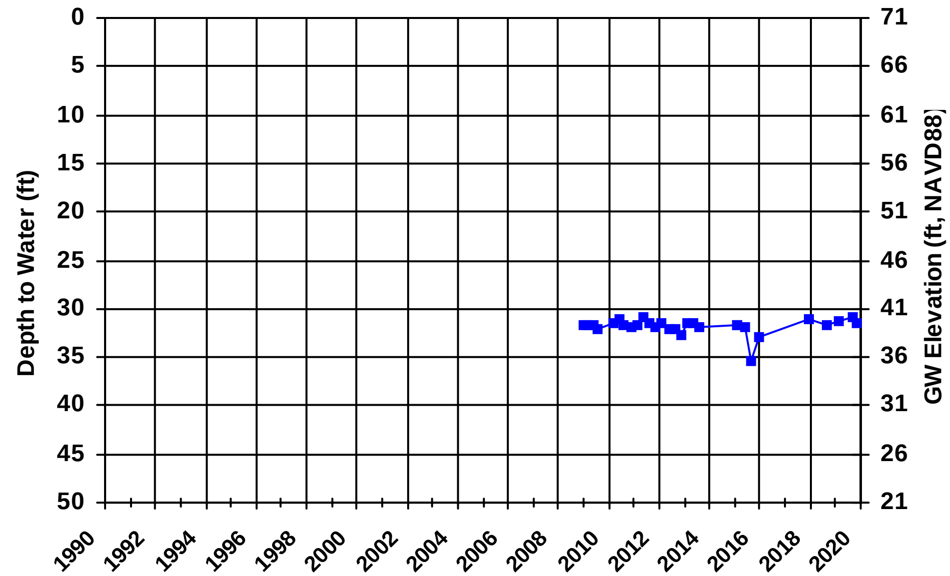



Manual Water Level Measurement    Transducer Water Level Measurement

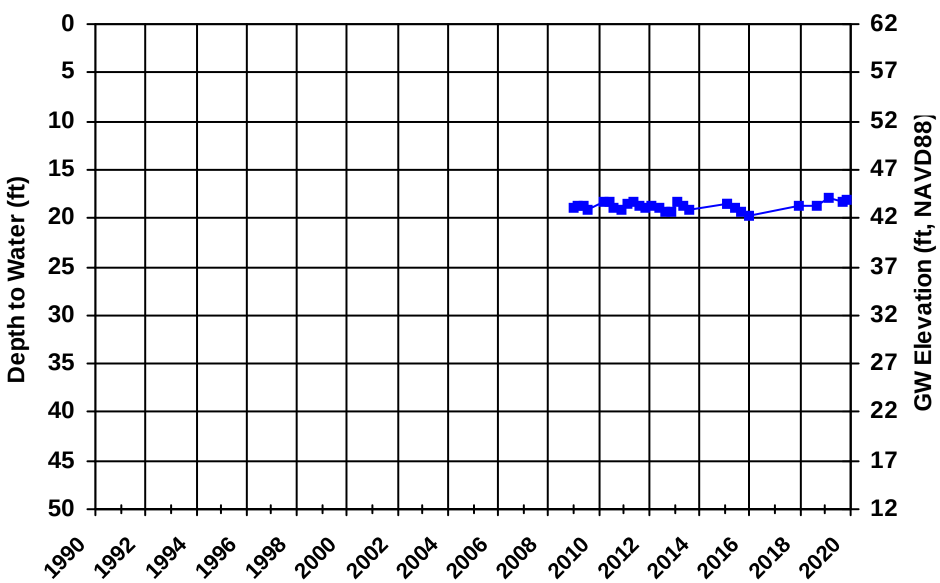
WellID: 5 Binn
Zone: Shallow
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): 45



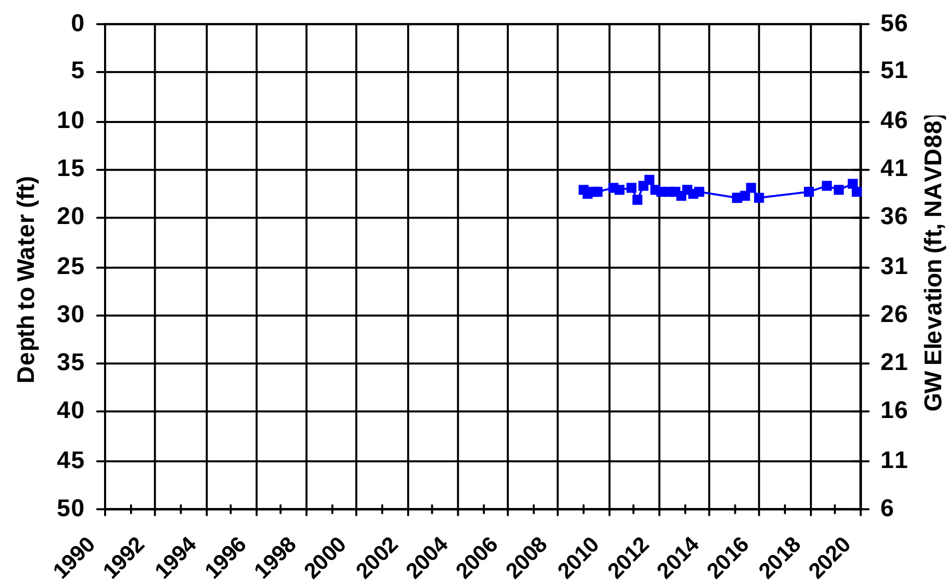

WellID: BG-1
Zone: Shallow
Owner: CofB | Perf Int (ft): 40-55 | Well Depth (ft): 55




WellID: BG-2
Zone: Shallow
Owner: CofB | Perf Int (ft): 22.5-37.5 | Well Depth (ft): 37.5

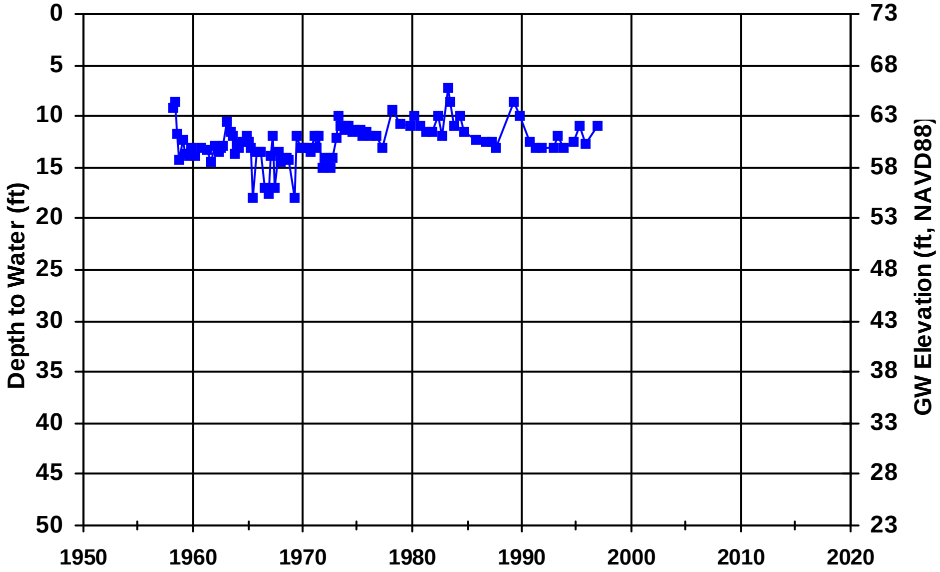



WellID: BG-3
Zone: Shallow
Owner: CofB | Perf Int (ft): 20-35 | Well Depth (ft): 35

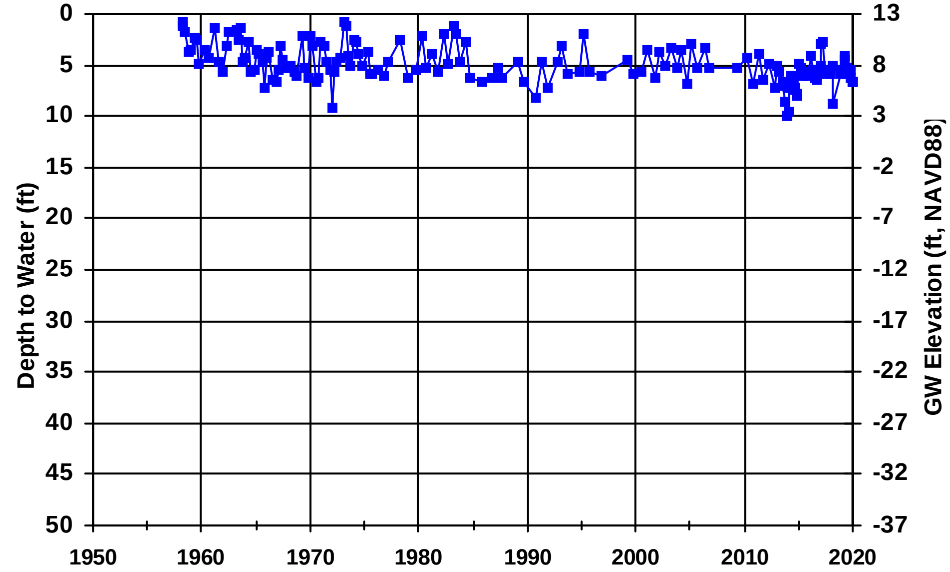



Manual Water Level Measurement — Transducer Water Level Measurement

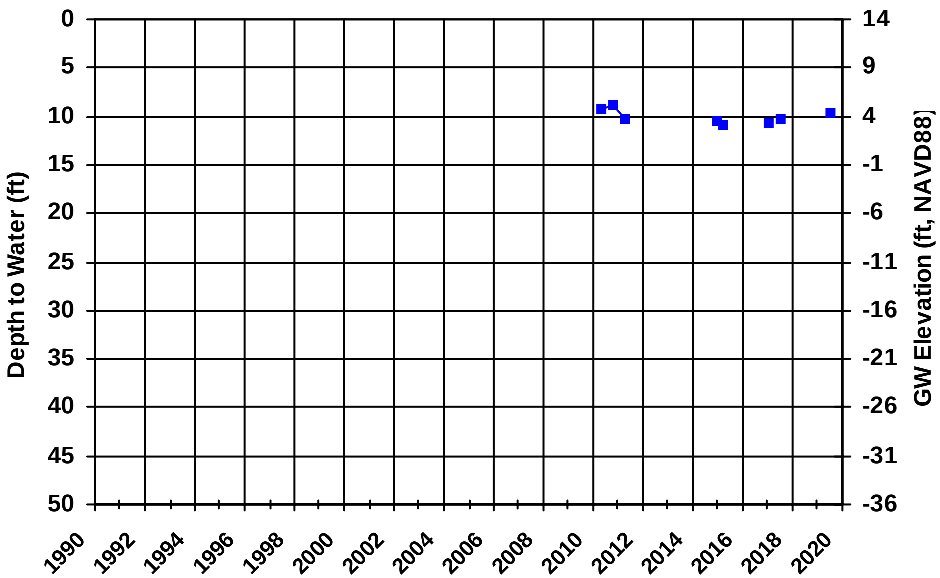
**WellID: 5-2**
**Zone: Shallow**
Owner: ECCID    Perf Int (ft): N/A    Well Depth (ft): <20



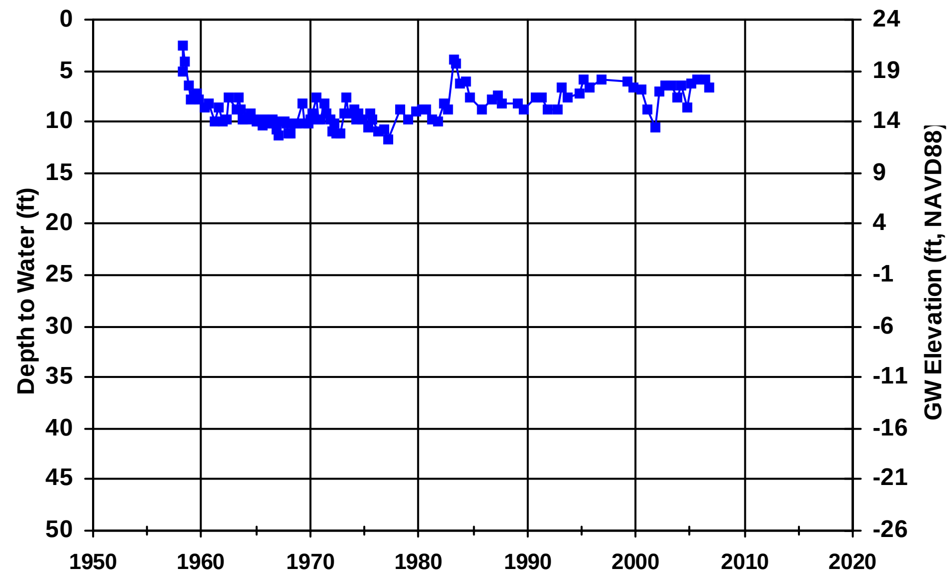

**WellID: 5-33**
**Zone: Shallow**
Owner: ECCID    Perf Int (ft): N/A    Well Depth (ft): 11




**WellID: 5-34**
**Zone: Shallow**
Owner: ECCID    Perf Int (ft): N/A    Well Depth (ft): 11

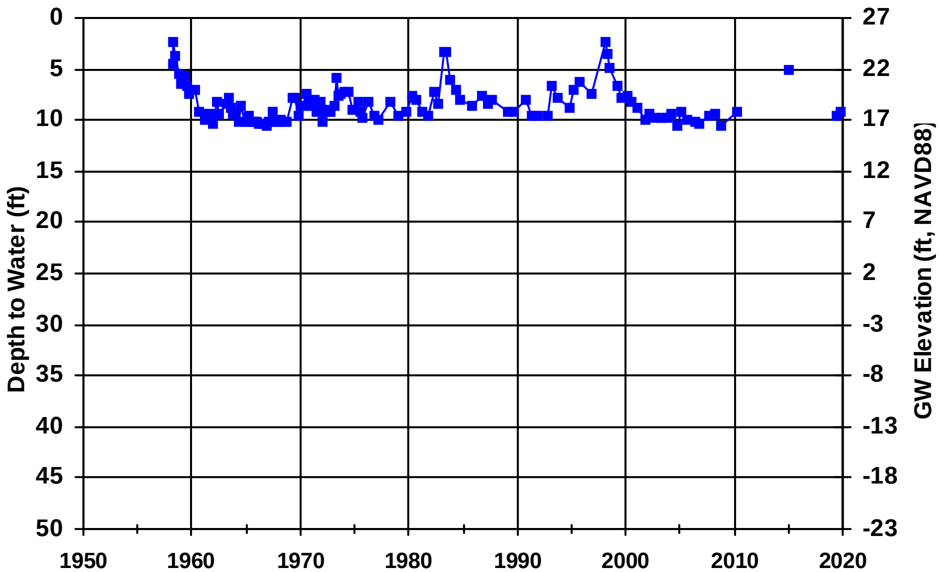



**WellID: 5-35**
**Zone: Shallow**
Owner: ECCID    Perf Int (ft): N/A    Well Depth (ft): 11

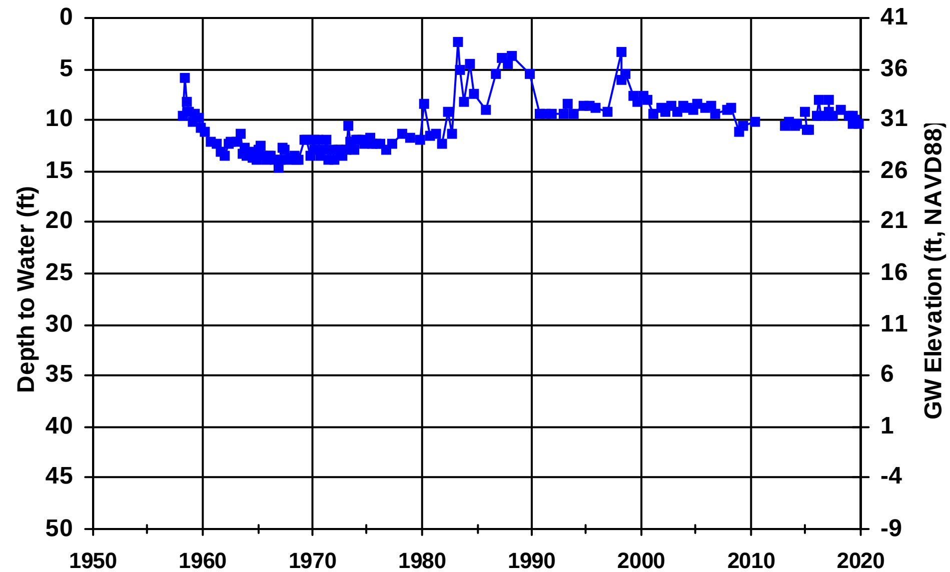



Manual Water Level Measurement    Transducer Water Level Measurement

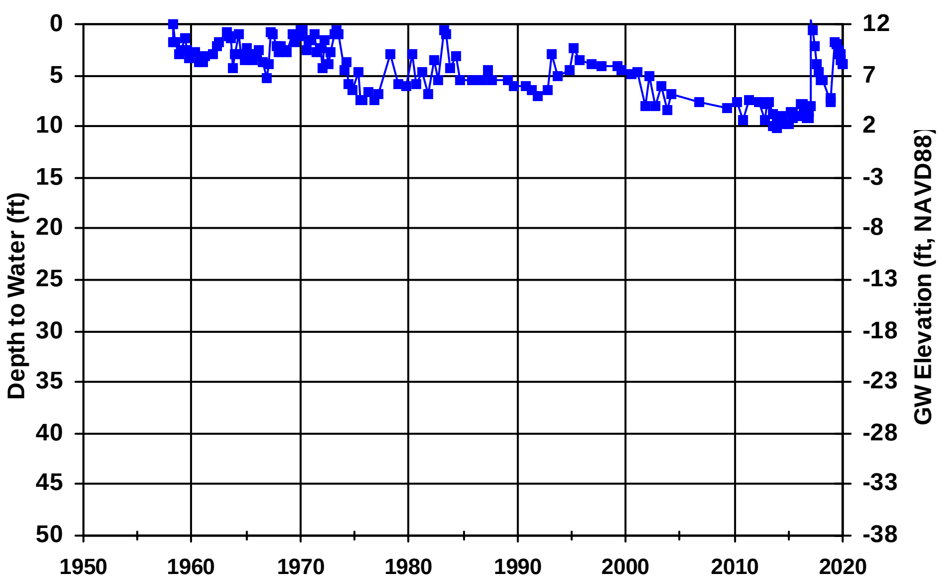
**WellID:** 5-36
**Zone:** Shallow
Owner: ECCID Perf Int (ft): N/A Well Depth (ft): 11



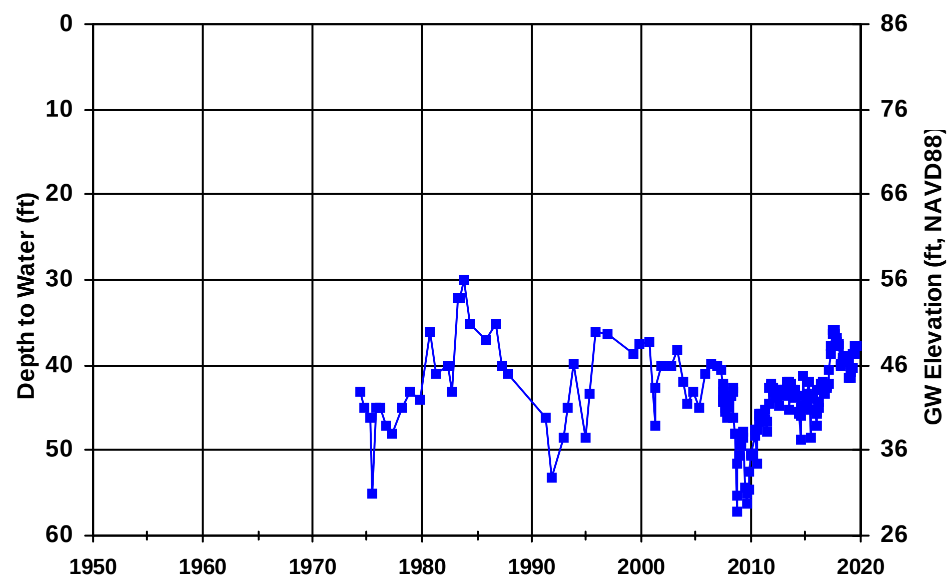

**WellID:** 5-37
**Zone:** Shallow
Owner: ECCID Perf Int (ft): N/A Well Depth (ft): >15




**WellID:** 5-39
**Zone:** Shallow
Owner: ECCID Perf Int (ft): N/A Well Depth (ft): 11

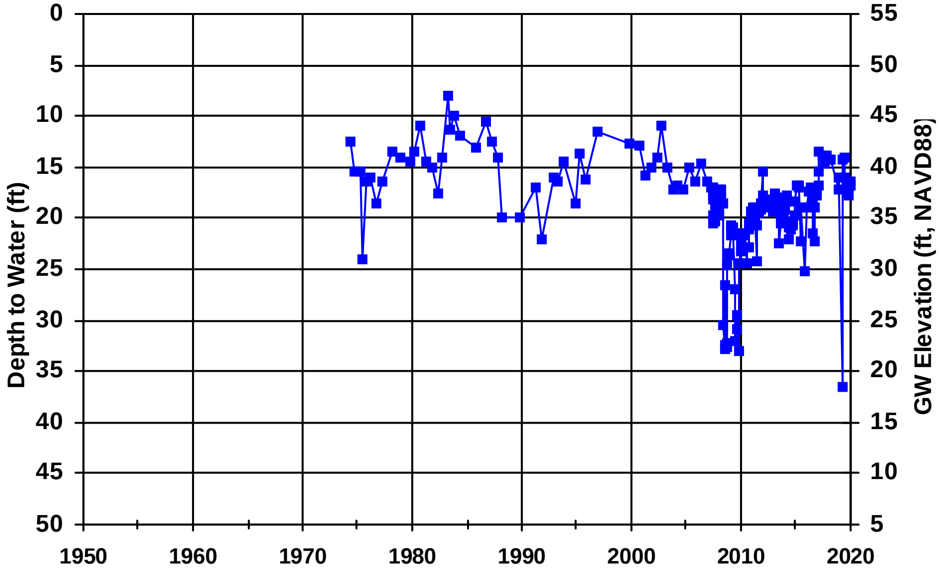



**WellID:** Well #1 (4-54)
**Zone:** Shallow
Owner: ECCID Perf Int (ft): 85-165 Well Depth (ft): 165

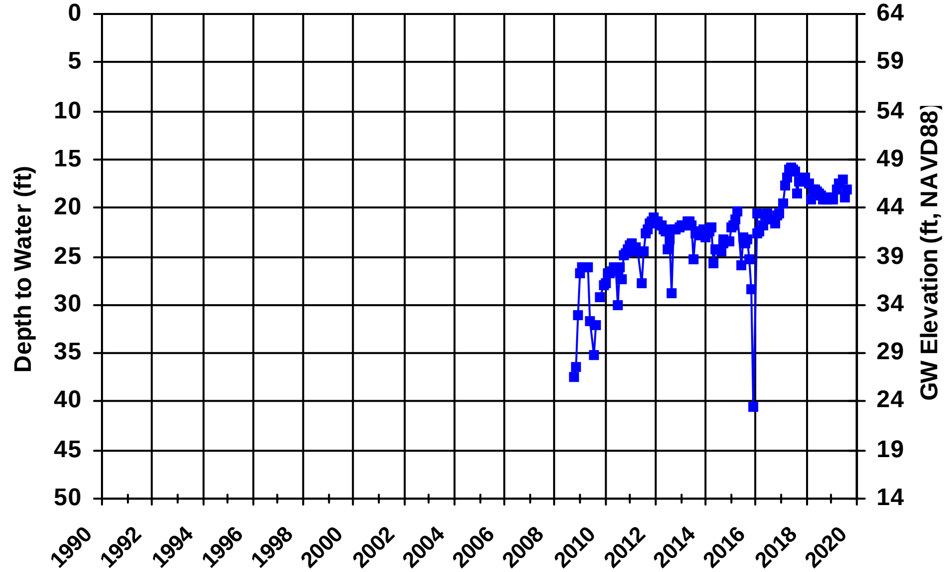



Manual Water Level Measurement Transducer Water Level Measurement

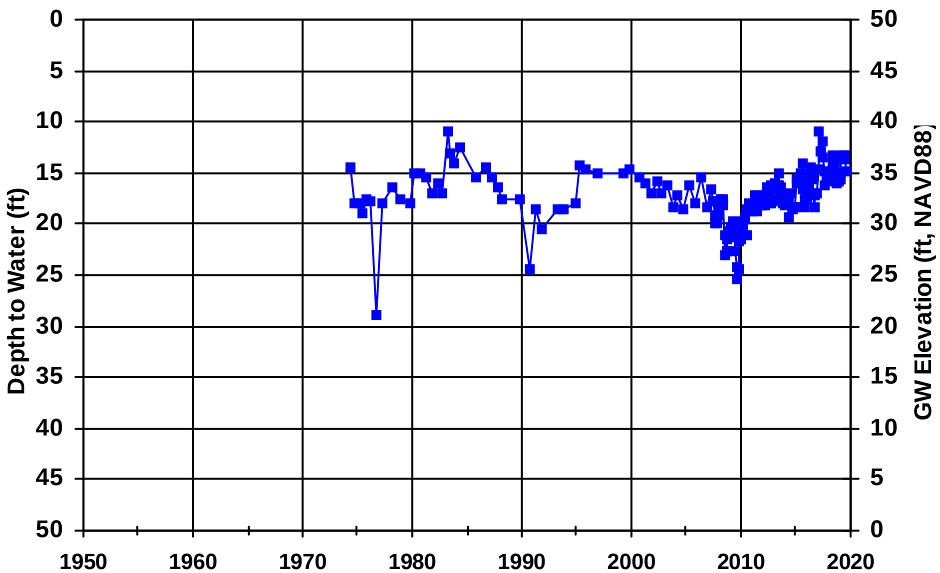
**WellID: Well #11 (4-61-A)**
**Zone: Shallow**
Owner: ECCID | Perf Int (ft): 50-100 | Well Depth (ft): 100



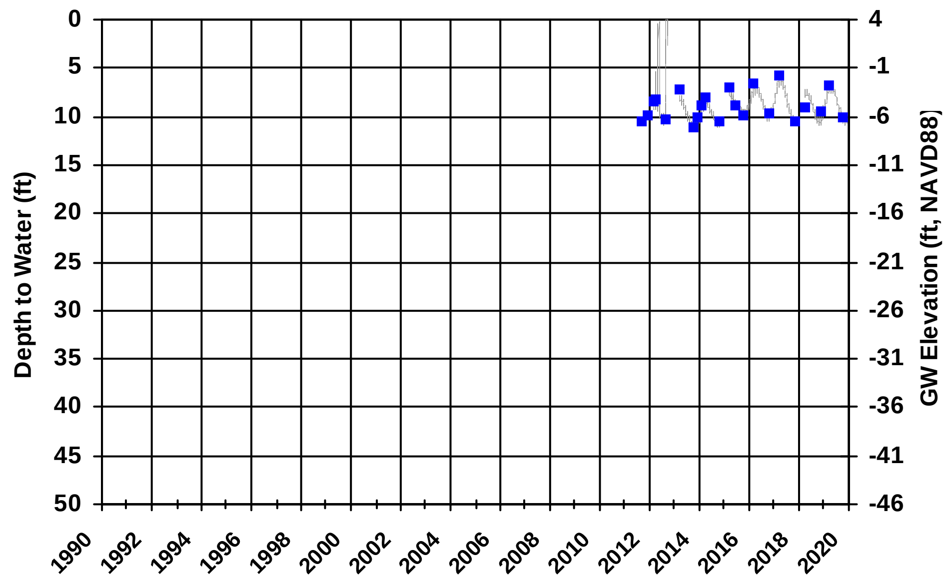

**WellID: Well #13**
**Zone: Shallow**
Owner: ECCID | Perf Int (ft): 145-185 | Well Depth (ft): 185




**WellID: Well #6 (4-60)**
**Zone: Shallow**
Owner: ECCID | Perf Int (ft): 30-50 | Well Depth (ft): 50

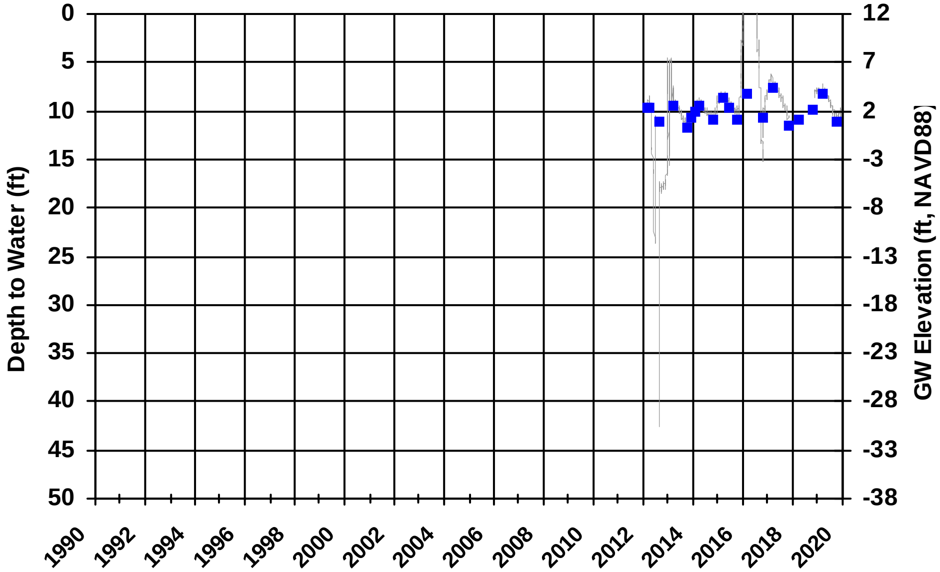



**WellID: 1BMW-140**
**Zone: Shallow**
Owner: TODB | Perf Int (ft): 100-130 | Well Depth (ft): 140

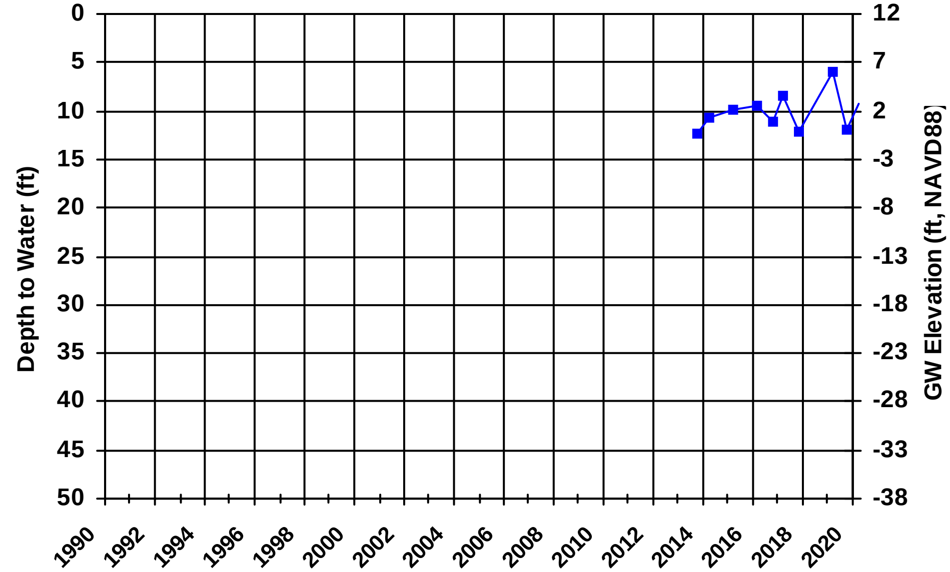



Manual Water Level Measurement    Transducer Water Level Measurement

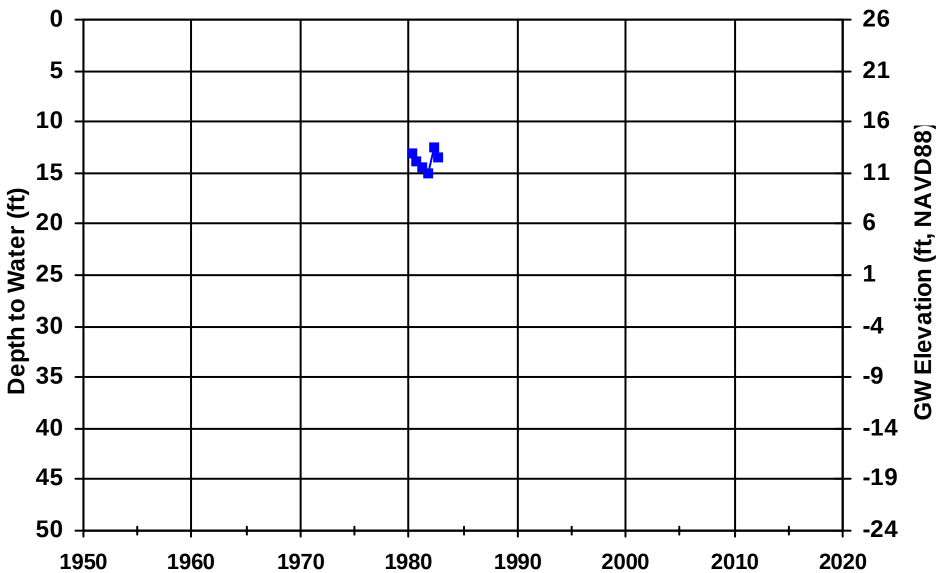
**WellID: 4AMW-152**
**Zone: Shallow**
Owner: TODB | Perf Int (ft): 122-142 | Well Depth (ft): 152



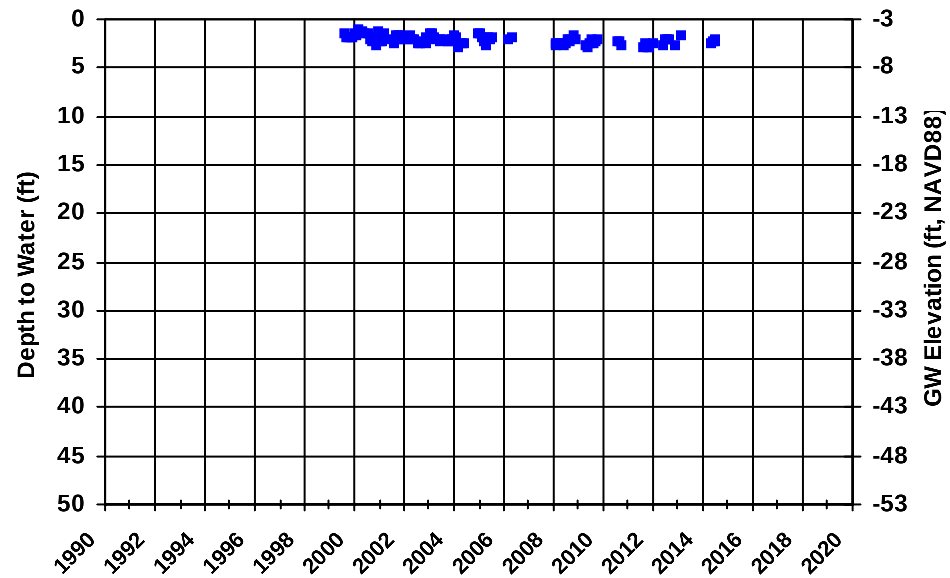

**WellID: 7MW-115**
**Zone: Shallow**
Owner: TODB | Perf Int (ft): 95-105 | Well Depth (ft): 115




**WellID: USGS-380020121443901**
**Zone: Shallow**
Owner: USGS | Perf Int (ft): N/A | Well Depth (ft): 66

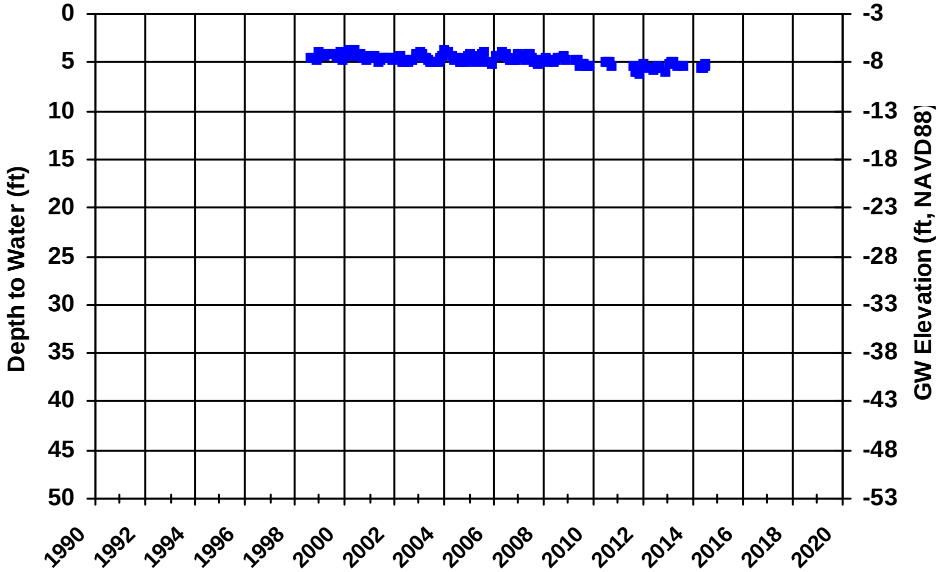



**WellID: 01N04E20L001M**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20

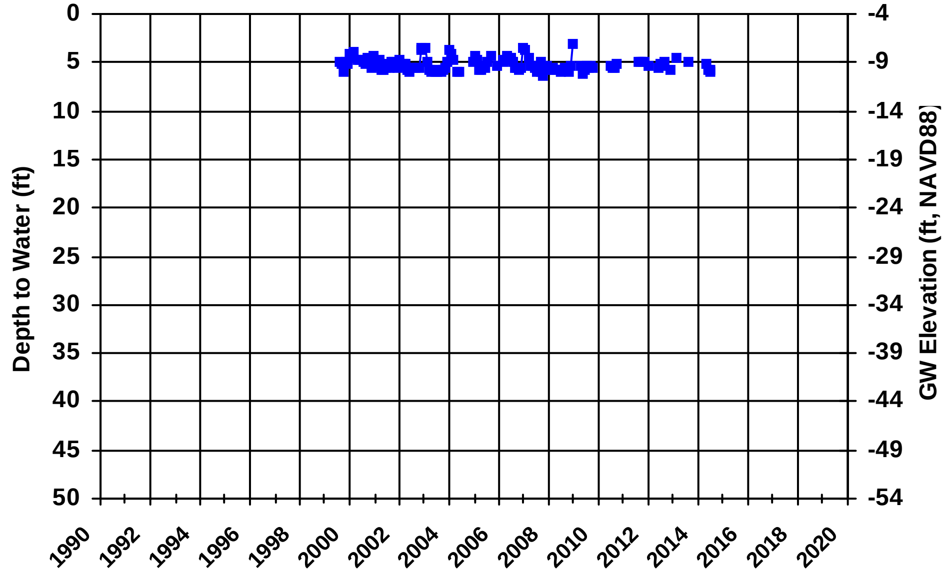



Manual Water Level Measurement    Transducer Water Level Measurement

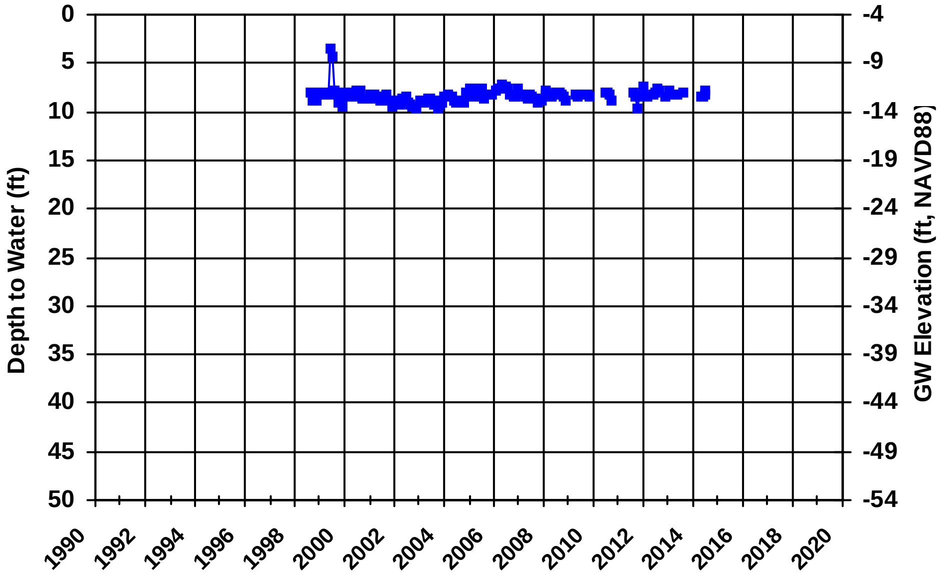
**WellID: 01N04E20P001M**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20



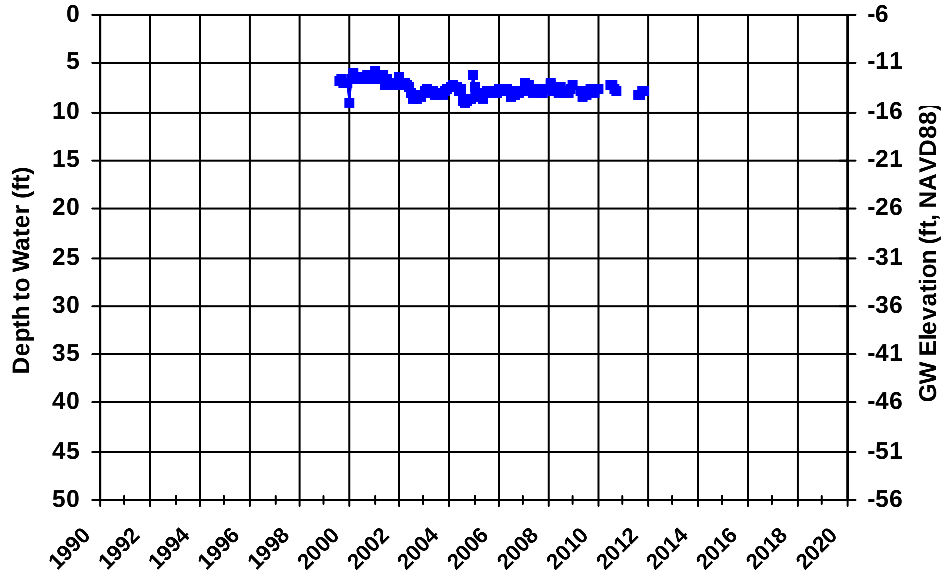

**WellID: 01N04E20P002M**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20




**WellID: 01N04E29C002M**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20

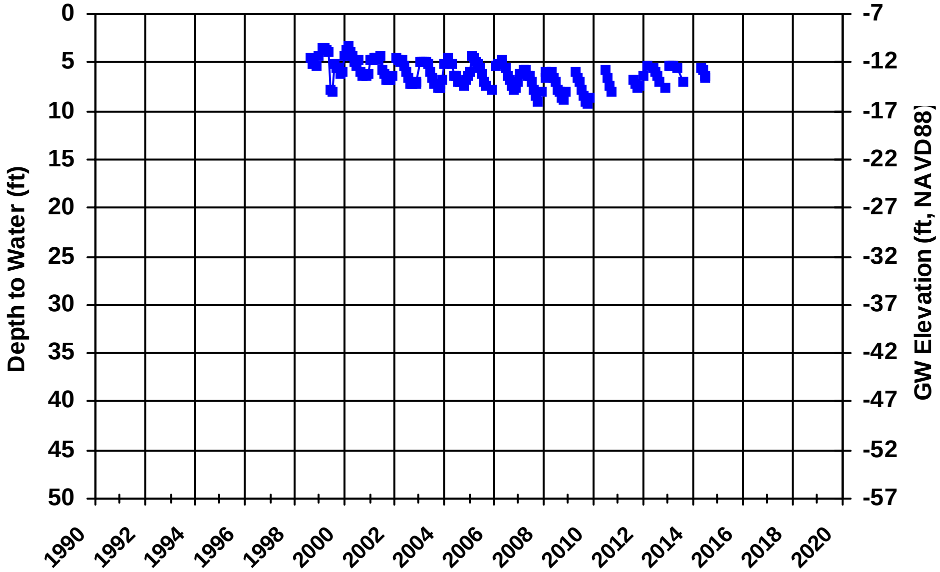



**WellID: 01N04E29D001M**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20

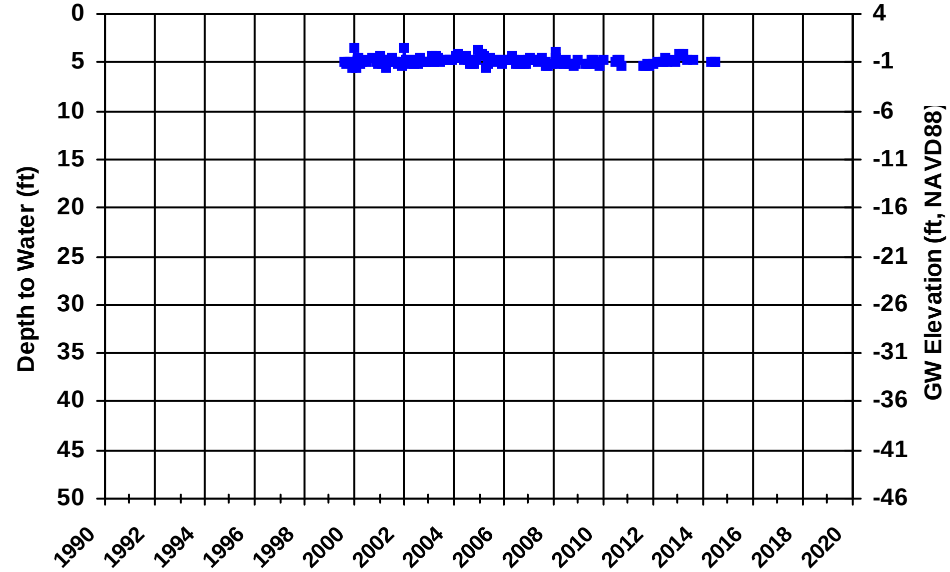



Manual Water Level Measurement Transducer Water Level Measurement

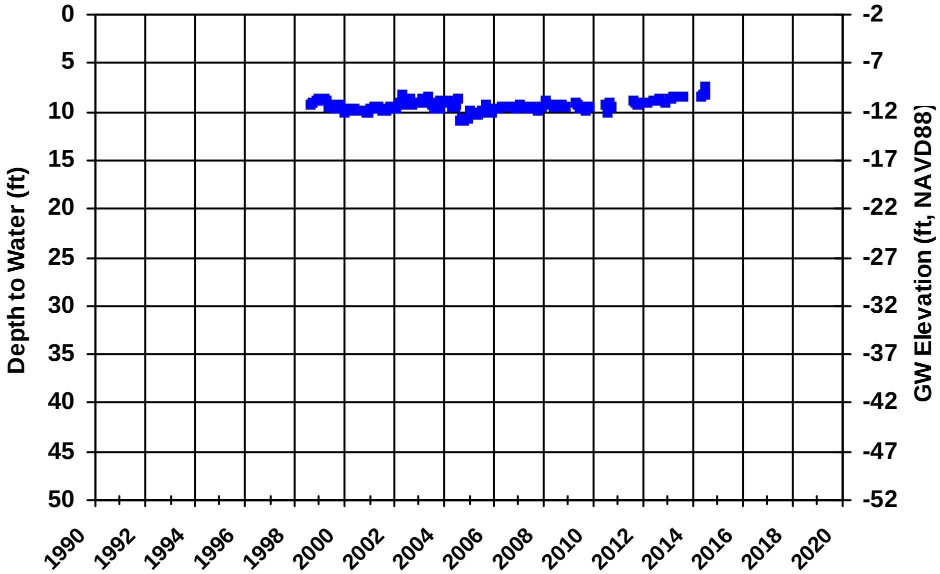
**WellID: 01N04E29P001M**
**Zone: Shallow**
Owner: N/A	Perf Int (ft): N/A	Well Depth (ft): 20



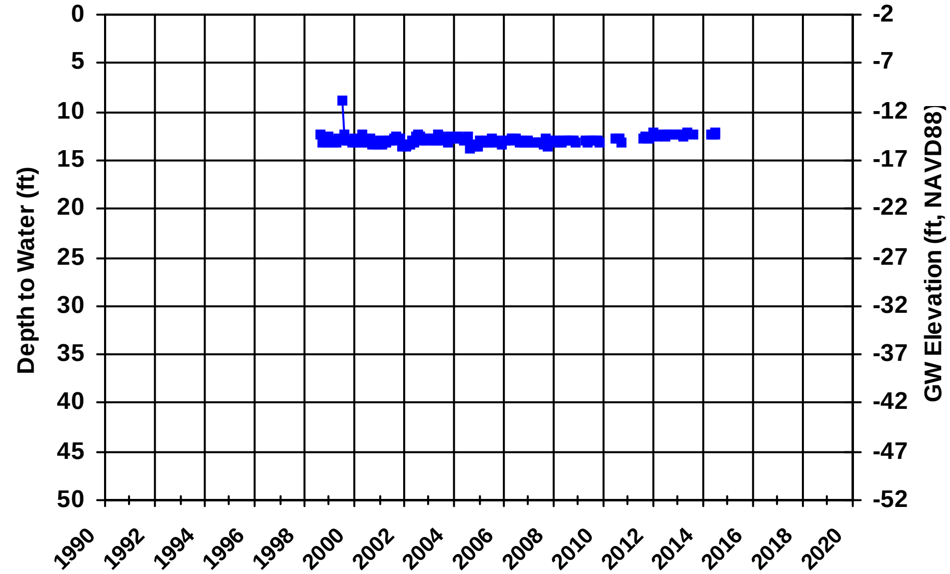

**WellID: 01N04E30G001M**
**Zone: Shallow**
Owner: N/A	Perf Int (ft): N/A	Well Depth (ft): 20




**WellID: 01N04E30H001M**
**Zone: Shallow**
Owner: N/A	Perf Int (ft): N/A	Well Depth (ft): 20




**WellID: 01N04E30J001M**
**Zone: Shallow**
Owner: N/A	Perf Int (ft): N/A	Well Depth (ft): 20

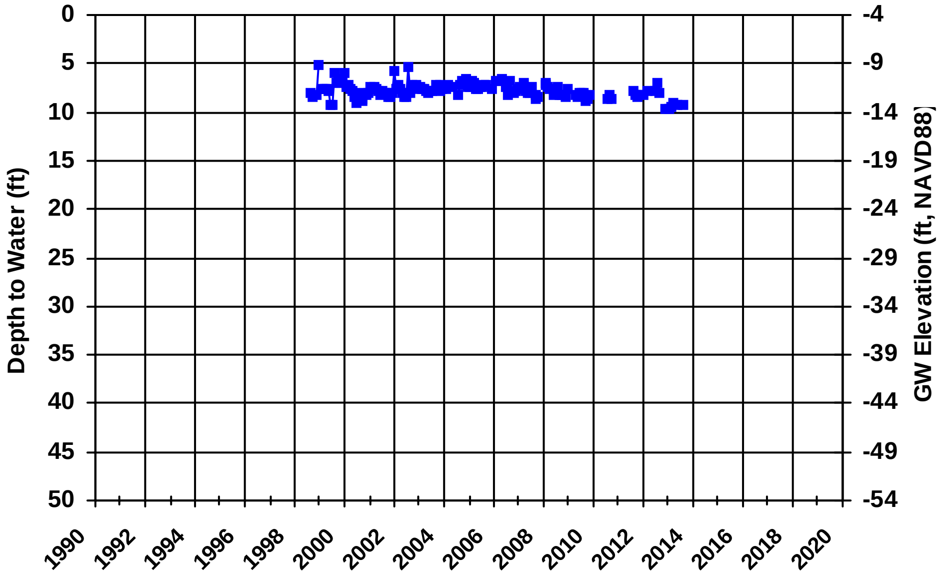



Manual Water Level Measurement	Transducer Water Level Measurement

**WellID: 01N04E31H001M**

**Zone: Shallow**

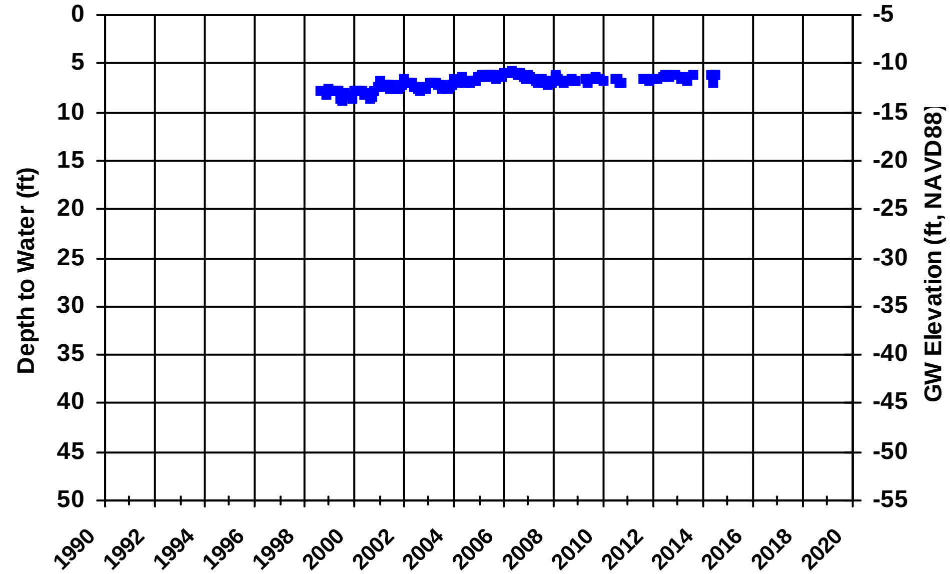
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: 01N04E31H002M**

**Zone: Shallow**

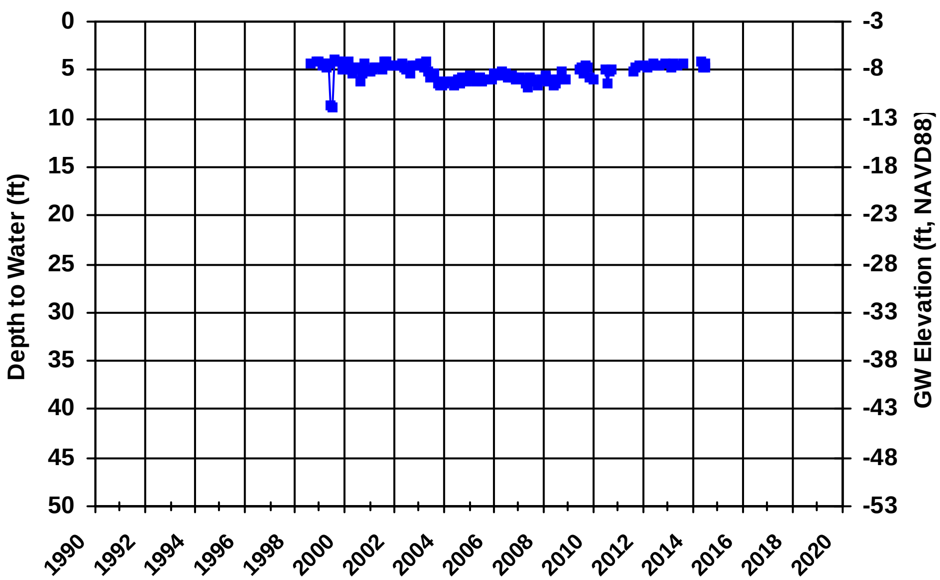
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: 01N04E31K001M**

**Zone: Shallow**

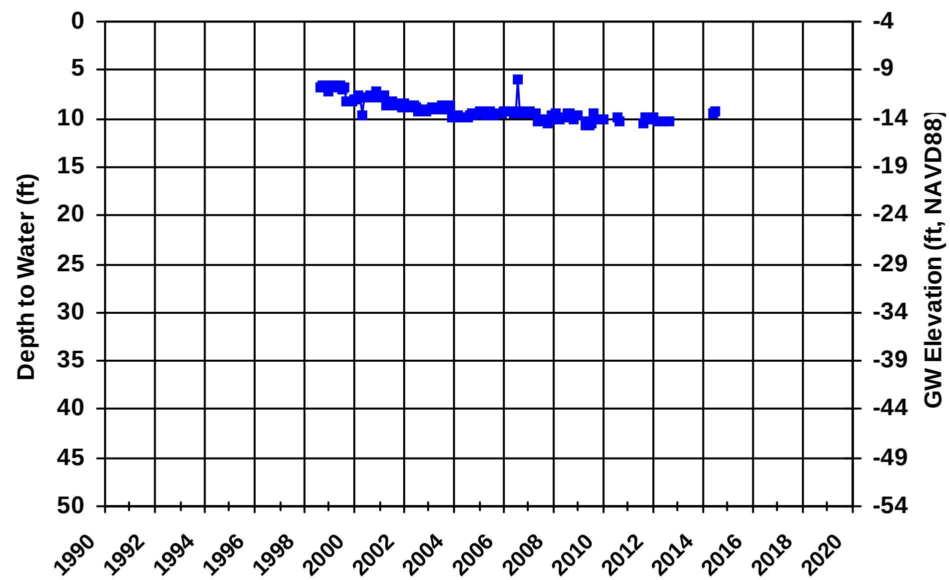
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: 01N04E31Q001M**

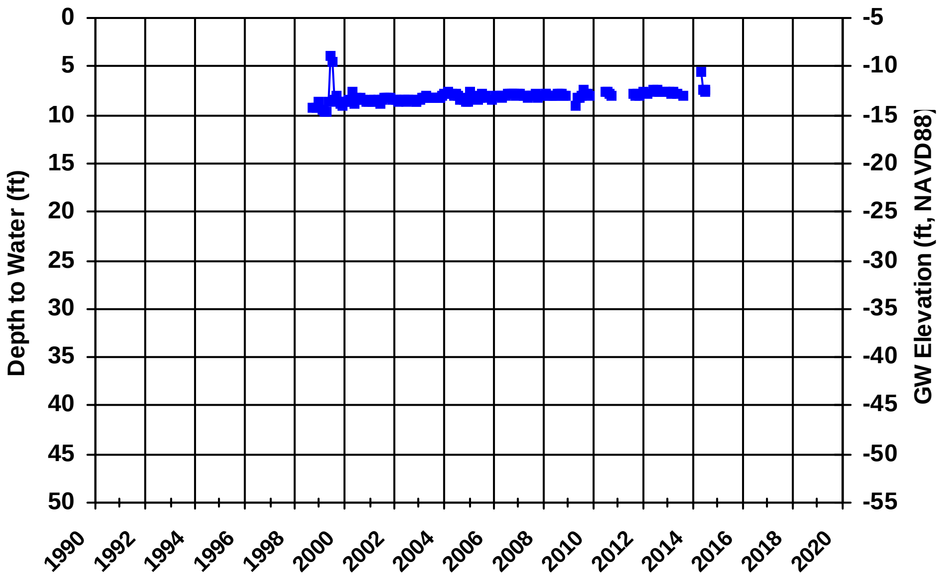
**Zone: Shallow**

Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20

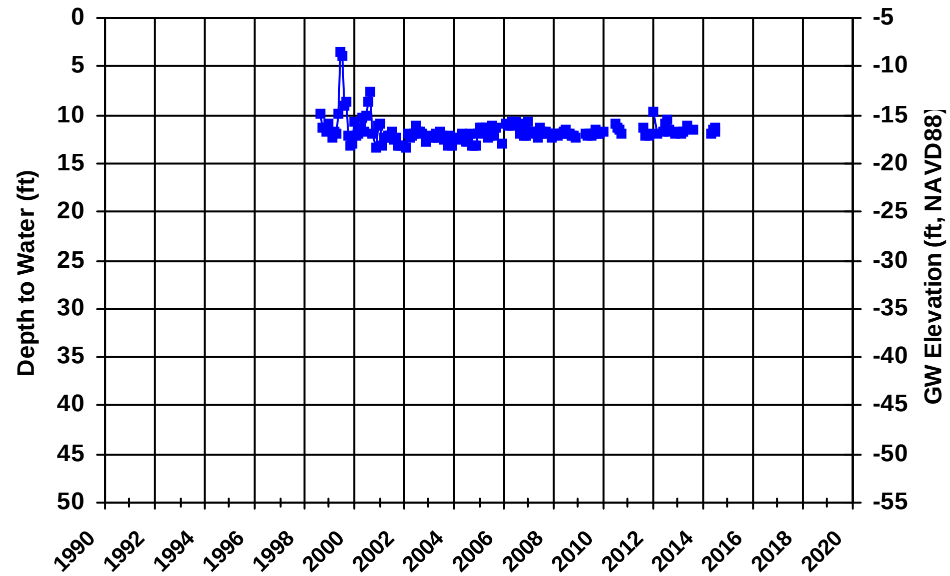



Manual Water Level Measurement    Transducer Water Level Measurement

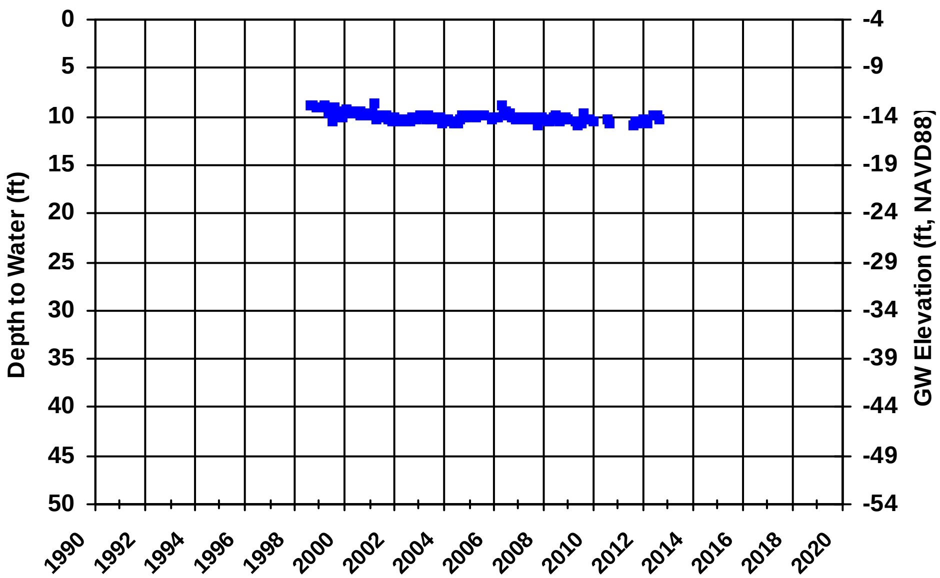
**WellID: 01N04E32D002M**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20



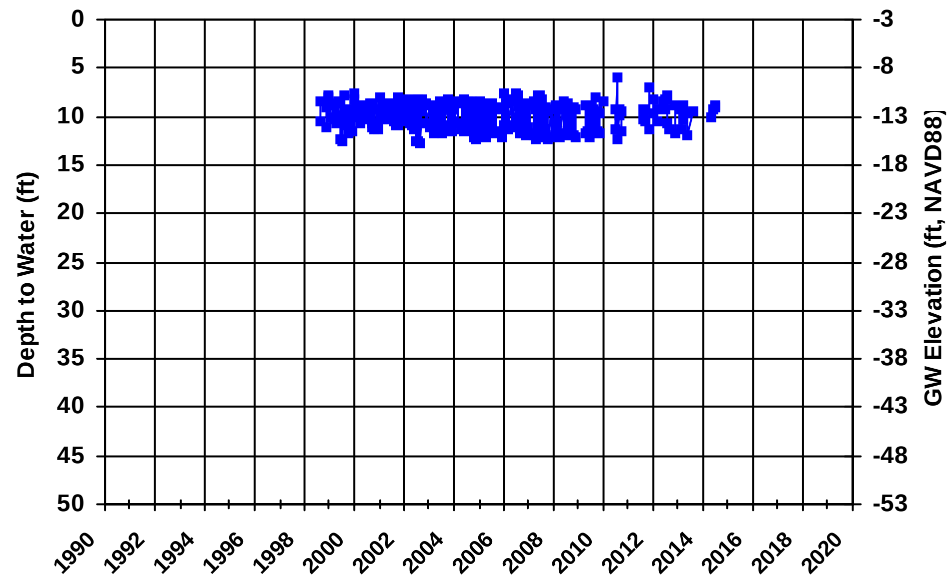

**WellID: 01N04E32E001M**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: 01S04E06L001M**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: 01S04E06L002M**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20

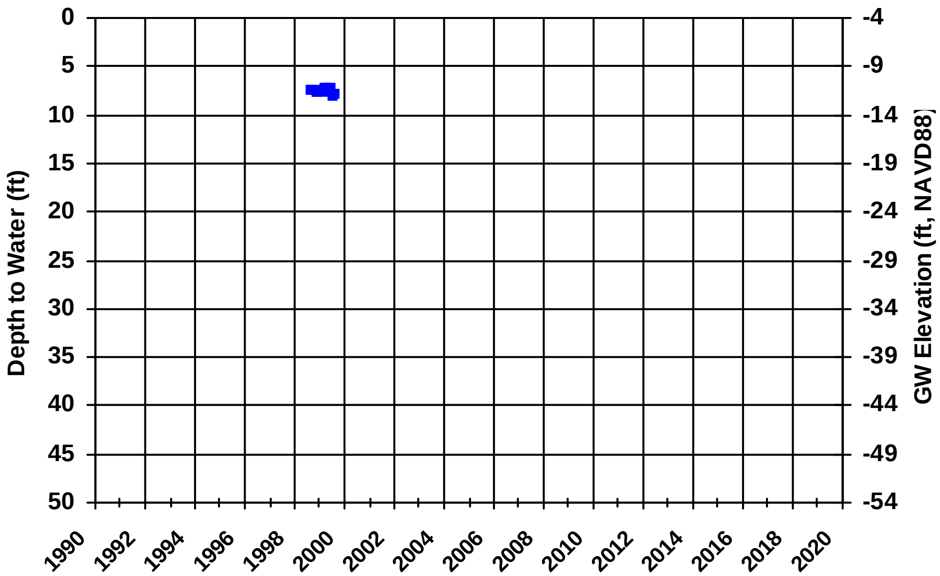



Manual Water Level Measurement    Transducer Water Level Measurement

**WellID: 01S04E06P002M**

**Zone: Shallow**

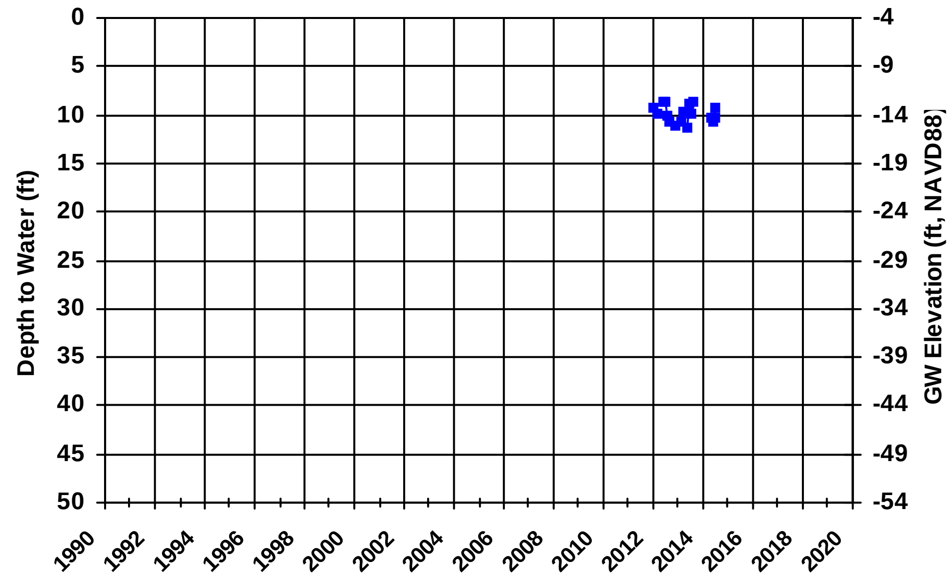
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20




**WellID: 01S04E06Q001M**

**Zone: Shallow**

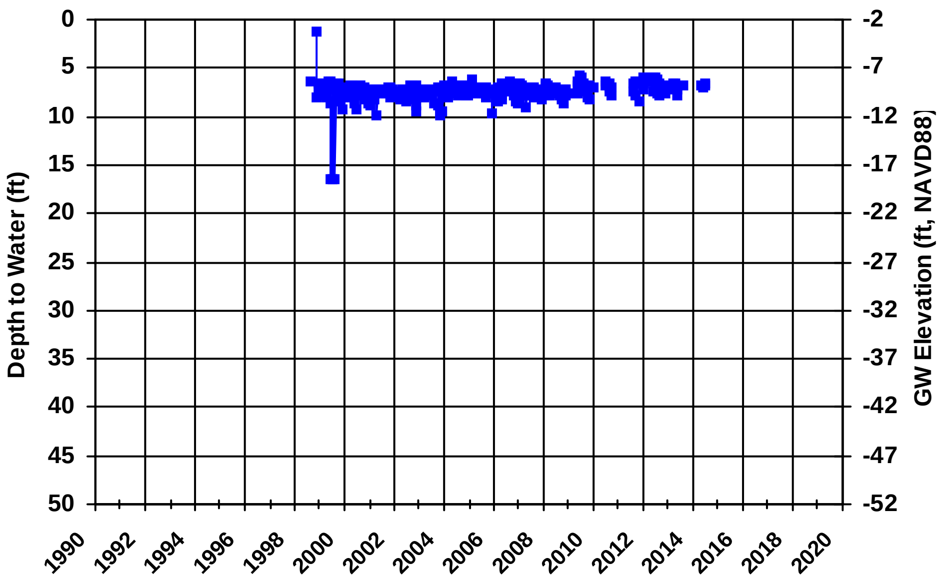
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20




**WellID: 01S04E07A001M**

**Zone: Shallow**

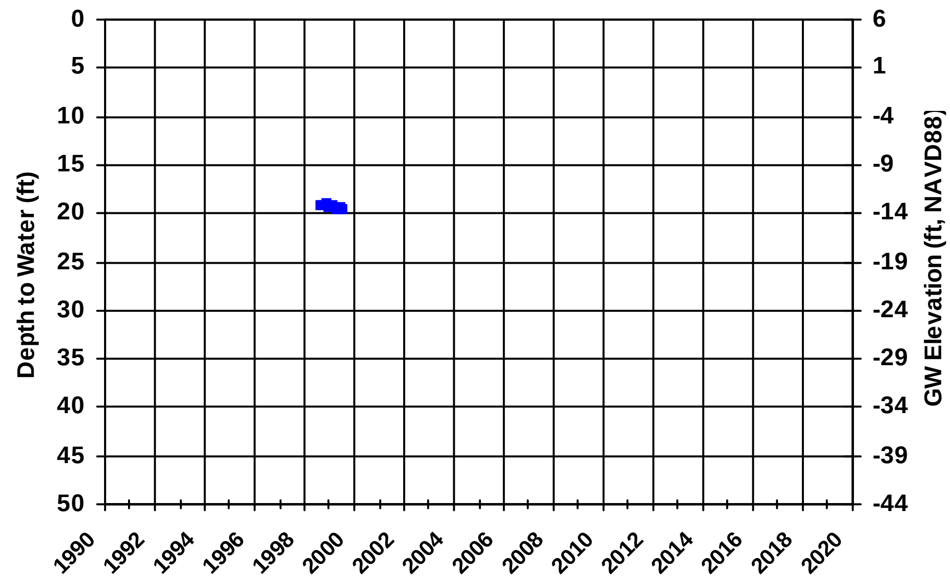
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20




**WellID: 01S04E07B001M**

**Zone: Shallow**

Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20

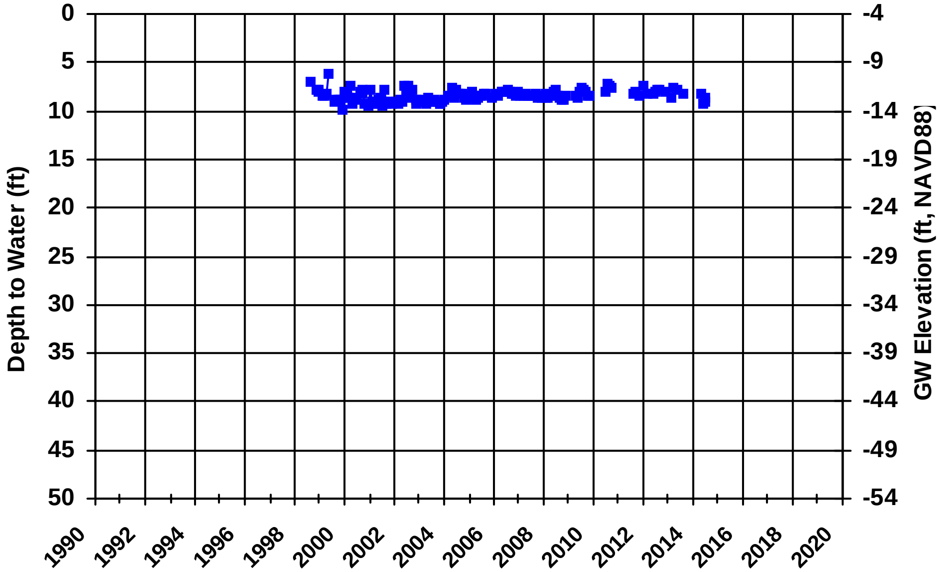



Manual Water Level Measurement — Transducer Water Level Measurement

**WellID: 01S04E08A001M**

**Zone: Shallow**

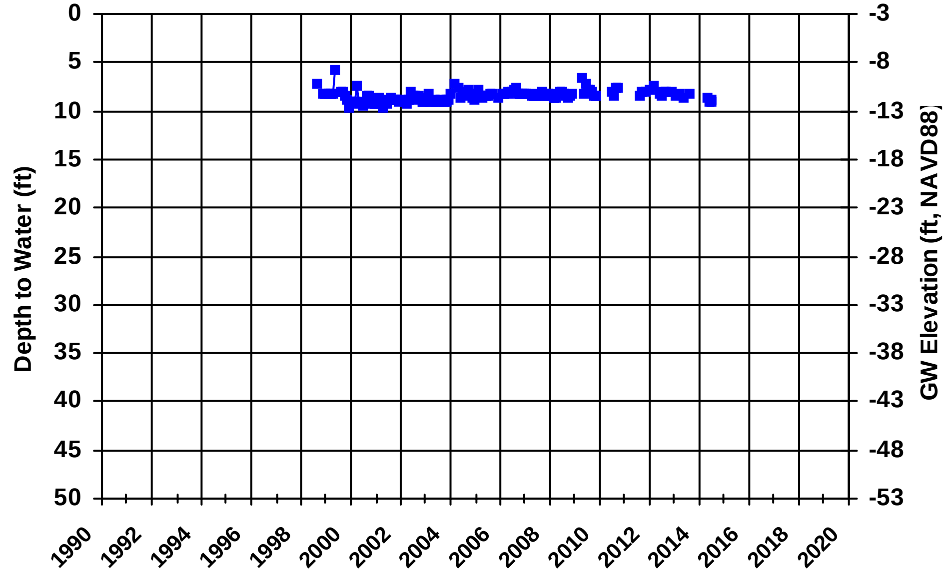
Owner: N/A    Perf Int (ft): N/A    Well Depth (ft): 20




**WellID: 01S04E08H001M**

**Zone: Shallow**

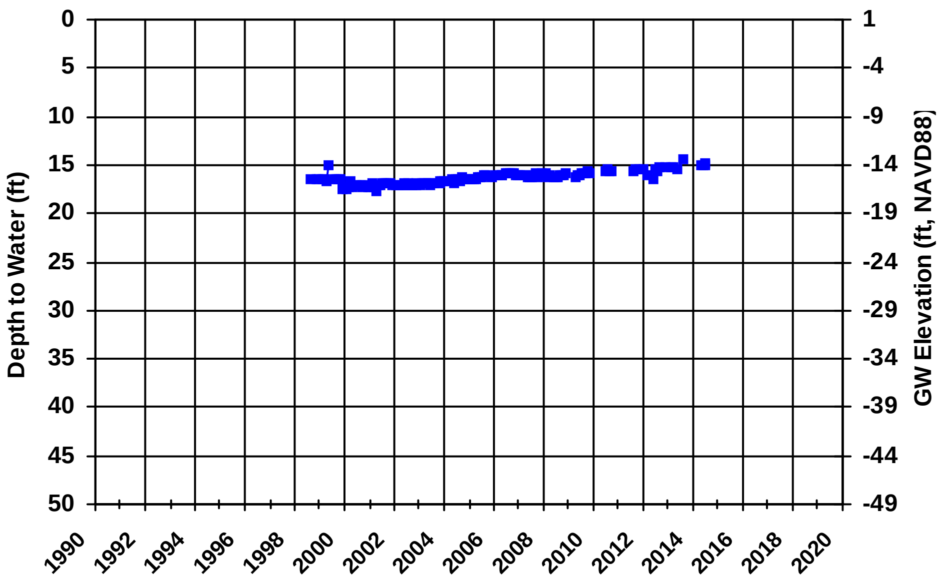
Owner: N/A    Perf Int (ft): N/A    Well Depth (ft): 20




**WellID: 01S04E08K001M**

**Zone: Shallow**

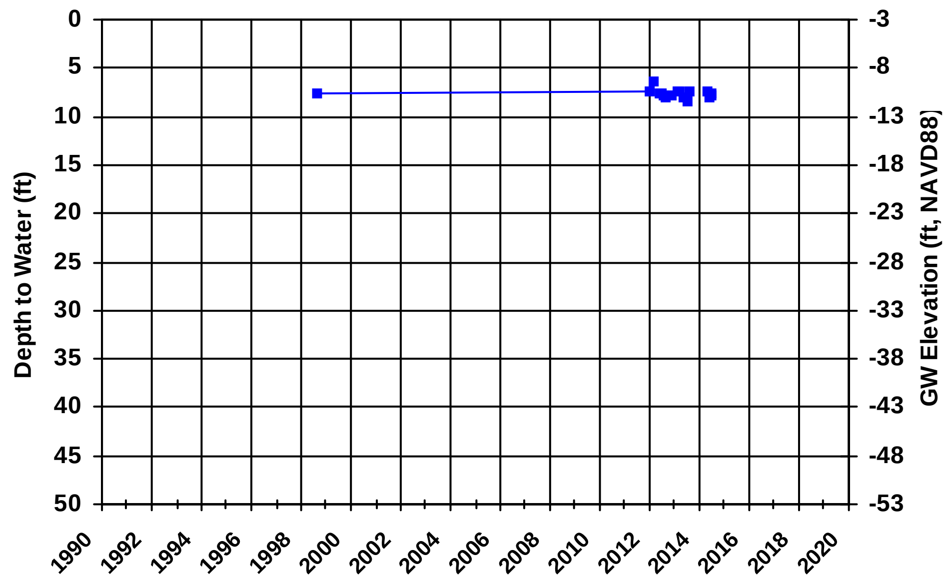
Owner: N/A    Perf Int (ft): N/A    Well Depth (ft): 20




**WellID: 01S04E08L001M**

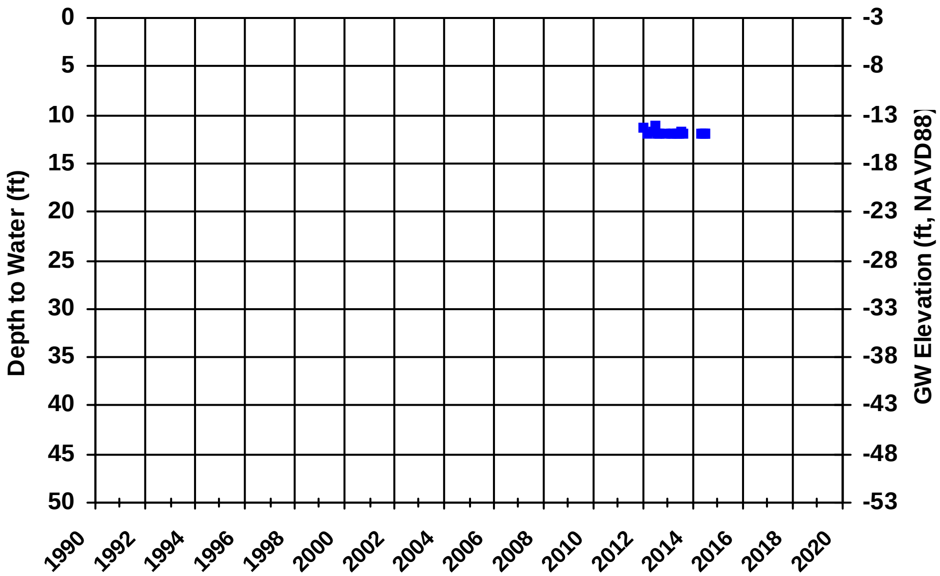
**Zone: Shallow**

Owner: N/A    Perf Int (ft): N/A    Well Depth (ft): 20

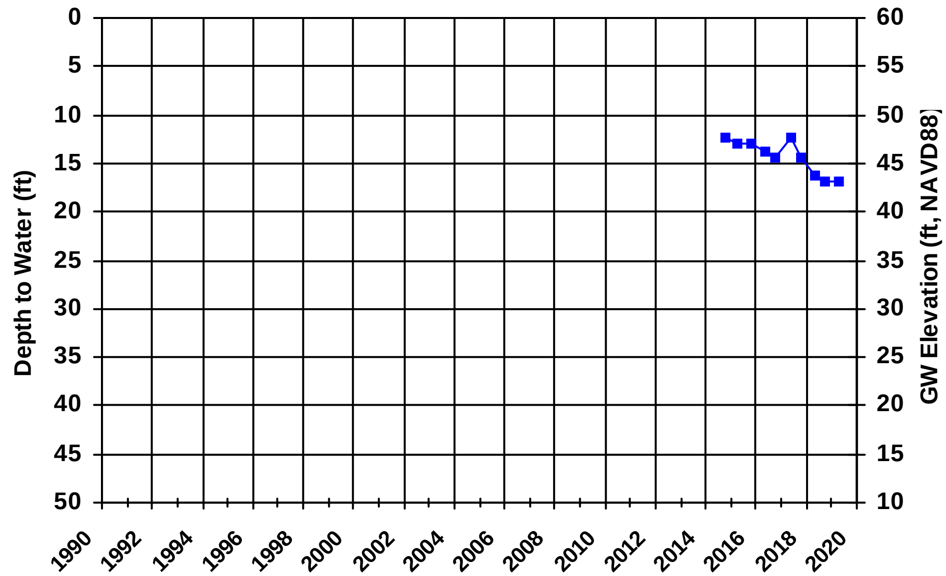



Manual Water Level Measurement    Transducer Water Level Measurement

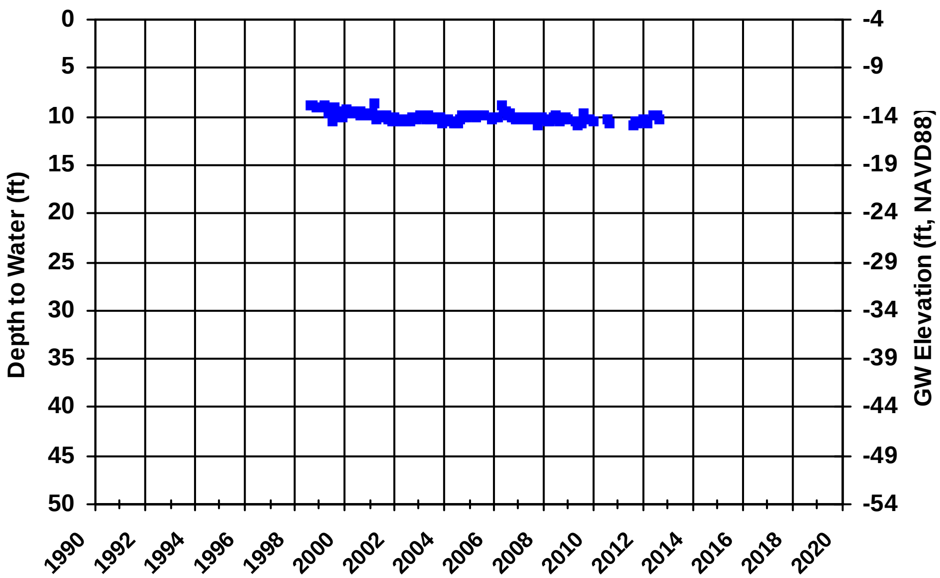
**WellID: 01S04E08M001M**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20



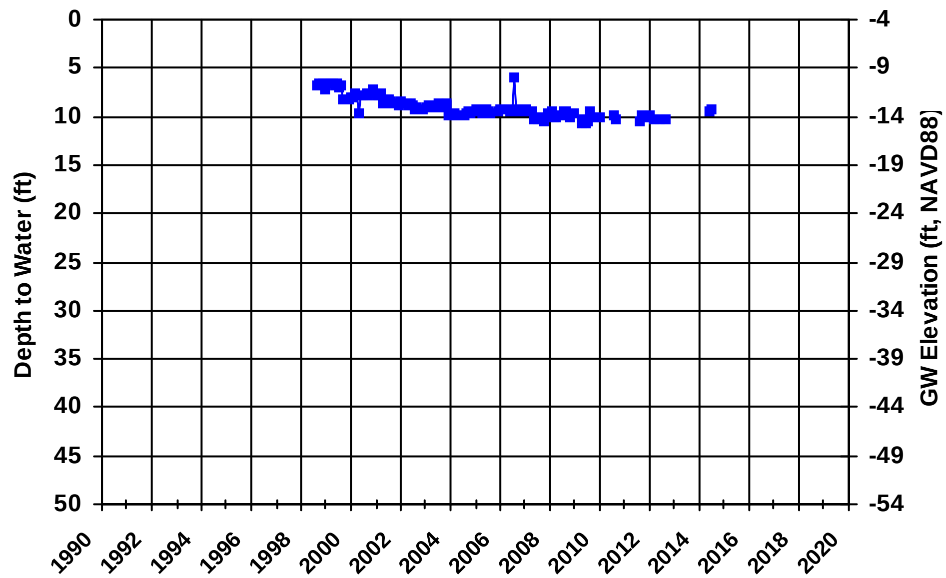

**WellID: 1S/4E 31P 5**
**Zone: Shallow**
Owner: N/A Perf Int (ft): 8-23 Well Depth (ft): 24




**WellID: 378435N1215801W001**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20




**WellID: 378826N1215755W001**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20

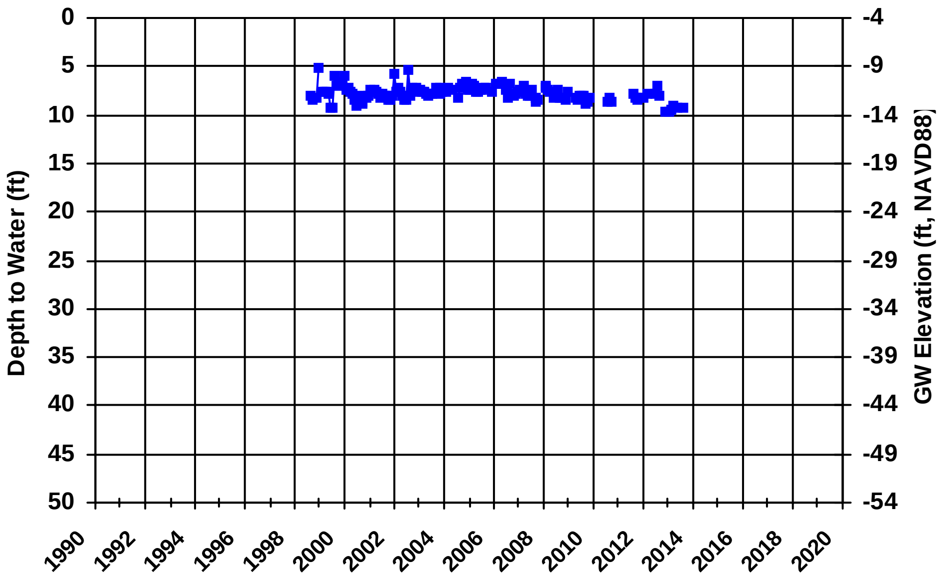



Manual Water Level Measurement Transducer Water Level Measurement

**WellID: 378957N1215652W001**

**Zone: Shallow**

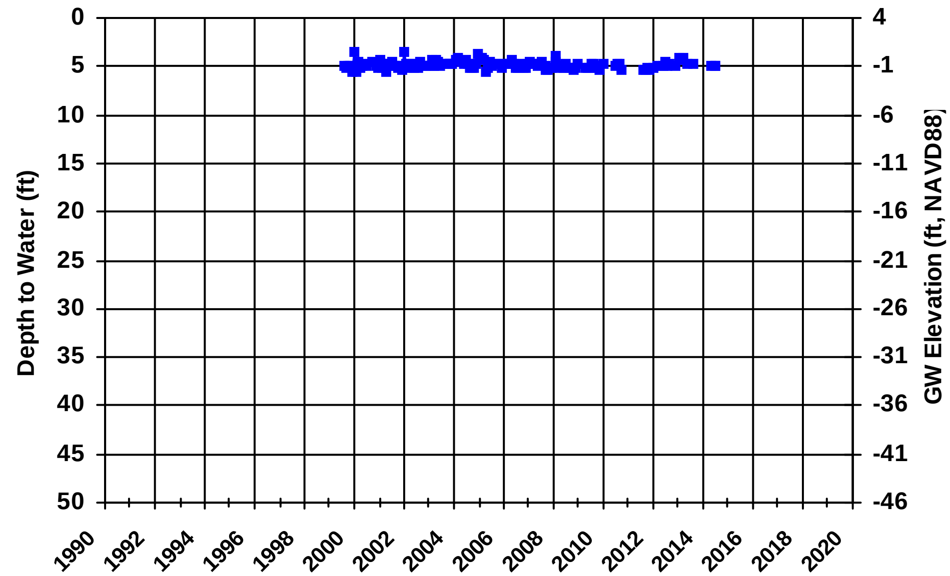
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: 379050N1215730W001**

**Zone: Shallow**

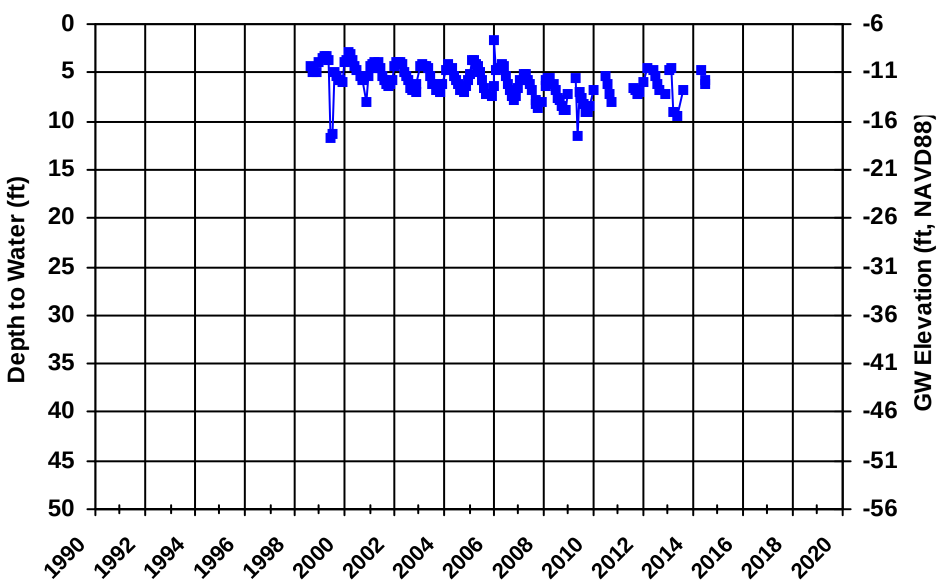
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: BD-1**

**Zone: Shallow**

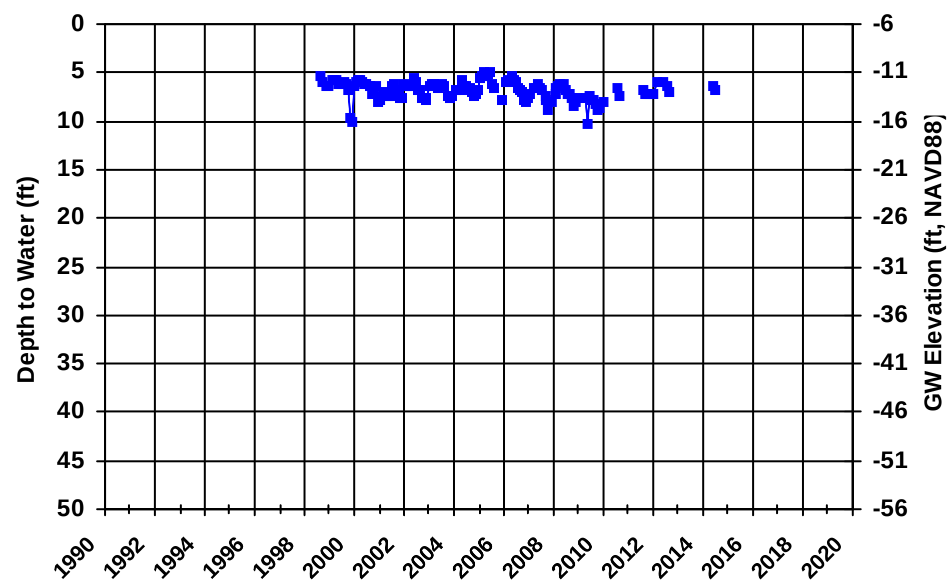
Owner: N/A | Perf Int (ft): 90-100 | Well Depth (ft): 100




**WellID: BD-2**

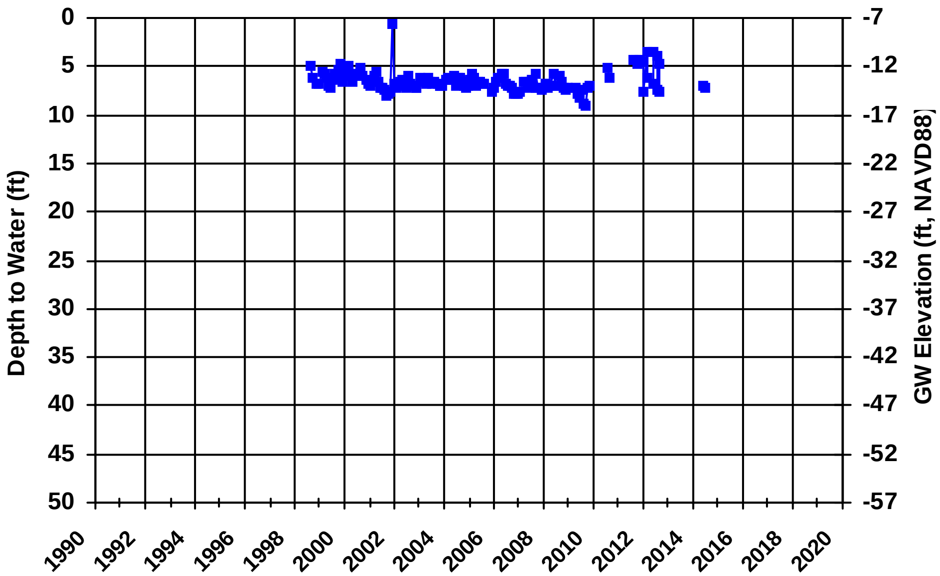
**Zone: Shallow**

Owner: N/A | Perf Int (ft): 90-100 | Well Depth (ft): 100

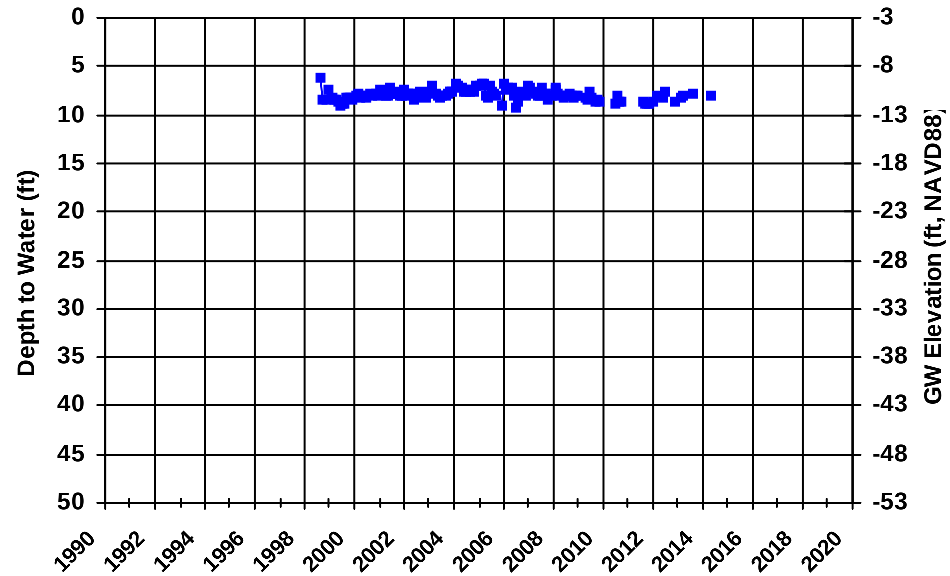



Manual Water Level Measurement    Transducer Water Level Measurement

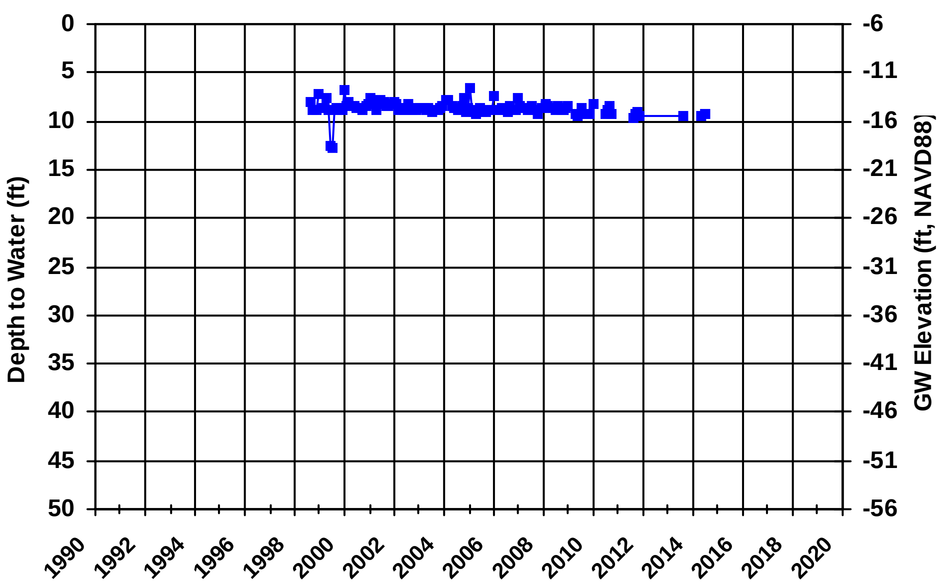
**WellID: BD-3**
**Zone: Shallow**
Owner: N/A Perf Int (ft): 90-100 Well Depth (ft): 100



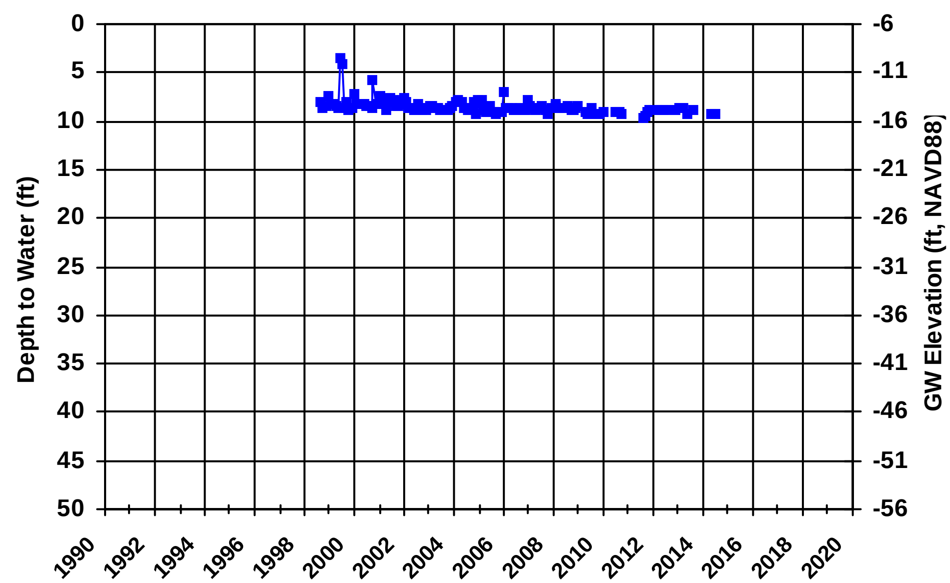

**WellID: BS-4**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20




**WellID: BS-5**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20

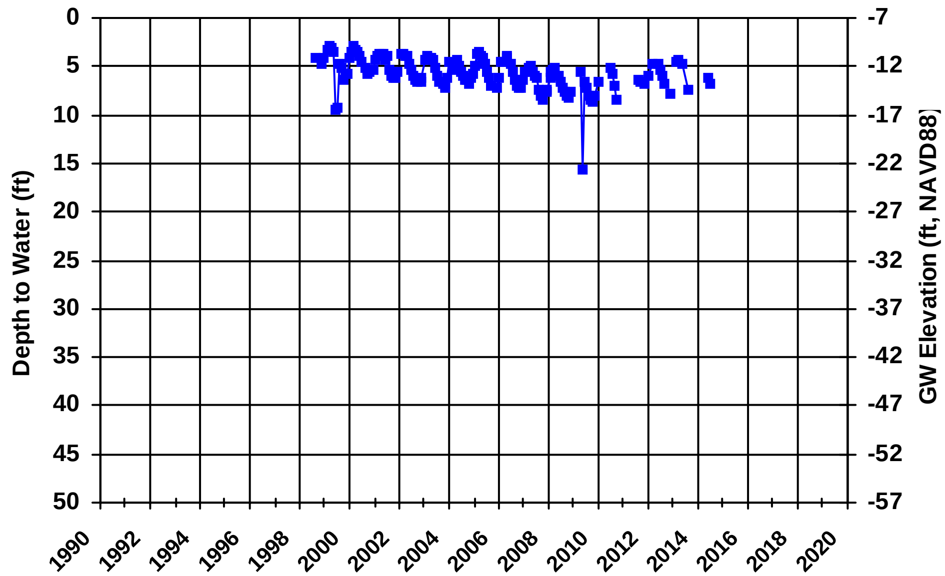



**WellID: BS-6**
**Zone: Shallow**
Owner: N/A Perf Int (ft): N/A Well Depth (ft): 20

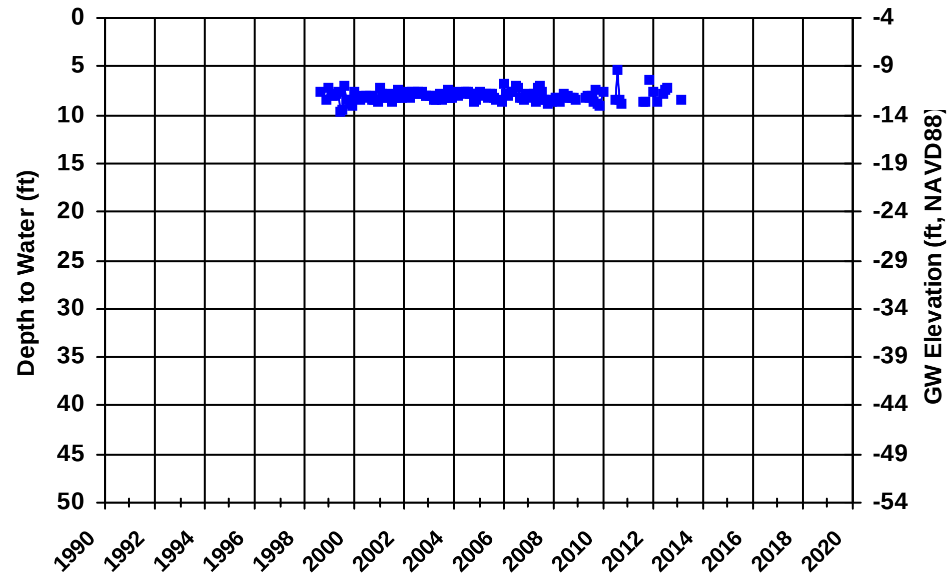



Manual Water Level Measurement    Transducer Water Level Measurement

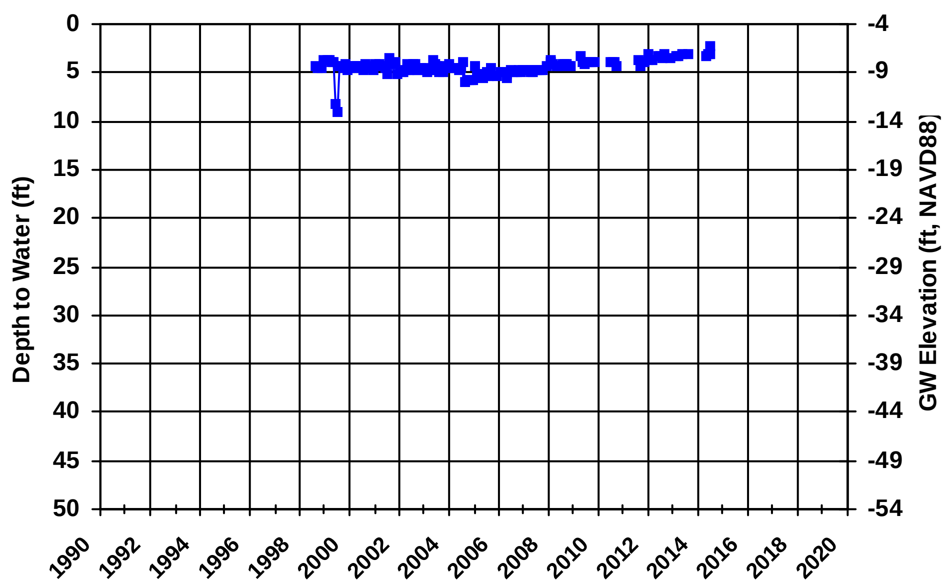
**WellID: VD-2**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20



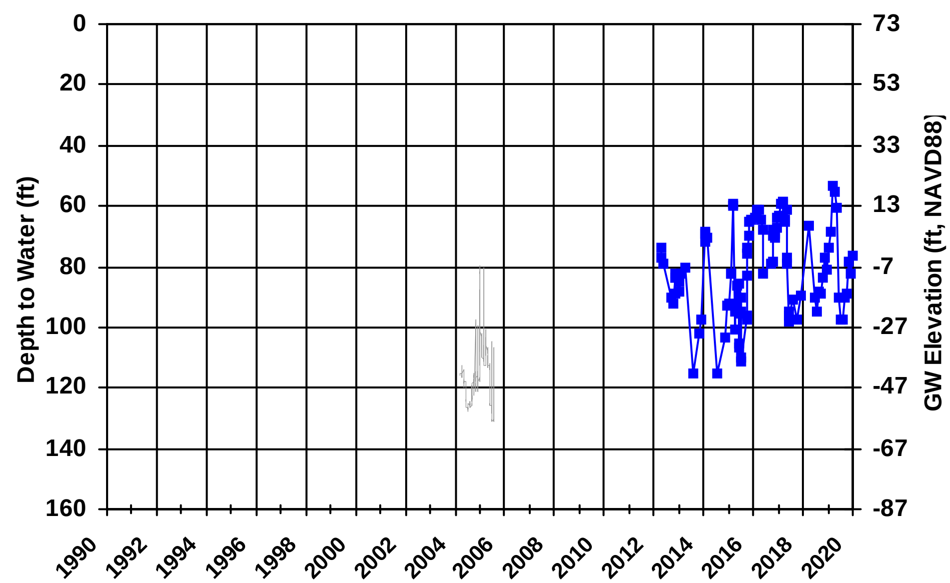

**WellID: VS-10**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20




**WellID: VS-3**
**Zone: Shallow**
Owner: N/A | Perf Int (ft): N/A | Well Depth (ft): 20

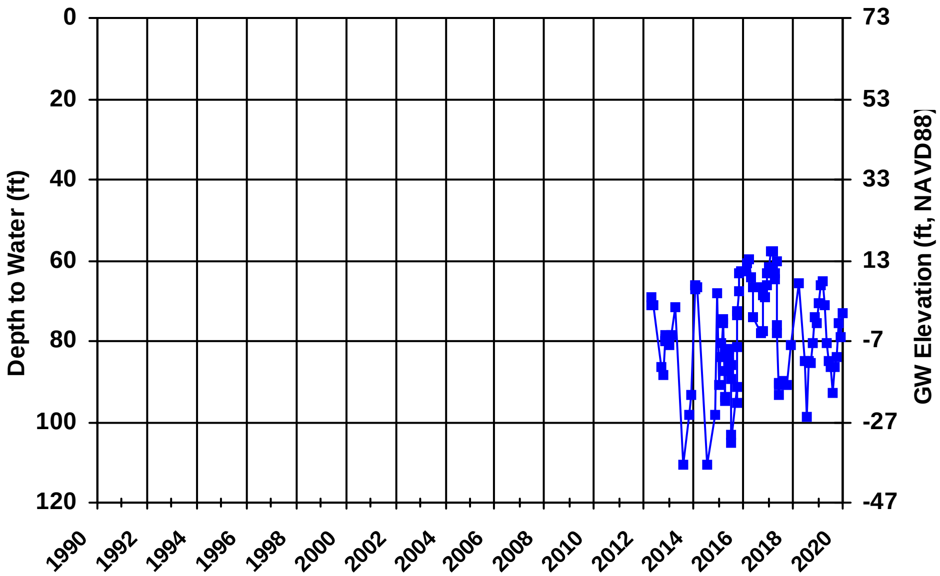



**WellID: Brentwood MW-14 Deep**
**Zone: Deep**
Owner: CofB | Perf Int (ft): 284-315 | Well Depth (ft): 324

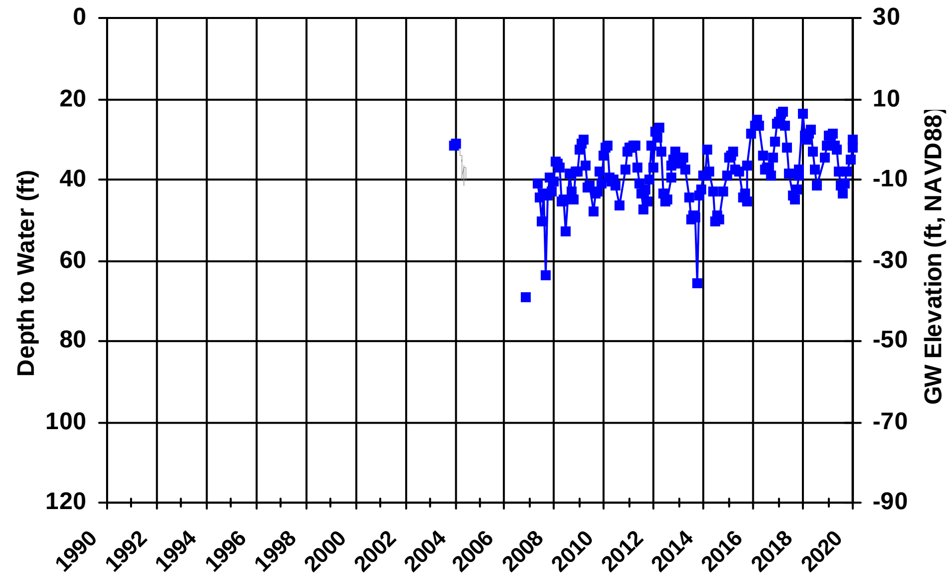



Manual Water Level Measurement | Transducer Water Level Measurement

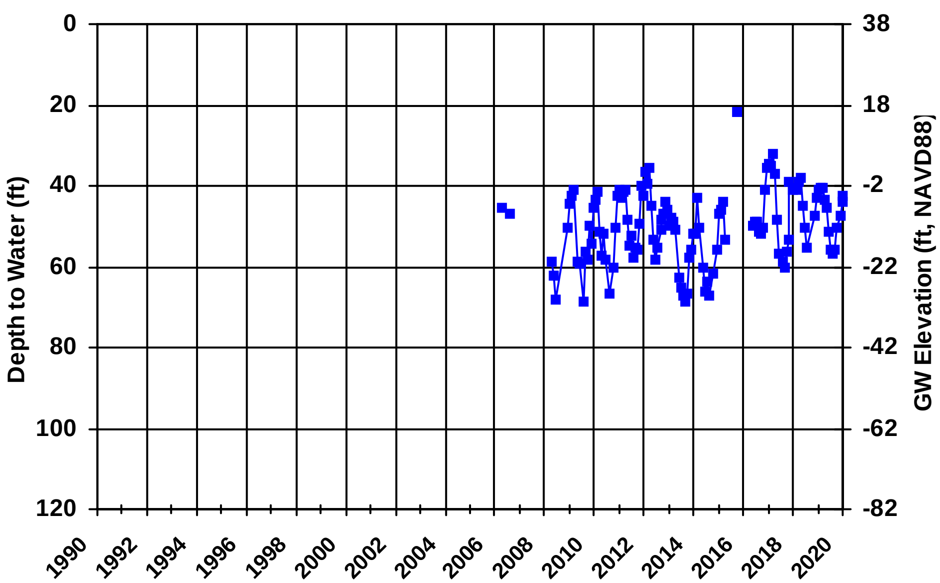
**WellID:** Brentwood MW-14 Int.
**Zone:** Deep
Owner: CofB    Perf Int (ft): 200-210, 220-230    Well Depth (ft): 240



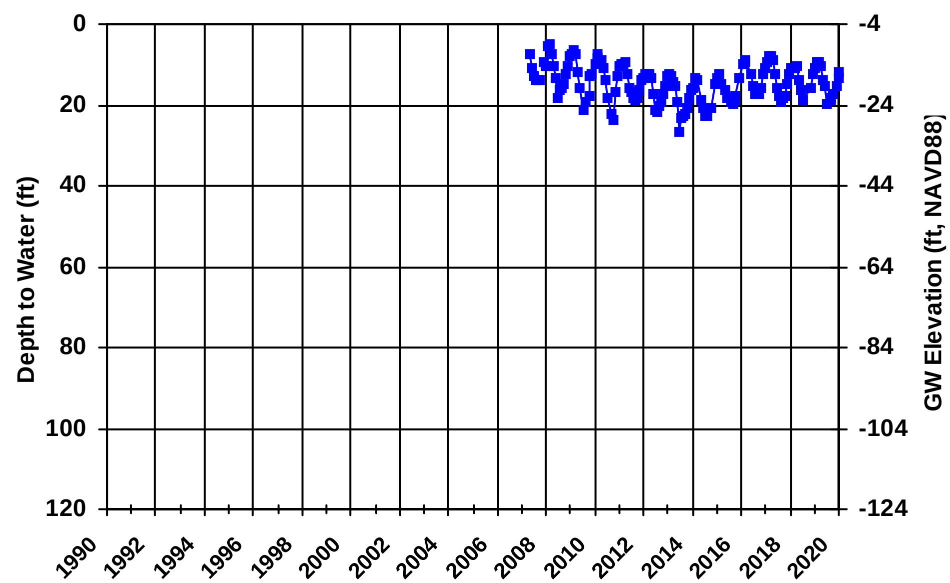

**WellID:** Creekside MW
**Zone:** Deep
Owner: DWD    Perf Int (ft): 230-240    Well Depth (ft): 380




**WellID:** DIABLO WATER DISTRICT-Glen Park Well
**Zone:** Deep
Owner: DWD    Perf Int (ft): 230-245, 260-300    Well Depth (ft): 315




**WellID:** DIABLO WATER DISTRICT-South Park
**Zone:** Deep
Owner: DWD    Perf Int (ft): 204-264, 284-299    Well Depth (ft): 323

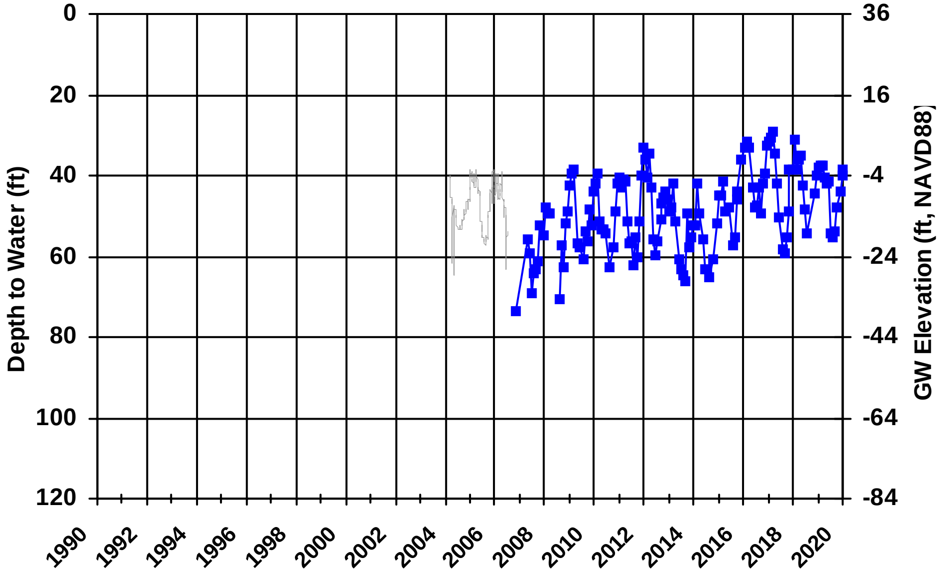



Manual Water Level Measurement    Transducer Water Level Measurement

**WellID: Glen Park MW**

**Zone: Deep**

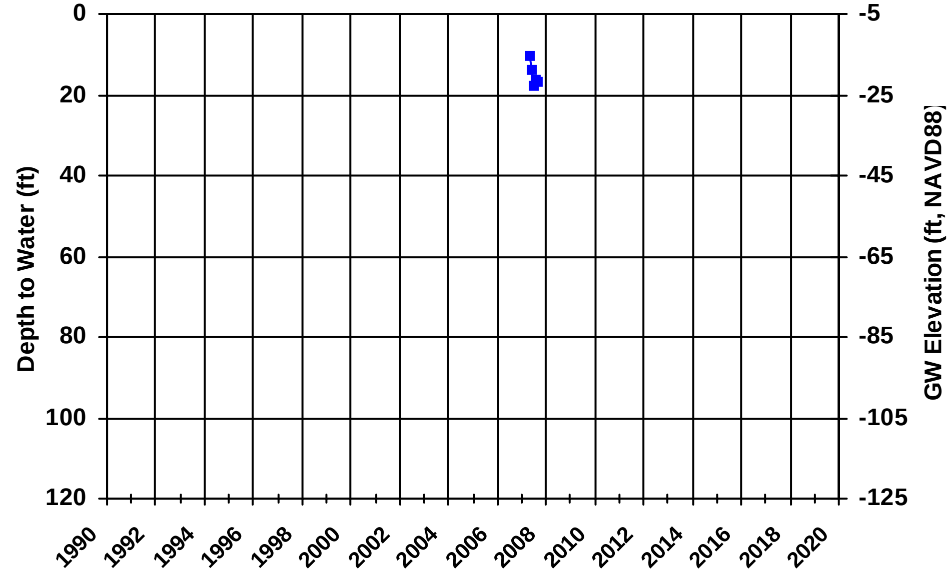
Owner: DWD    Perf Int (ft): 220-230, 260-290  Well Depth (ft): 300




**WellID: Rock Island (Westside pump #2)**

**Zone: Deep**

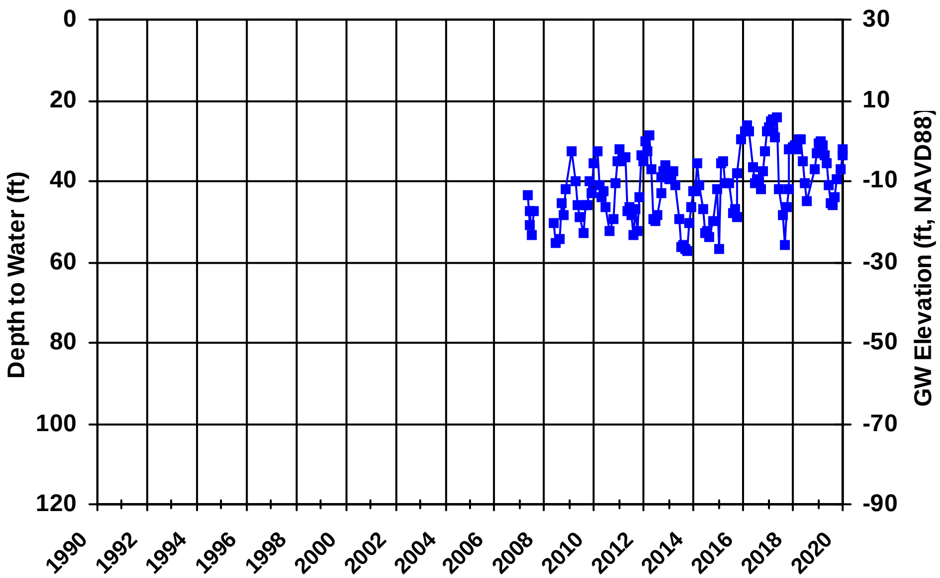
Owner: DWD    Perf Int (ft): 240-270, 284-292  Well Depth (ft): 320




**WellID: Stonecreek MW-300**

**Zone: Deep**

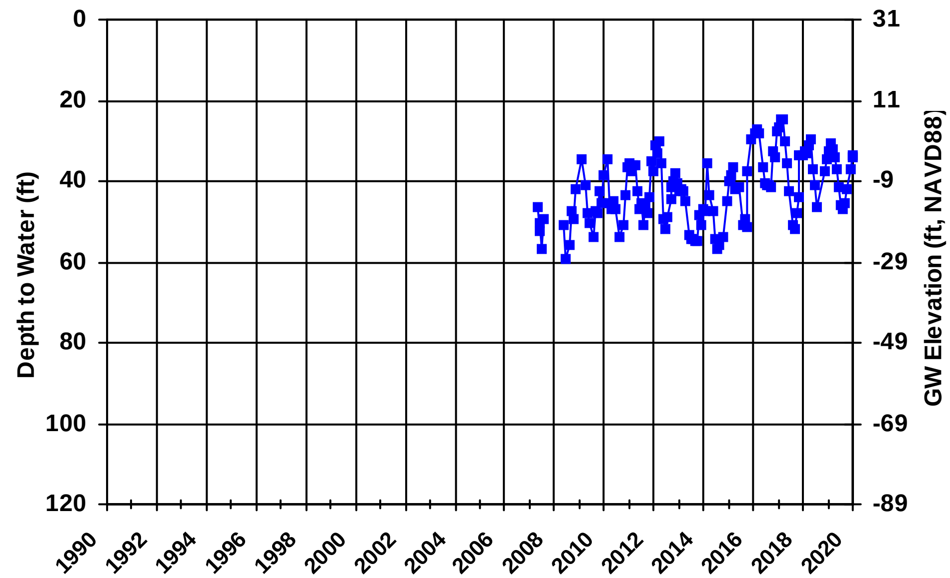
Owner: DWD    Perf Int (ft): 230-240, 280-290  Well Depth (ft): 300




**WellID: Stonecreek MW-360**

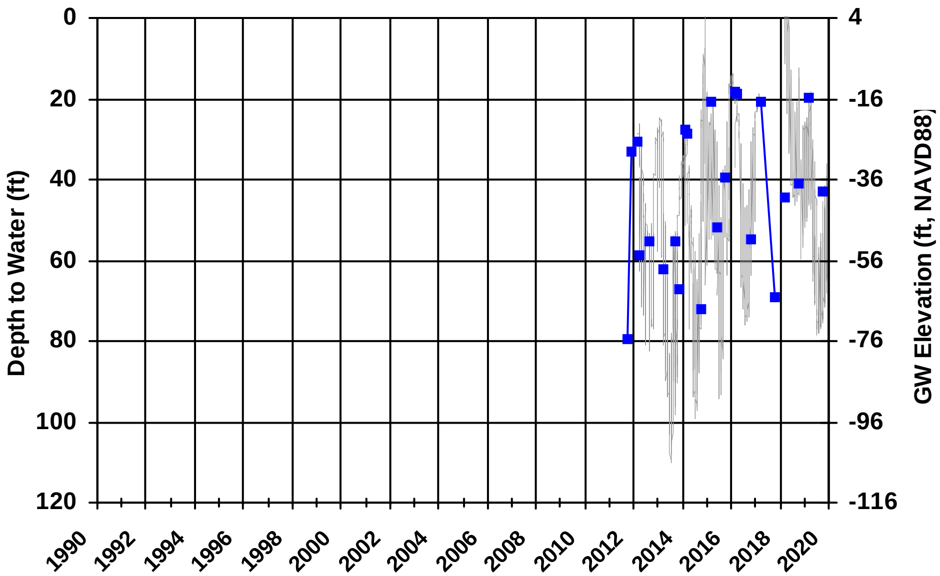
**Zone: Deep**

Owner: DWD    Perf Int (ft): 340-350    Well Depth (ft): 360

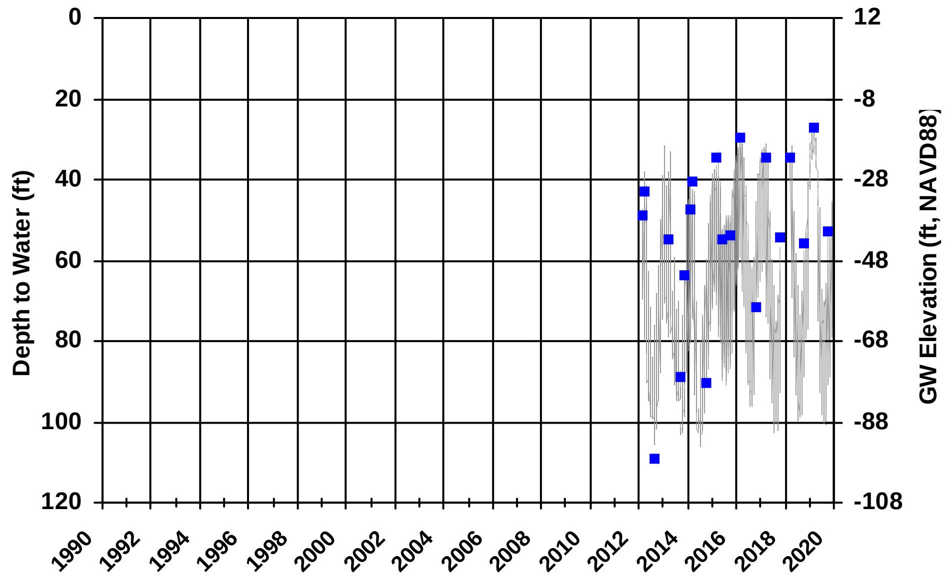



Manual Water Level Measurement    Transducer Water Level Measurement

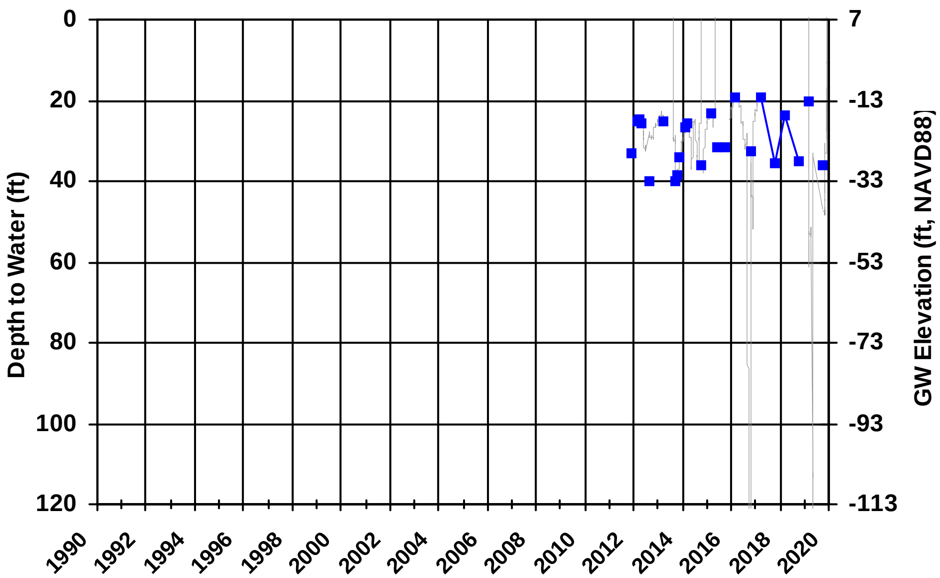
WellID: 1BMW-343
Zone: Deep
Owner: TODB
Perf Int (ft): 270-289, 309-338 Well Depth (ft): 343



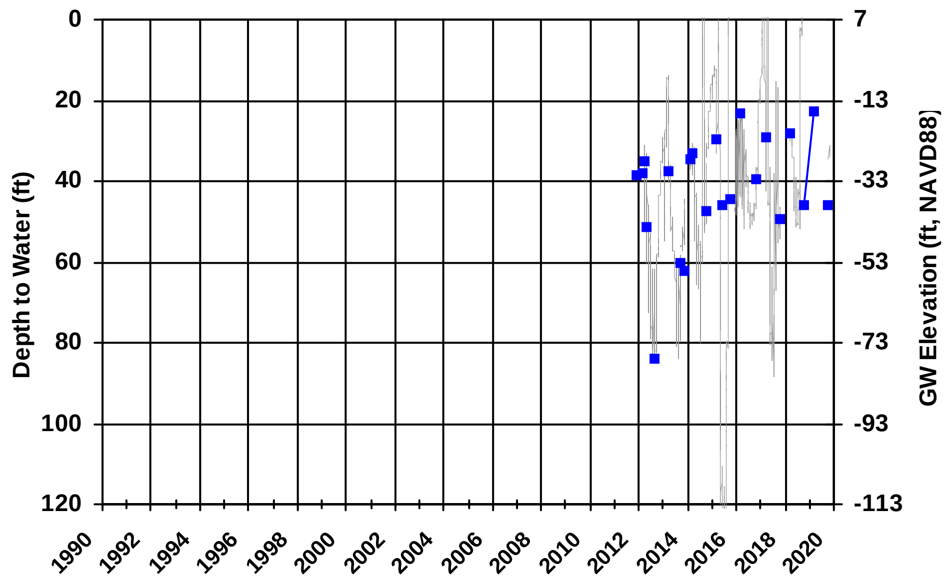

WellID: 4AMW-357
Zone: Deep
Owner: TODB
Perf Int (ft): 307-347 Well Depth (ft): 357




WellID: 6MW-250
Zone: Deep
Owner: TODB
Perf Int (ft): 200-210, 230-240 Well Depth (ft): 250

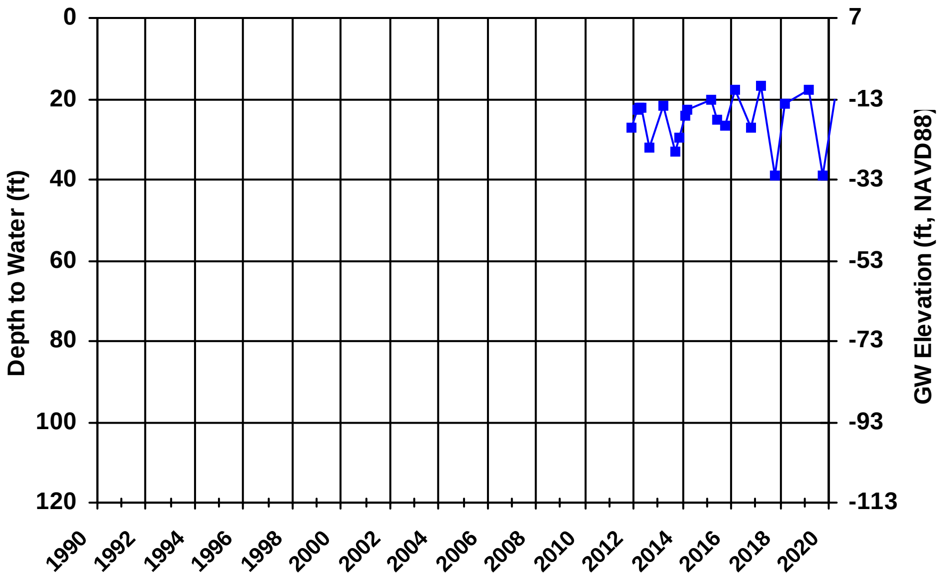



WellID: 6MW-350
Zone: Deep
Owner: TODB
Perf Int (ft): 280-290, 330-340 Well Depth (ft): 350

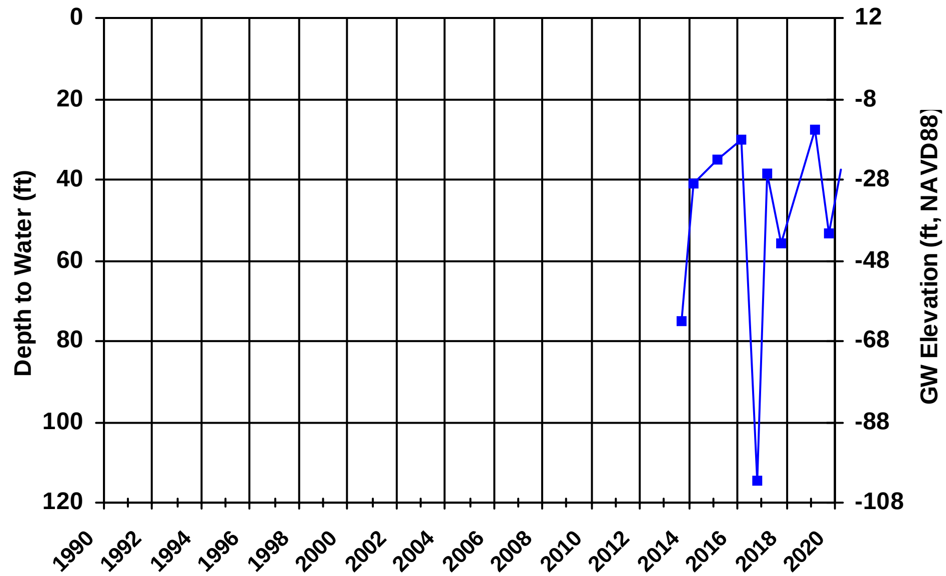



Manual Water Level Measurement
Transducer Water Level Measurement

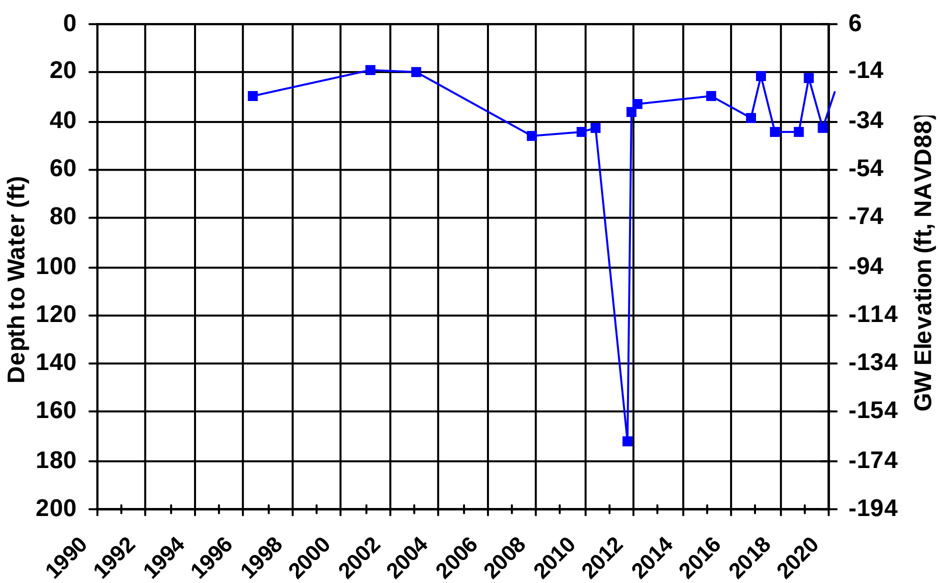
**WellID: 6MW-410**
**Zone: Deep**
Owner: TODB  Perf Int (ft): 390-400  Well Depth (ft): 410



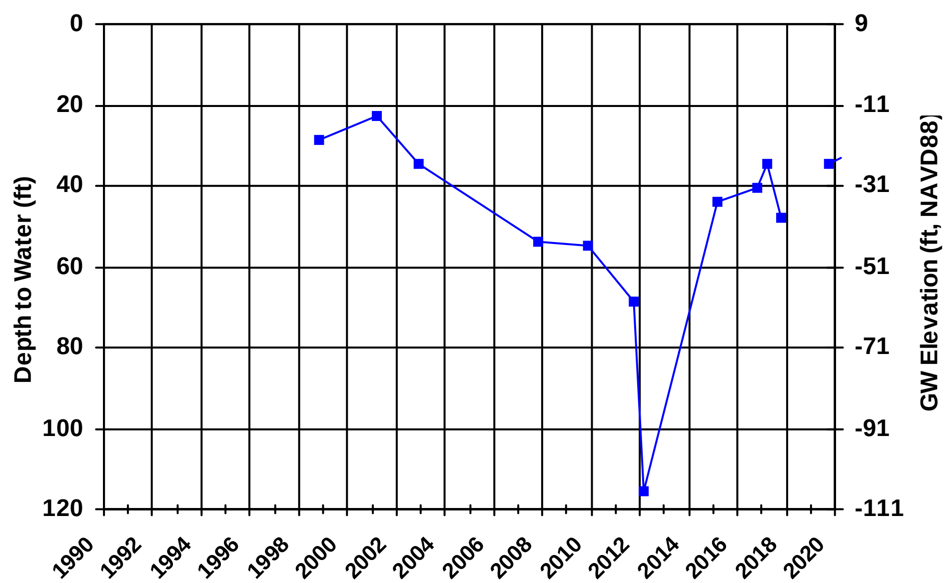

**WellID: 7MW-330**
**Zone: Deep**
Owner: TODB  Perf Int (ft): 310-320  Well Depth (ft): 330




**WellID: TOWN OF DISCOVERY BAY-WELL 01B**
**Zone: Deep**
Owner: TODB  Perf Int (ft): 271-289, 308-340  Well Depth (ft): 350

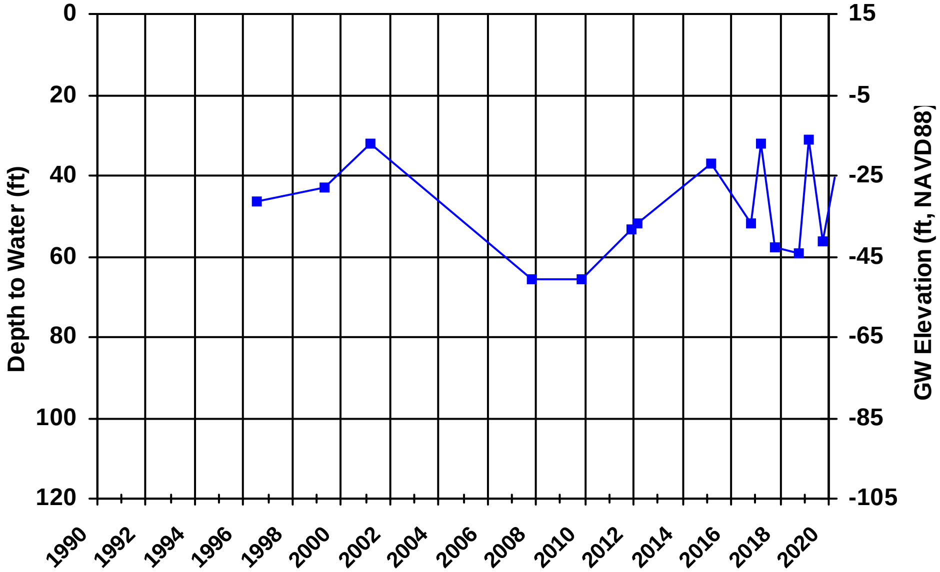



**WellID: TOWN OF DISCOVERY BAY-WELL 02**
**Zone: Deep**
Owner: TODB  Perf Int (ft): 245-335  Well Depth (ft): 348

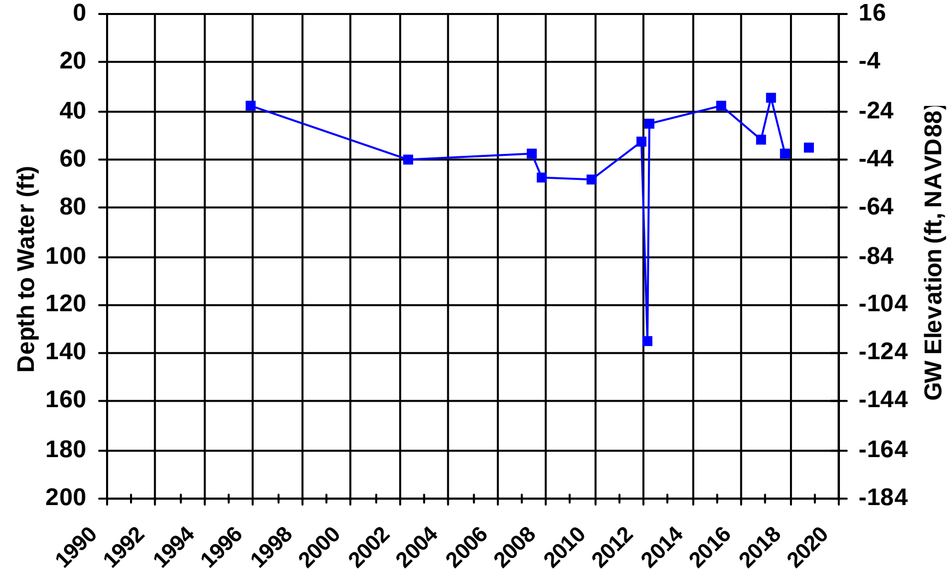



Manual Water Level Measurement  Transducer Water Level Measurement

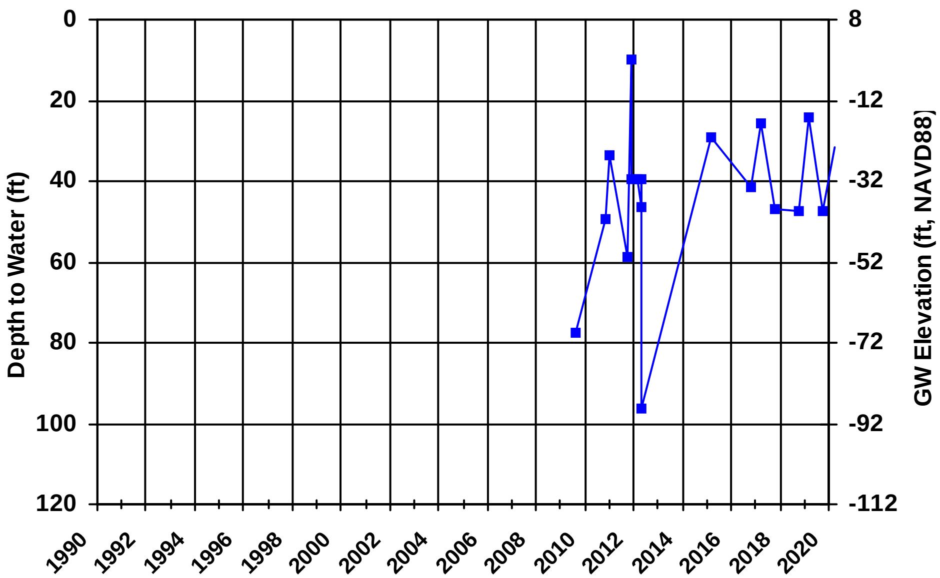
**WellID: TOWN OF DISCOVERY BAY-WELL 04A**
**Zone: Deep**
Owner: TODB | Perf Int (ft): 307-347 | Well Depth (ft): 357



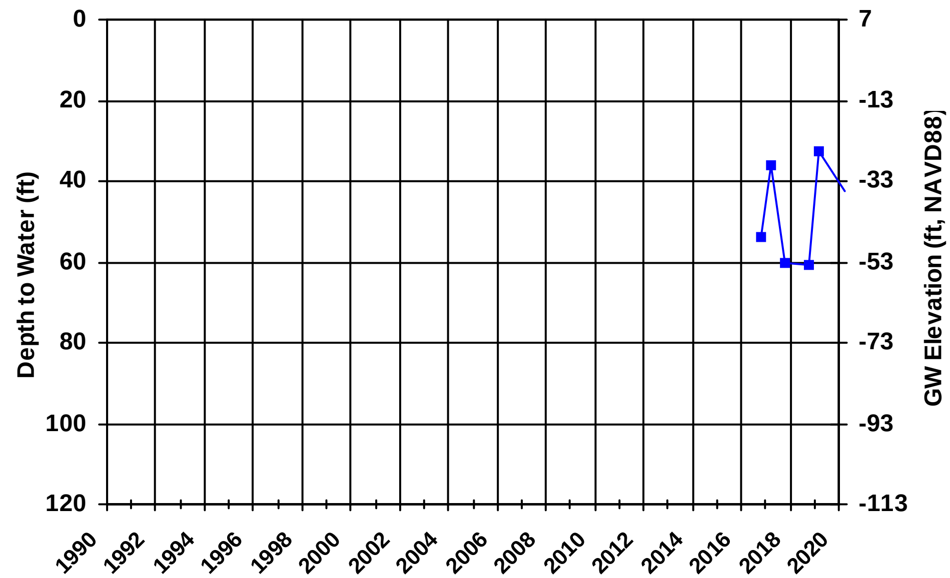

**WellID: TOWN OF DISCOVERY BAY-WELL 05A**
**Zone: Deep**
Owner: TODB | Perf Int (ft): 251-281, 307-347 | Well Depth (ft): 357




**WellID: TOWN OF DISCOVERY BAY-WELL 06**
**Zone: Deep**
Owner: TODB | Perf Int (ft): 270-295, 305-350 | Well Depth (ft): 360




**WellID: TOWN OF DISCOVERY BAY-WELL 07**
**Zone: Deep**
Owner: TODB | Perf Int (ft): 282-292 | Well Depth (ft): 346

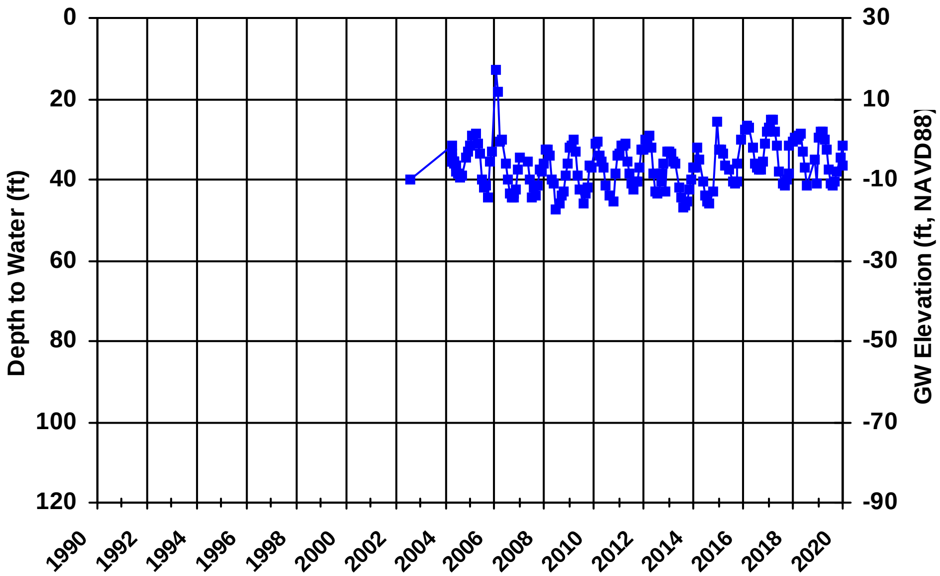



Manual Water Level Measurement | Transducer Water Level Measurement

**WellID: KNIGHTSEN COMMUNITY WATER SYSTEM-Well Head**

**Zone: Deep**

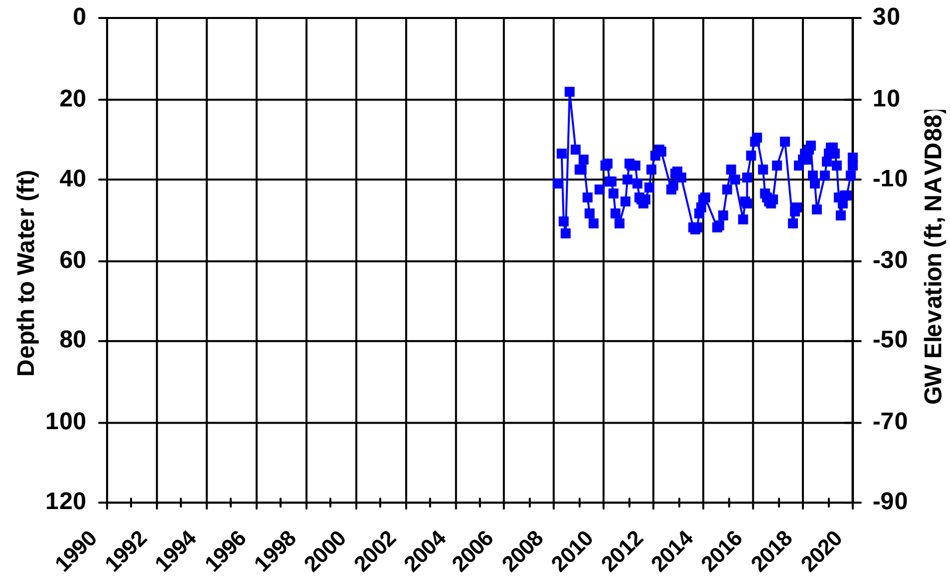
Owner: KNIGHTSEN COMMUNITY    Perf Int (ft): 235-255, 275-295    Well Depth (ft): 305




**WellID: KNIGHTSEN ELEMENTARY SCHOOL-WELL 3**

**Zone: Deep**

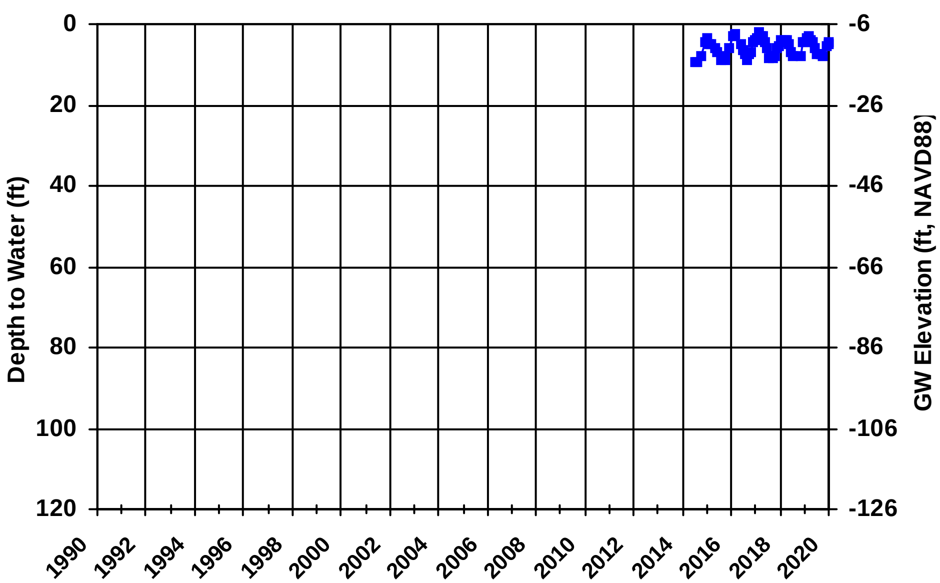
Owner: KNIGHTSEN ELEMENTAR    Perf Int (ft): 395-415    Well Depth (ft): 415




**WellID: Bethel Island (Sugar Barge Marina-Well Head)**

**Zone: Deep**

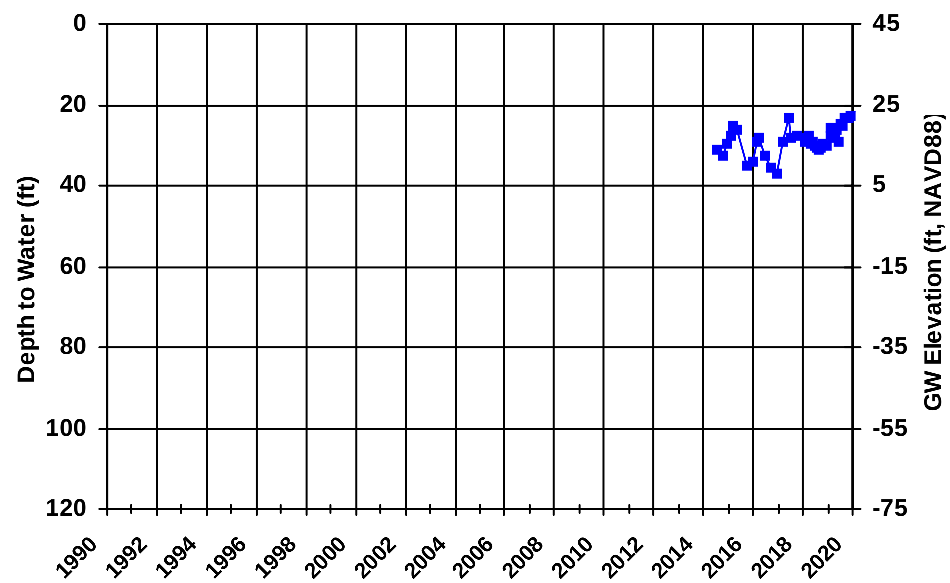
Owner: SUGAR BARGE MARINA    Perf Int (ft): 317-333    Well Depth (ft): 333




**WellID: 2 Casing**

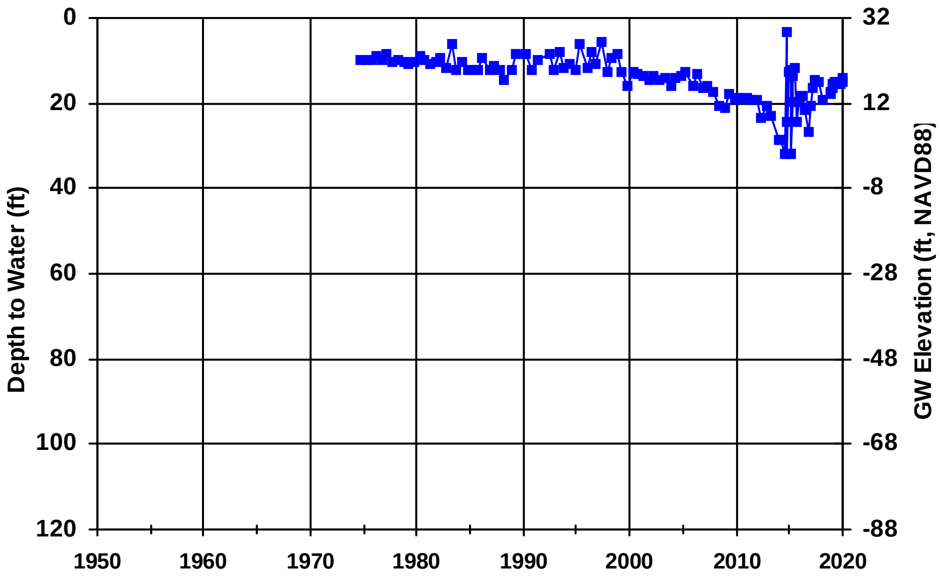
**Zone: Composite**

Owner: BBID    Perf Int (ft): 71-163    Well Depth (ft): 163

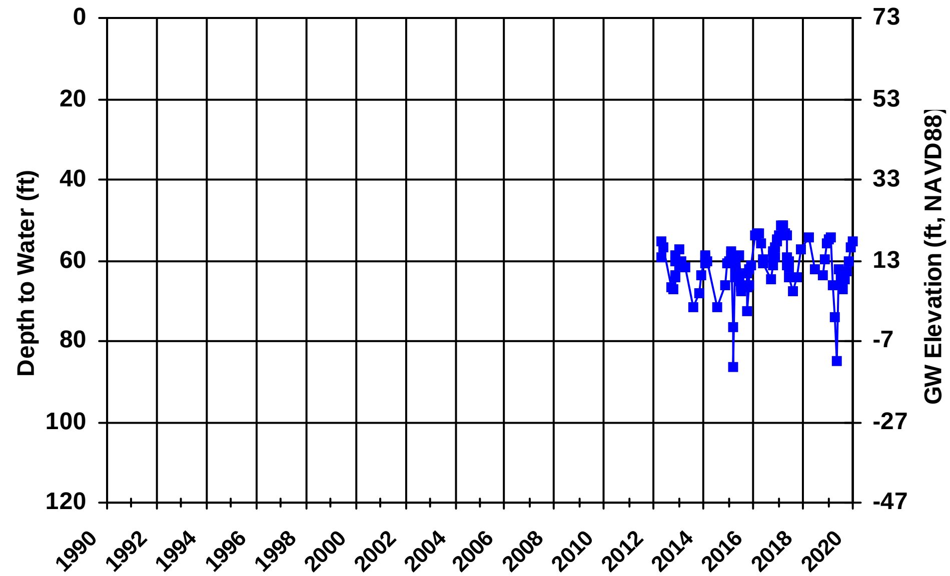



Manual Water Level Measurement    Transducer Water Level Measurement

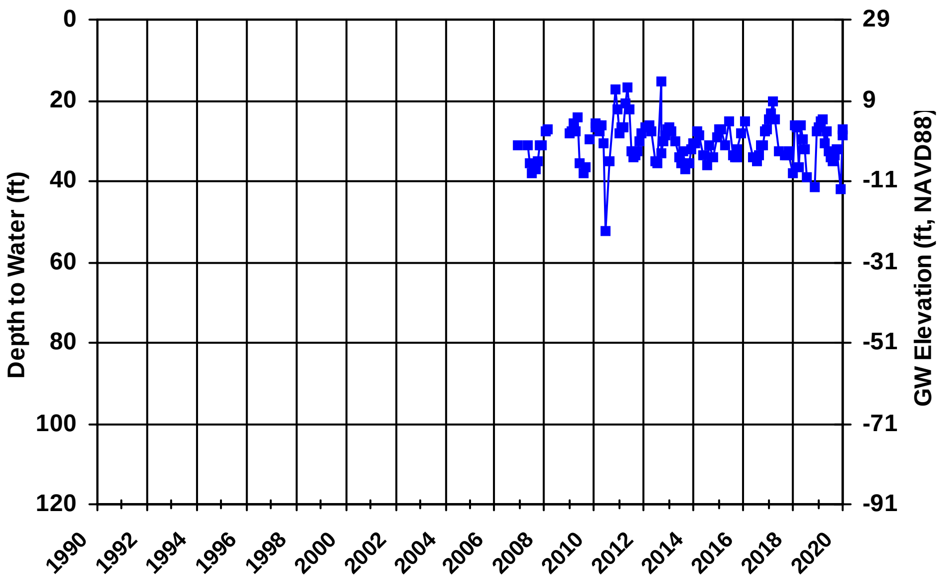
WellID: 6 Byer
Zone: Composite
Owner: BBID Perf Int (ft): N/A Well Depth (ft): 185



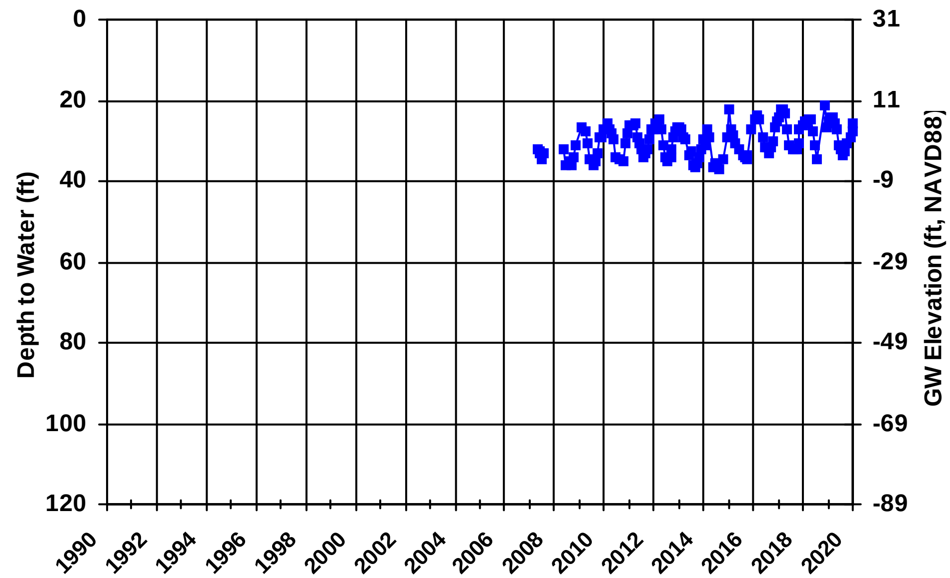

WellID: Brentwood MW-14 Shallow
Zone: Composite
Owner: CofB Perf Int (ft): 114-144 Well Depth (ft): 154




WellID: Knightsen School Irrigation (#2)
Zone: Composite
Owner: DWD Perf Int (ft): 167-191, 210-230 Well Depth (ft): 230

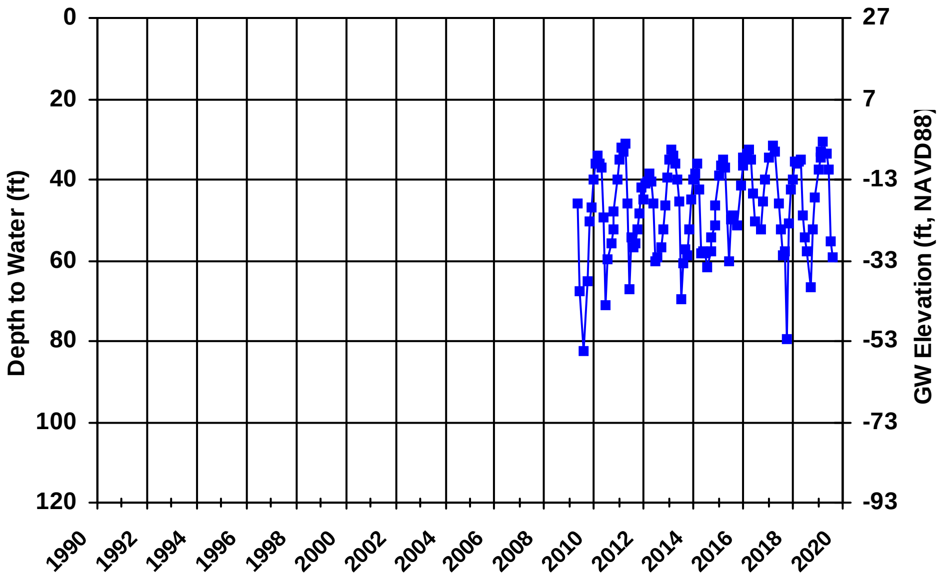



WellID: Stonecreek MW-160
Zone: Composite
Owner: DWD Perf Int (ft): 100-110, 140-150 Well Depth (ft): 160

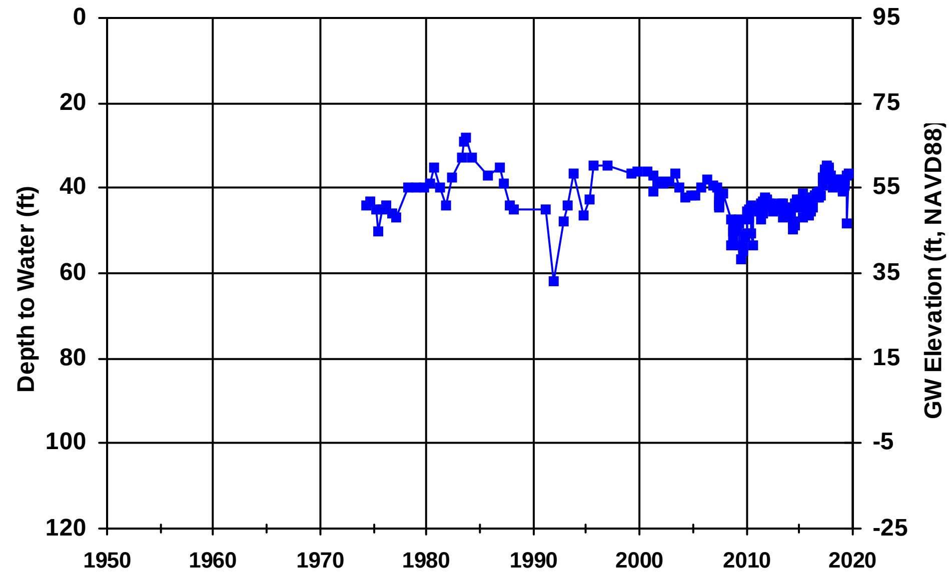



Manual Water Level Measurement Transducer Water Level Measurement

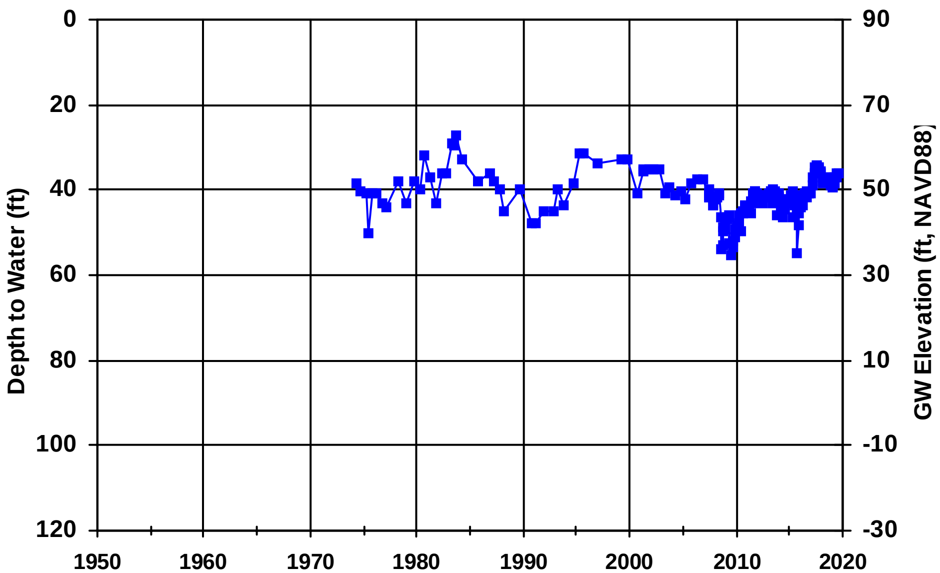
**WellID: Well #14**
**Zone: Composite**
Owner: ECCID    Perf Int (ft): 200-300    Well Depth (ft): 330



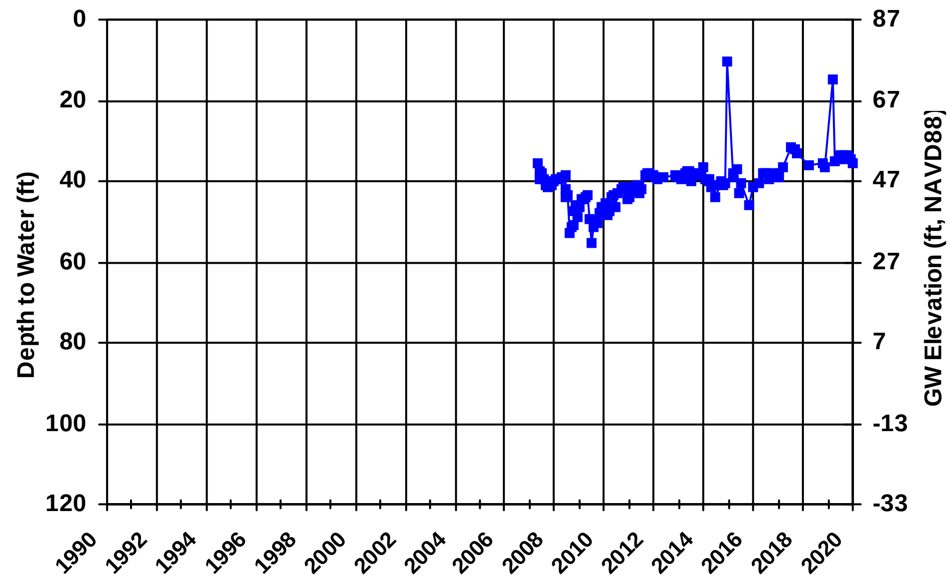

**WellID: Well #3 (4-55)**
**Zone: Composite**
Owner: ECCID    Perf Int (ft): 113-197, 281-365    Well Depth (ft): 365




**WellID: Well #4 (5-62)**
**Zone: Composite**
Owner: ECCID    Perf Int (ft): 68-125, 175-195    Well Depth (ft): 200

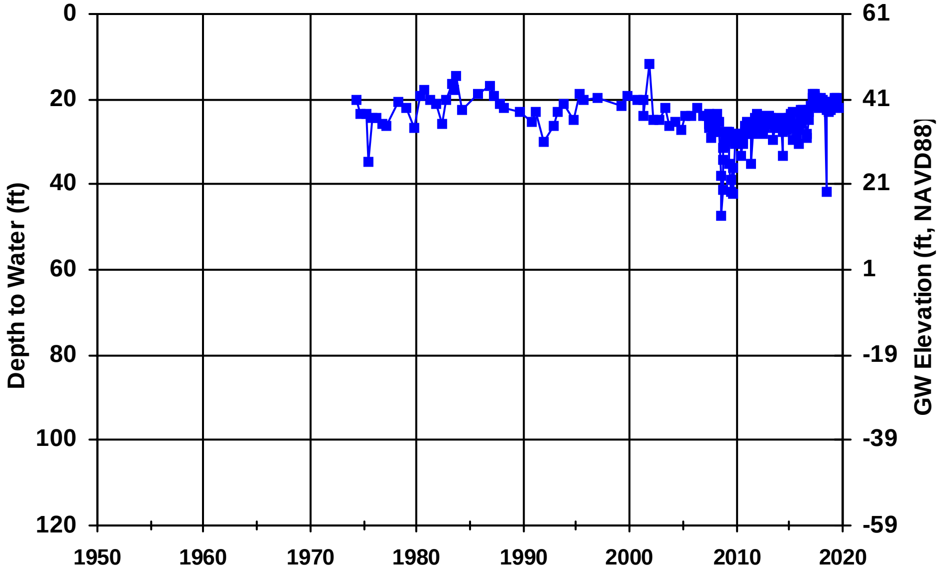



**WellID: Well #4 Old (4-56)**
**Zone: Composite**
Owner: ECCID    Perf Int (ft): 68-125, 175-195    Well Depth (ft): 203

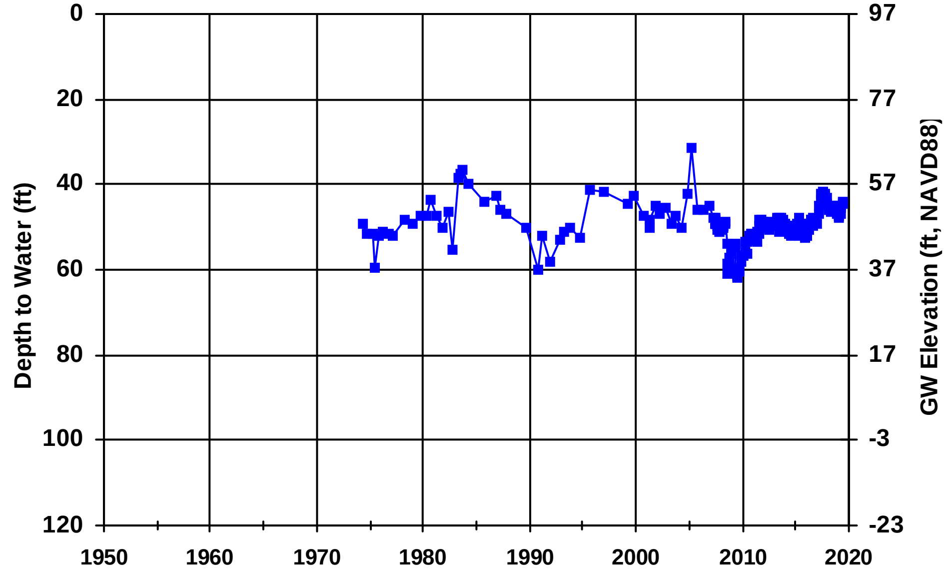



Manual Water Level Measurement    Transducer Water Level Measurement

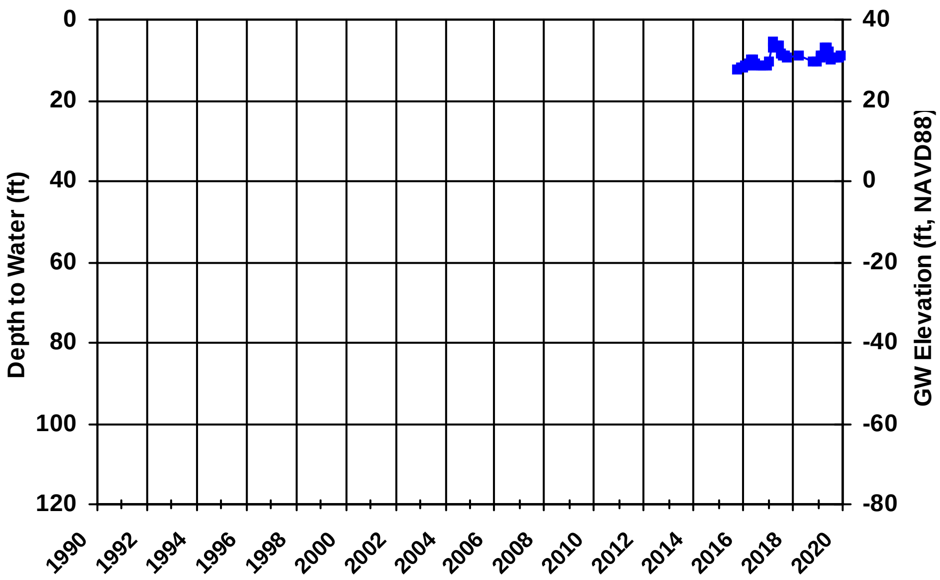
**WellID: Well #5 (4-57)**
**Zone: Composite**
Owner: ECCID  Perf Int (ft): 115-125, 170-175  Well Depth (ft): 290



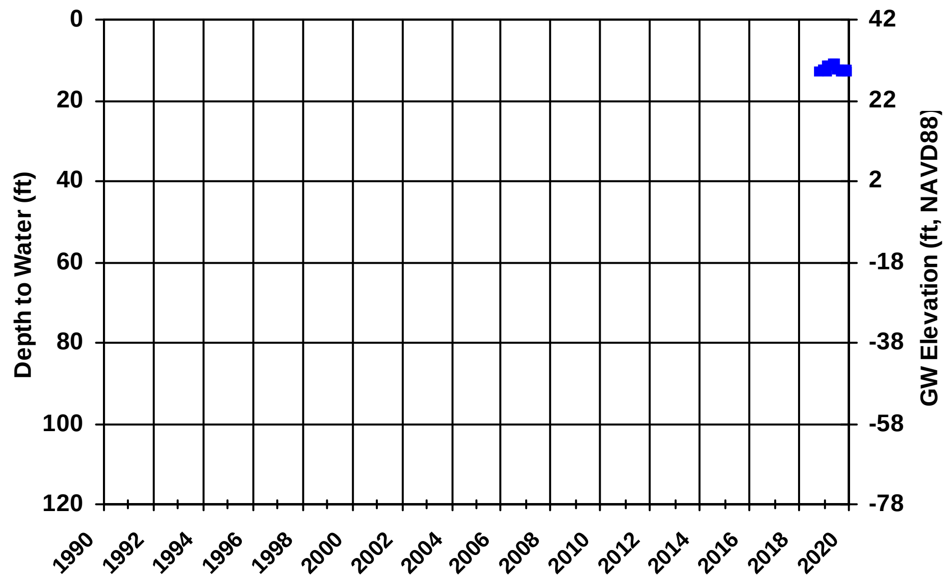

**WellID: Well #9 (4-58)**
**Zone: Composite**
Owner: ECCID  Perf Int (ft): 90-106, 118-126,  Well Depth (ft): 210




**WellID: 10 SM2**
**Zone: Unknown**
Owner: BBID  Perf Int (ft): N/A  Well Depth (ft): N/A

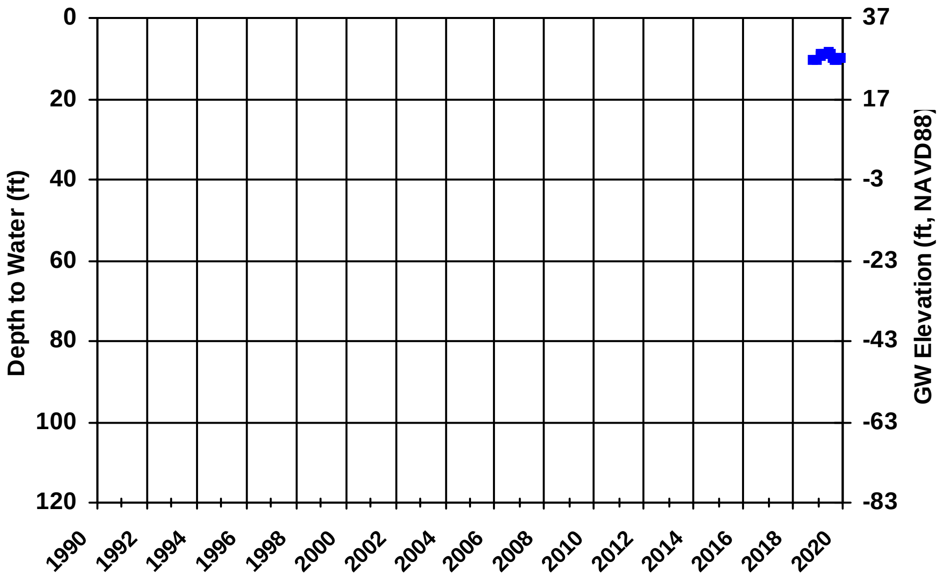



**WellID: 10A Taylor**
**Zone: Unknown**
Owner: BBID  Perf Int (ft): N/A  Well Depth (ft): N/A

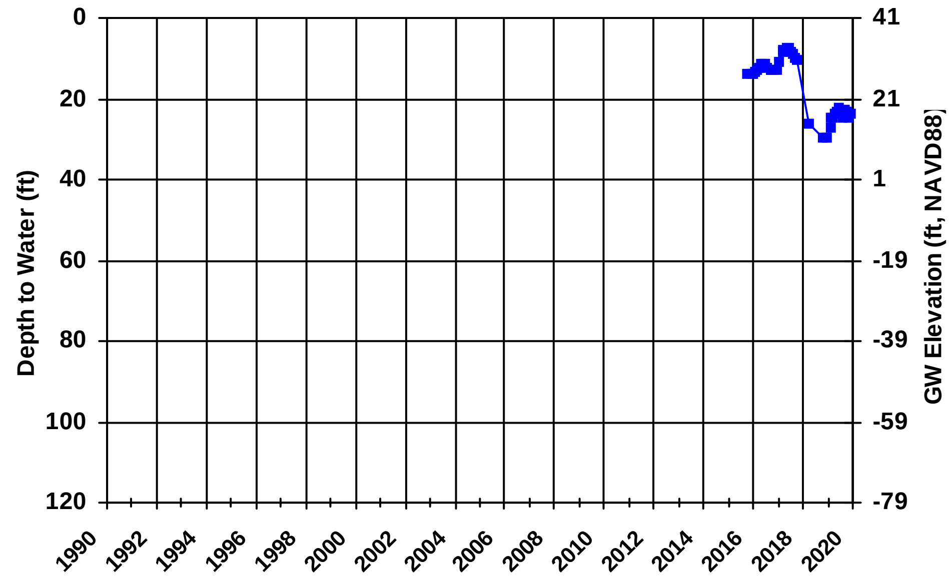



Manual Water Level Measurement  Transducer Water Level Measurement

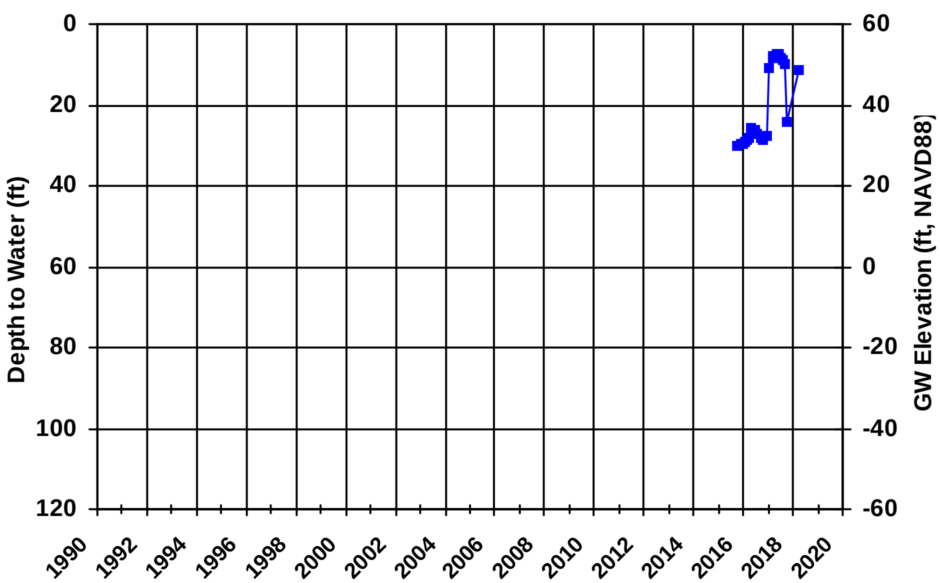
**WellID: 10C Marsh**
**Zone: Unknown**
Owner: BBID Perf Int (ft): N/A Well Depth (ft): N/A



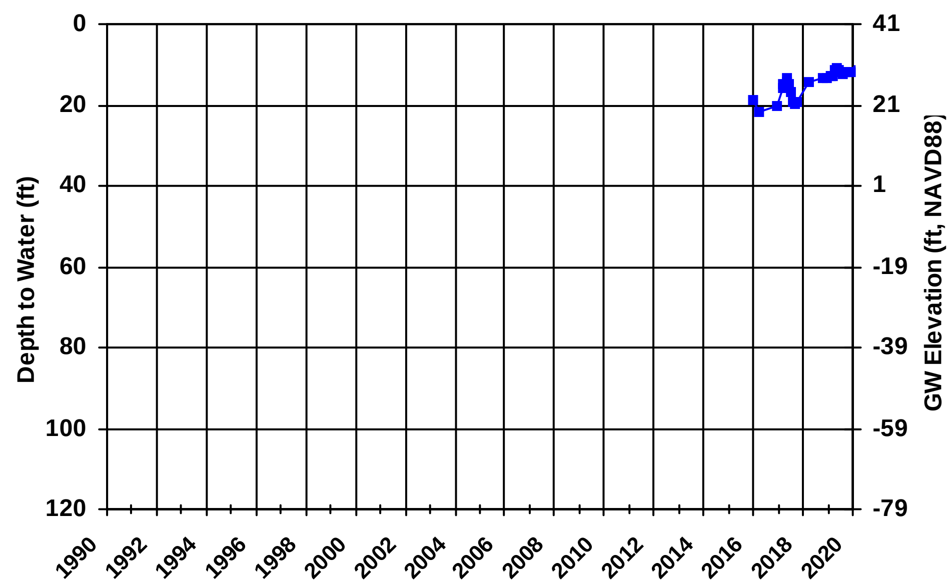

**WellID: 11 TN1**
**Zone: Unknown**
Owner: BBID Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: 12 TN2**
**Zone: Unknown**
Owner: BBID Perf Int (ft): N/A Well Depth (ft): N/A

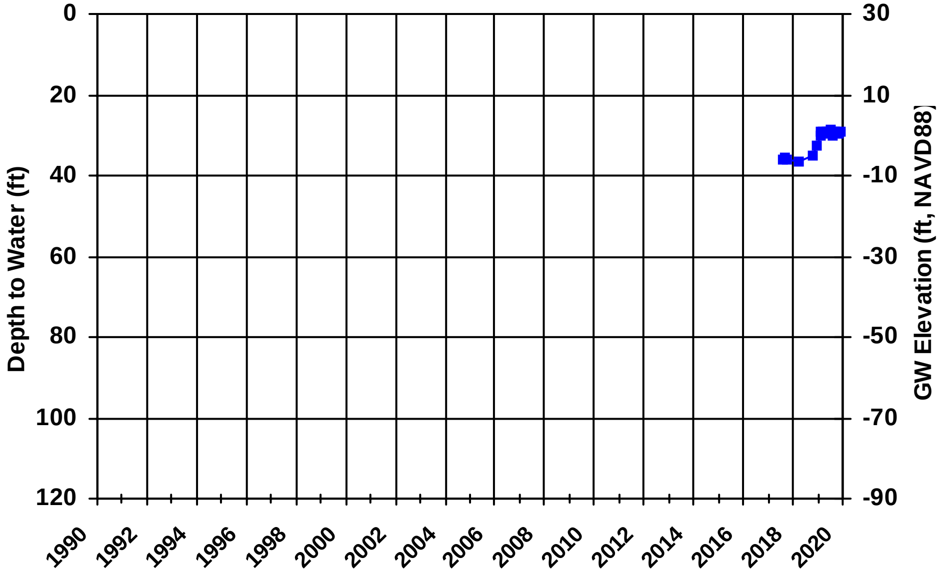



**WellID: 13 M**
**Zone: Unknown**
Owner: BBID Perf Int (ft): N/A Well Depth (ft): N/A

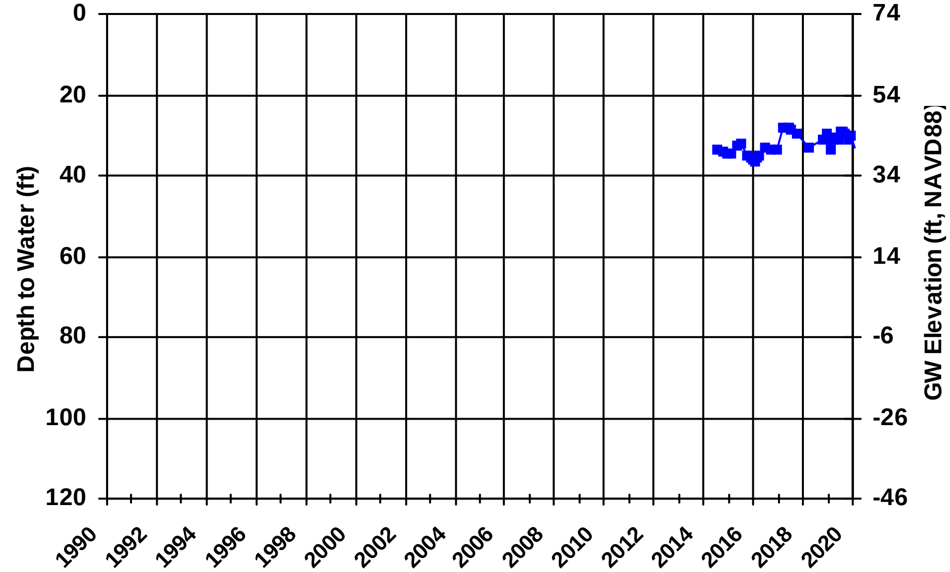



Manual Water Level Measurement Transducer Water Level Measurement

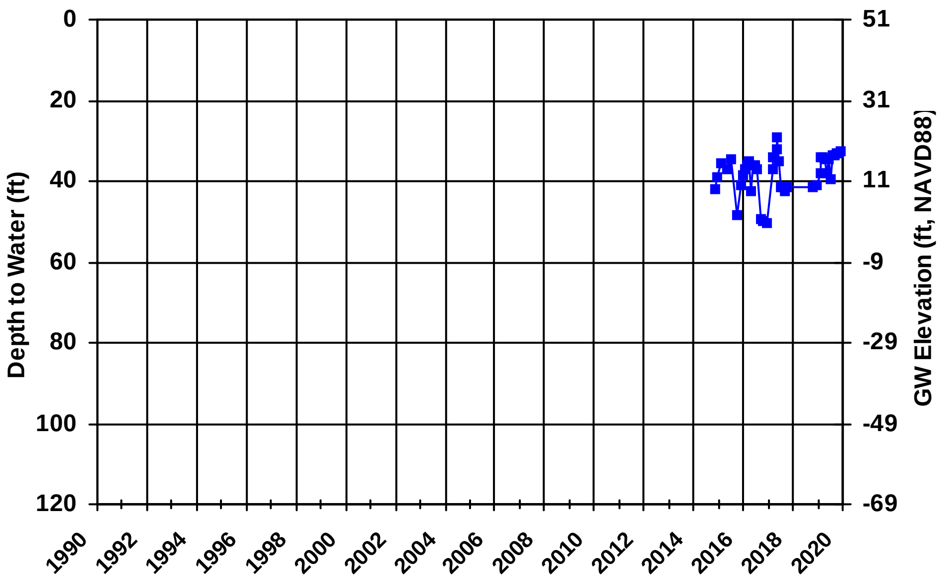
**WellID: 14 GNO**
**Zone: Unknown**
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): N/A



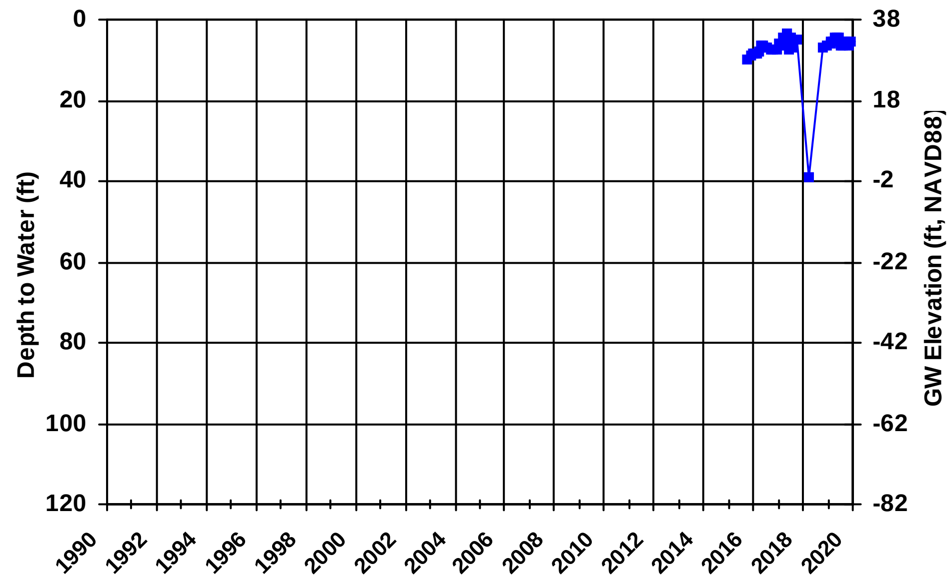

**WellID: 7 Hoffman 1**
**Zone: Unknown**
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID: 8 Casing 2**
**Zone: Unknown**
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): N/A

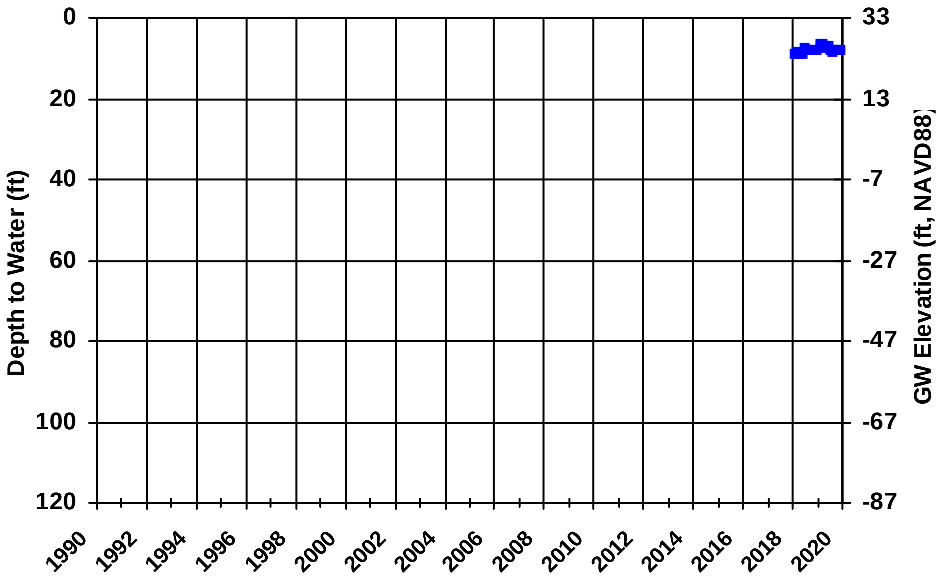



**WellID: 9 SM1**
**Zone: Unknown**
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): N/A

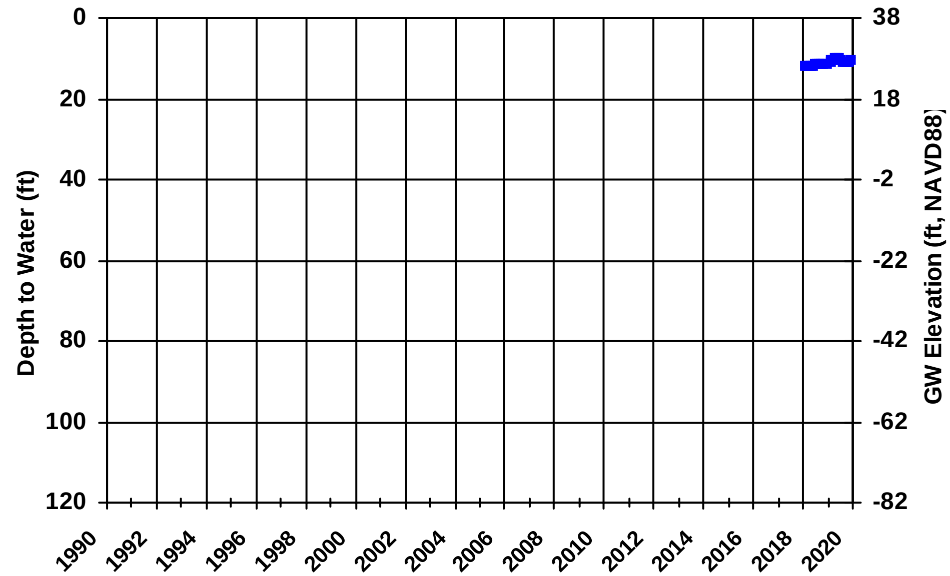



Manual Water Level Measurement    Transducer Water Level Measurement

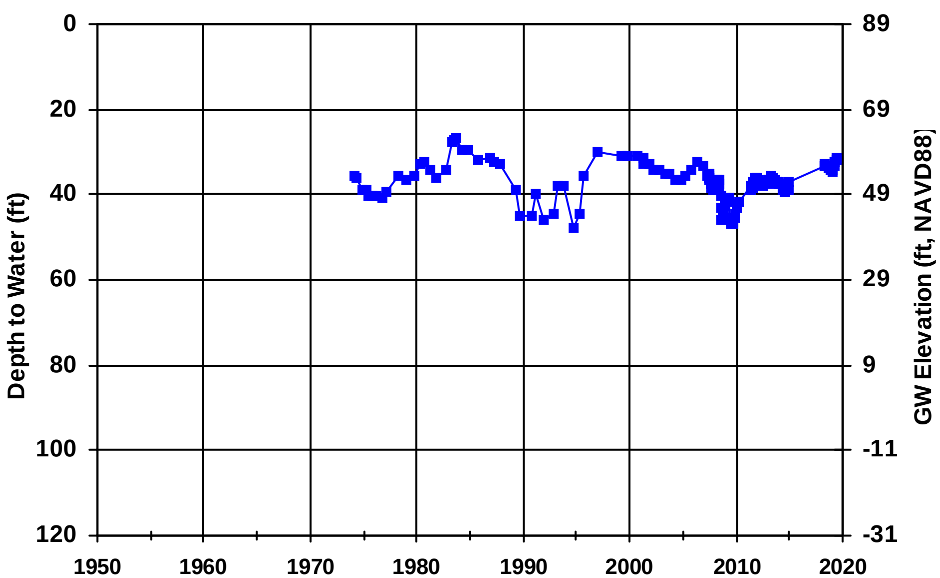
**WellID: 9d Abreu**
**Zone: Unknown**
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): N/A



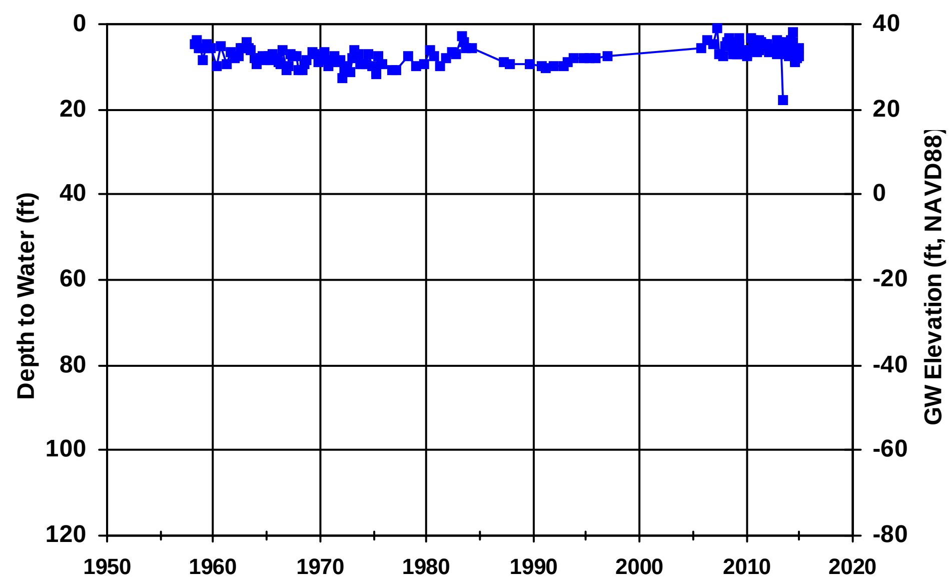

**WellID: 9e Hagen**
**Zone: Unknown**
Owner: BBID | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID: Anderson (4.66)**
**Zone: Unknown**
Owner: ECCID | Perf Int (ft): N/A | Well Depth (ft): N/A

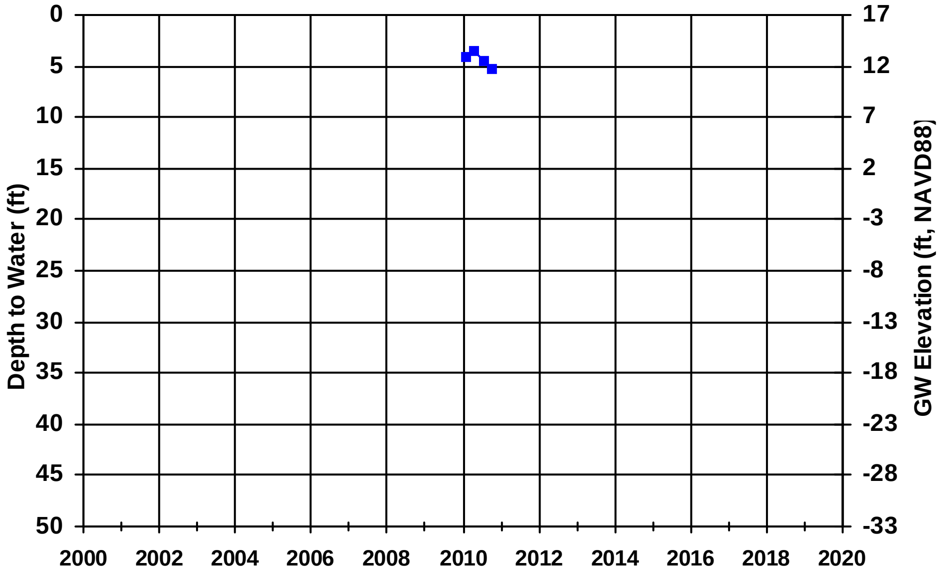



**WellID: Well #2 (5-30)**
**Zone: Unknown**
Owner: ECCID | Perf Int (ft): N/A | Well Depth (ft): N/A

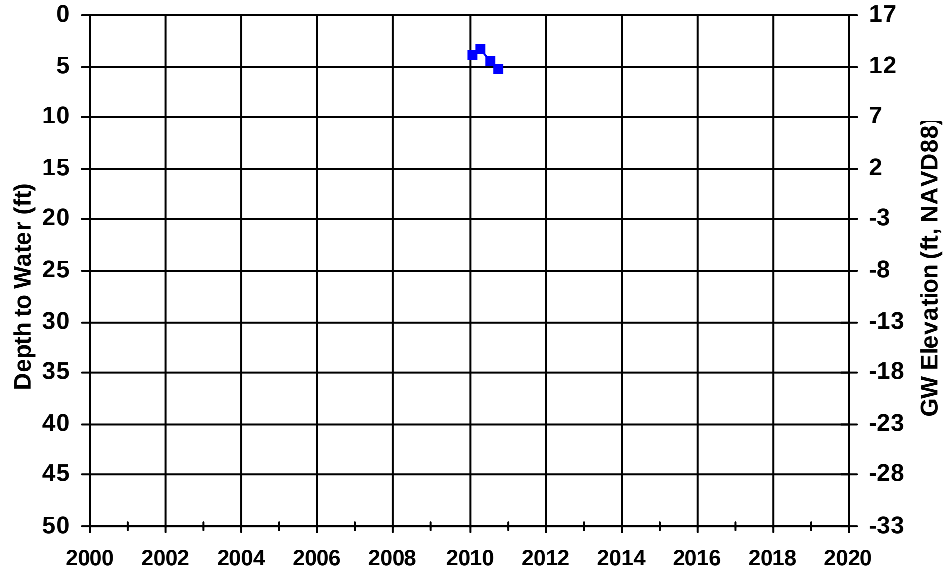



Manual Water Level Measurement | Transducer Water Level Measurement

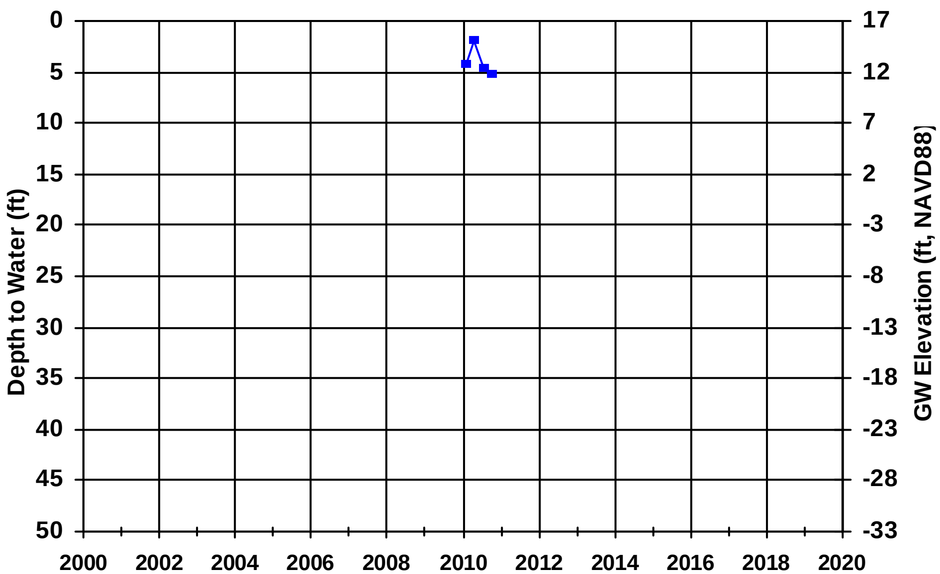
**WellID:** SL0601327206-EW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



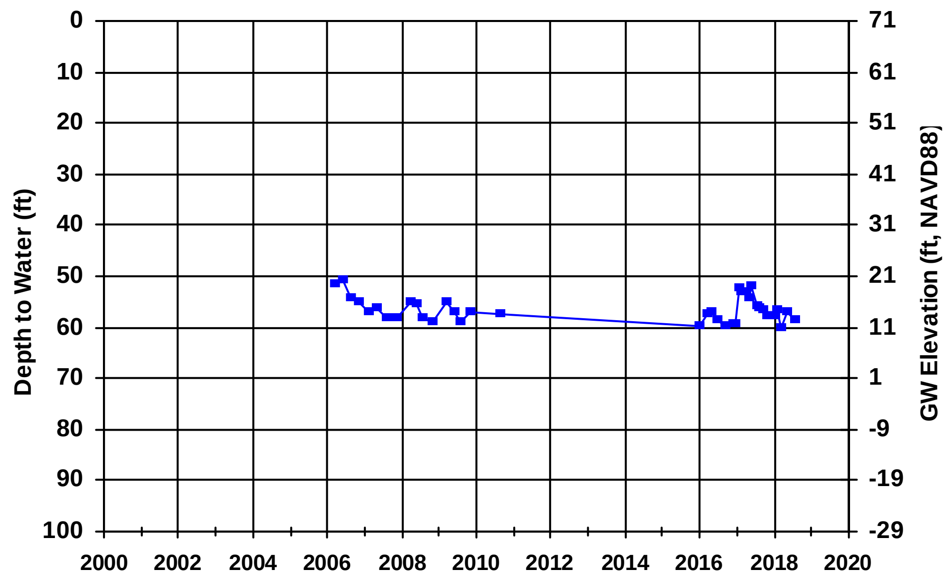

**WellID:** SL0601327206-MW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** SL0601327206-MW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

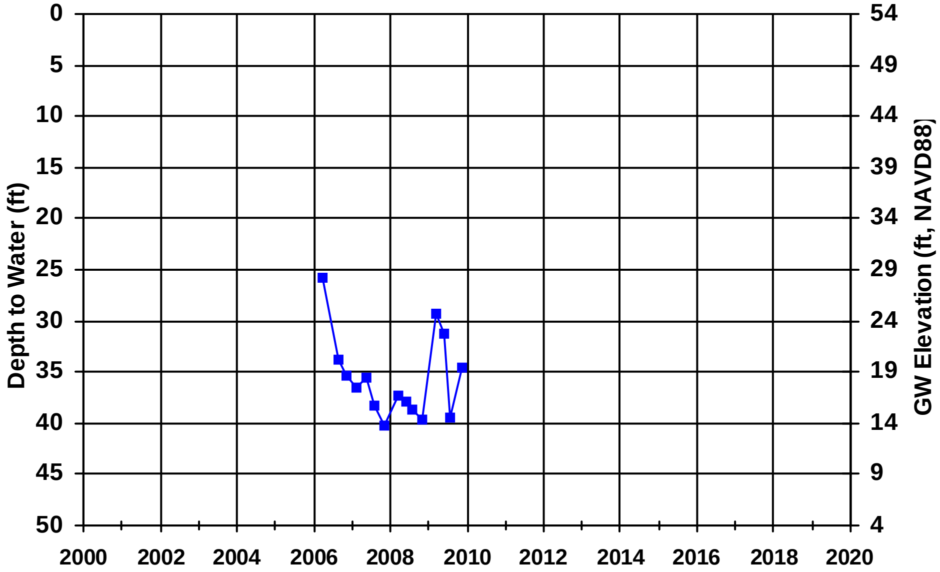



**WellID:** SL0601346154-94MW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

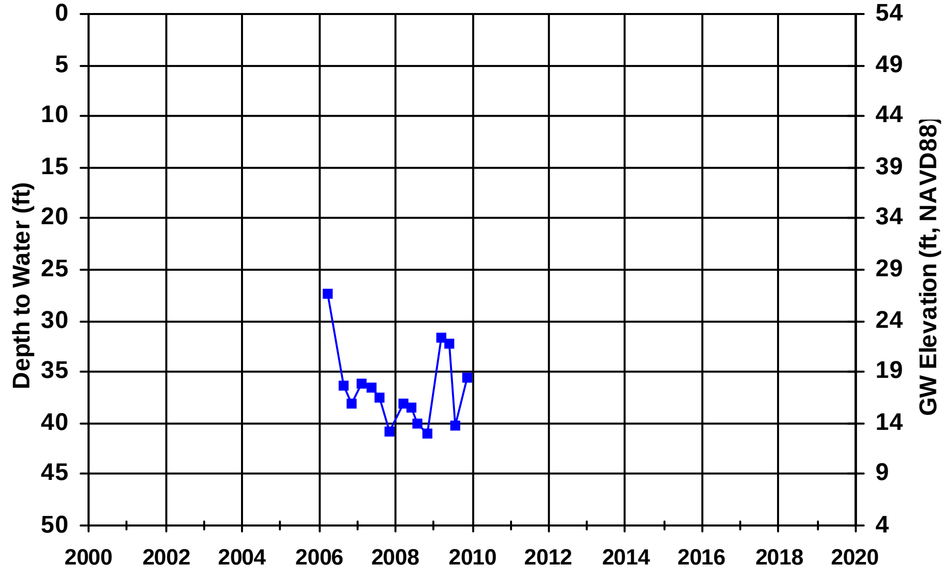



{R_WLhyd88}

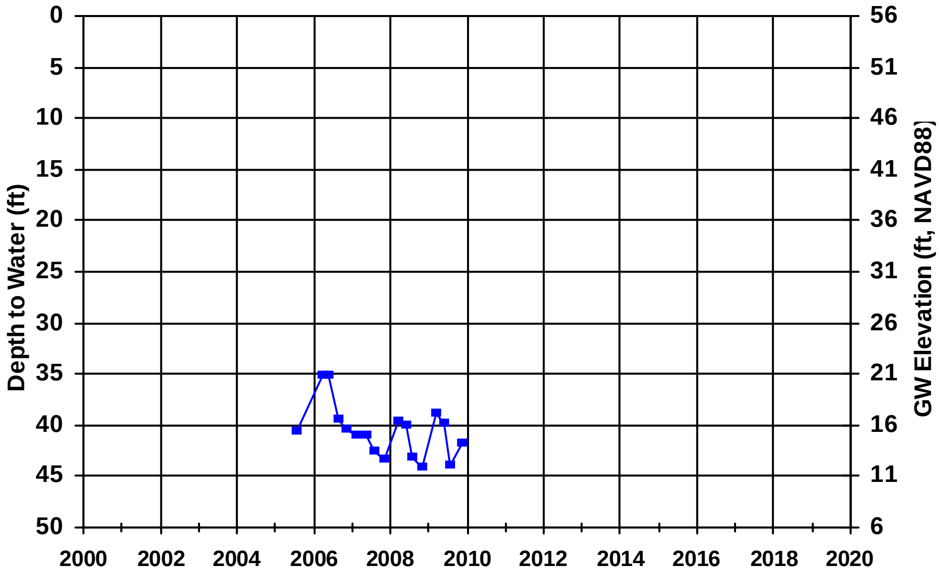
**WellID:** SL0601346154-94MW-12
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



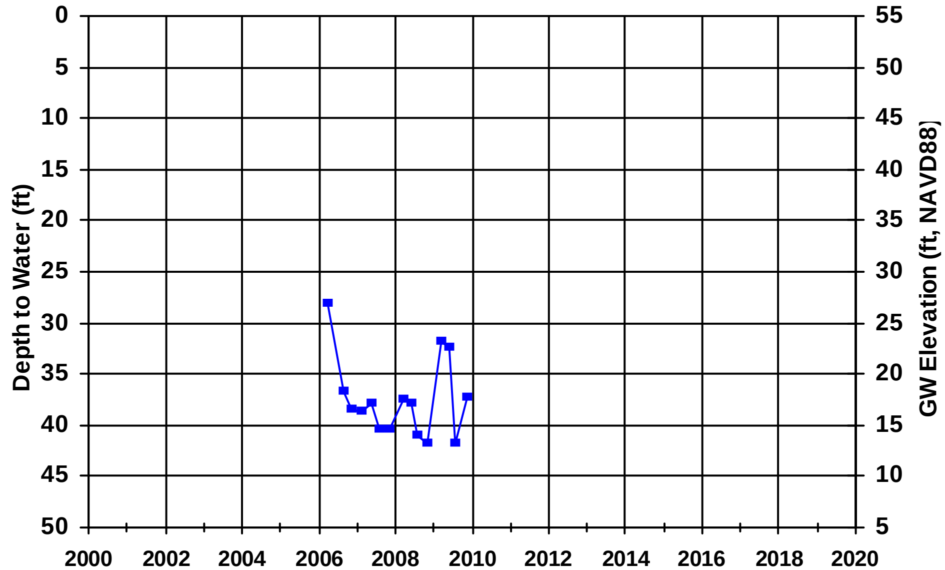

**WellID:** SL0601346154-94MW-14
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** SL0601346154-94MW-18
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



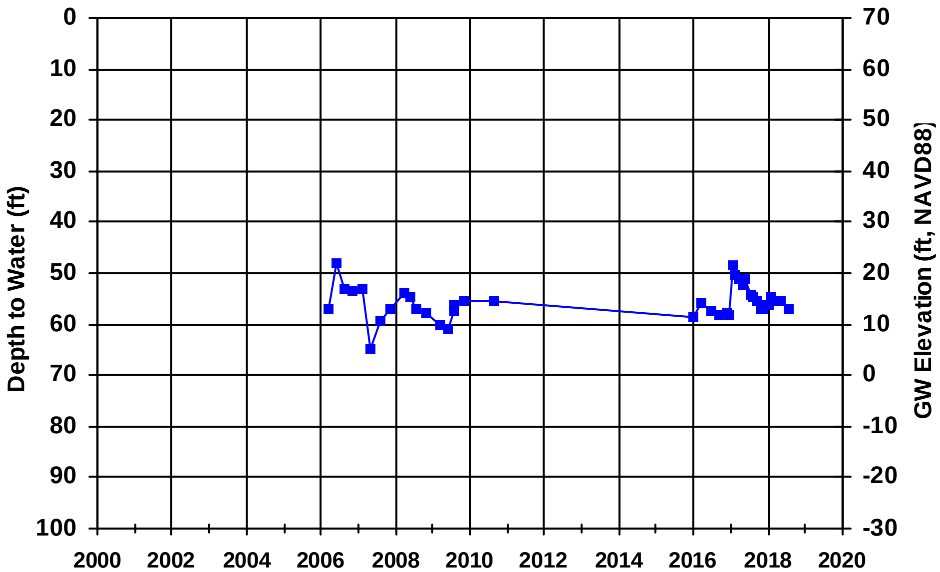

**WellID:** SL0601346154-94MW-19
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



**WellID:** SL0601346154-94MW-2

**Zone:** Shallow

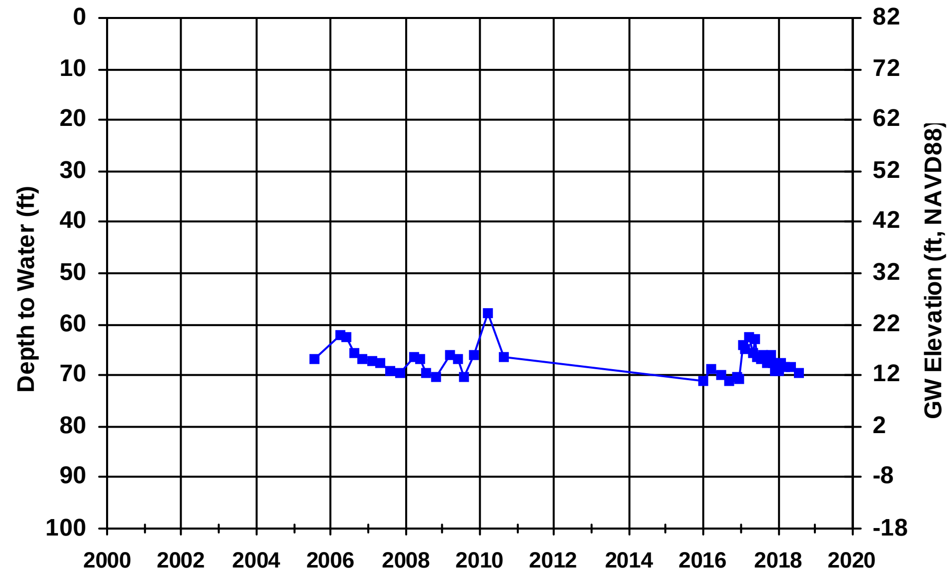
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL0601346154-94MW-22

**Zone:** Shallow

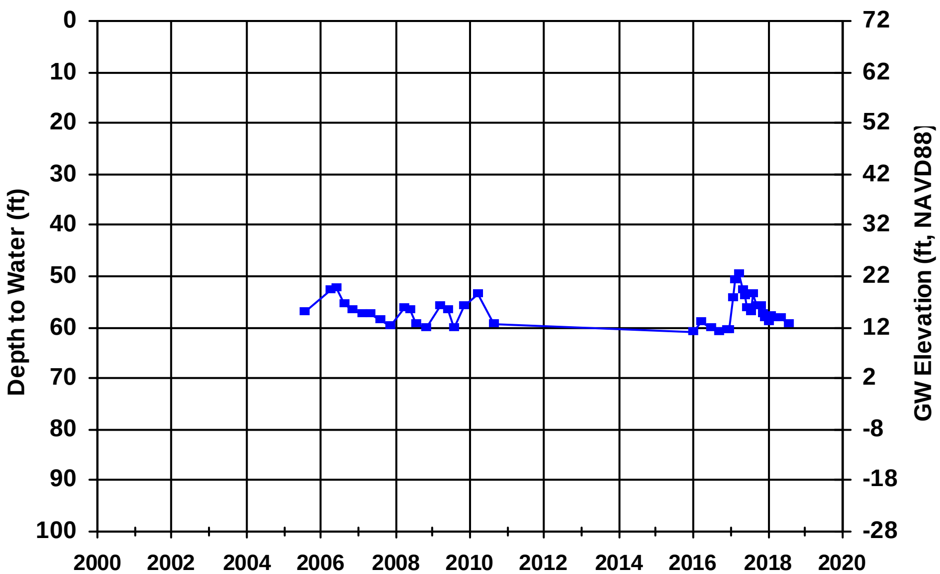
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL0601346154-94MW-23

**Zone:** Shallow

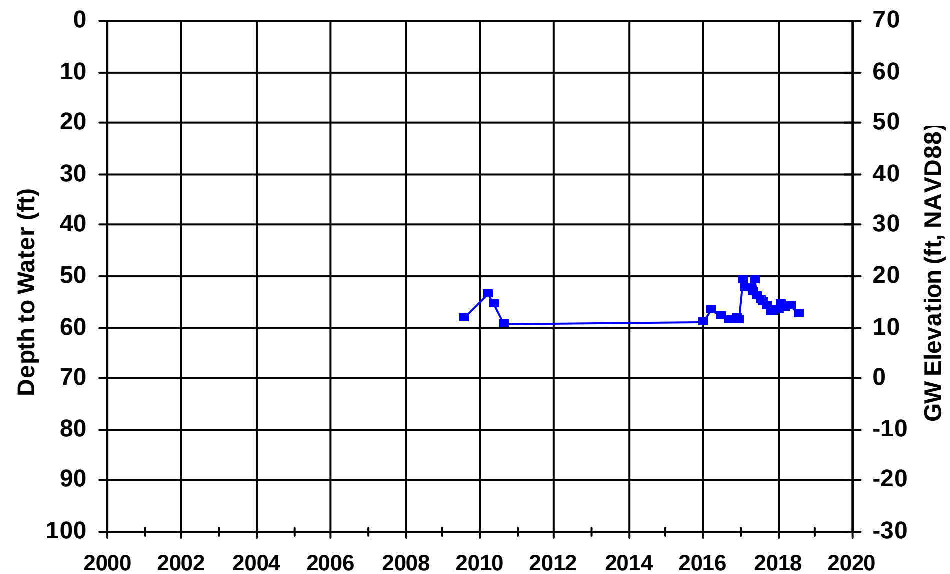
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL0601346154-94MW-25

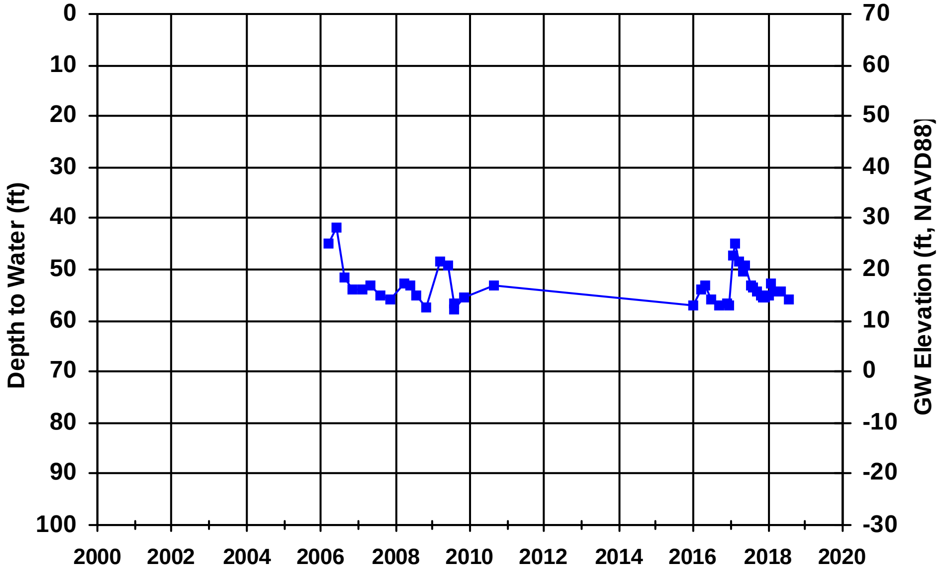
**Zone:** Shallow

Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

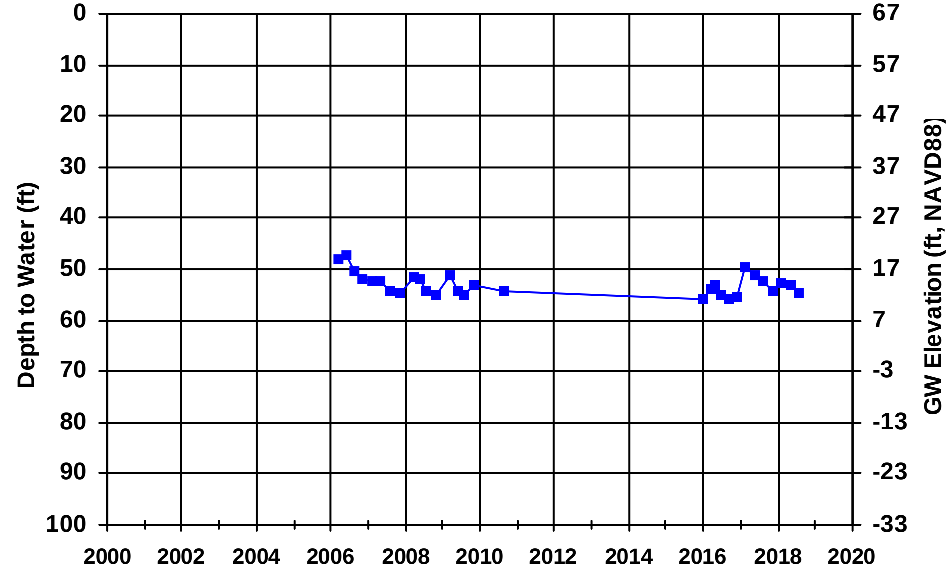



{R_WLhyd88}

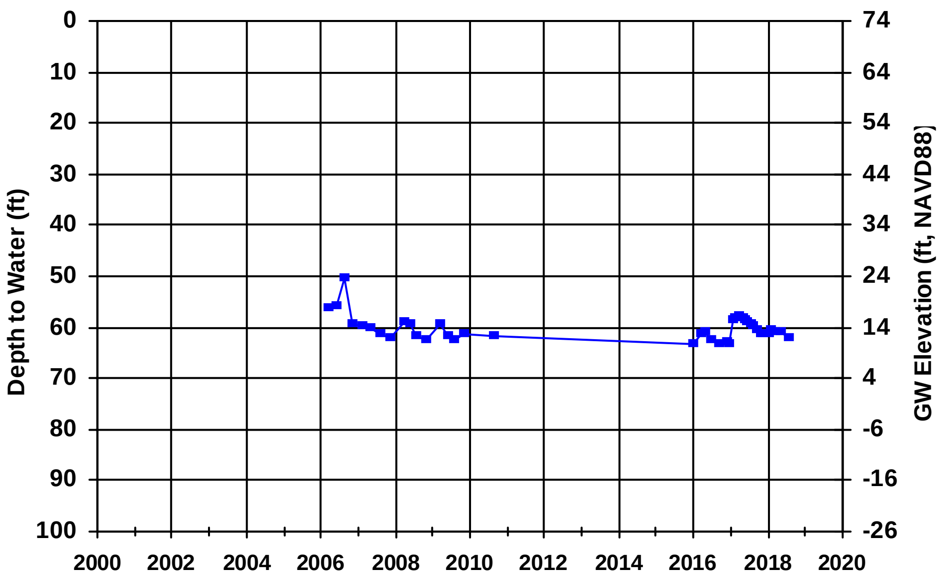
**WellID: SL0601346154-94MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



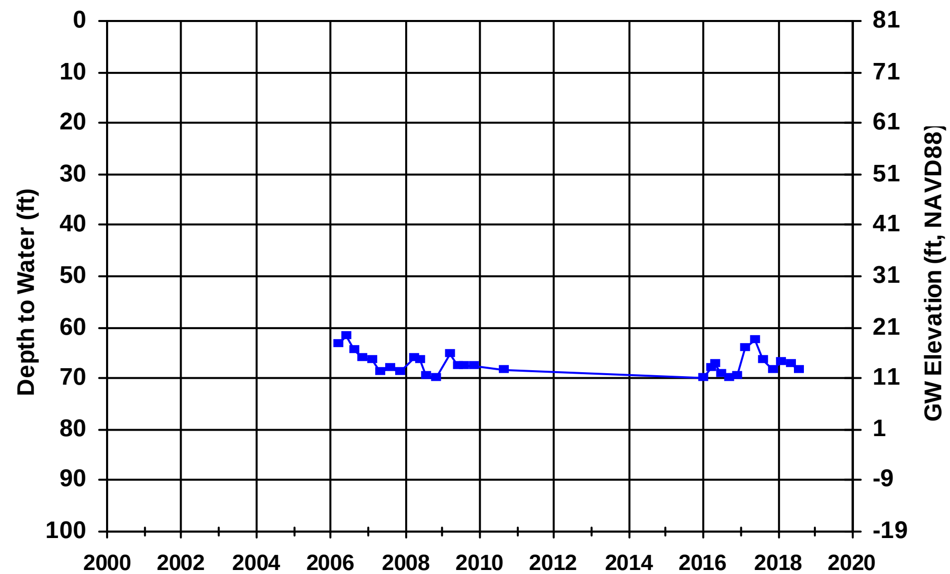

**WellID: SL0601346154-94MW-4**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: SL0601346154-94MW-5**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

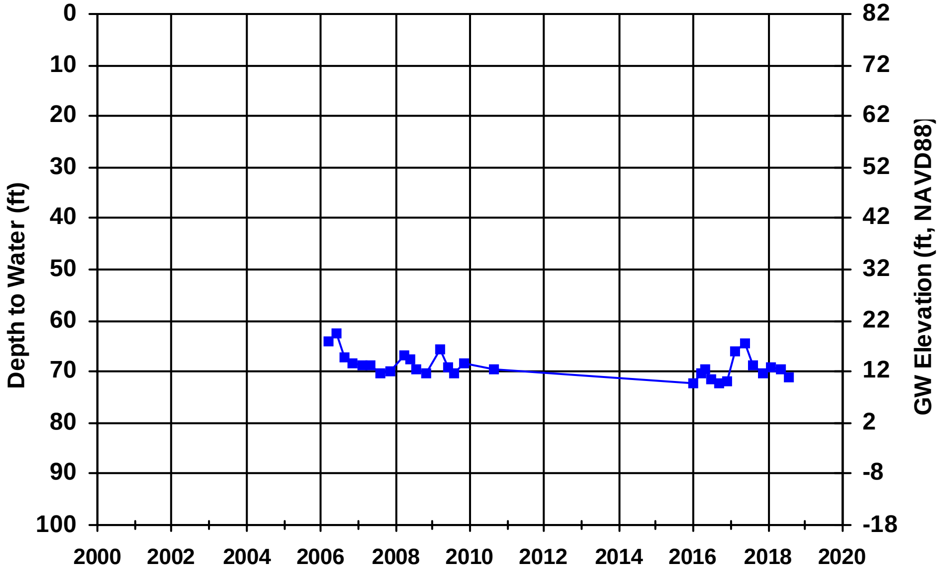



**WellID: SL0601346154-94MW-6**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

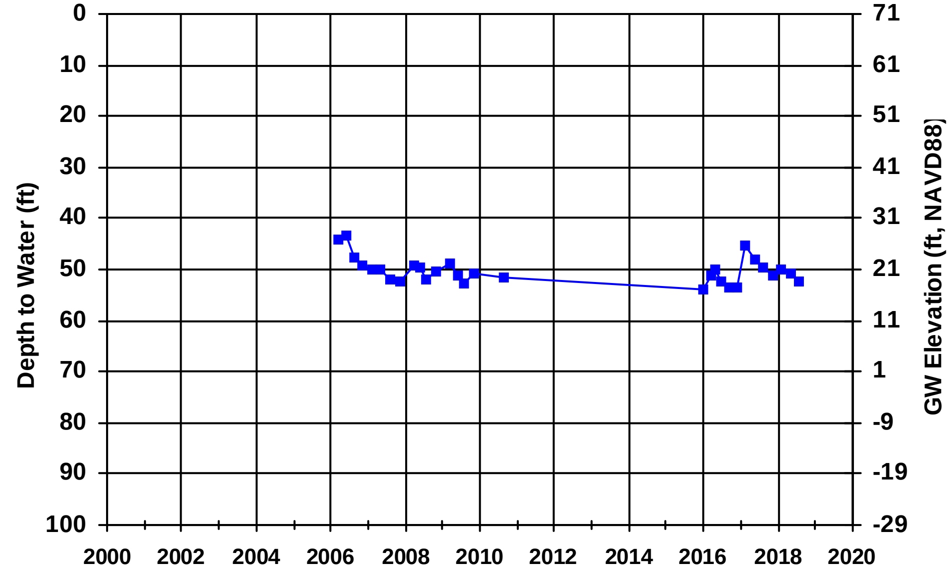



{R_WLhyd88}

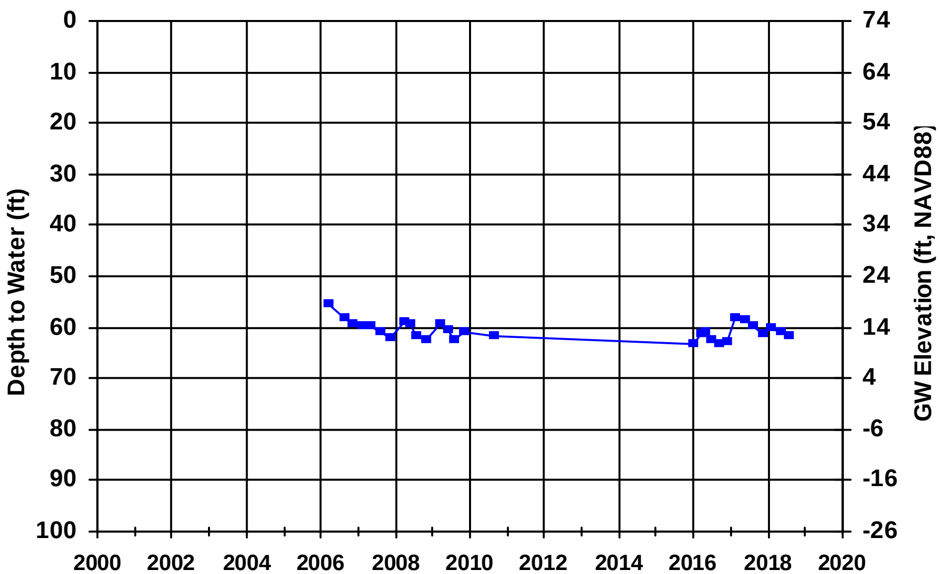
**WellID:** SL0601346154-94MW-7
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



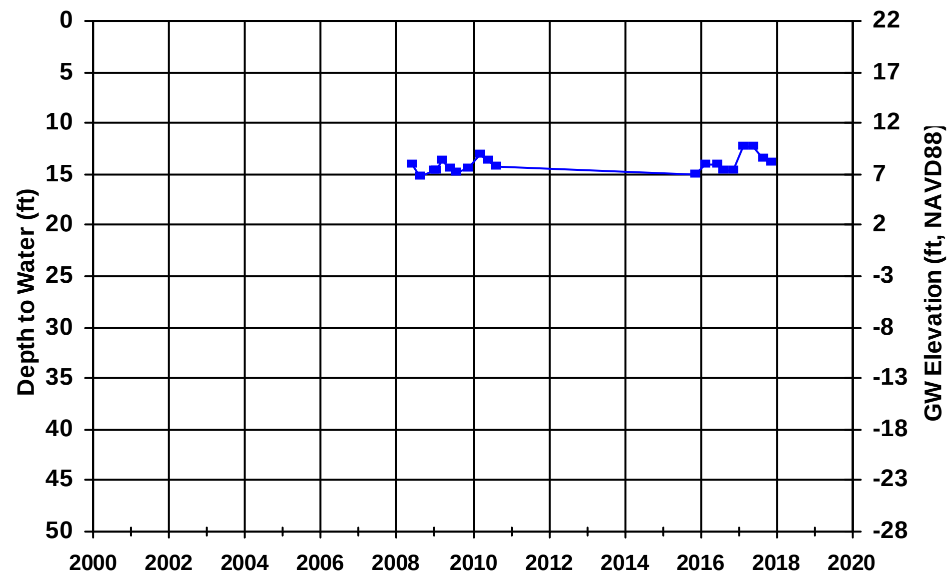

**WellID:** SL0601346154-94MW-8
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL0601346154-94MW-9
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

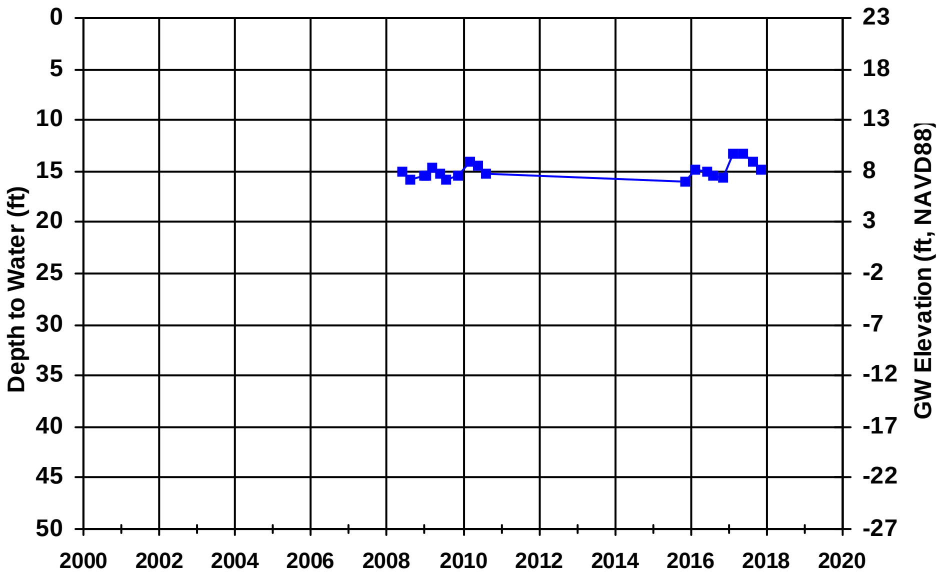



**WellID:** SL0601394831-MW-1
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

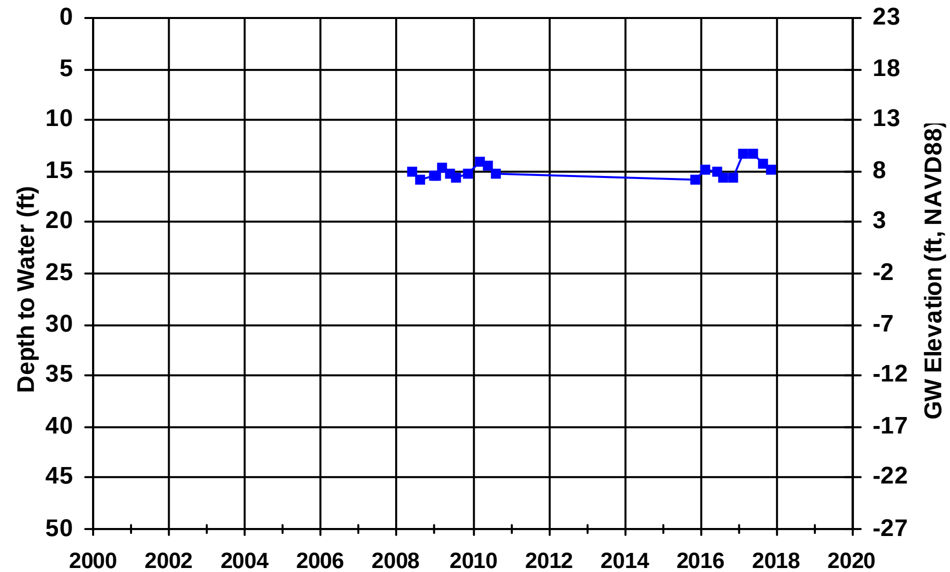



{R_WLhyd88}

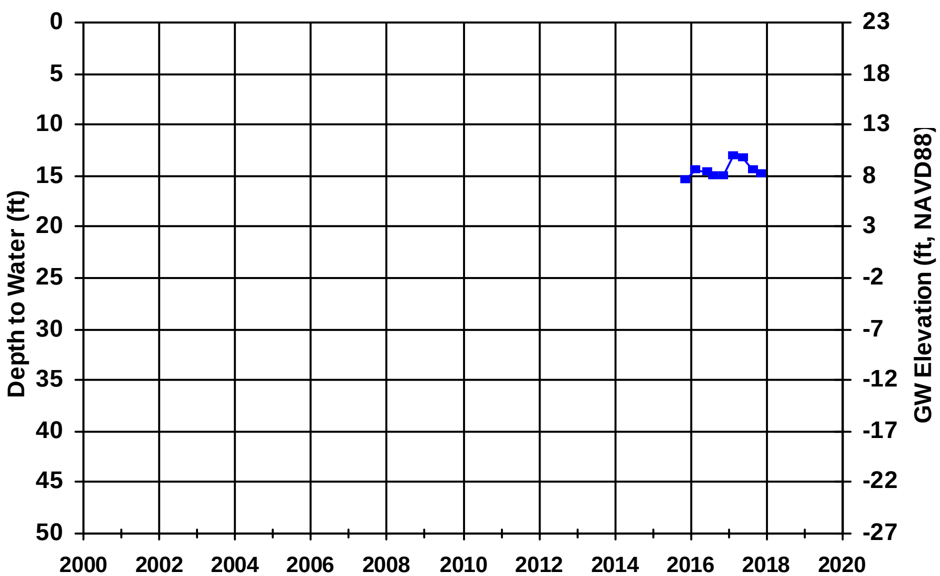
**WellID:** SL0601394831-MW-2
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



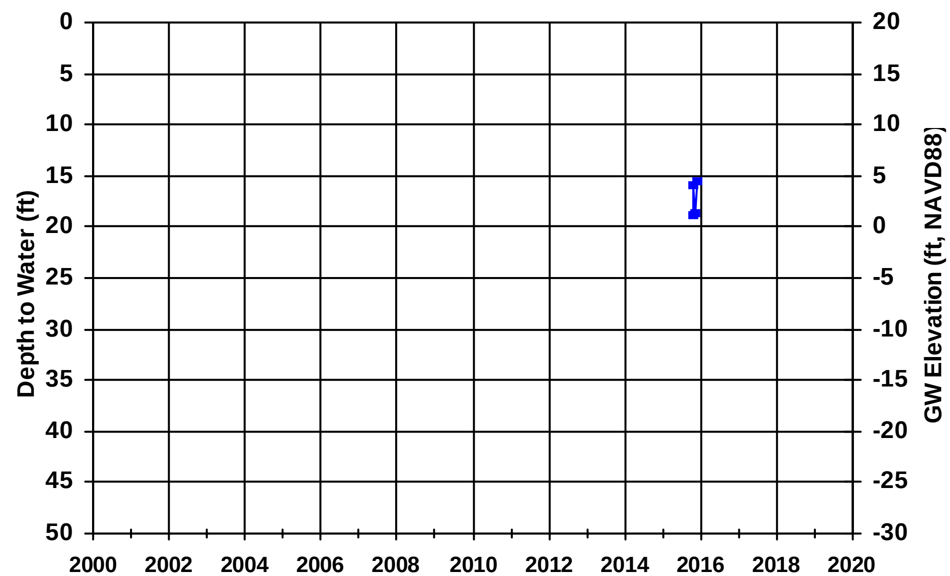

**WellID:** SL0601394831-MW-3
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** SL0601394831-MW-4
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

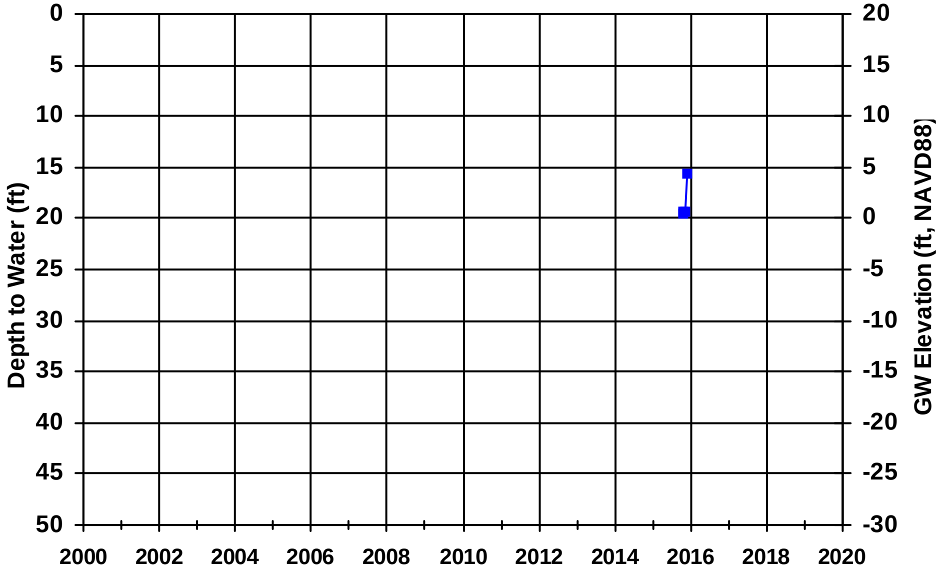



**WellID:** SL186102968-7EW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

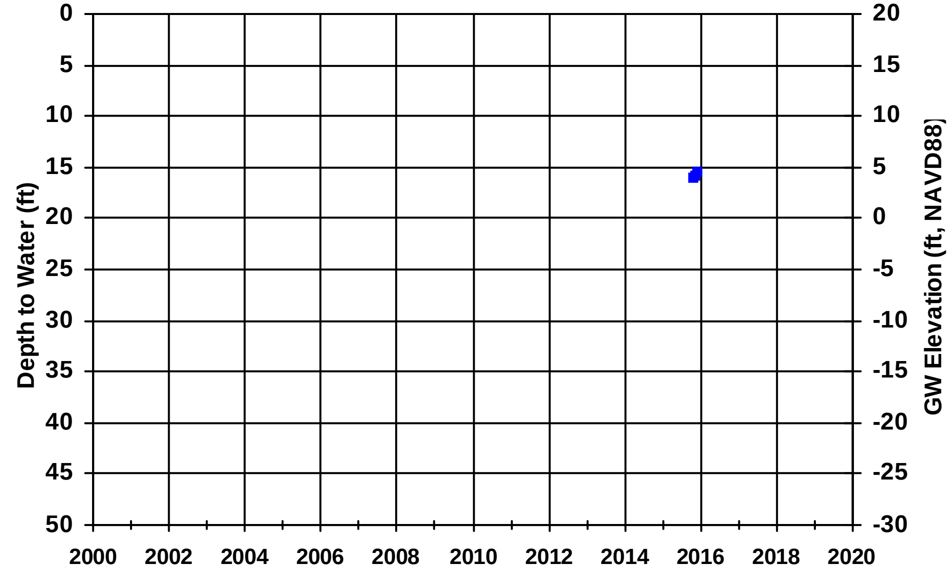



{R_WLhyd88}

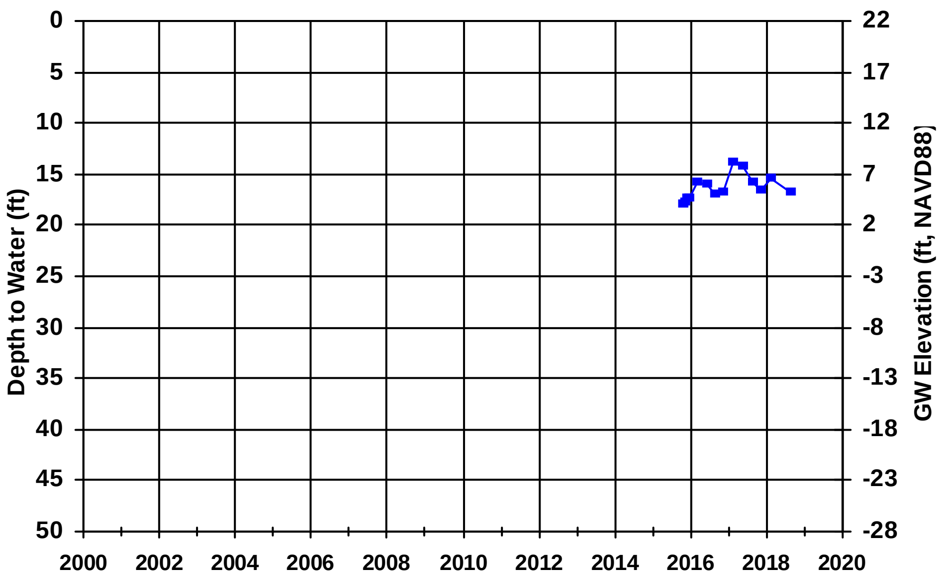
**WellID:** SL186102968-7EW-2
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



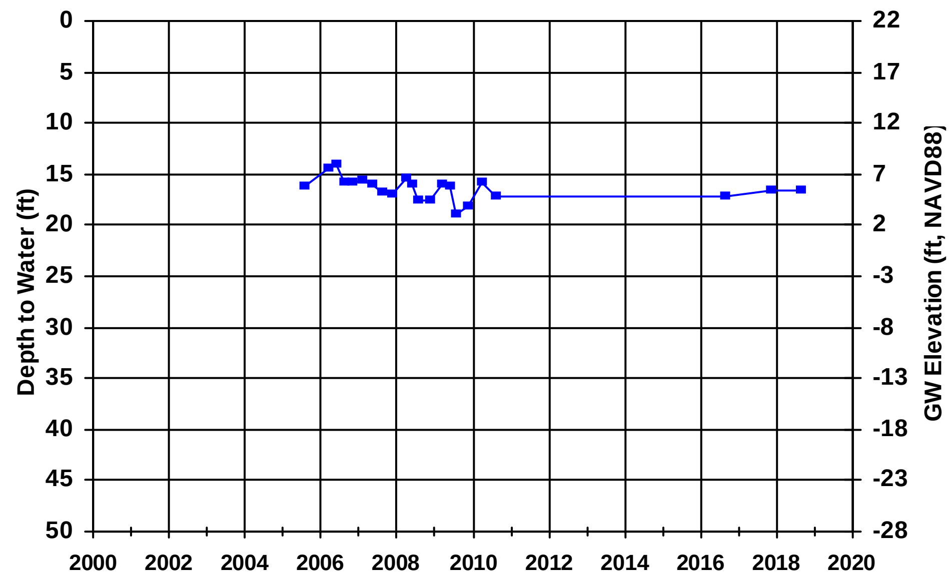

**WellID:** SL186102968-7EW-4
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** SL186102968-7EW-6
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

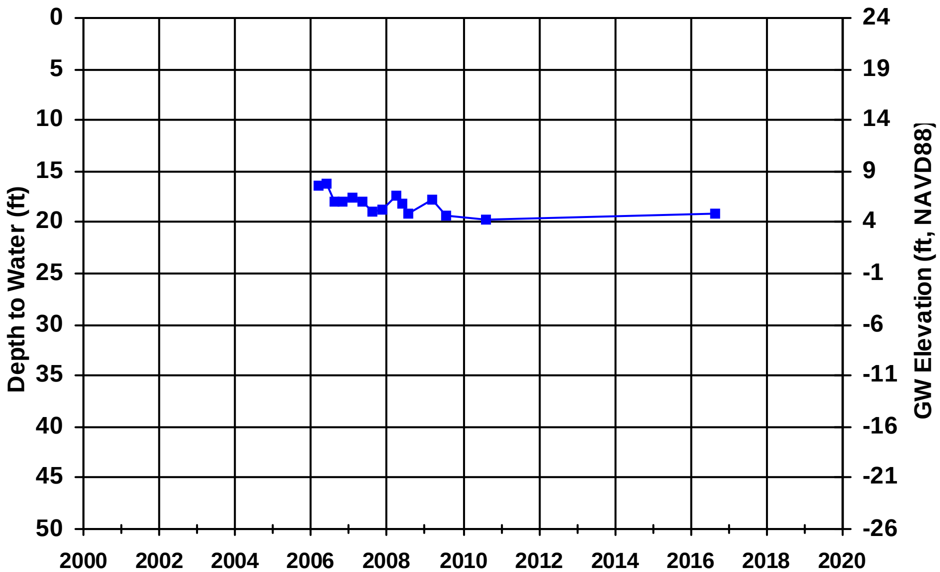



**WellID:** SL186102968-7MW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

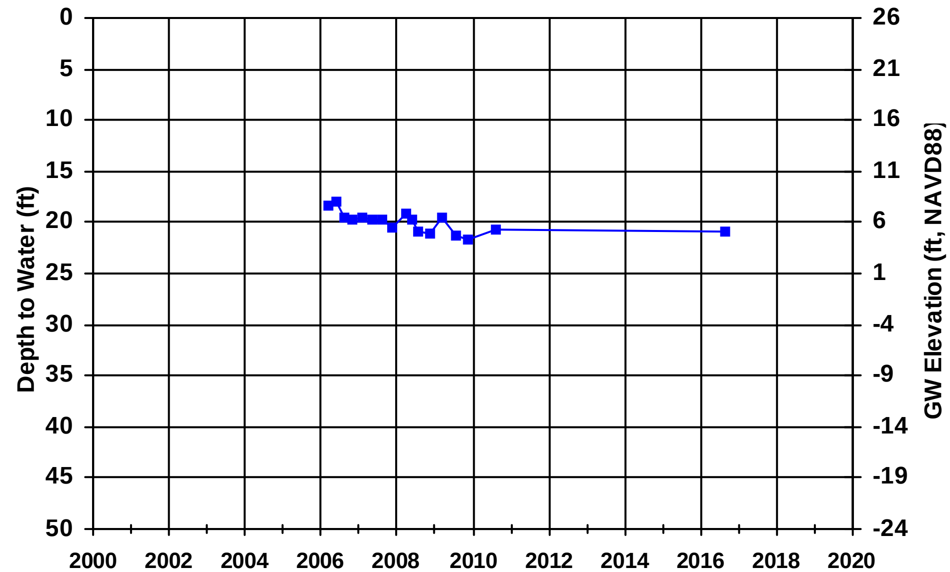



{R_WLhyd88}

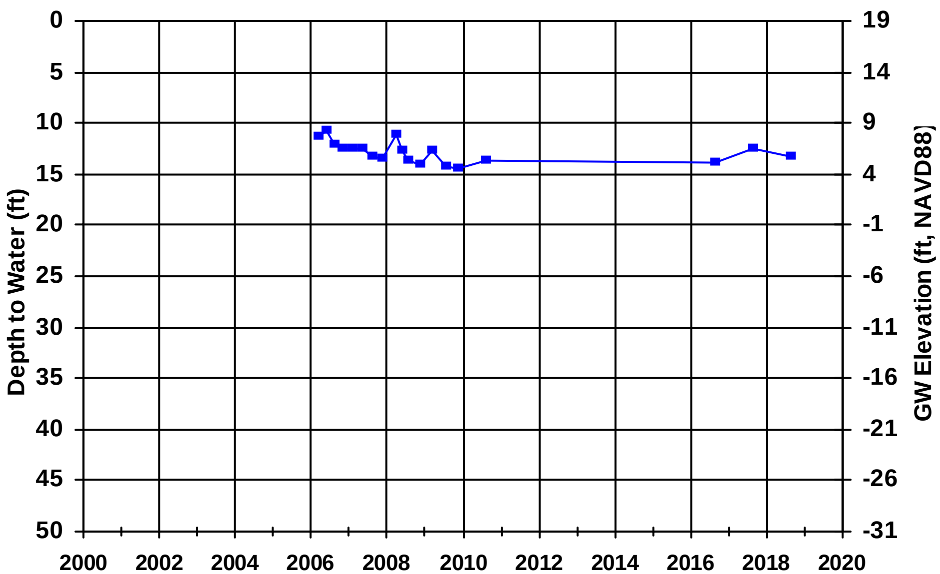
**WellID:** SL186102968-7MW-10
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



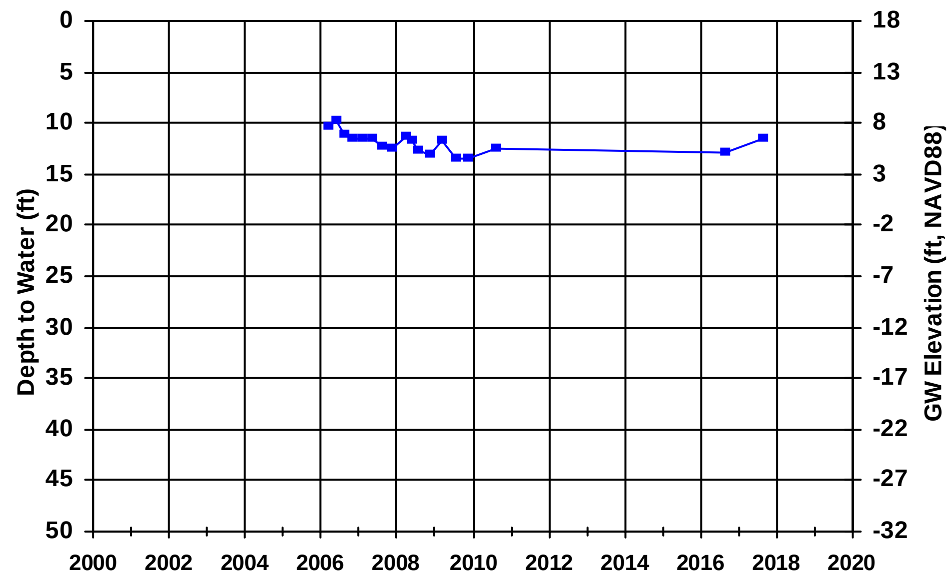

**WellID:** SL186102968-7MW-11
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** SL186102968-7MW-12
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

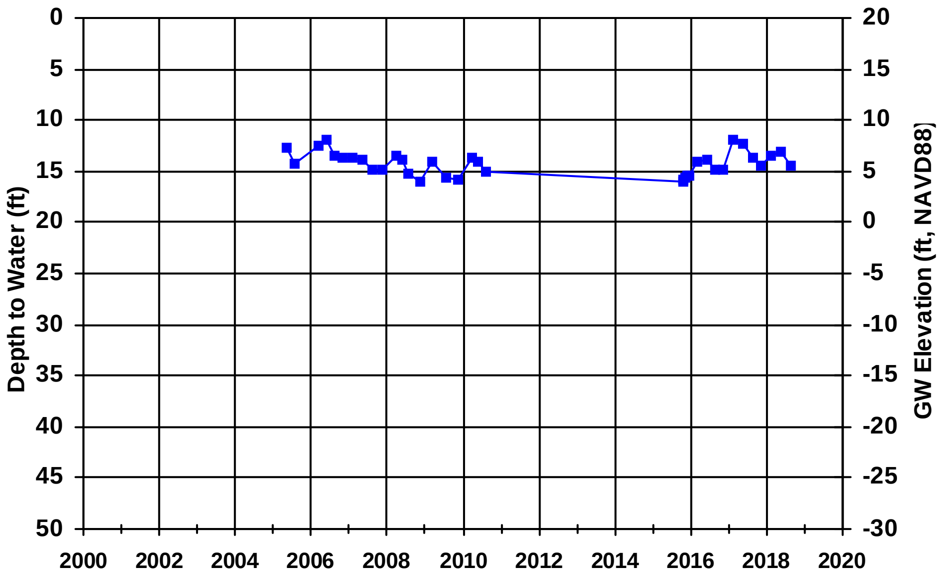



**WellID:** SL186102968-7MW-13
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

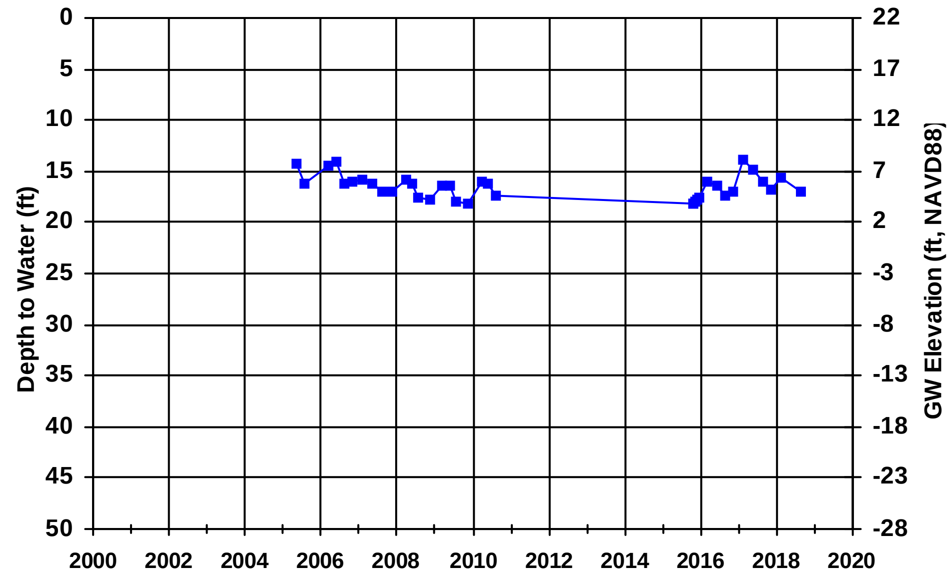



{R_WLhyd88}

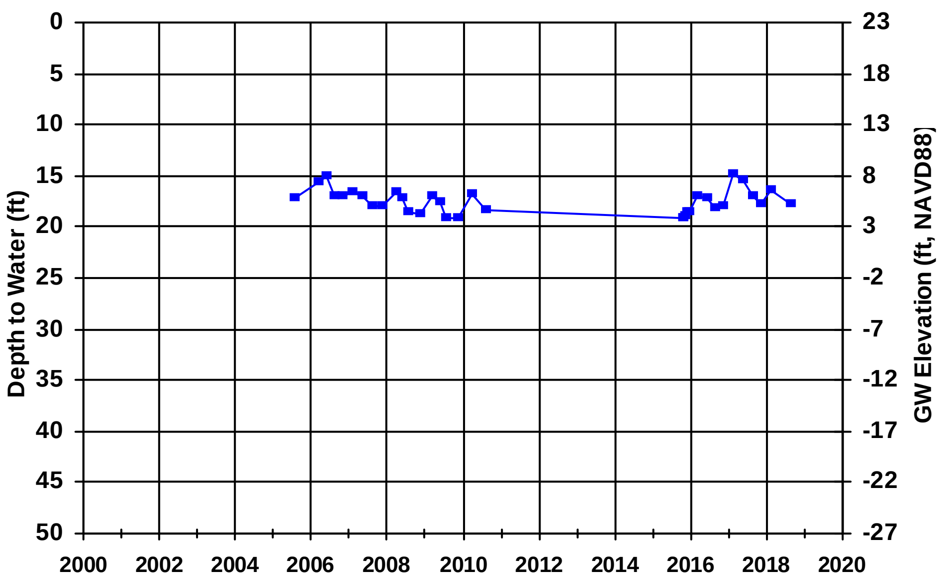
WellID: SL186102968-7MW-14
Zone: Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



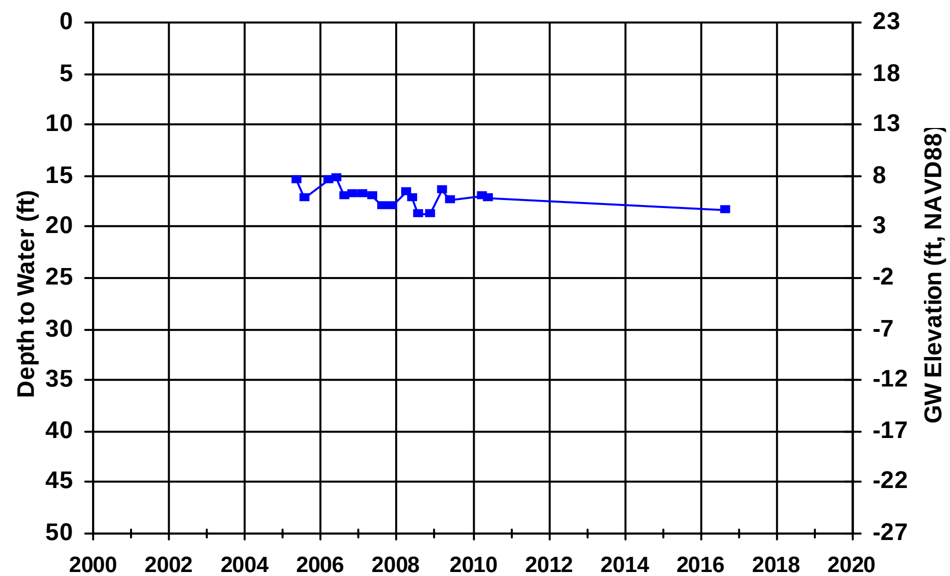

WellID: SL186102968-7MW-2
Zone: Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




WellID: SL186102968-7MW-3
Zone: Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

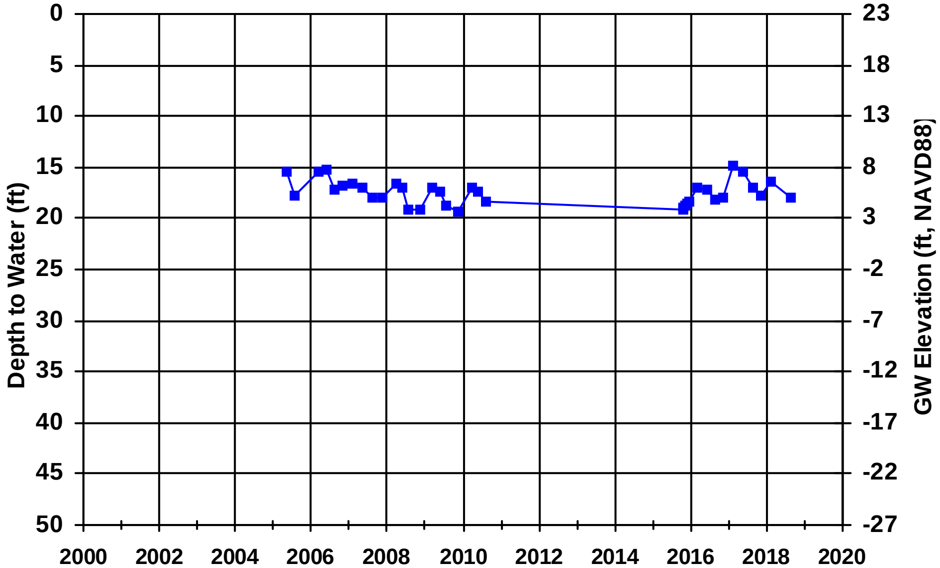



WellID: SL186102968-7MW-4
Zone: Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

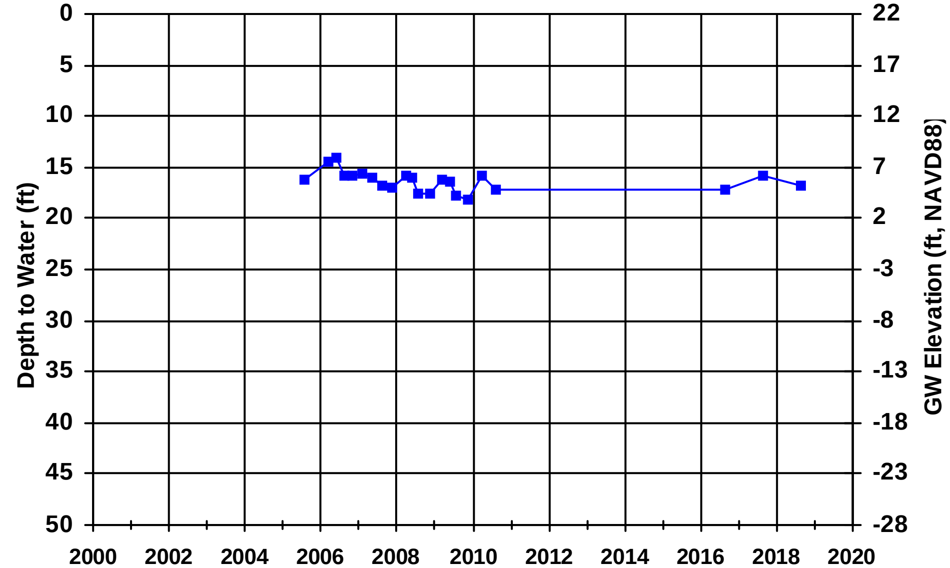



{R_WLhyd88}

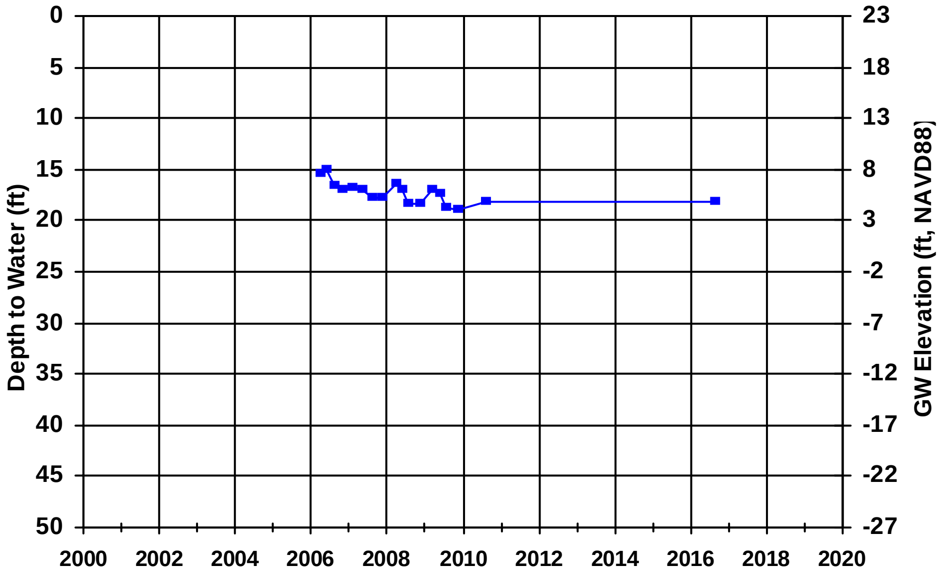
**WellID:** SL186102968-7MW-5
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



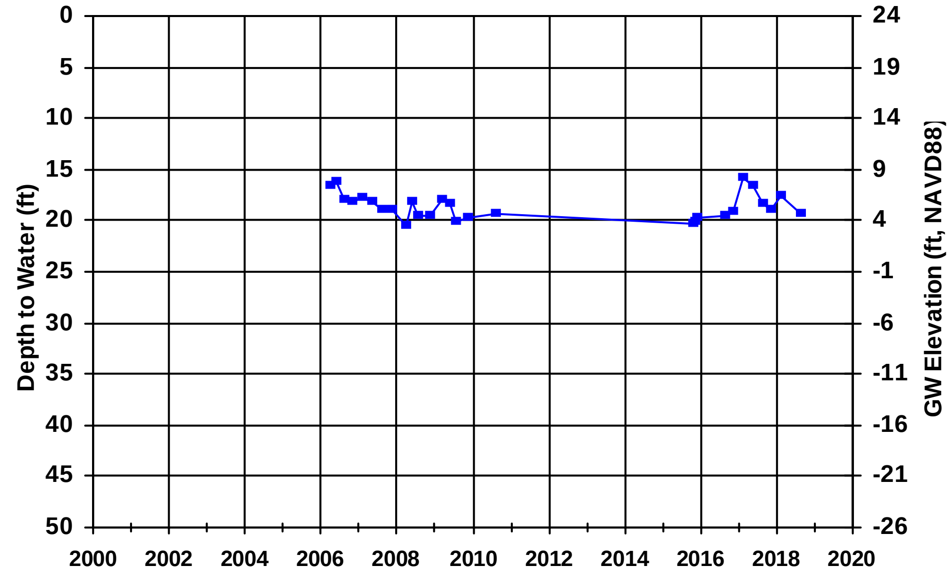

**WellID:** SL186102968-7MW-6
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** SL186102968-7MW-7
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

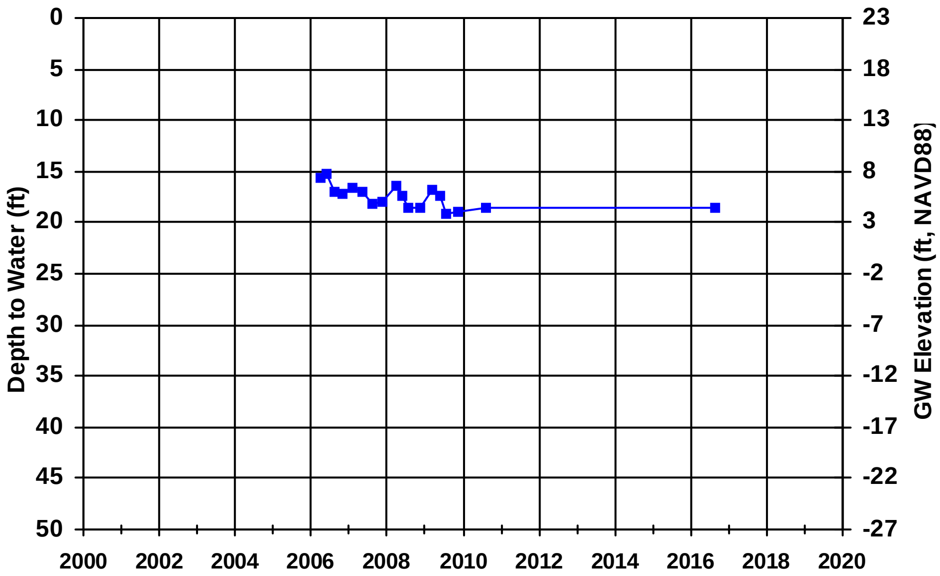



**WellID:** SL186102968-7MW-8
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

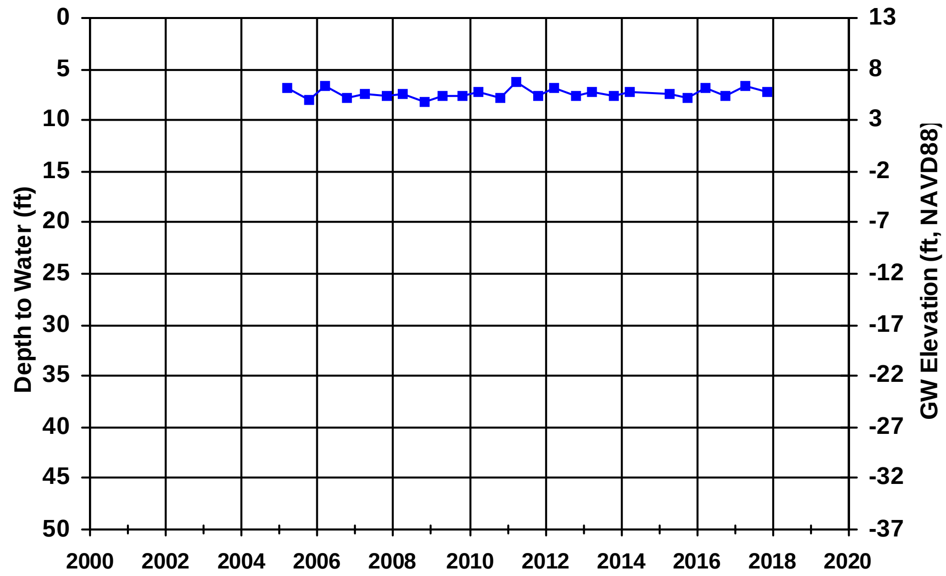



{R_WLhyd88}

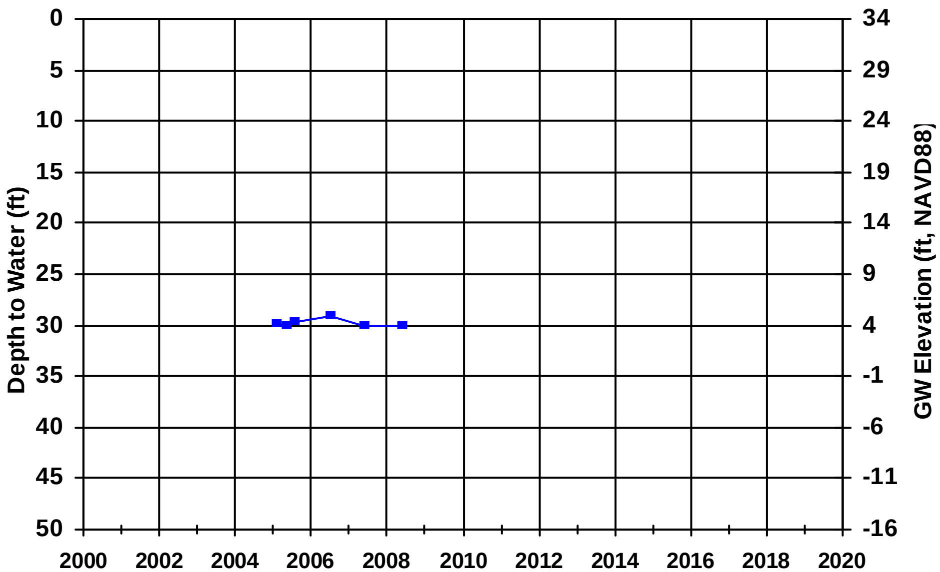
**WellID:** **SL186102968-7MW-9**
**Zone:** **Shallow**
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A



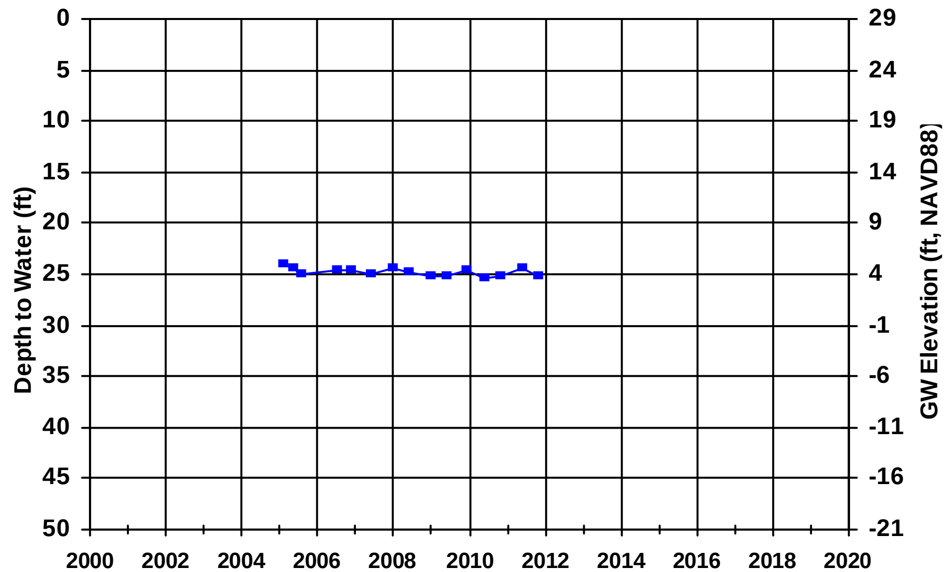

**WellID:** **SL20210828-903B1**
**Zone:** **Shallow**
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A




**WellID:** **SL205032990-W-01**
**Zone:** **Shallow**
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A

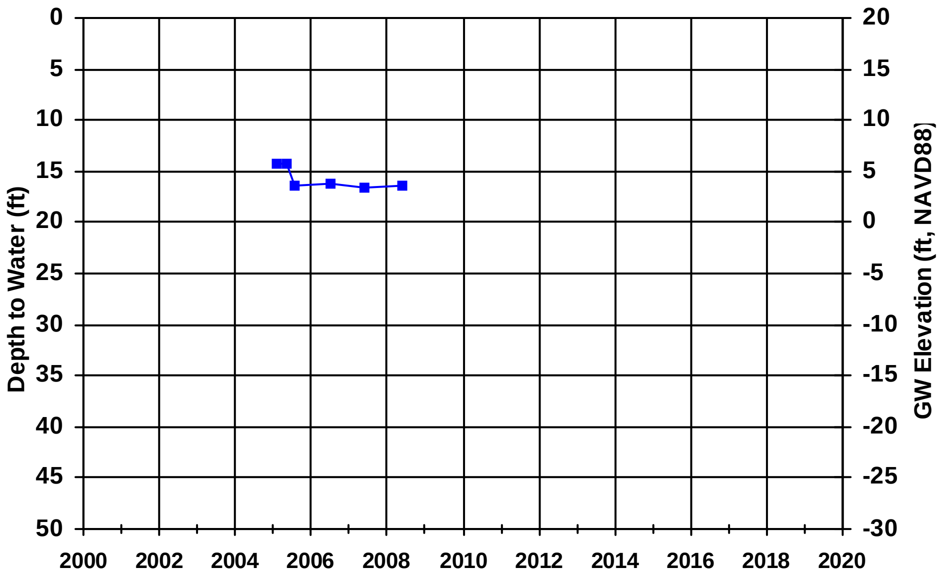



**WellID:** **SL205032990-W-02**
**Zone:** **Shallow**
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A

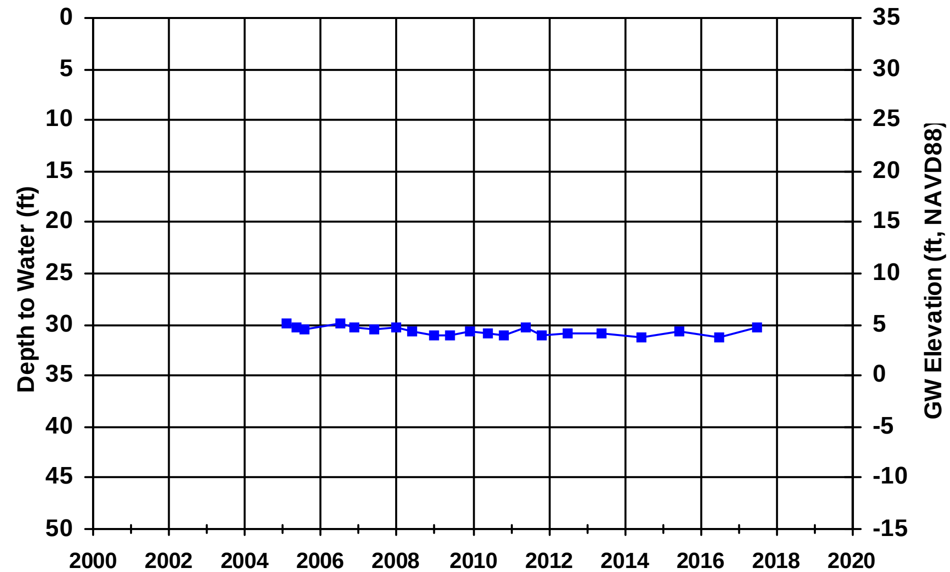



{R_WLhyd88}

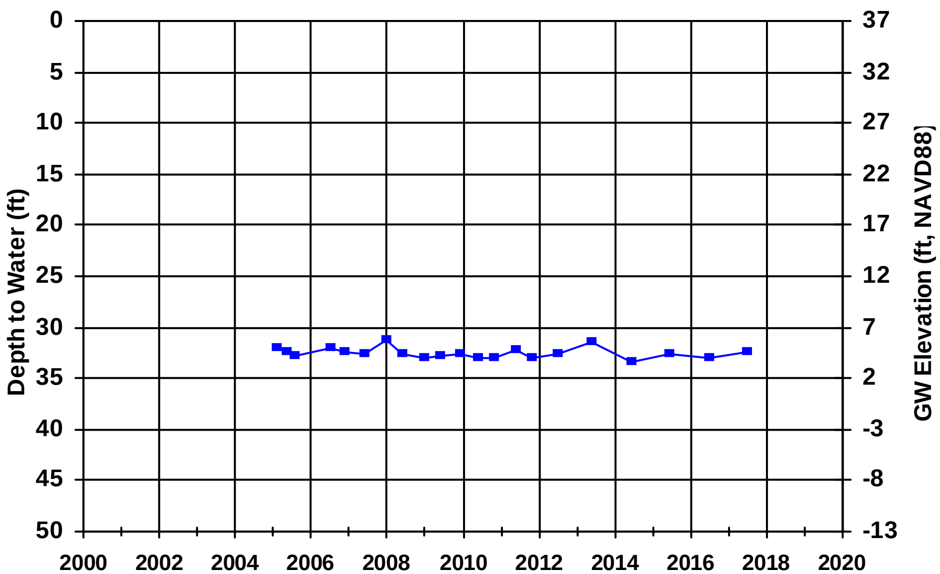
**WellID:** SL205032990-W-03
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



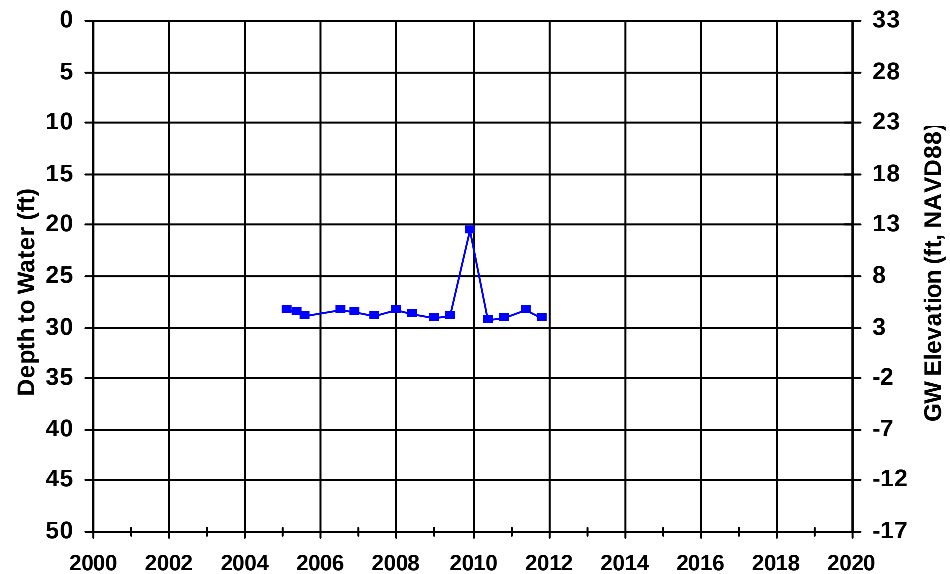

**WellID:** SL205032990-W-04
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL205032990-W-05
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

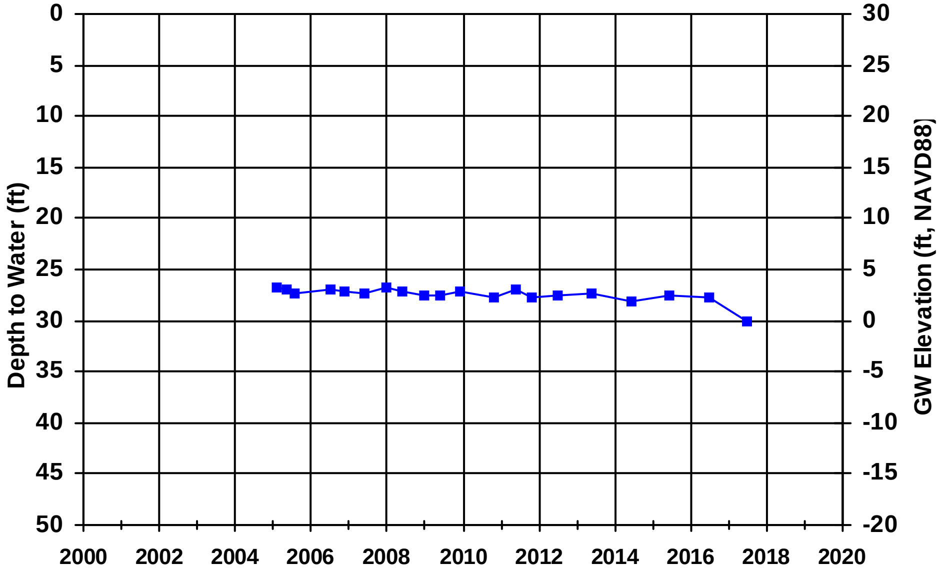



**WellID:** SL205032990-W-06
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

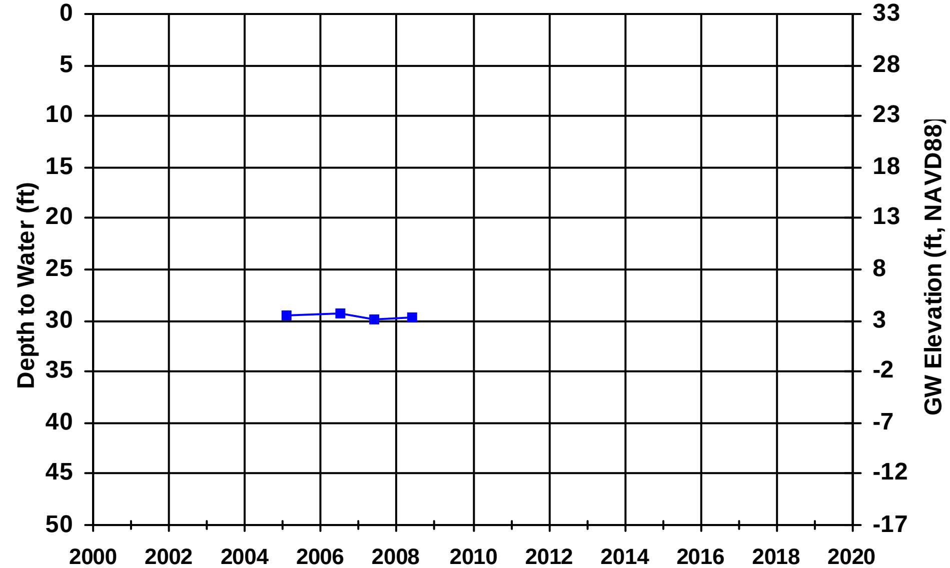



{R_WLhyd88}

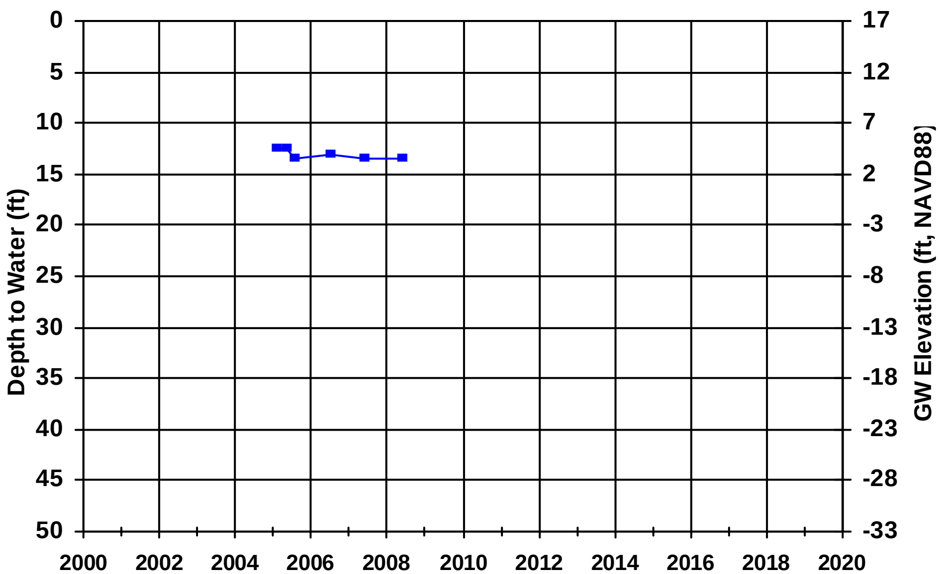
**WellID:** SL205032990-W-07
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



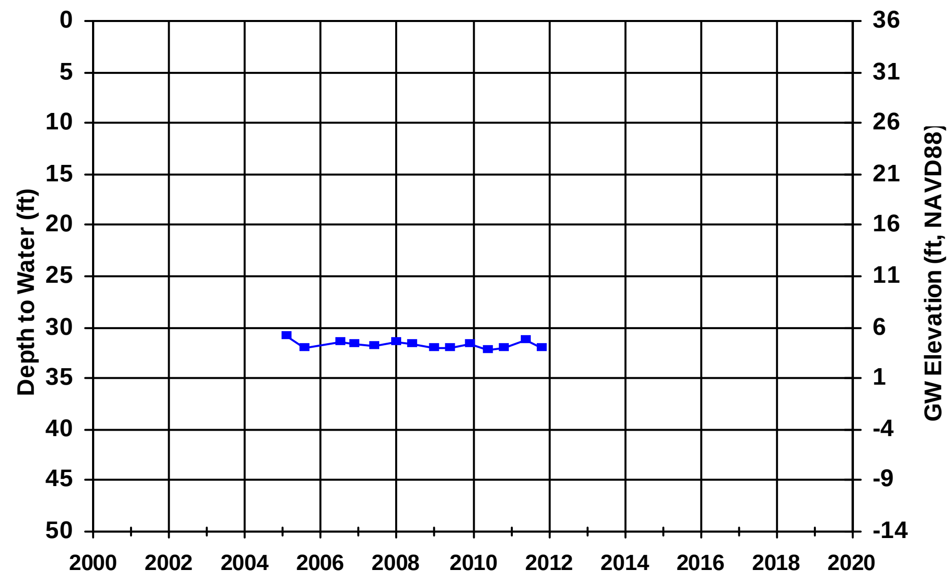

**WellID:** SL205032990-W-08
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL205032990-W-09
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

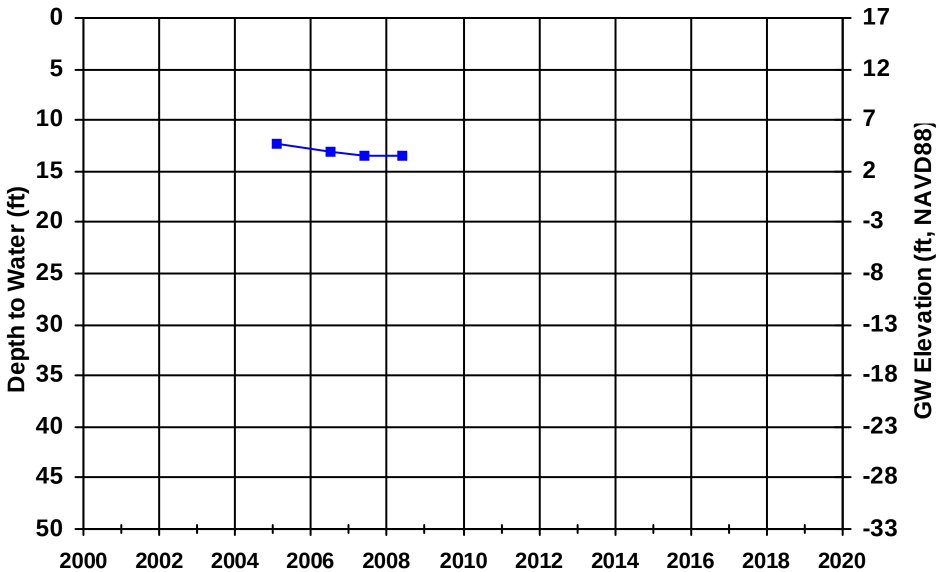



**WellID:** SL205032990-W-10
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

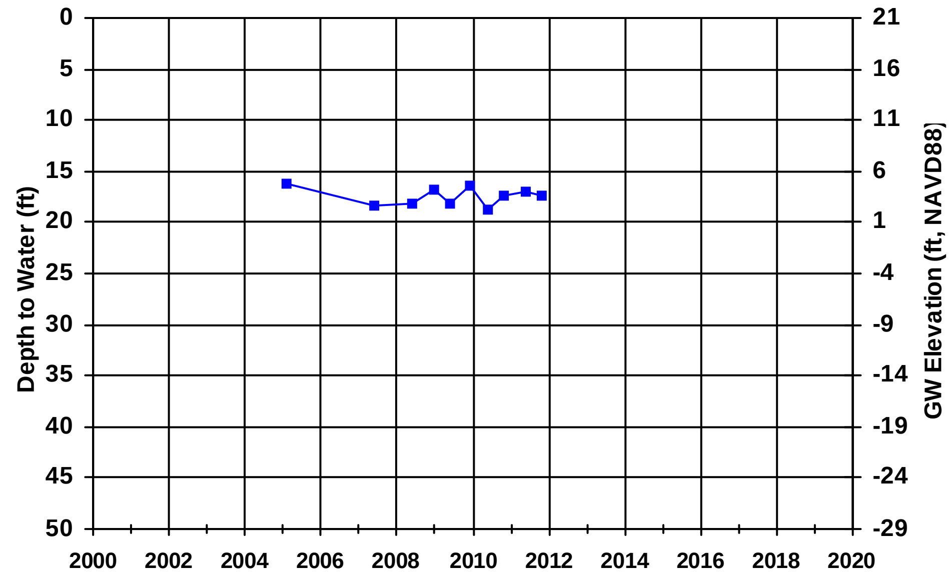



{R_WLhyd88}

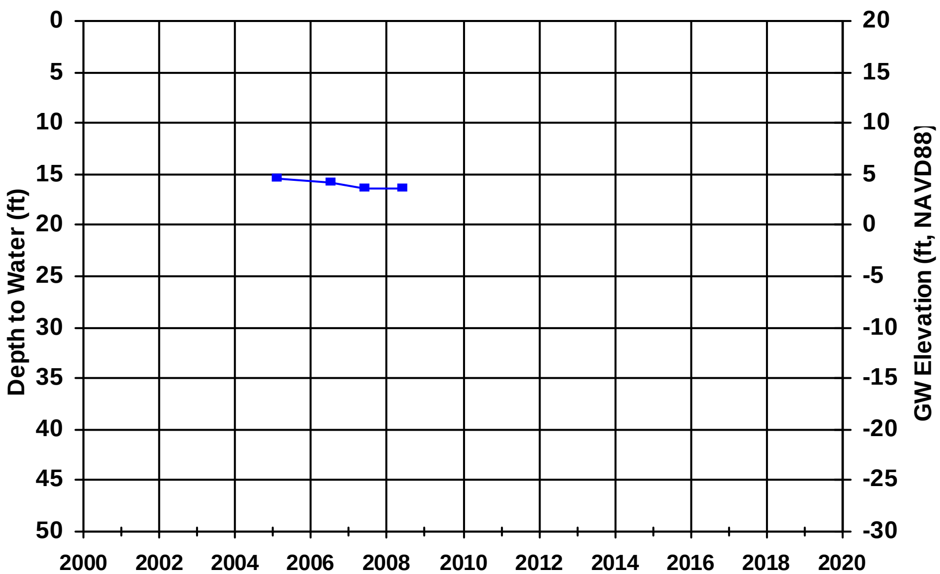
**WellID: SL205032990-W-11**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



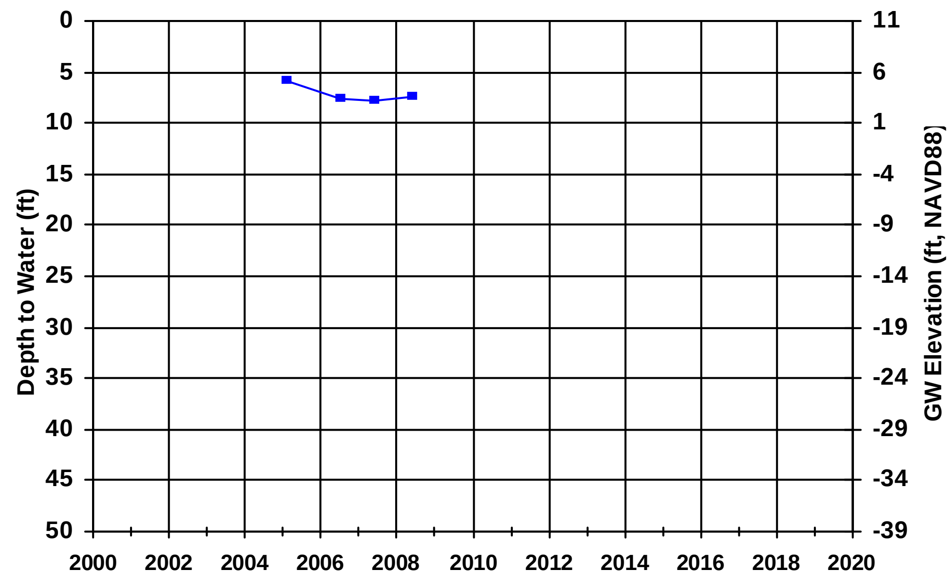

**WellID: SL205032990-W-12**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: SL205032990-W-13**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

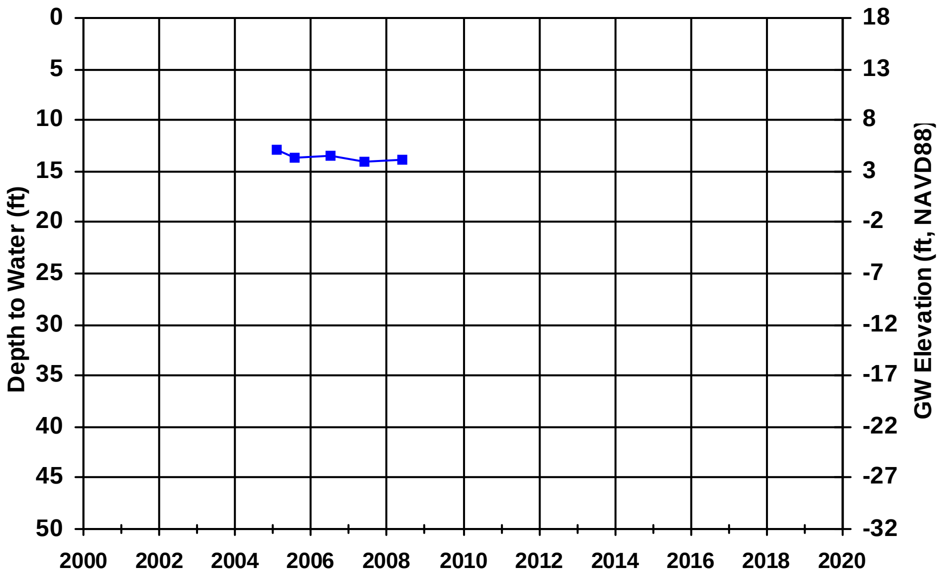



**WellID: SL205032990-W-14**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

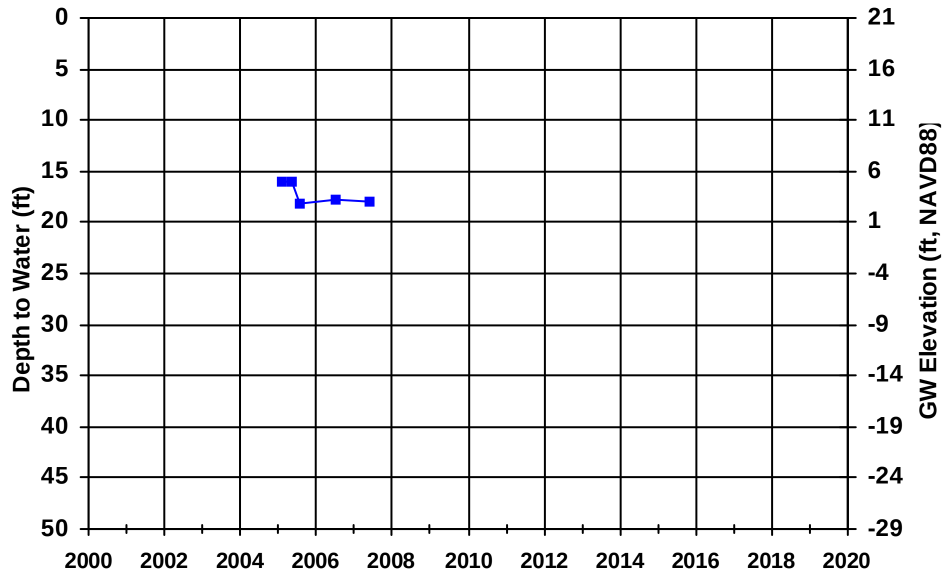



{R_WLhyd88}

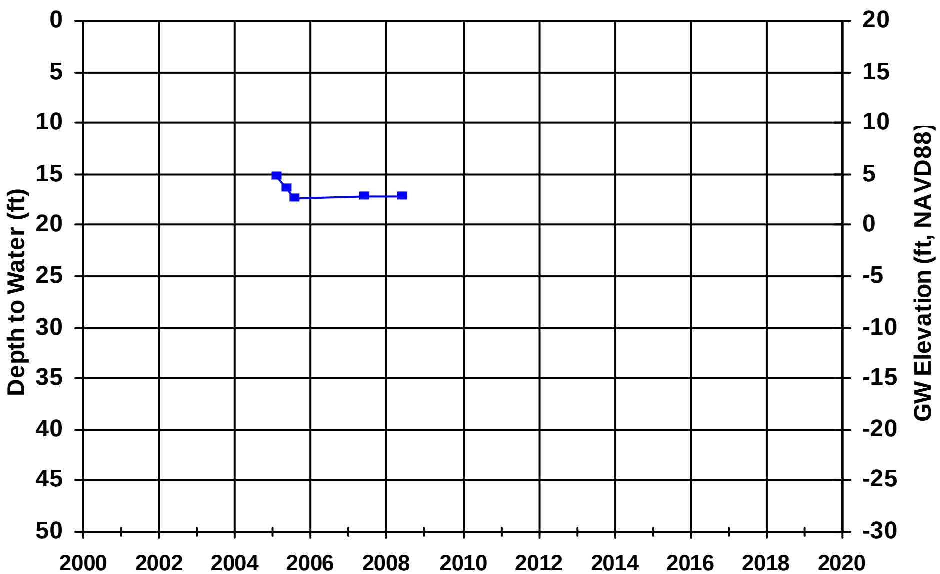
**WellID: SL205032990-W-15**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



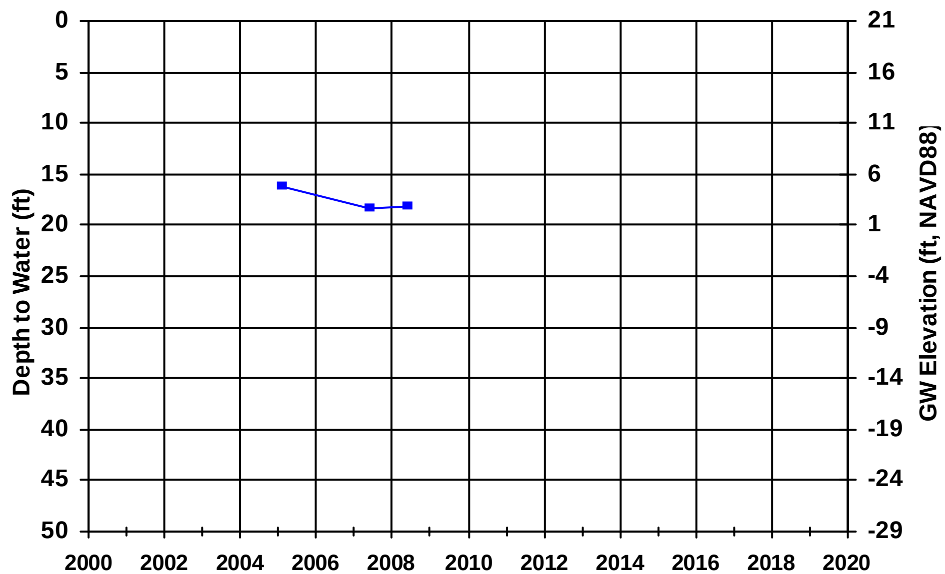

**WellID: SL205032990-W-16**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: SL205032990-W-17**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

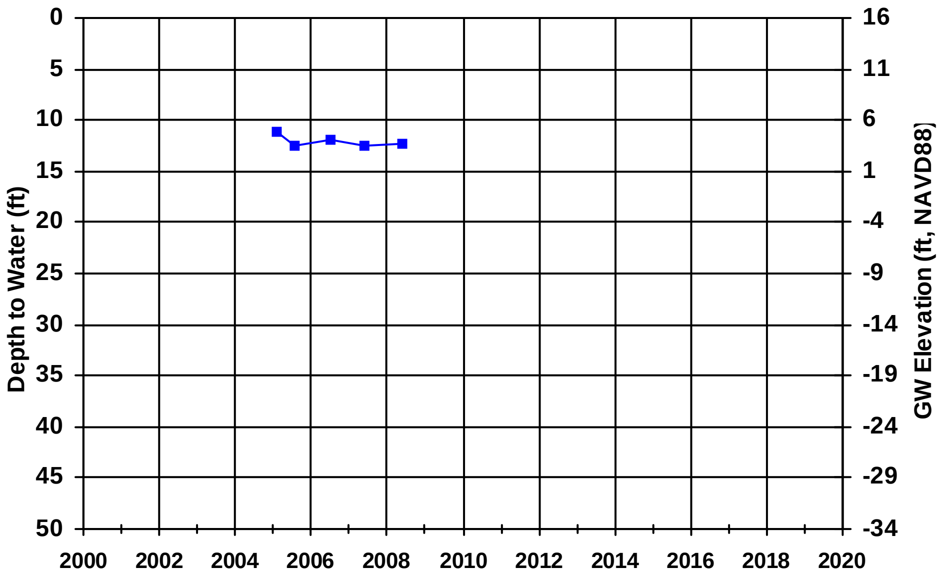



**WellID: SL205032990-W-18**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

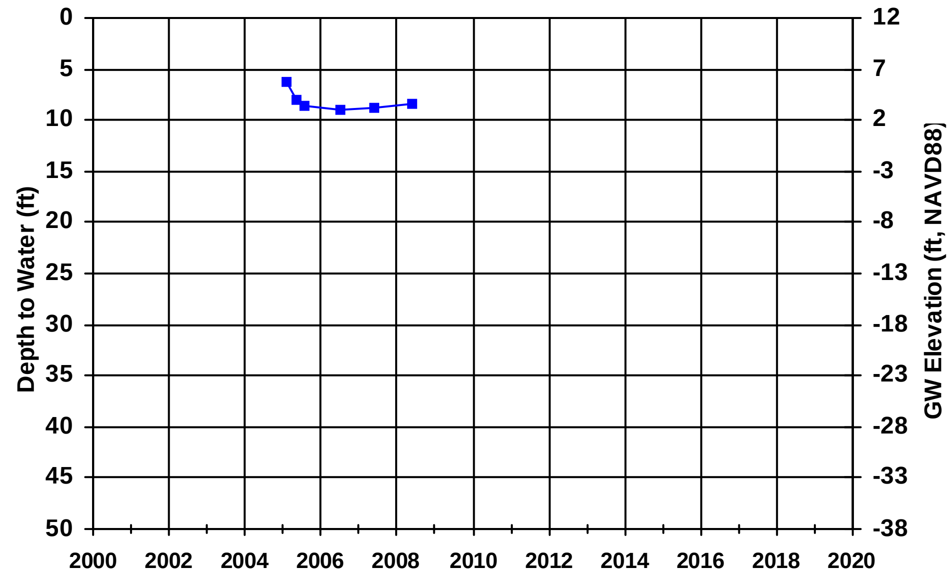



{R_WLhyd88}

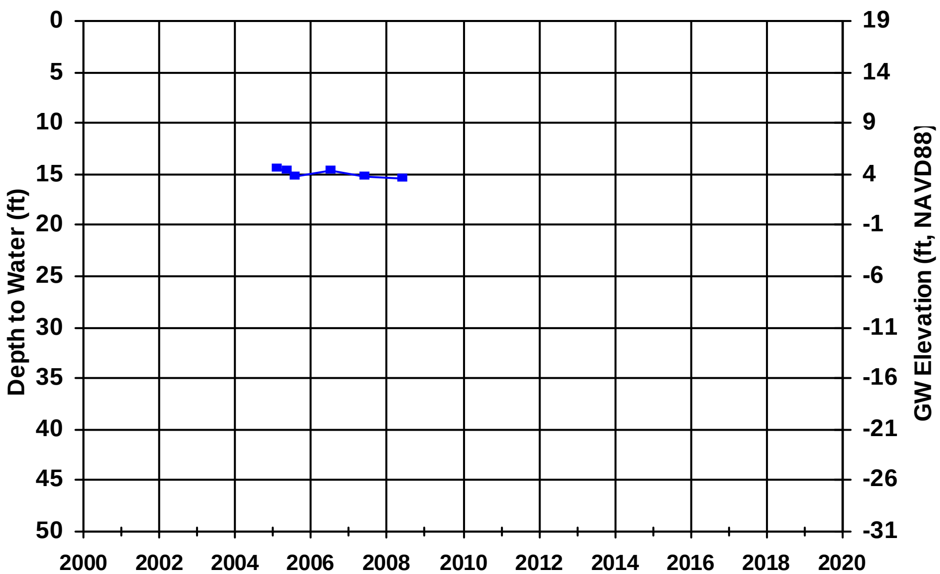
WellID: SL205032990-W-19
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



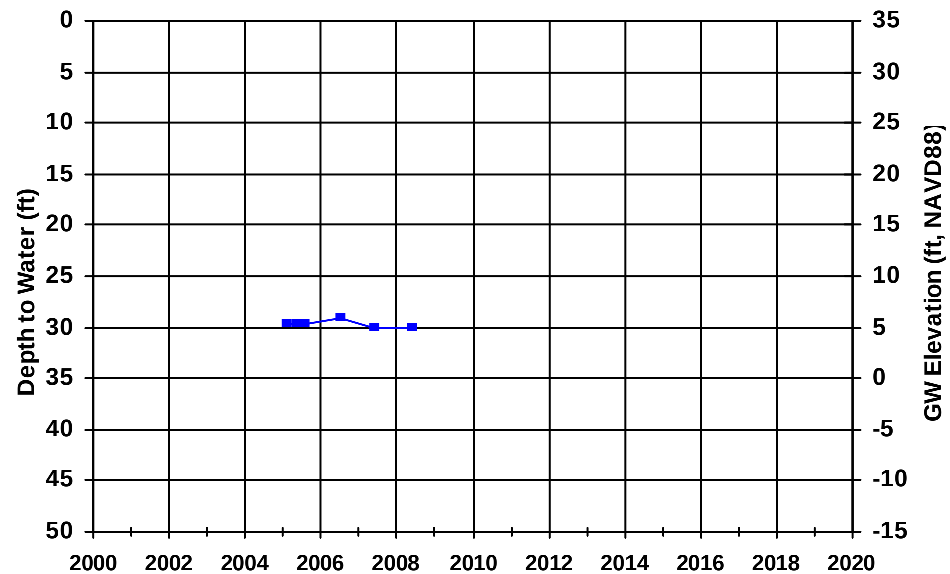

WellID: SL205032990-W-20
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: SL205032990-W-21
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

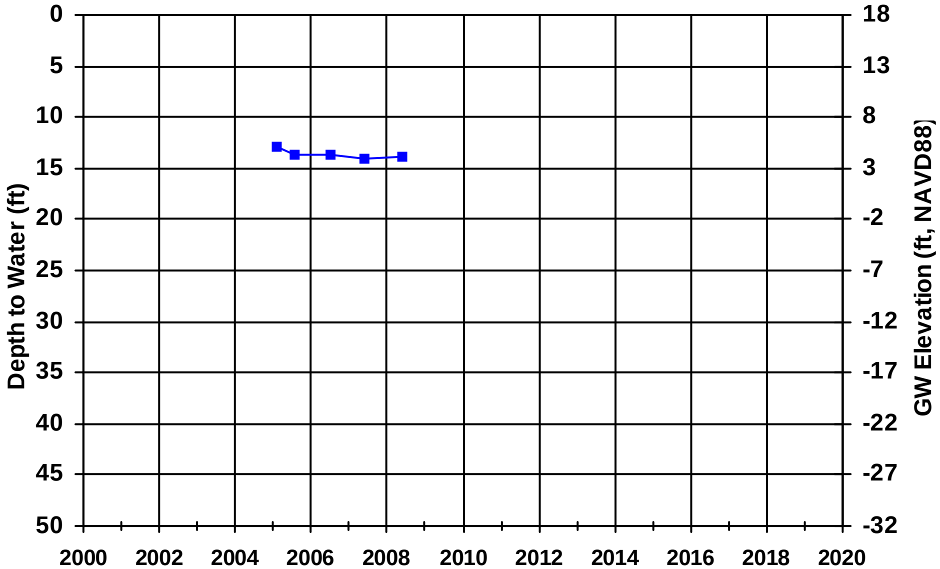



WellID: SL205032990-W-22
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

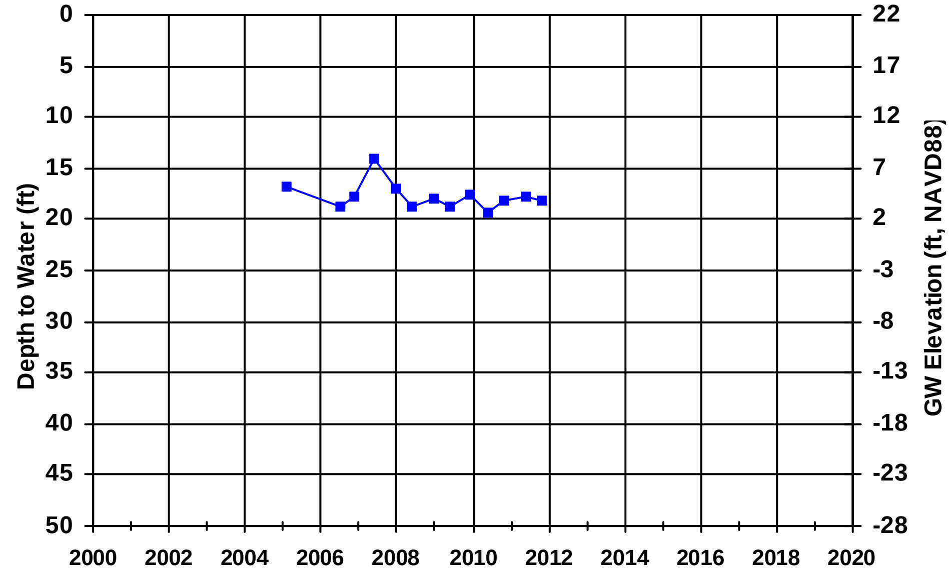



{R_WLhyd88}

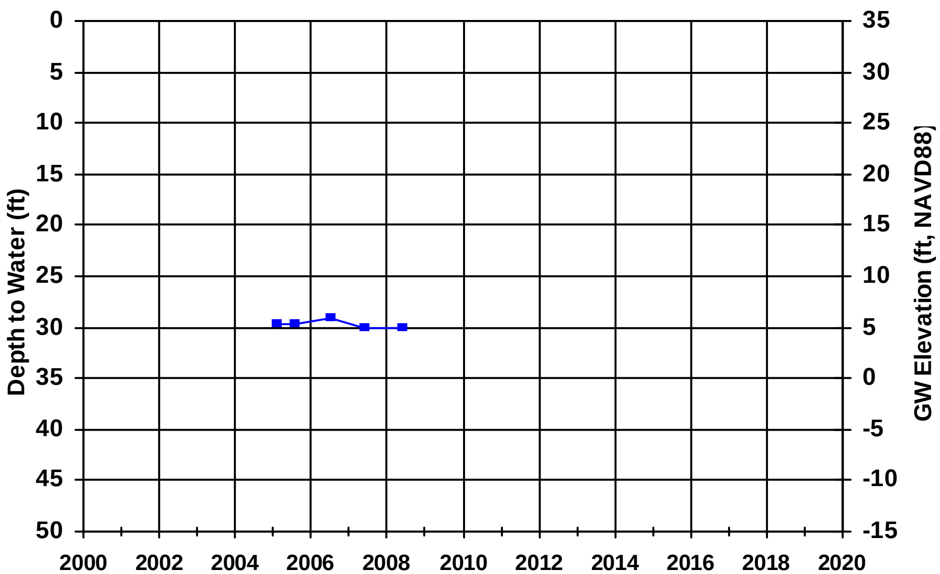
WellID: SL205032990-W-23
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



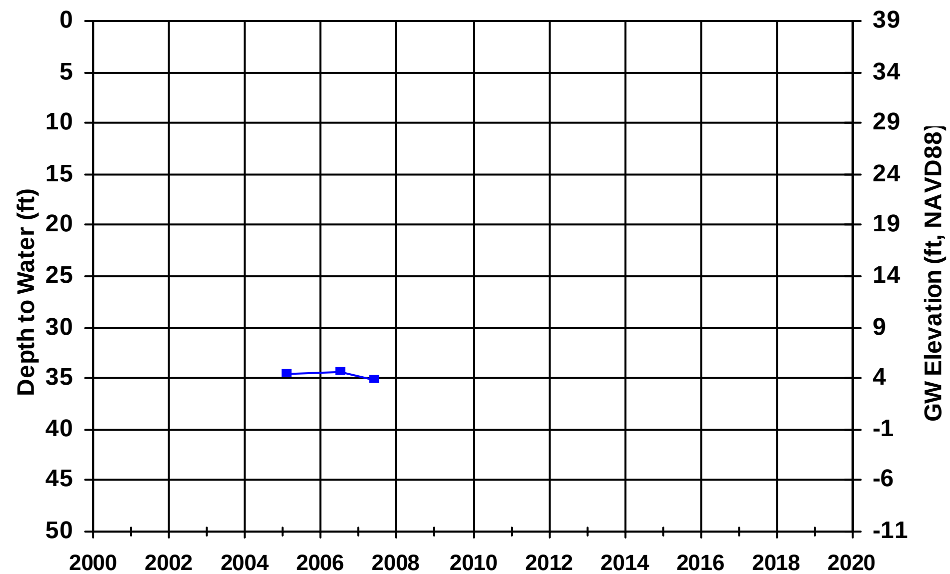

WellID: SL205032990-W-24
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: SL205032990-W-25
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

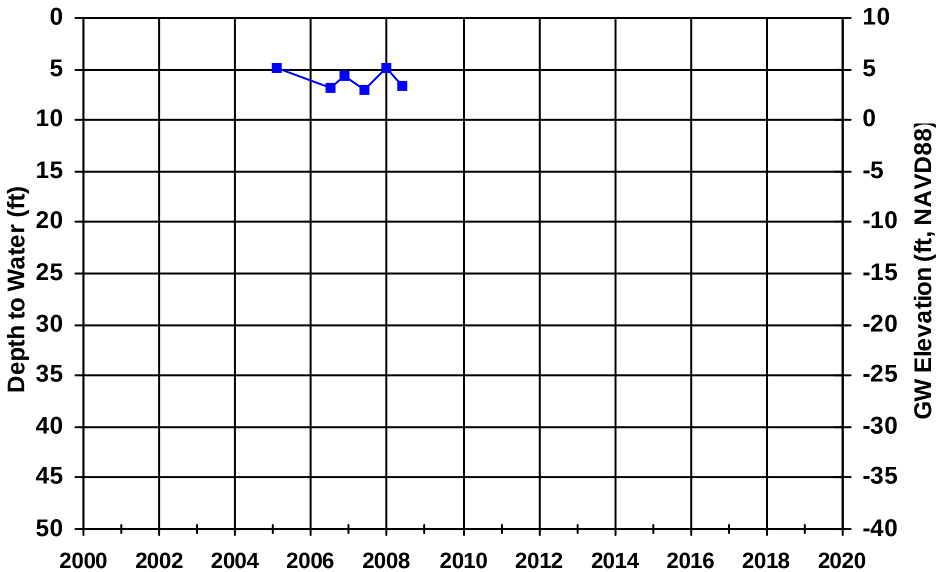



WellID: SL205032990-W-26
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

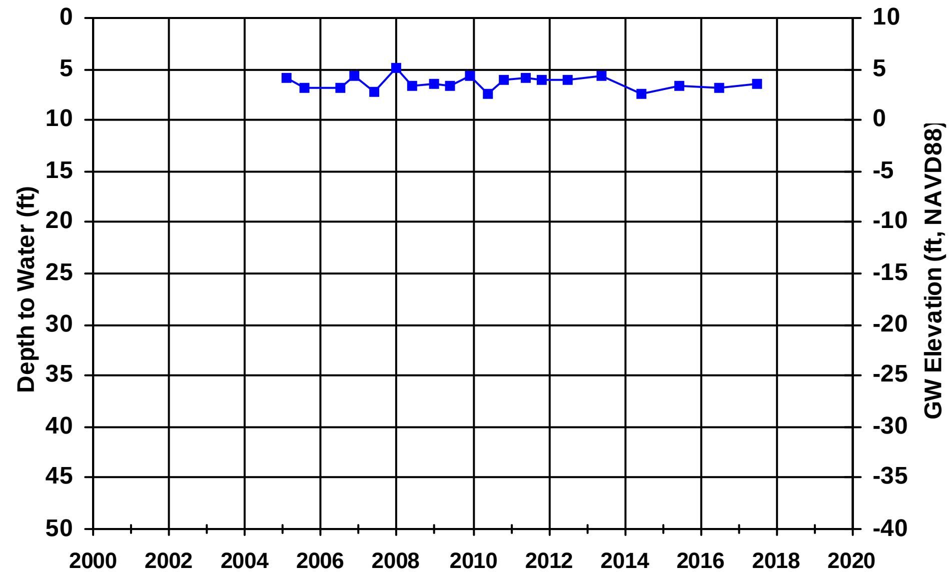



{R_WLhyd88}

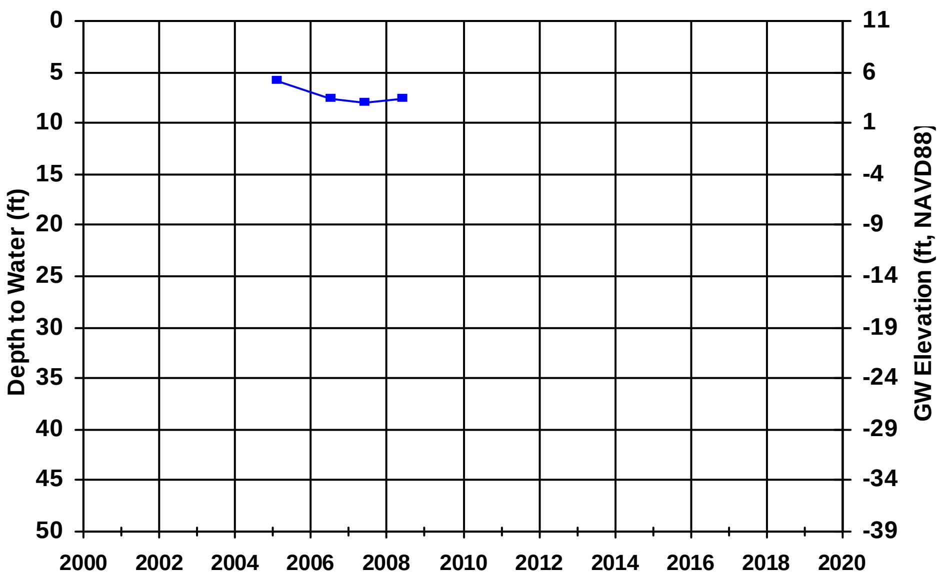
WellID: SL205032990-W-27
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



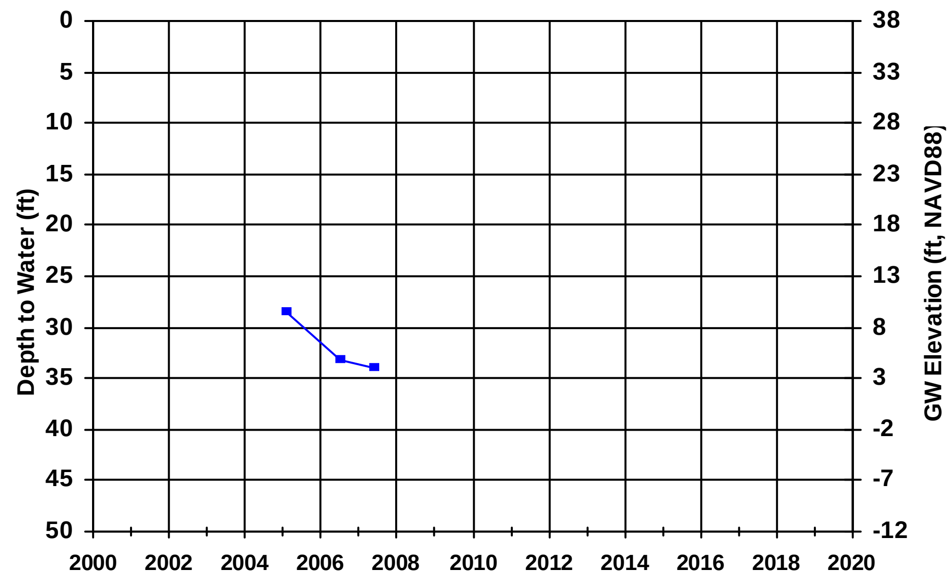

WellID: SL205032990-W-28
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: SL205032990-W-29
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

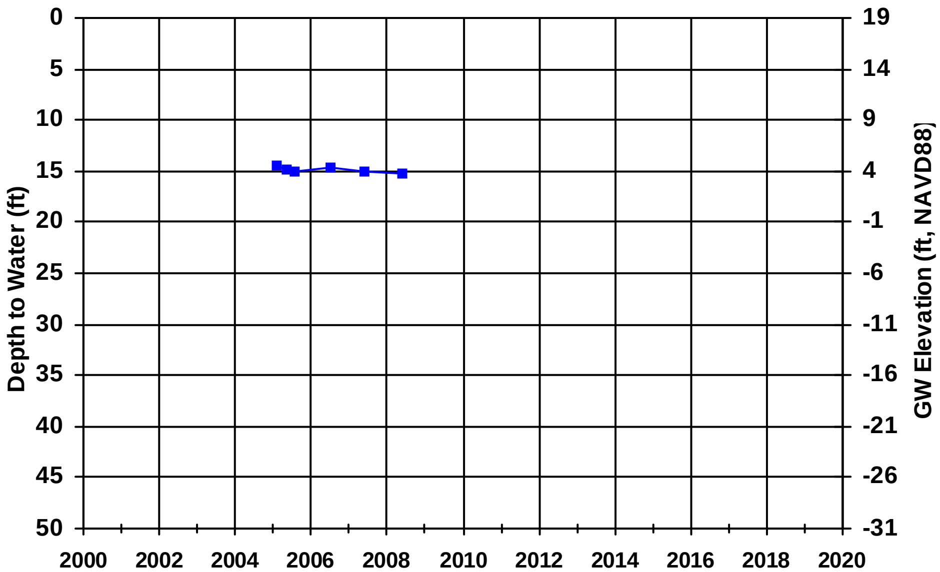



WellID: SL205032990-W-30
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

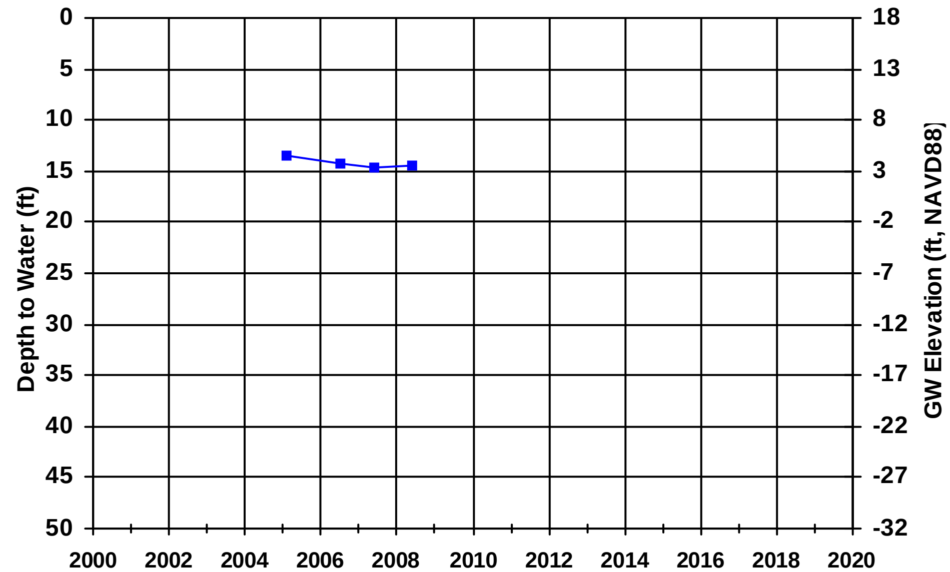



{R_WLhyd88}

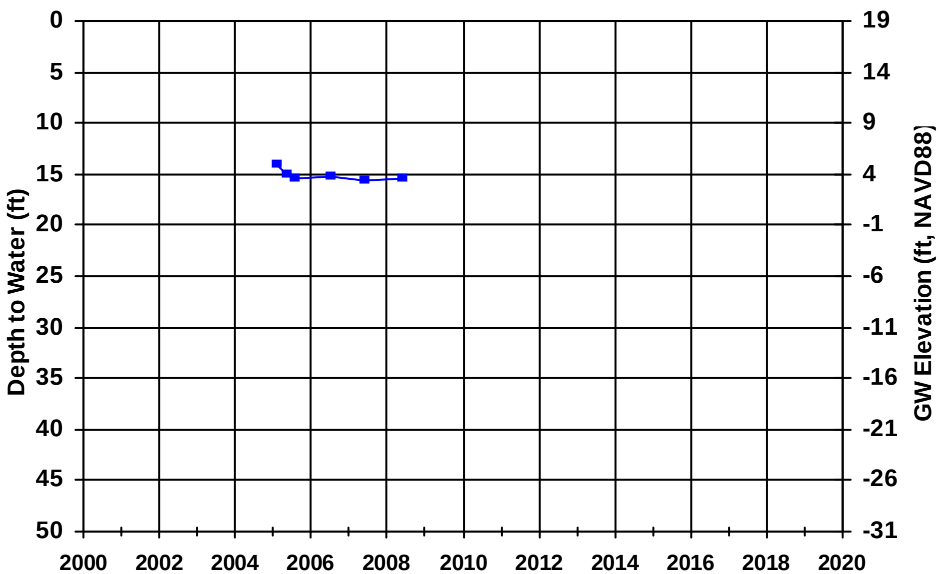
**WellID:** SL205032990-W-31
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



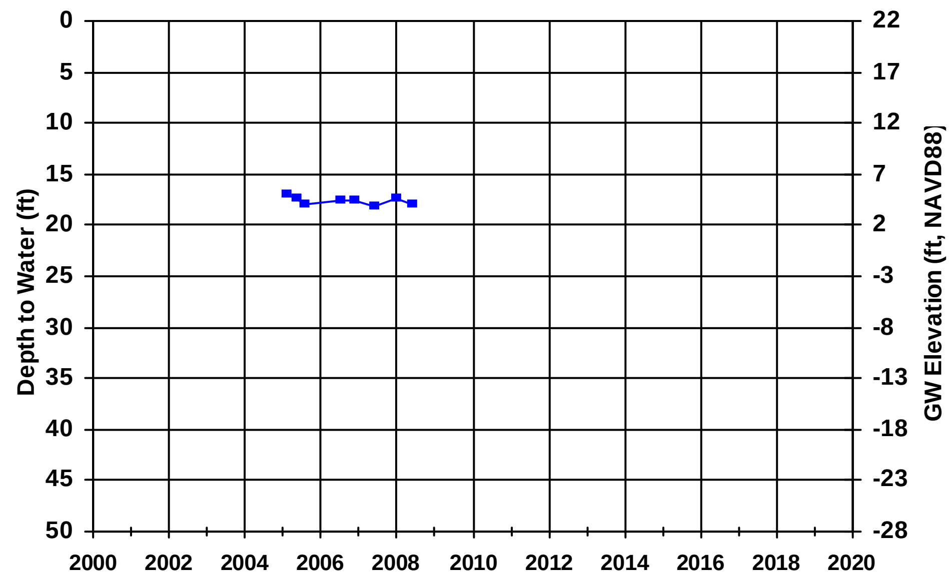

**WellID:** SL205032990-W-32
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** SL205032990-W-33
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

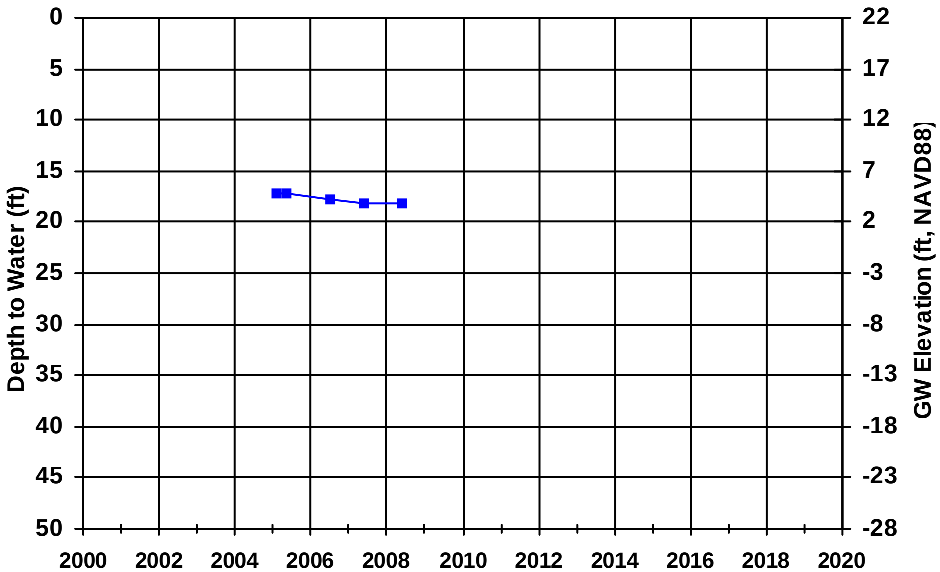



**WellID:** SL205032990-W-34
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

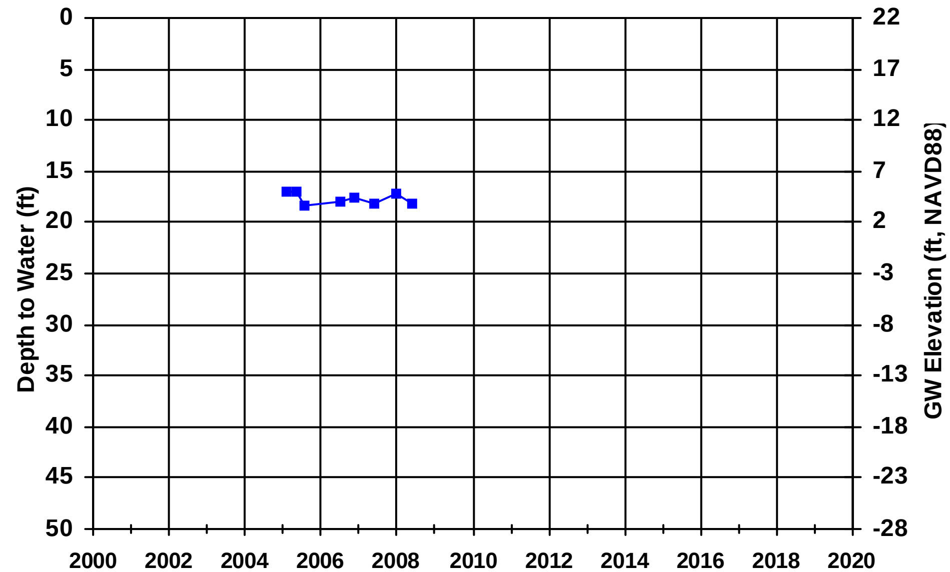



{R_WLhyd88}

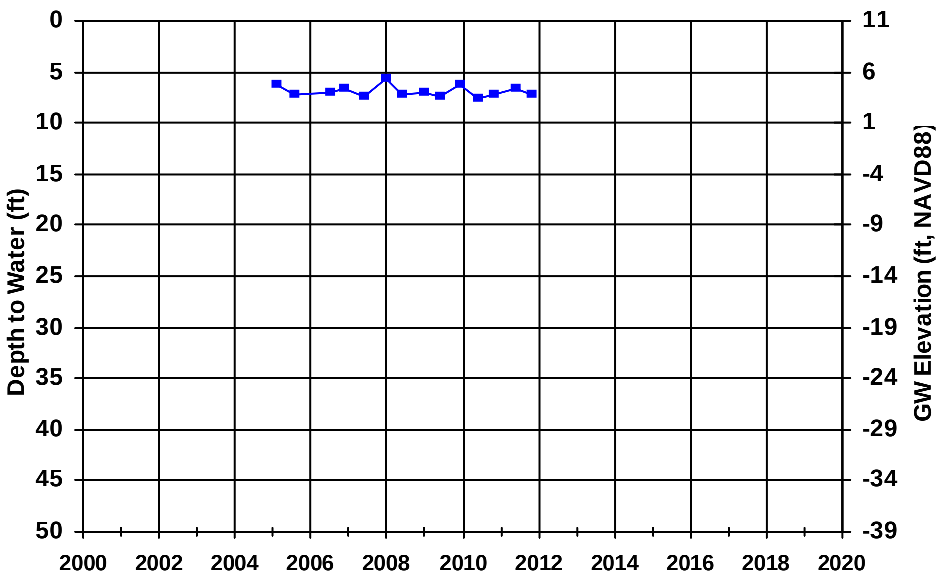
**WellID:** SL205032990-W-35
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



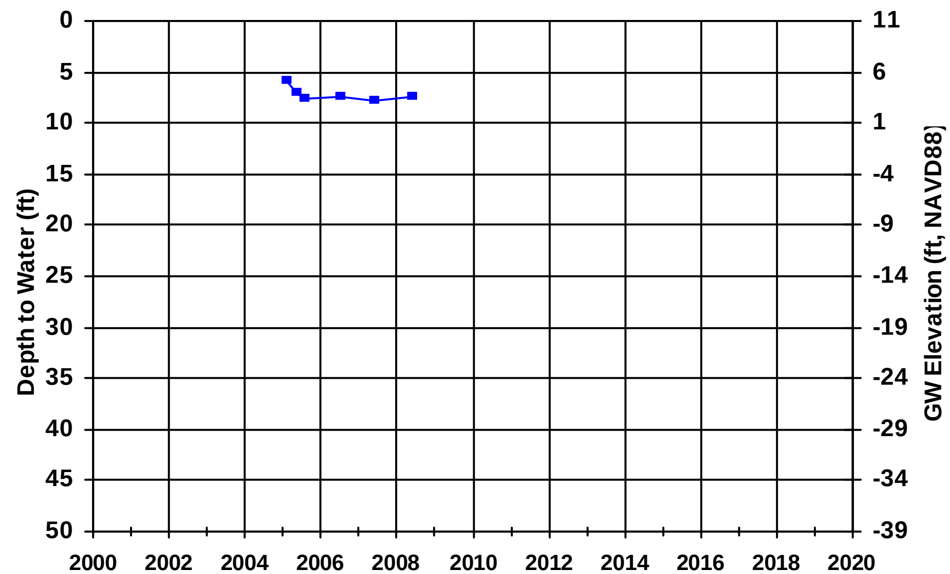

**WellID:** SL205032990-W-36
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** SL205032990-W-37
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

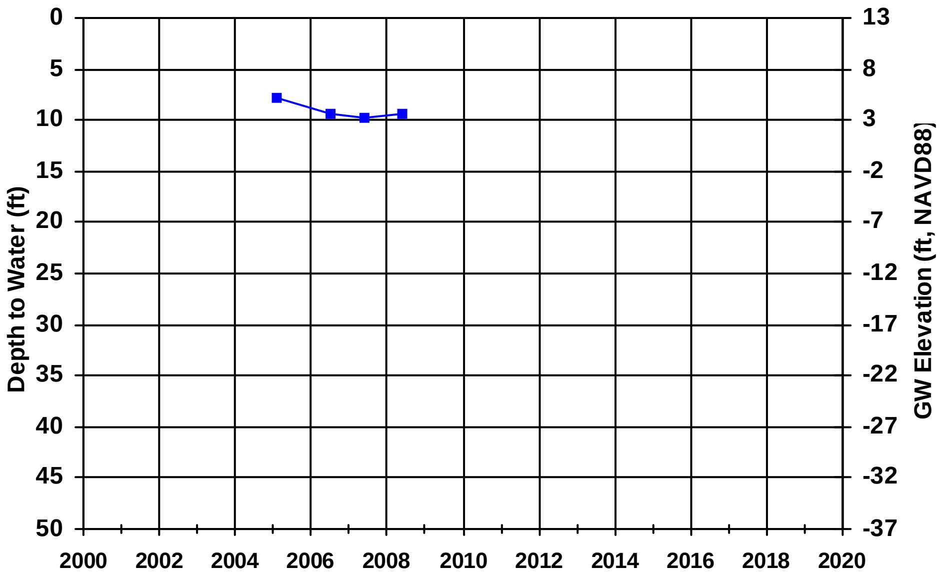



**WellID:** SL205032990-W-38
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

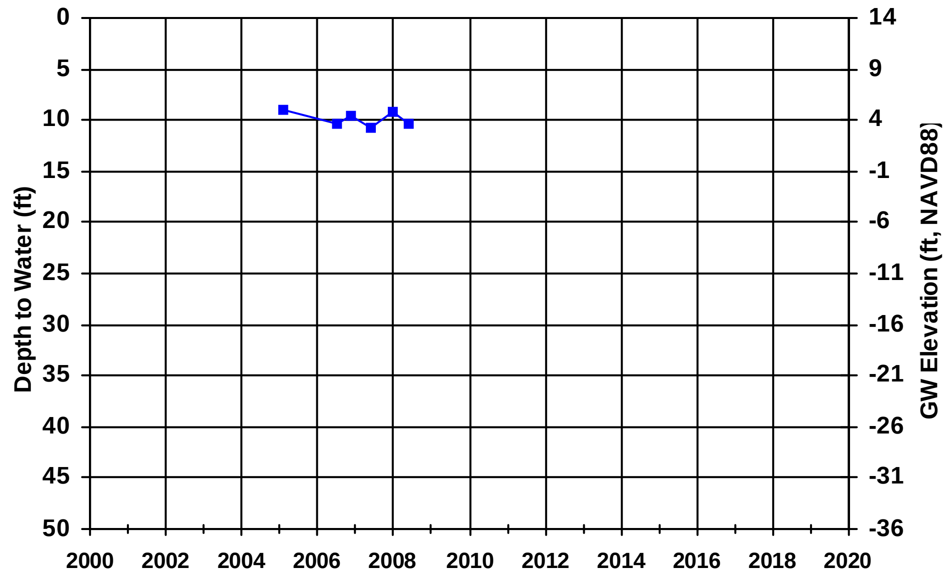



{R_WLhyd88}

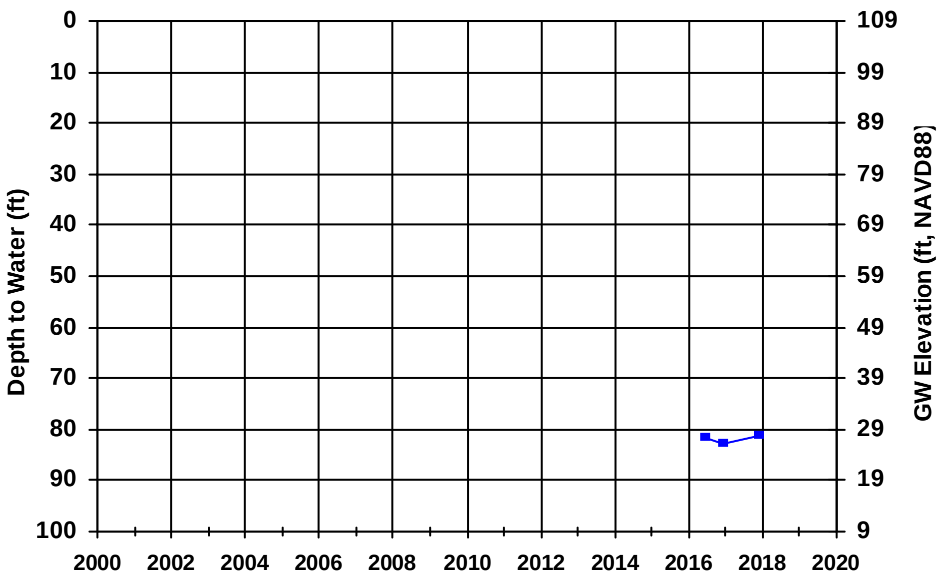
**WellID:** SL205032990-W-39
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



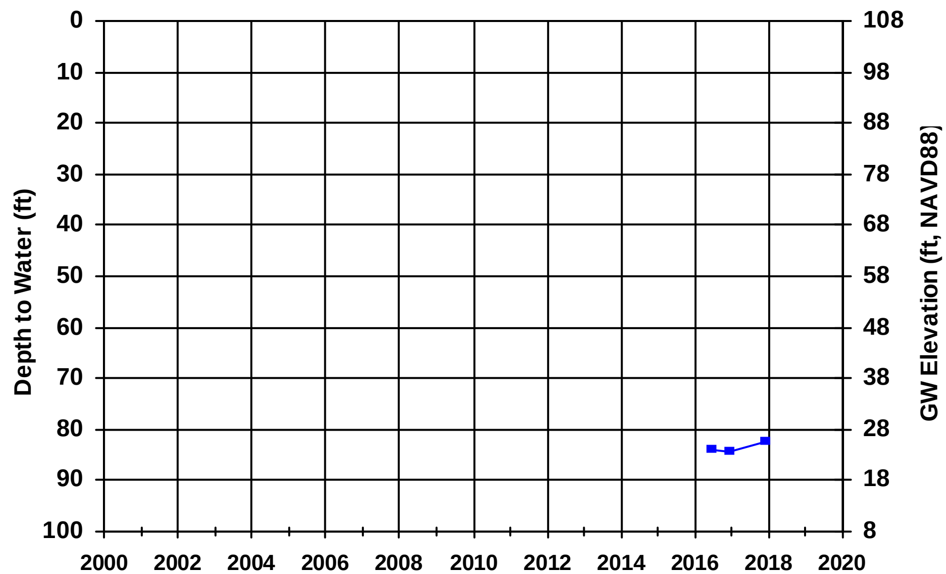

**WellID:** SL205032990-W-40
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** SL205092993-MW-12A
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

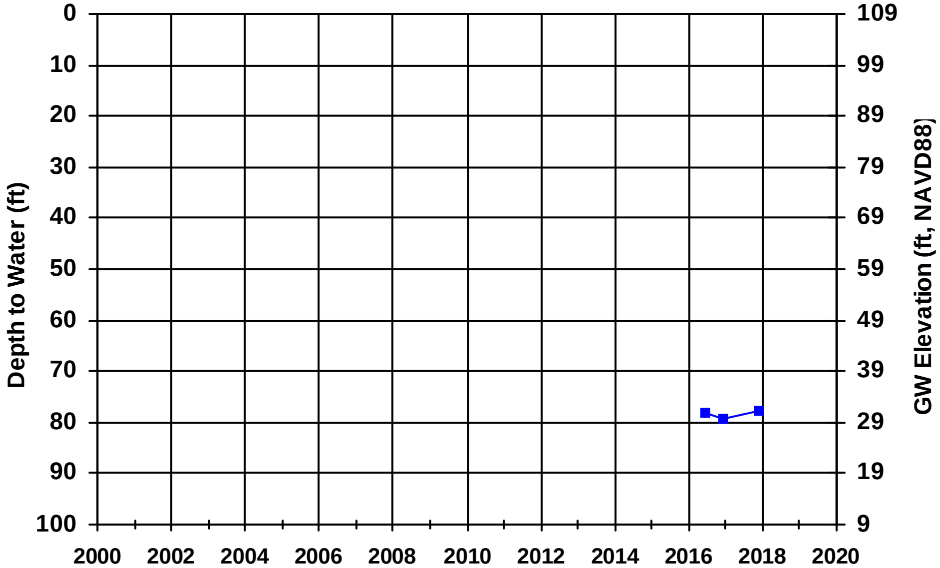



**WellID:** SL205092993-MW-14A
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

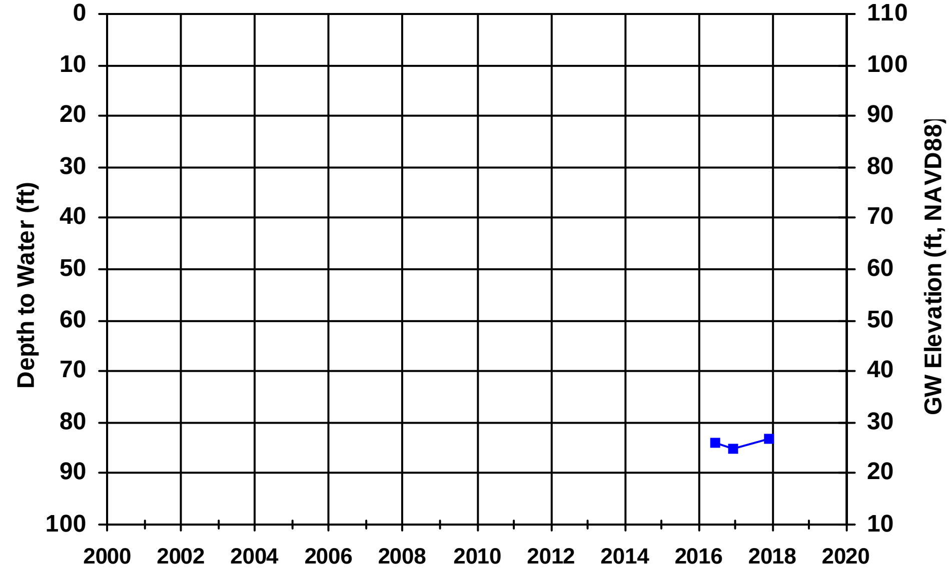



{R_WLhyd88}

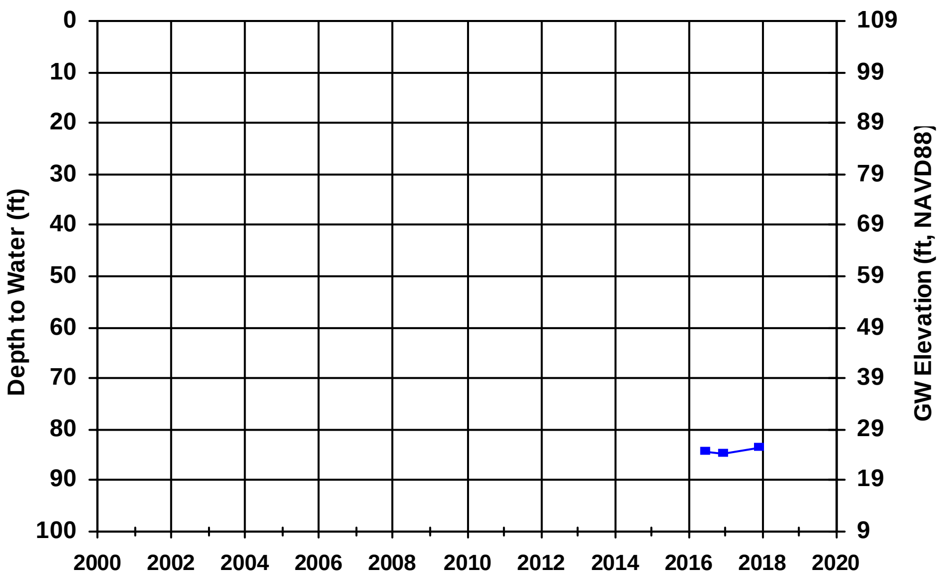
**WellID: SL205092993-MW-17A**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



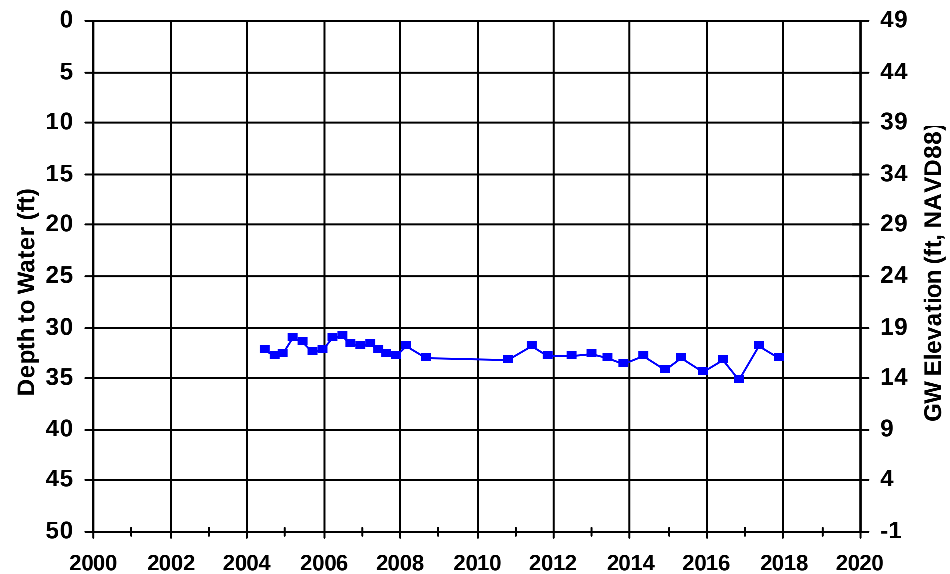

**WellID: SL205092993-MW-6A**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: SL205092993-MW-8A**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

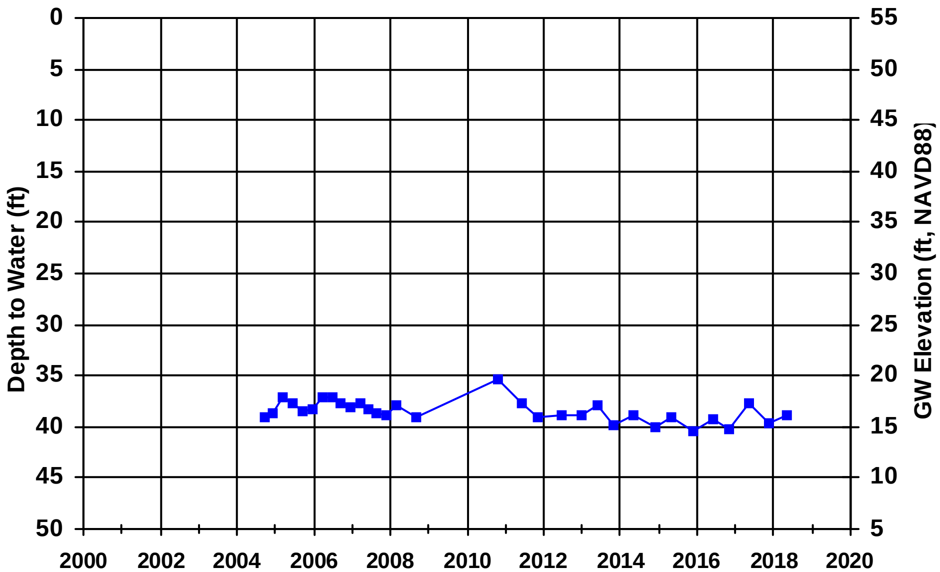



**WellID: T0601300676-MW-11**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

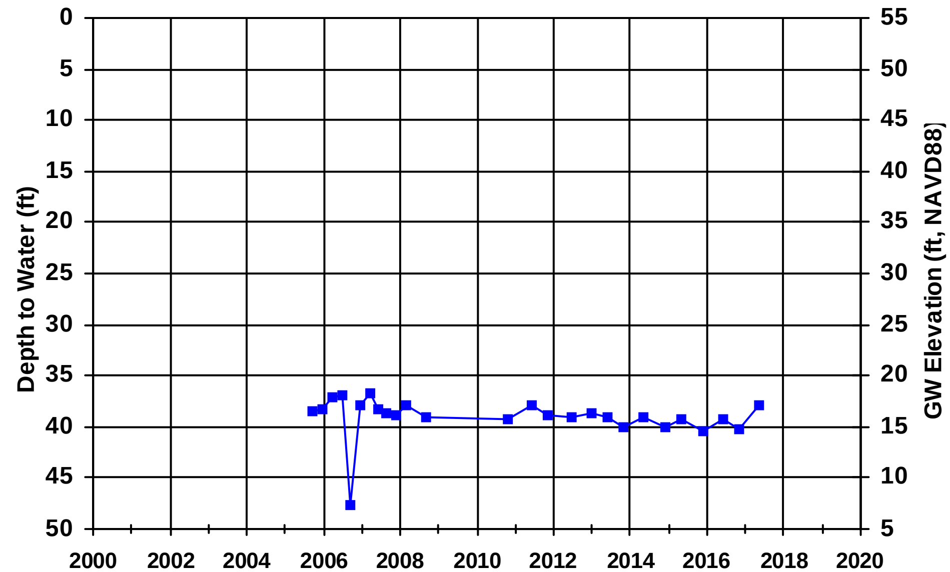



{R_WLhyd88}

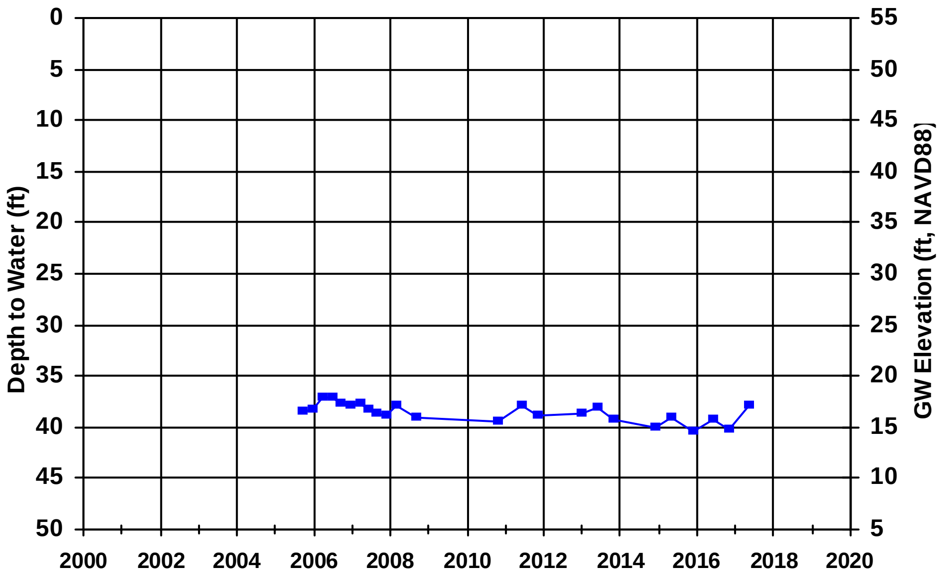
**WellID: T0601300676-MW-16A**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



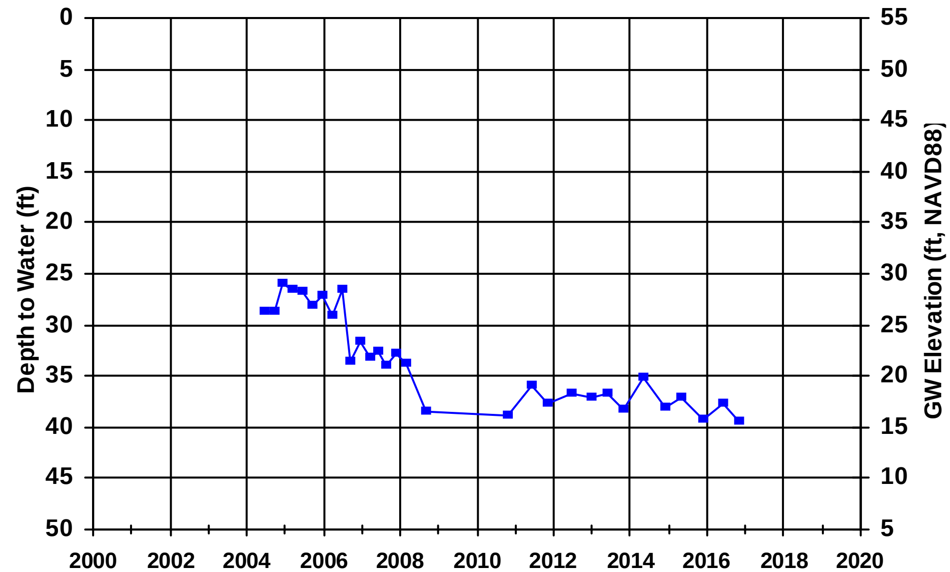

**WellID: T0601300676-MW-16B**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID: T0601300676-MW-16C**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

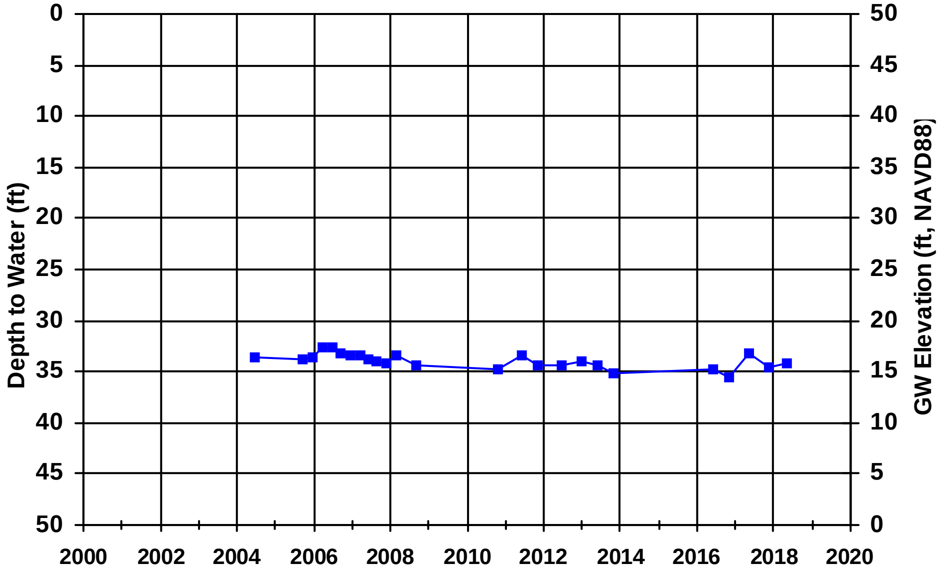



**WellID: T0601300676-MW-17**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

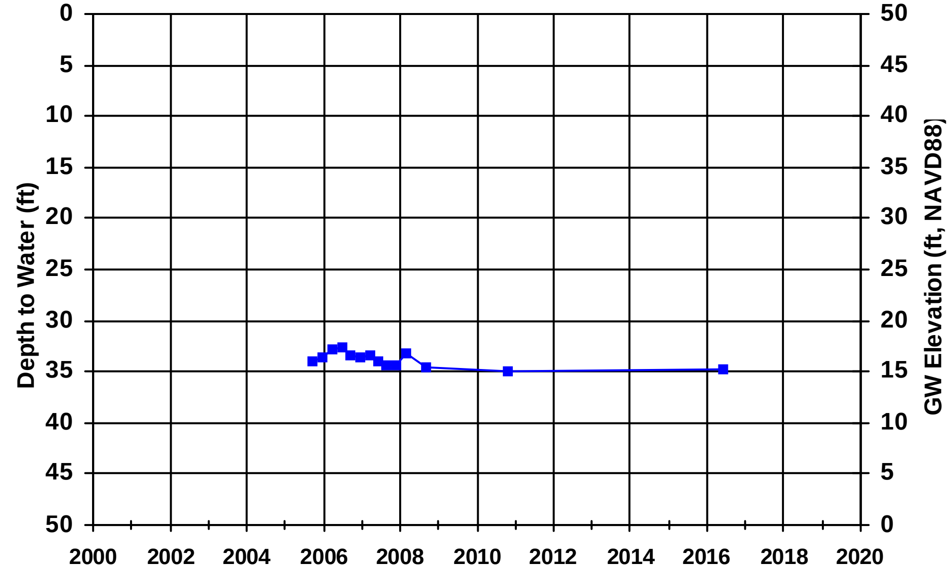



{R_WLhyd88}

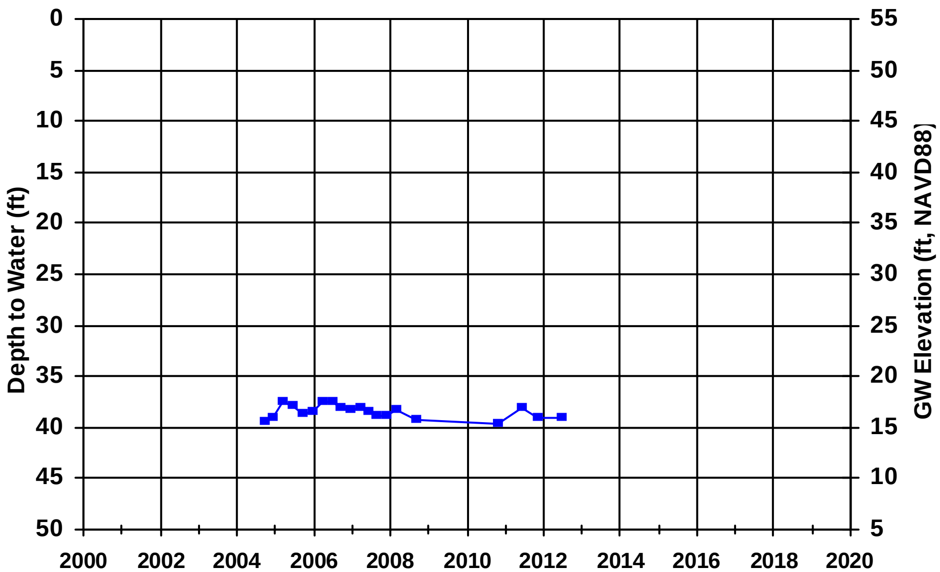
**WellID:** **T0601300676-MW-22**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



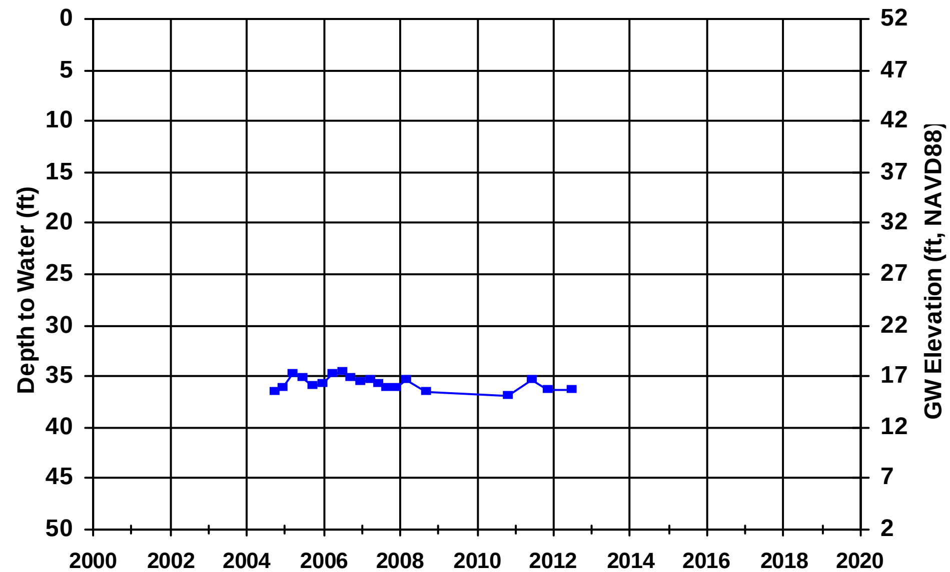

**WellID:** **T0601300676-MW-22C**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300676-MW-23**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

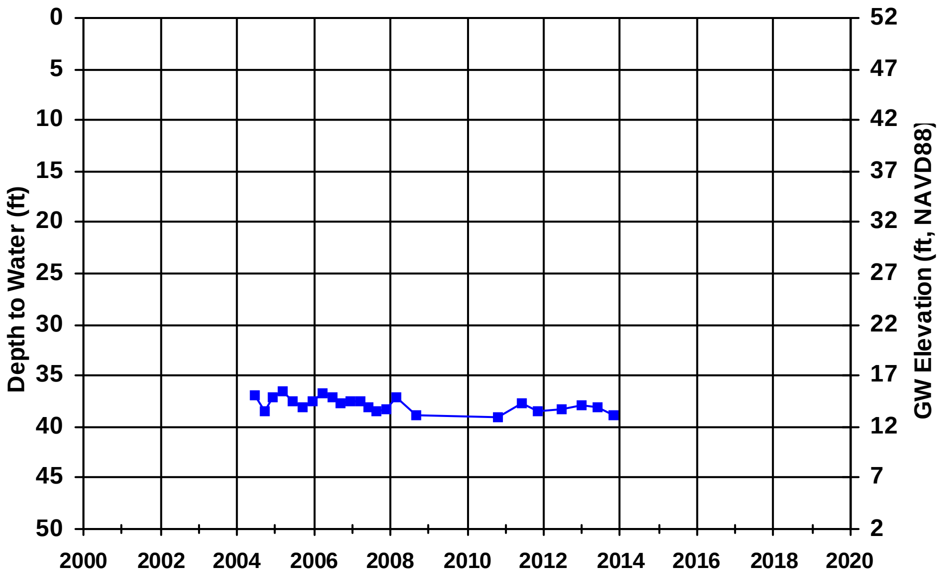



**WellID:** **T0601300676-MW-24**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

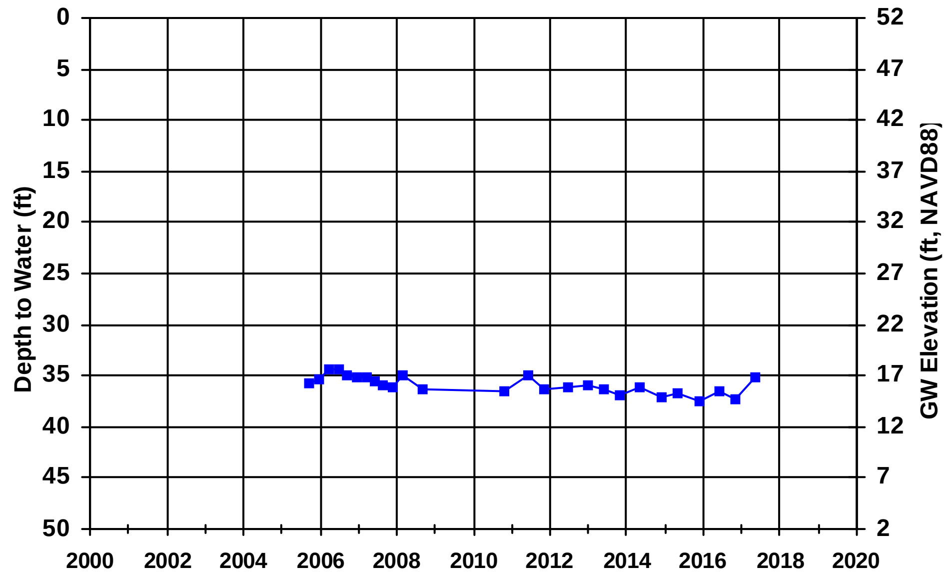



{R_WLhyd88}

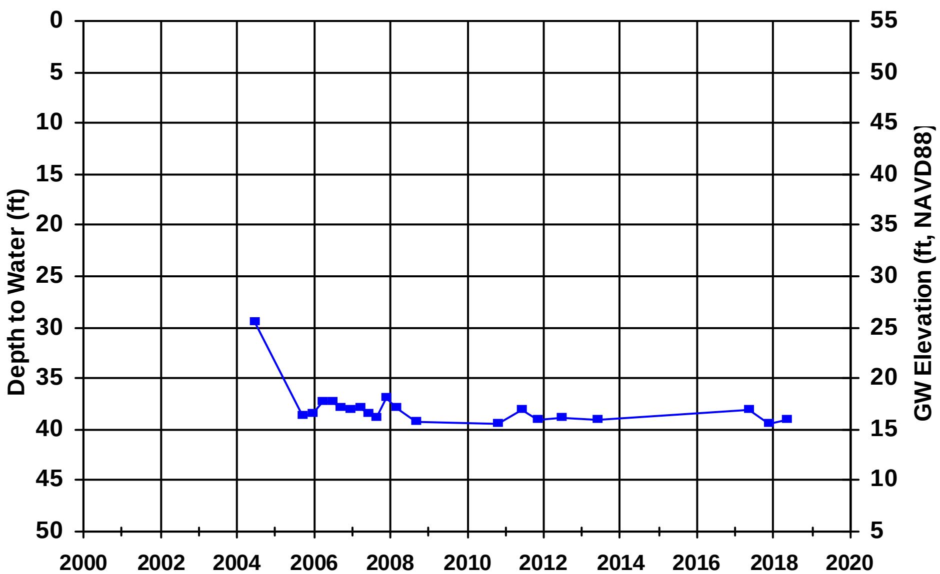
**WellID:** **T0601300676-MW-25**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



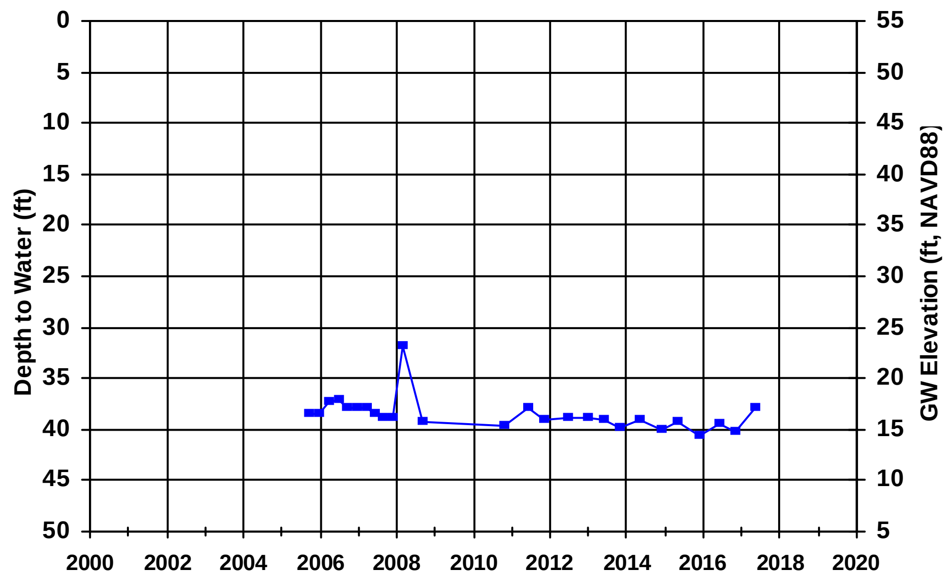

**WellID:** **T0601300676-MW-25B**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300676-MW-26**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

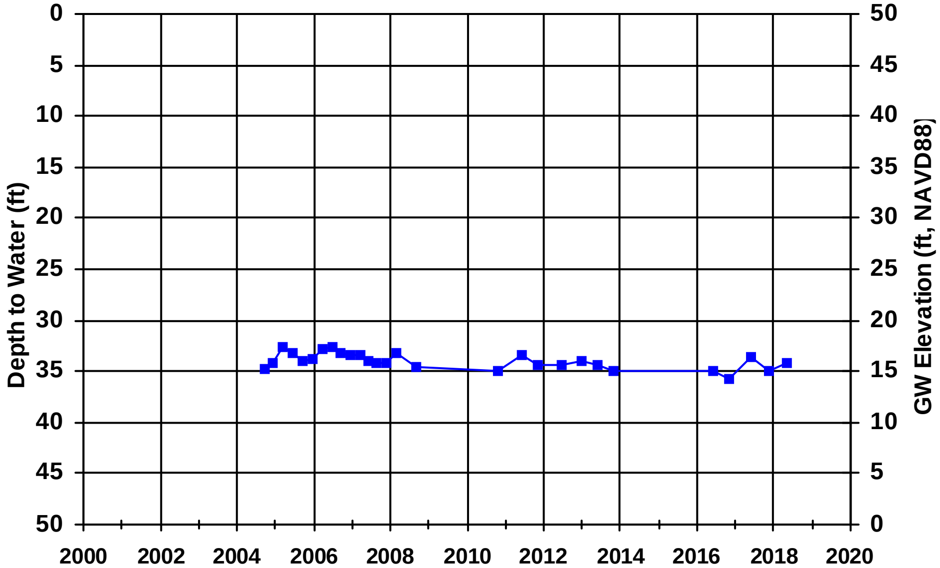



**WellID:** **T0601300676-MW-26B**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

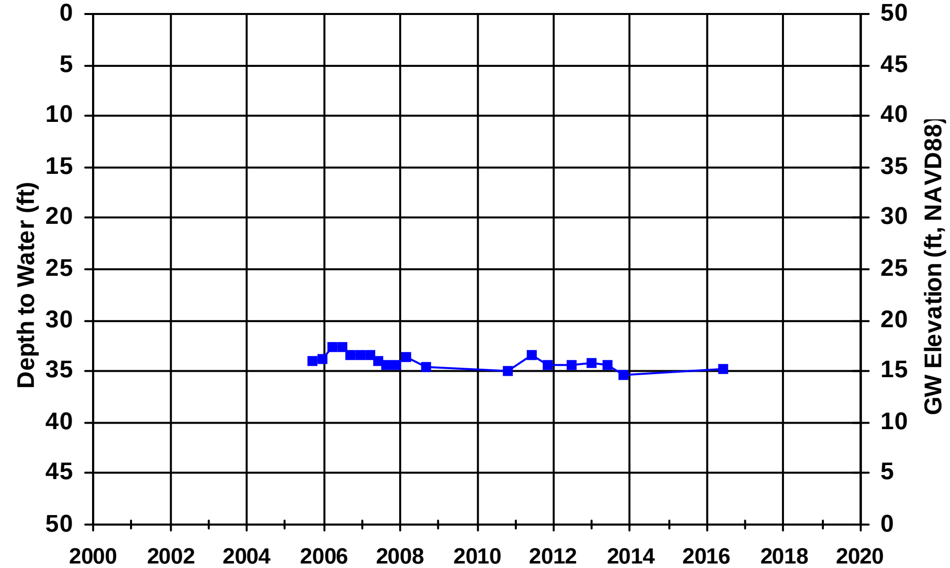



{R_WLhyd88}

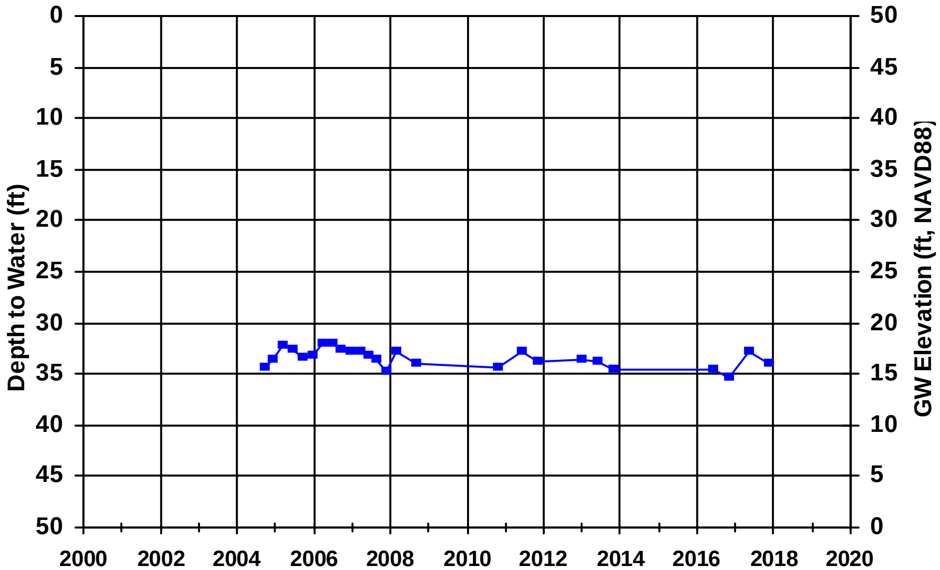
**WellID:** **T0601300676-MW-28**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



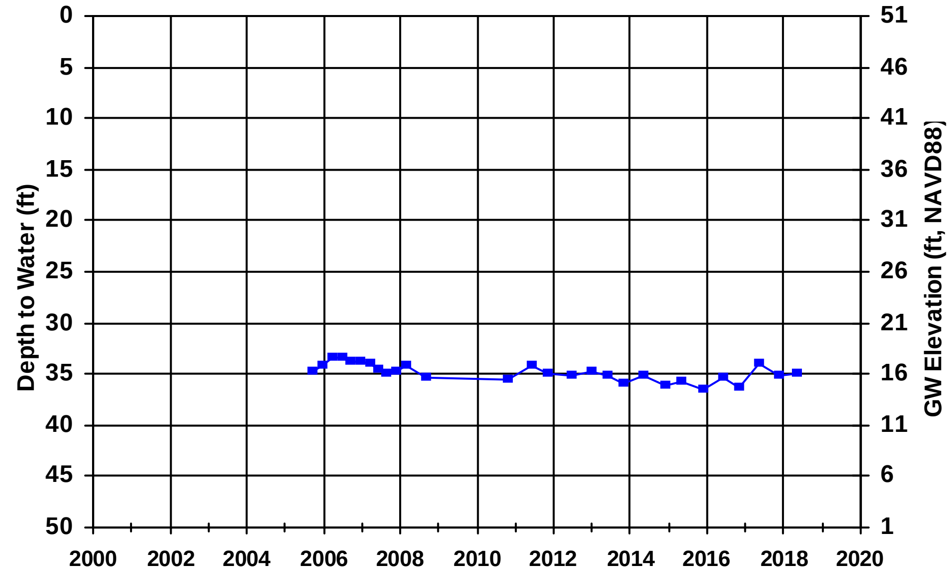

**WellID:** **T0601300676-MW-28C**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300676-MW-29**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

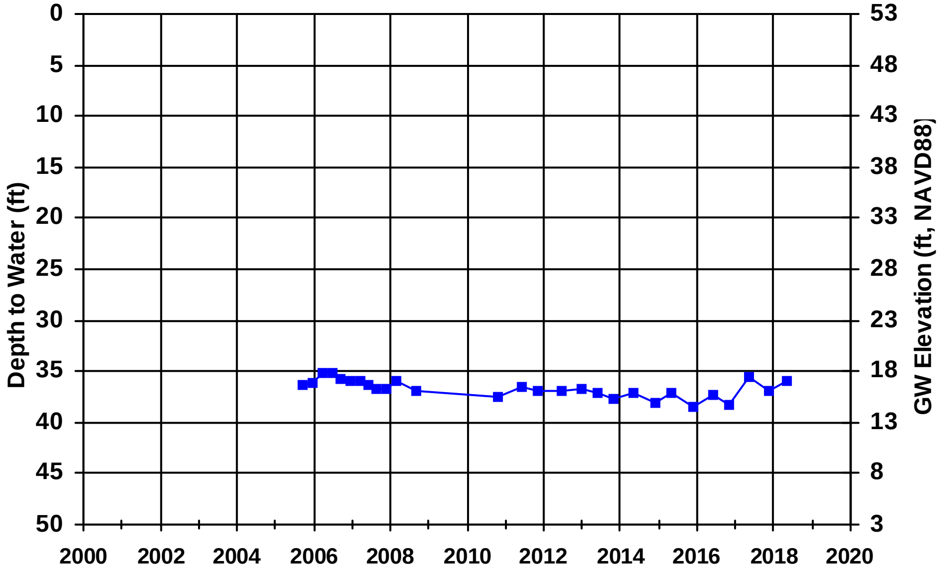



**WellID:** **T0601300676-MW-30A**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

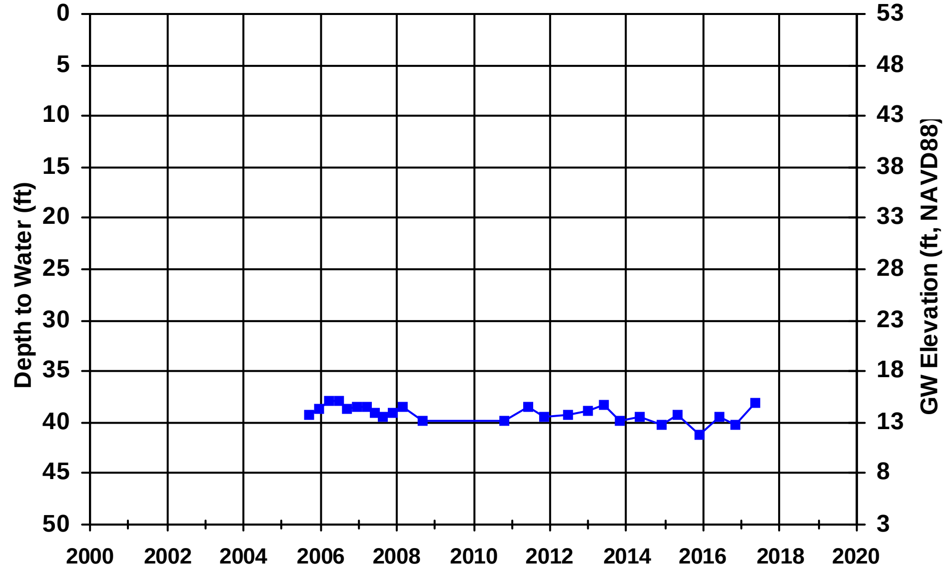



{R_WLhyd88}

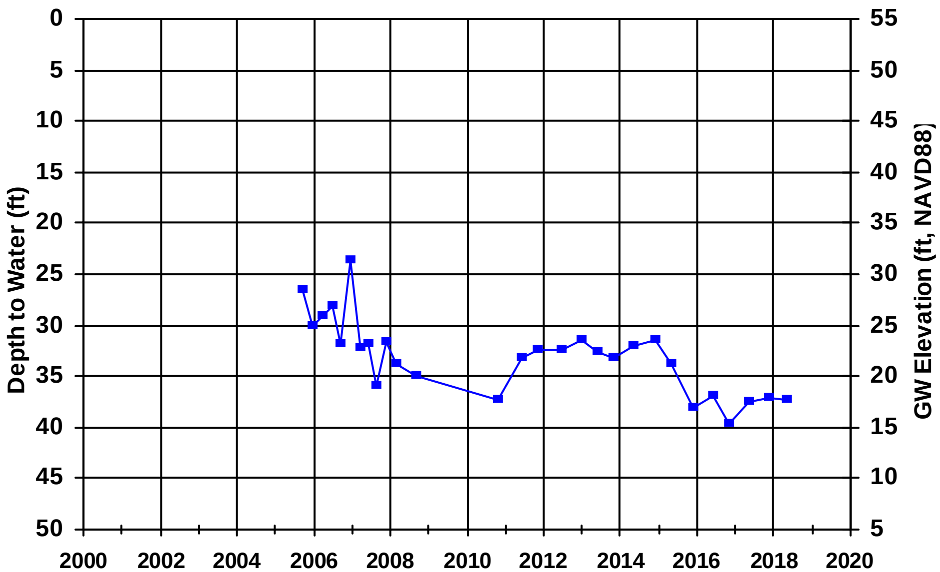
**WellID:** **T0601300676-MW-31A**
**Zone:** **Shallow**
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A



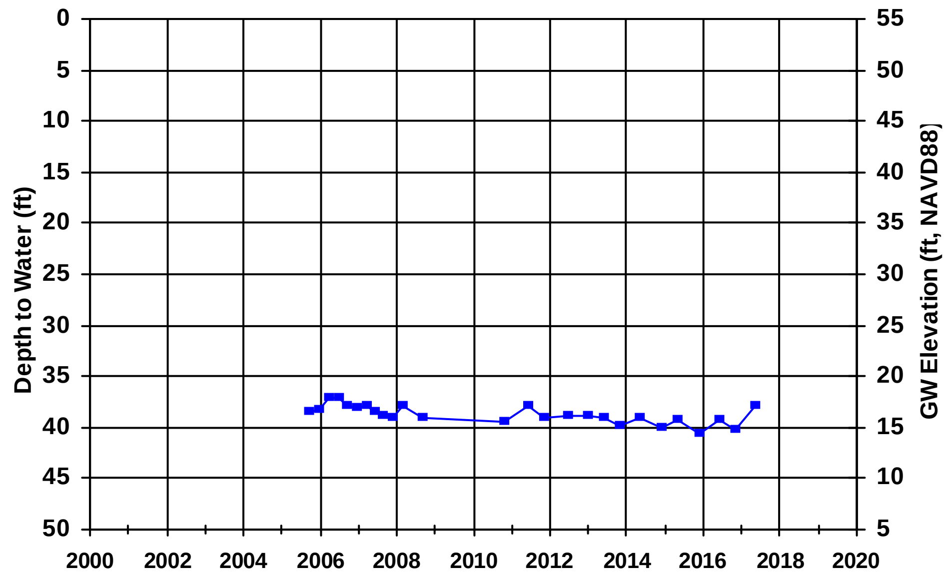

**WellID:** **T0601300676-MW-32D**
**Zone:** **Shallow**
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A




**WellID:** **T0601300676-MW-5A**
**Zone:** **Shallow**
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A

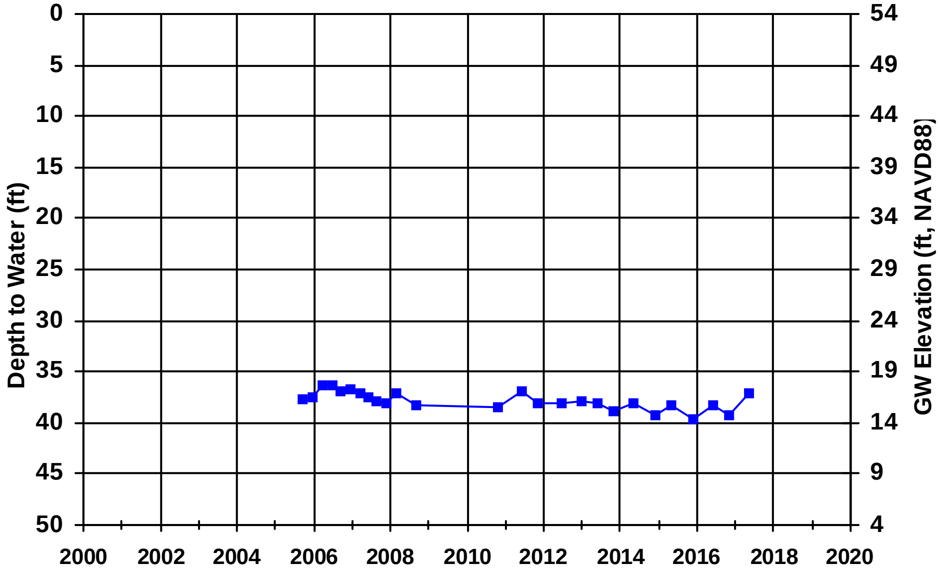



**WellID:** **T0601300676-MW-5B**
**Zone:** **Shallow**
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A

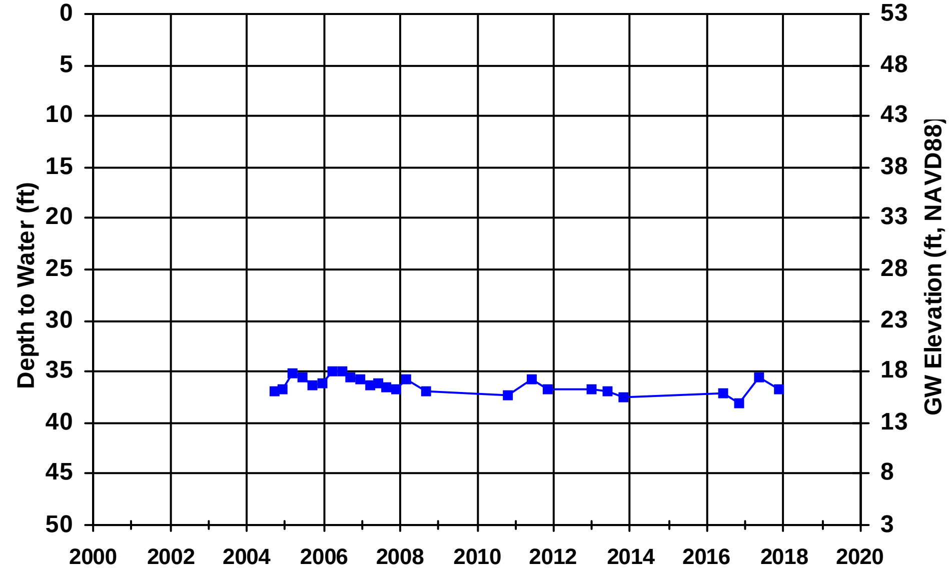



{R_WLhyd88}

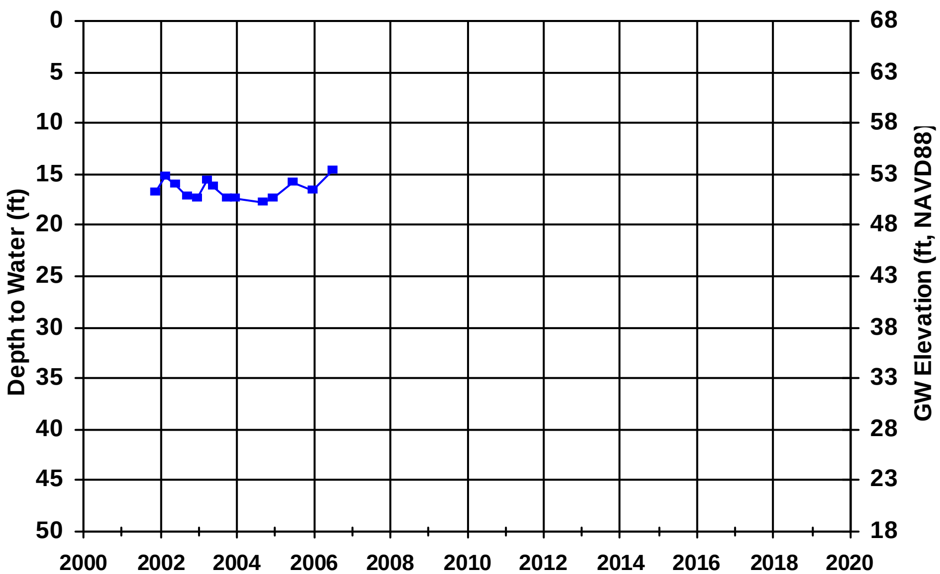
**WellID:** T0601300676-MW-5C
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



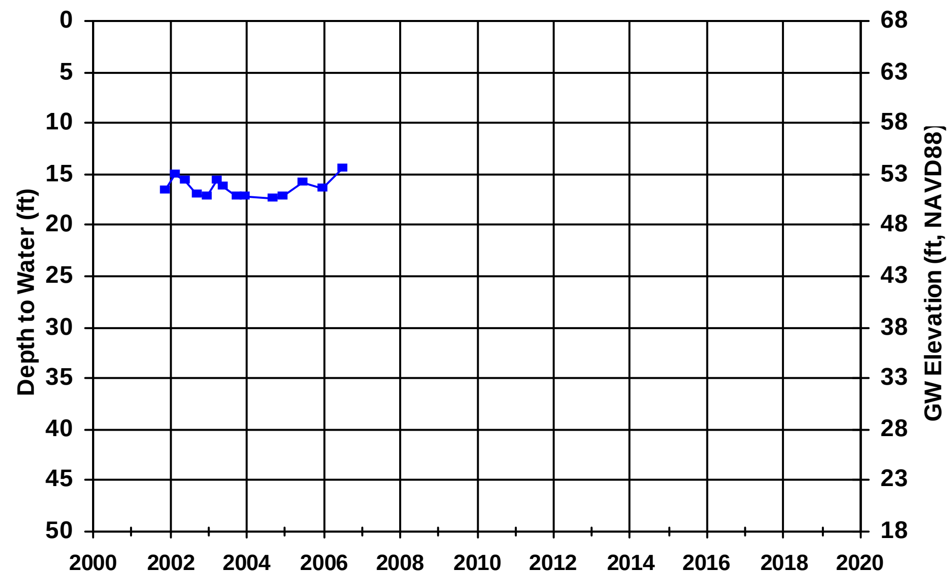

**WellID:** T0601300676-MW-6
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300744-W-1
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

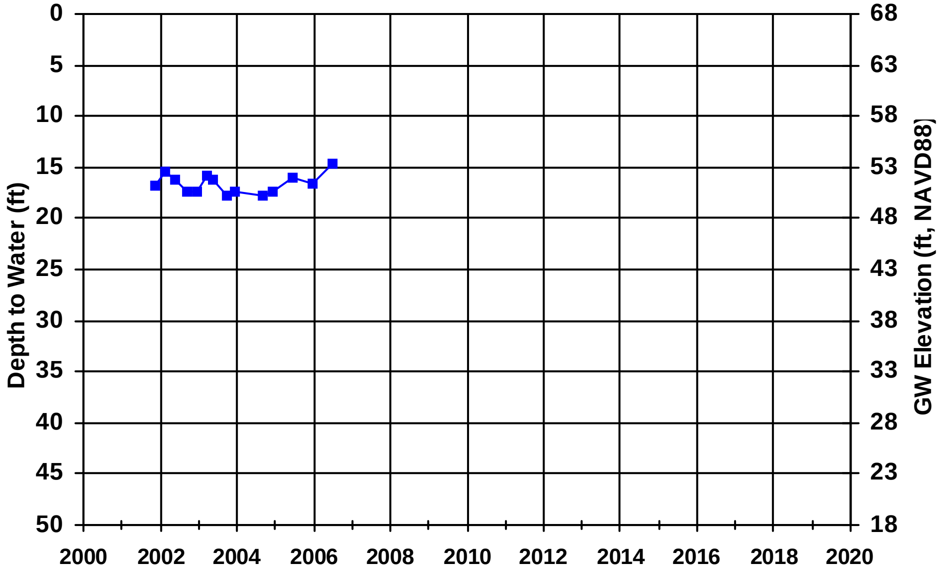



**WellID:** T0601300744-W-2
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

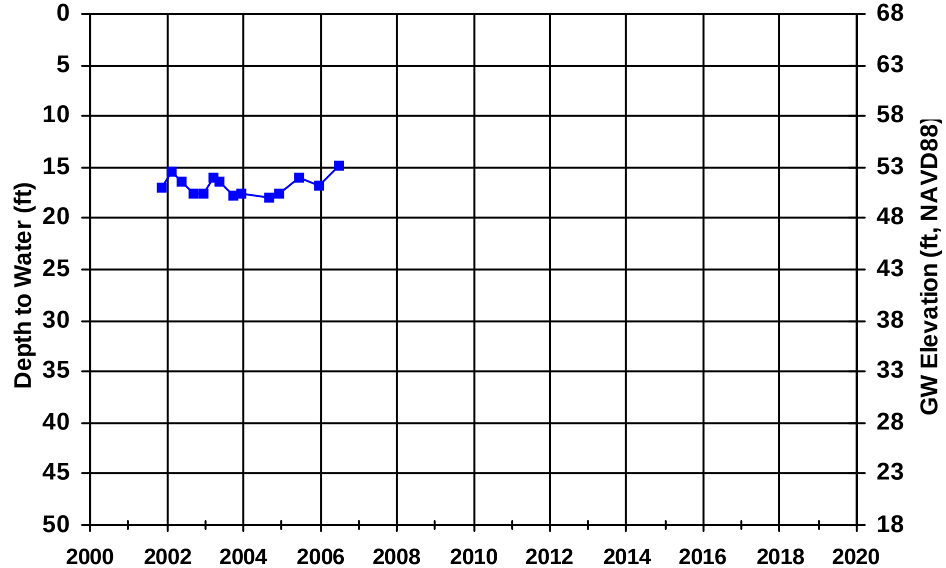



{R_WLhyd88}

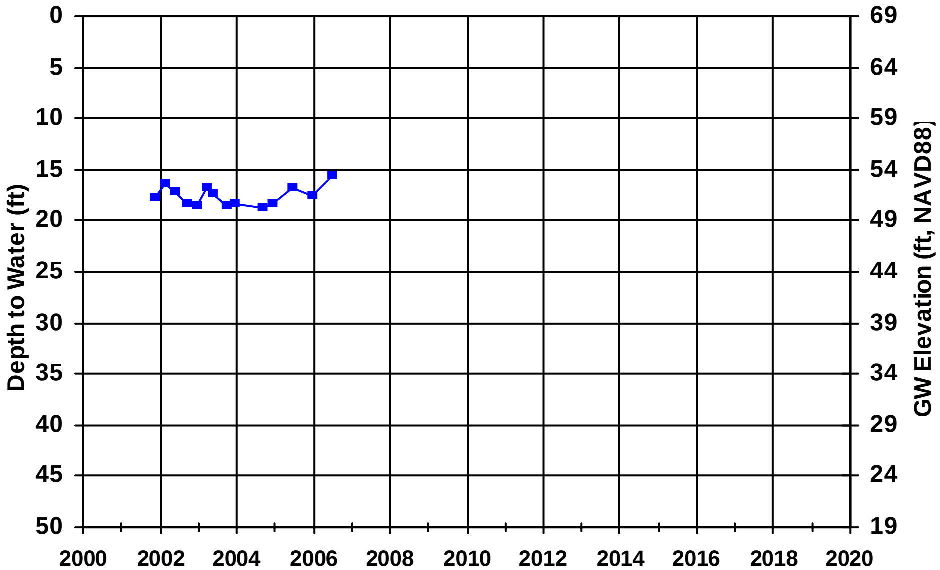
**WellID:** **T0601300744-W-3**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



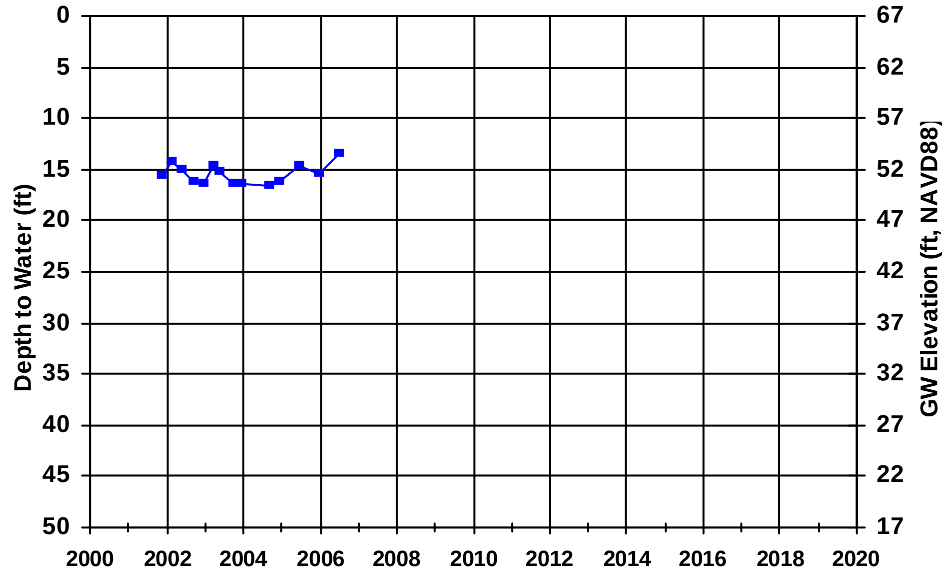

**WellID:** **T0601300744-W-4**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300744-W-5B**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

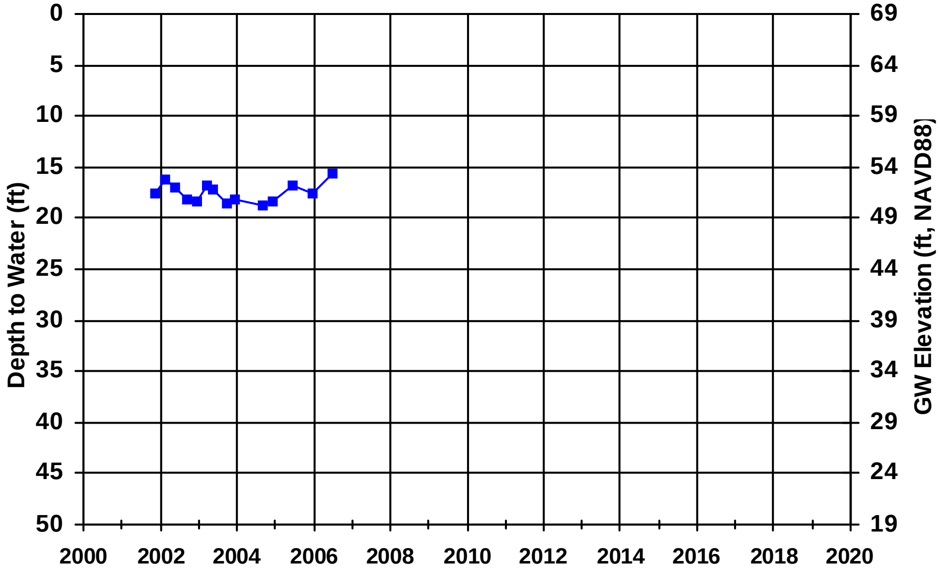



**WellID:** **T0601300744-W-6**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

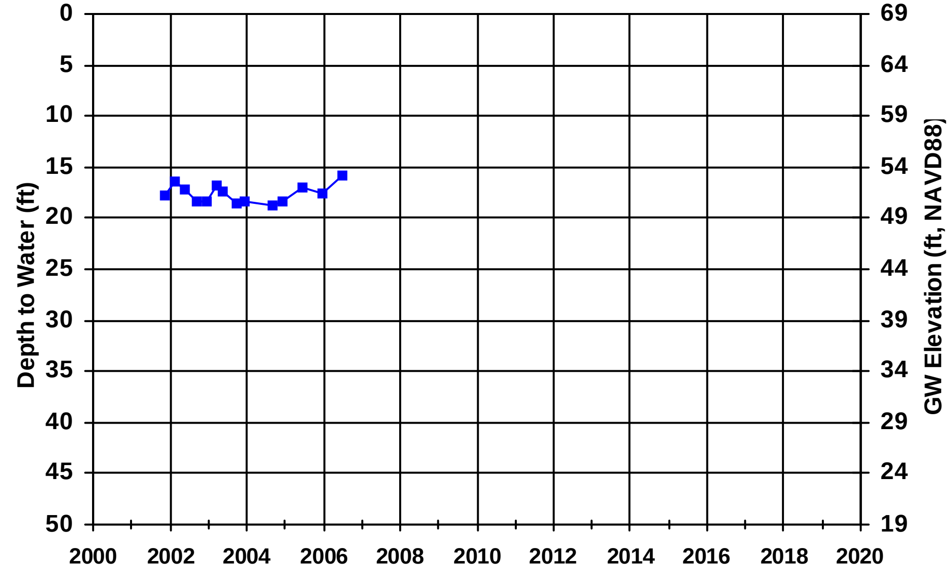



{R_WLhyd88}

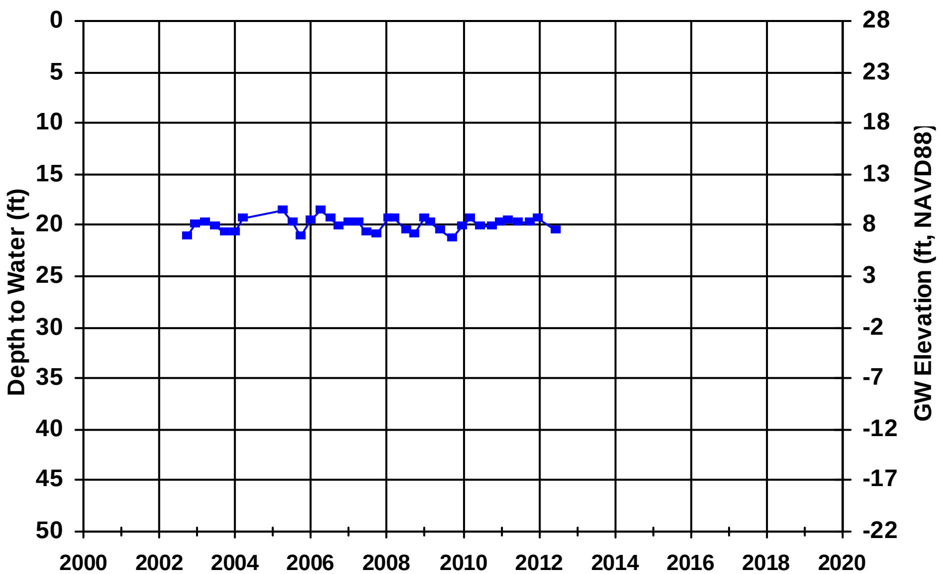
**WellID:** T0601300744-W-7B
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



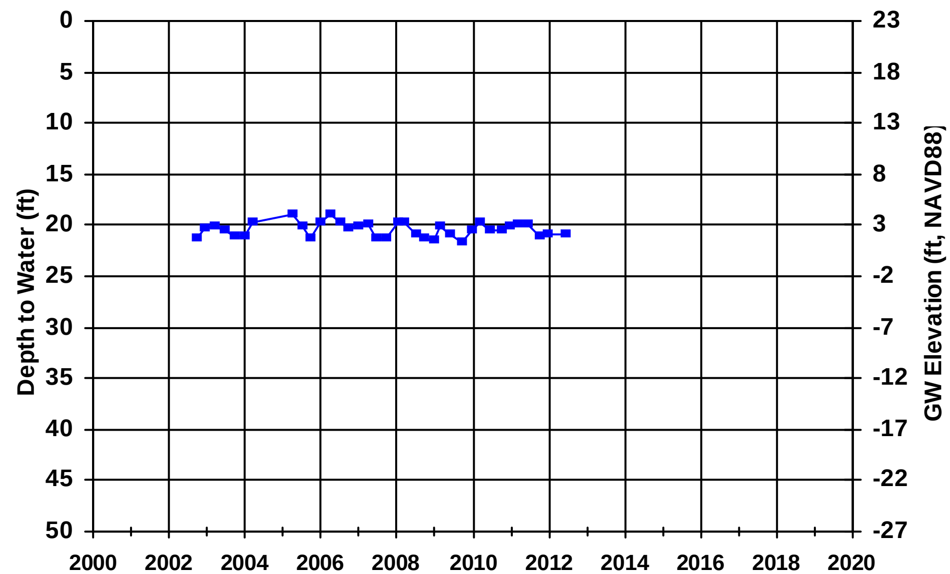

**WellID:** T0601300744-W-8
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300747-MW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

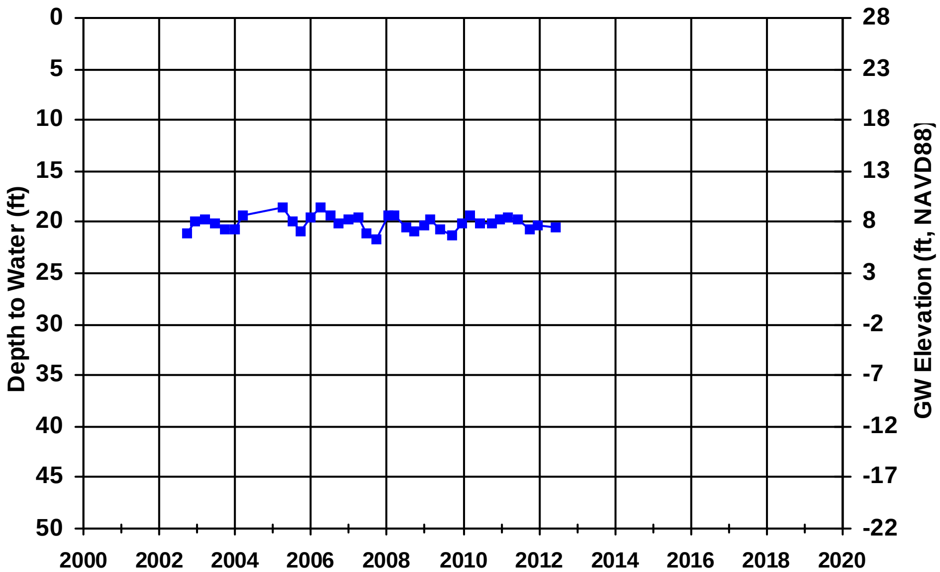



**WellID:** T0601300747-MW-2
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

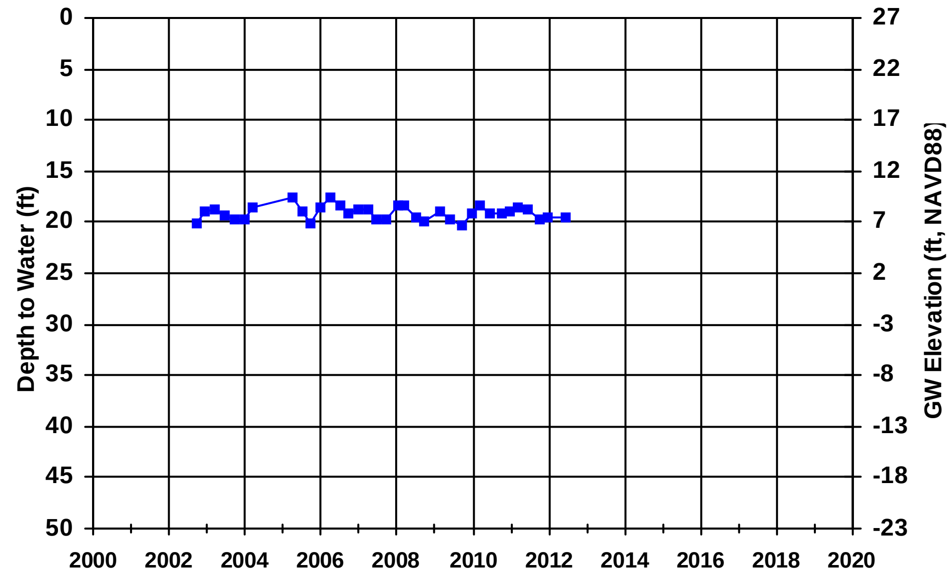



{R_WLhyd88}

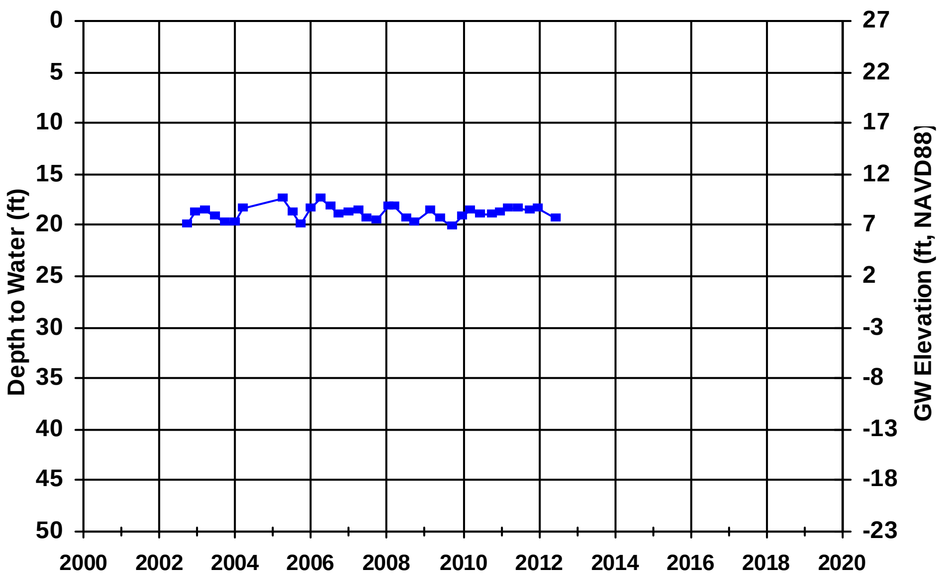
**WellID:** T0601300747-MW-3
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



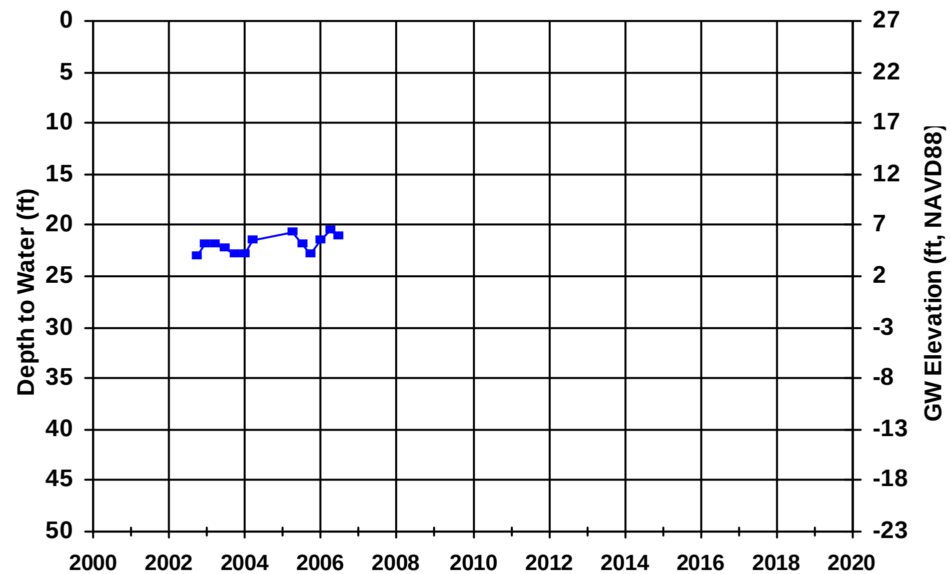

**WellID:** T0601300747-MW-4
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300747-MW-5
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

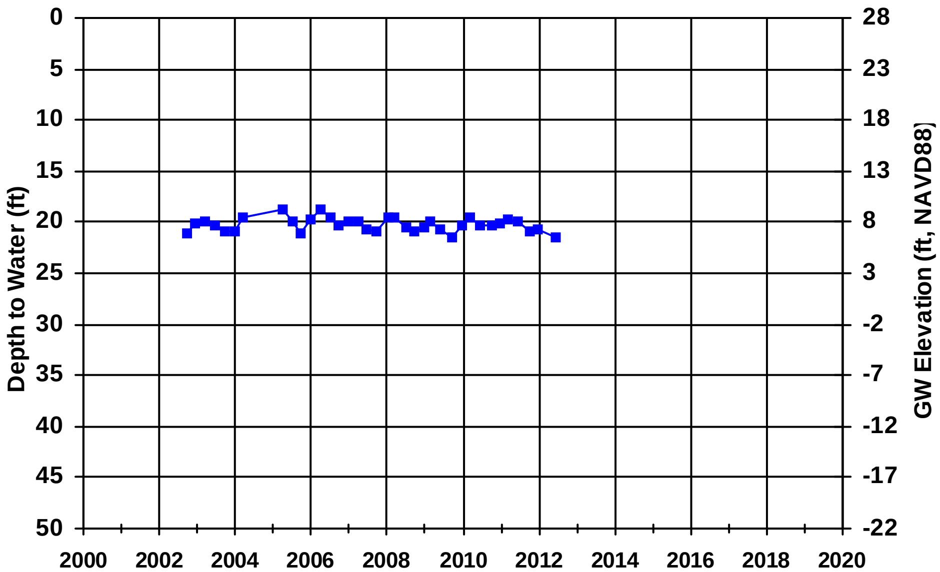



**WellID:** T0601300747-MW-6
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

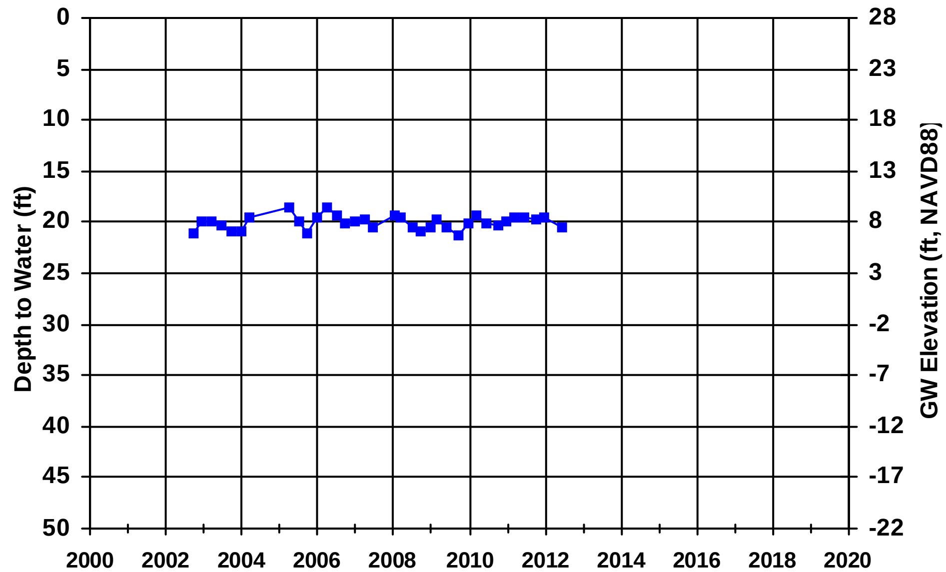



{R_WLhyd88}

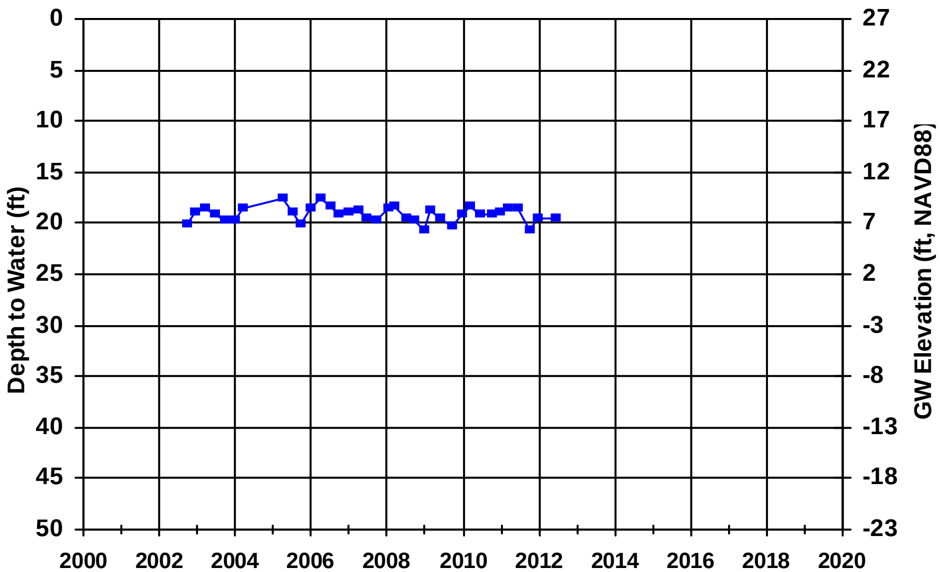
**WellID:** T0601300747-MW-7
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



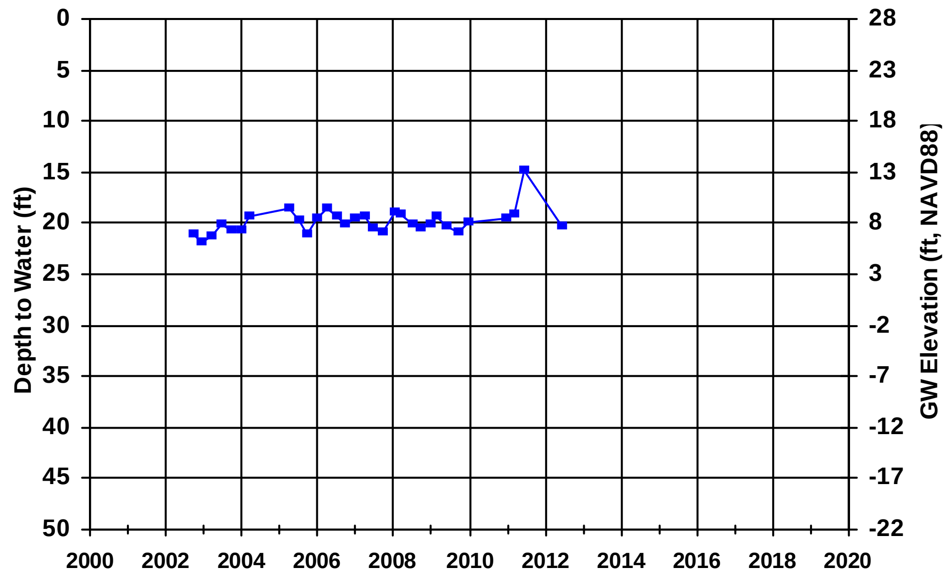

**WellID:** T0601300747-MW-8
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300747-MW-9
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

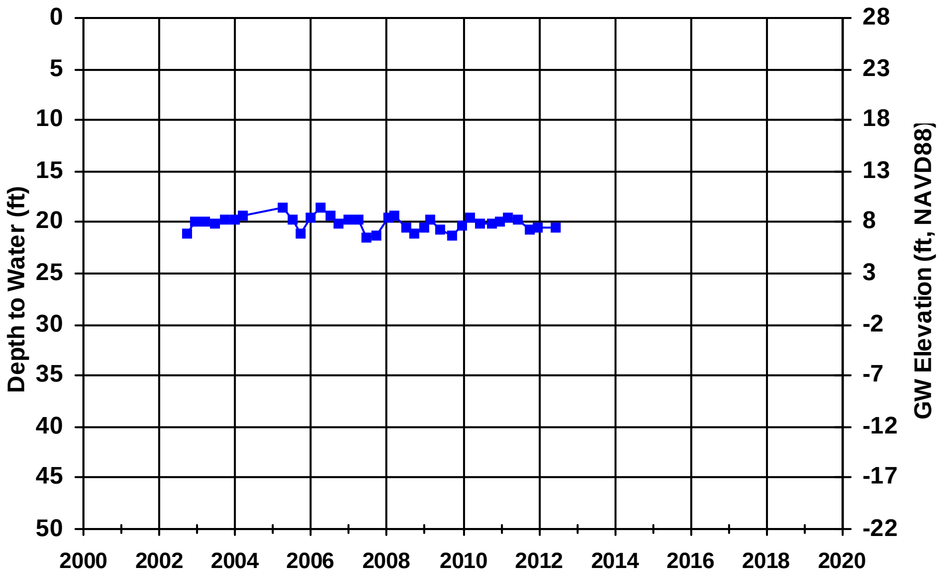



**WellID:** T0601300747-PZ-01
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

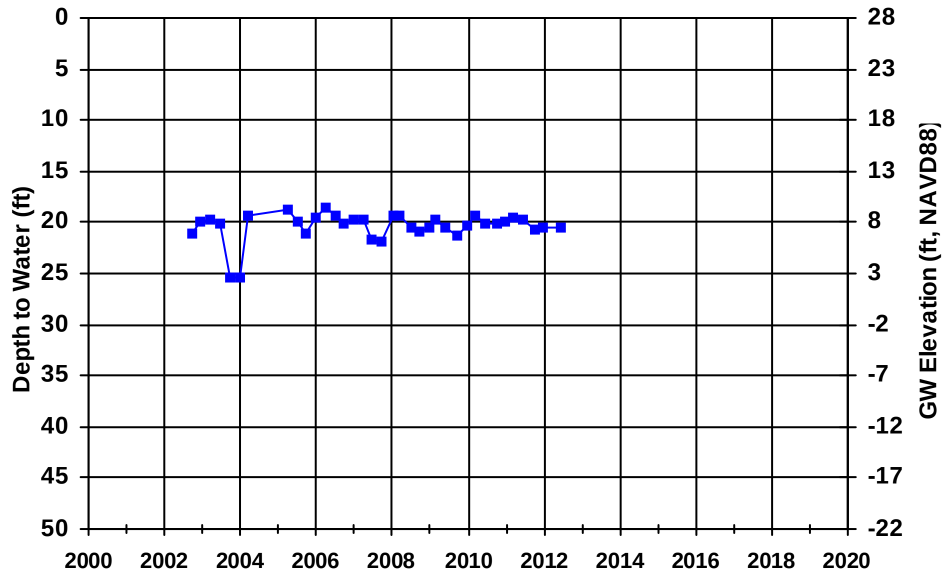



{R_WLhyd88}

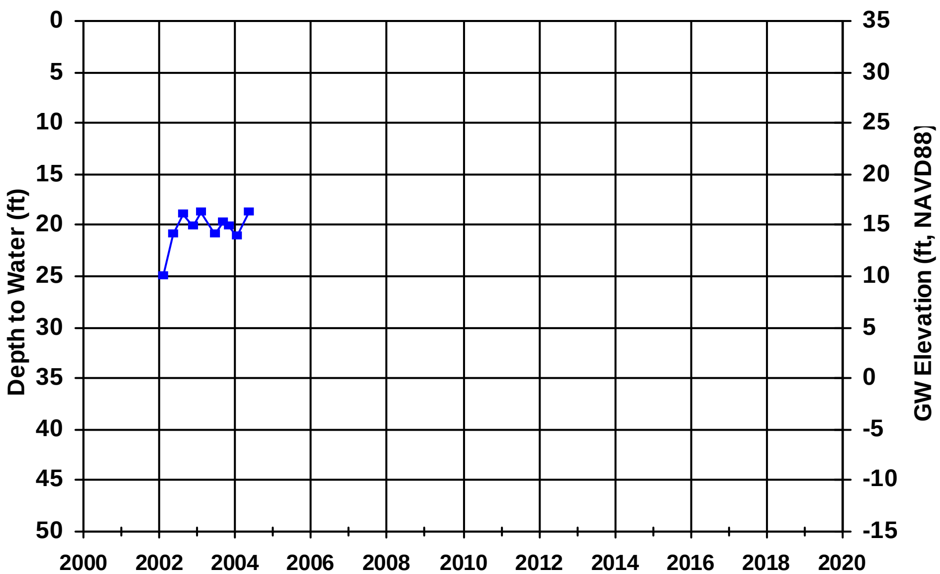
WellID: T0601300747-PZ-02
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



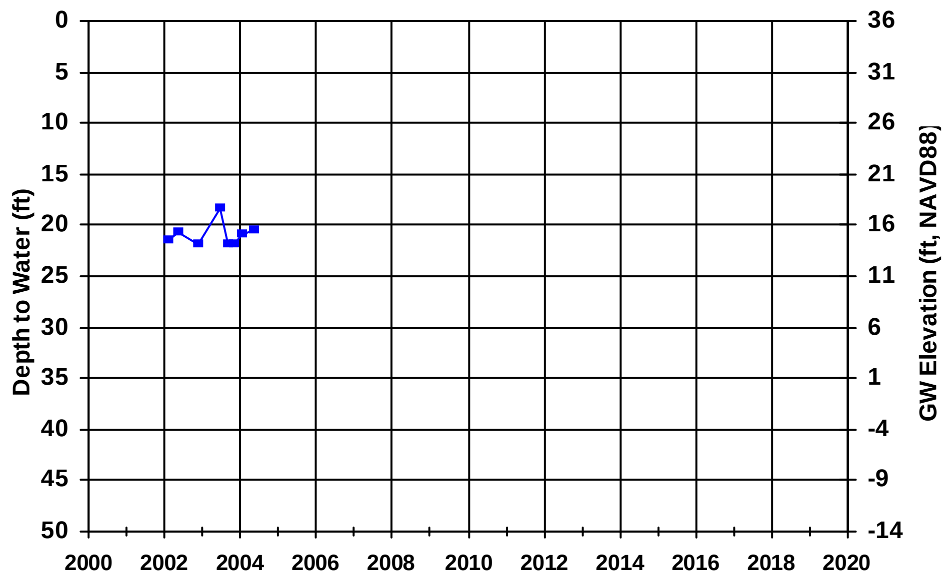

WellID: T0601300747-PZ-03
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300756-EW100
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

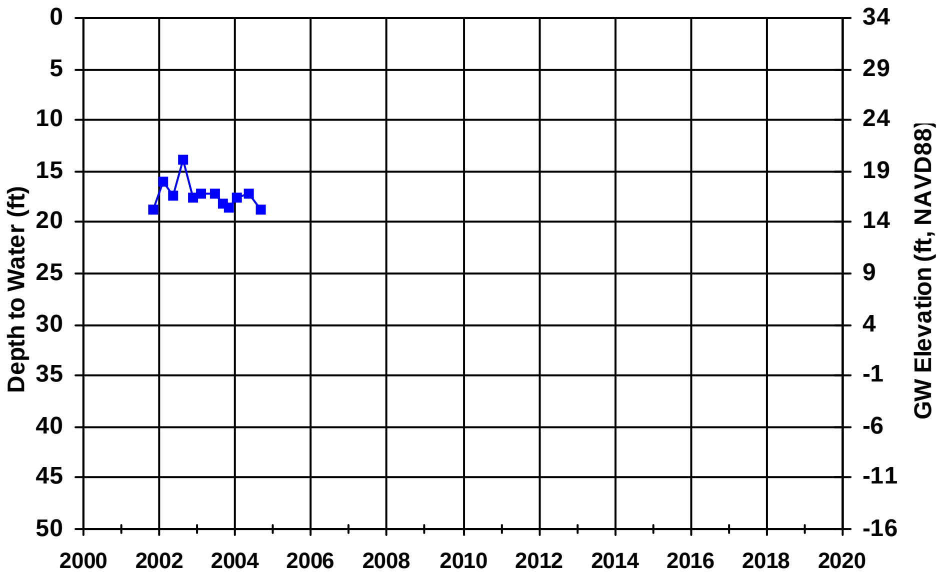



WellID: T0601300756-EW101
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

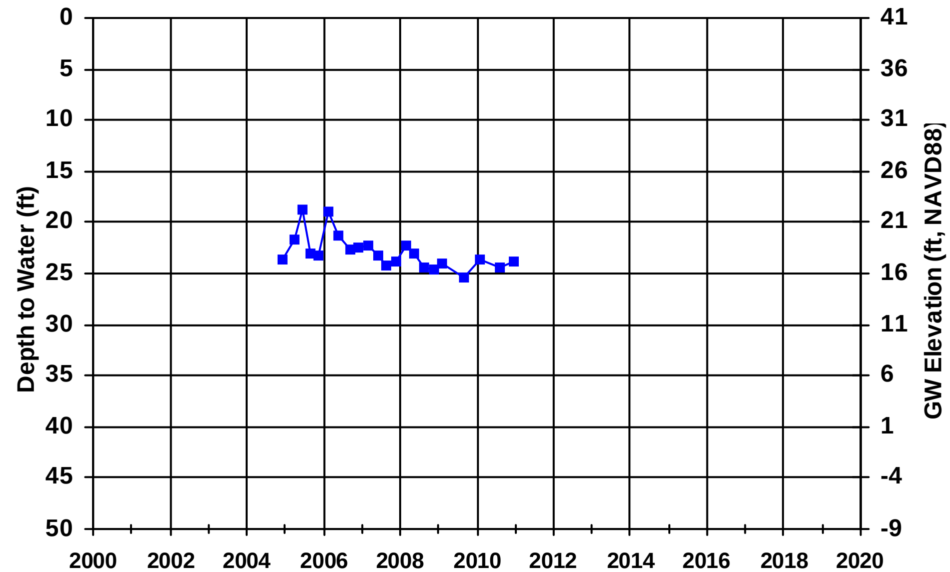



{R_WLhyd88}

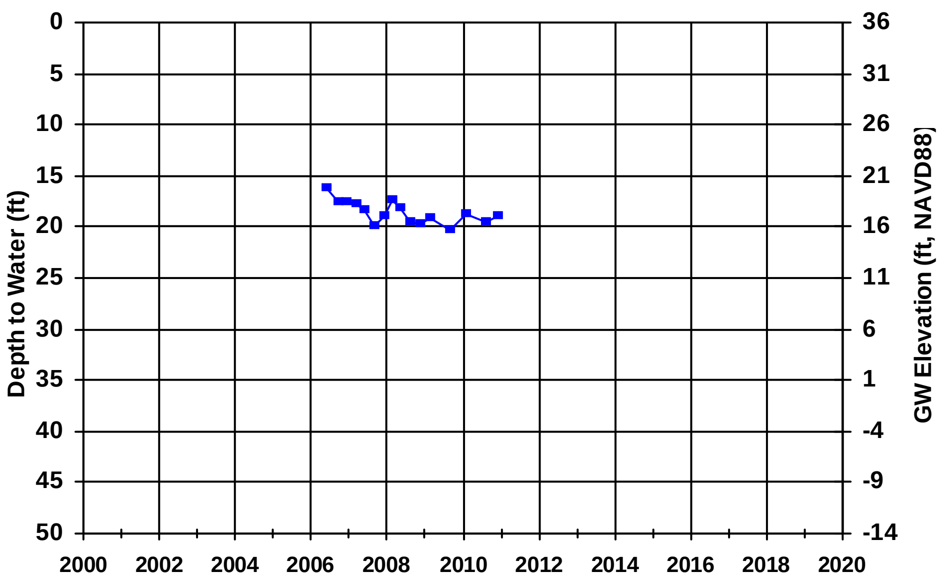
**WellID:** **T0601300756-MW-1**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



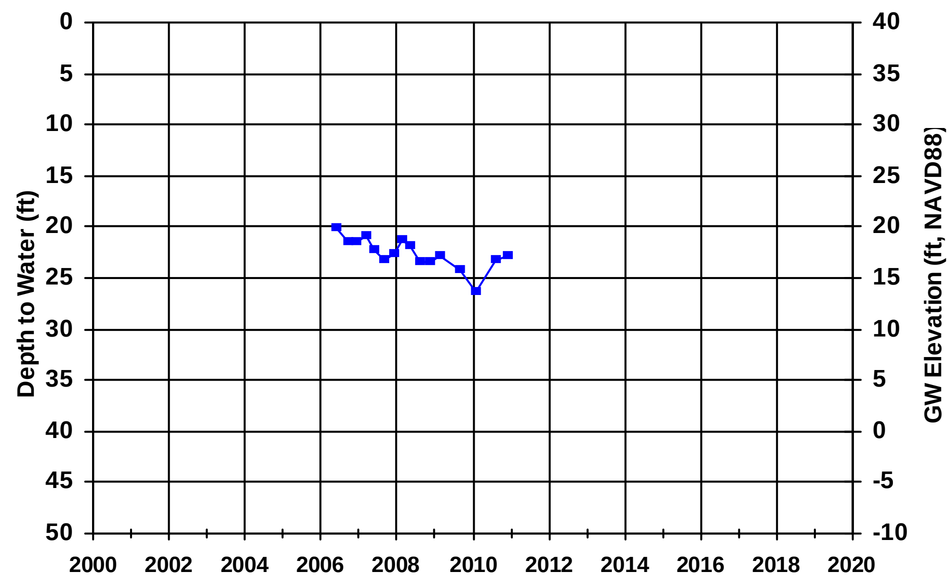

**WellID:** **T0601300756-MW-10L**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300756-MW-10U**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

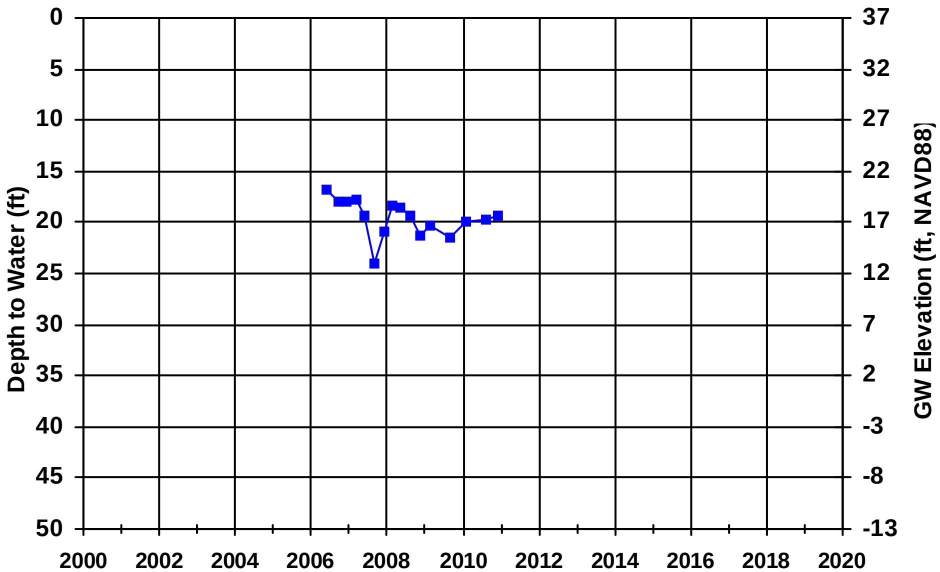



**WellID:** **T0601300756-MW-11L**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

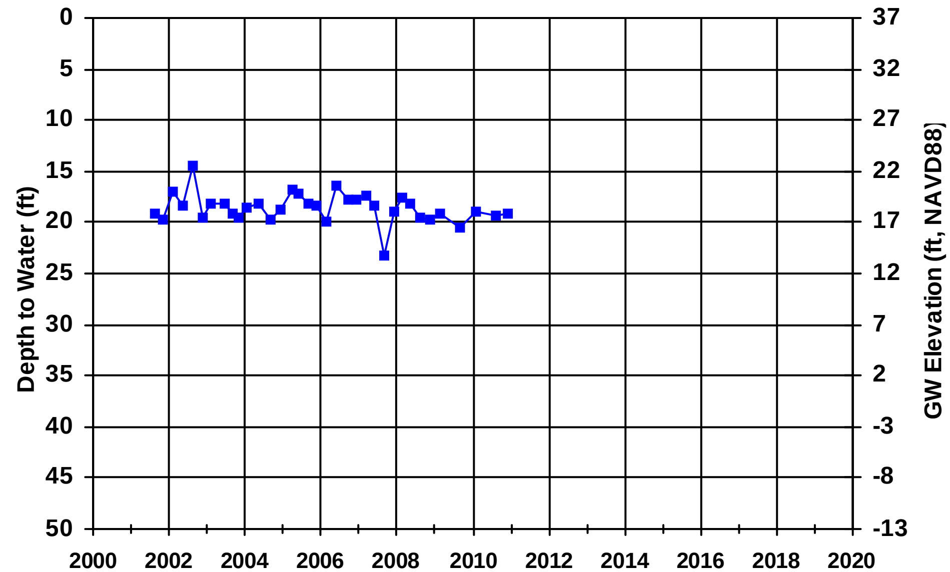



{R_WLhyd88}

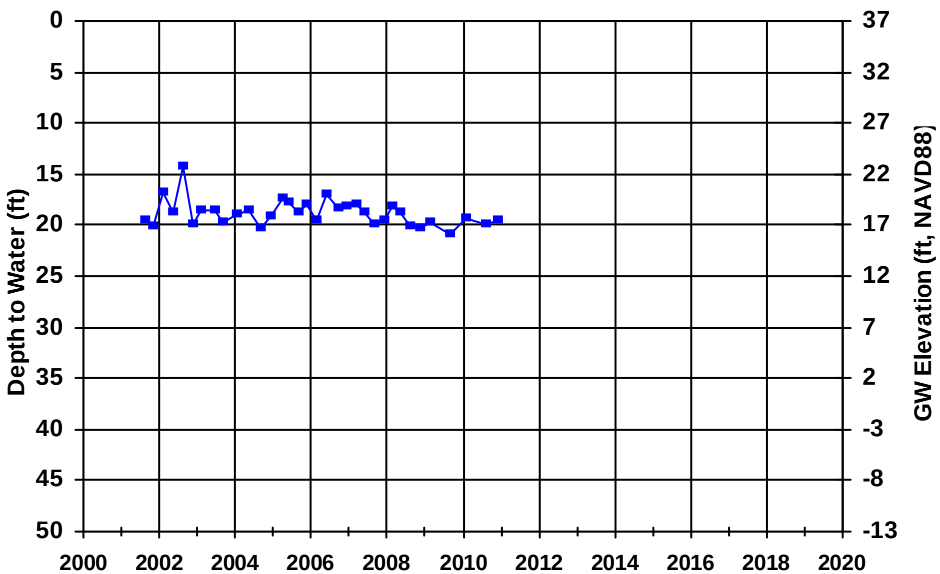
**WellID:** T0601300756-MW-12L
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



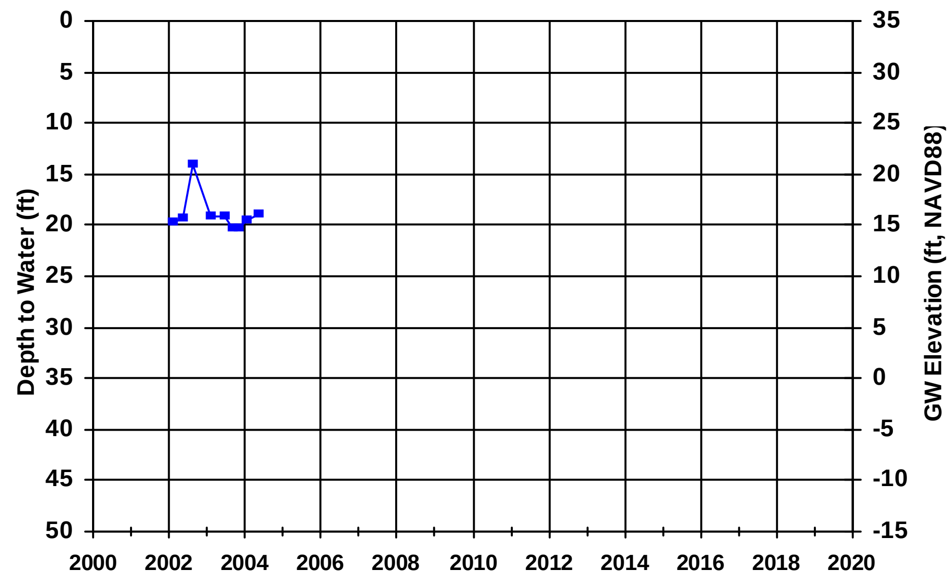

**WellID:** T0601300756-MW-2
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300756-MW-3
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

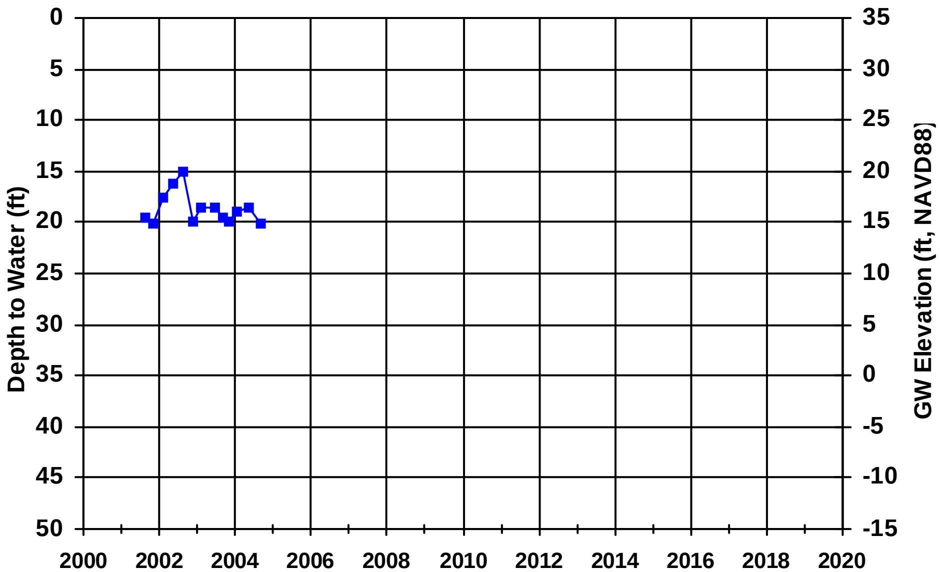



**WellID:** T0601300756-MW-4
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

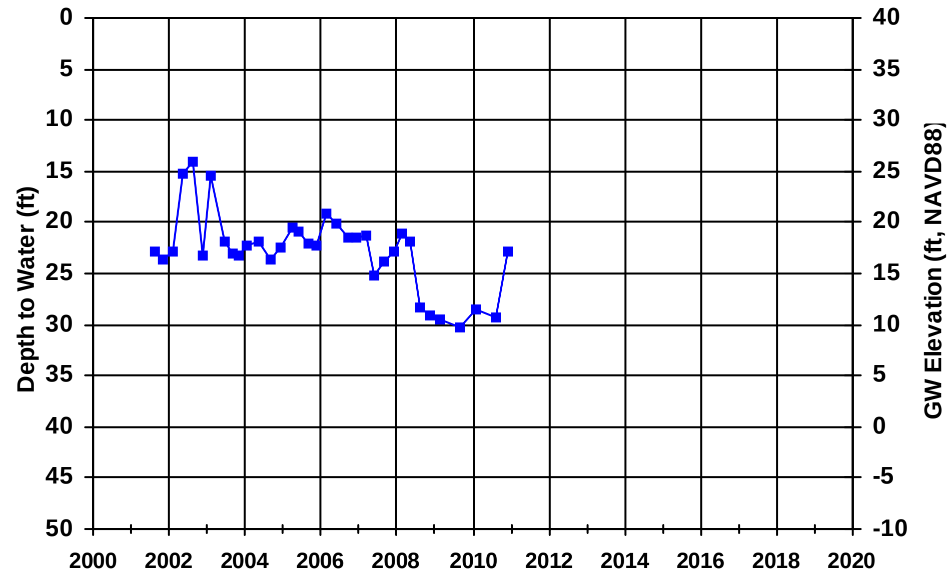



{R_WLhyd88}

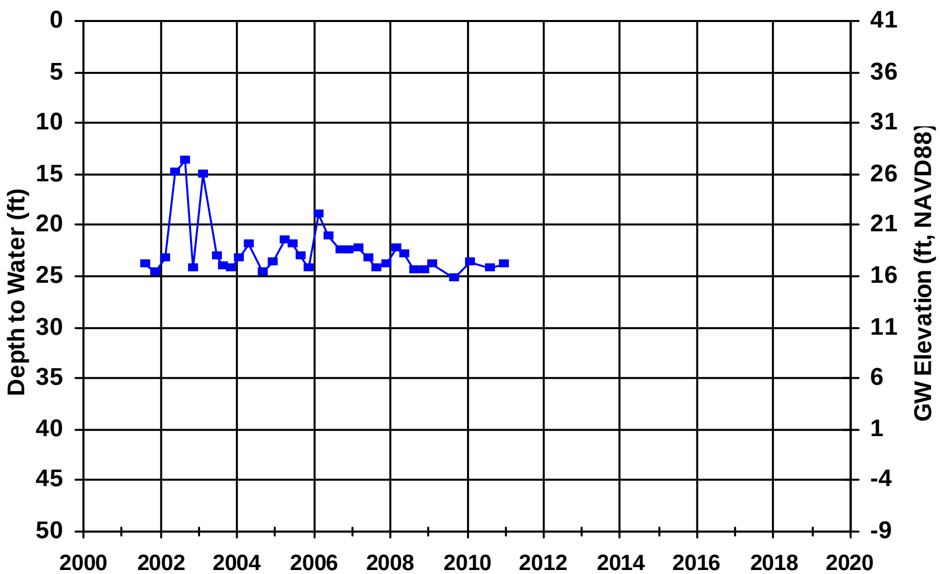
**WellID:** T0601300756-MW-5
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



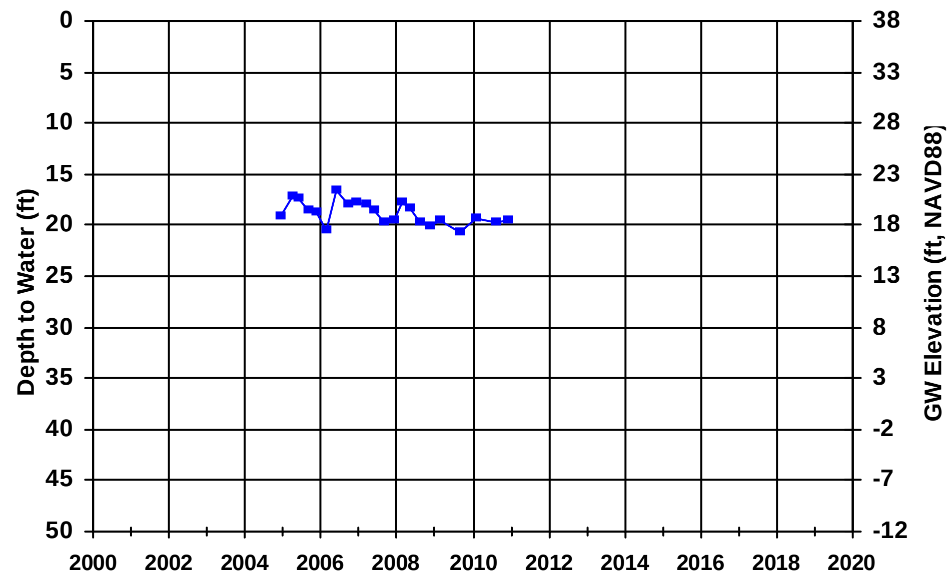

**WellID:** T0601300756-MW-6A
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300756-MW-7A
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

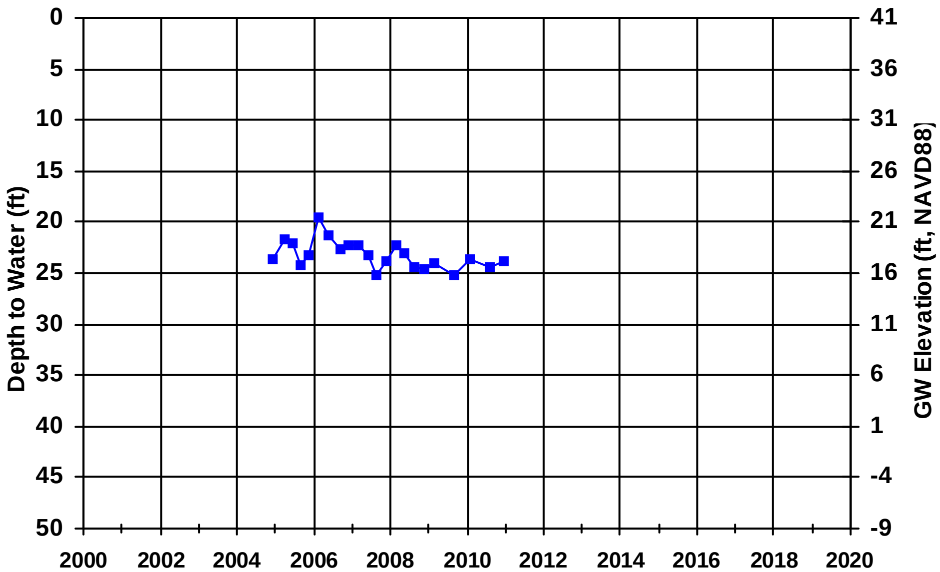



**WellID:** T0601300756-MW-8U
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

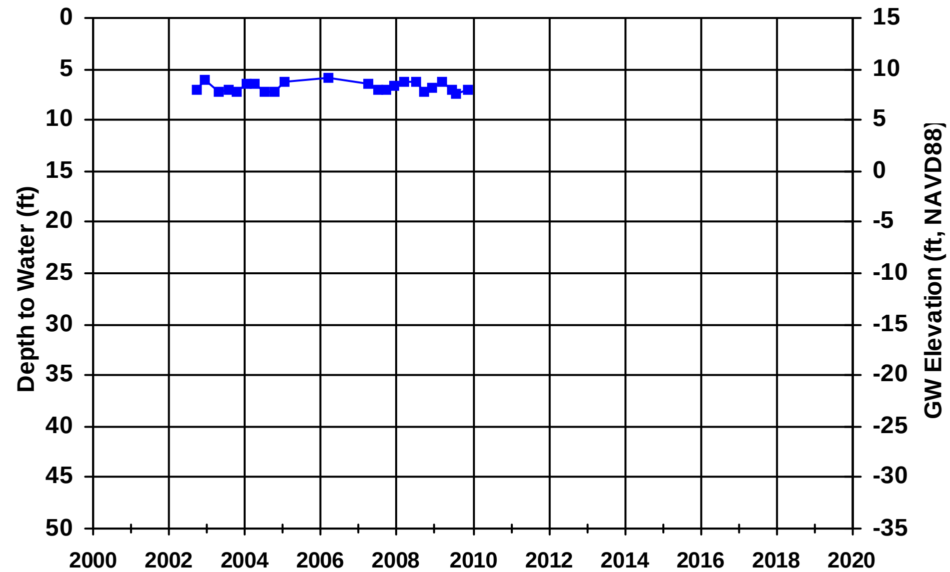



{R_WLhyd88}

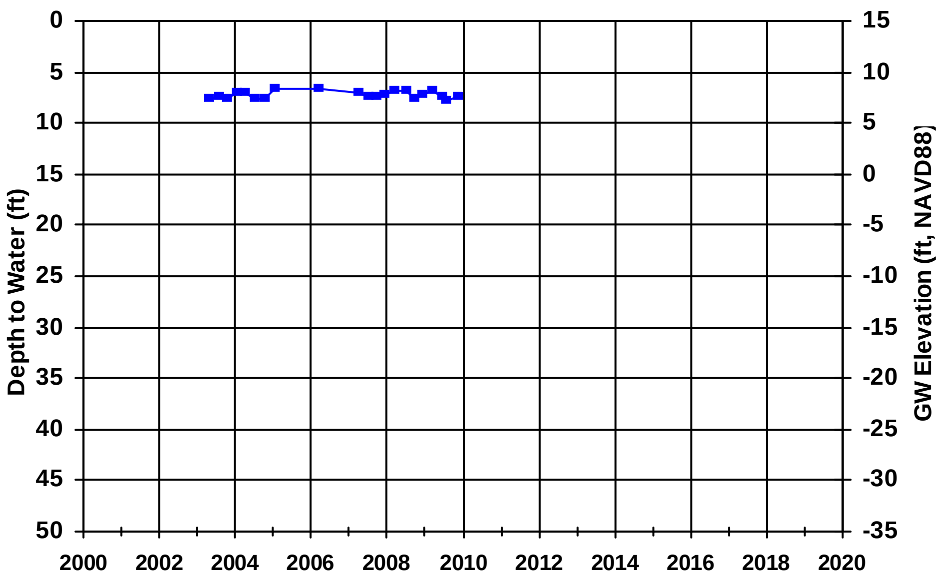
**WellID:** T0601300756-MW-9U
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



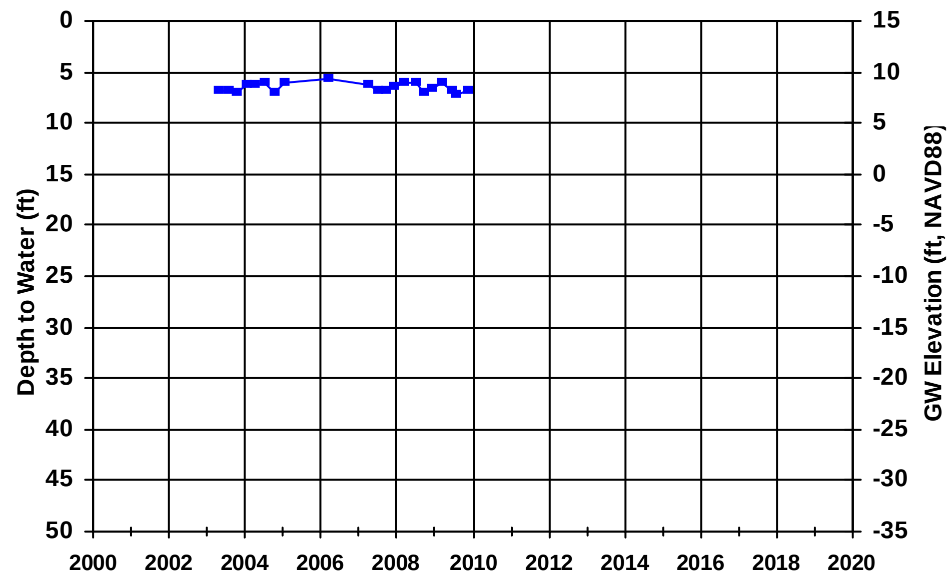

**WellID:** T0601300764-MW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



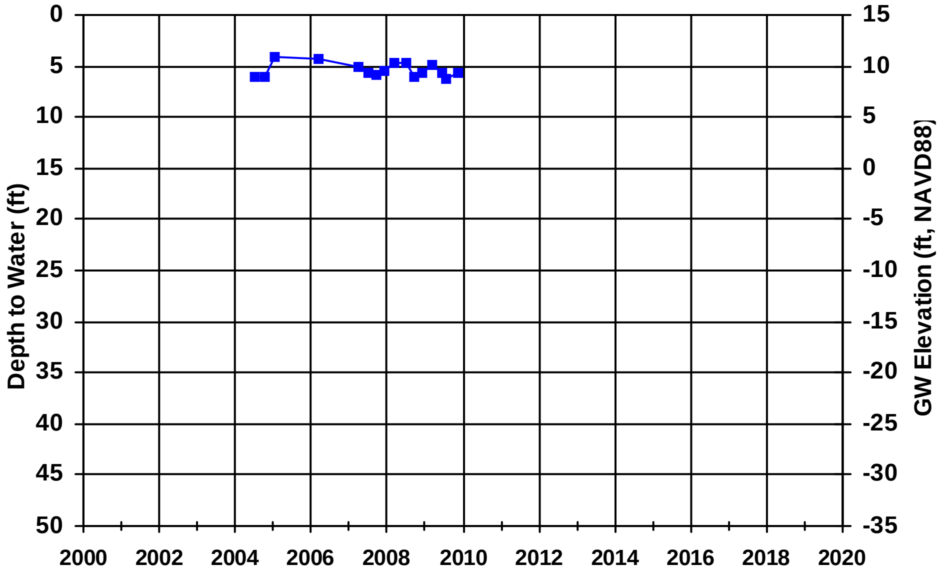

**WellID:** T0601300764-MW-10
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



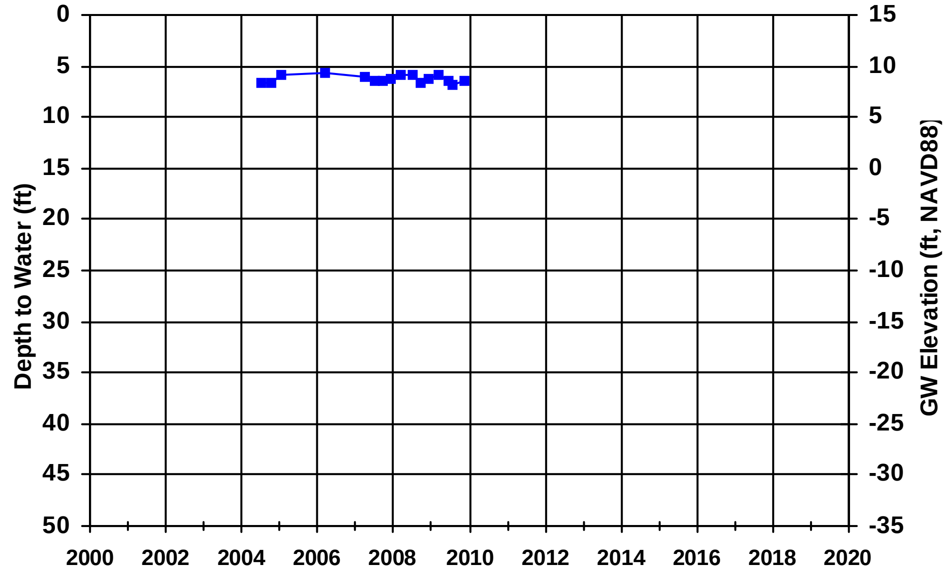

**WellID:** T0601300764-MW-11
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



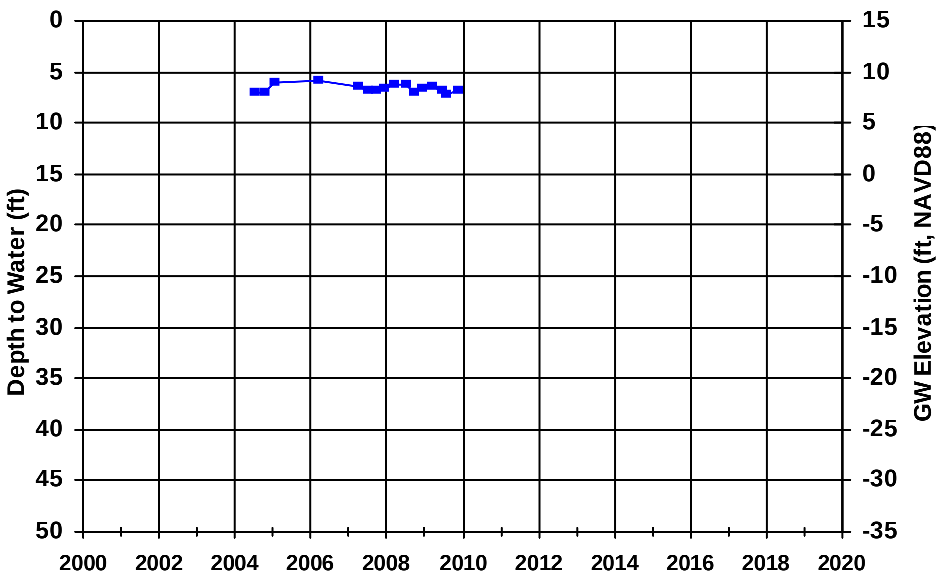
**WellID:** **T0601300764-MW-12**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



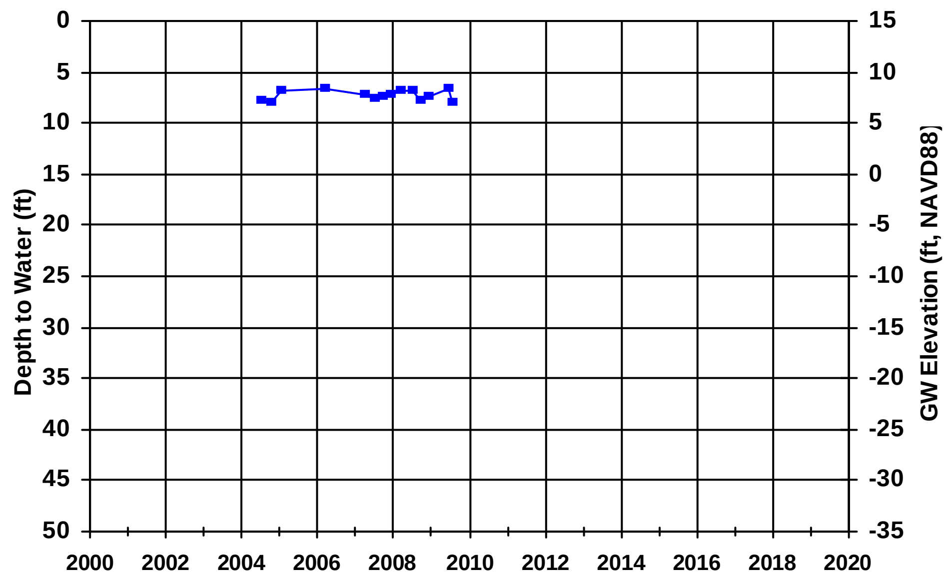

**WellID:** **T0601300764-MW-13S**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601300764-MW-14D**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

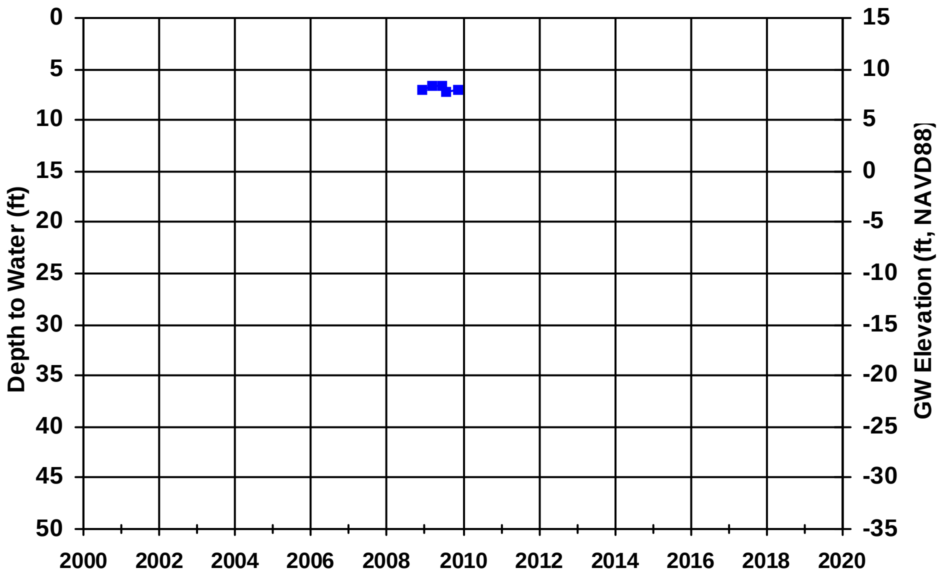



**WellID:** **T0601300764-MW-15**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

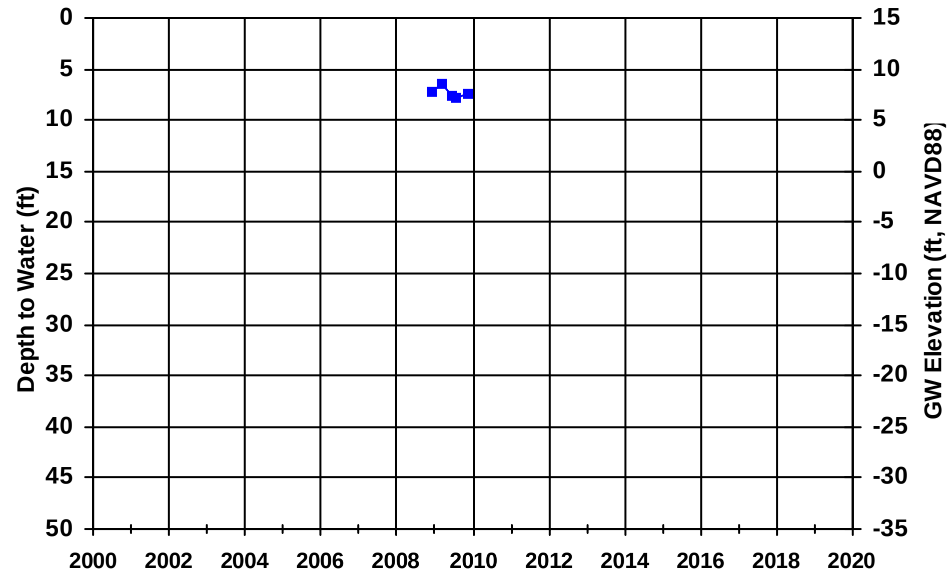



{R_WLhyd88}

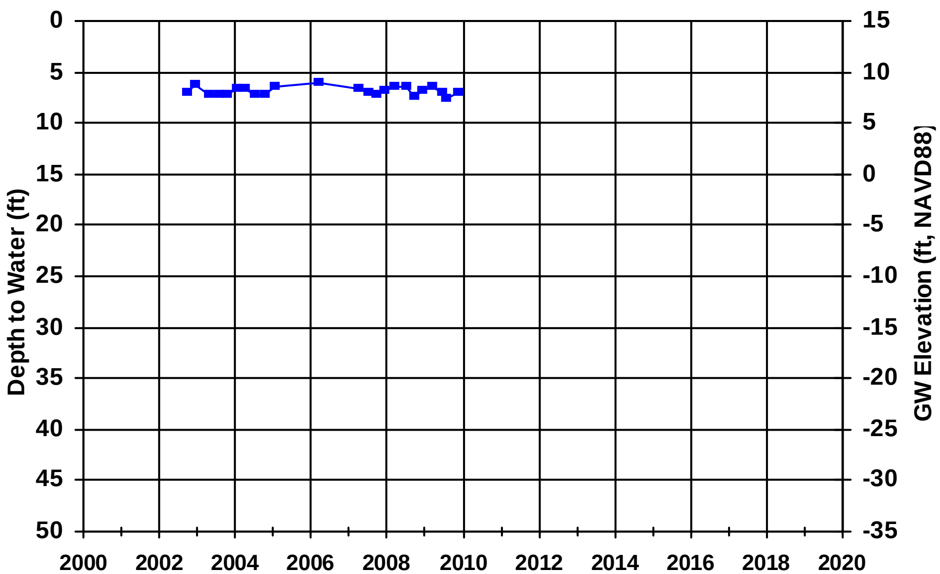
**WellID:** T0601300764-MW-16
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



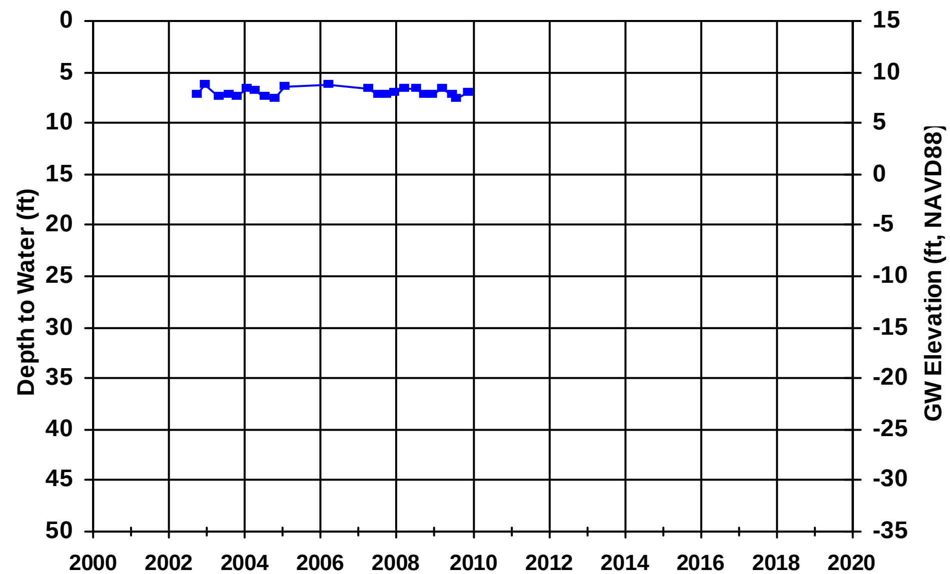

**WellID:** T0601300764-MW-17
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300764-MW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

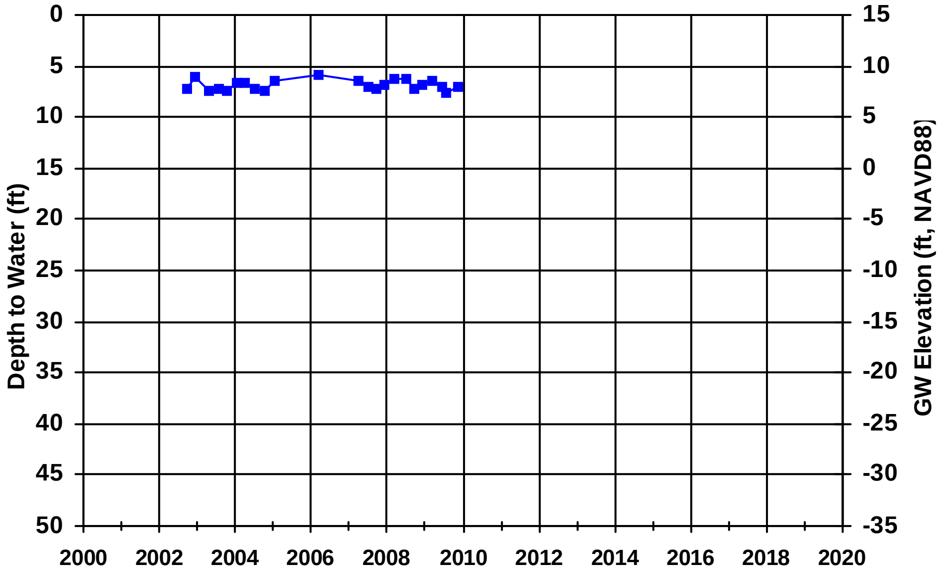



**WellID:** T0601300764-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

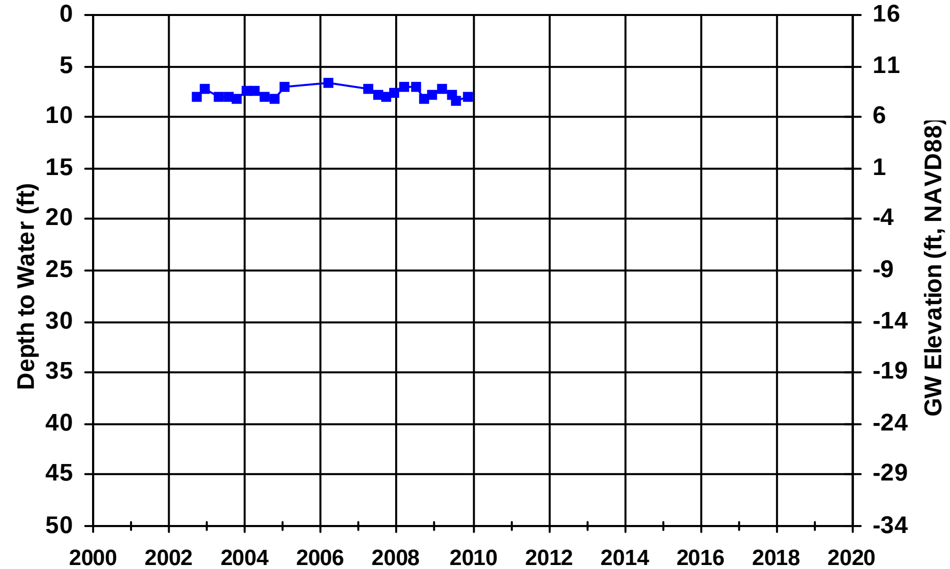



{R_WLhyd88}

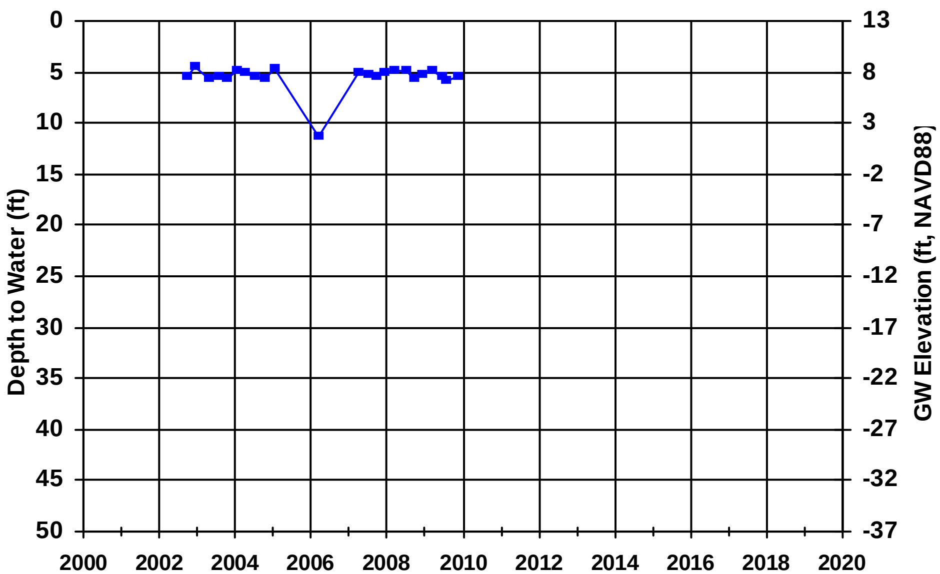
**WellID: T0601300764-MW-4**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



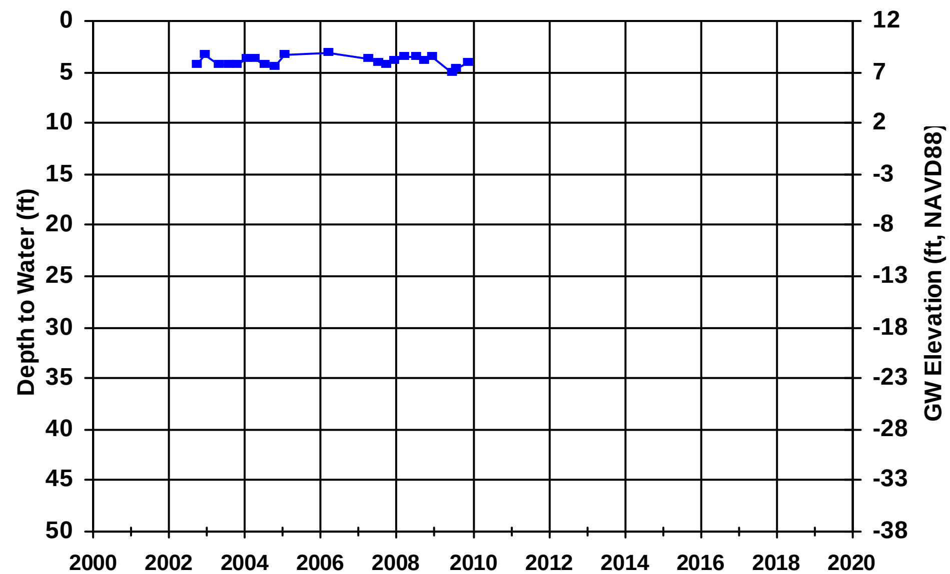

**WellID: T0601300764-MW-5**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID: T0601300764-MW-6**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

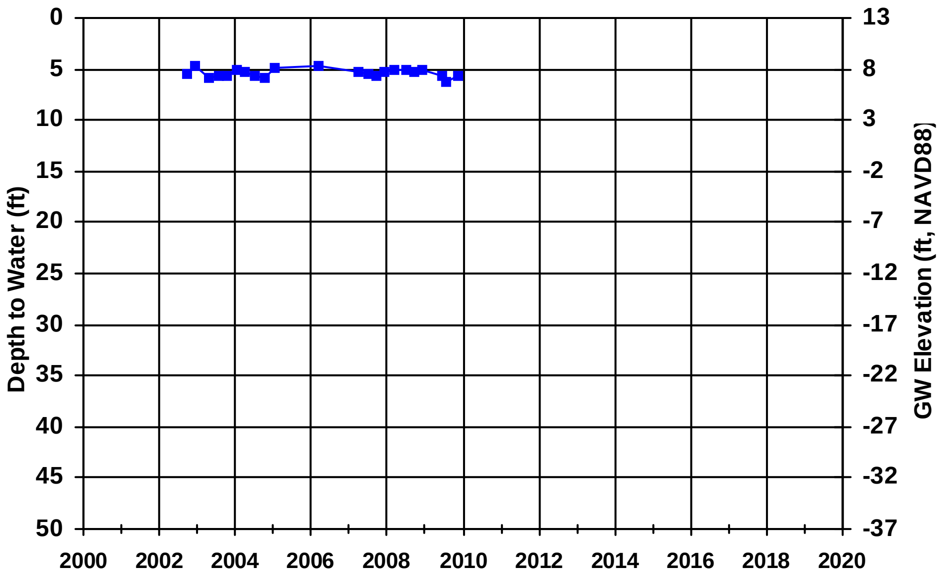



**WellID: T0601300764-MW-7**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

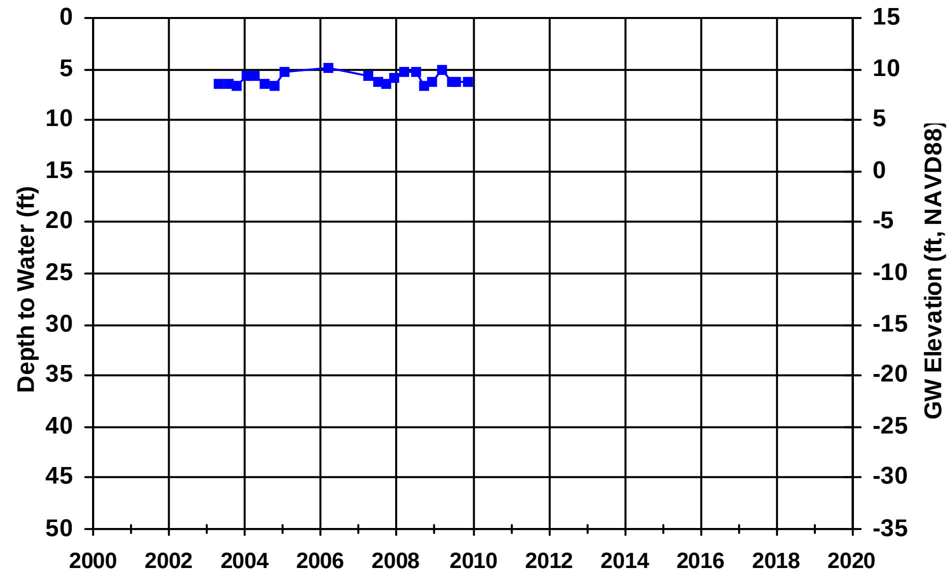



{R_WLhyd88}

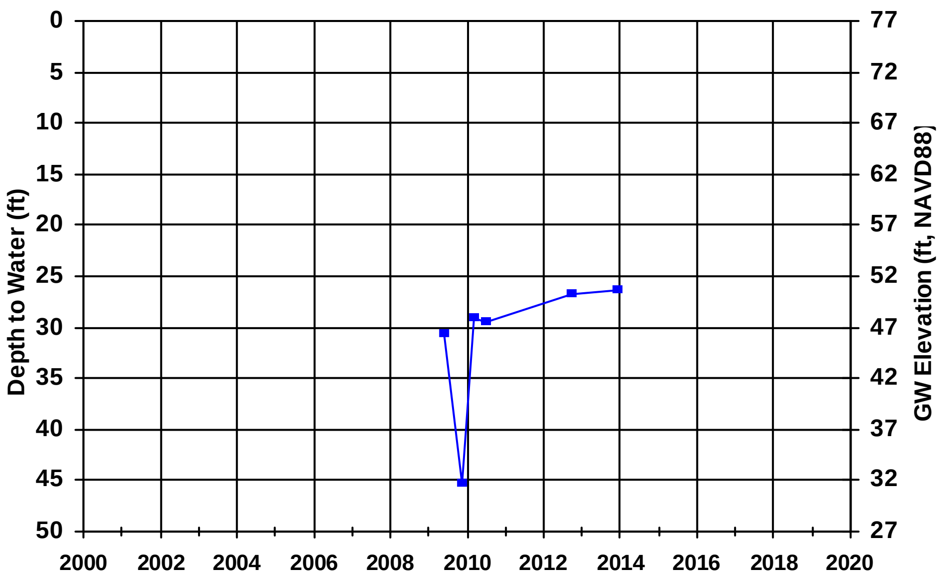
**WellID: T0601300764-MW-8**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



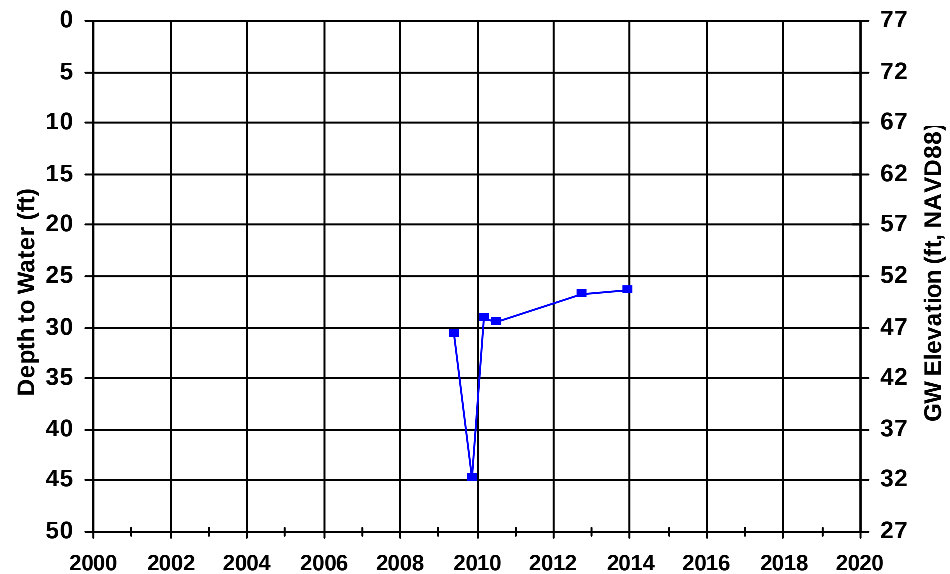

**WellID: T0601300764-MW-9**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300766-IW10**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

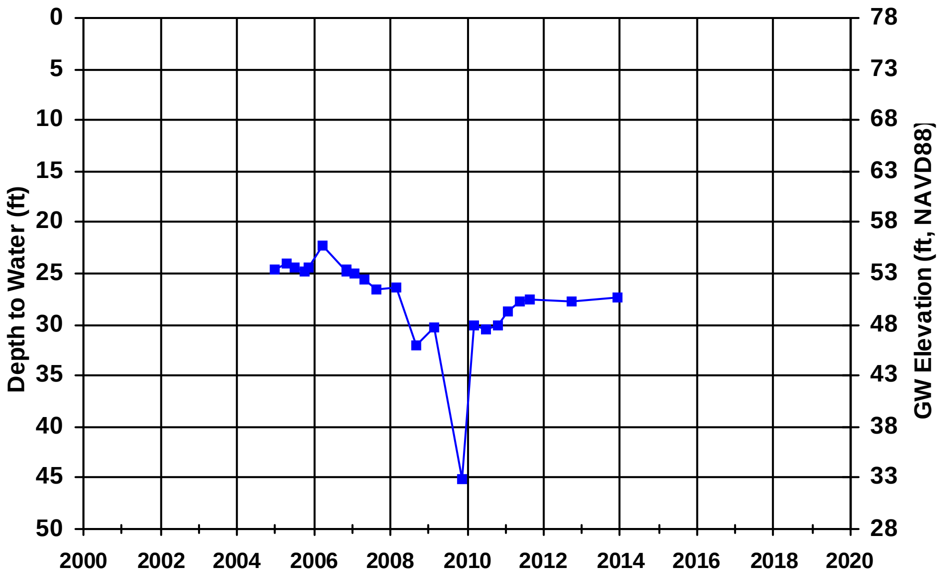



**WellID: T0601300766-IW9**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

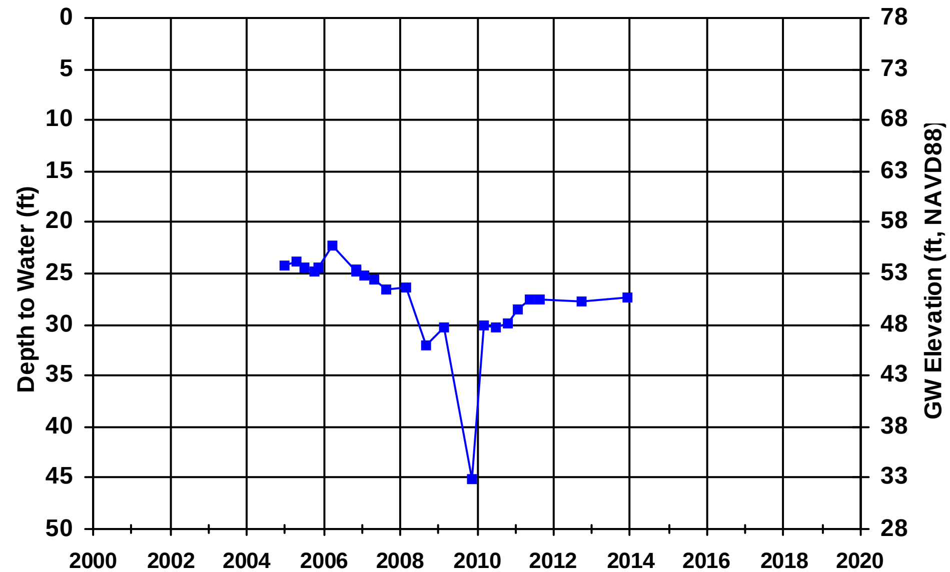



{R_WLhyd88}

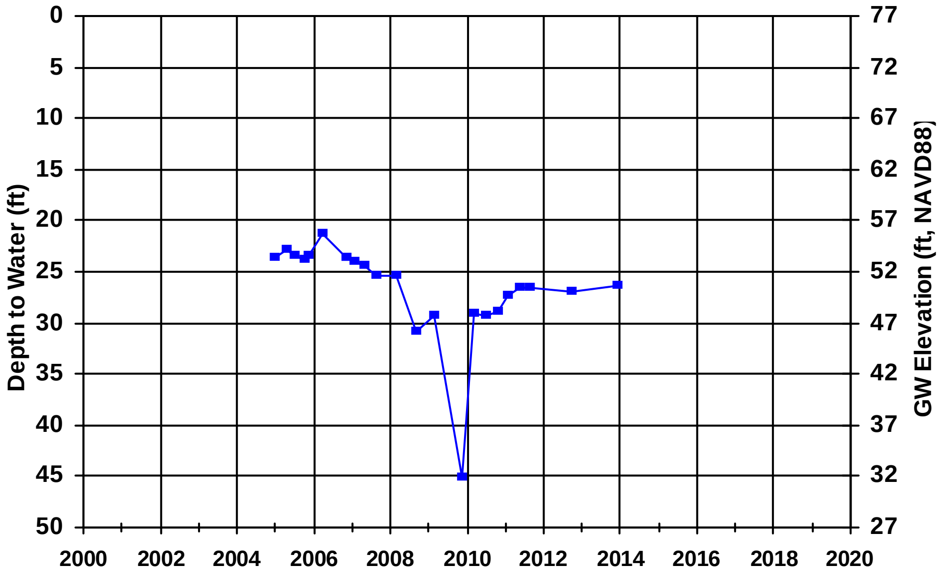
**WellID: T0601300766-MW1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



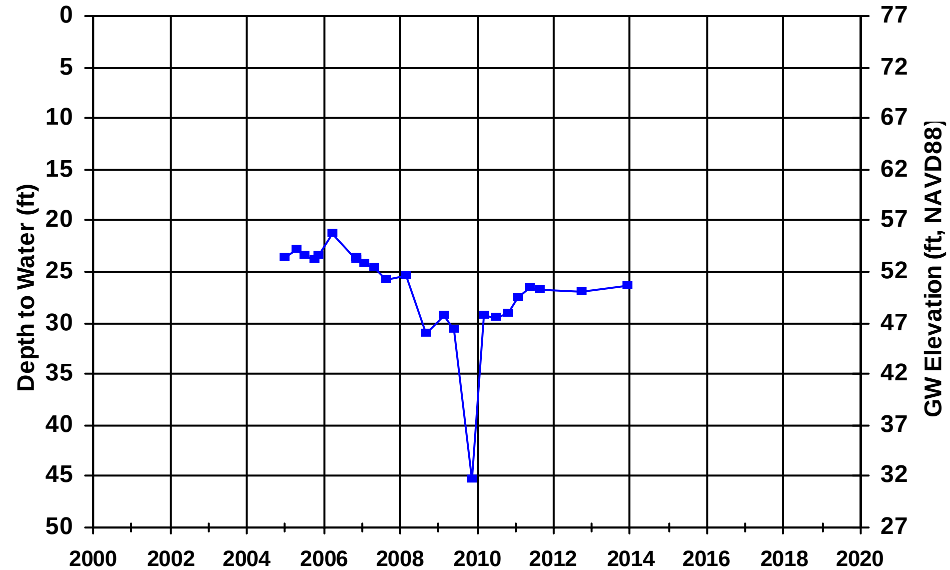

**WellID: T0601300766-MW2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300766-MW3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

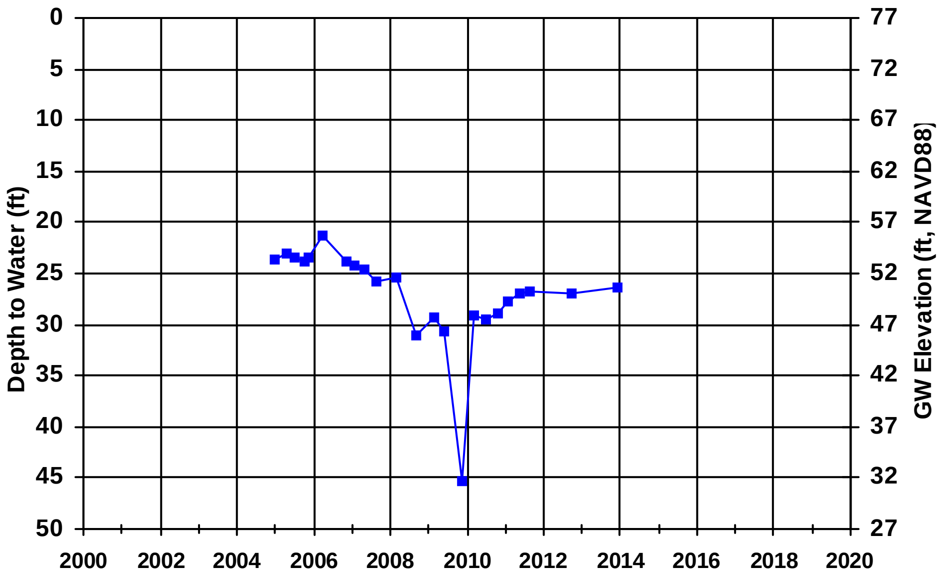



**WellID: T0601300766-MW4**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

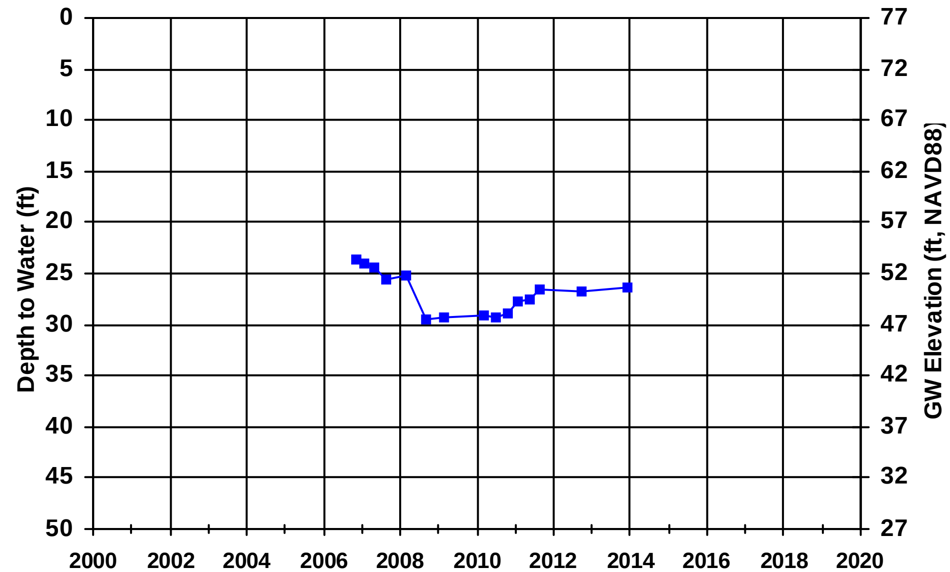



{R_WLhyd88}

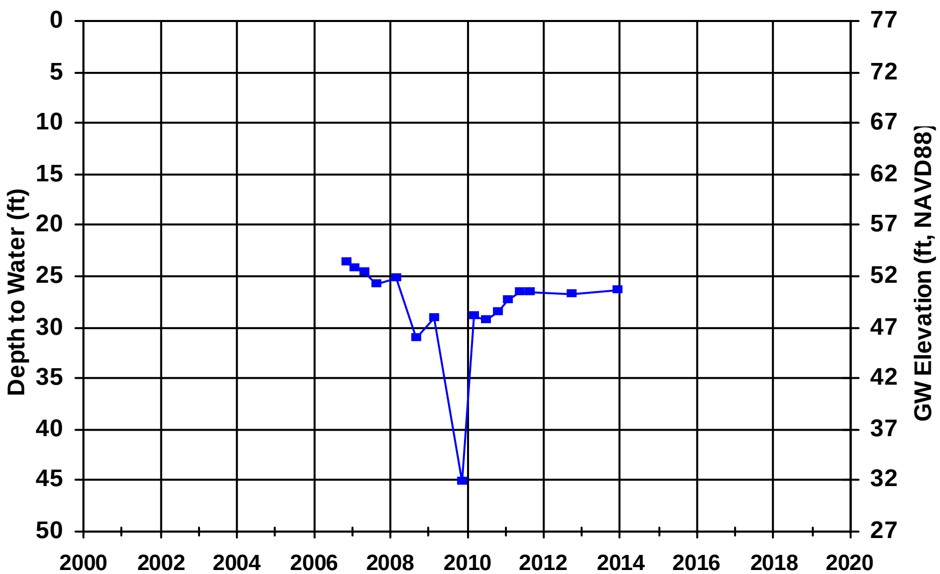
WellID: T0601300766-MW5
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



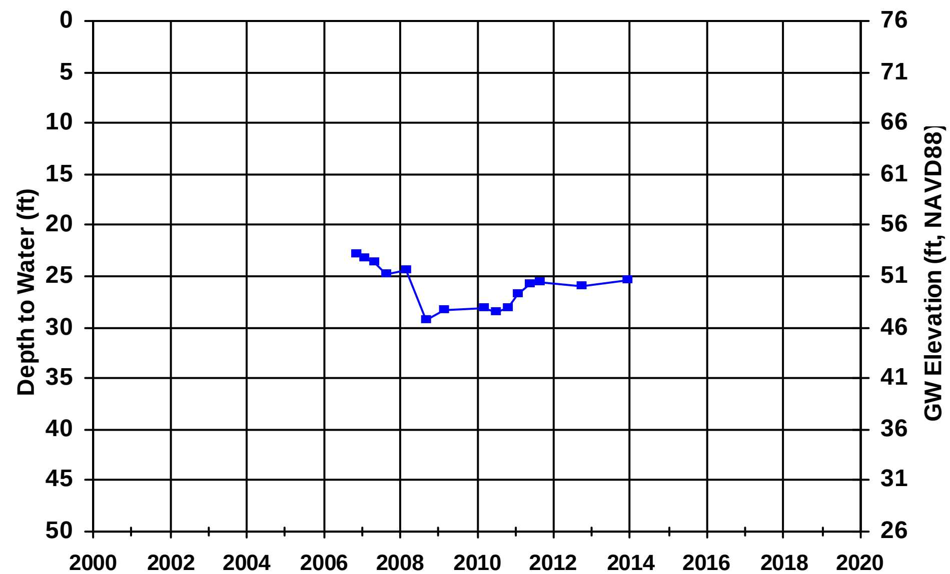

WellID: T0601300766-MW6A
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300766-MW6B
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

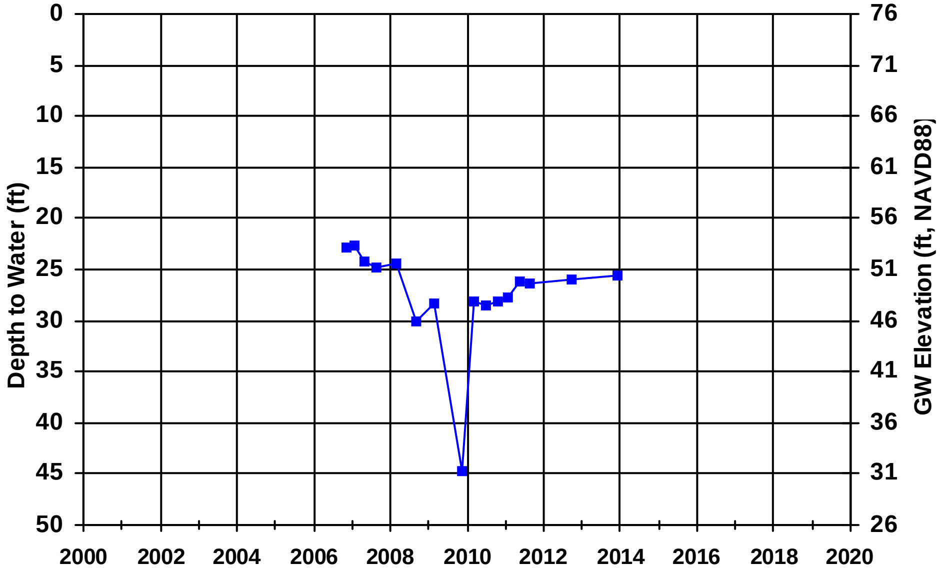



WellID: T0601300766-MW7A
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

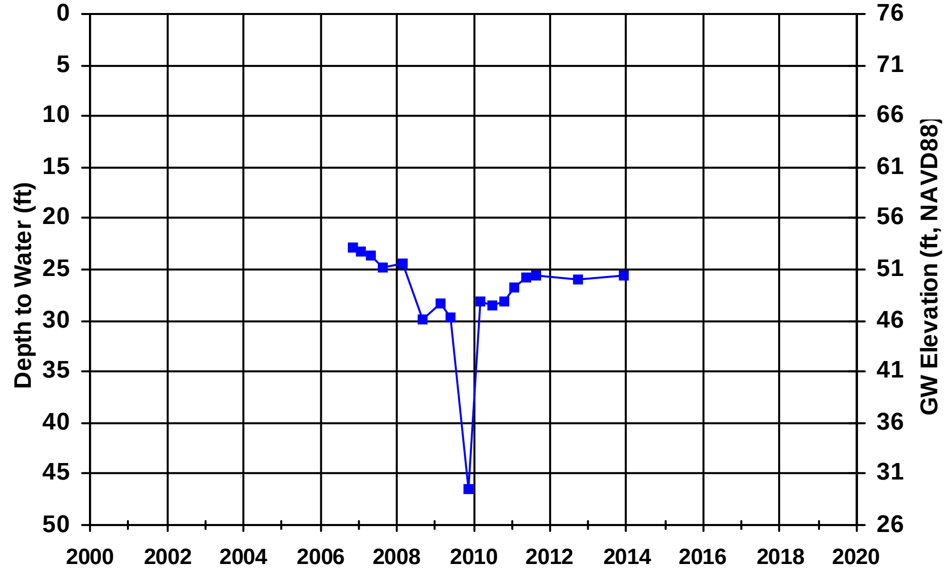



{R_WLhyd88}

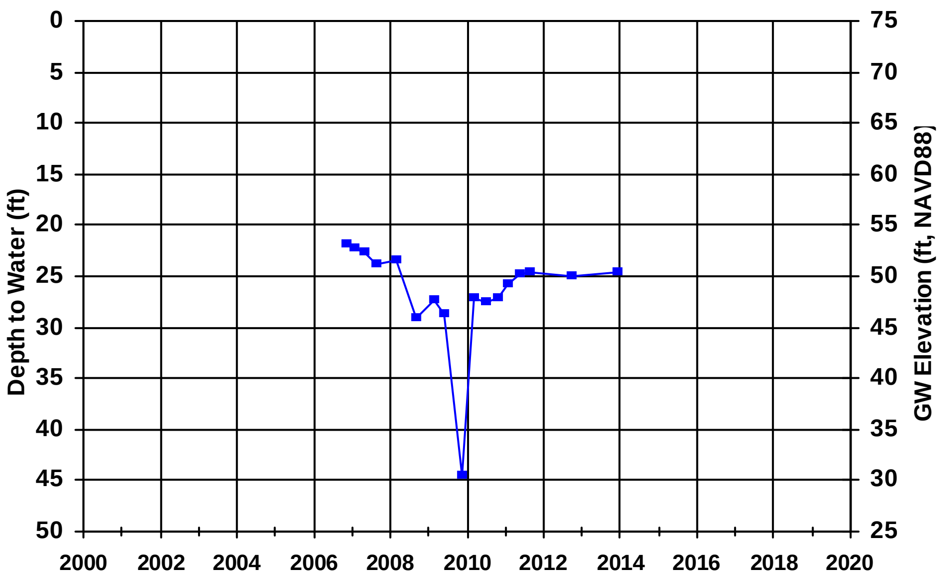
**WellID:** **T0601300766-MW7B**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



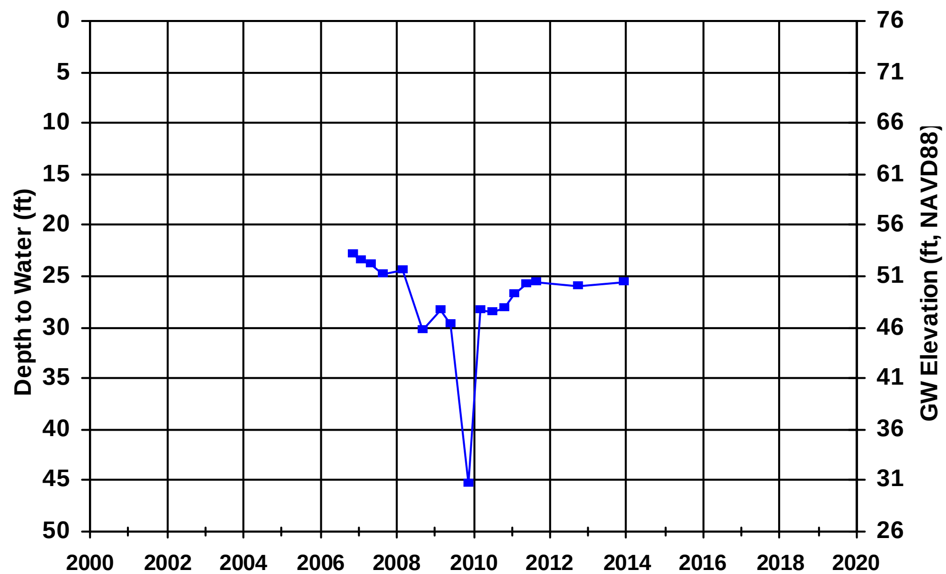

**WellID:** **T0601300766-MW8A**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300766-MW8B**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

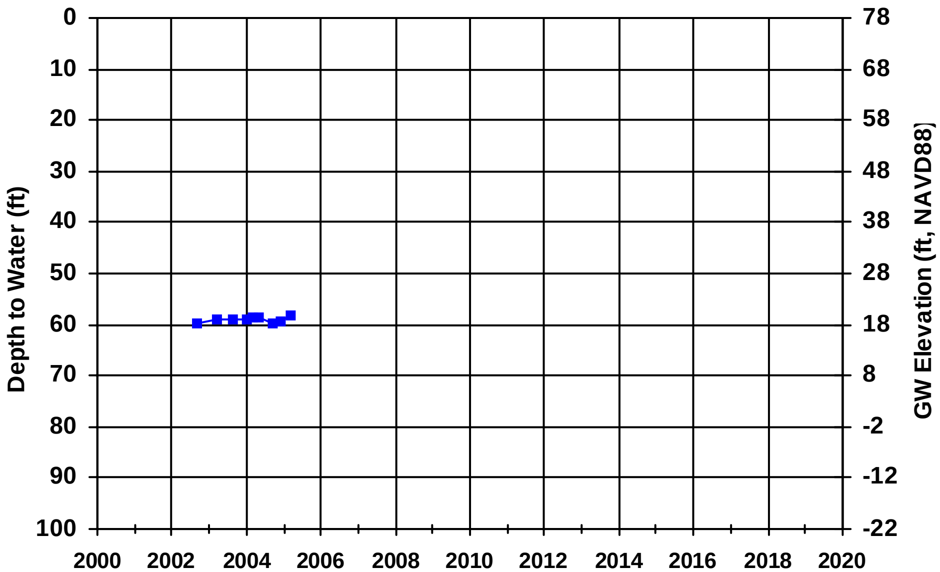



**WellID:** **T0601300766-MW8C**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

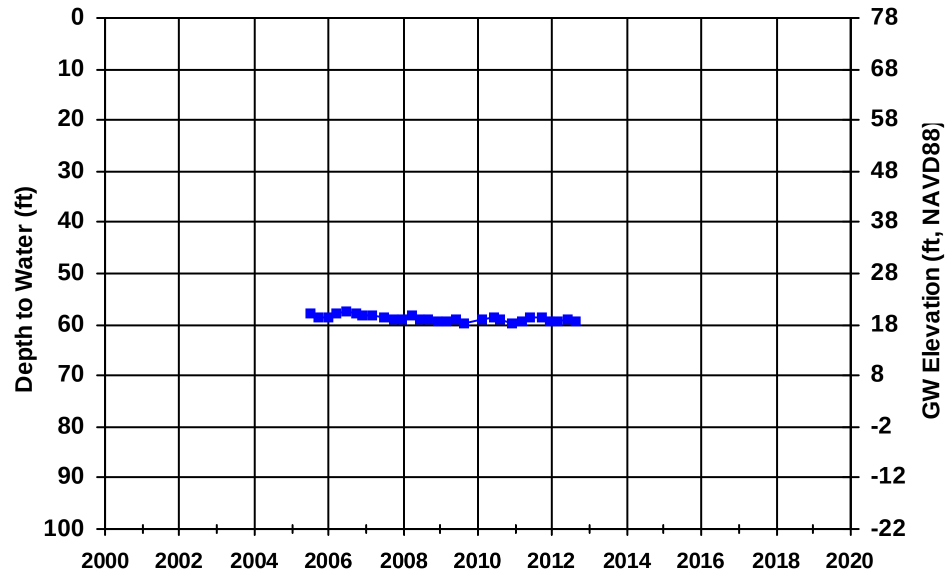



{R_WLhyd88}

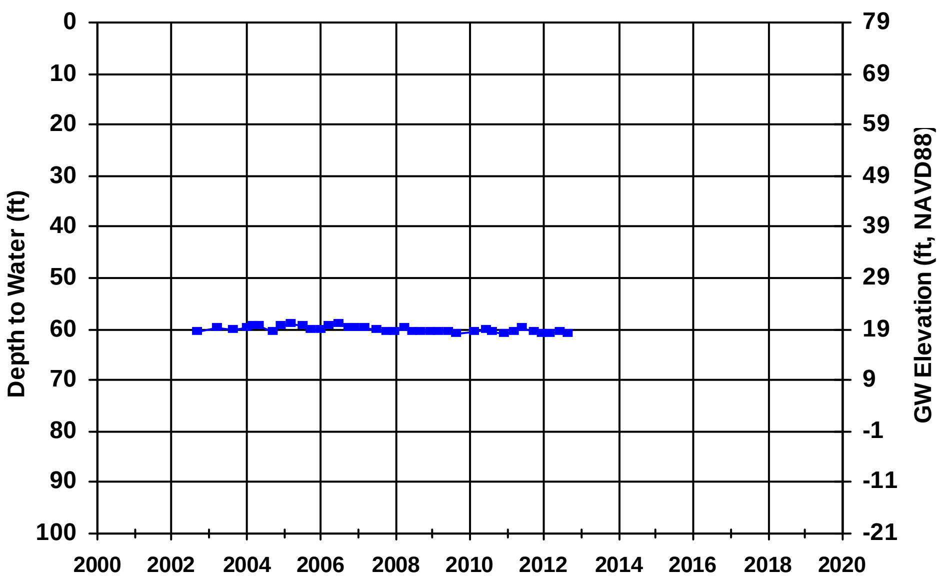
**WellID: T0601300768-MW-1**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



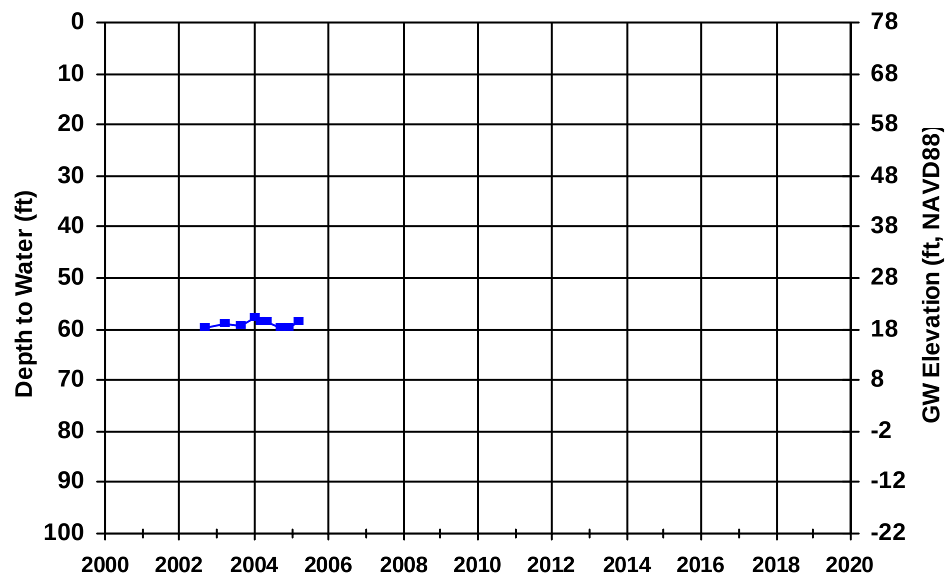

**WellID: T0601300768-MW-1R**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID: T0601300768-MW-2**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

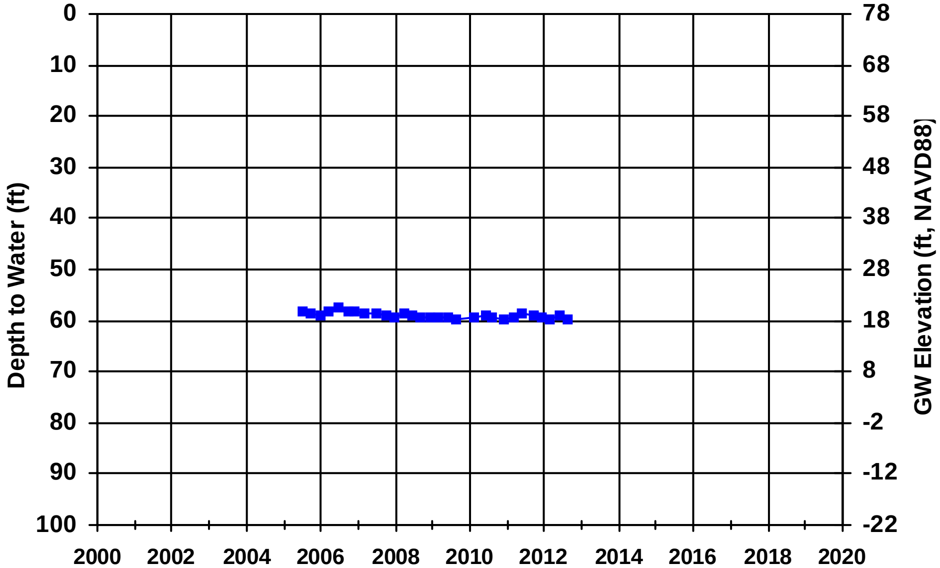



**WellID: T0601300768-MW-3**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

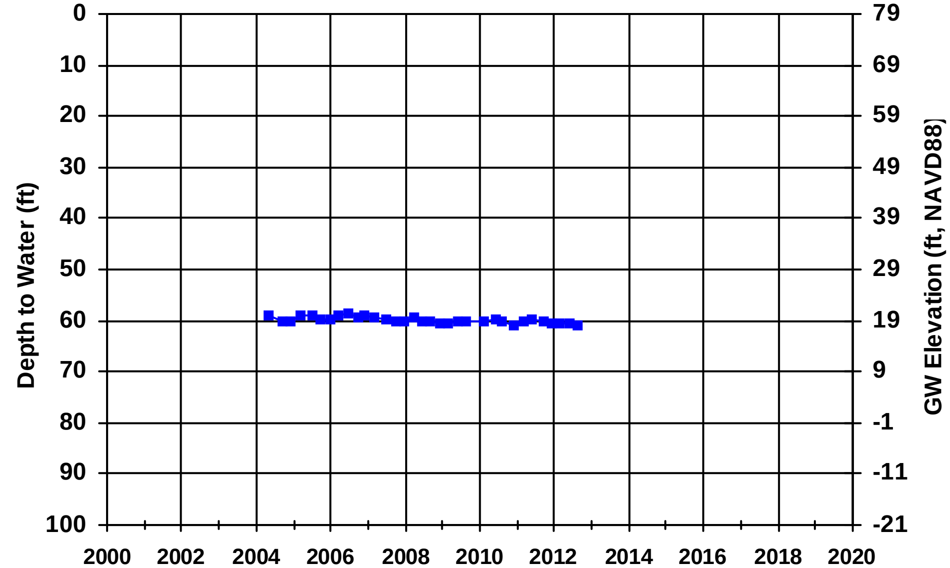



{R_WLhyd88}

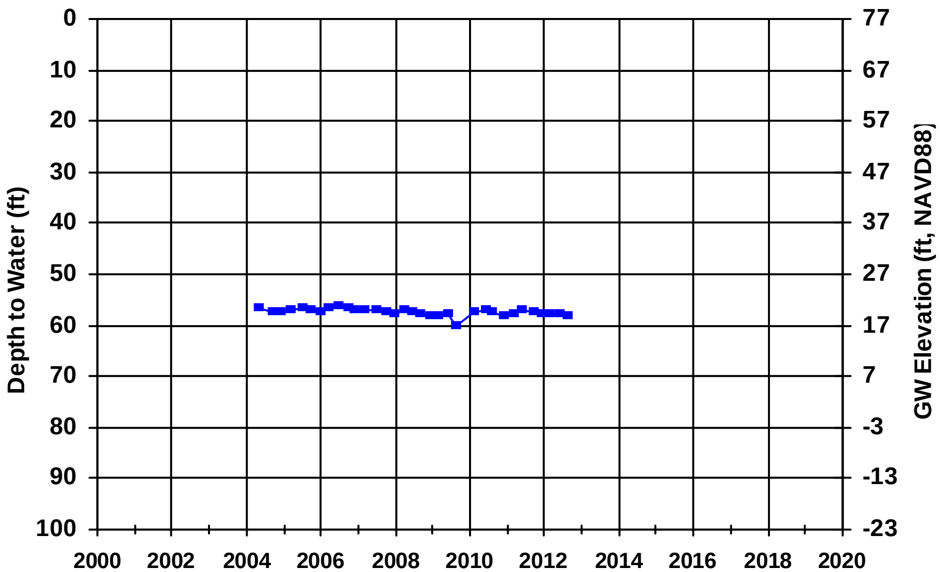
**WellID: T0601300768-MW-3R**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



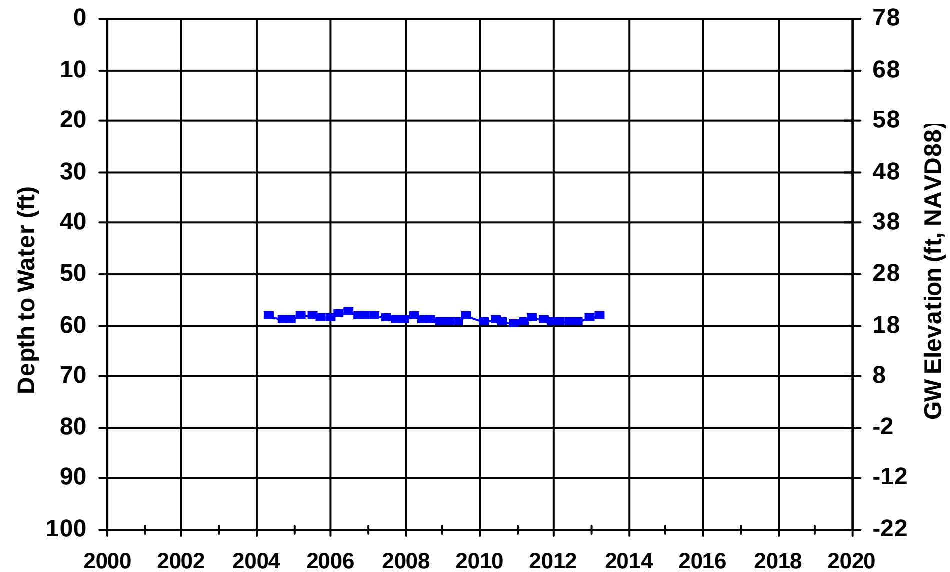

**WellID: T0601300768-MW-4**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID: T0601300768-MW-6**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

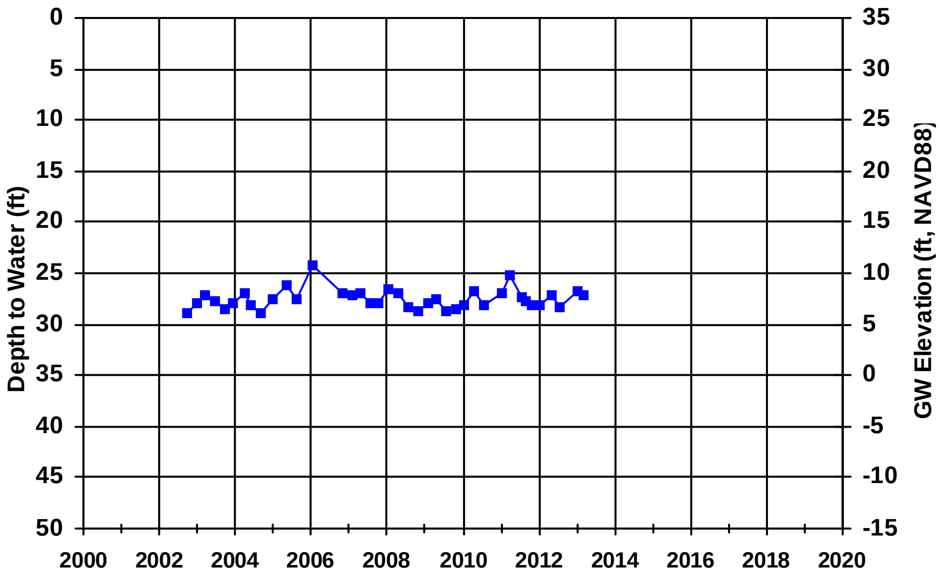



**WellID: T0601300768-MW-7**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

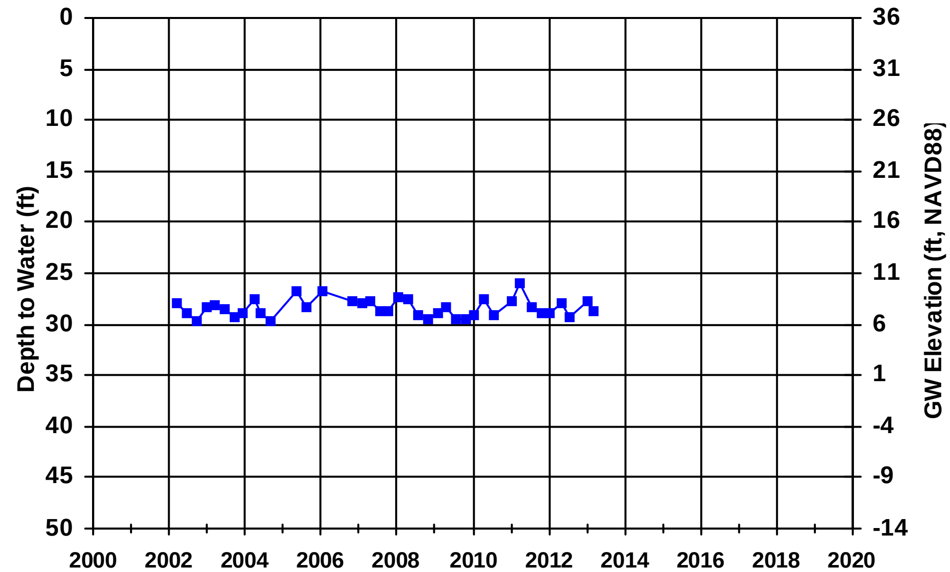



{R_WLhyd88}

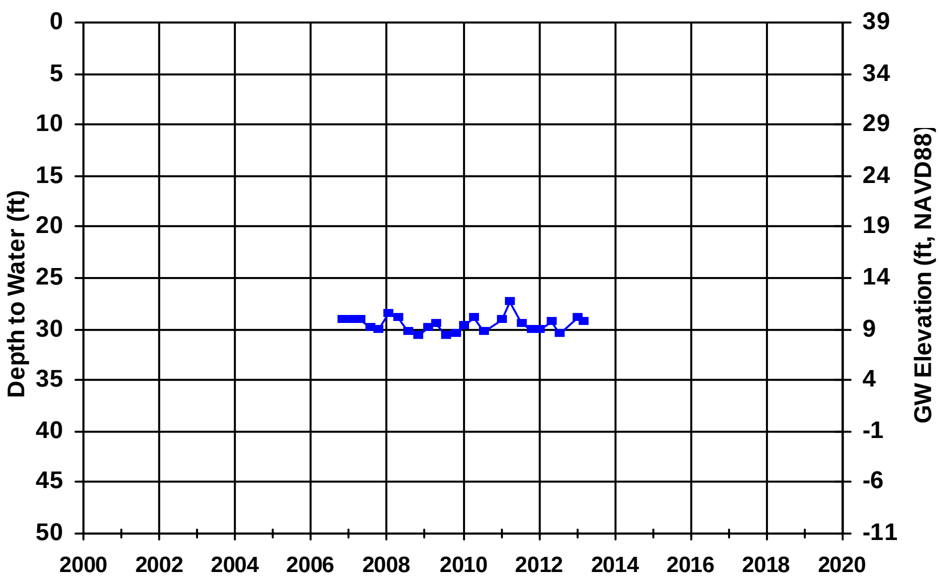
**WellID:** T0601300772-MW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



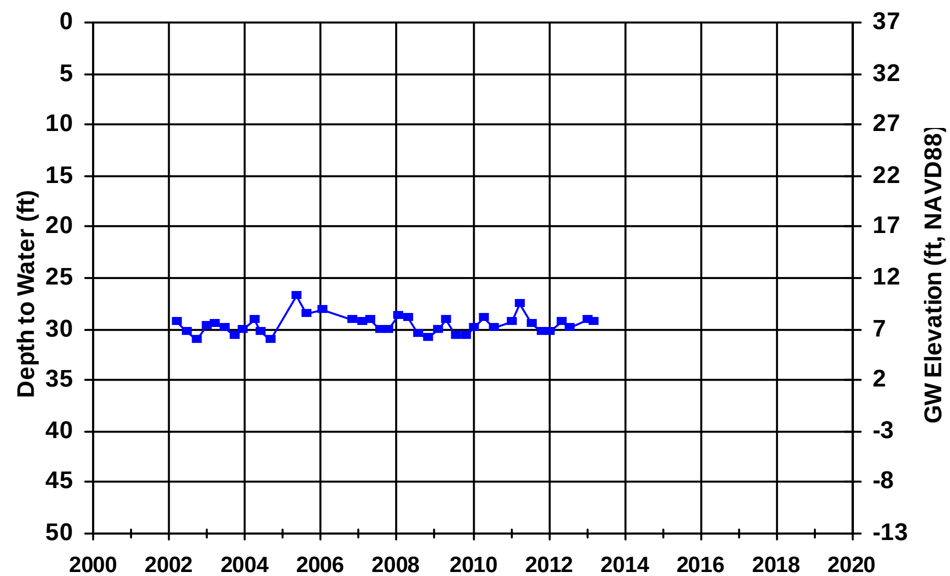

**WellID:** T0601300772-MW-10
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



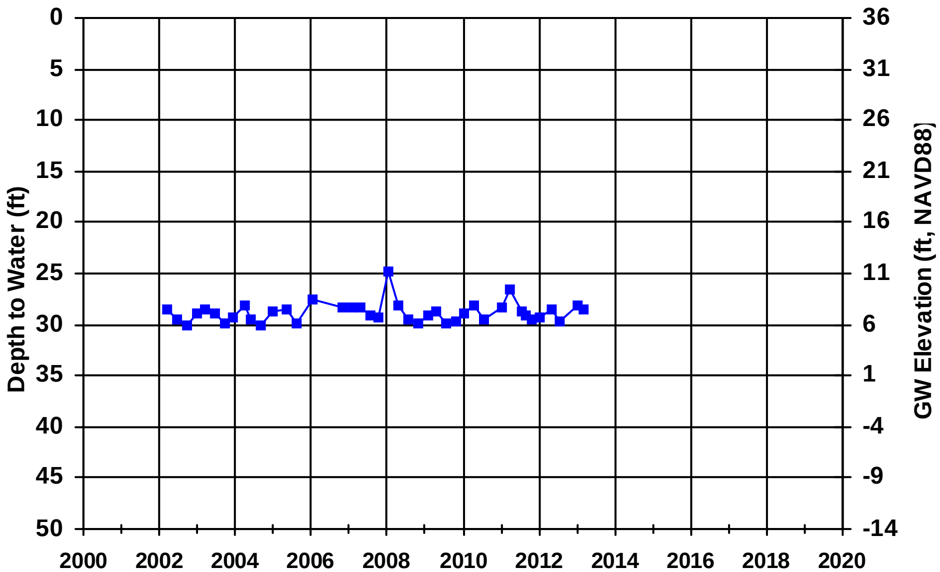

**WellID:** T0601300772-MW-11
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



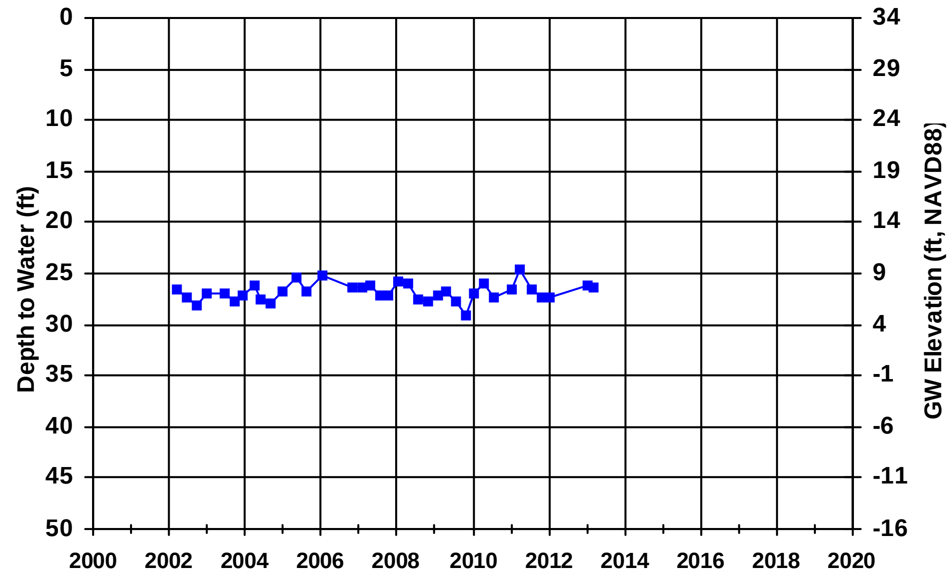

**WellID:** T0601300772-MW-12
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



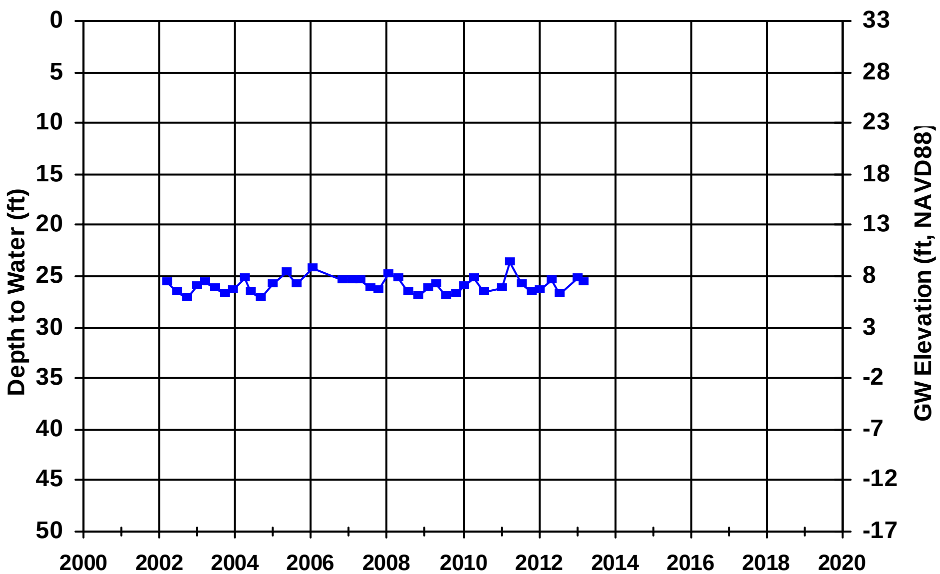
**WellID:** **T0601300772-MW-13**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



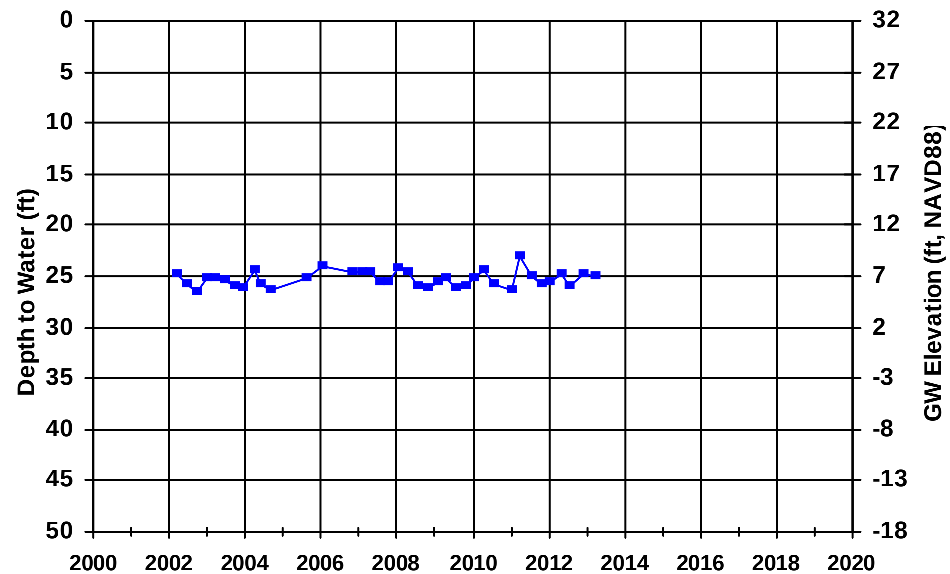

**WellID:** **T0601300772-MW-14**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



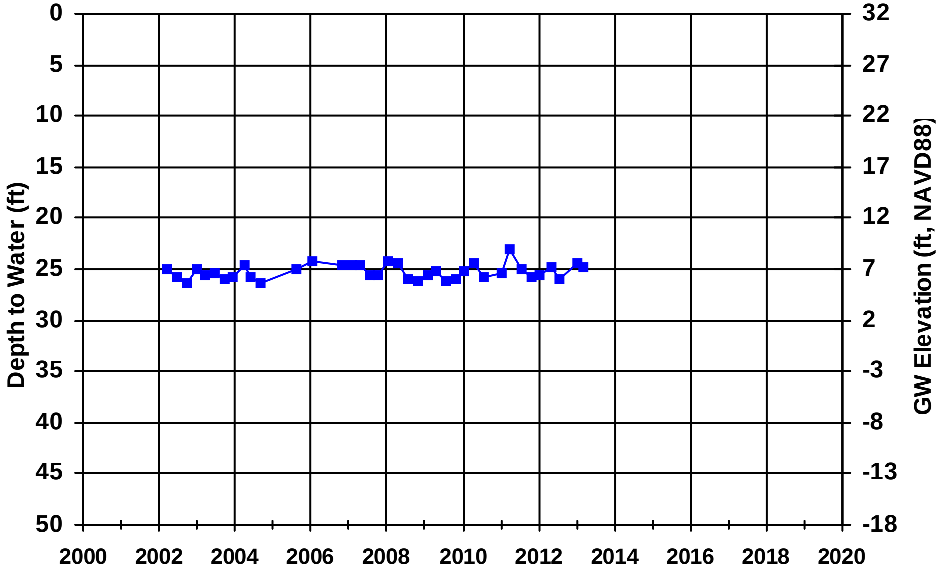

**WellID:** **T0601300772-MW-15**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



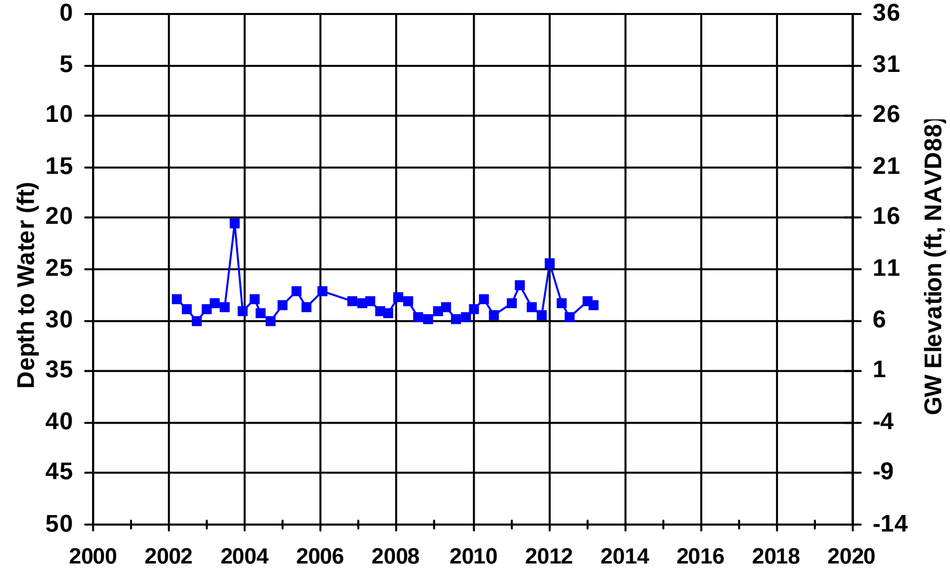

**WellID:** **T0601300772-MW-16**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



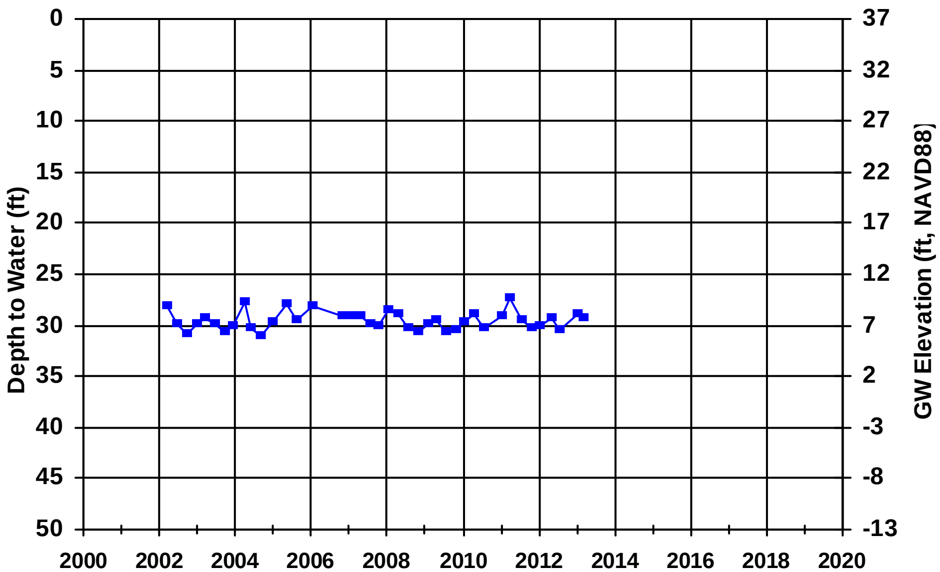
**WellID:** T0601300772-MW-17
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



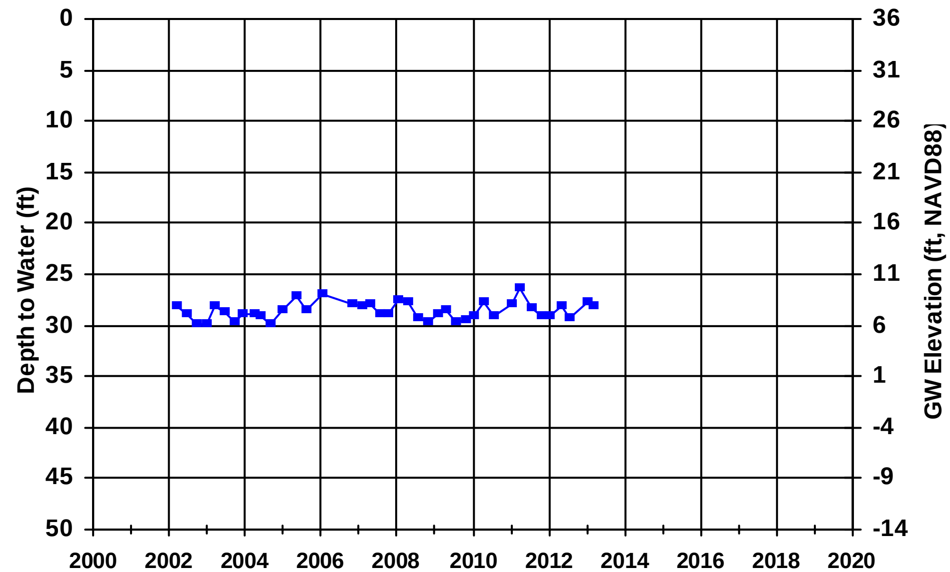

**WellID:** T0601300772-MW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300772-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

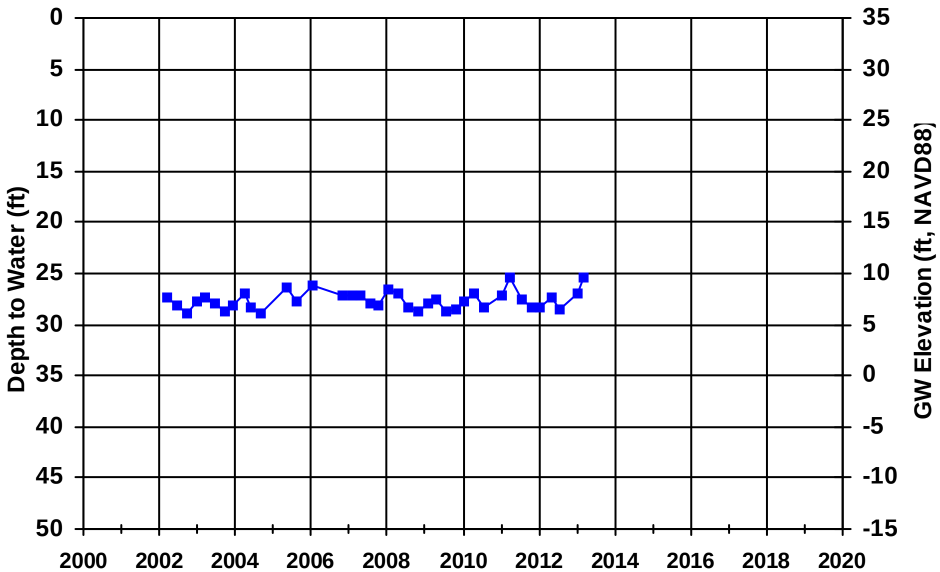



**WellID:** T0601300772-MW-4
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

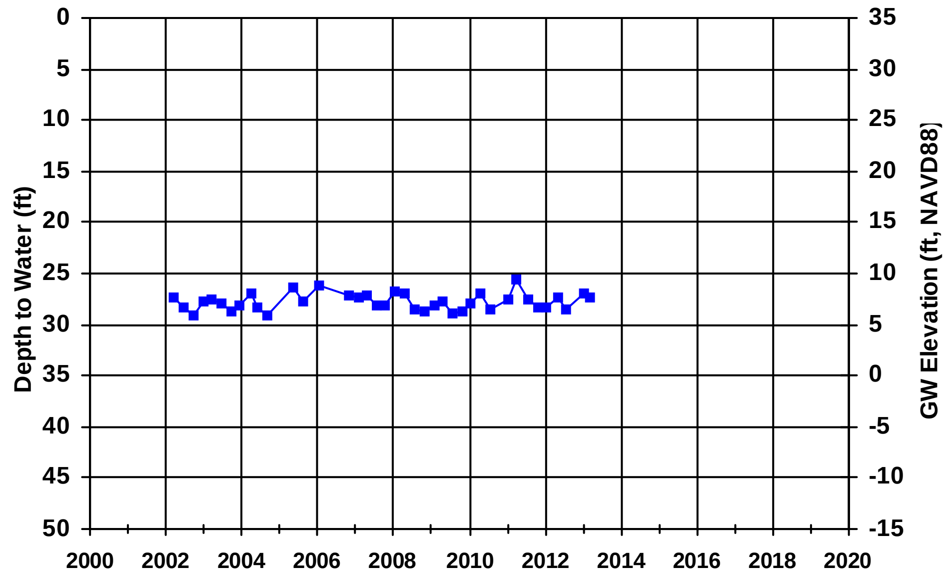



{R_WLhyd88}

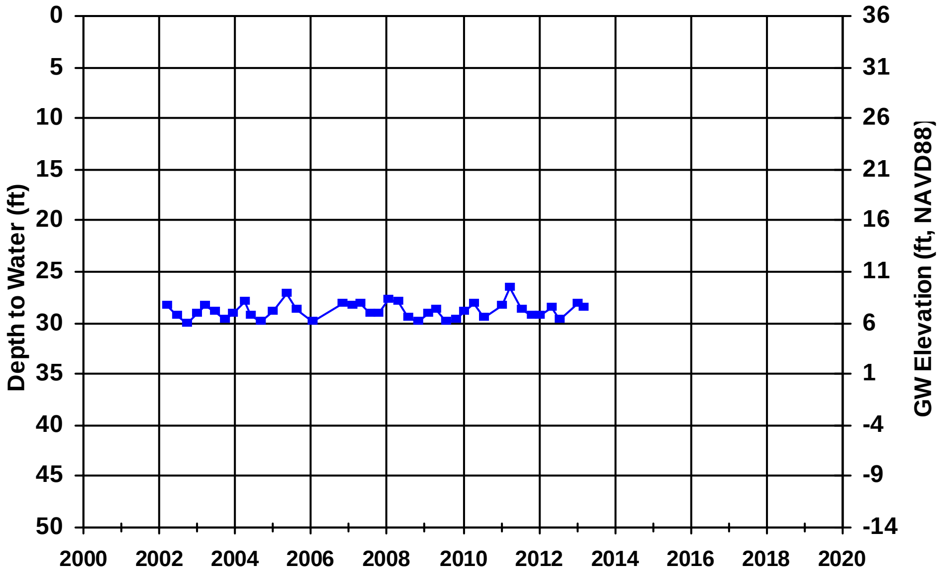
WellID: T0601300772-MW-5
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



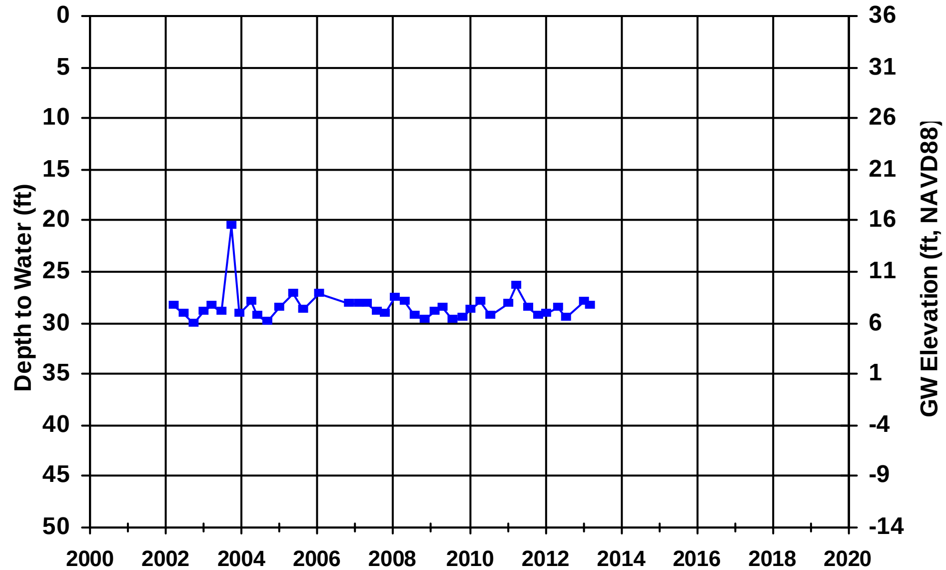

WellID: T0601300772-MW-6
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300772-MW-7
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

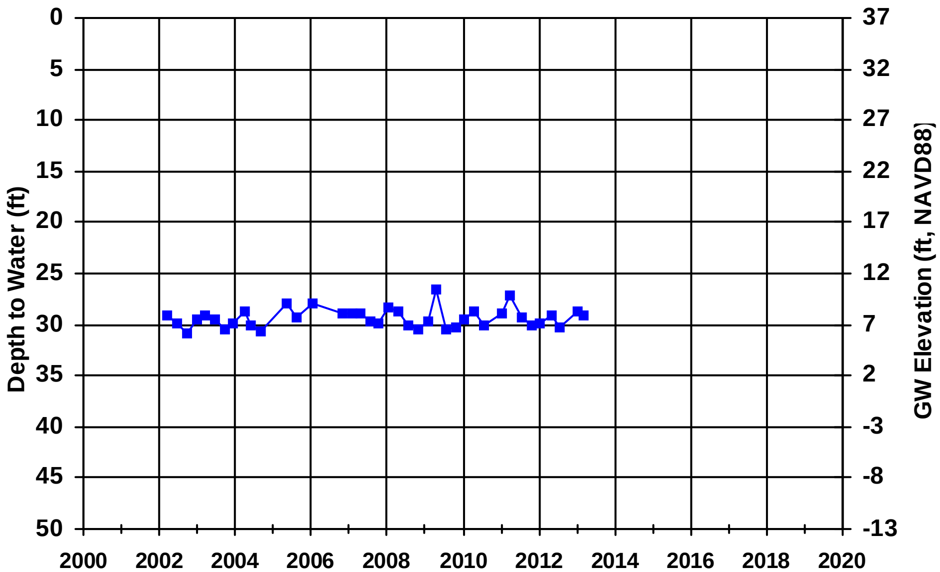



WellID: T0601300772-MW-8
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

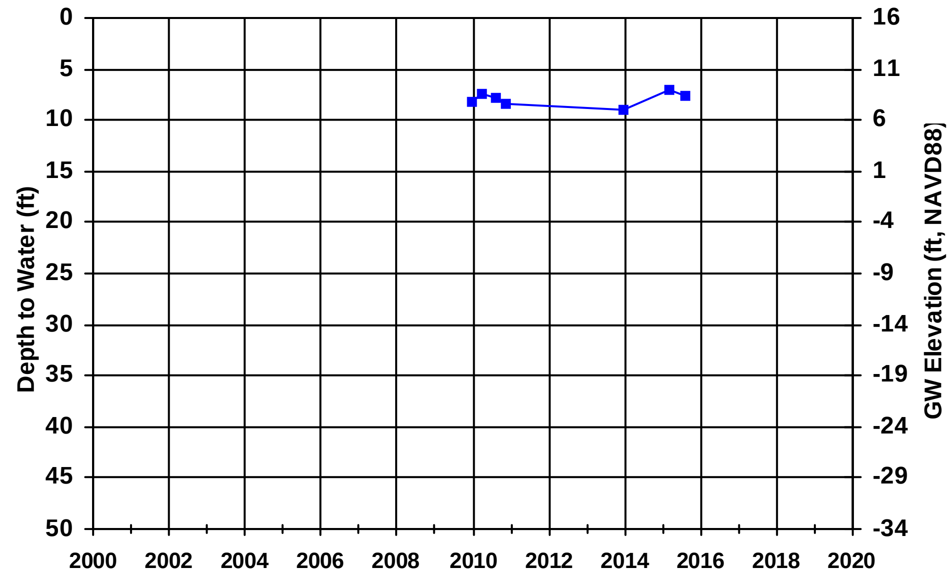



{R_WLhyd88}

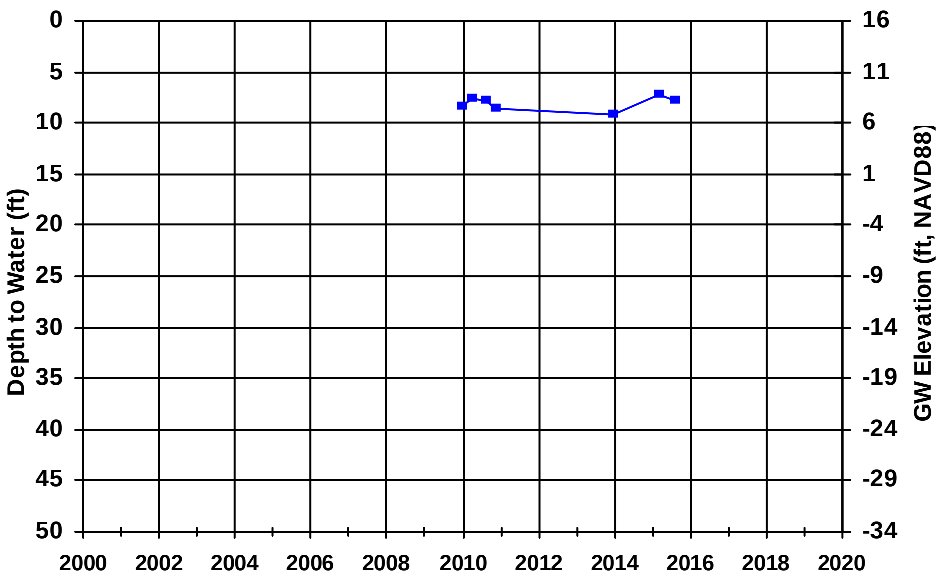
**WellID: T0601300772-MW-9**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



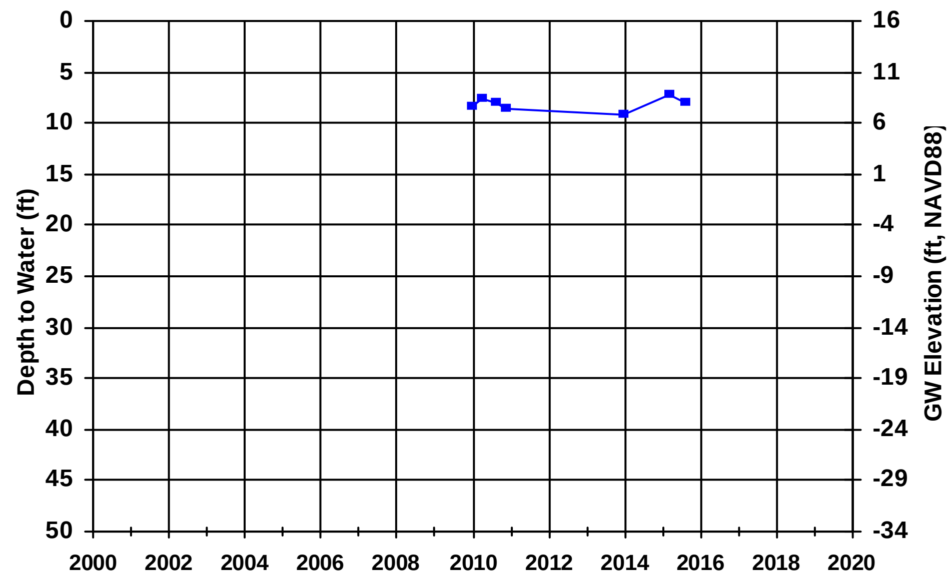

**WellID: T0601300775-EW-1**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



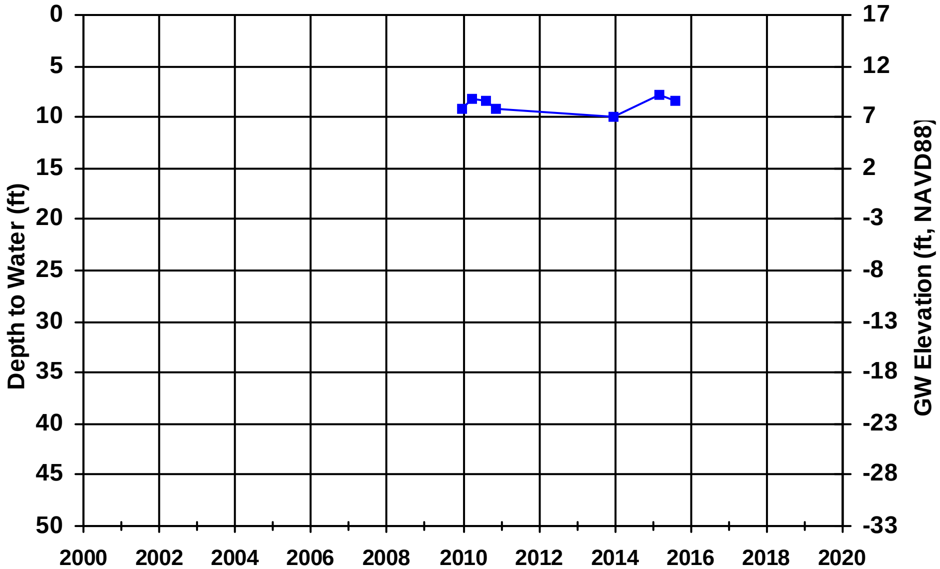

**WellID: T0601300775-EW-2**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



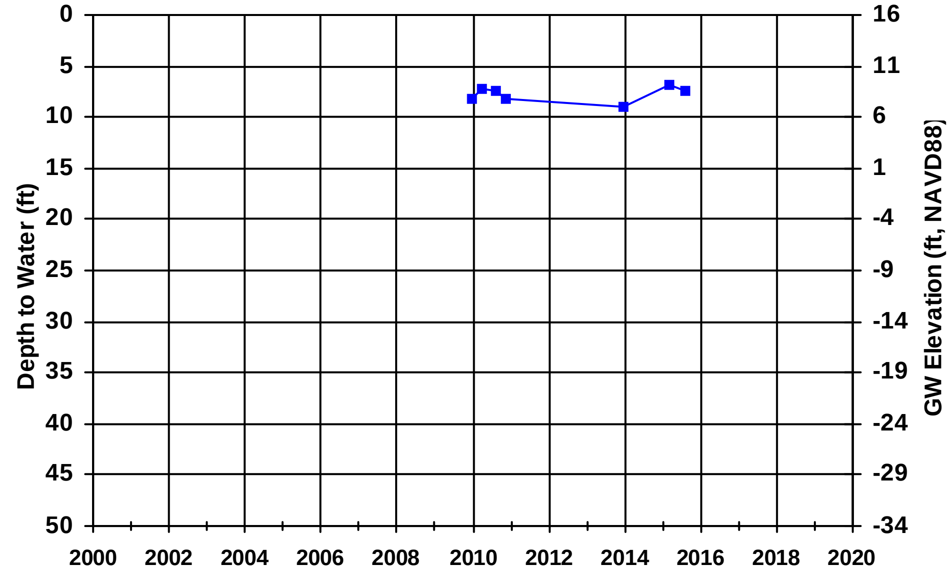

**WellID: T0601300775-EW-3**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



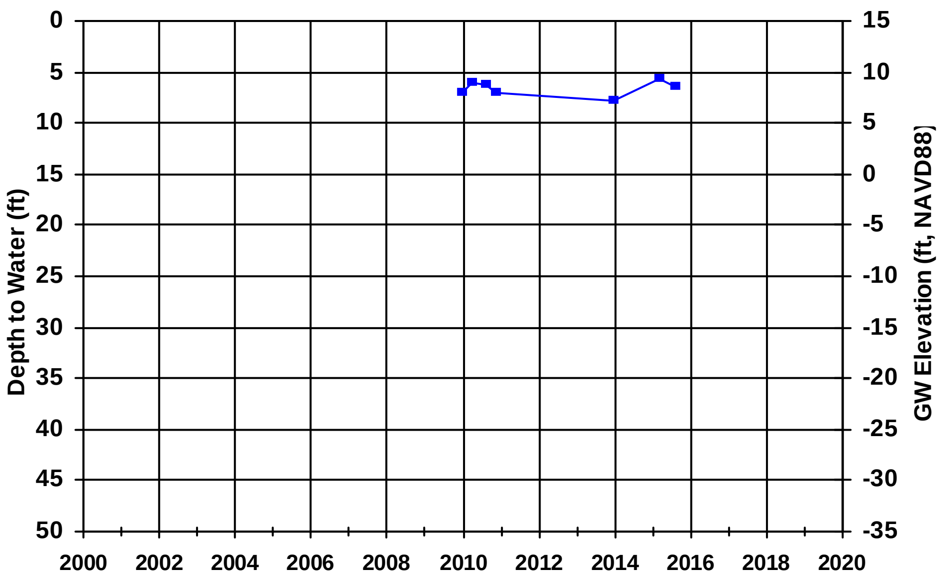
**WellID: T0601300775-MW-1**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



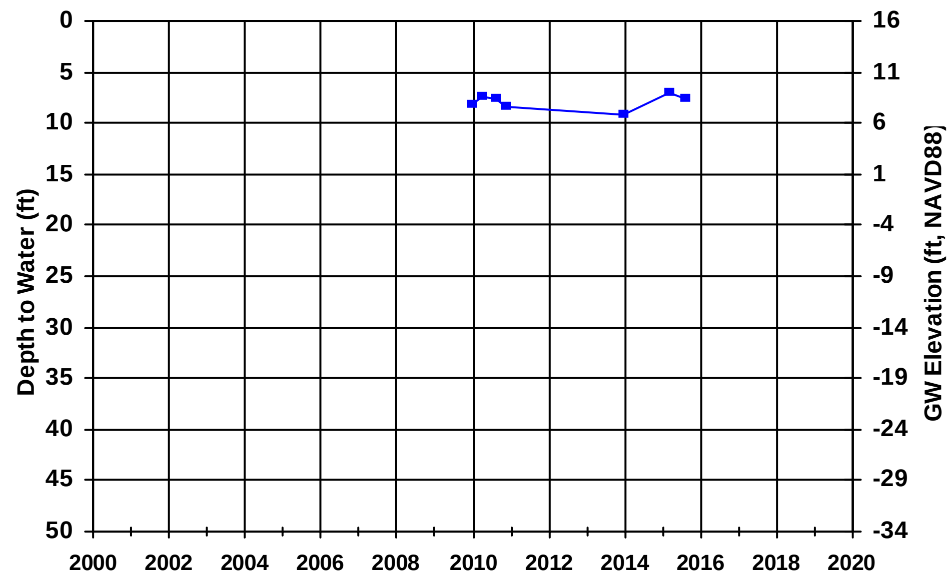

**WellID: T0601300775-MW-2**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID: T0601300775-MW-3**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

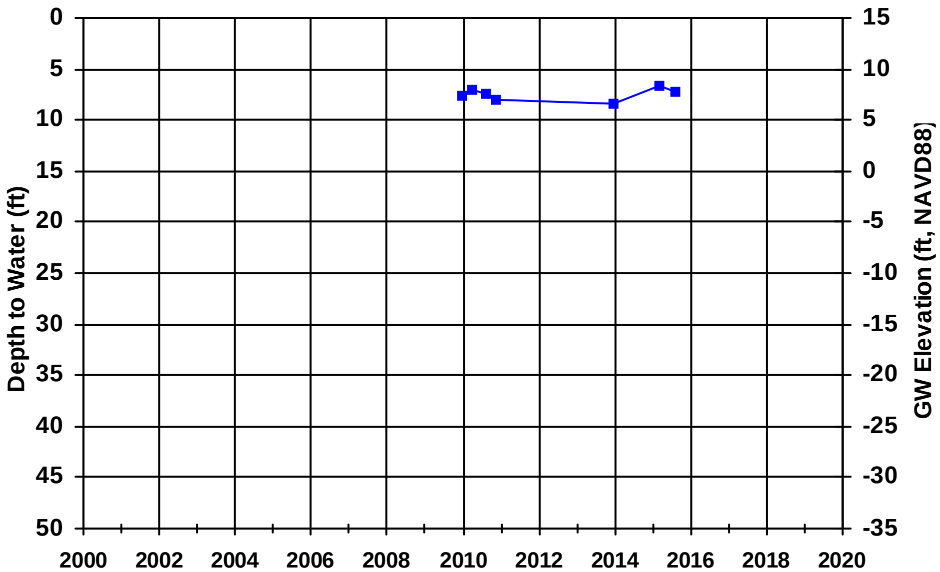



**WellID: T0601300775-MW-4**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

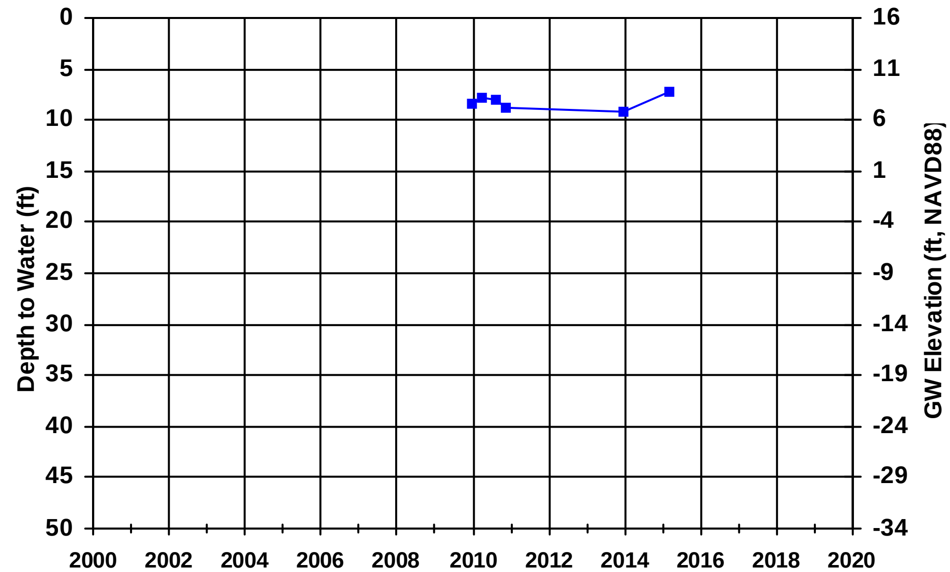



{R_WLhyd88}

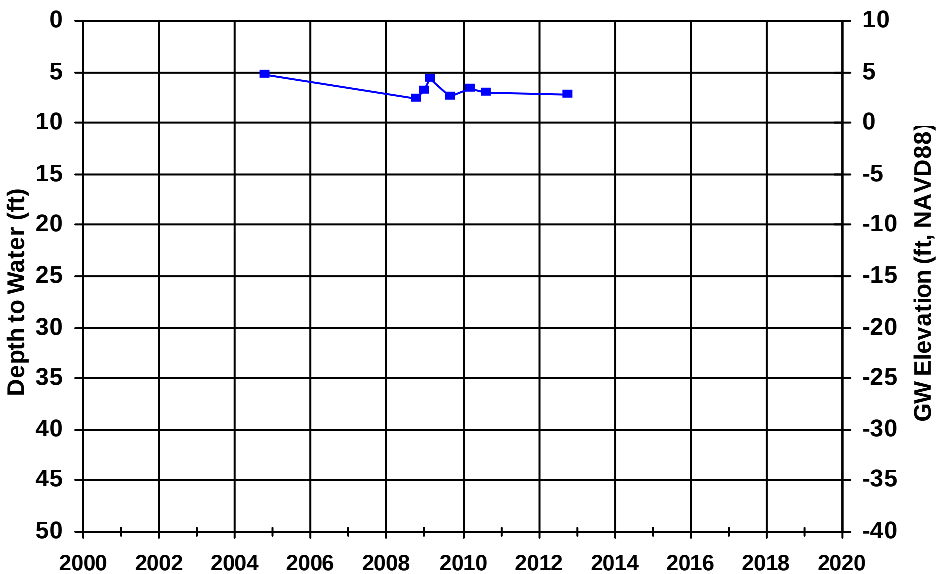
**WellID:** T0601300775-MW-5
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



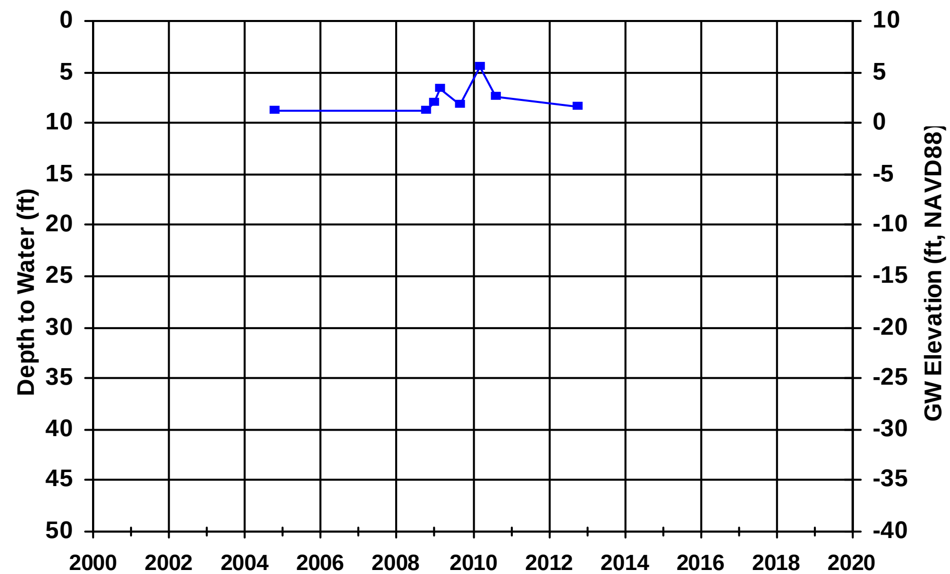

**WellID:** T0601300775-MW-6
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300776-KMW-10
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

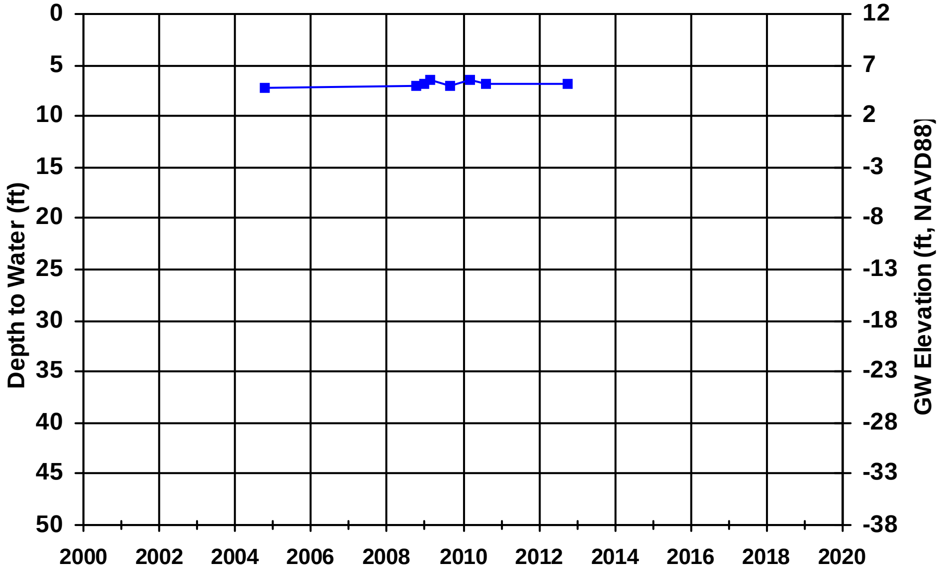



**WellID:** T0601300776-KMW-11
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

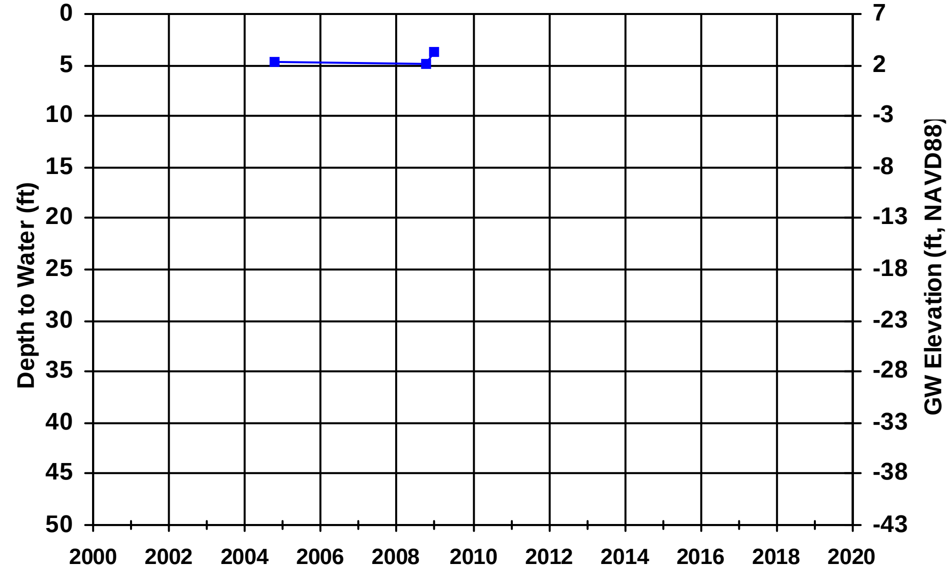



{R_WLhyd88}

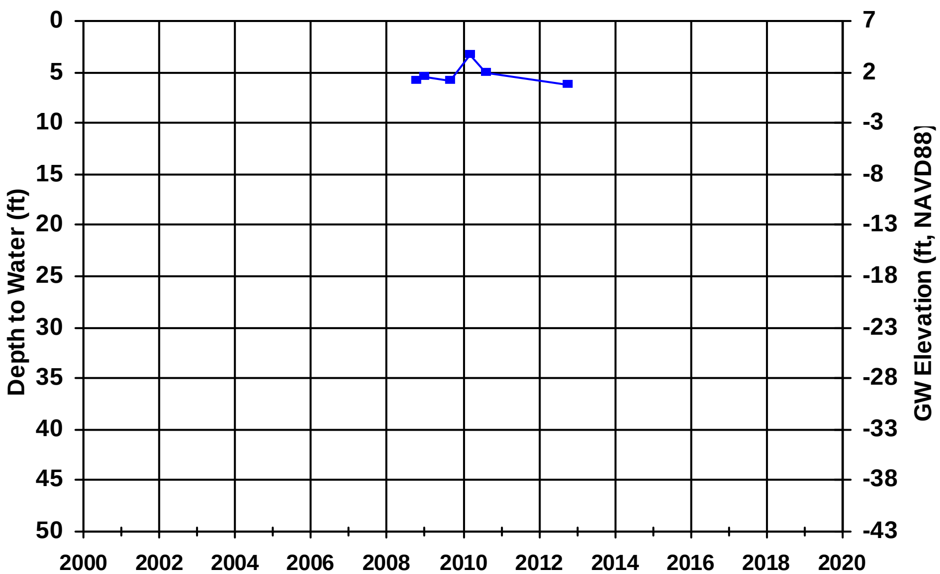
**WellID: T0601300776-KMW-8**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



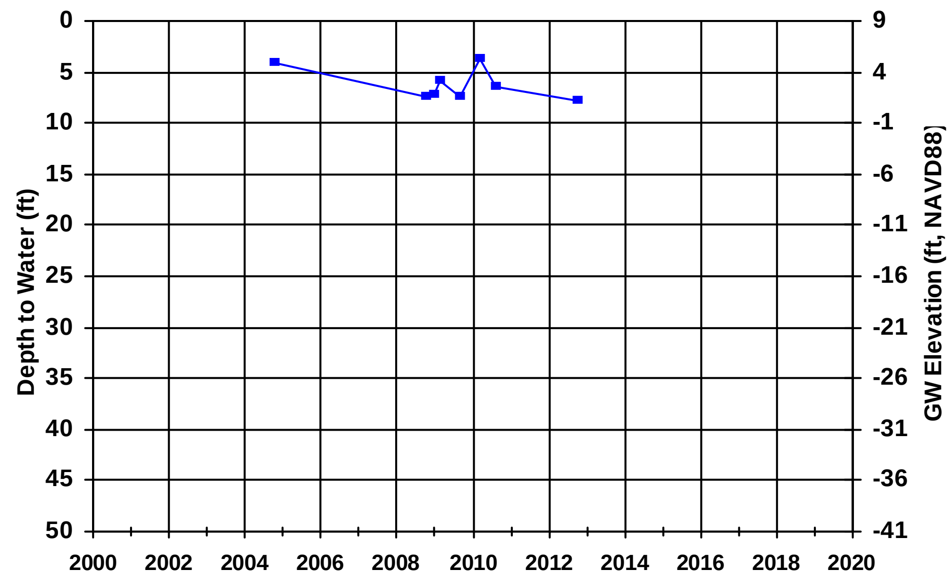

**WellID: T0601300776-KMW-9**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300776-MW-12**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

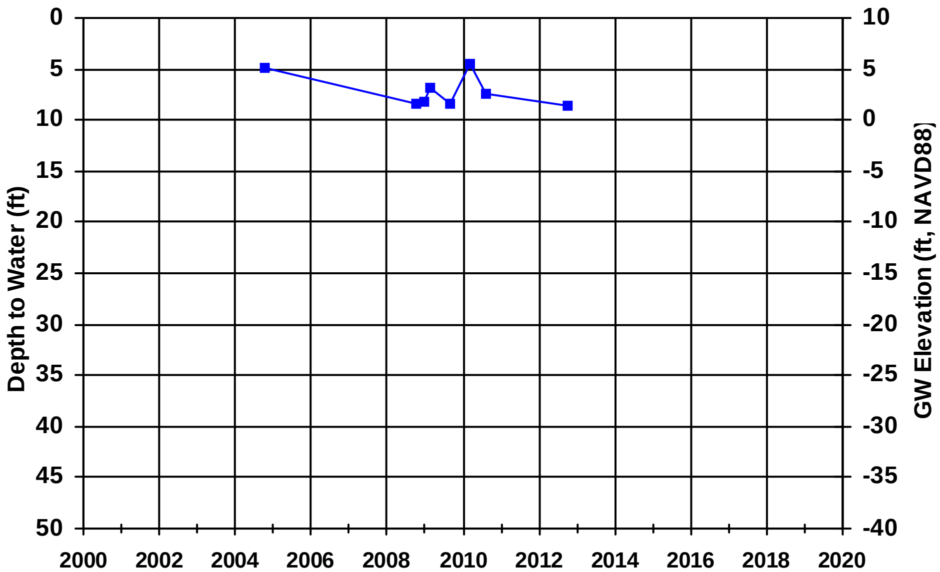



**WellID: T0601300776-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

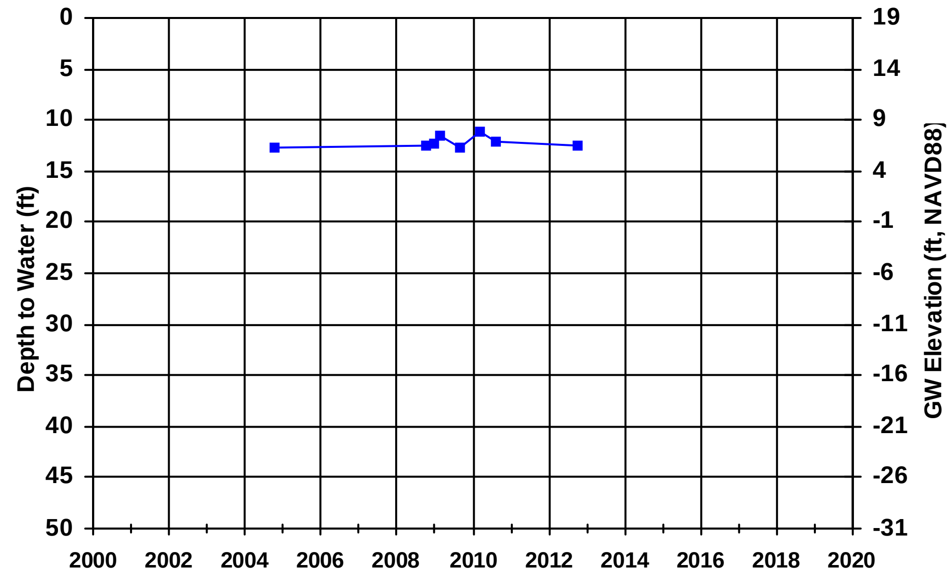



{R_WLhyd88}

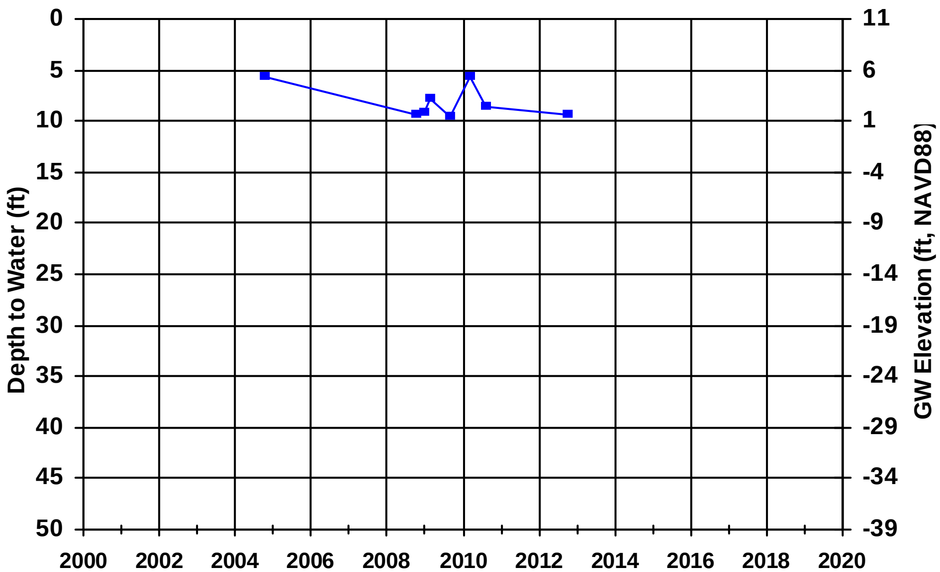
**WellID:** **T0601300776-MW-3**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



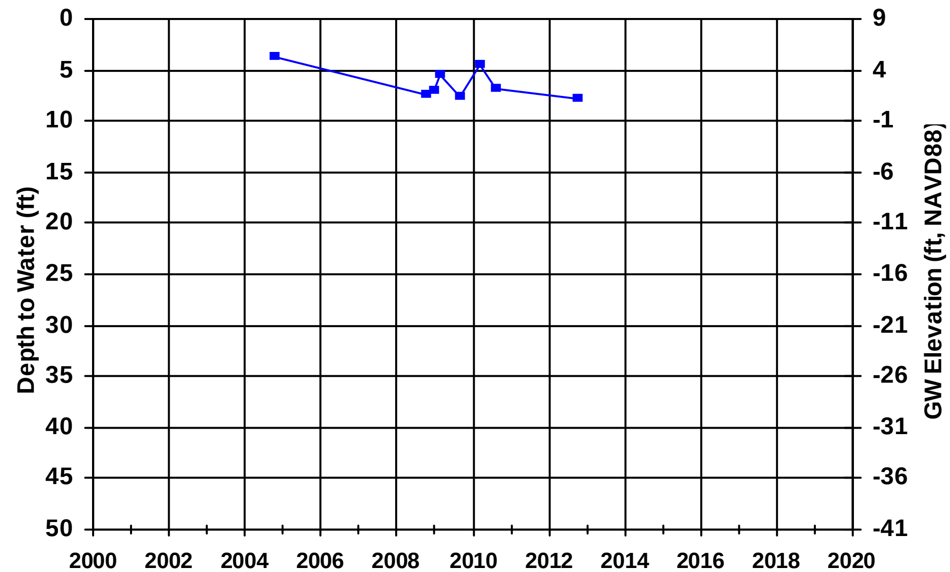

**WellID:** **T0601300776-MW-4**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300776-MW-5**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

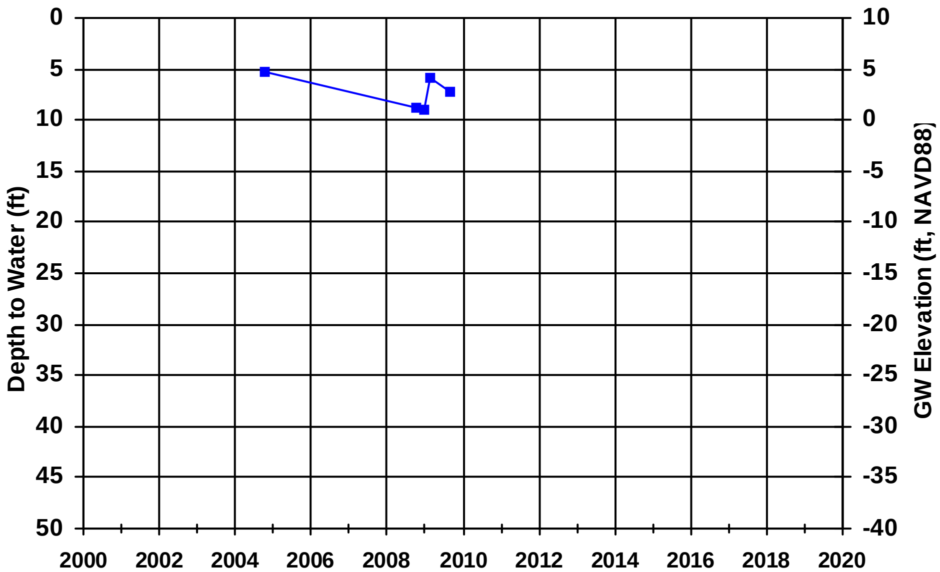



**WellID:** **T0601300776-MW-6**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

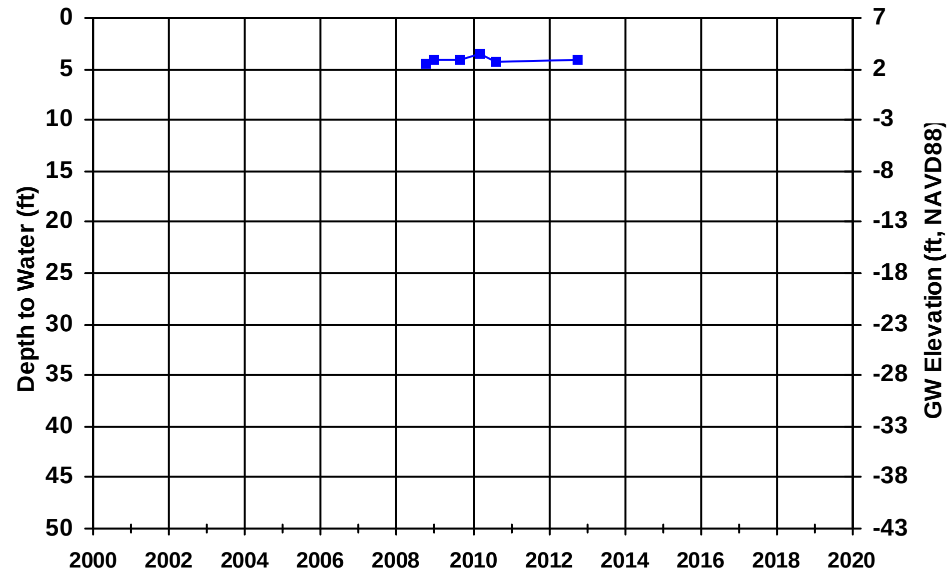



{R_WLhyd88}

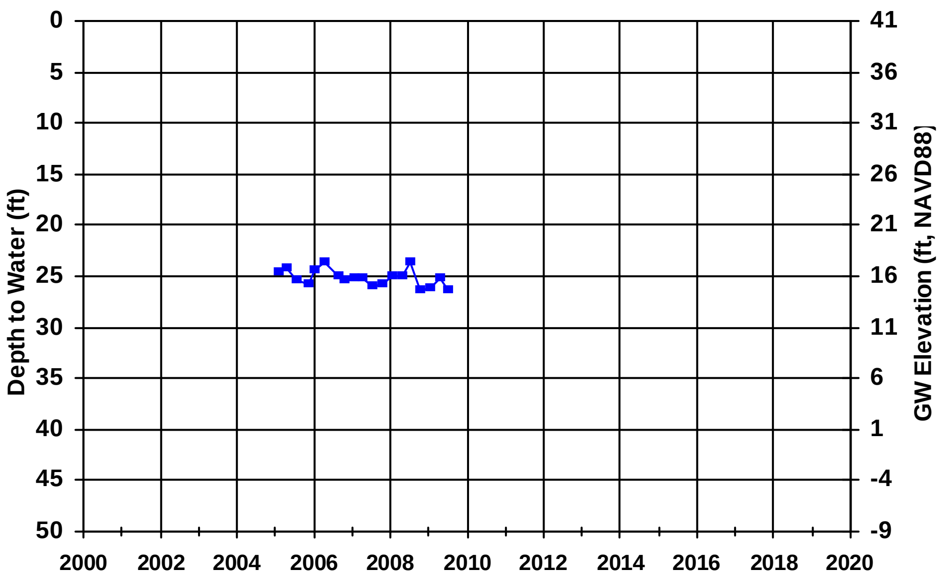
**WellID:** T0601300776-MW-7A
**Zone:** Shallow
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A



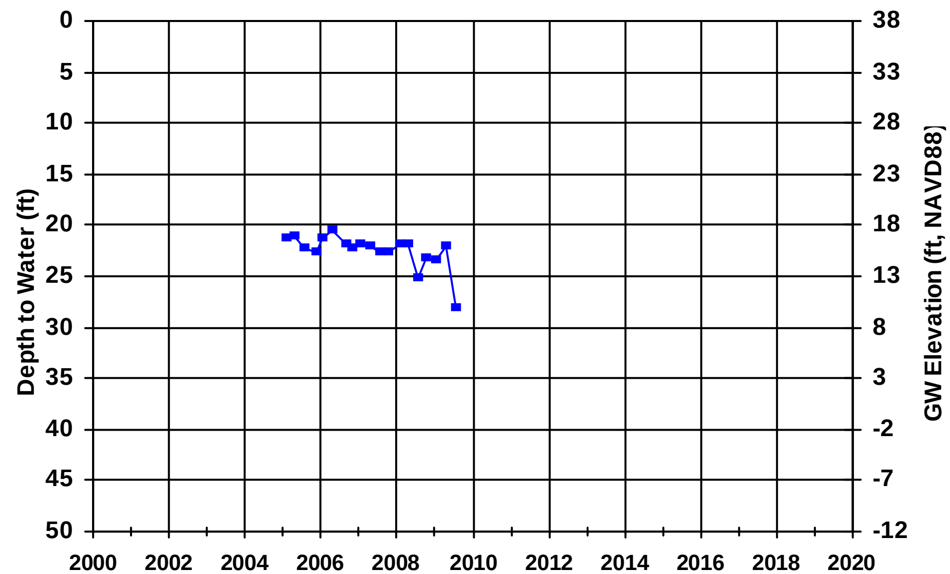

**WellID:** T0601300776-SG-10
**Zone:** Shallow
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A




**WellID:** T0601300780-MW-10
**Zone:** Shallow
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A

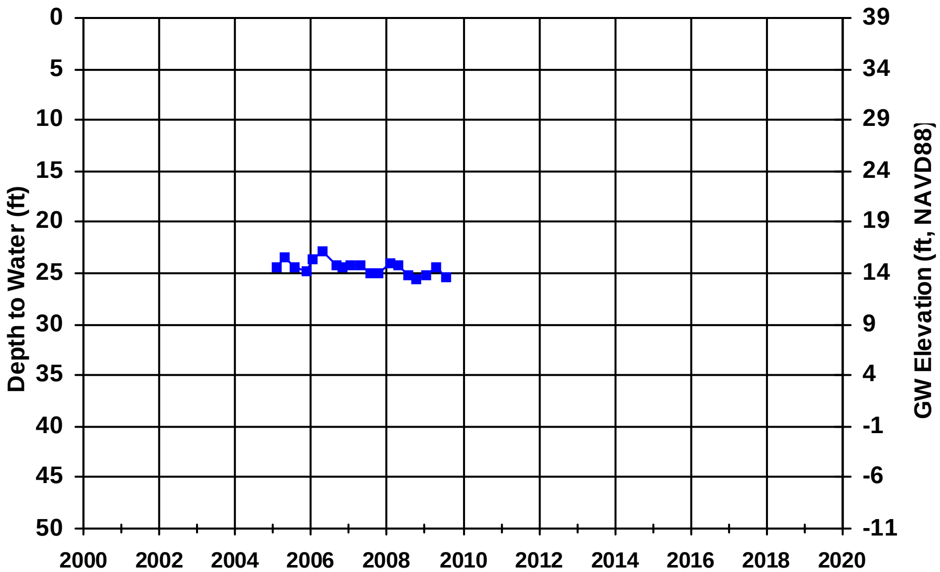



**WellID:** T0601300780-MW-11
**Zone:** Shallow
Source: Geotracker  Perf Int (ft): N/A  Well Depth (ft): N/A

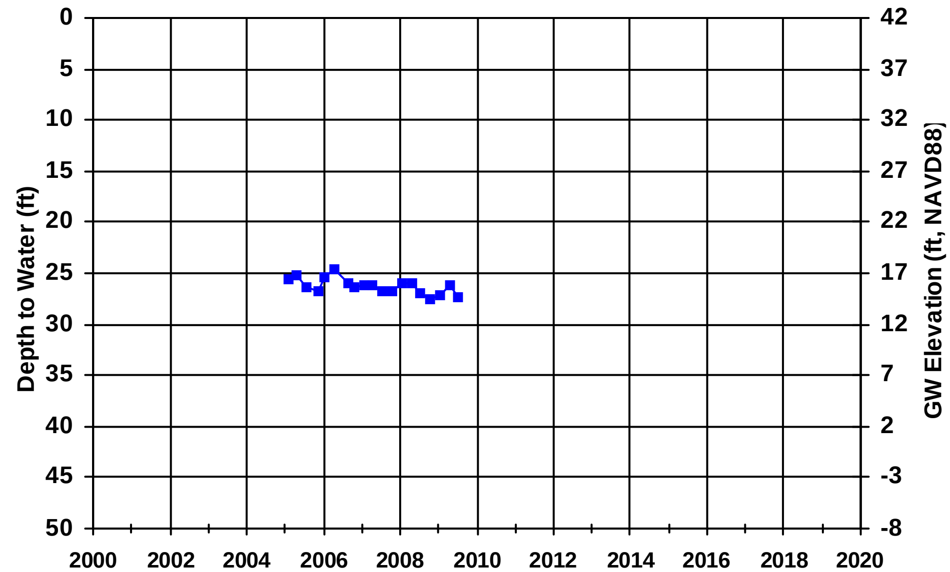



{R_WLhyd88}

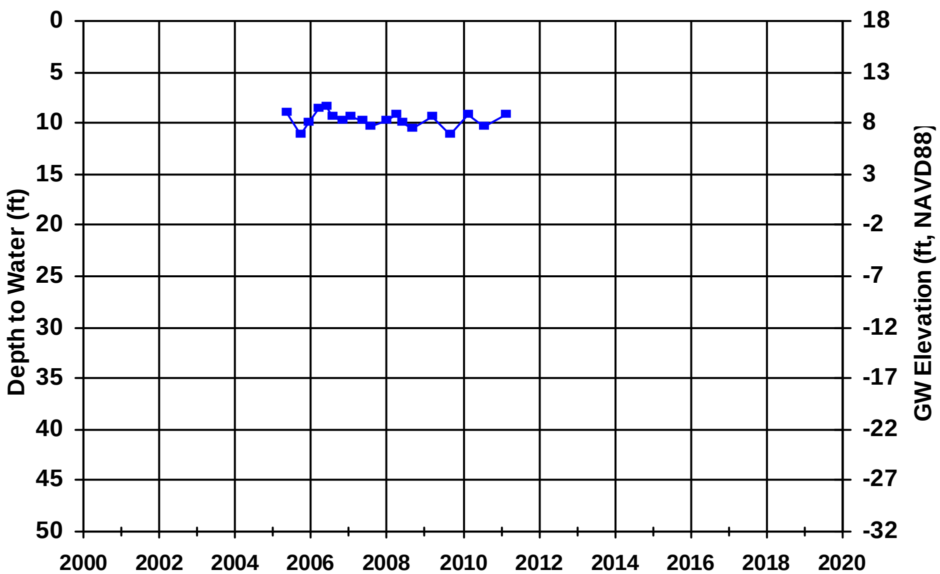
**WellID:** **T0601300780-MW-12**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



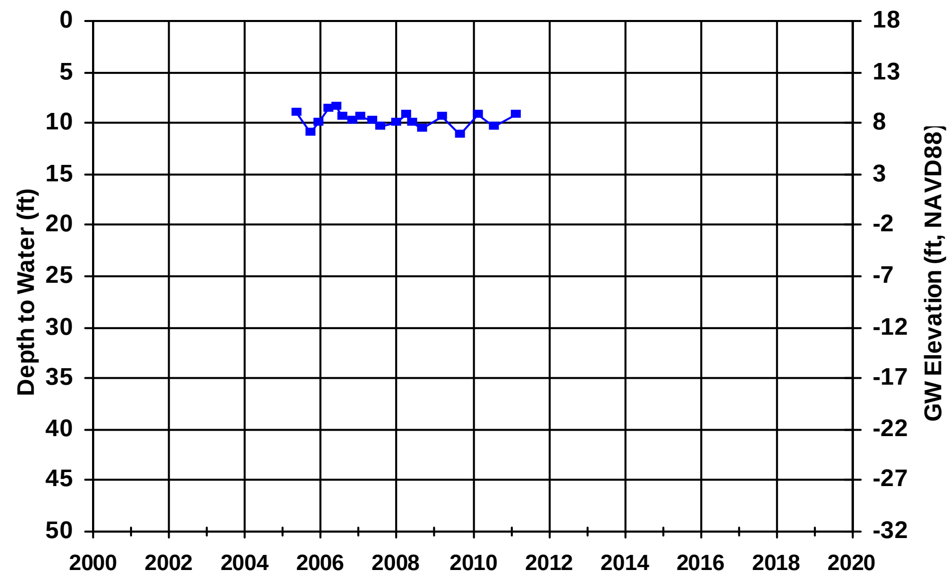

**WellID:** **T0601300780-MW-9**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300781-DW-1A**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

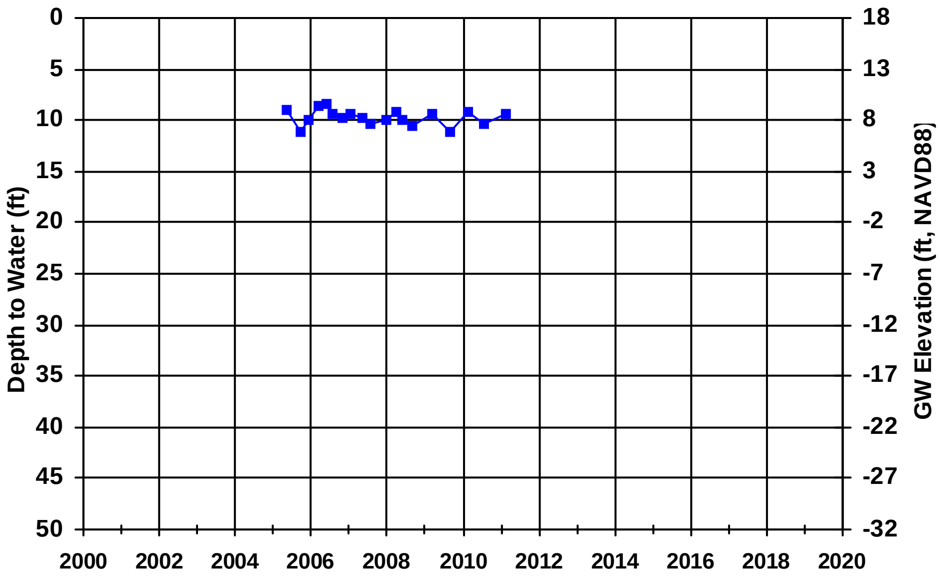



**WellID:** **T0601300781-DW-1B**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

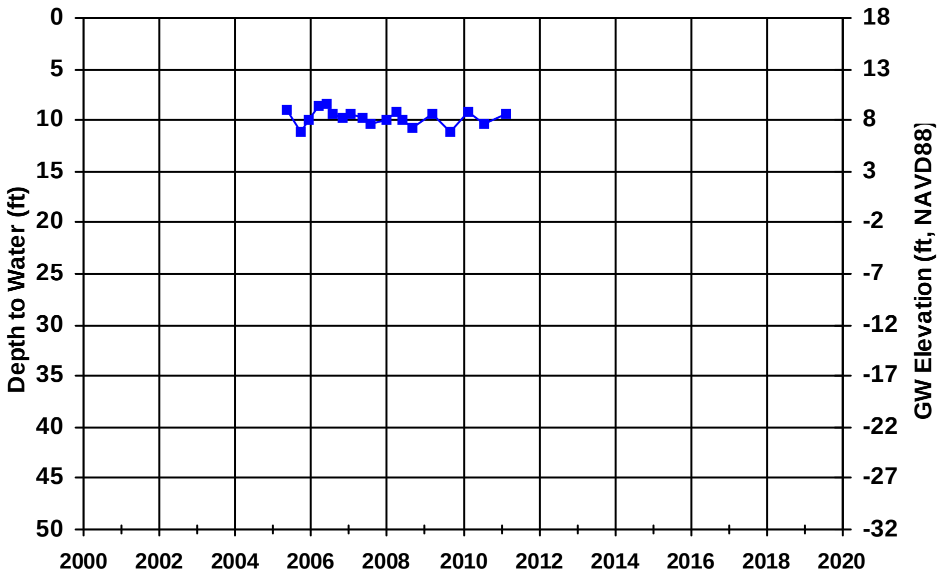



{R_WLhyd88}

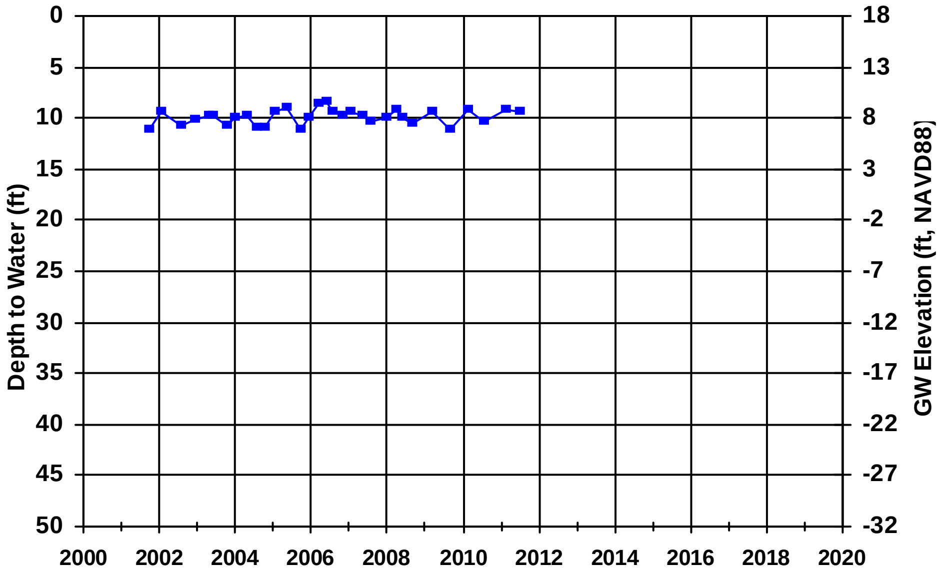
**WellID: T0601300781-DW-2A**
**Zone: Shallow**
Source: Geotracker	Perf Int (ft): N/A	Well Depth (ft): N/A



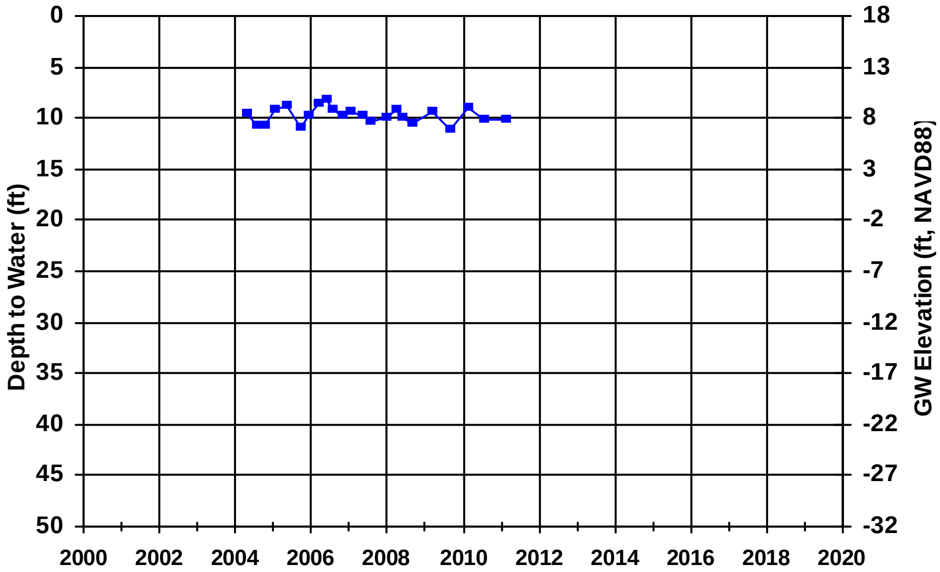

**WellID: T0601300781-DW-2B**
**Zone: Shallow**
Source: Geotracker	Perf Int (ft): N/A	Well Depth (ft): N/A




**WellID: T0601300781-MW-1**
**Zone: Shallow**
Source: Geotracker	Perf Int (ft): N/A	Well Depth (ft): N/A

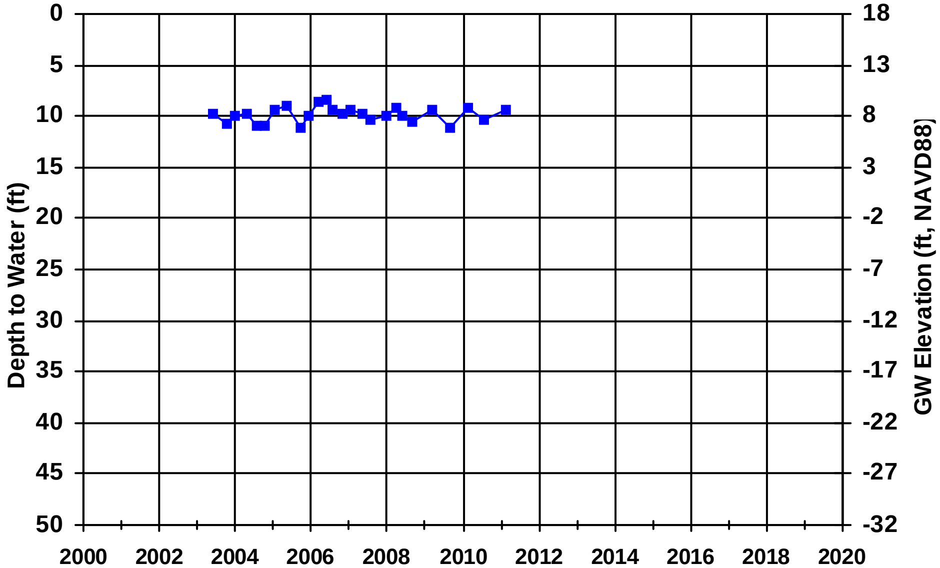



**WellID: T0601300781-MW-2**
**Zone: Shallow**
Source: Geotracker	Perf Int (ft): N/A	Well Depth (ft): N/A

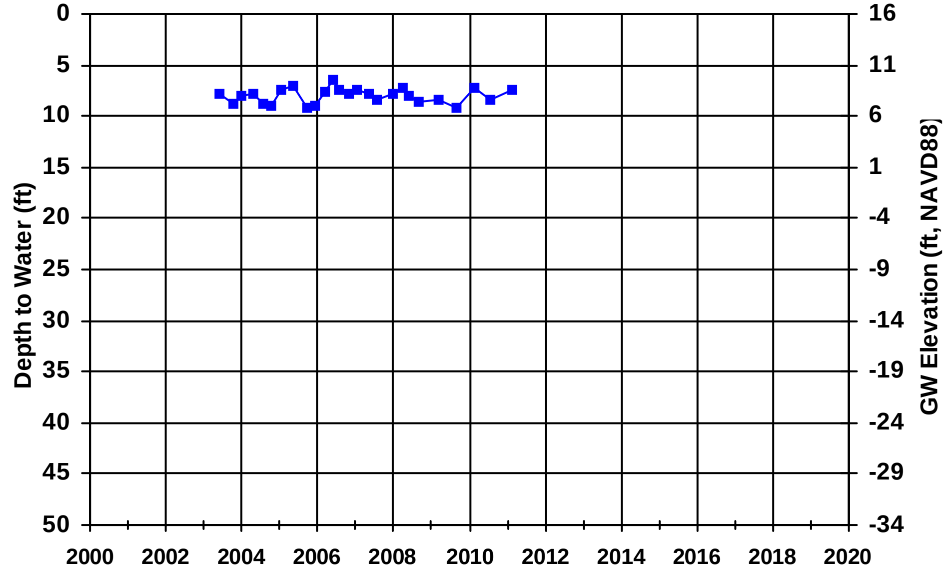



{R_WLhyd88}

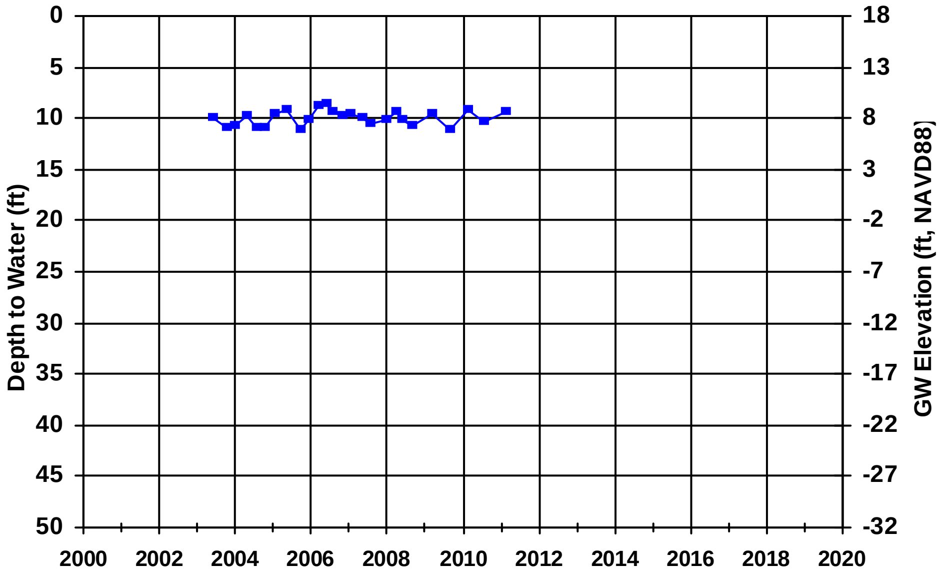
**WellID:** **T0601300781-MW-3**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



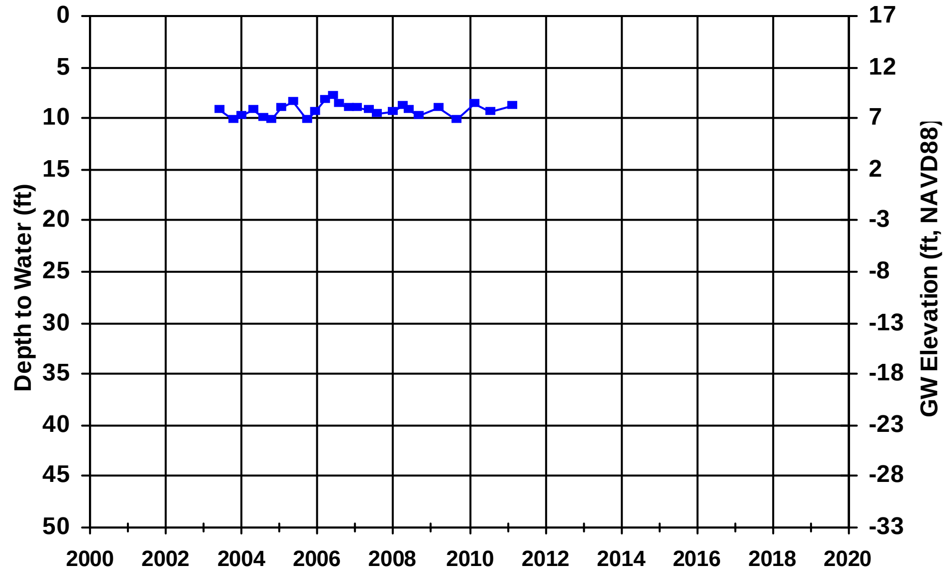

**WellID:** **T0601300781-MW-4**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300781-MW-5**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

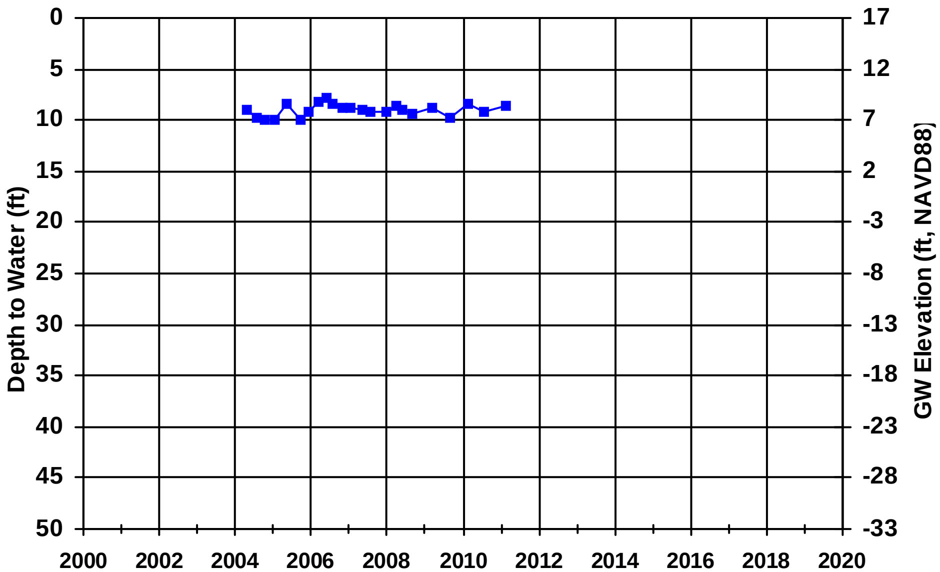



**WellID:** **T0601300781-MW-6**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

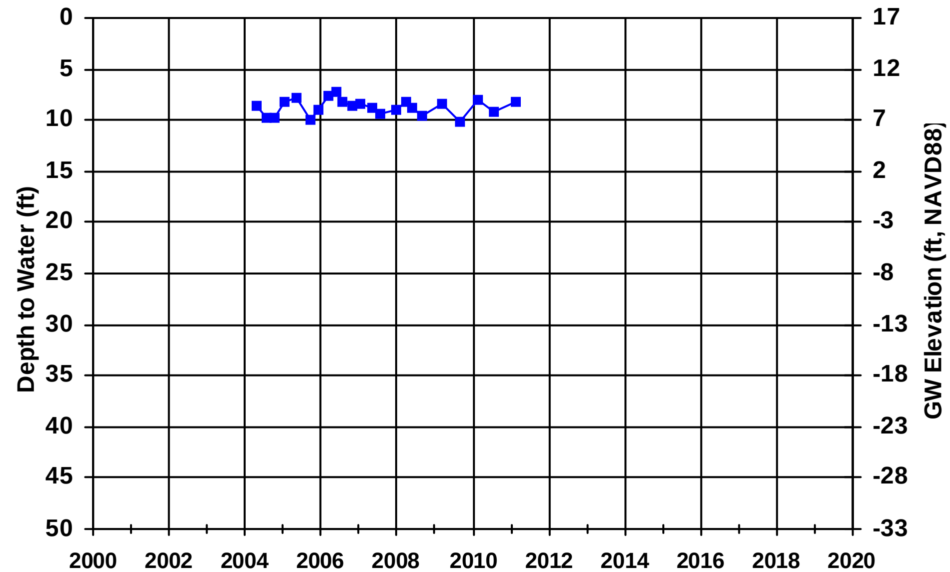



{R_WLhyd88}

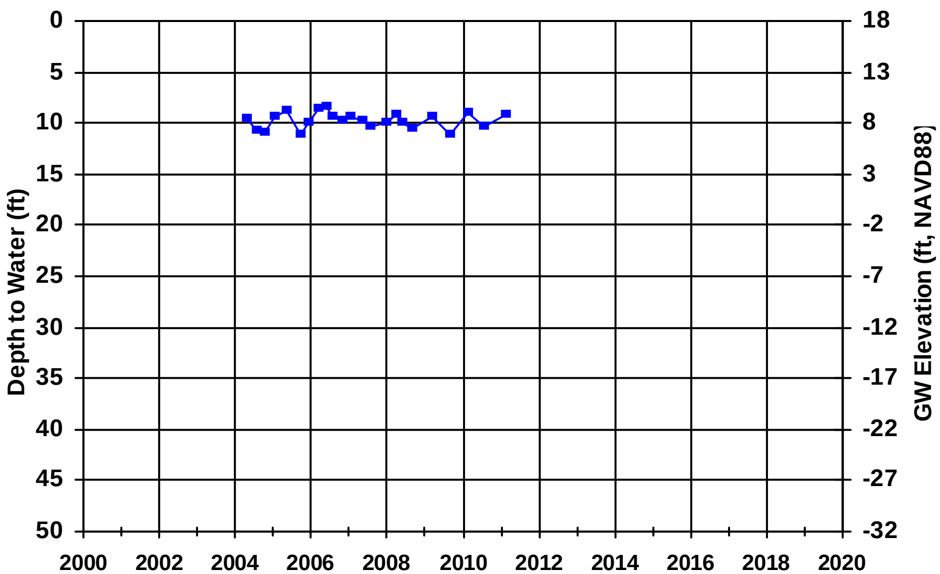
**WellID:** T0601300781-MW-7
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



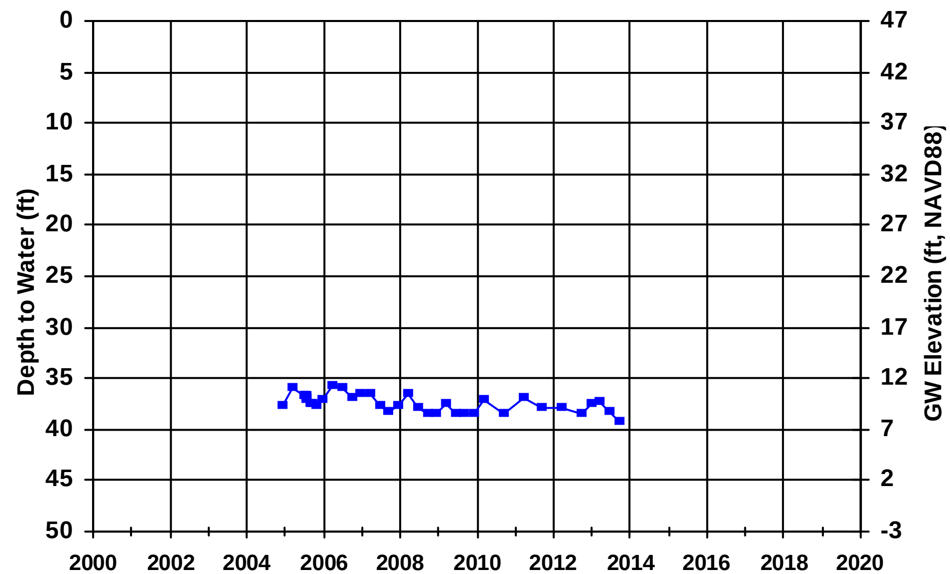

**WellID:** T0601300781-MW-8
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300781-MW-9
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

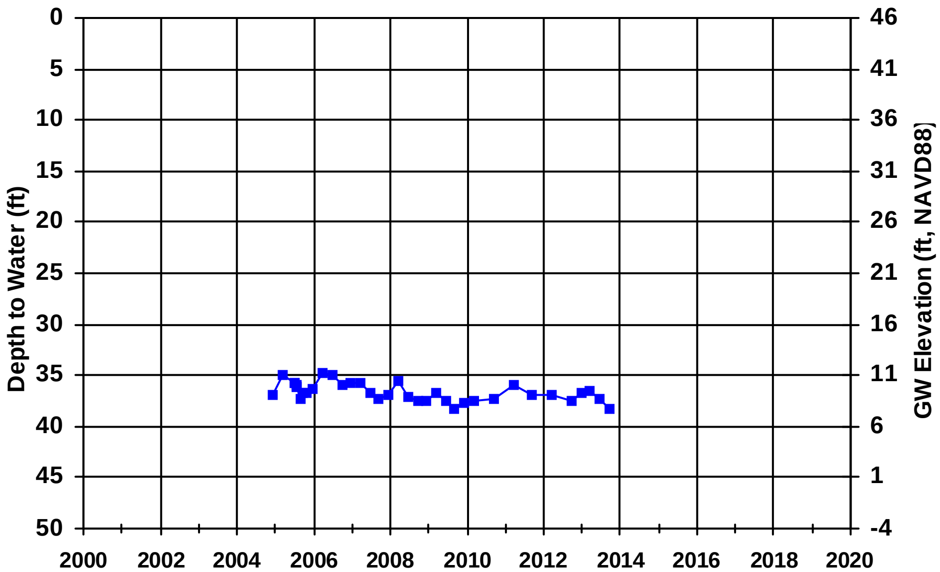



**WellID:** T0601300782-EW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

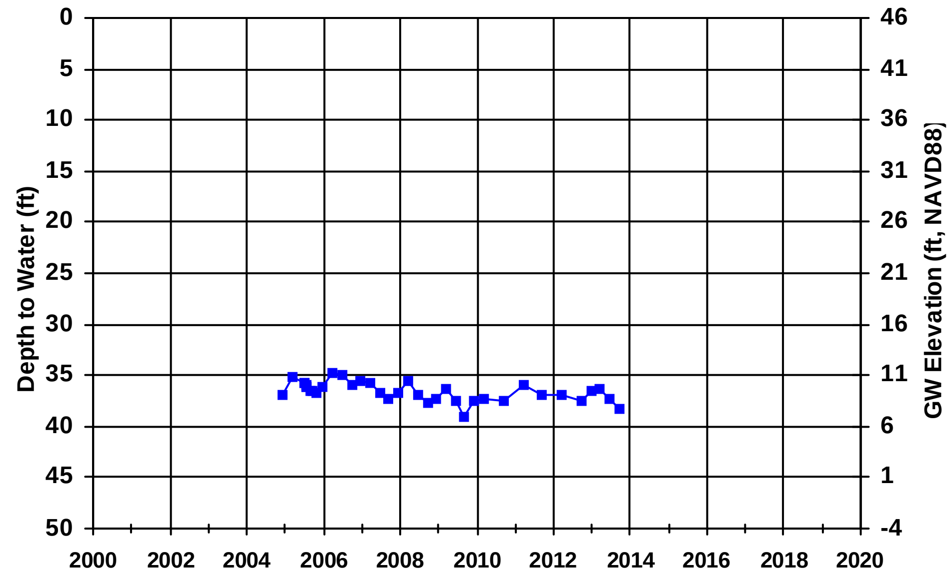



{R_WLhyd88}

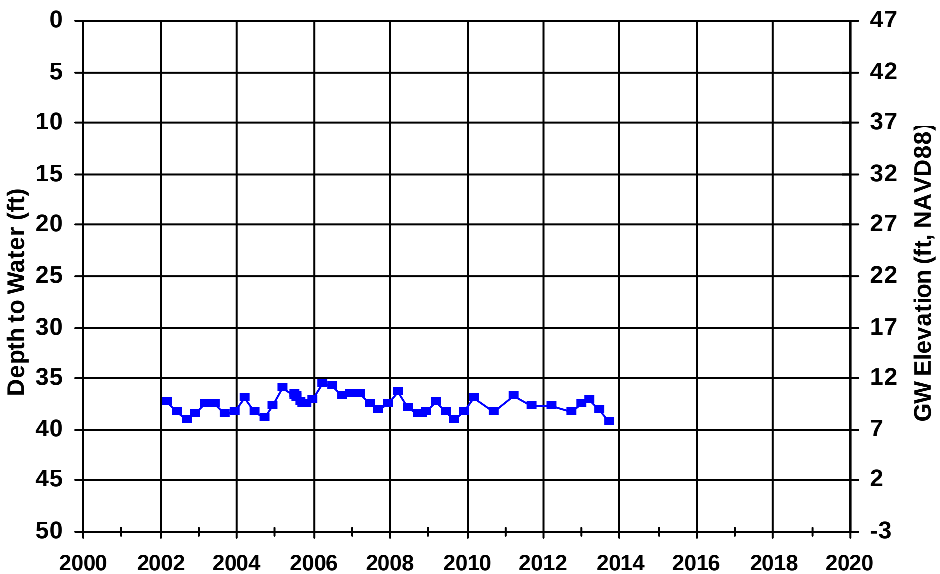
**WellID:** **T0601300782-EW-2**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



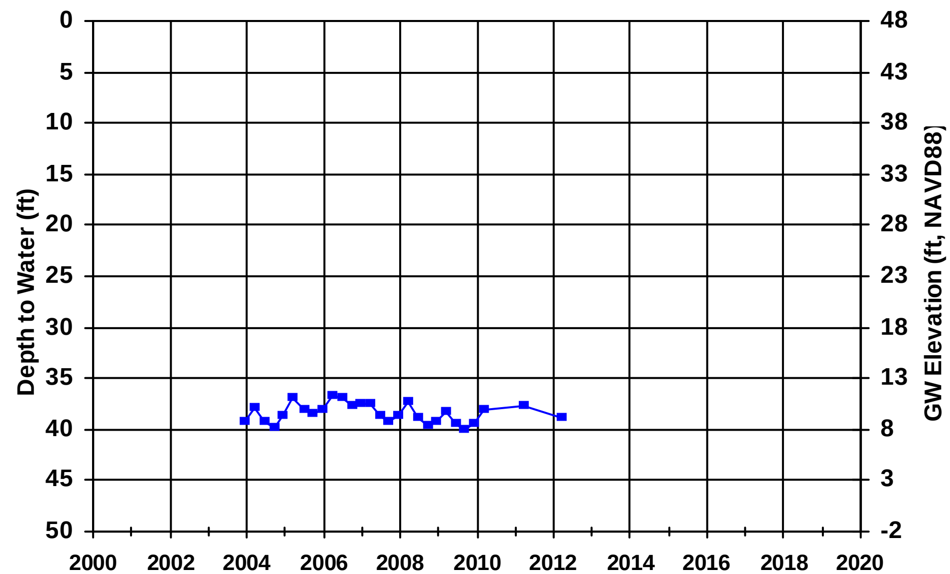

**WellID:** **T0601300782-EW-3**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601300782-MW-1**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

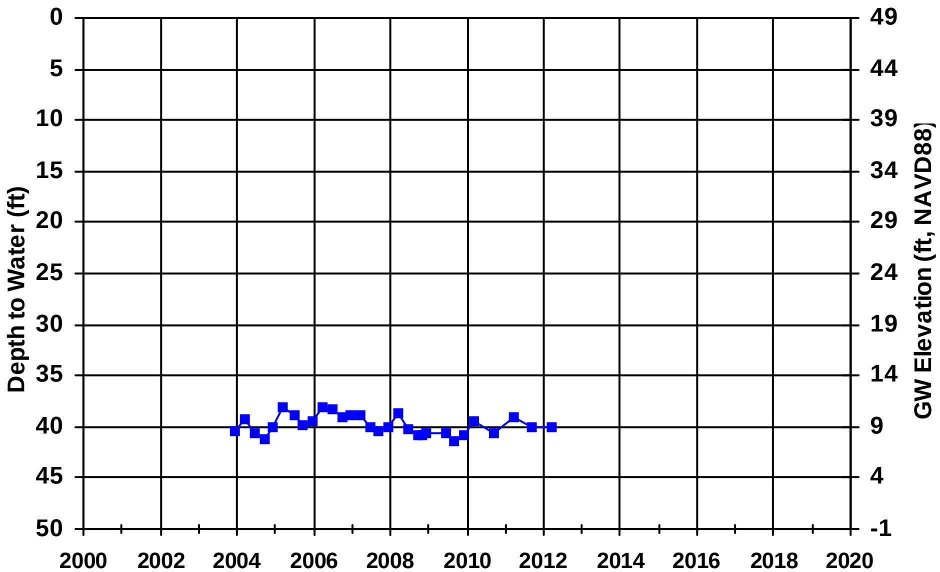



**WellID:** **T0601300782-MW-10**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

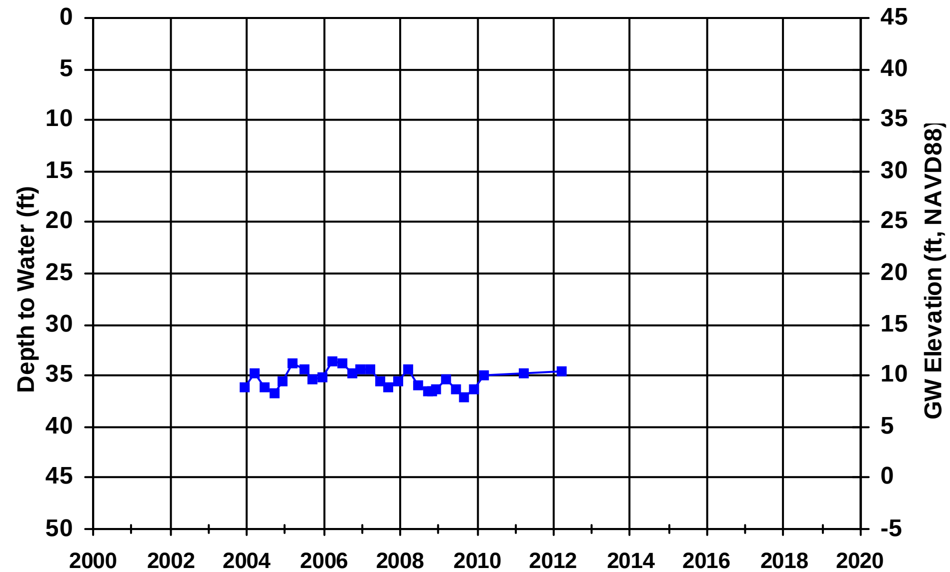



{R_WLhyd88}

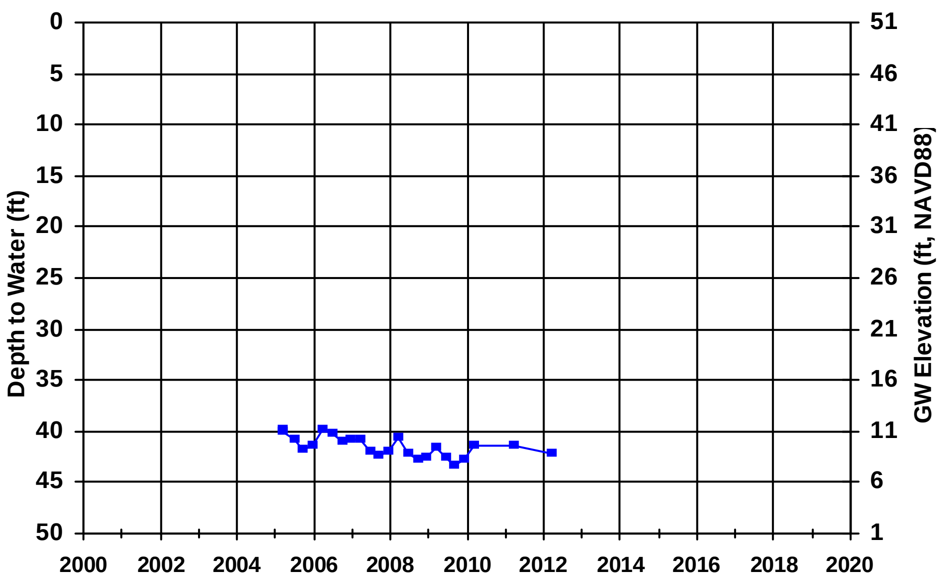
**WellID:** **T0601300782-MW-11**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



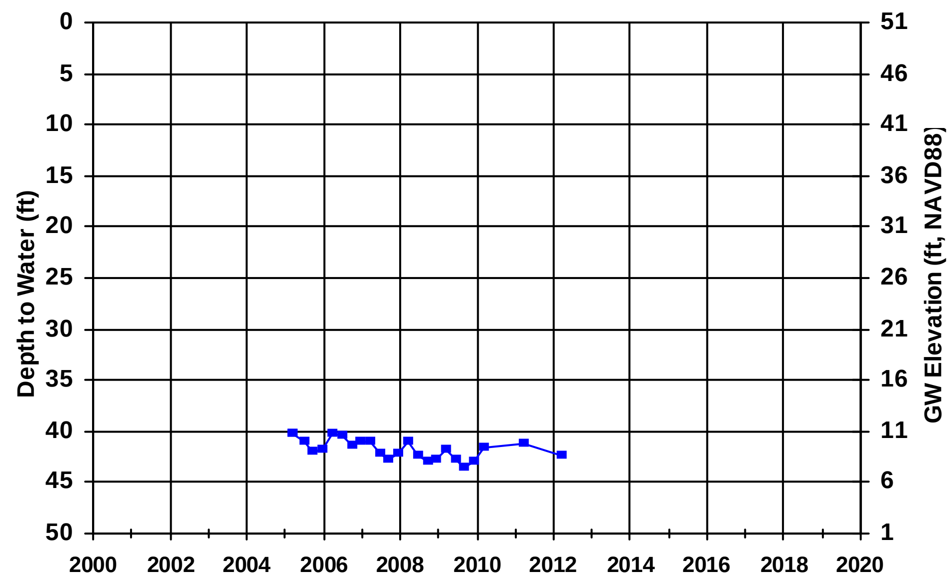

**WellID:** **T0601300782-MW-12**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300782-MW-13**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

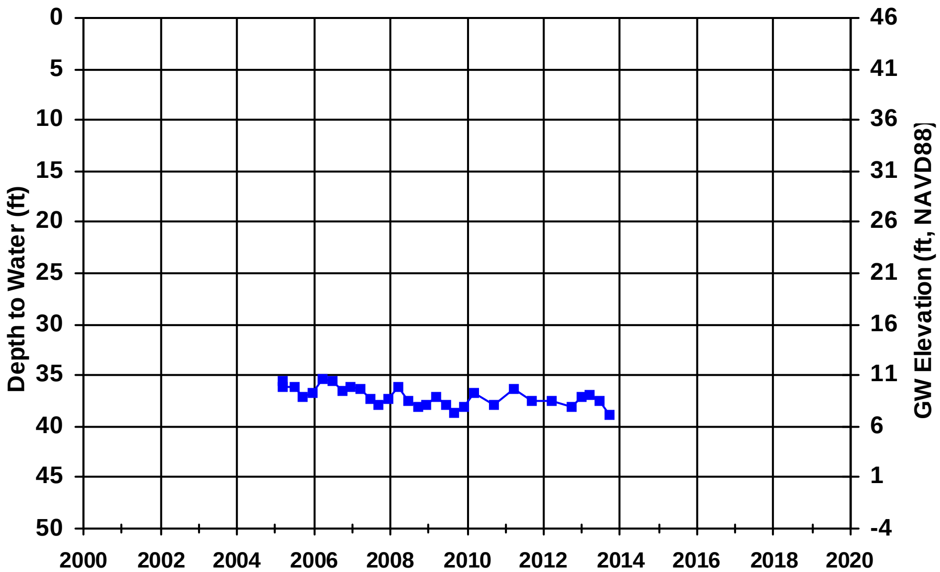



**WellID:** **T0601300782-MW-14**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

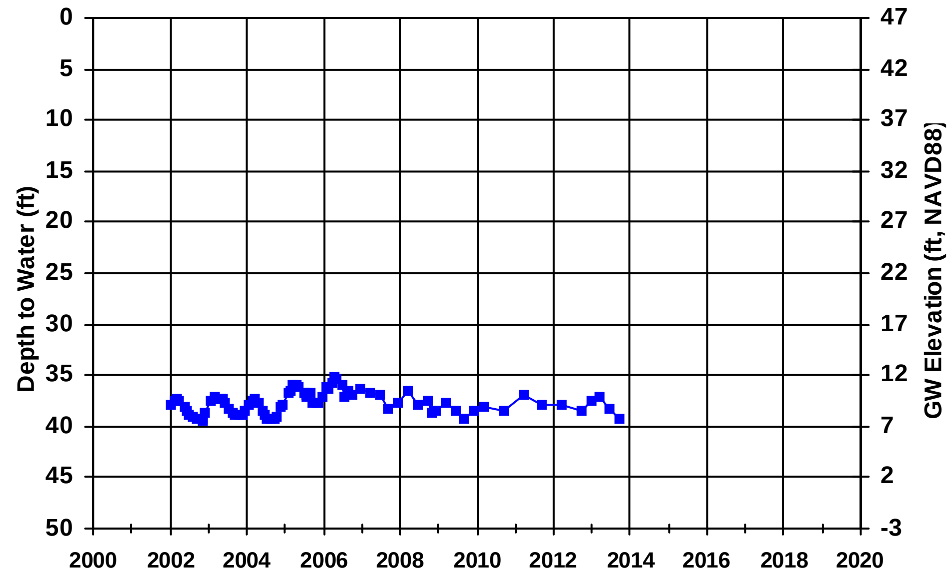



{R_WLhyd88}

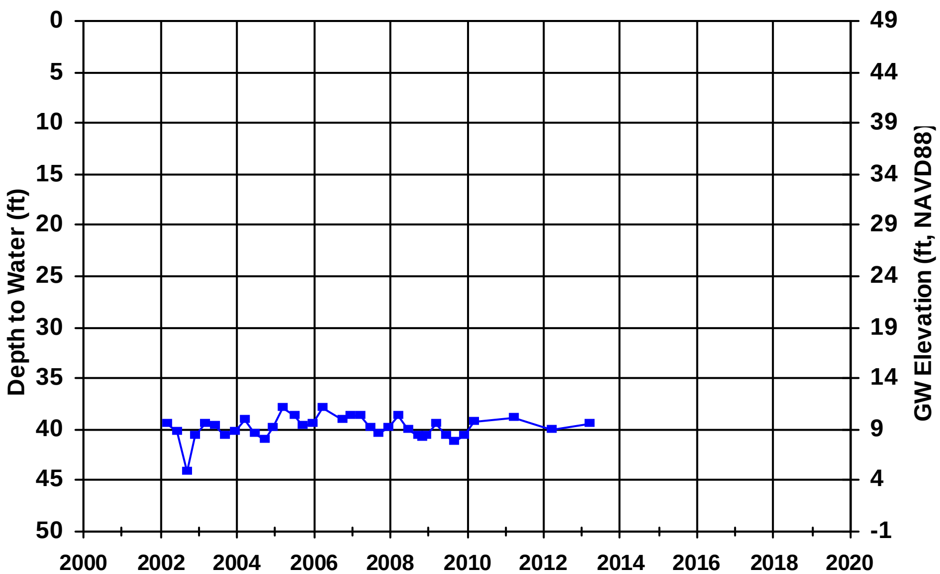
**WellID:** T0601300782-MW-15
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



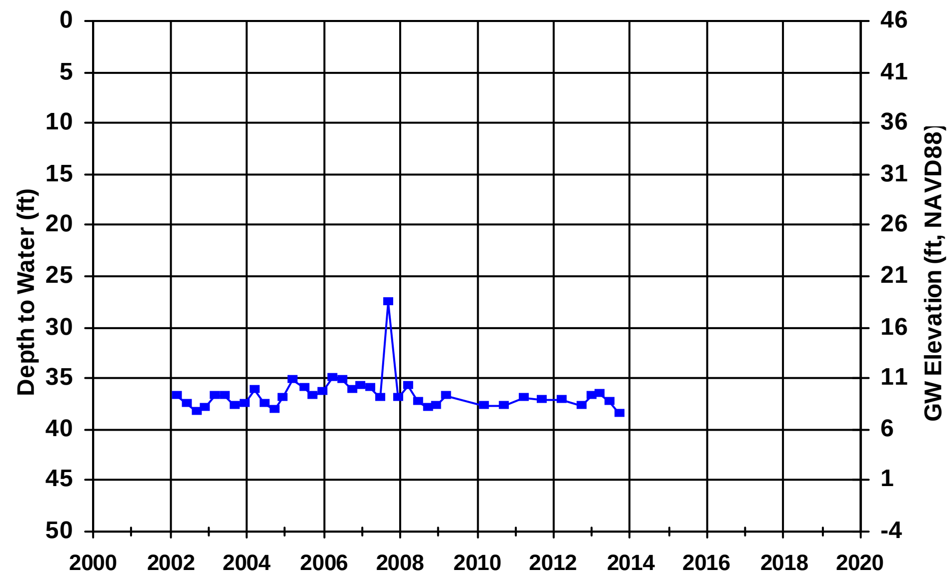

**WellID:** T0601300782-MW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300782-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

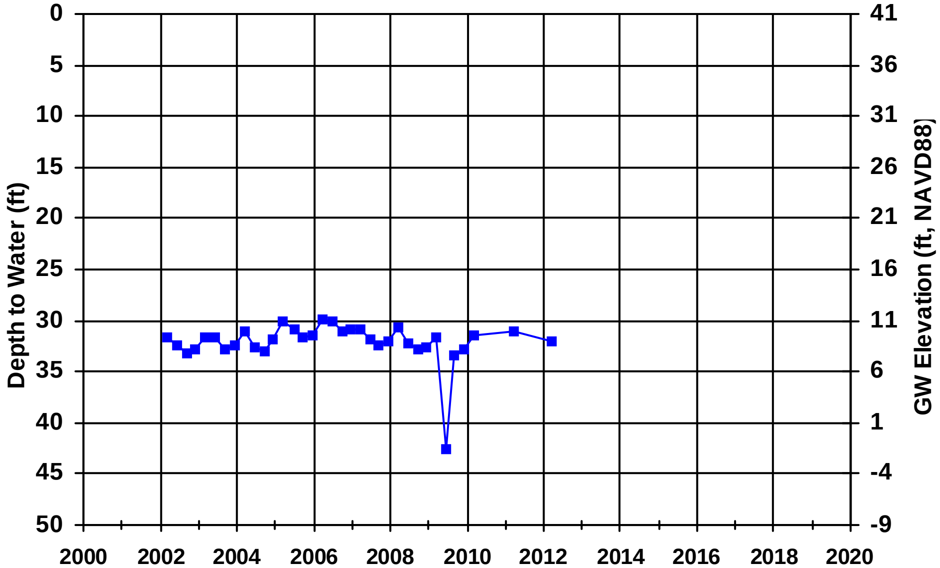



**WellID:** T0601300782-MW-4
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

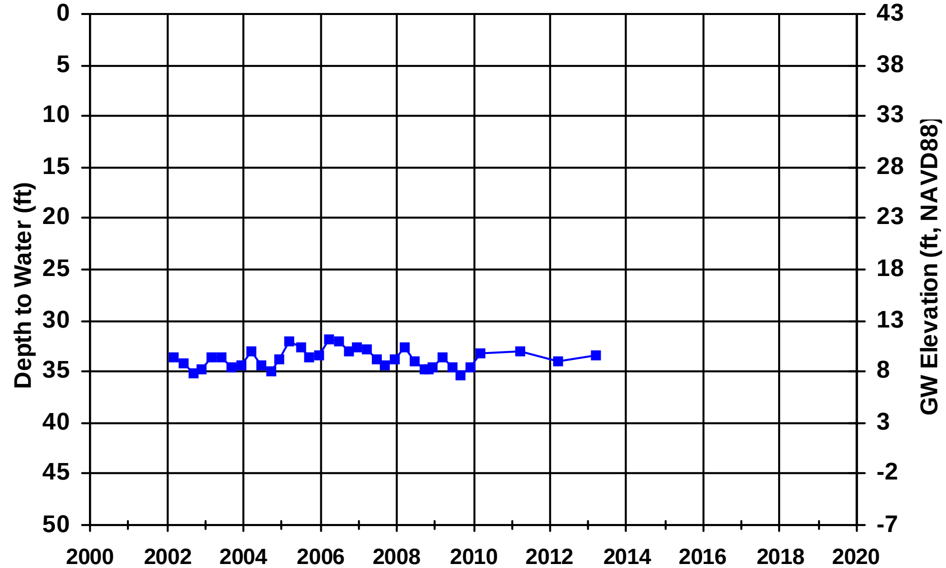



{R_WLhyd88}

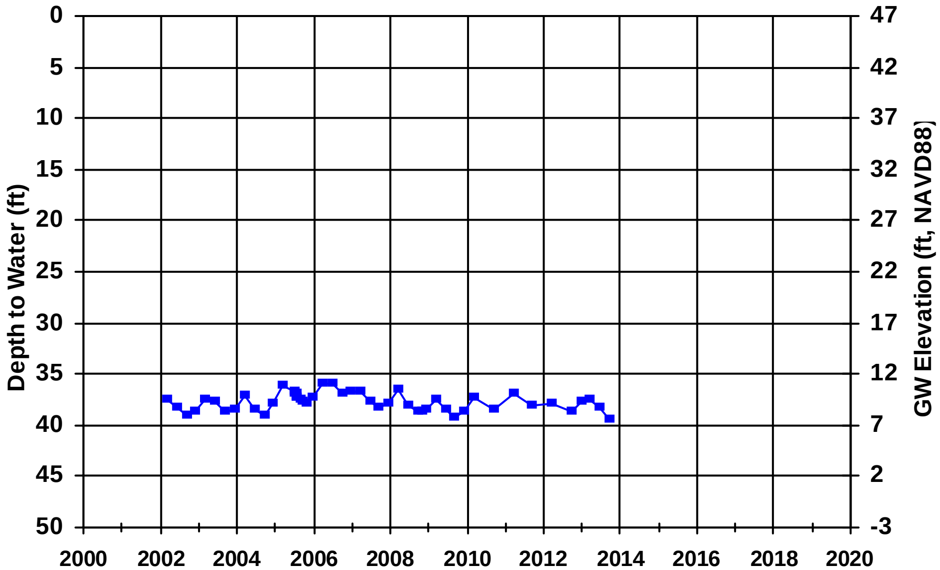
**WellID:** **T0601300782-MW-5**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



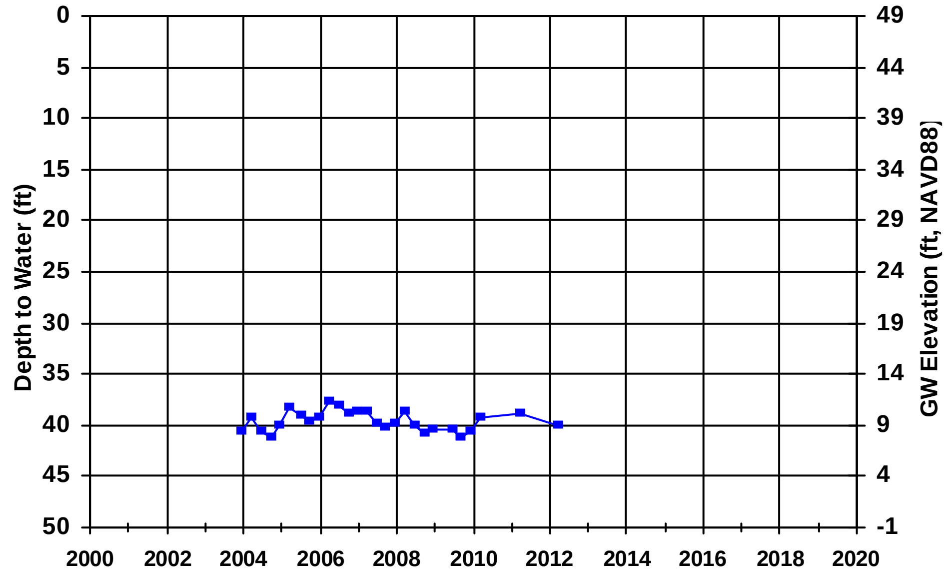

**WellID:** **T0601300782-MW-6**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300782-MW-7**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

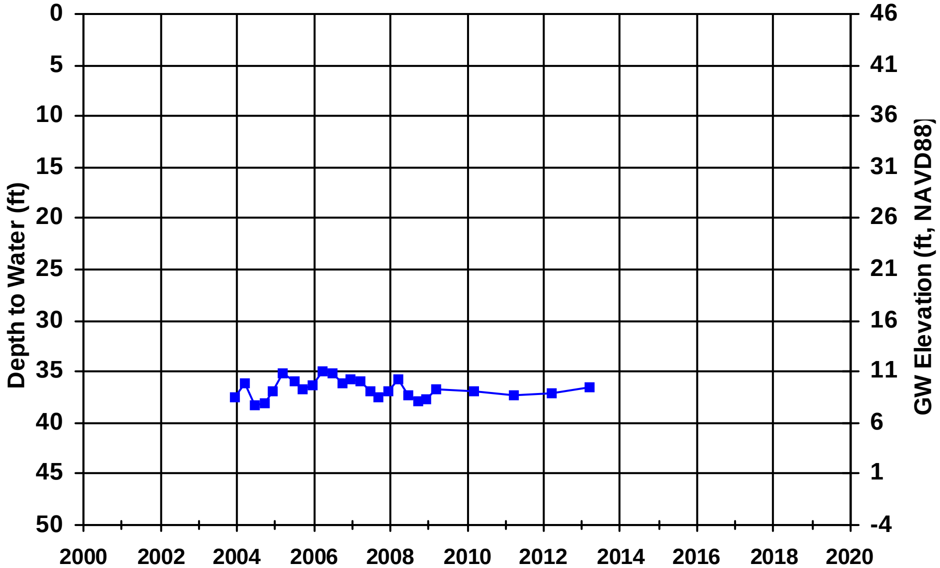



**WellID:** **T0601300782-MW-8**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

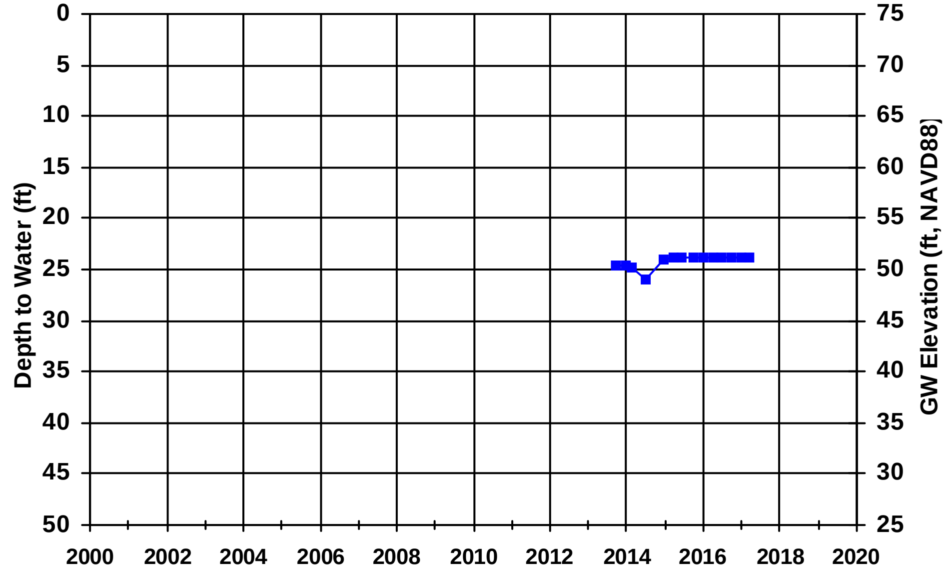



{R_WLhyd88}

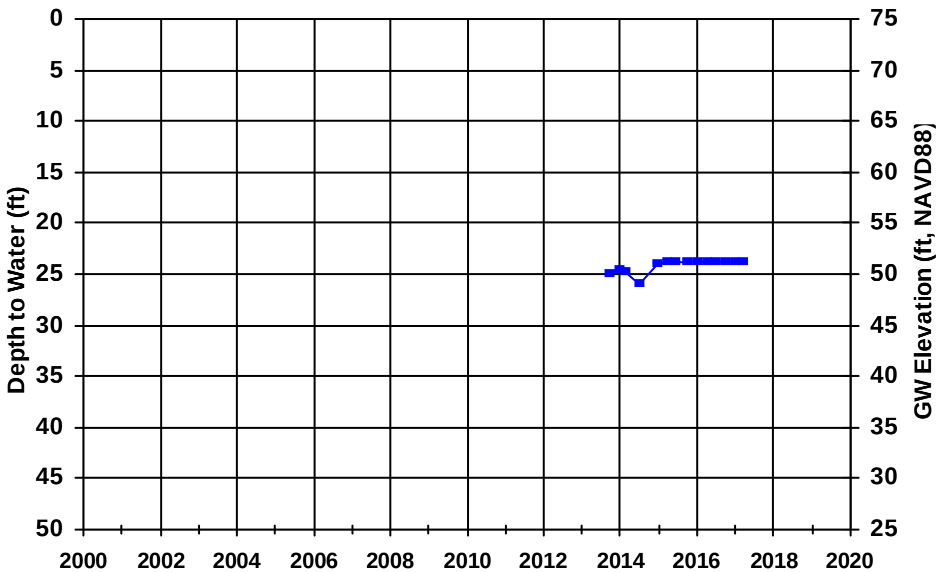
**WellID:** T0601300782-MW-9
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



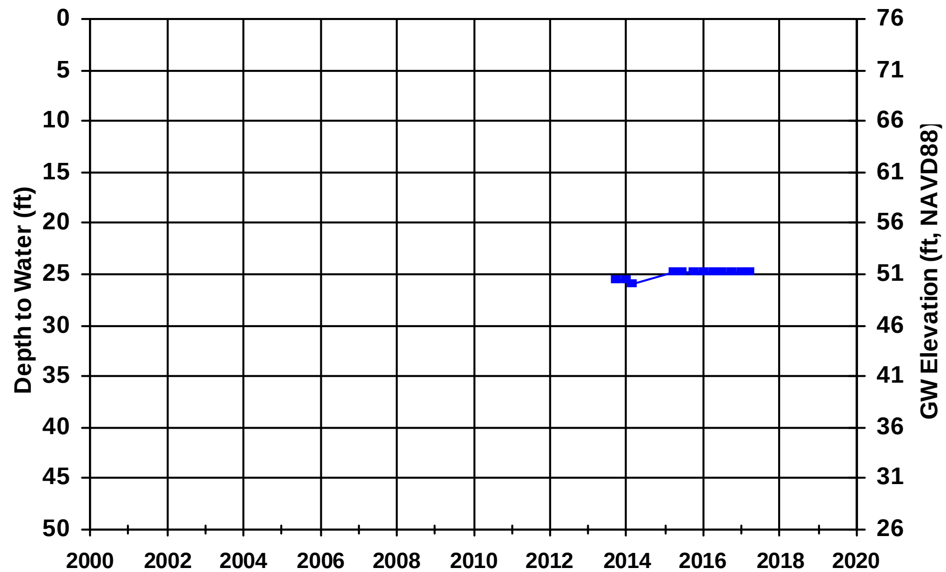

**WellID:** T0601300783-DW-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300783-DW-2
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

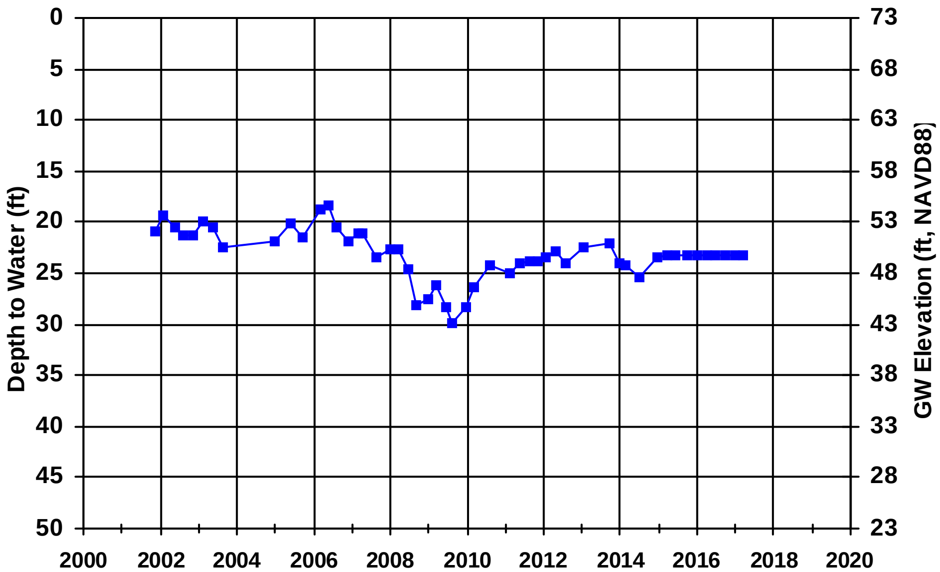



**WellID:** T0601300783-DW-3
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

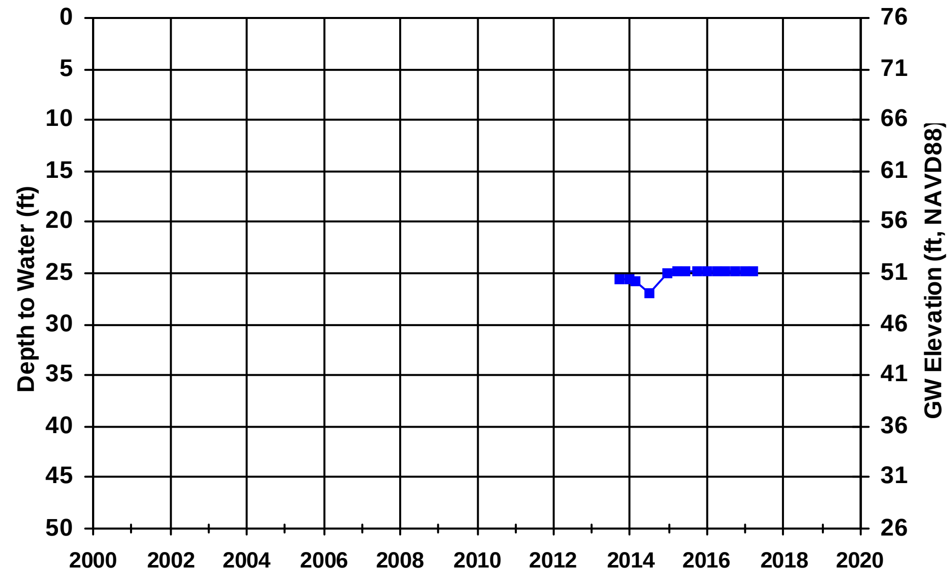



{R_WLhyd88}

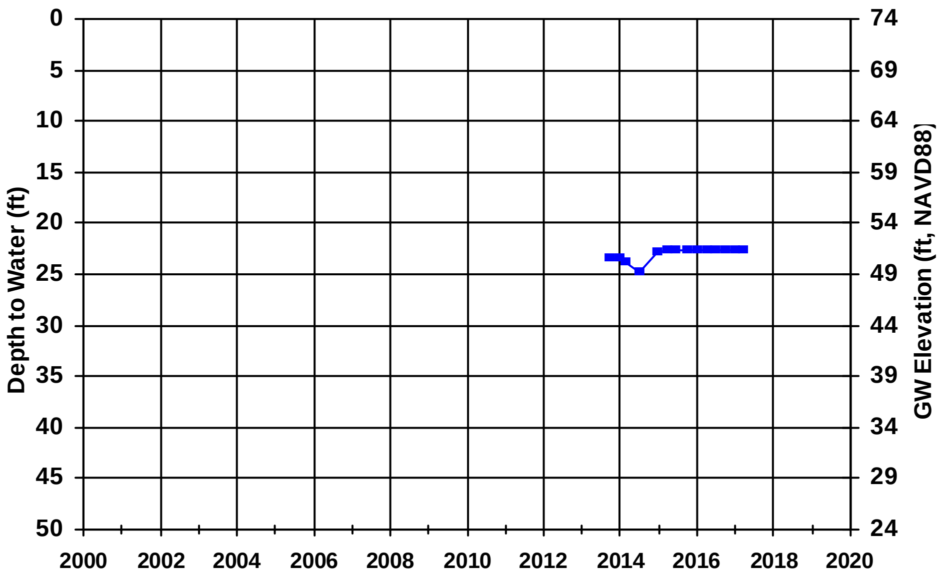
**WellID:** T0601300783-MW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



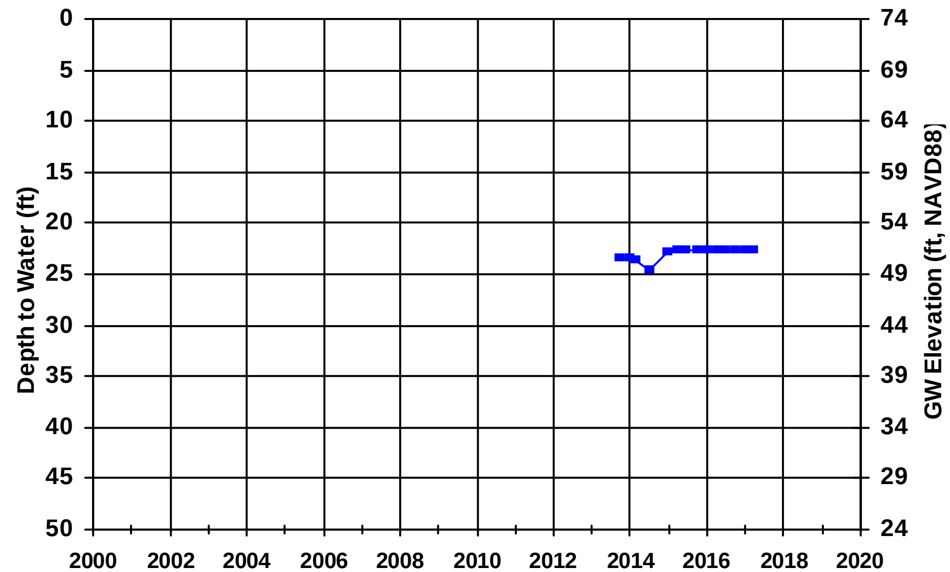

**WellID:** T0601300783-MW-10
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300783-MW-11
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

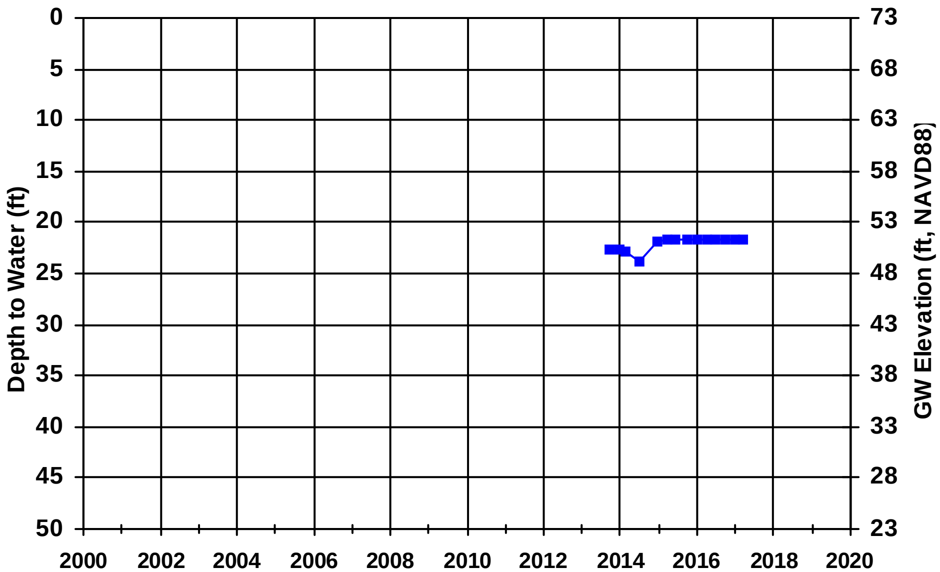



**WellID:** T0601300783-MW-12
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

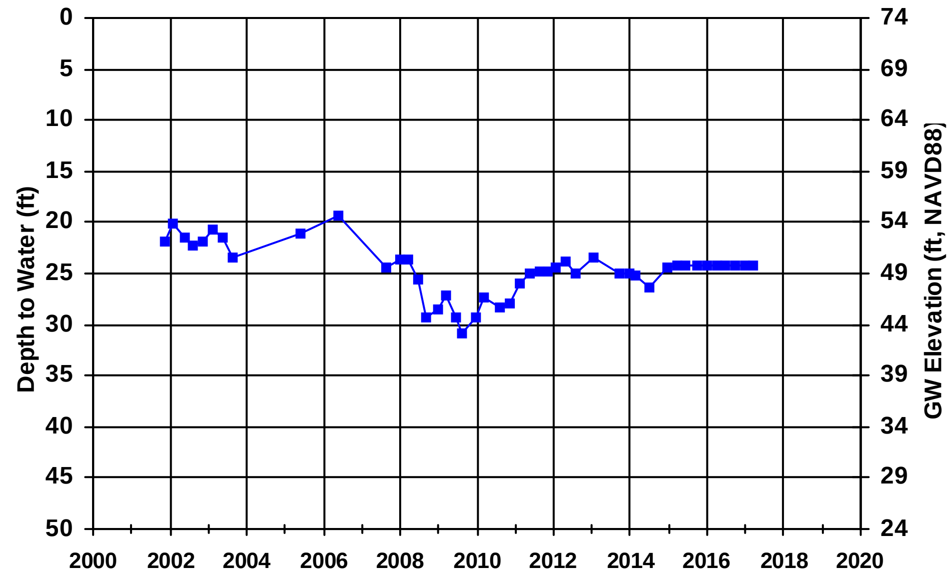



{R_WLhyd88}

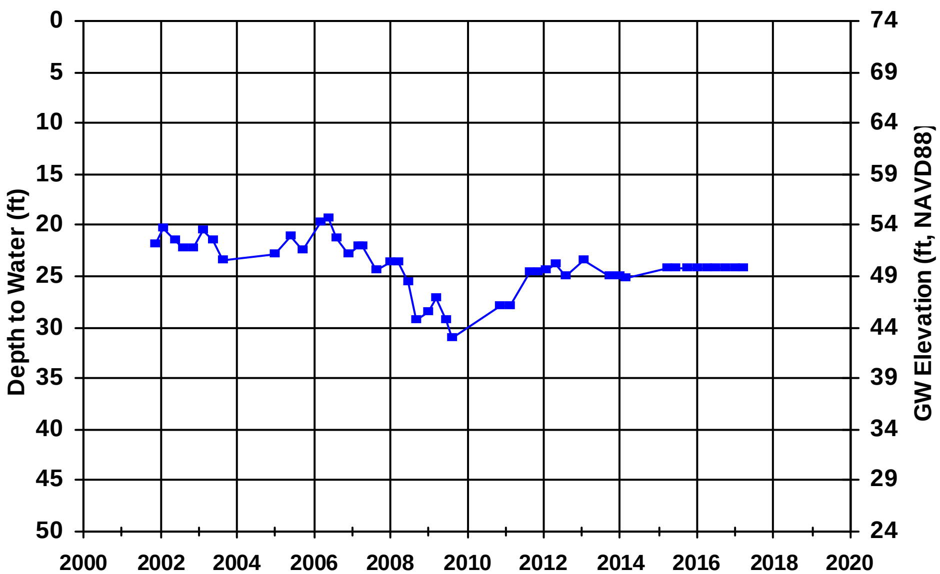
**WellID: T0601300783-MW-13**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



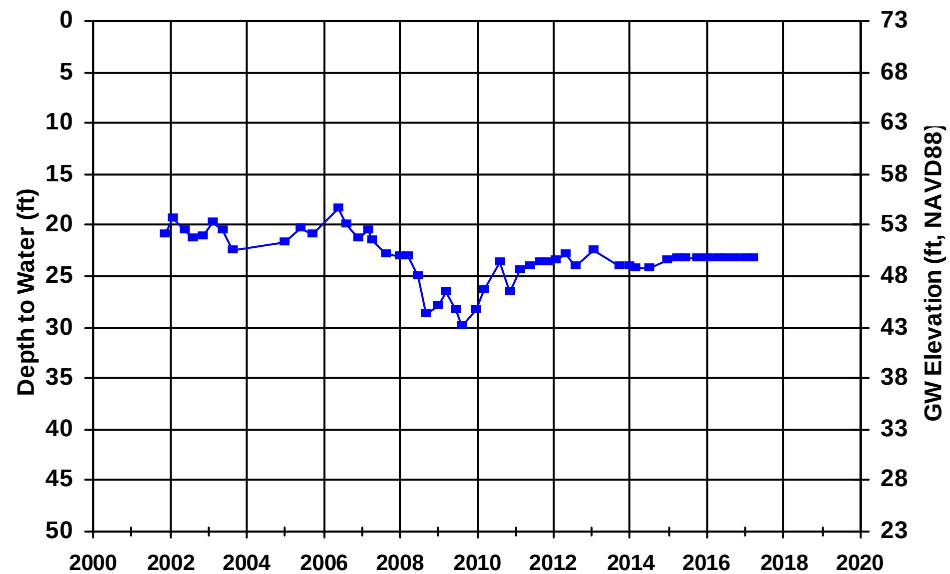

**WellID: T0601300783-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



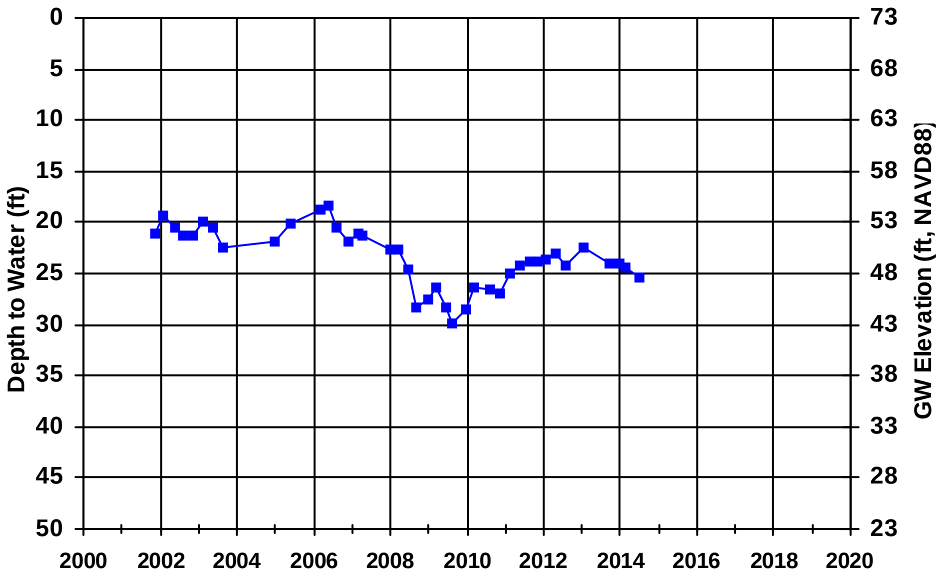

**WellID: T0601300783-MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



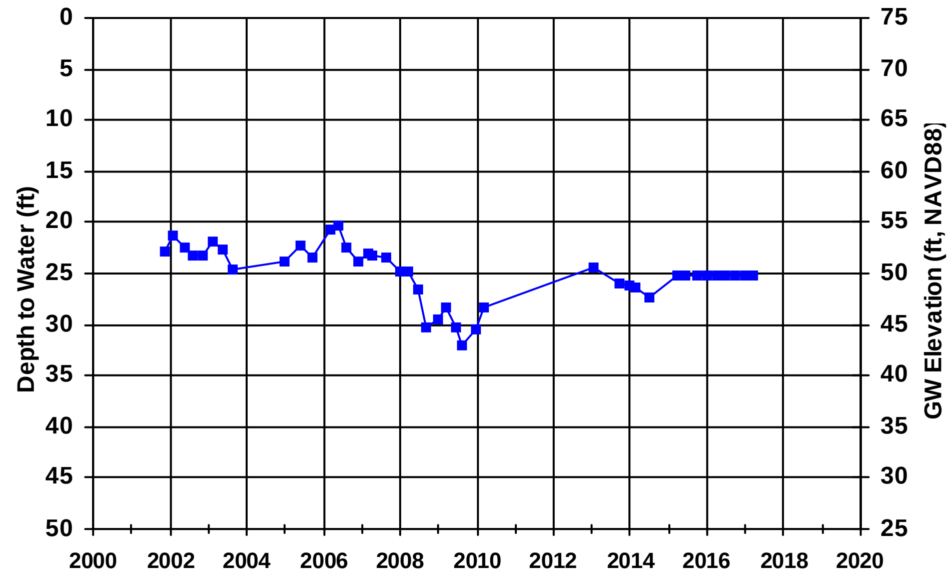

**WellID: T0601300783-MW-4**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



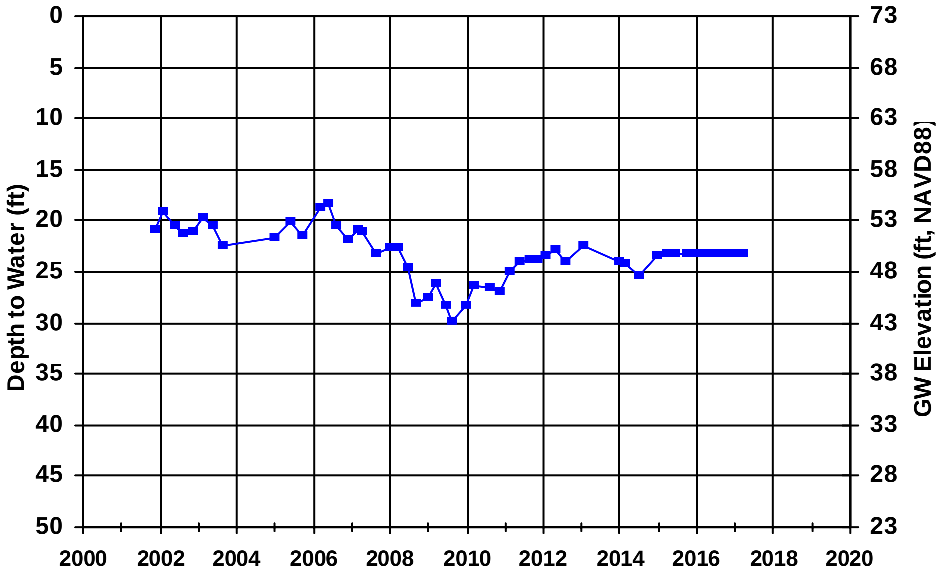
**WellID: T0601300783-MW-5**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



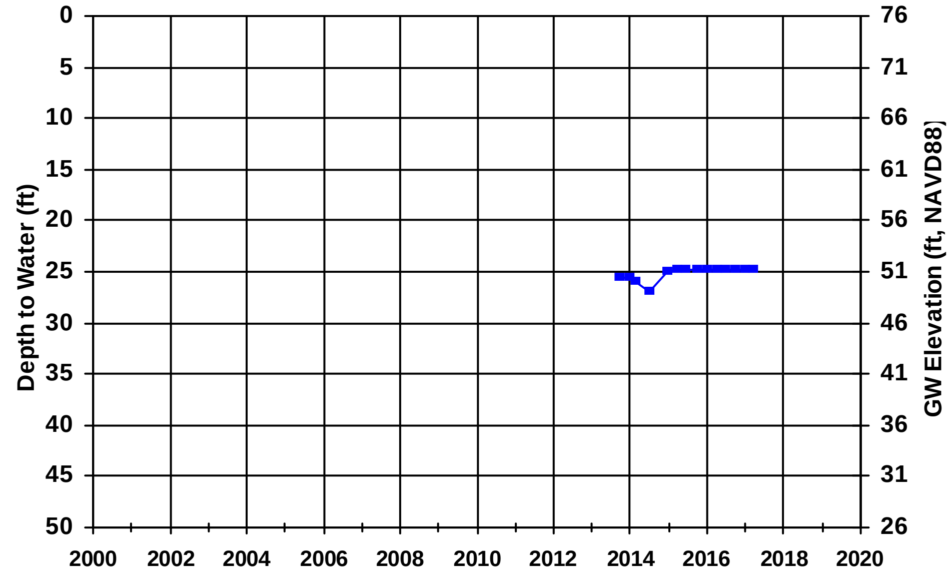

**WellID: T0601300783-MW-6**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300783-MW-7**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

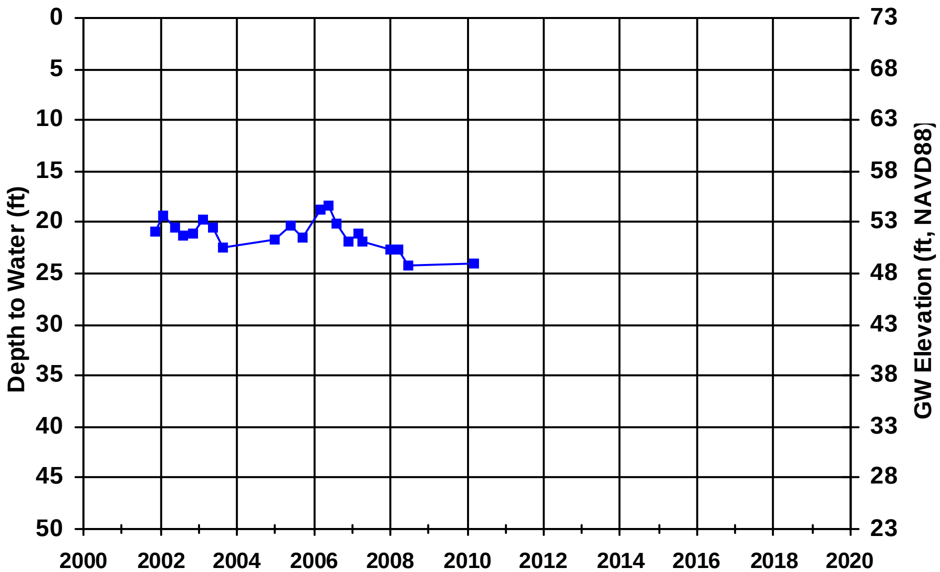



**WellID: T0601300783-MW-9**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

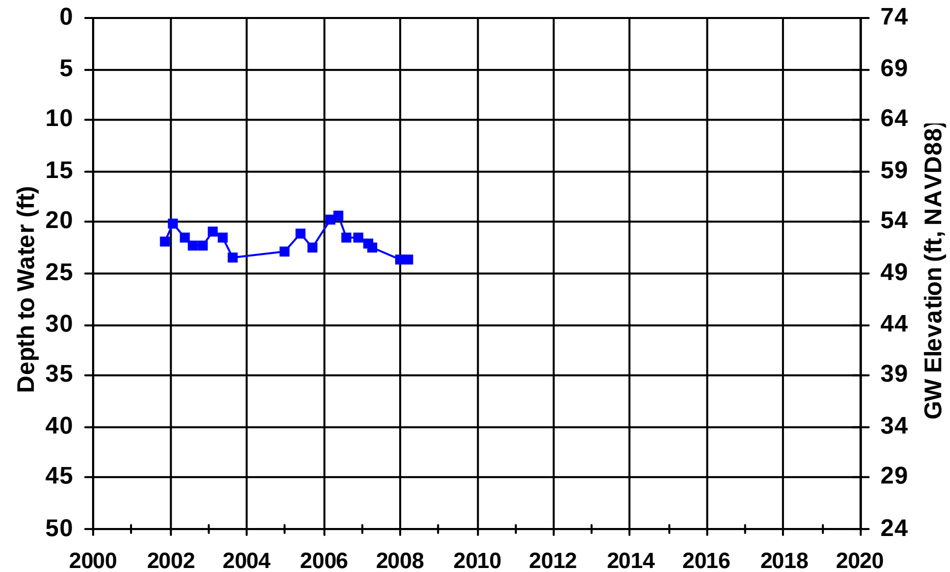



{R_WLhyd88}

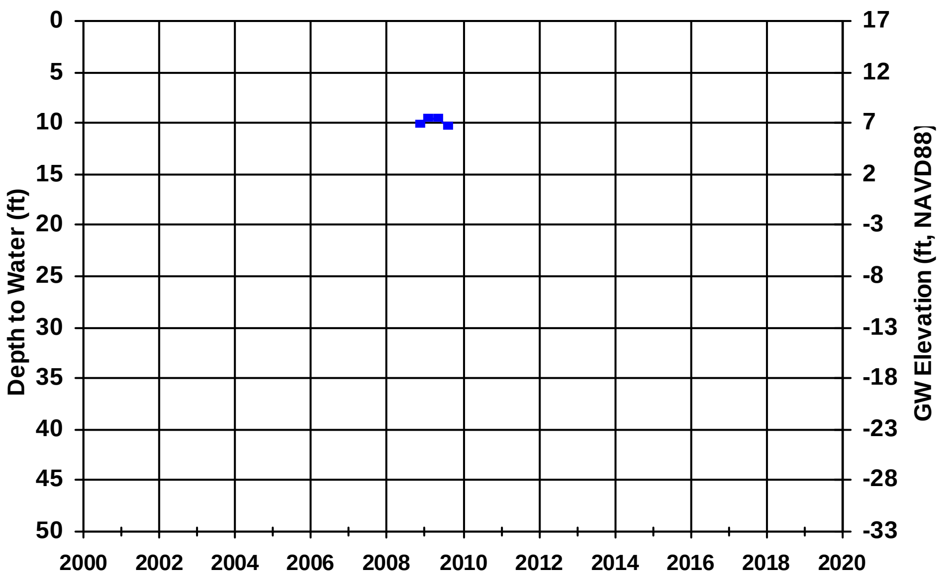
**WellID: T0601300783-SVE-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



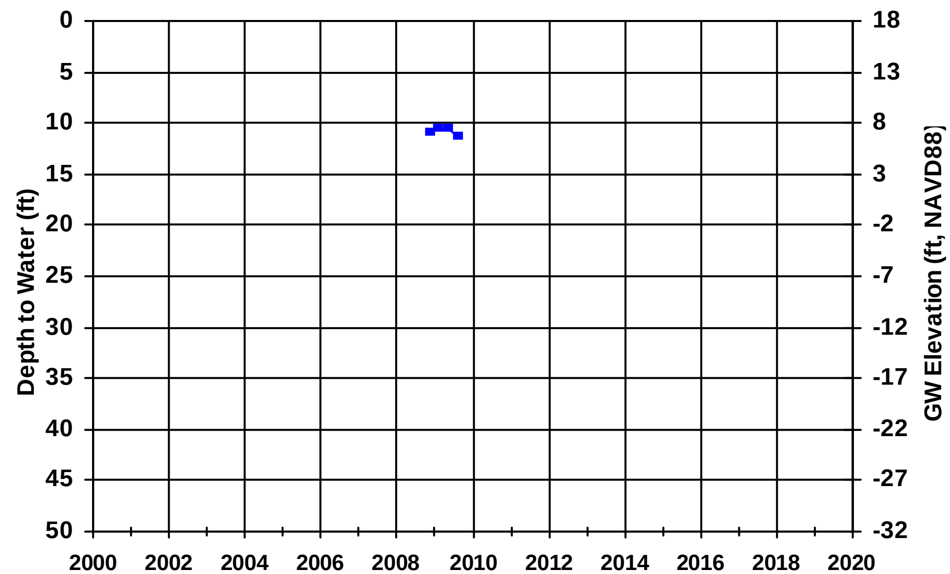

**WellID: T0601300783-SVE-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300784-MW-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

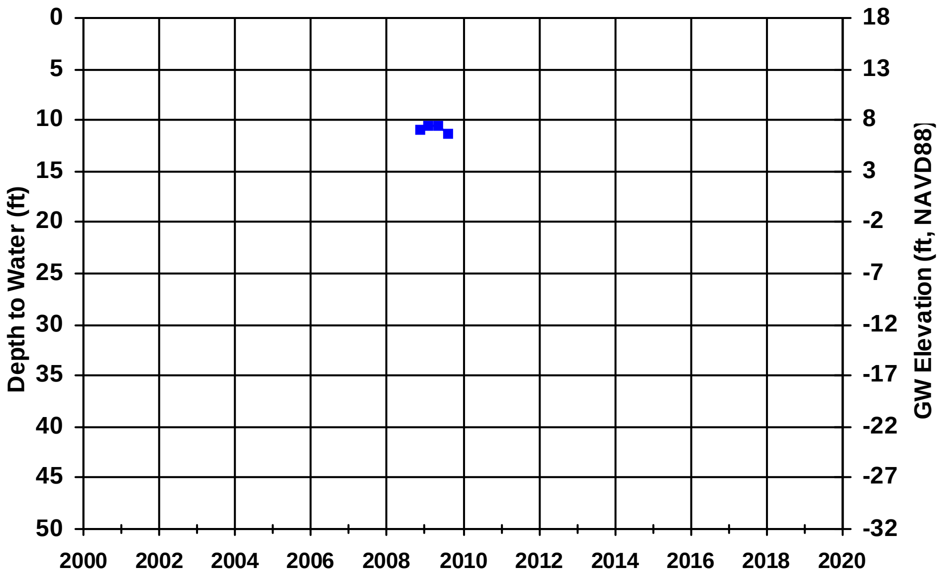



**WellID: T0601300784-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

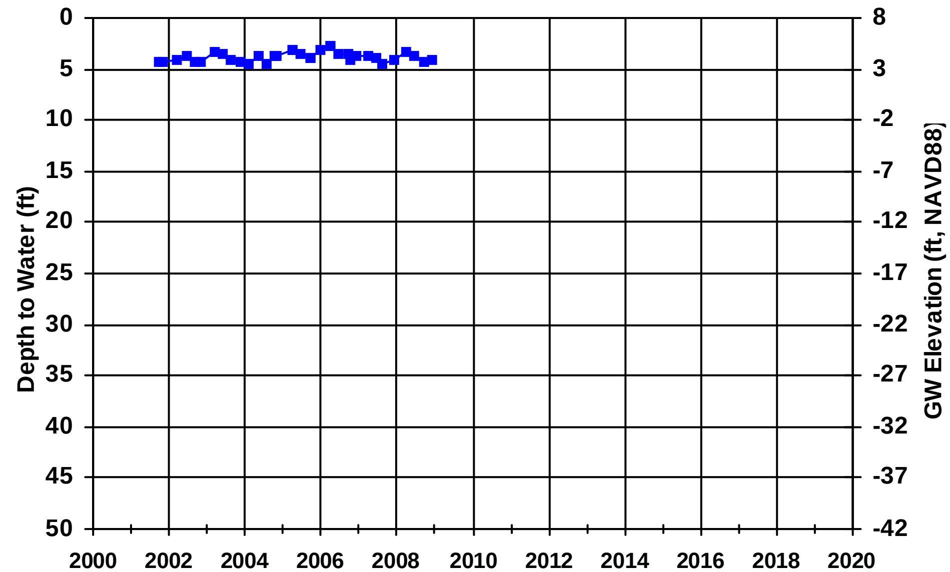



{R_WLhyd88}

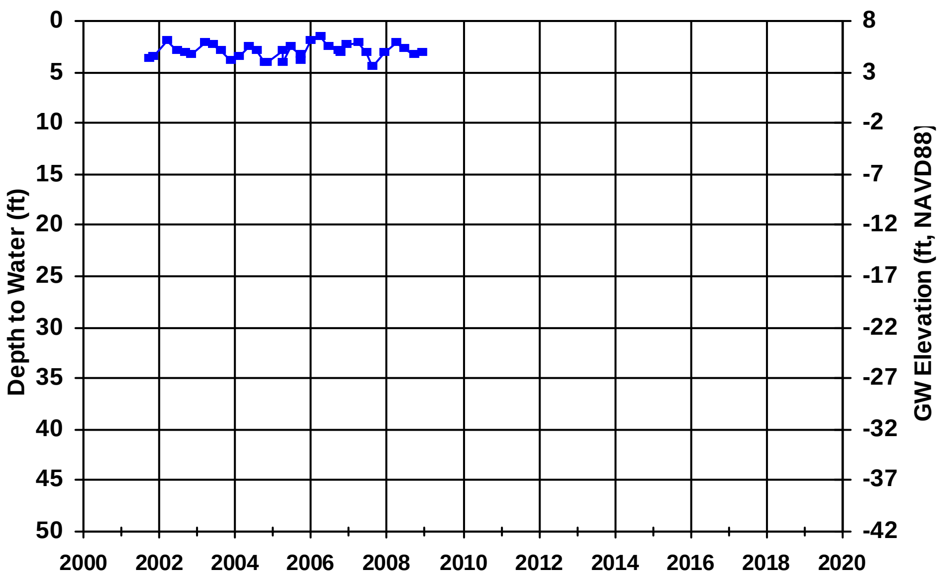
**WellID: T0601300784-MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



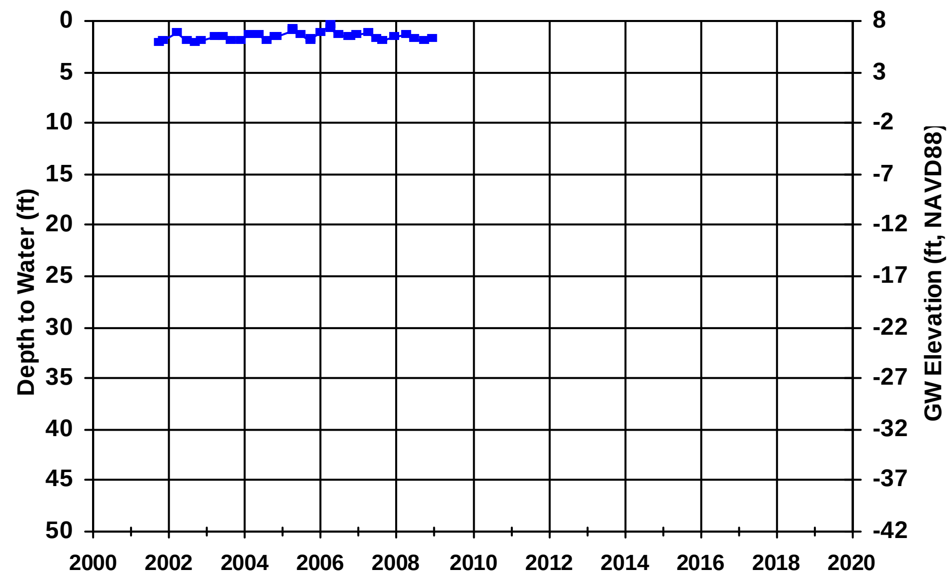

**WellID: T0601300788-MW-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300788-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

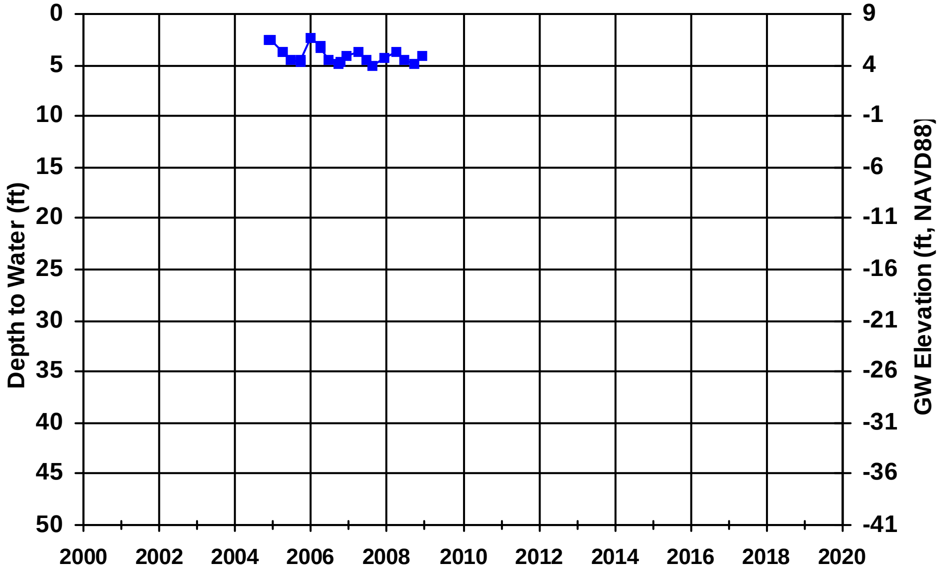



**WellID: T0601300788-MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

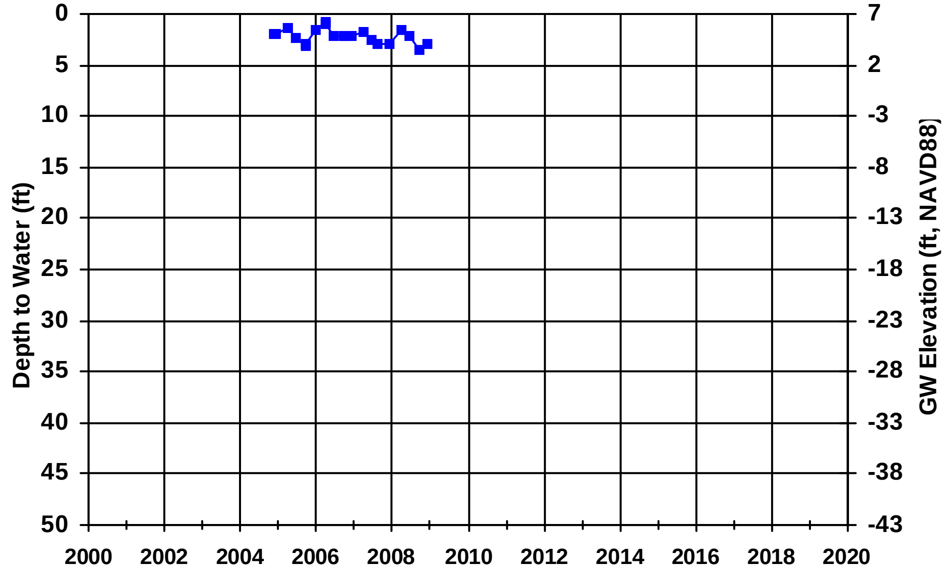



{R_WLhyd88}

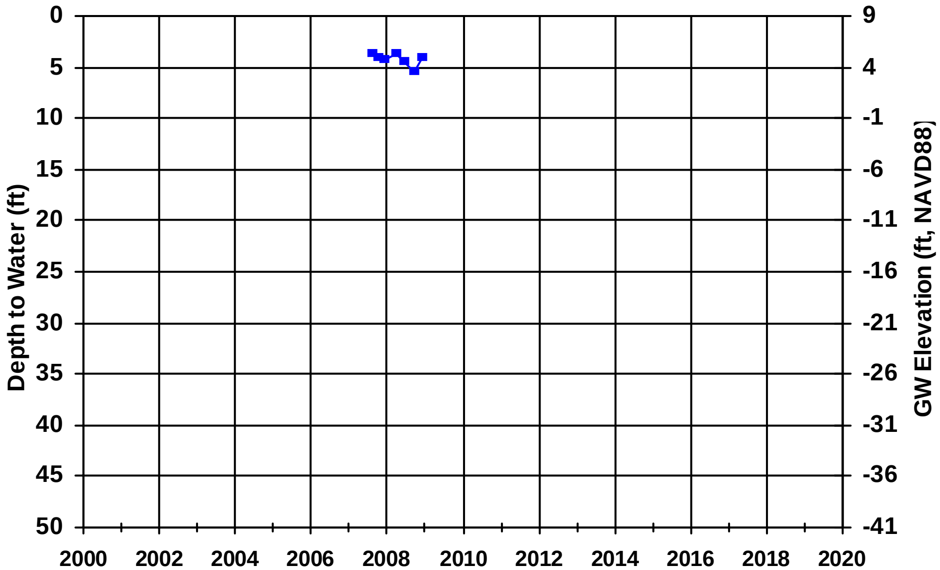
**WellID:** T0601300788-MW-4
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



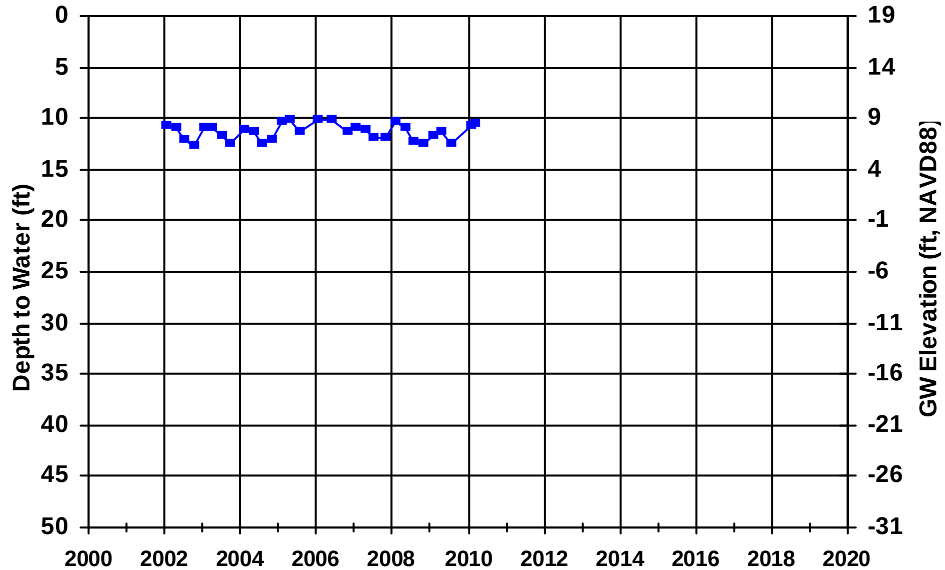

**WellID:** T0601300788-MW-5
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300788-MW-6
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

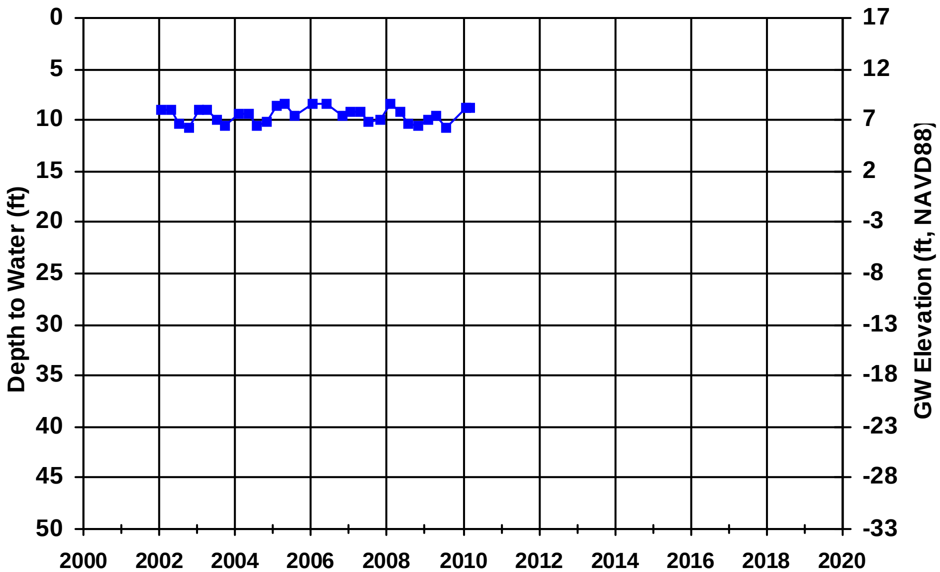



**WellID:** T0601300790-MW-1
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

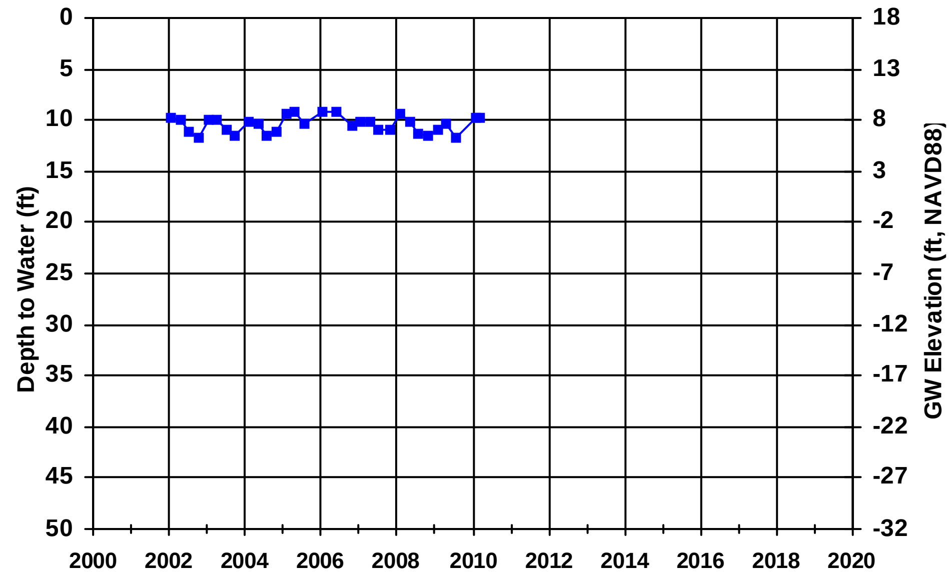



{R_WLhyd88}

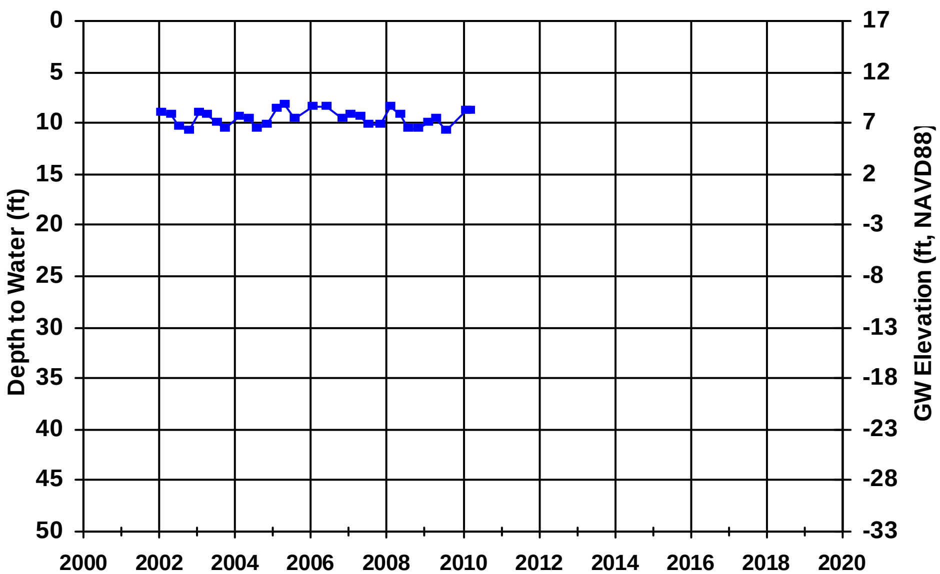
**WellID:** **T0601300790-MW-2**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



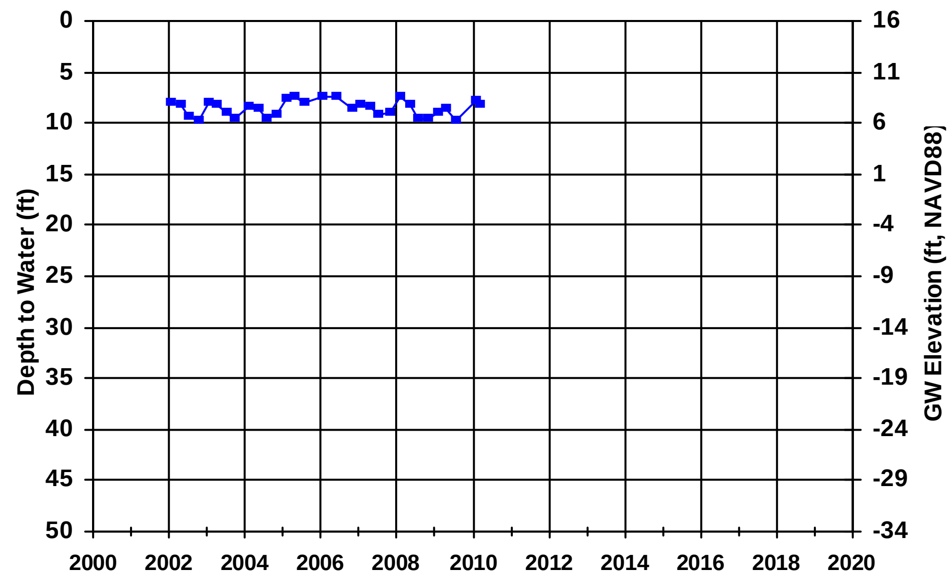

**WellID:** **T0601300790-MW-3**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300790-MW-4**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

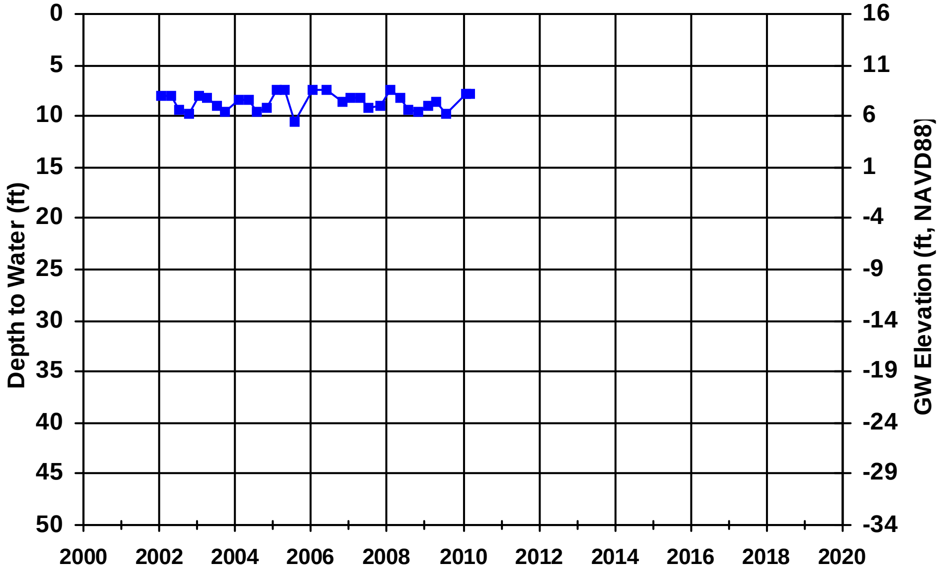



**WellID:** **T0601300790-MW-5**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

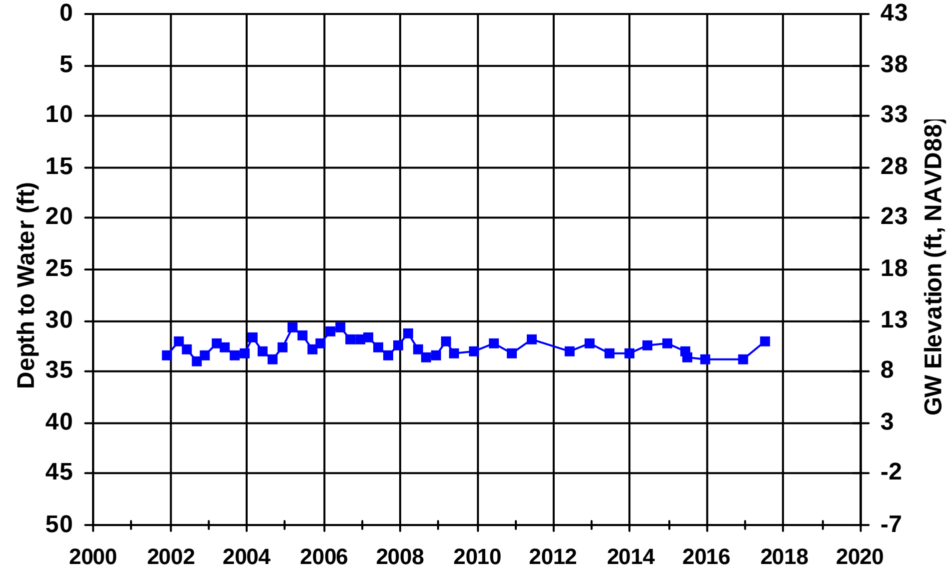



{R_WLhyd88}

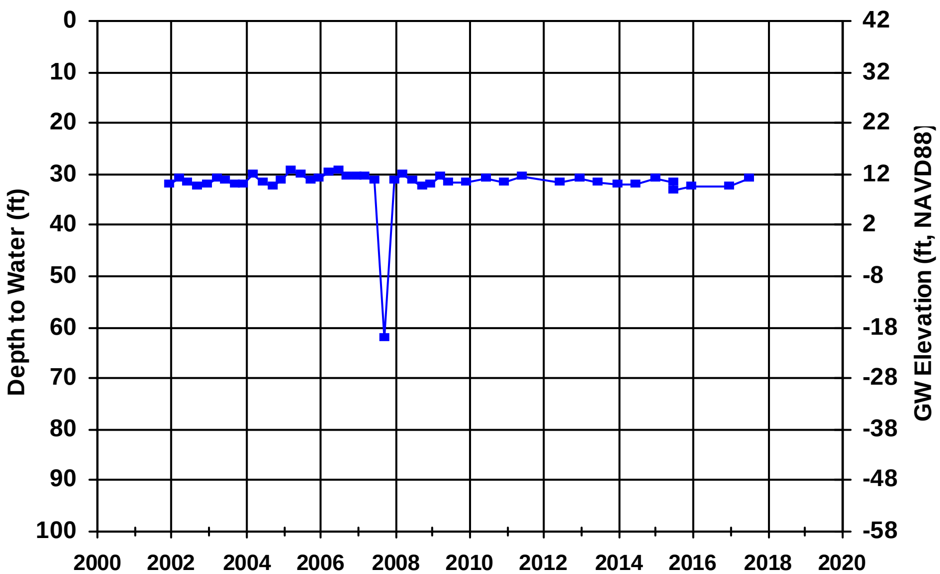
**WellID: T0601300790-MW-6**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



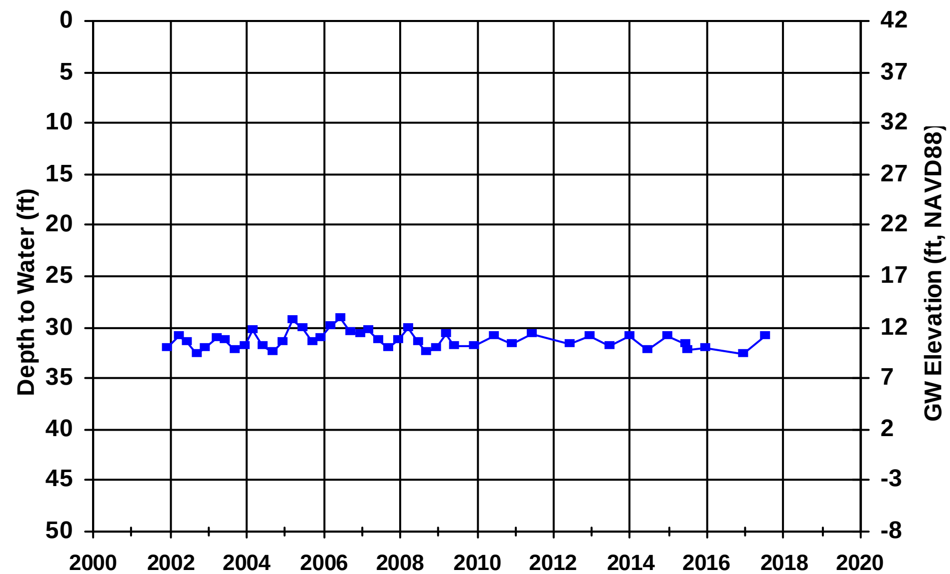

**WellID: T0601300800-BW-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300800-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

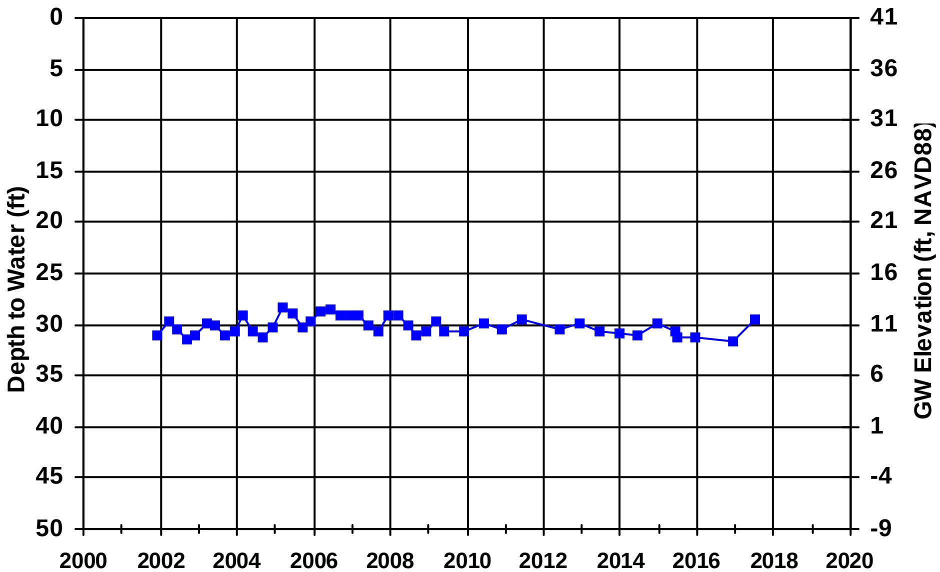



**WellID: T0601300800-MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

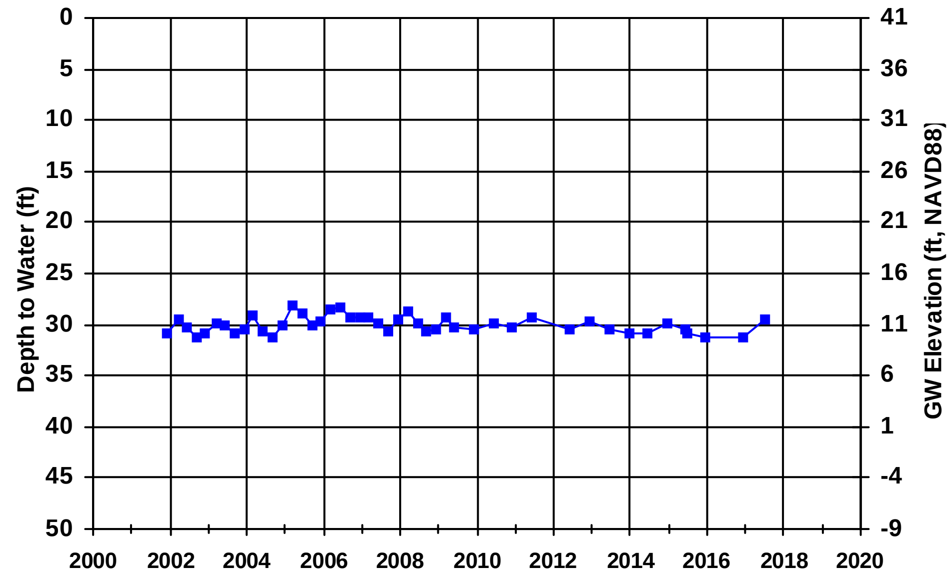



{R_WLhyd88}

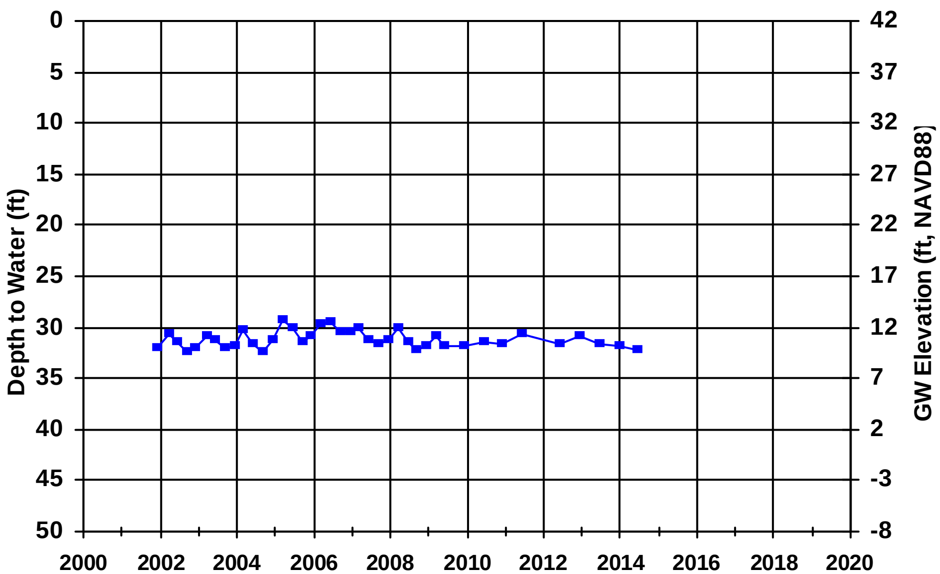
**WellID: T0601300800-MW-4A**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



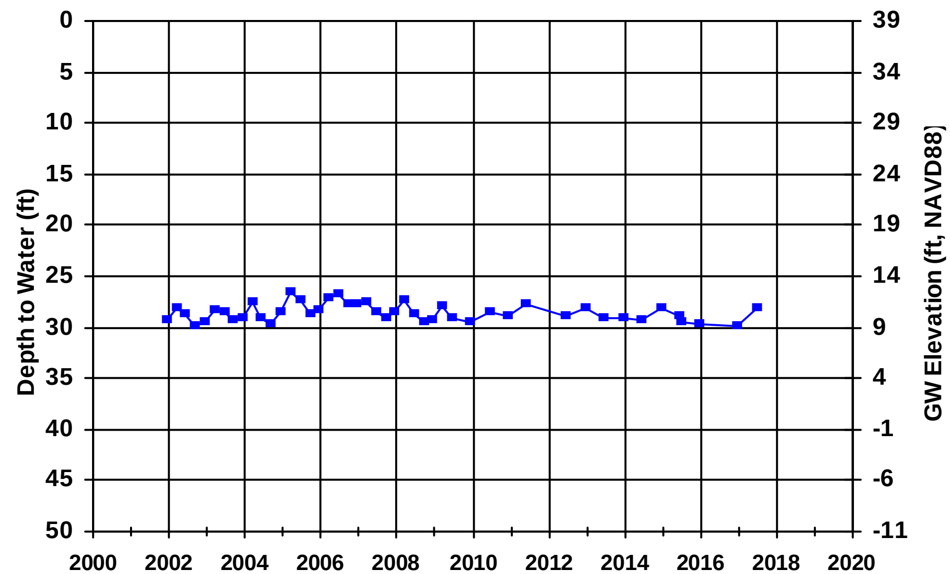

**WellID: T0601300800-MW-4B**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300800-MW-5B**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

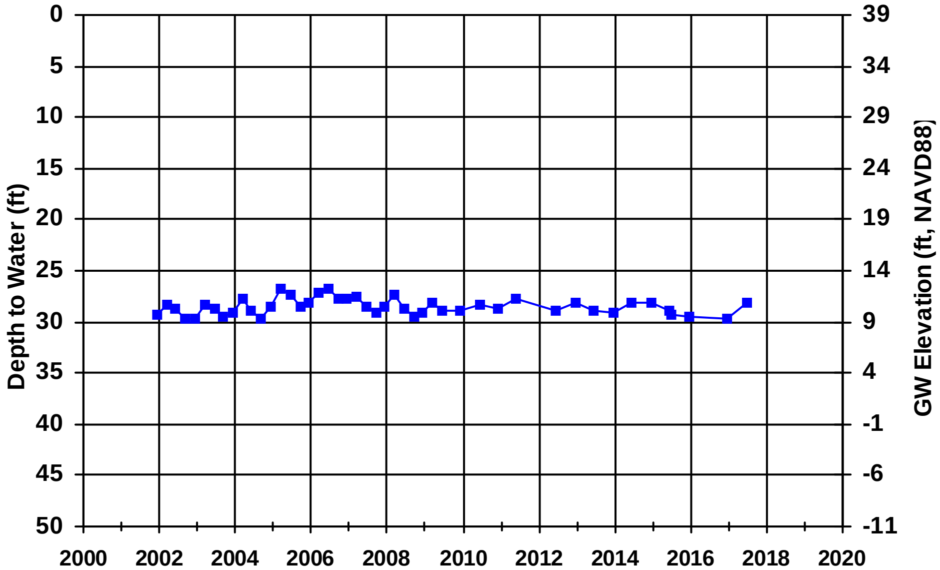



**WellID: T0601300800-MW-6A**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

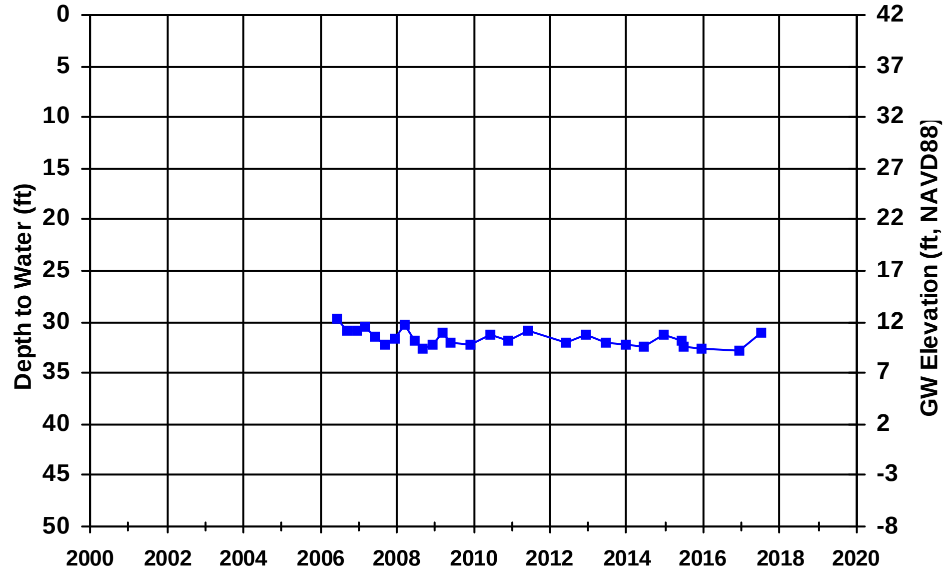



{R_WLhyd88}

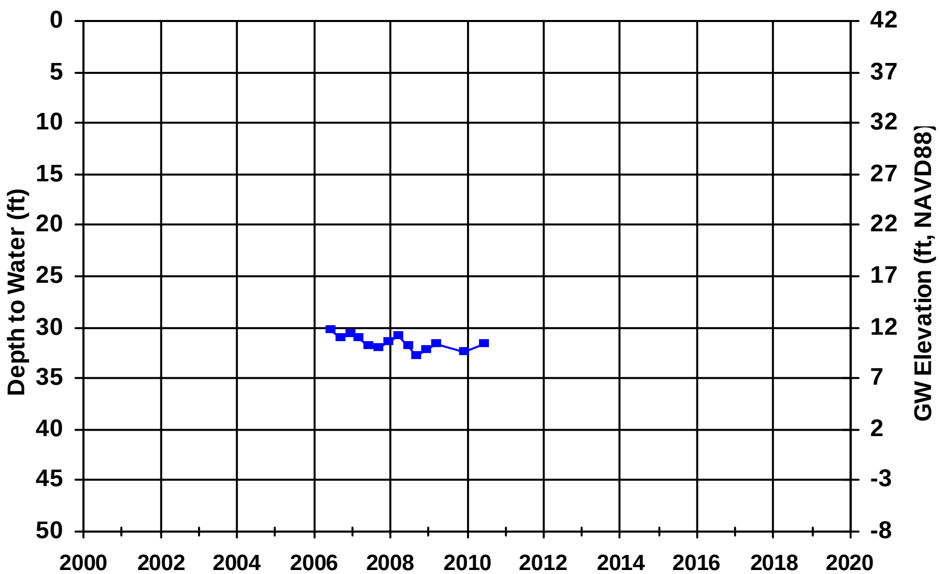
**WellID:** T0601300800-MW-6B
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



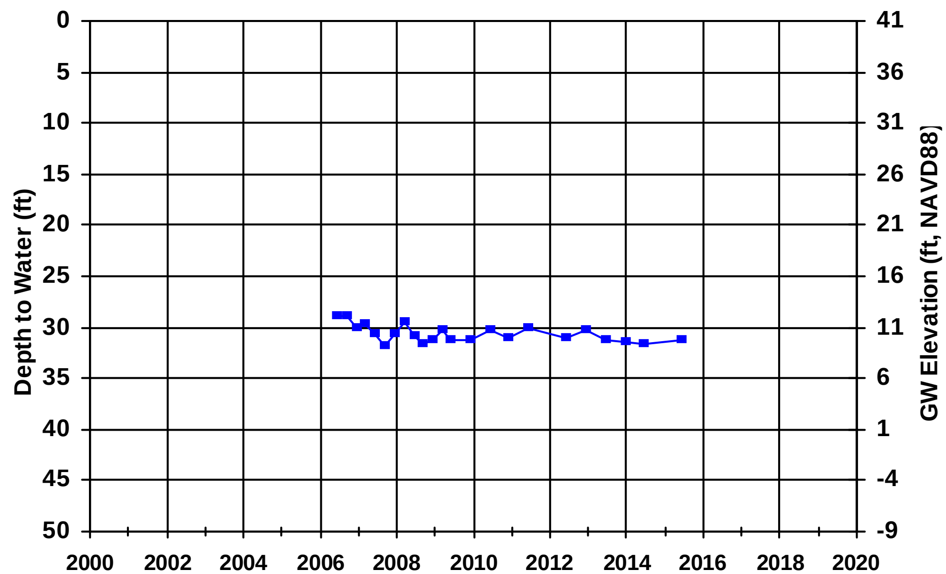

**WellID:** T0601300800-MW-7B
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300800-MW-7BL
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

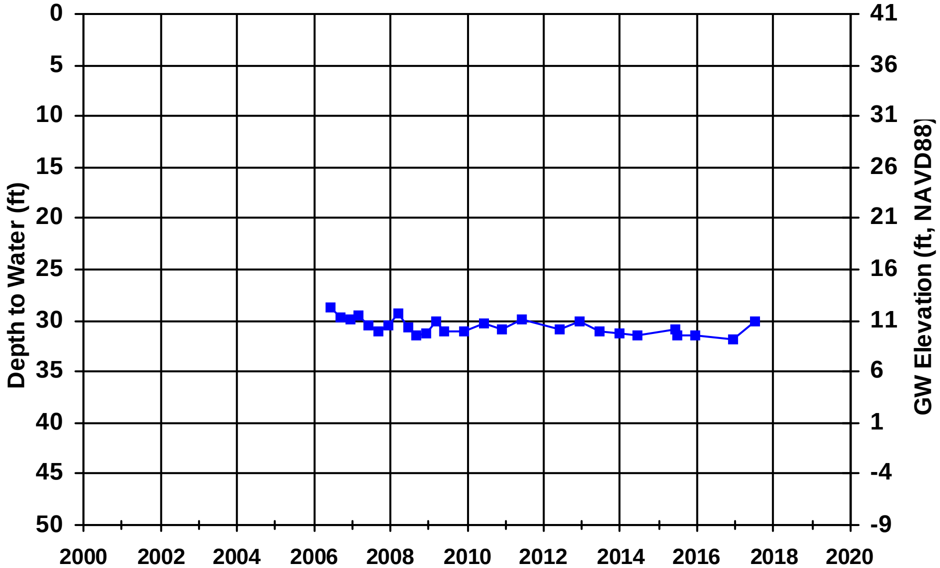



**WellID:** T0601300800-MW-8A
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

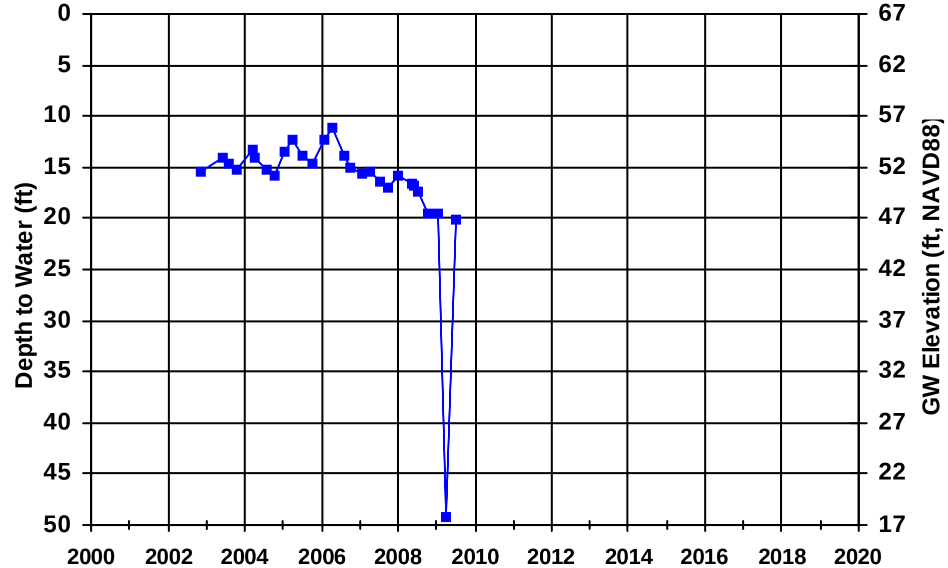



{R_WLhyd88}

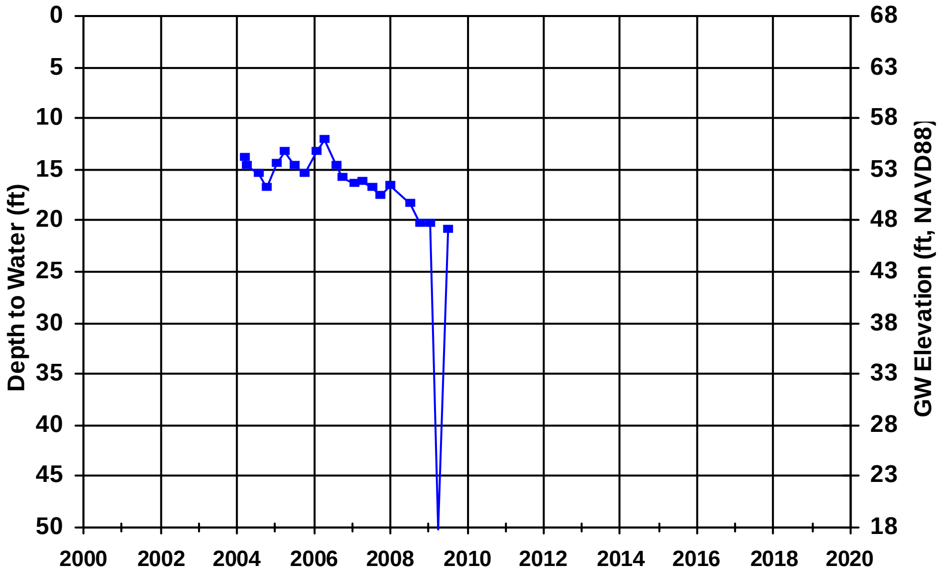
**WellID:** **T0601300800-MW-8BL**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



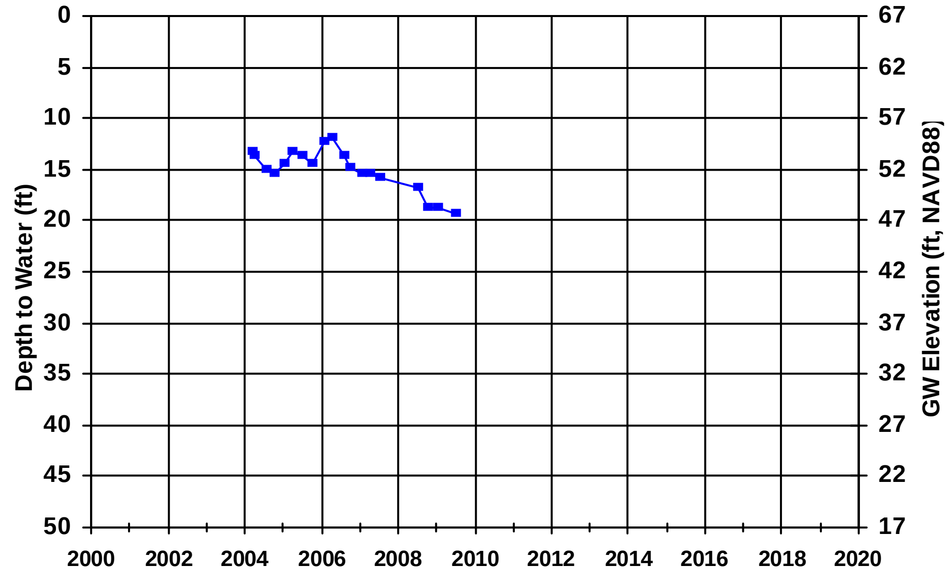

**WellID:** **T0601300802-MW-1**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300802-MW-10**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

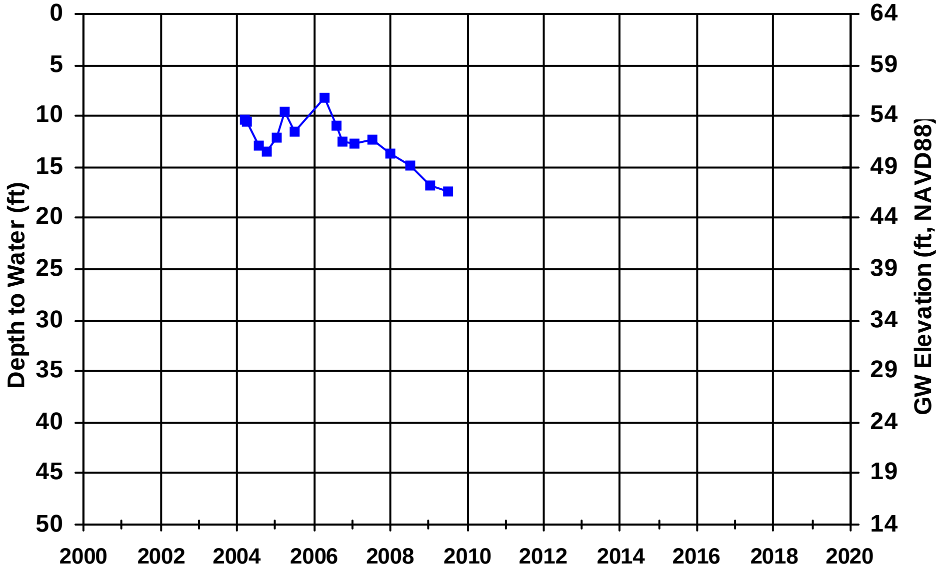



**WellID:** **T0601300802-MW-11**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

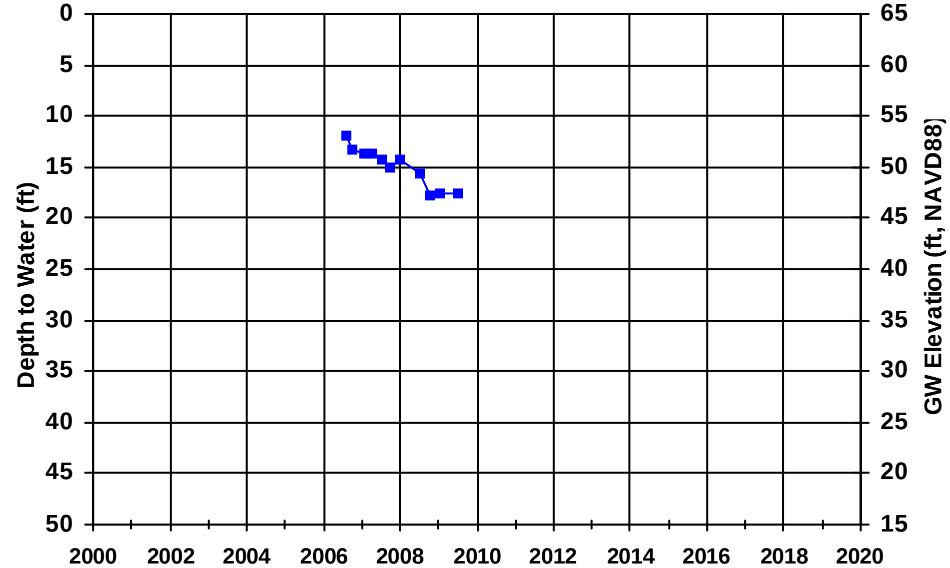



{R_WLhyd88}

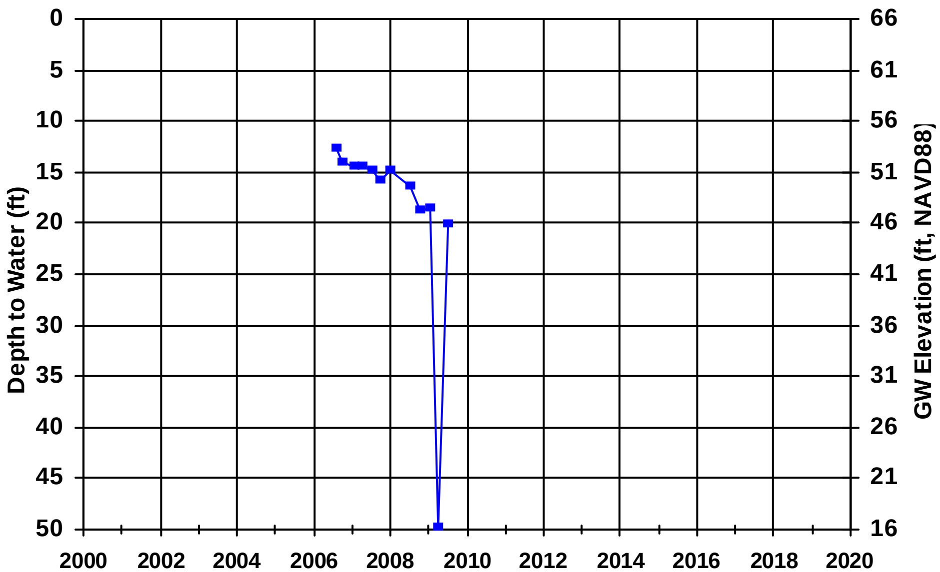
**WellID:** **T0601300802-MW-12**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



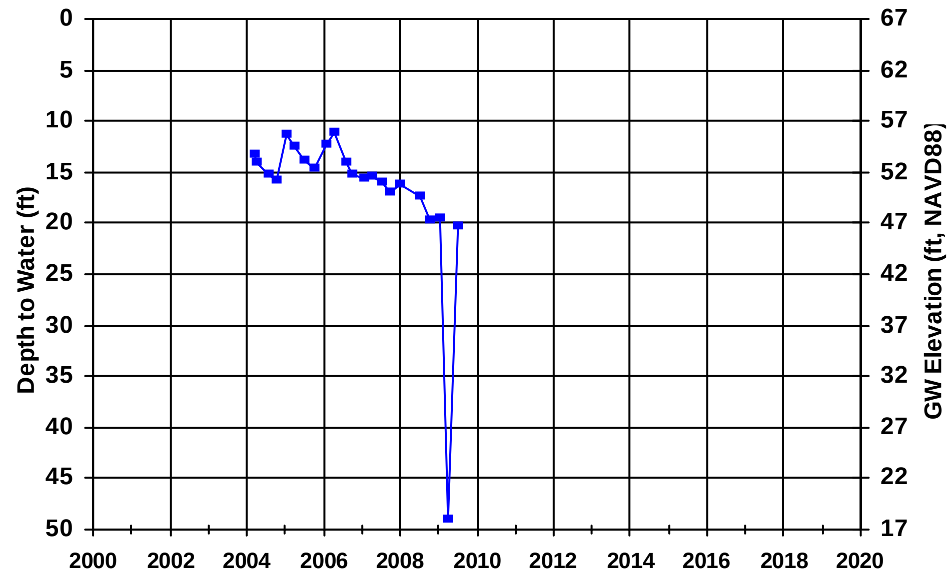

**WellID:** **T0601300802-MW-13**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300802-MW-14**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

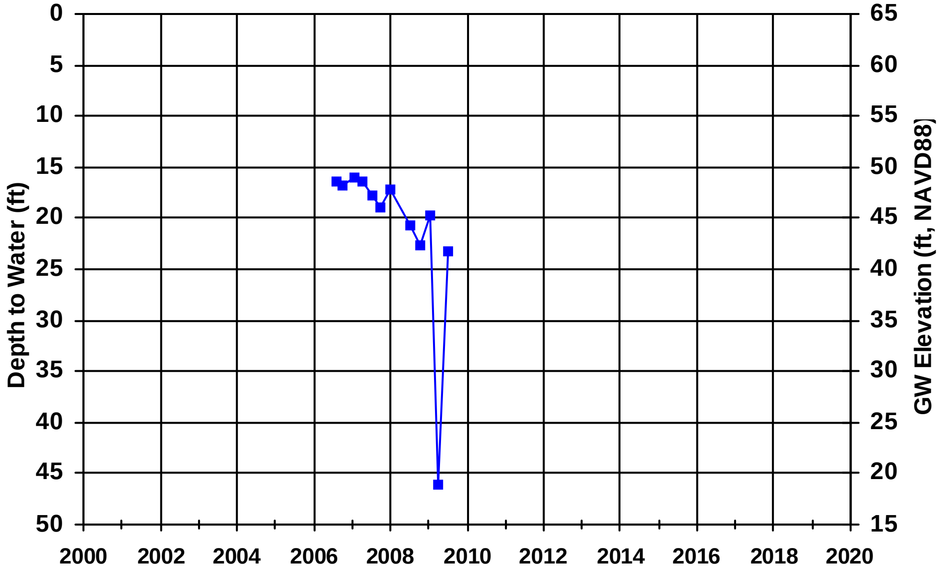



**WellID:** **T0601300802-MW-15D**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

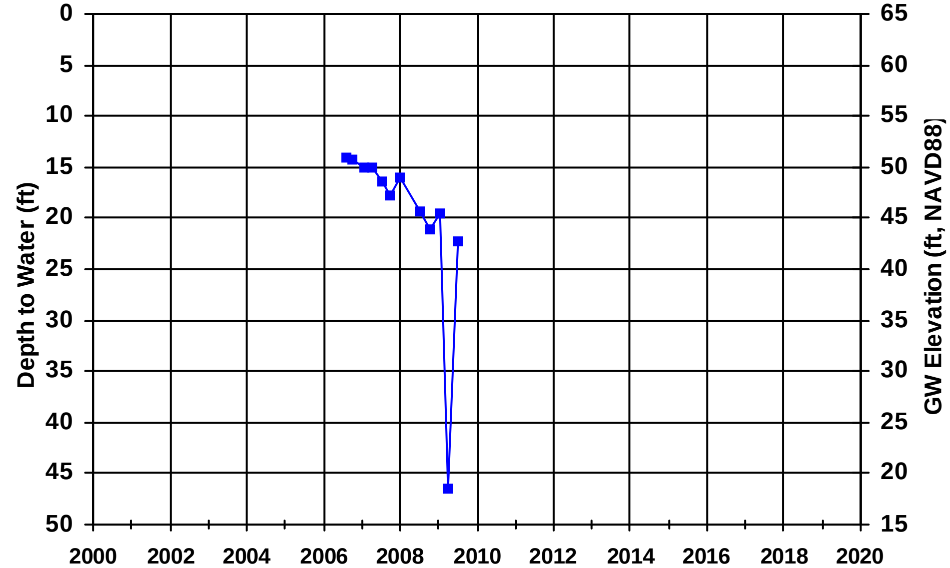



{R_WLhyd88}

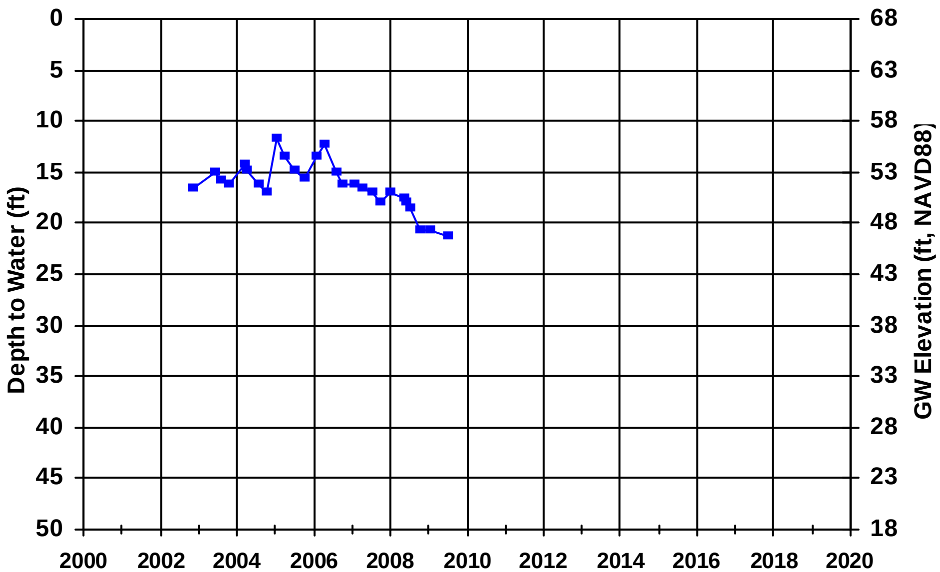
**WellID:** T0601300802-MW-16D
**Zone:** Shallow
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A



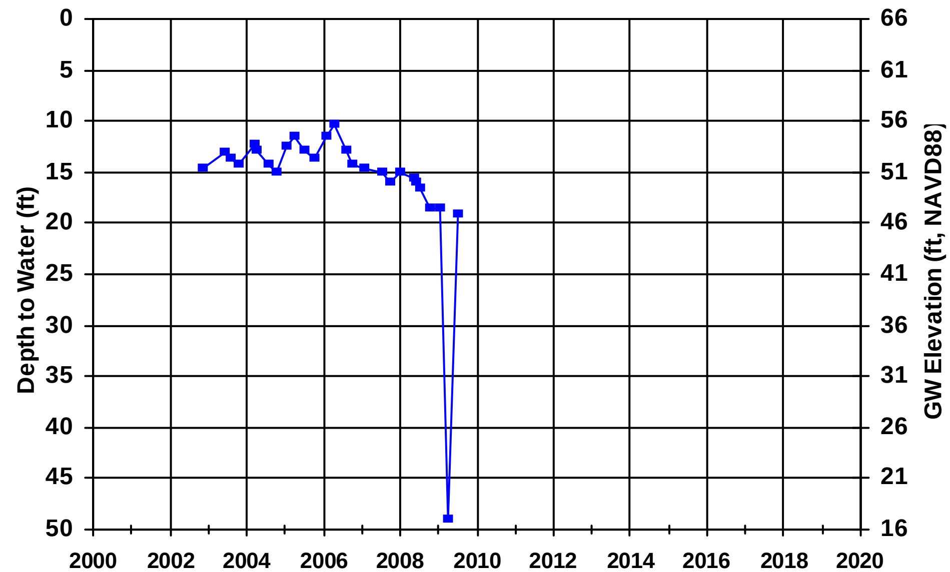

**WellID:** T0601300802-MW-17D
**Zone:** Shallow
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A




**WellID:** T0601300802-MW-2
**Zone:** Shallow
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A

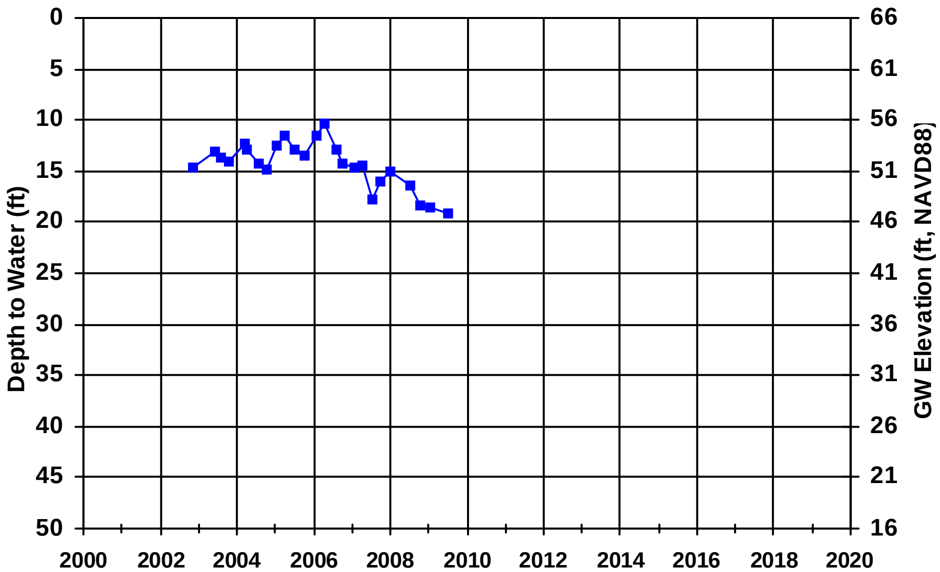



**WellID:** T0601300802-MW-3
**Zone:** Shallow
Source: Geotracker   Perf Int (ft): N/A   Well Depth (ft): N/A

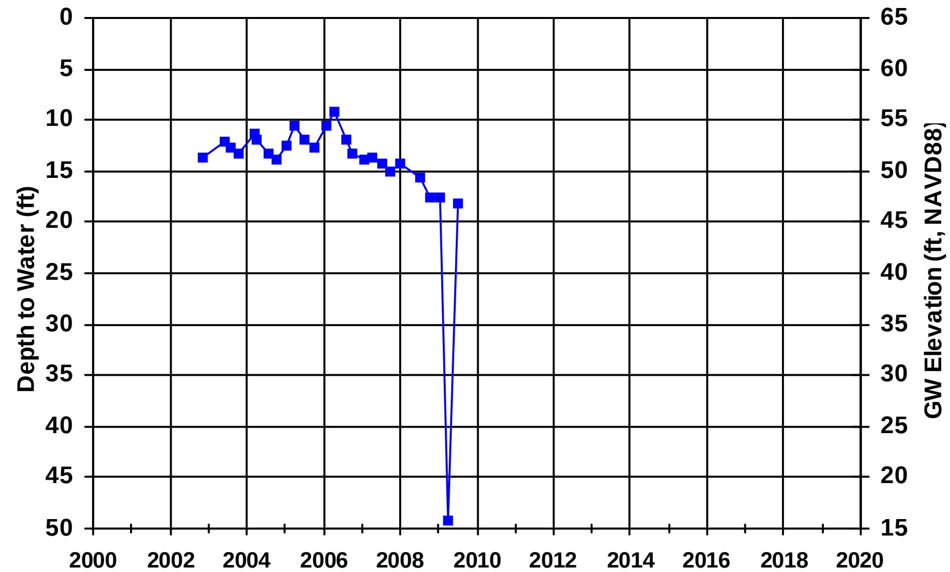



{R_WLhyd88}

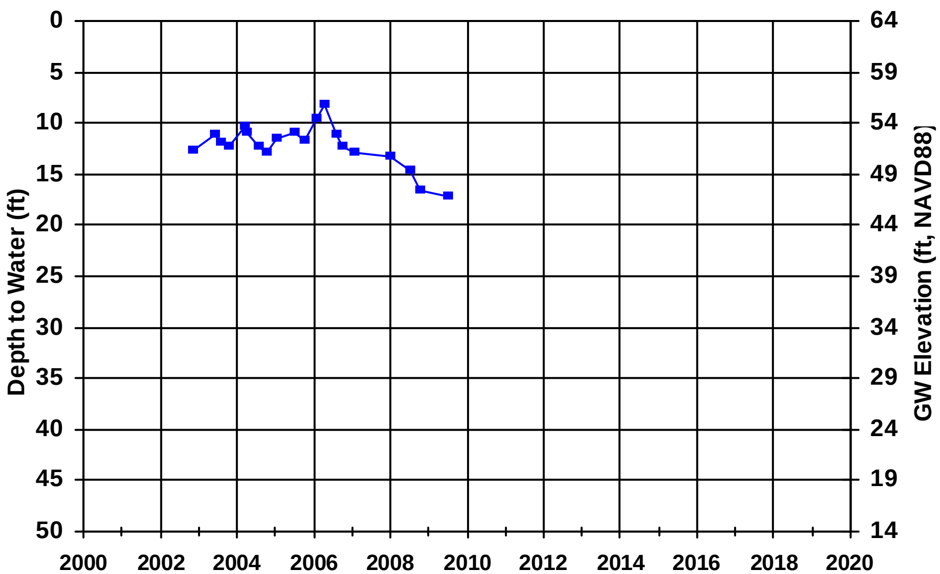
**WellID:** T0601300802-MW-4
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



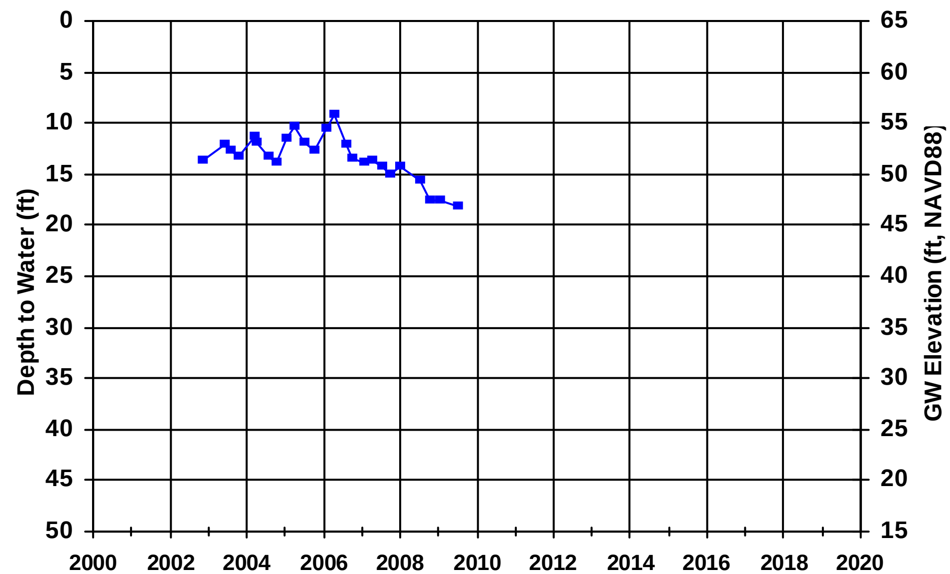

**WellID:** T0601300802-MW-5
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300802-MW-6
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

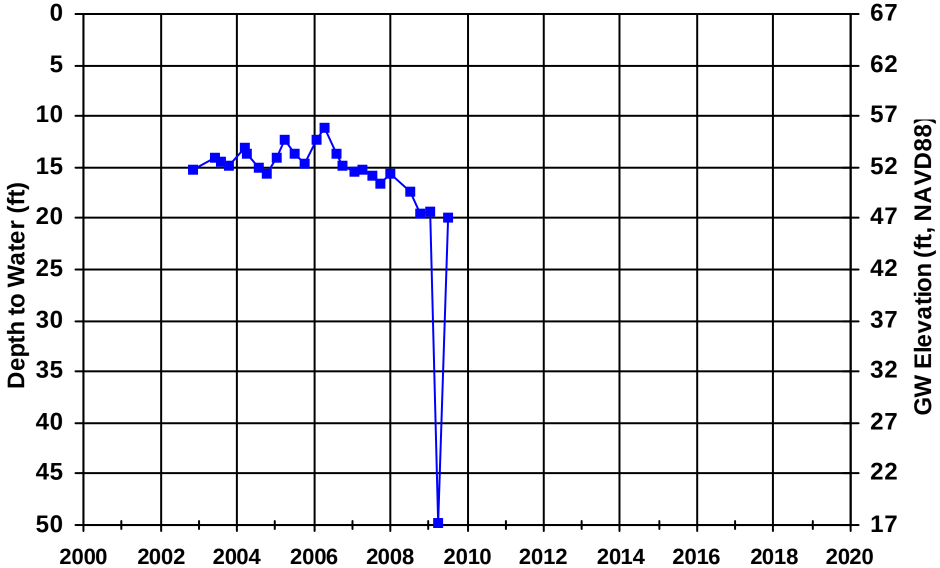



**WellID:** T0601300802-MW-7
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

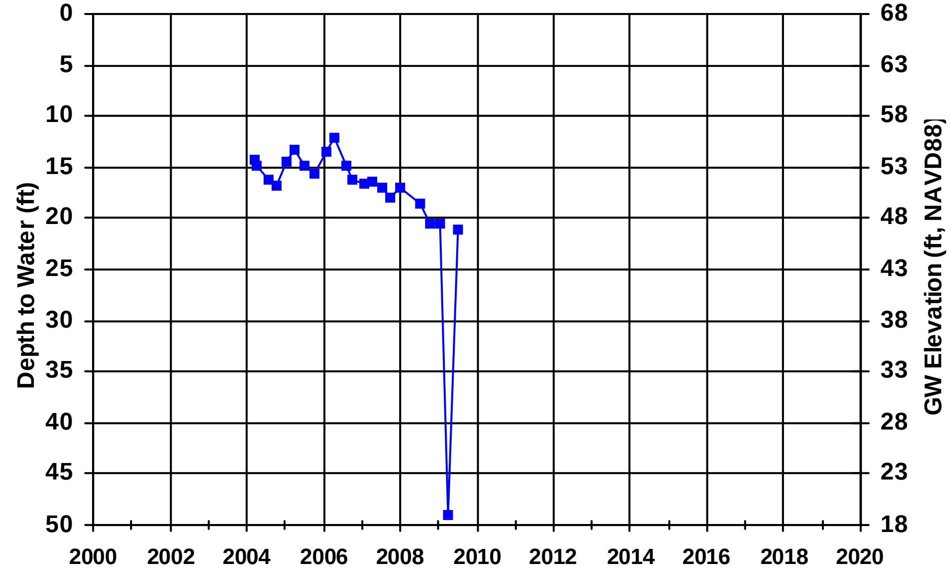



{R_WLhyd88}

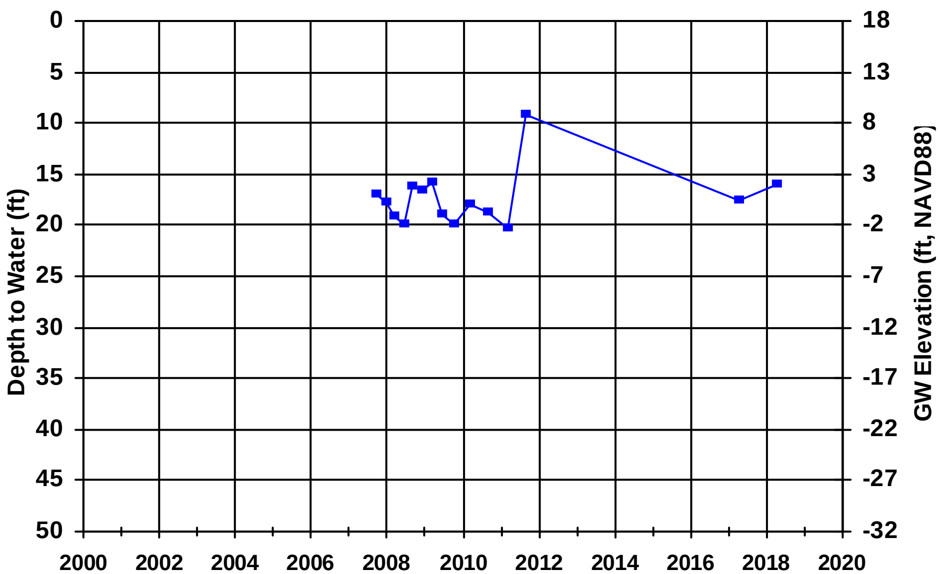
**WellID:** **T0601300802-MW-8**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



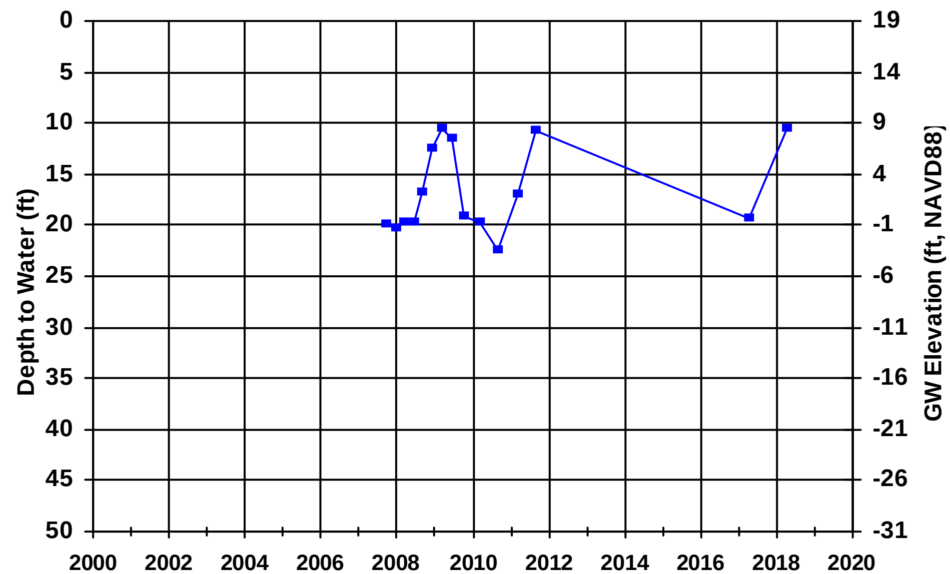

**WellID:** **T0601300802-MW-9D**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300803-STEW-23**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

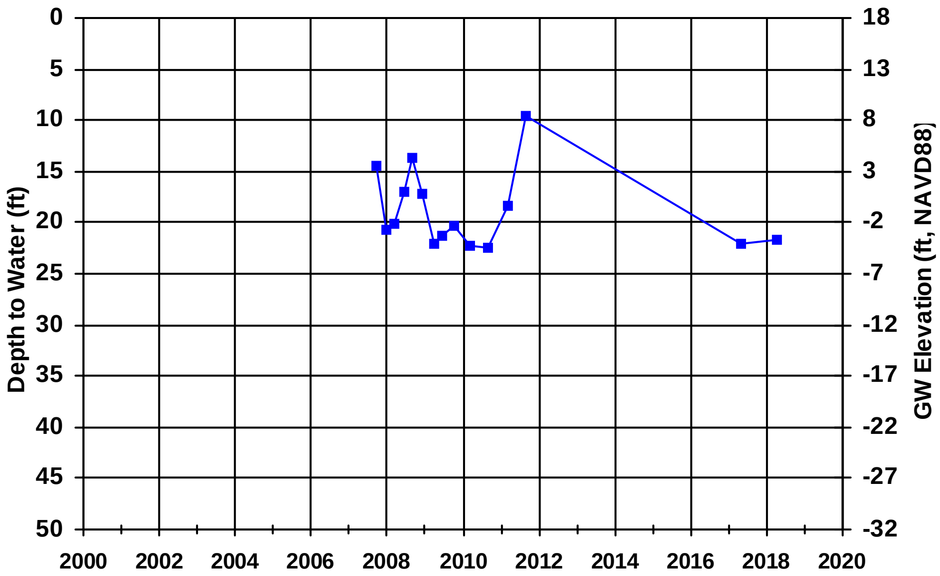



**WellID:** **T0601300803-STEW-24**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

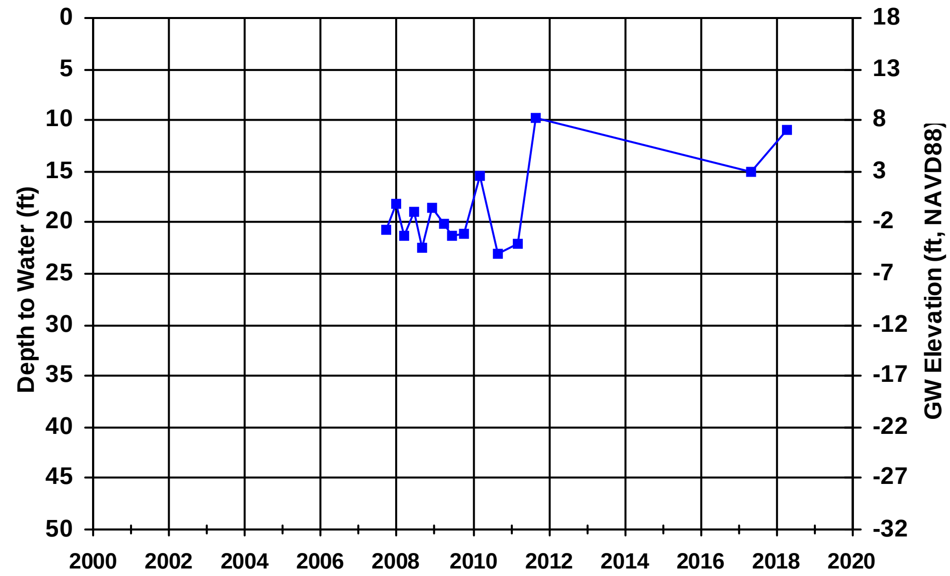



{R_WLhyd88}

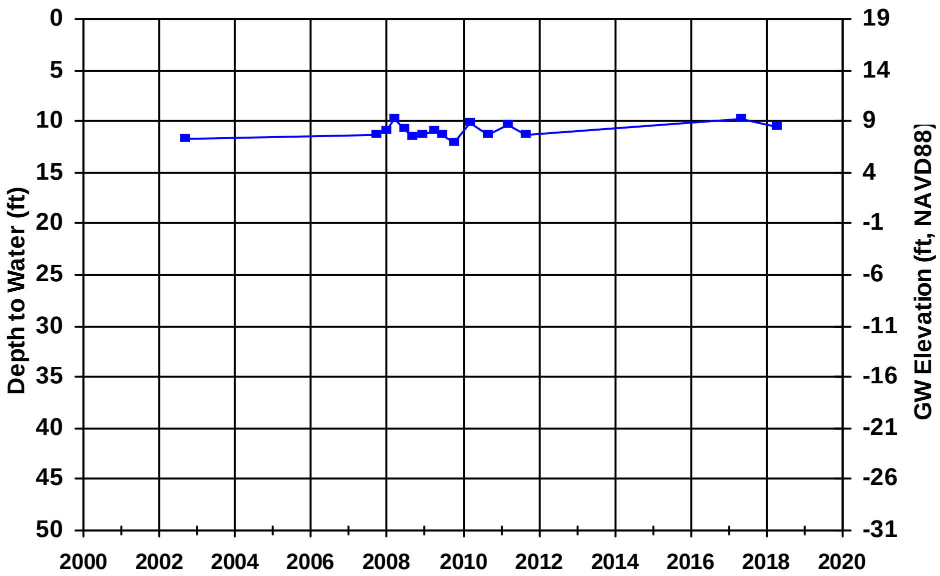
WellID: T0601300803-STEW-25
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



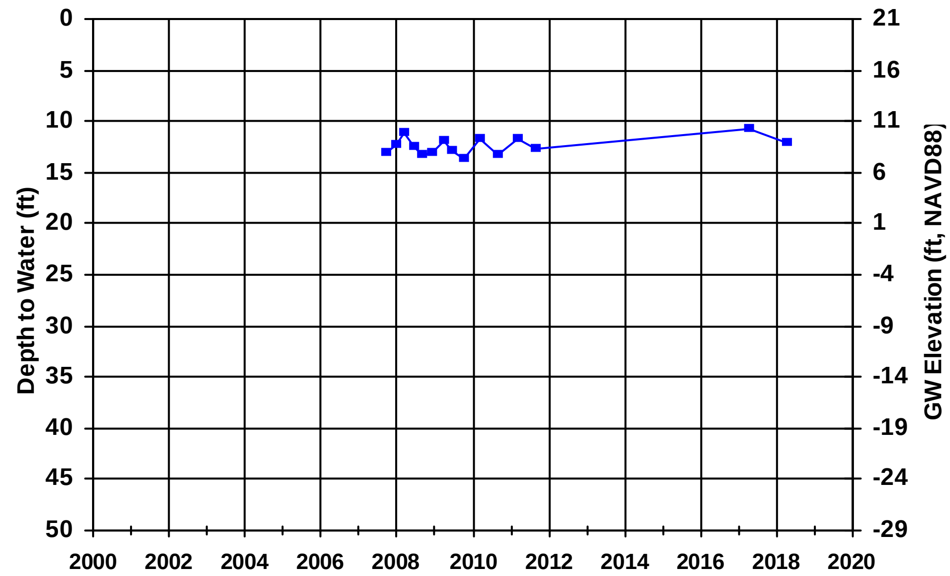

WellID: T0601300803-STEW-26
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300803-STMW-1
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

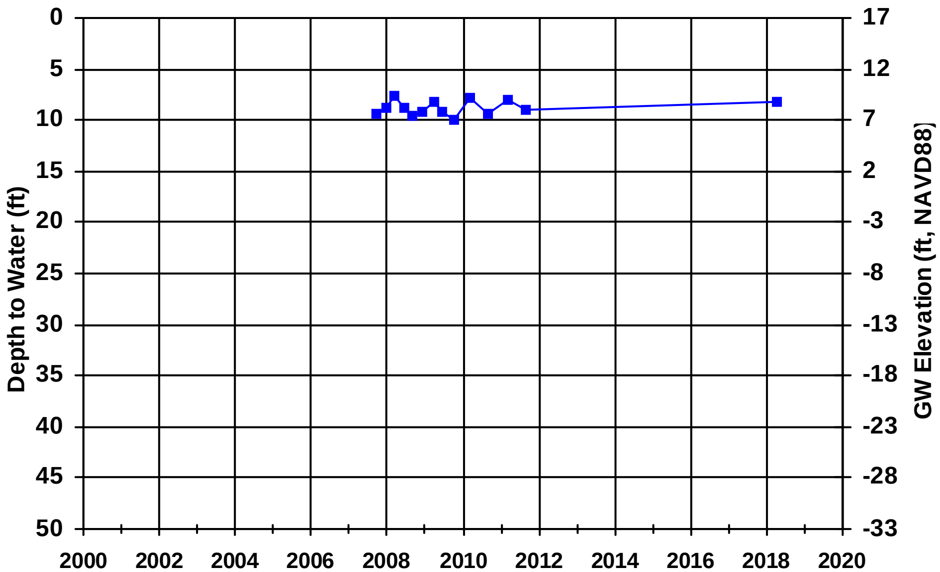



WellID: T0601300803-STMW-17
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

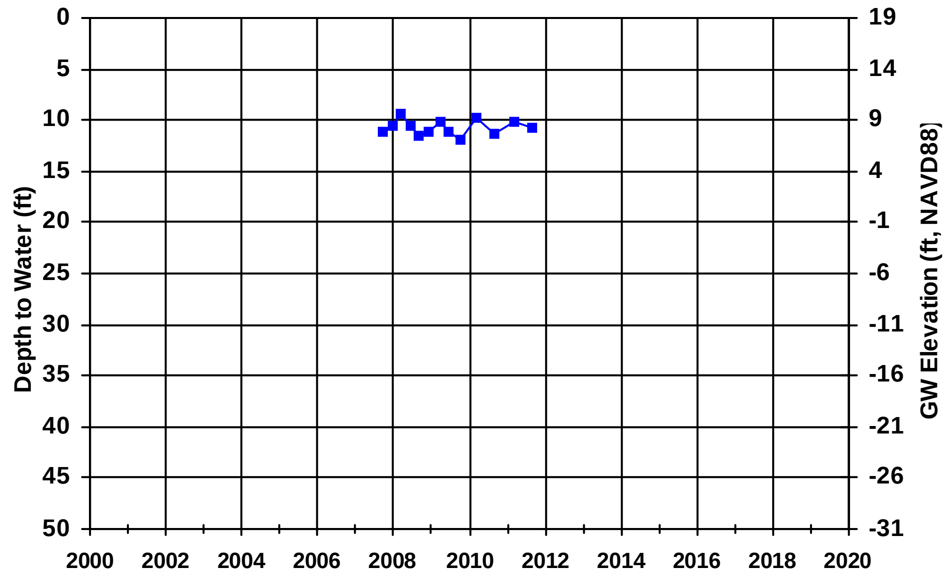



{R_WLhyd88}

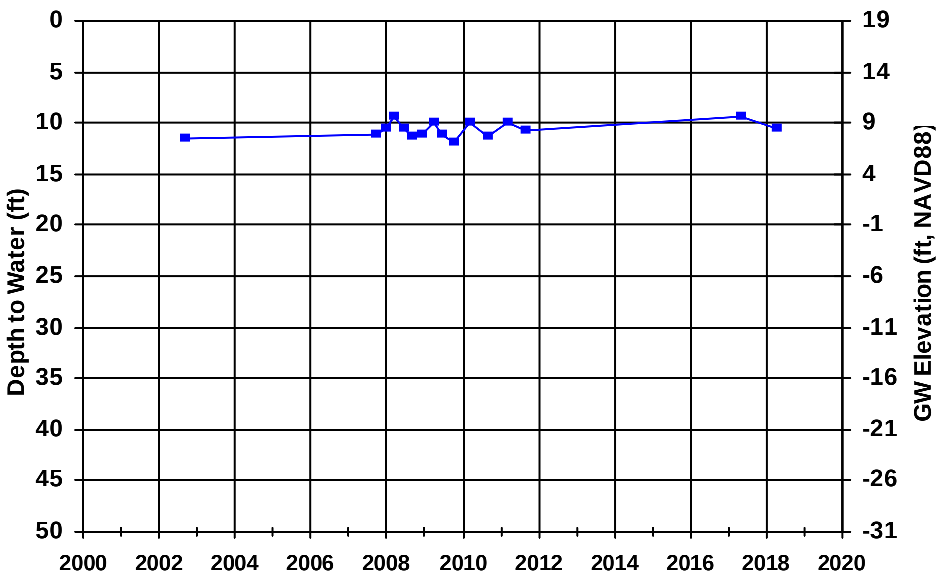
**WellID:** T0601300803-STMW-18
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



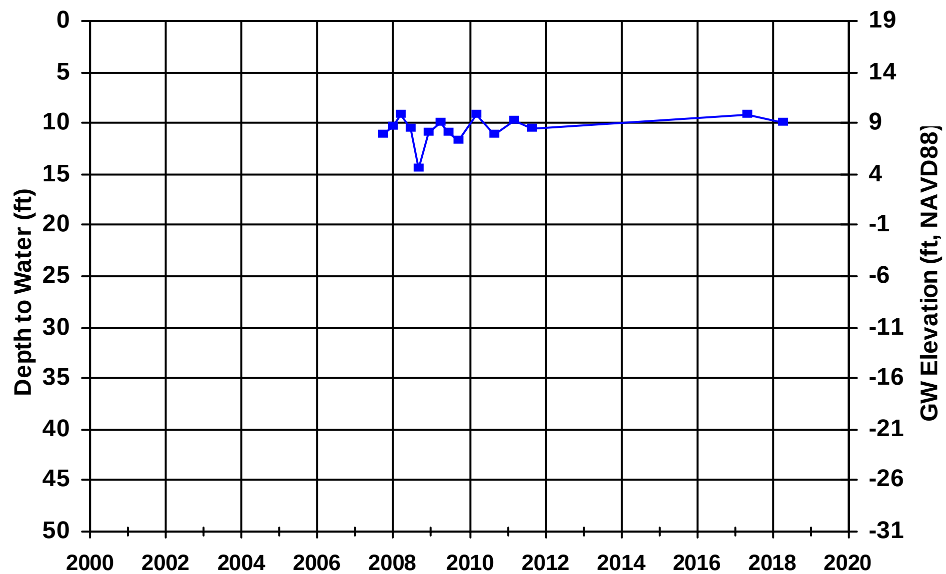

**WellID:** T0601300803-STMW-19
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300803-STMW-2
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

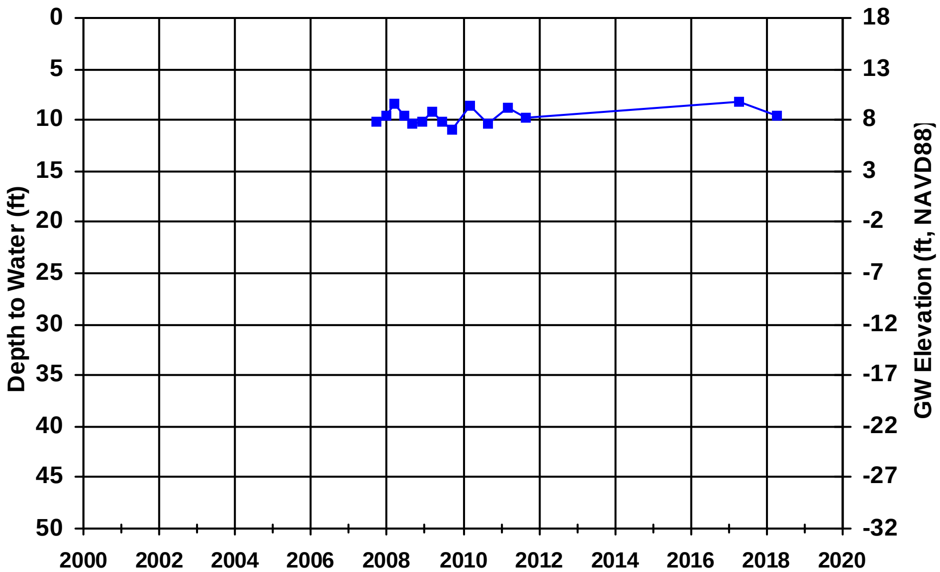



**WellID:** T0601300803-STMW-20
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

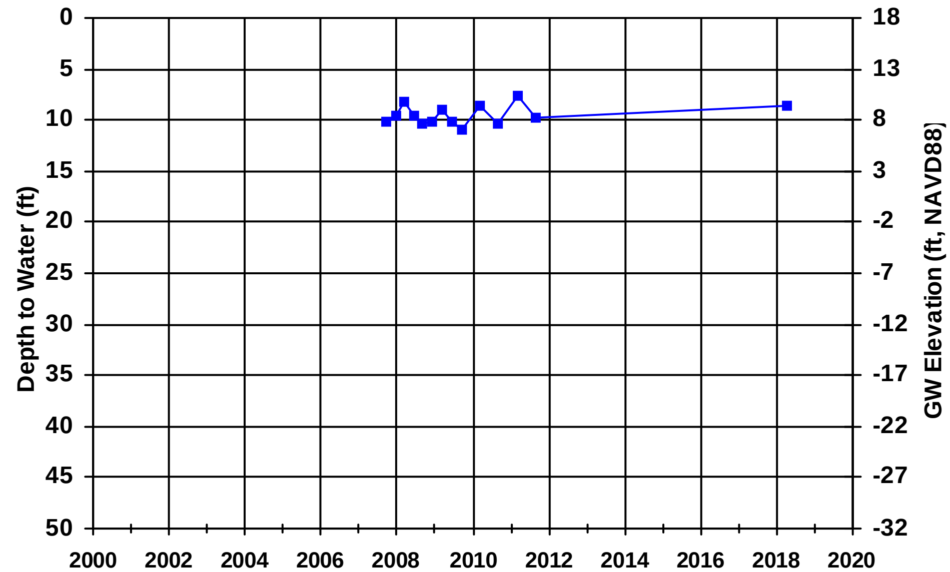



{R_WLhyd88}

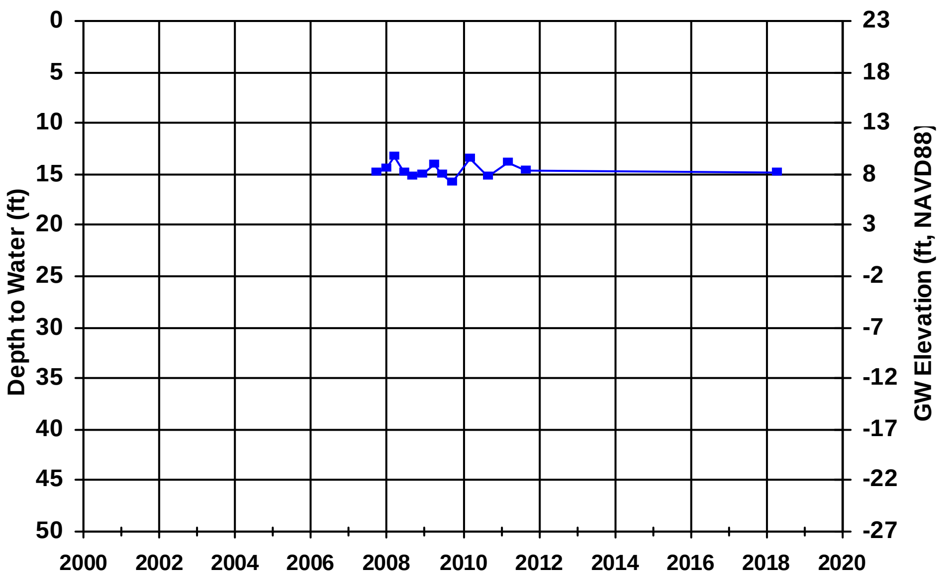
**WellID: T0601300803-STMW-21**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



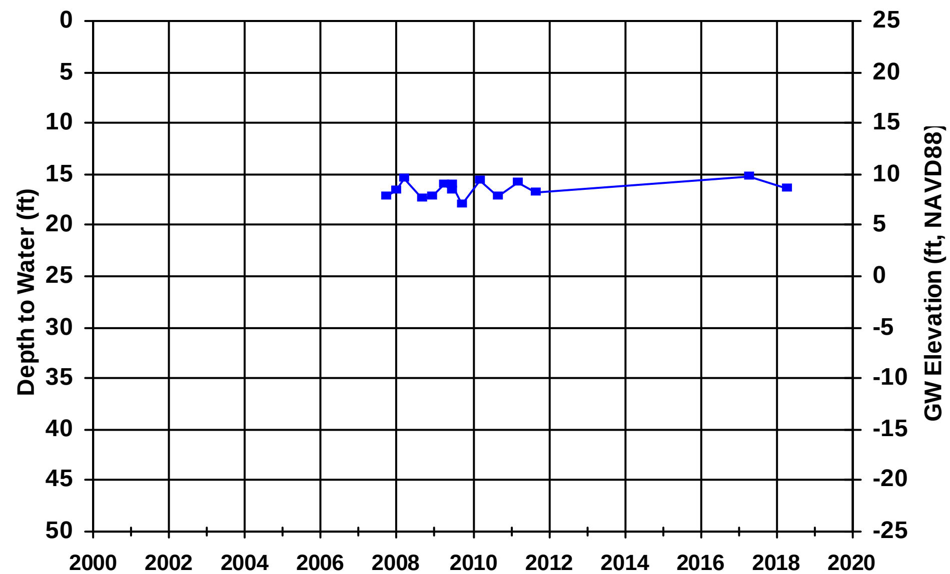

**WellID: T0601300803-STMW-22**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300803-STMW-27**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

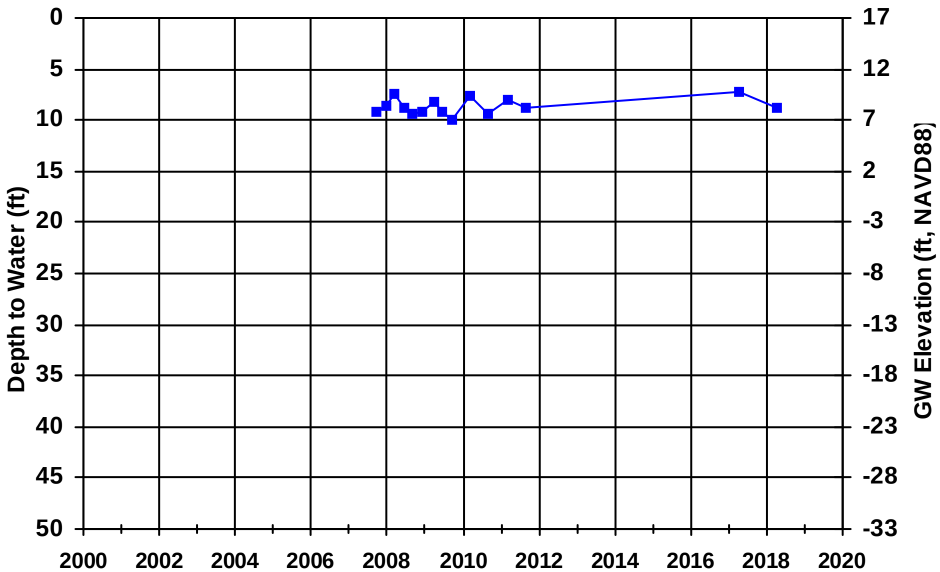



**WellID: T0601300803-STMW-28**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

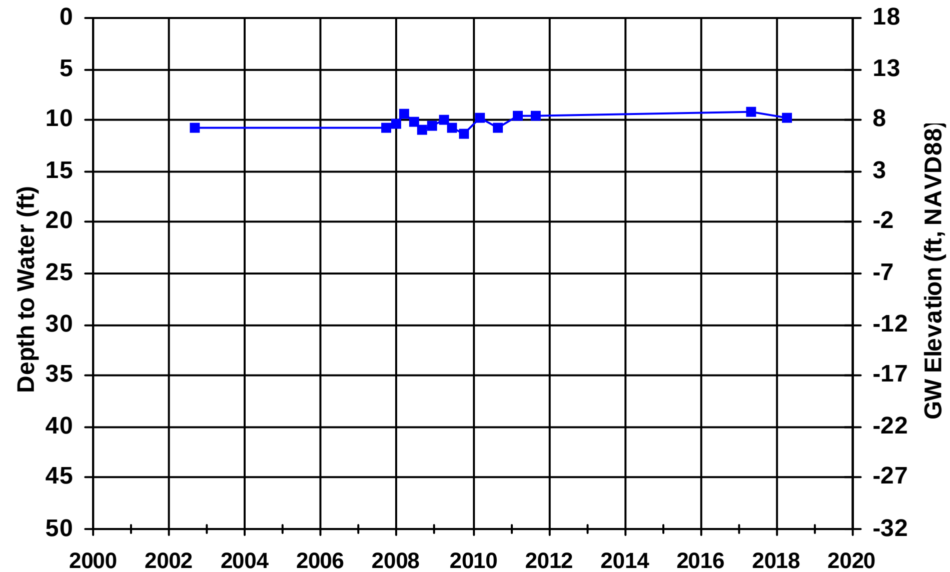



{R_WLhyd88}

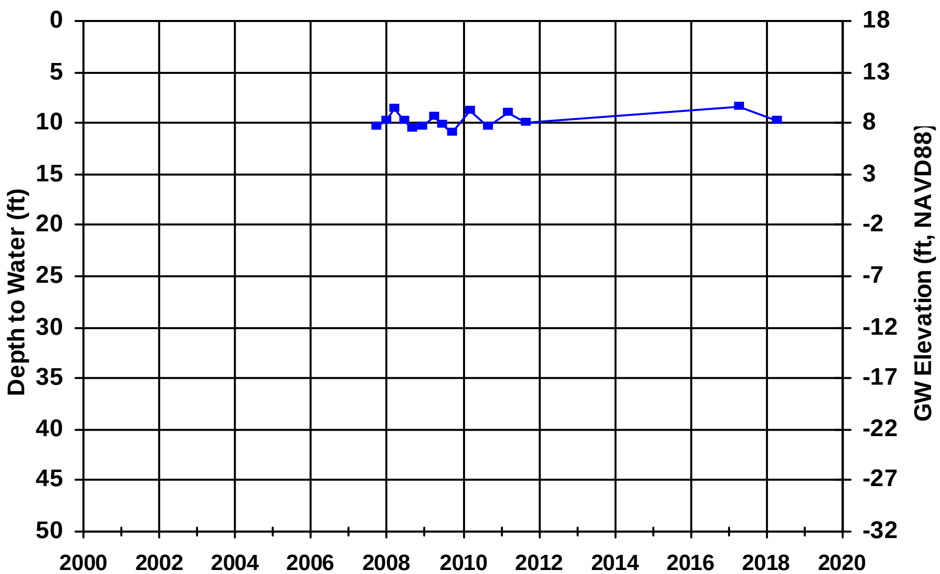
**WellID:** T0601300803-STMW-29
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



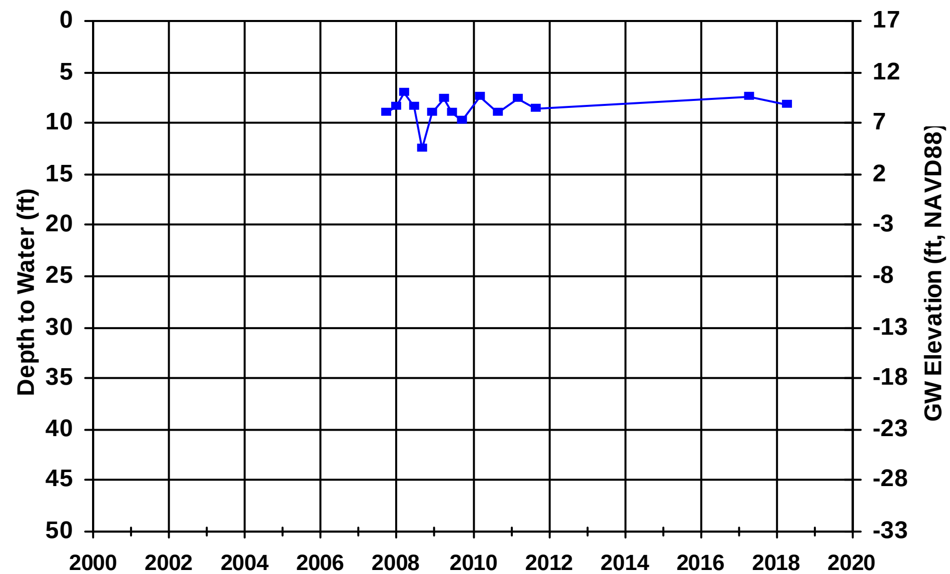

**WellID:** T0601300803-STMW-3
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300803-STMW-30
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

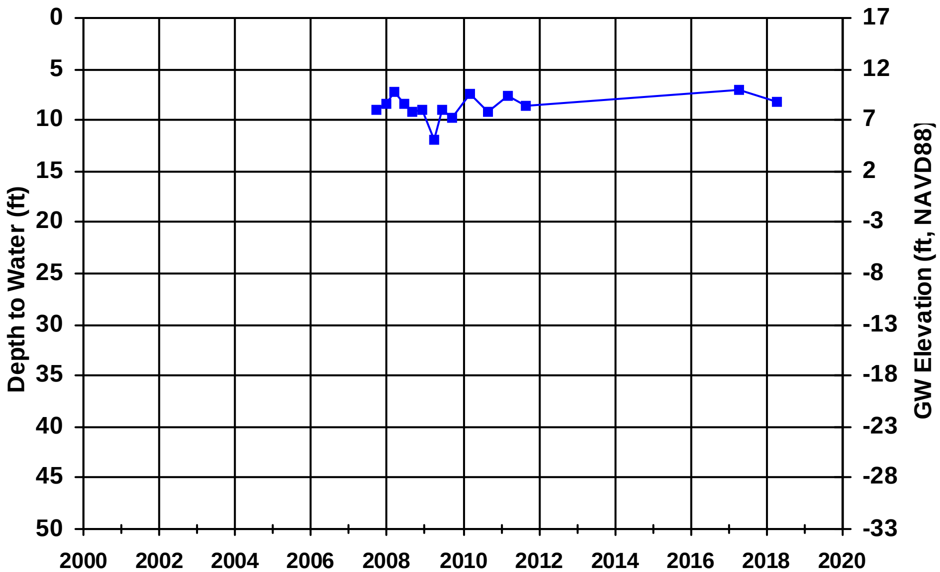



**WellID:** T0601300803-STMW-31
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

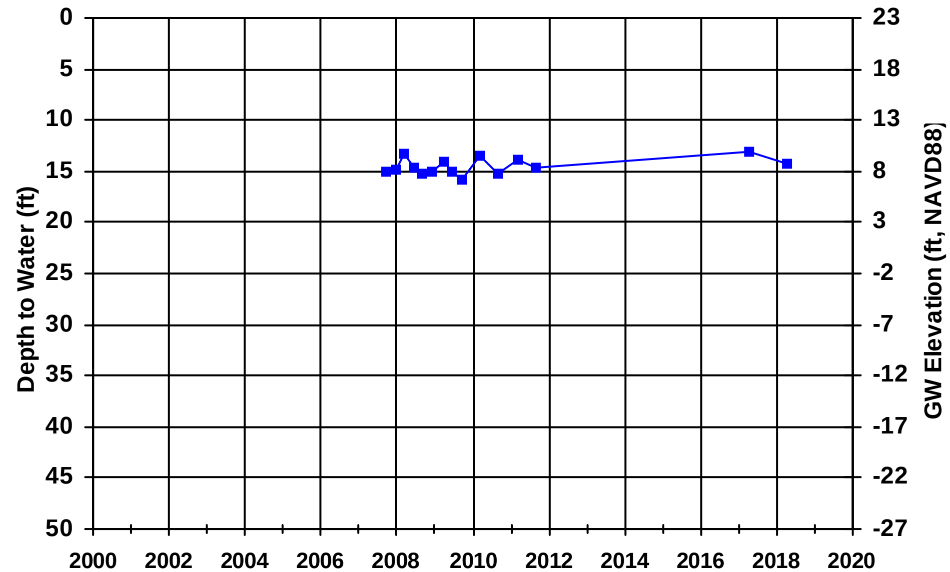



{R_WLhyd88}

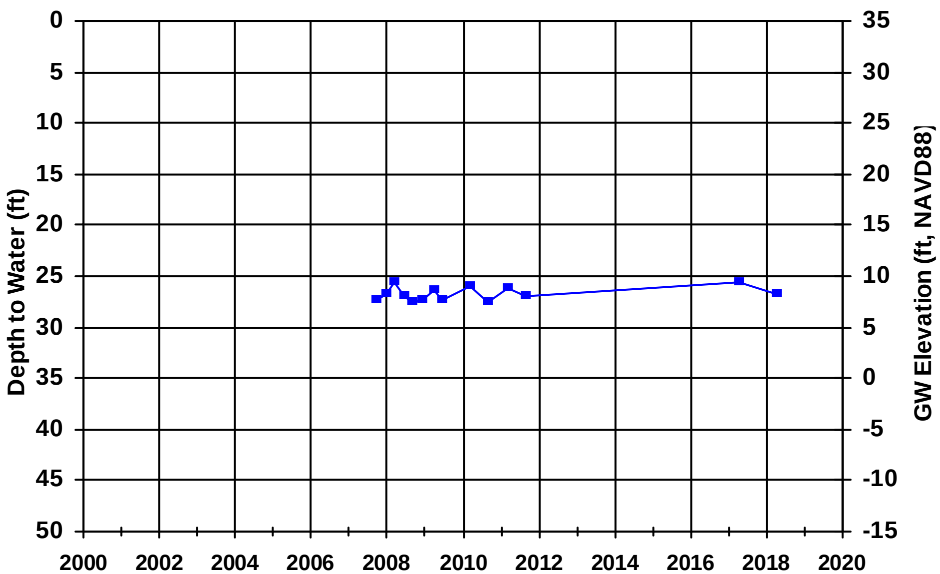
**WellID:** **T0601300803-STMW-32**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



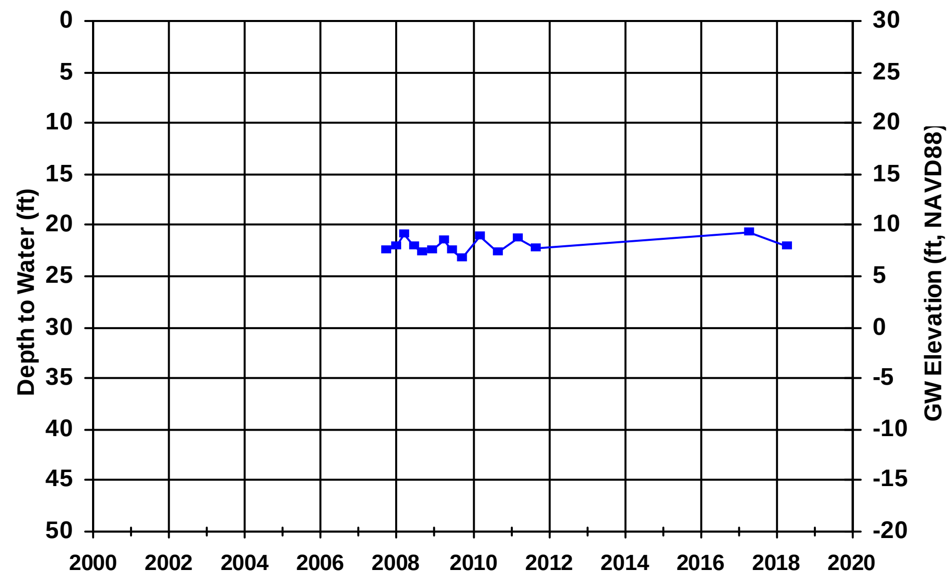

**WellID:** **T0601300803-STMW-33**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300803-STMW-34**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

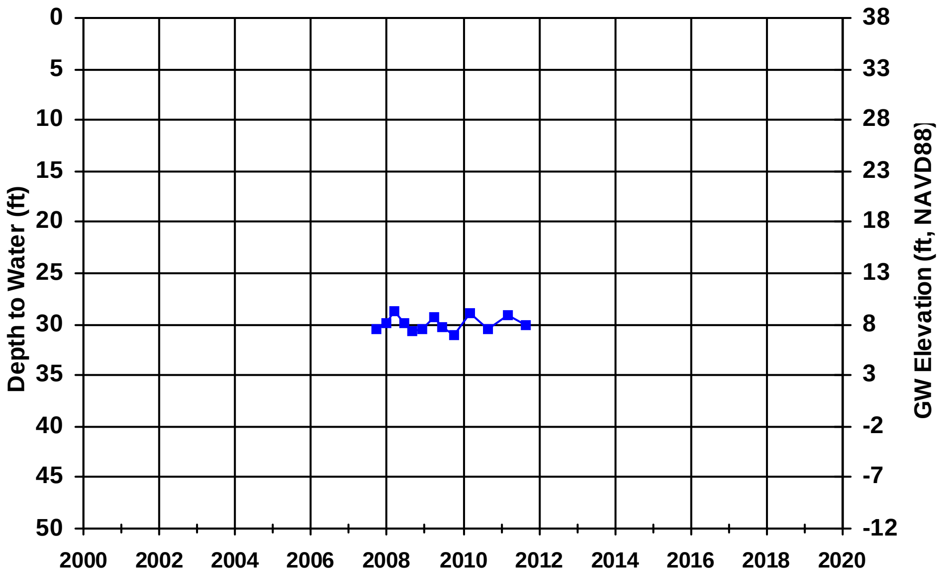



**WellID:** **T0601300803-STMW-35**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

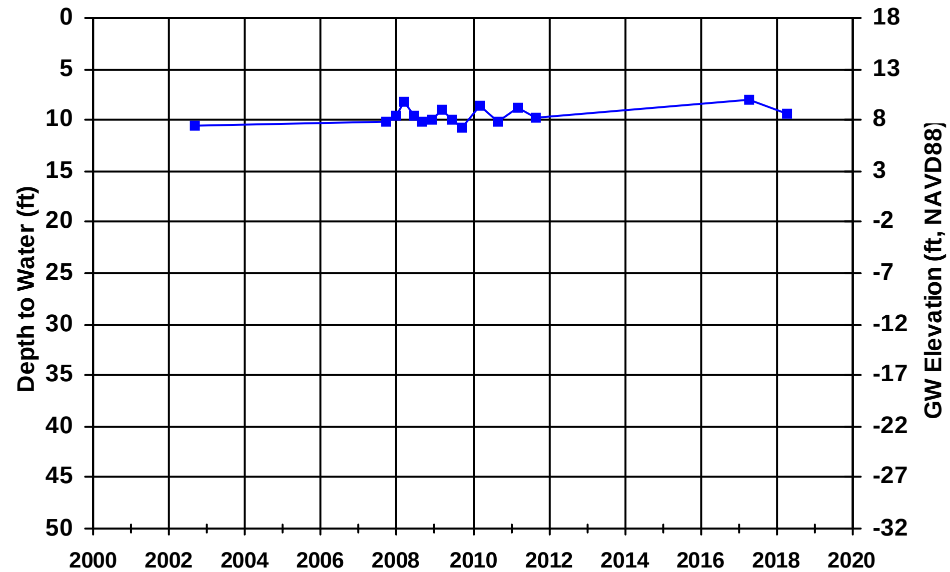



{R_WLhyd88}

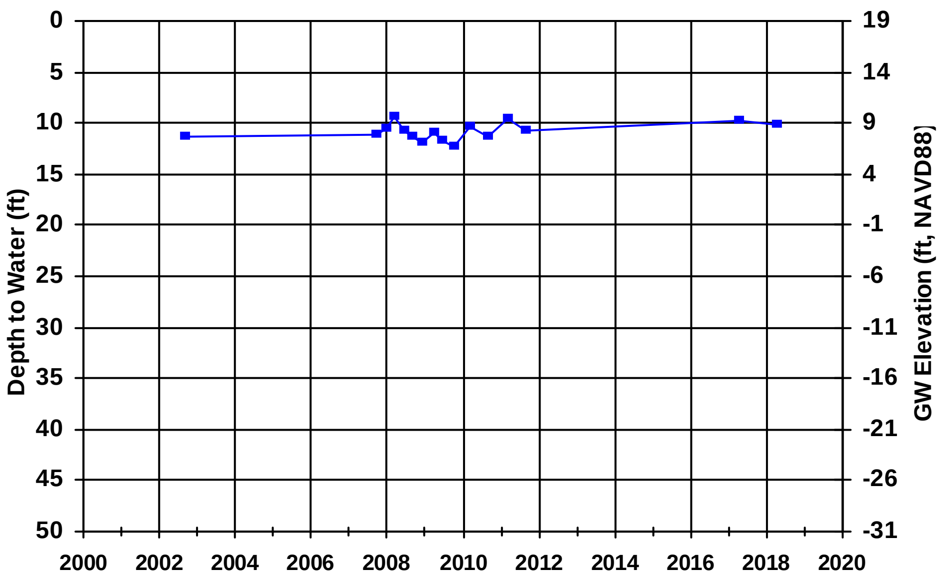
**WellID:** T0601300803-STMW-36
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



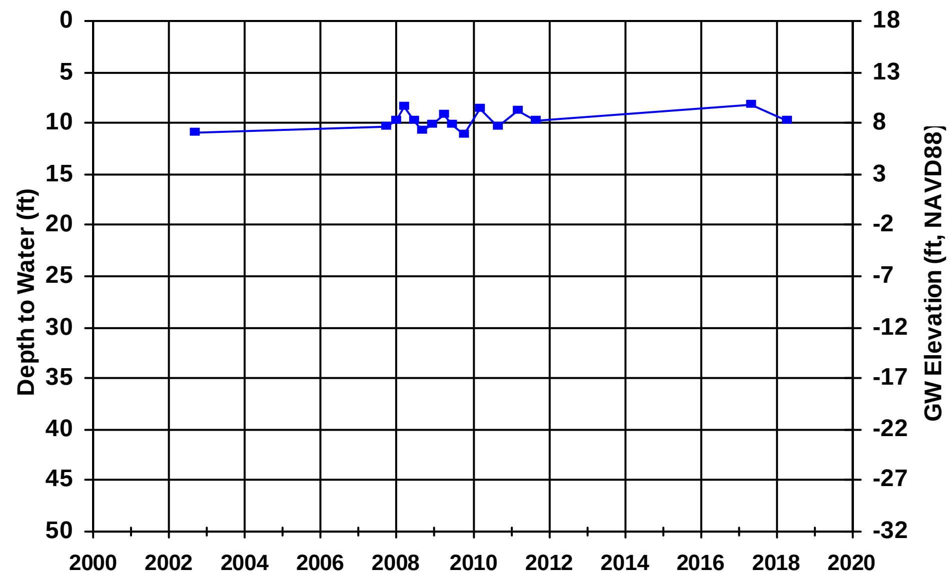

**WellID:** T0601300803-STMW-4
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300803-STMW-5
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

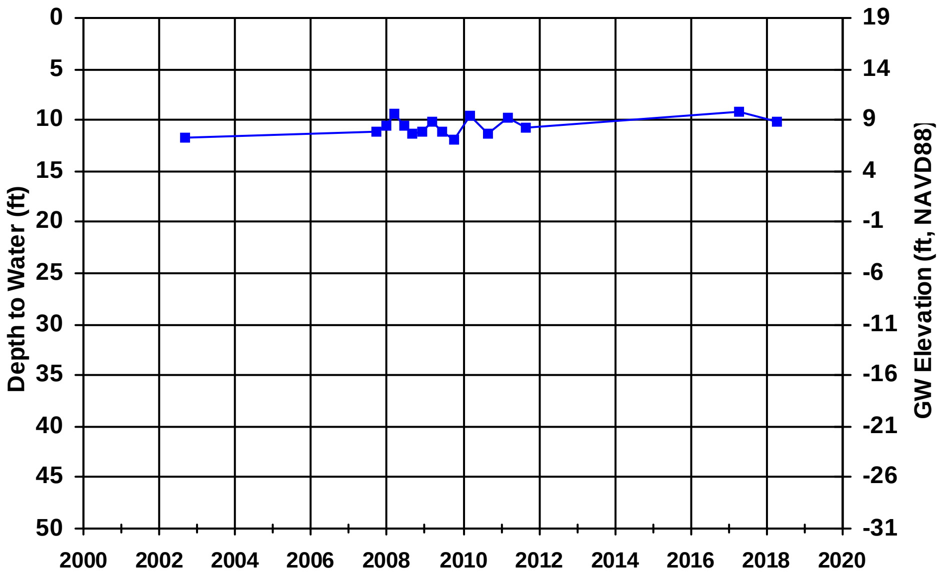



**WellID:** T0601300803-STMW-6
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

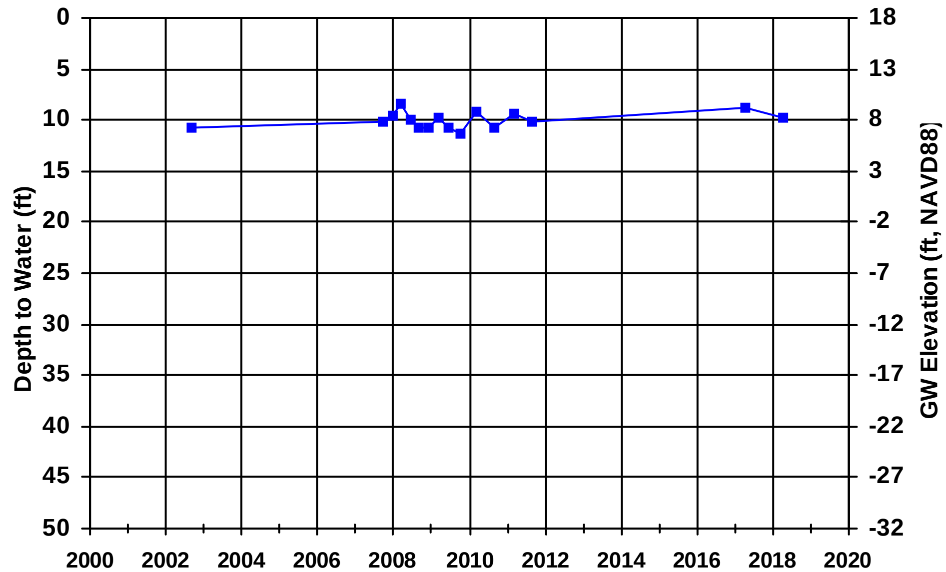



{R_WLhyd88}

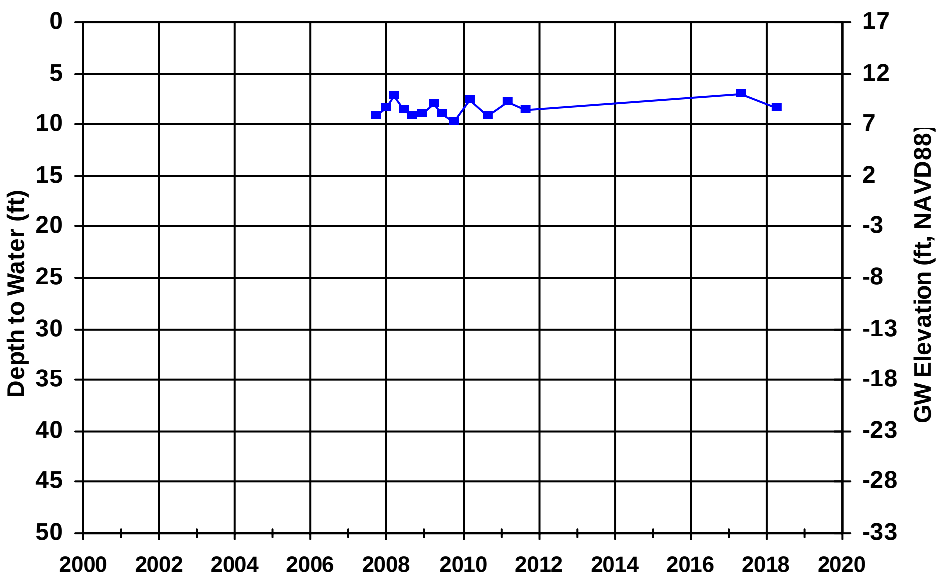
**WellID: T0601300803-STMW-7**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



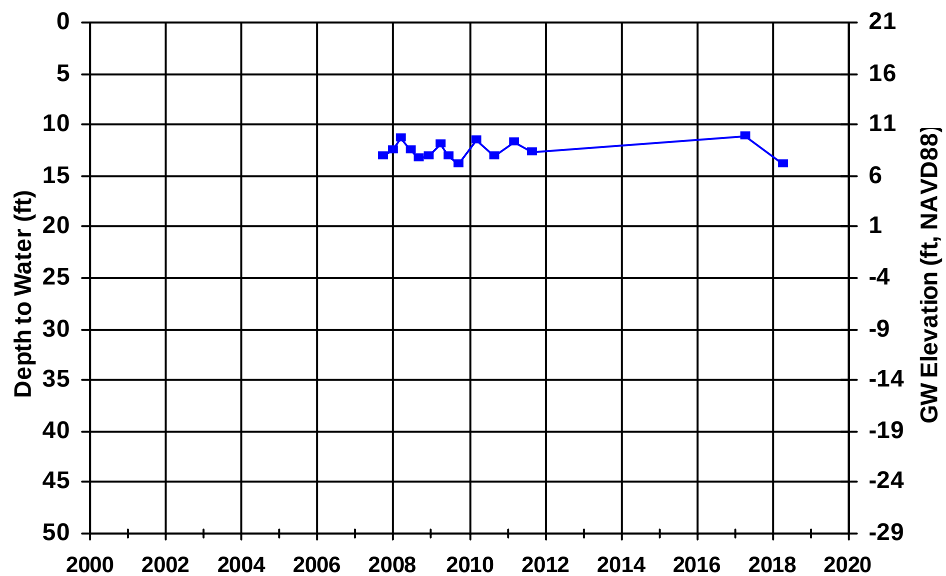

**WellID: T0601300803-STMW-8**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID: T0601300803-STMWD-10**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

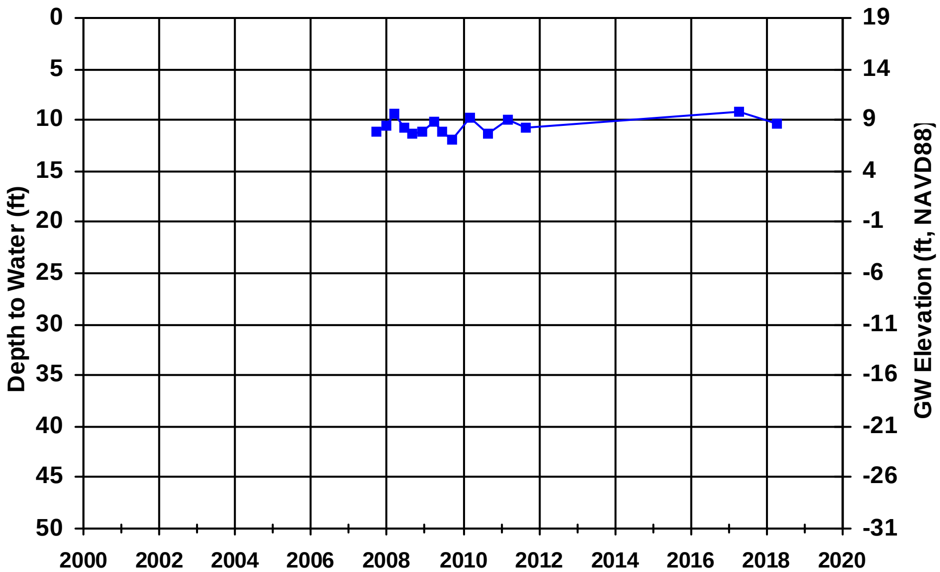



**WellID: T0601300803-STMWD-11**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

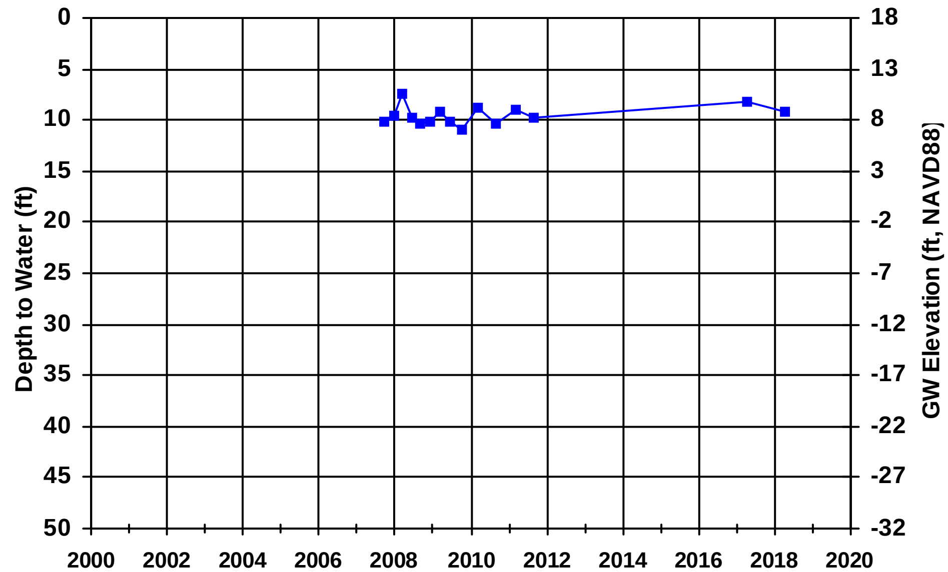



{R_WLhyd88}

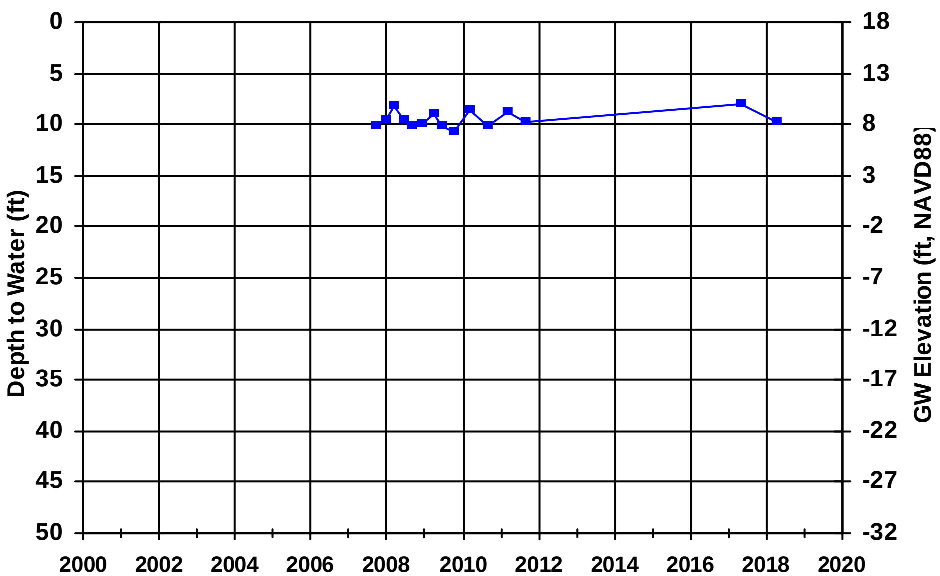
**WellID:** T0601300803-STMWD-12
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



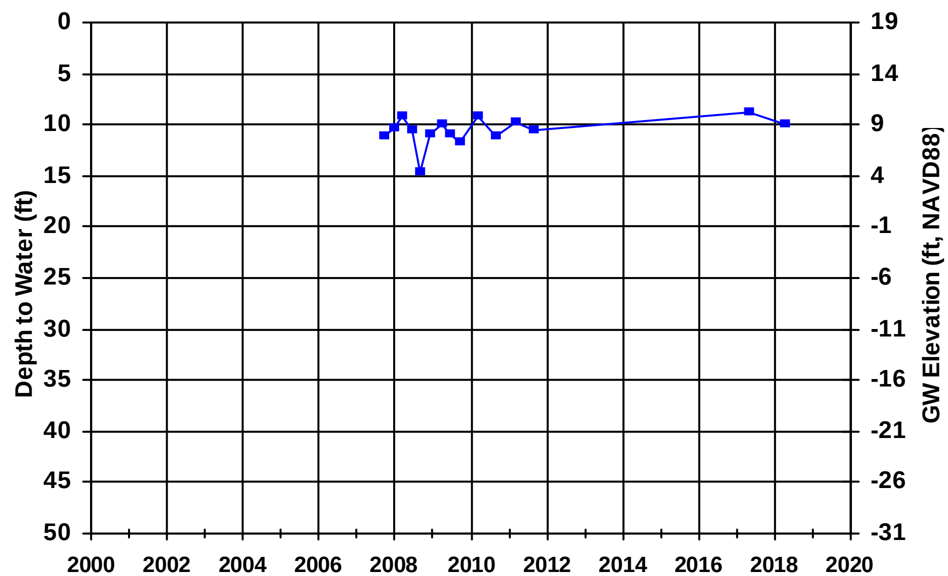

**WellID:** T0601300803-STMWD-14
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601300803-STMWD-15
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

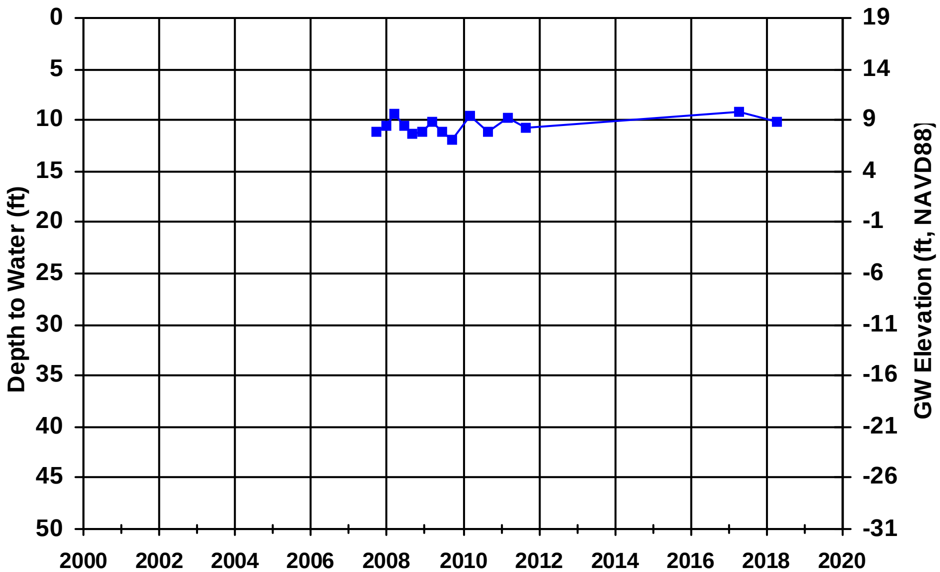



**WellID:** T0601300803-STMWD-16
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

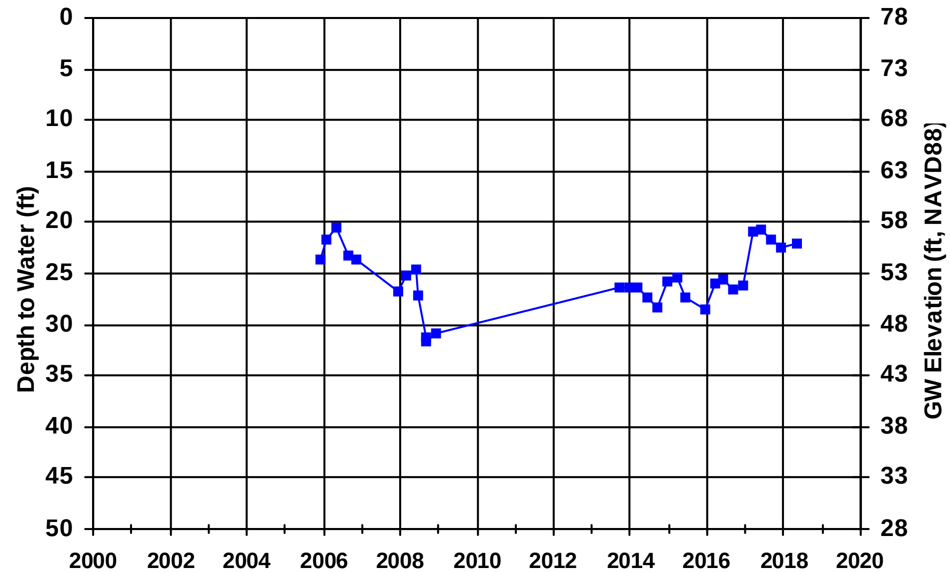



{R_WLhyd88}

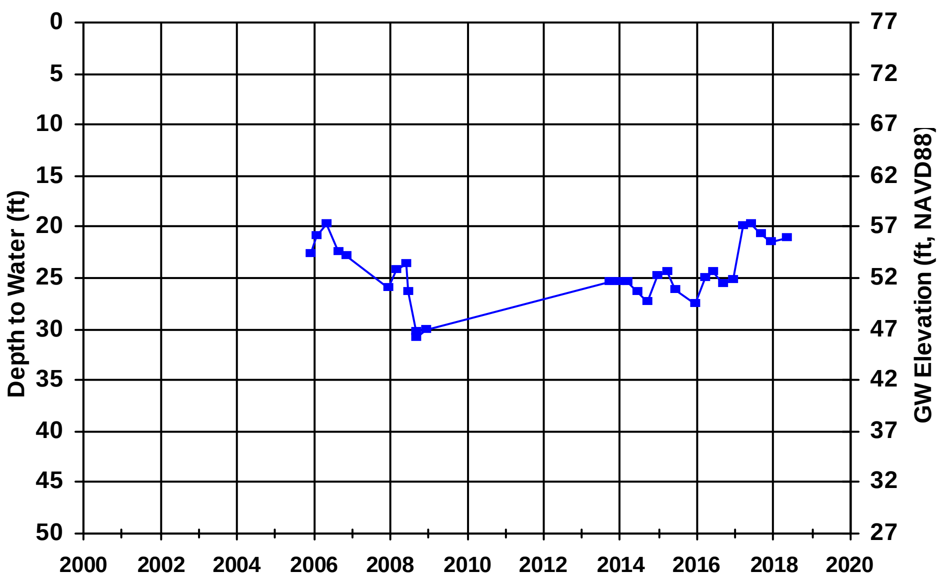
**WellID:** T0601300803-STMWD-9
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



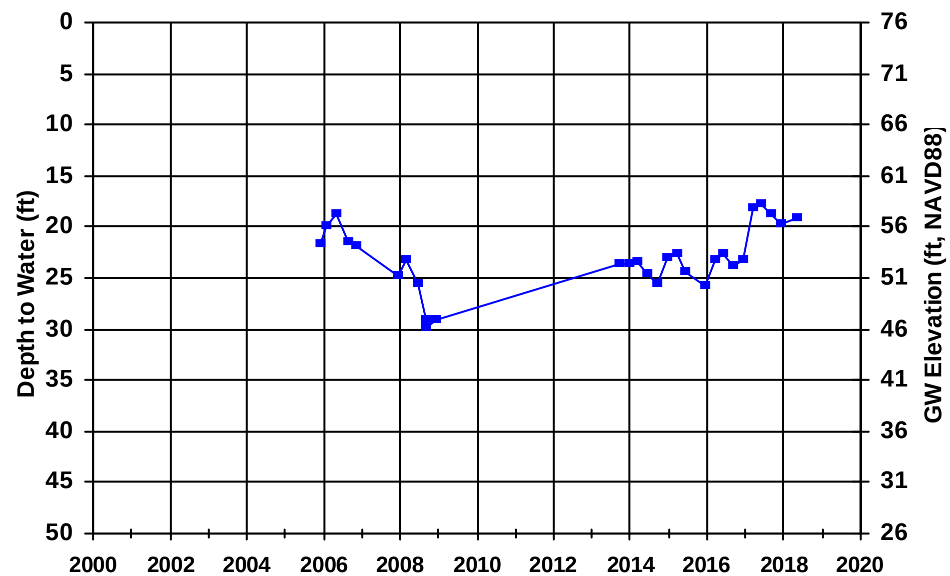

**WellID:** T0601300804-EW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300804-EW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

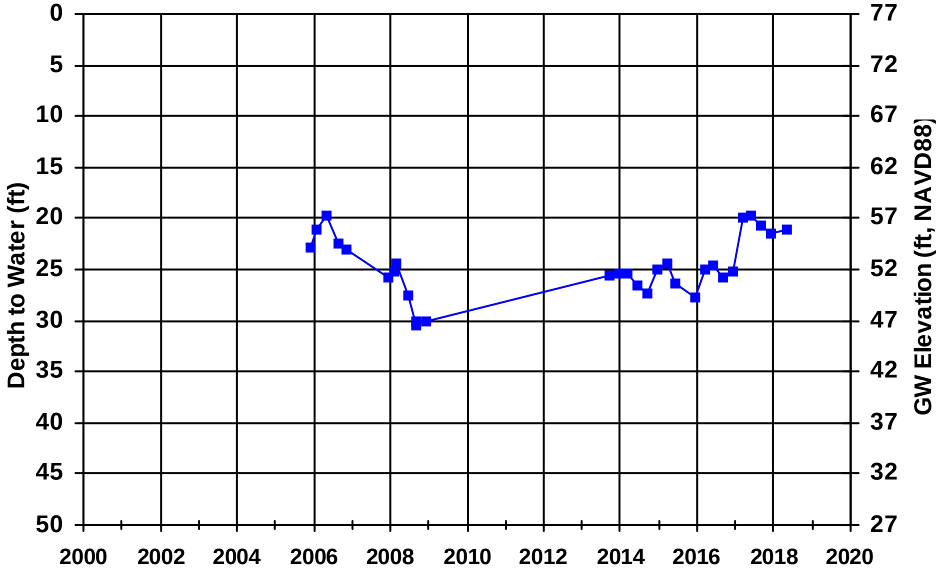



**WellID:** T0601300804-EW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

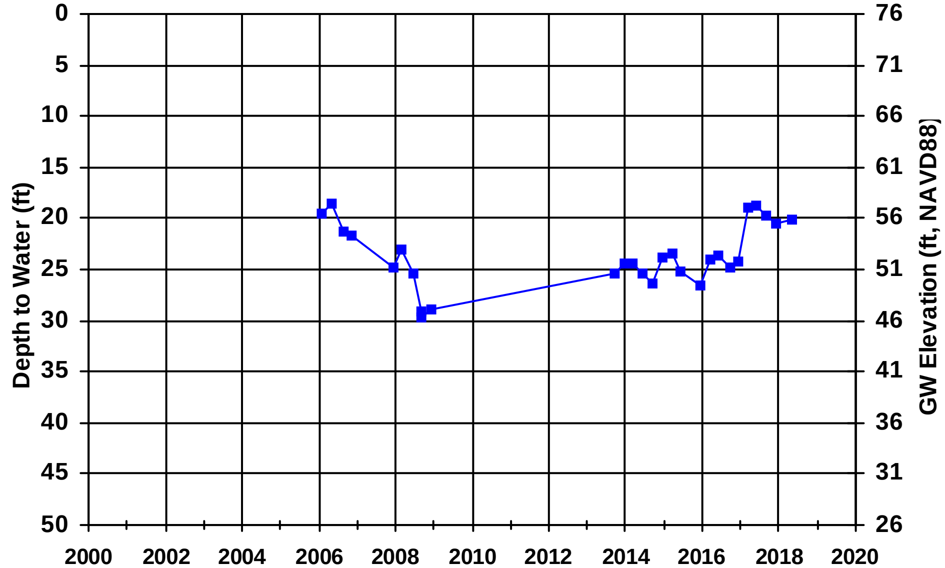



{R_WLhyd88}

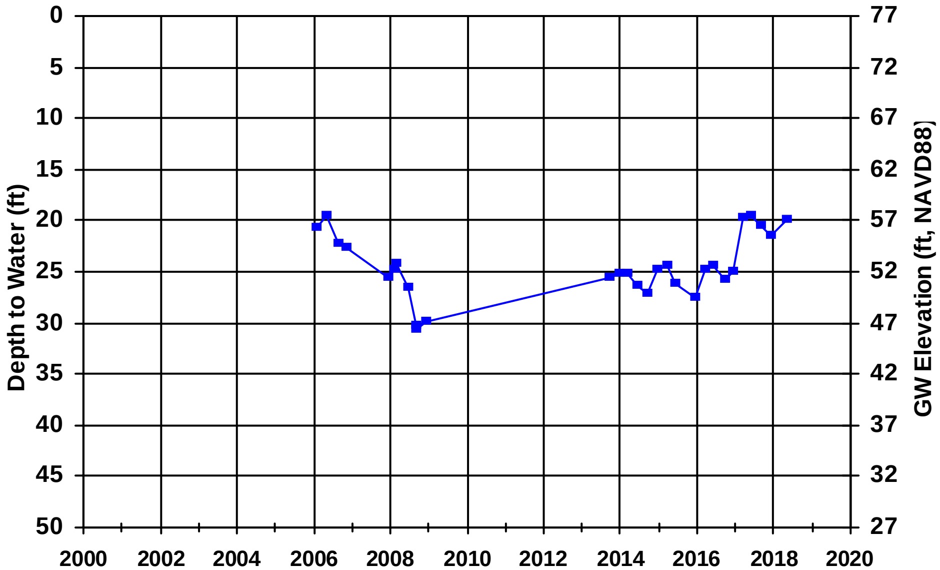
**WellID:** **T0601300804-EW-4**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



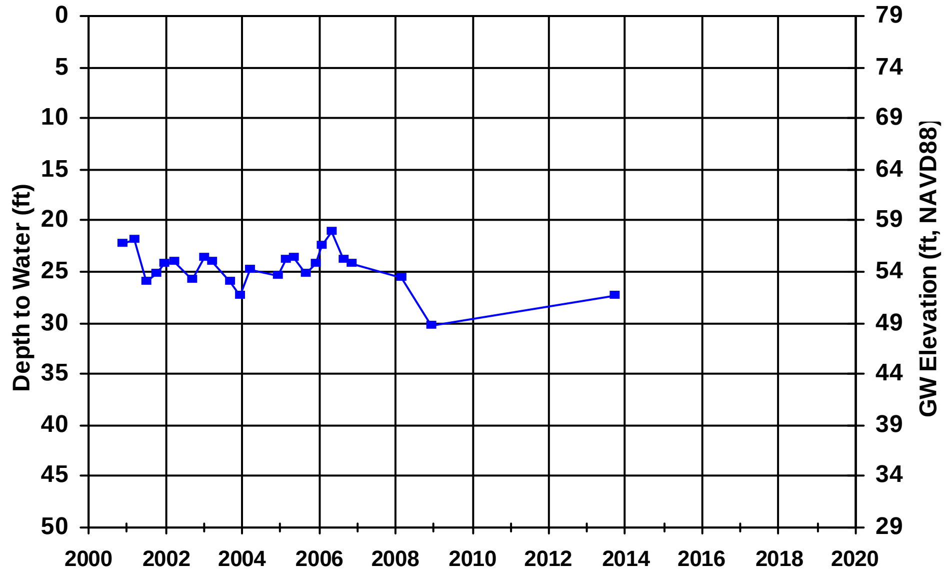

**WellID:** **T0601300804-EW-5**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601300804-EW-6**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

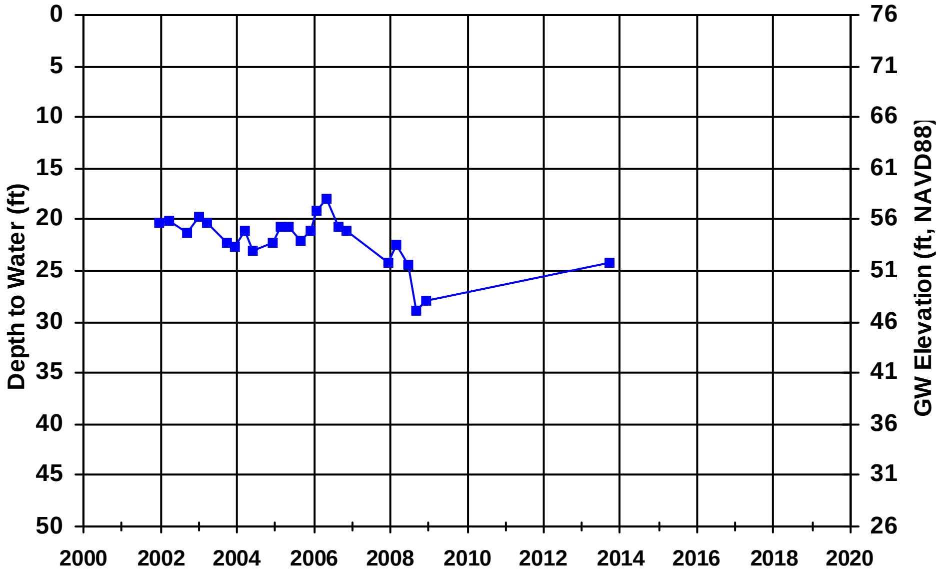



**WellID:** **T0601300804-MW-1**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

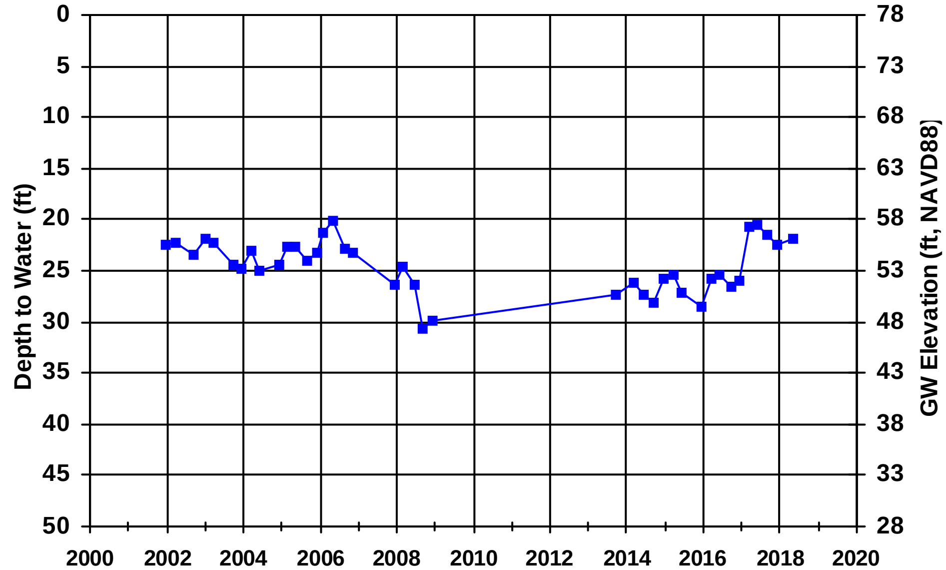



{R_WLhyd88}

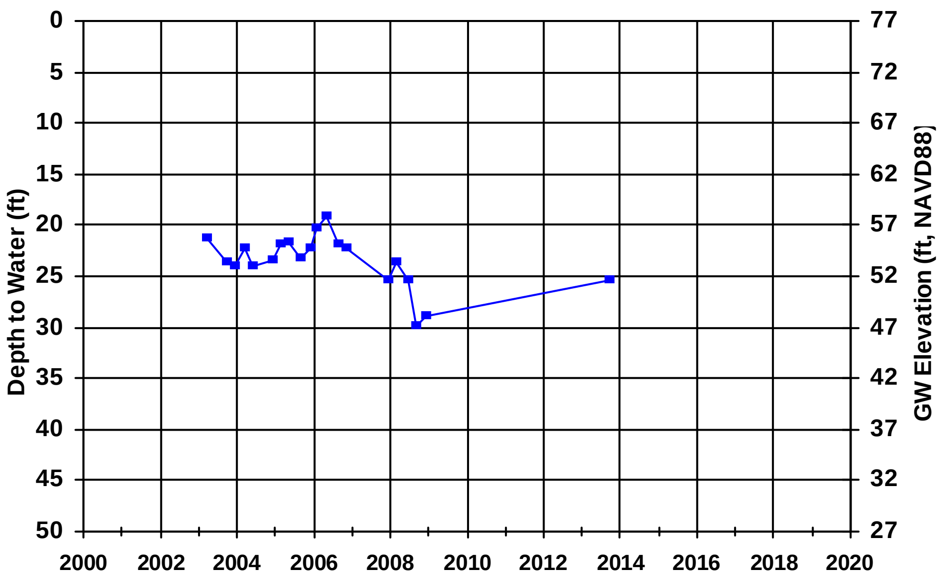
**WellID:** **T0601300804-MW-10**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



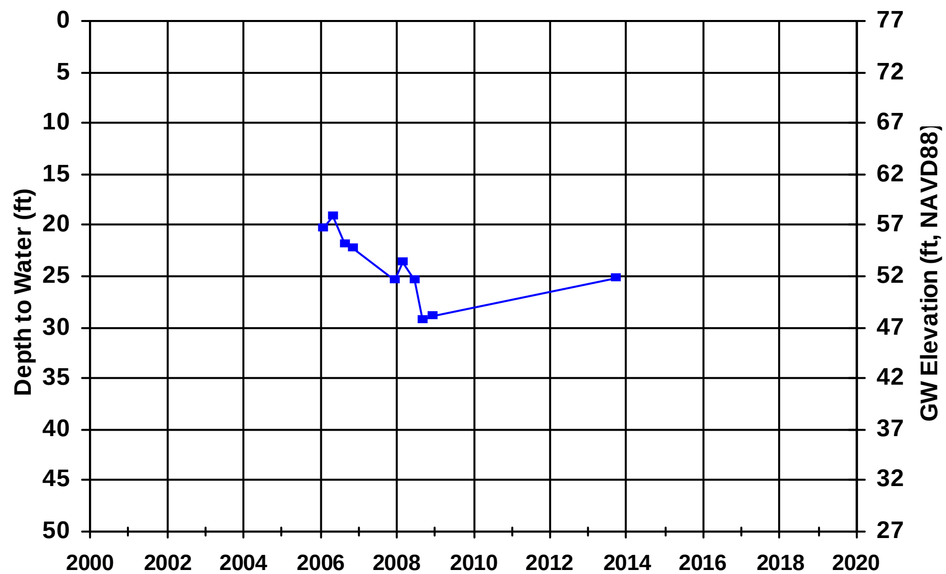

**WellID:** **T0601300804-MW-11**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300804-MW-12**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

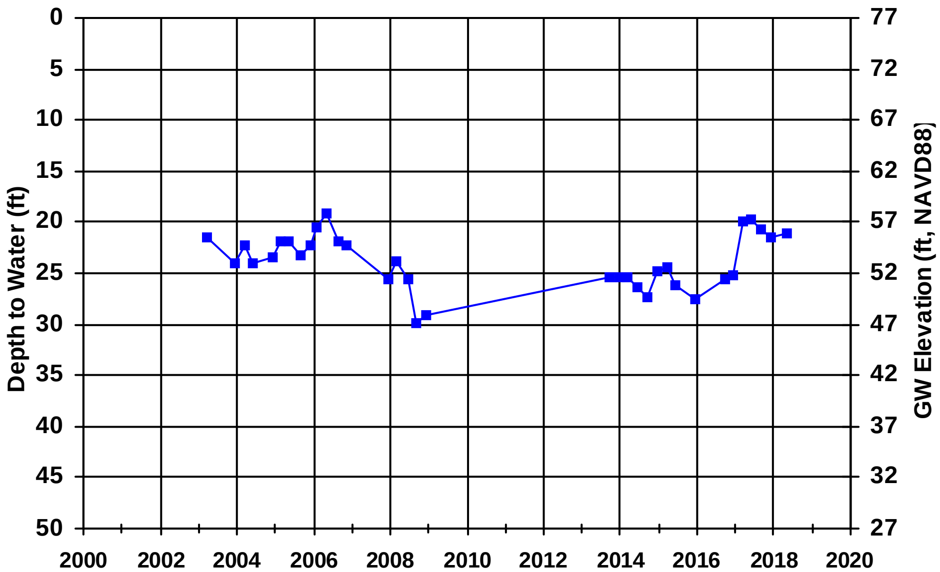



**WellID:** **T0601300804-MW-12A**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

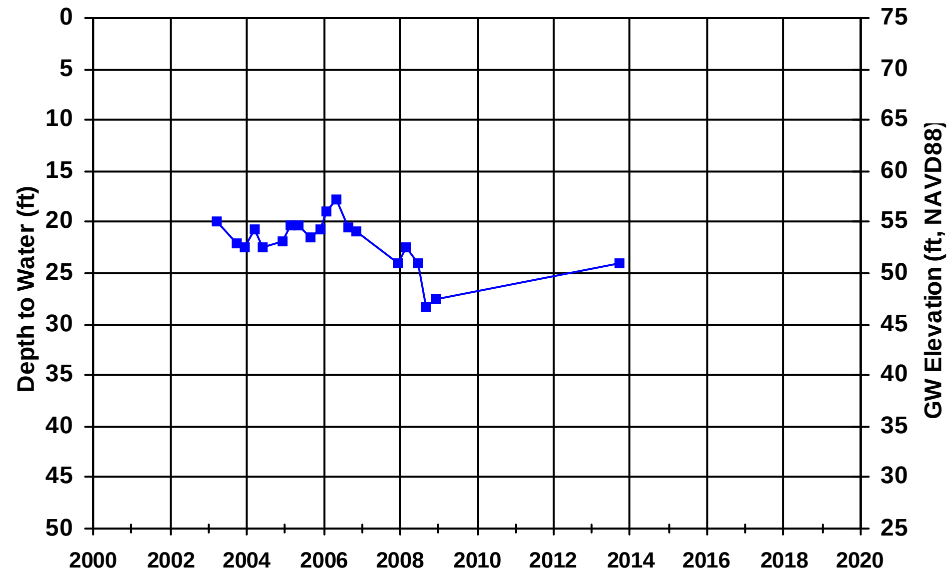



{R_WLhyd88}

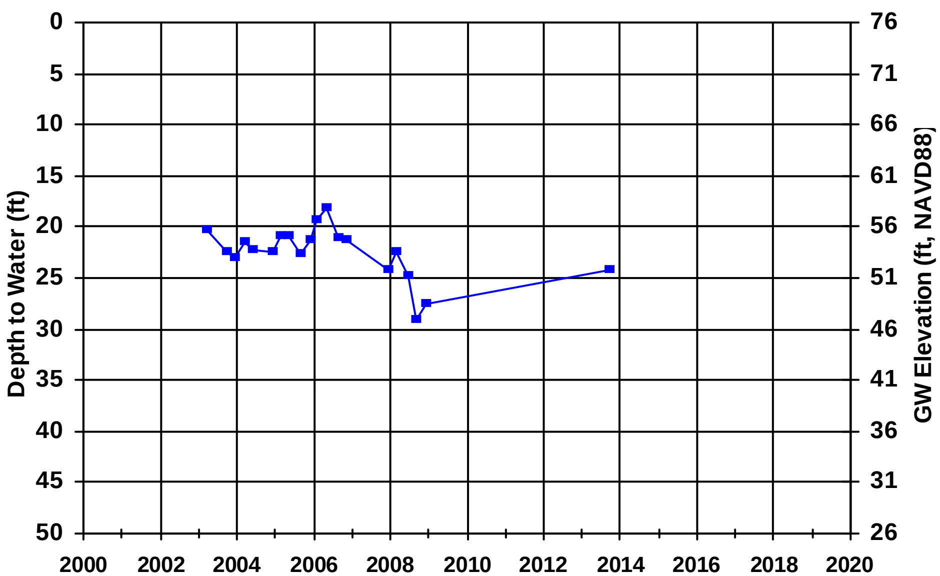
**WellID:** T0601300804-MW-13
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



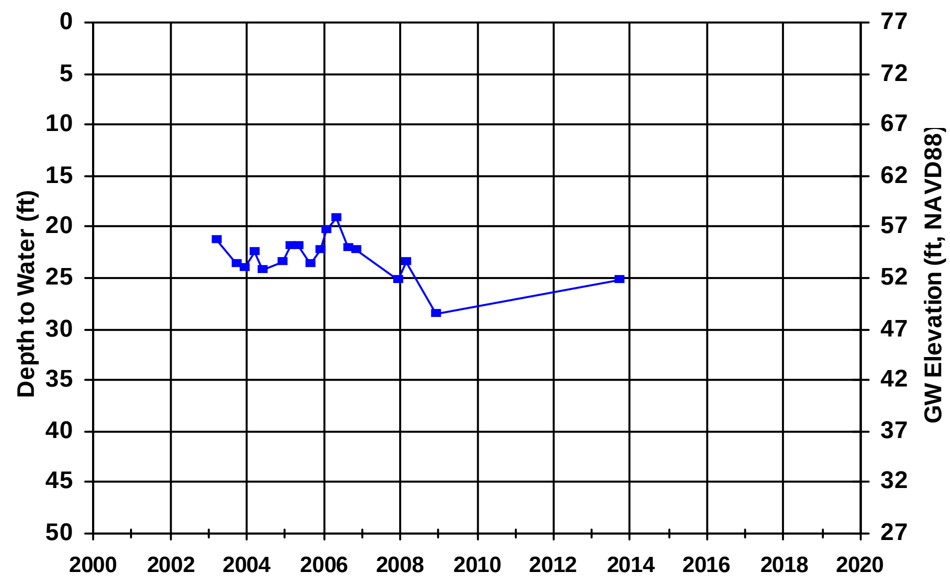

**WellID:** T0601300804-MW-14
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300804-MW-15B
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300804-MW-16B
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

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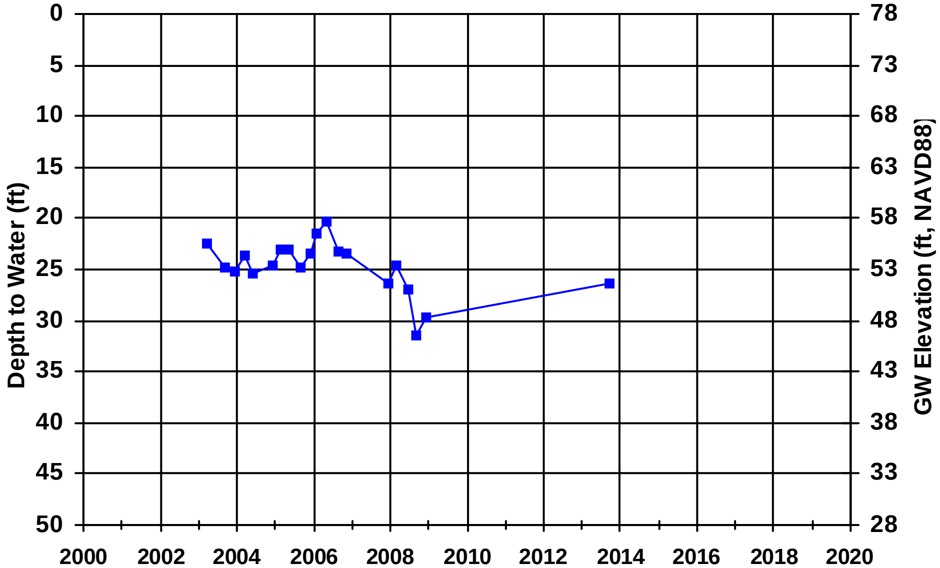
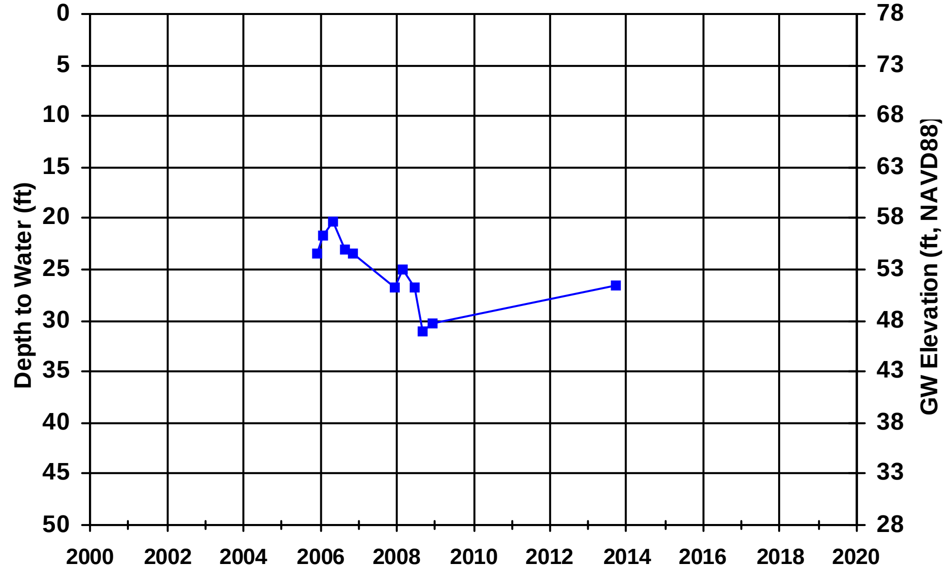
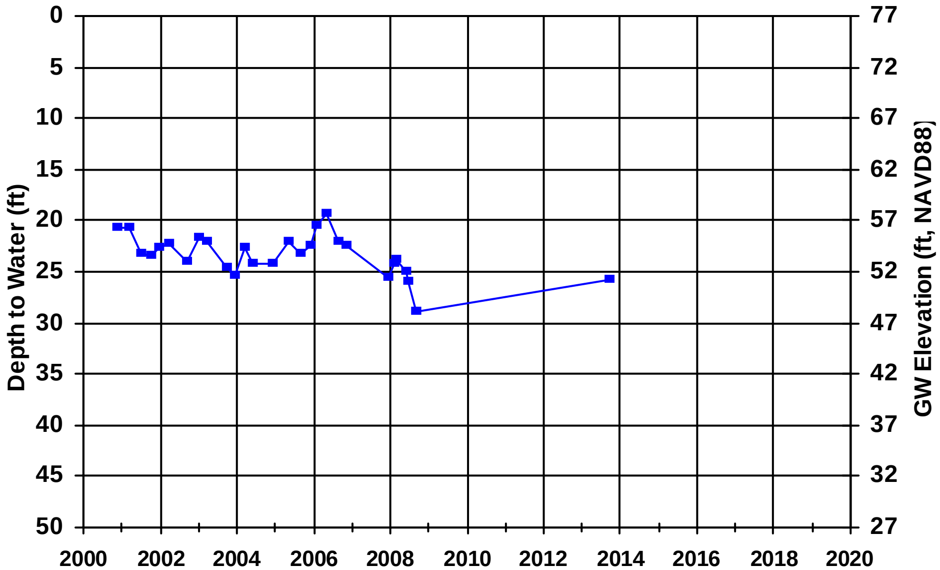
**WellID:** T0601300804-MW-17B
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



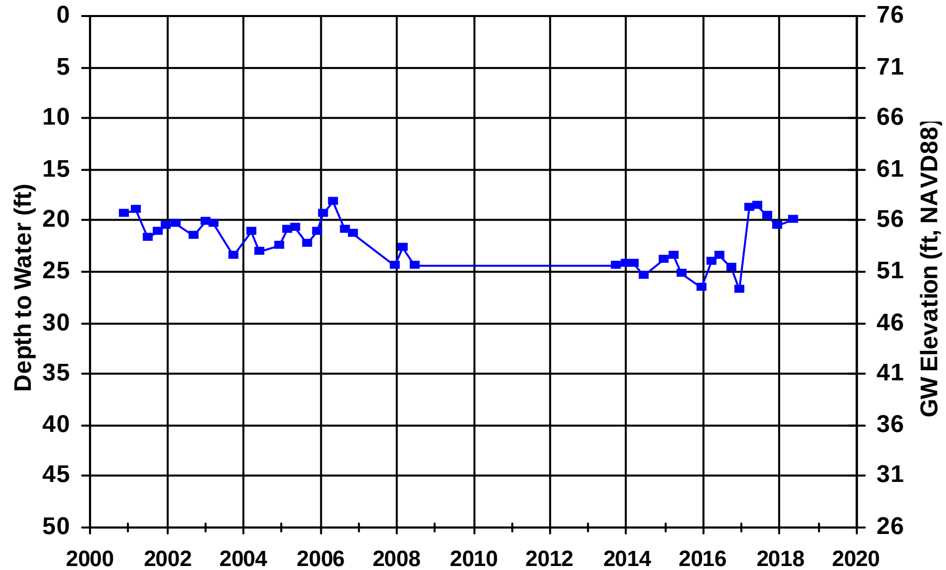

**WellID:** T0601300804-MW-2A
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300804-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

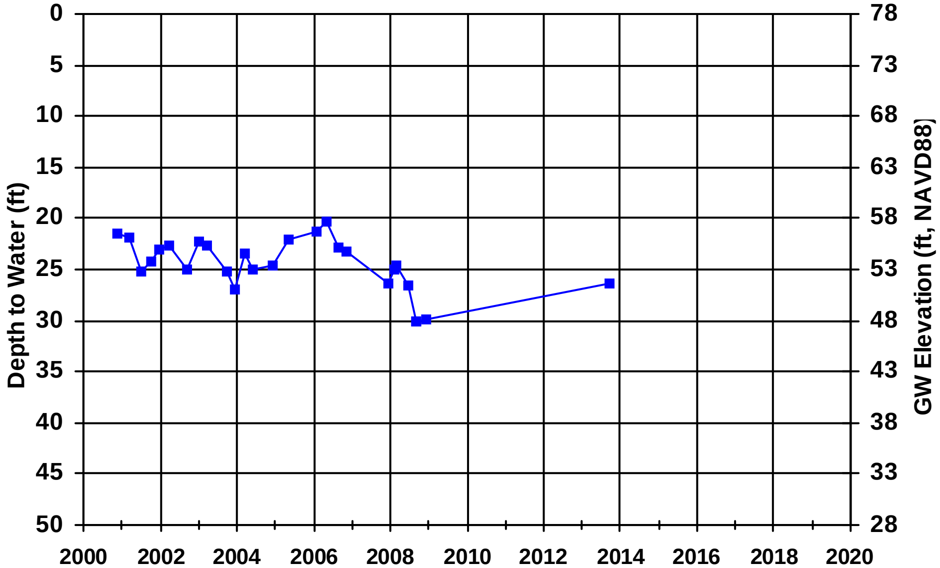



**WellID:** T0601300804-MW-4
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

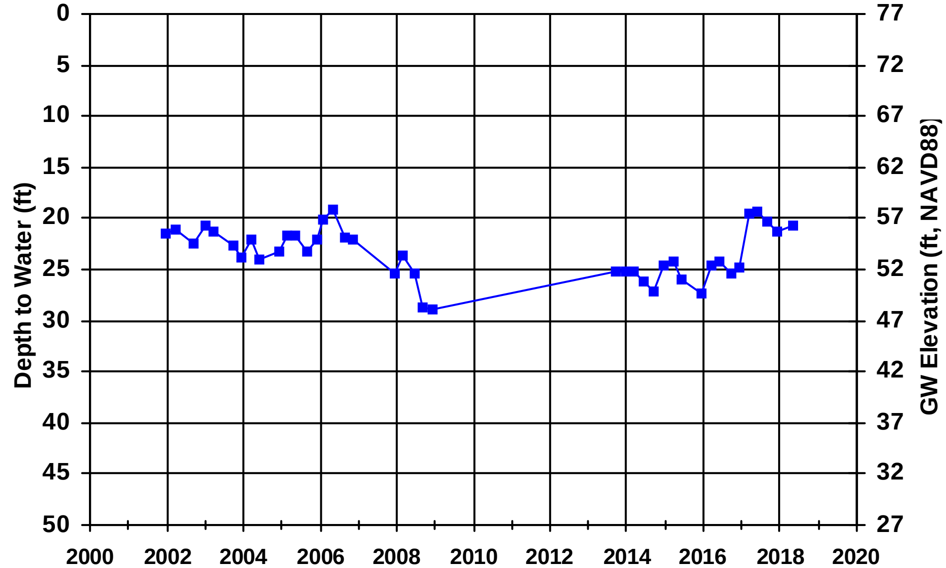



{R_WLhyd88}

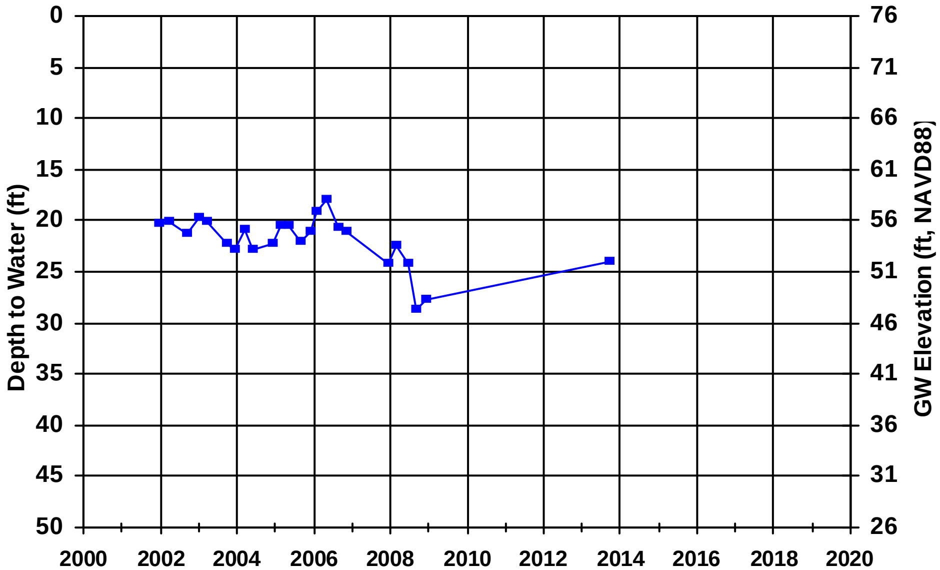
**WellID: T0601300804-MW-5**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



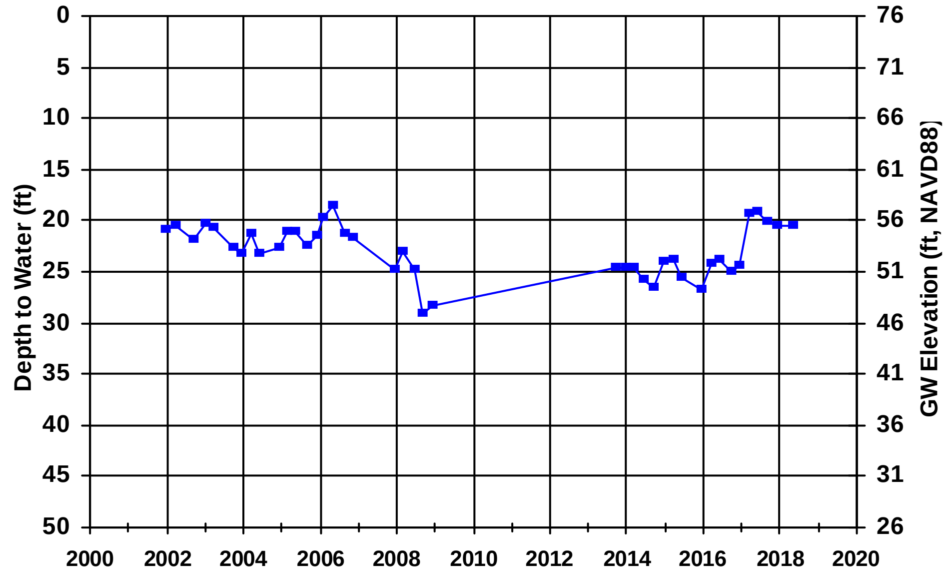

**WellID: T0601300804-MW-6**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601300804-MW-6D**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

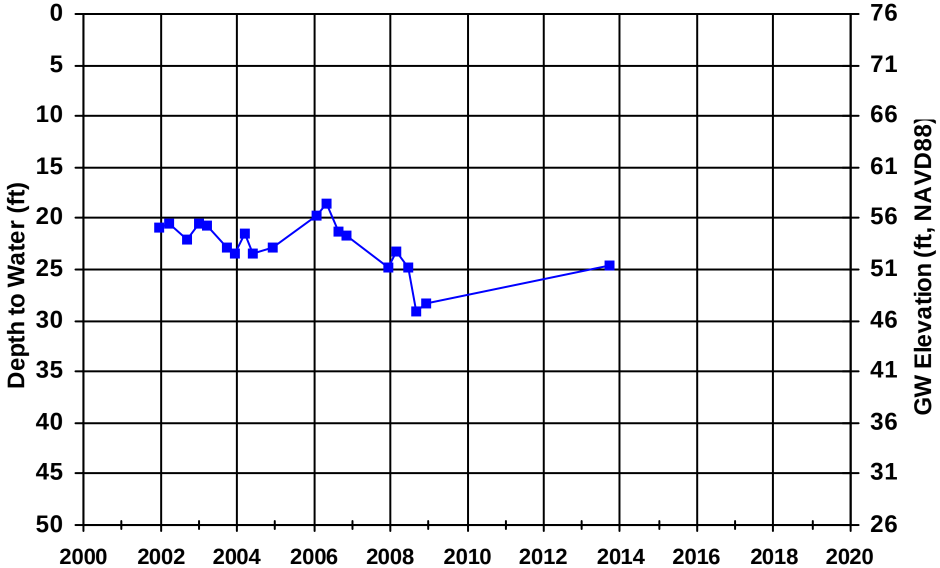



**WellID: T0601300804-MW-7**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

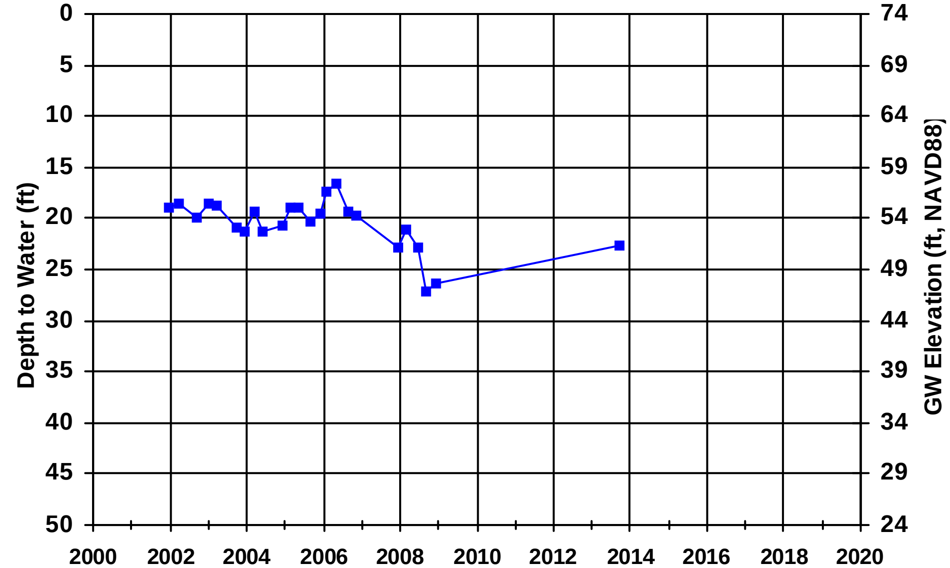



{R_WLhyd88}

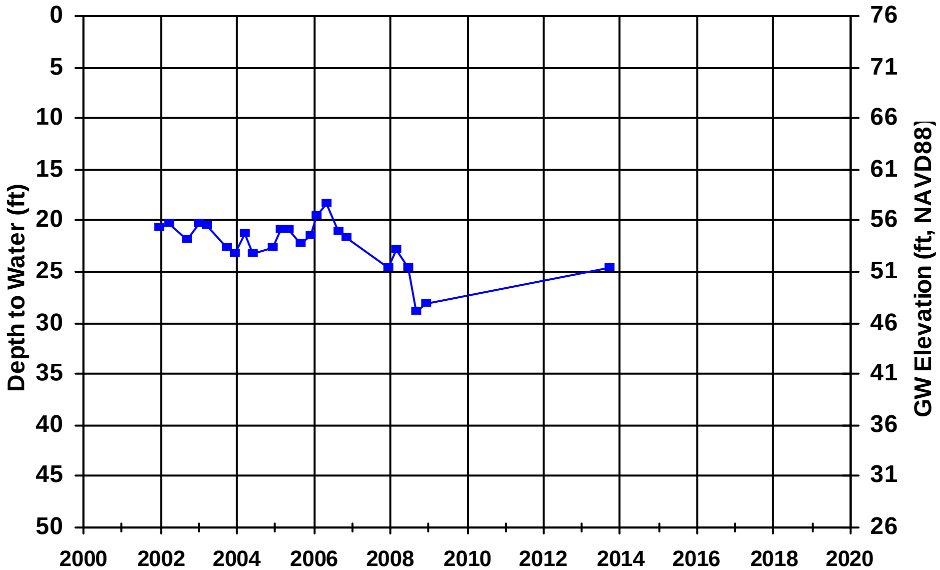
**WellID:** T0601300804-MW-7D
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



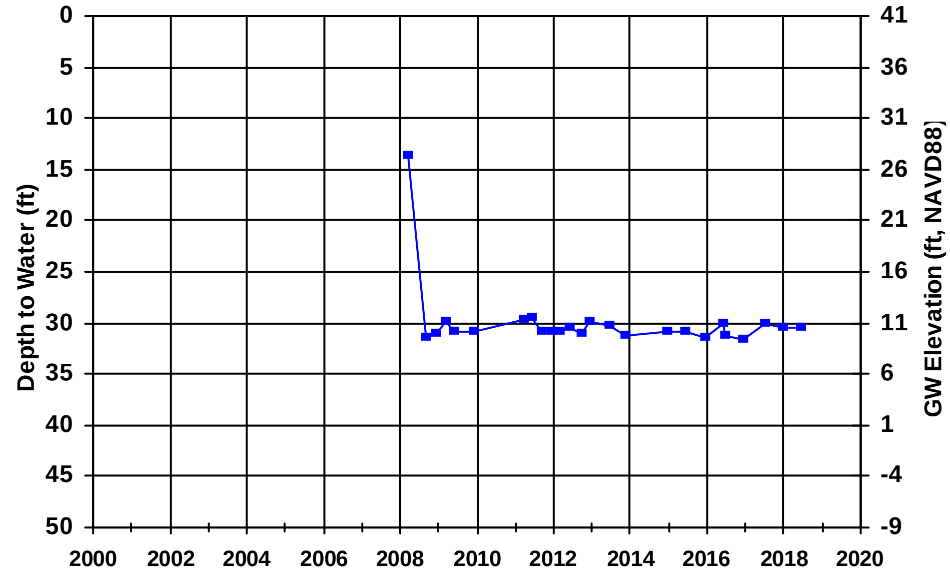

**WellID:** T0601300804-MW-8
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



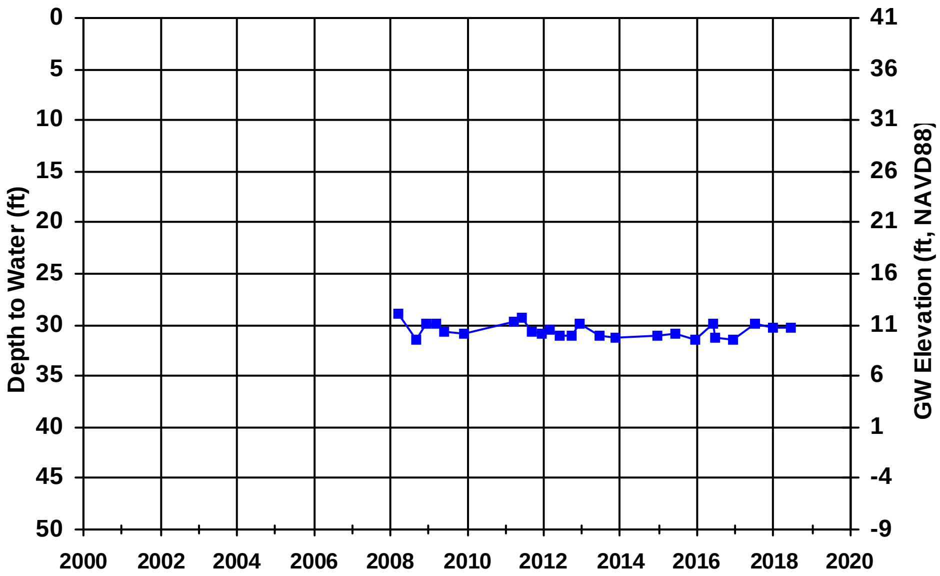

**WellID:** T0601300804-MW-9
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



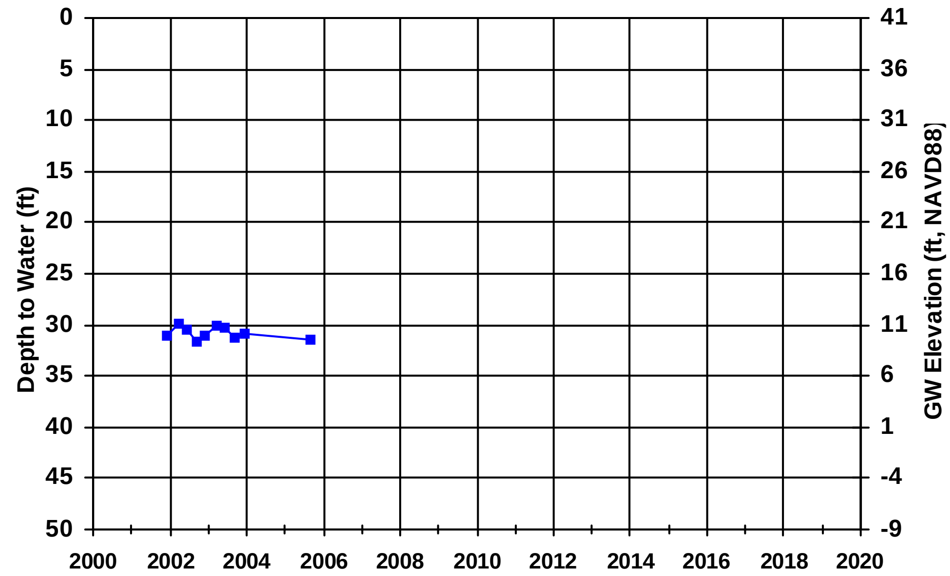

**WellID:** T0601300807-IP-1
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



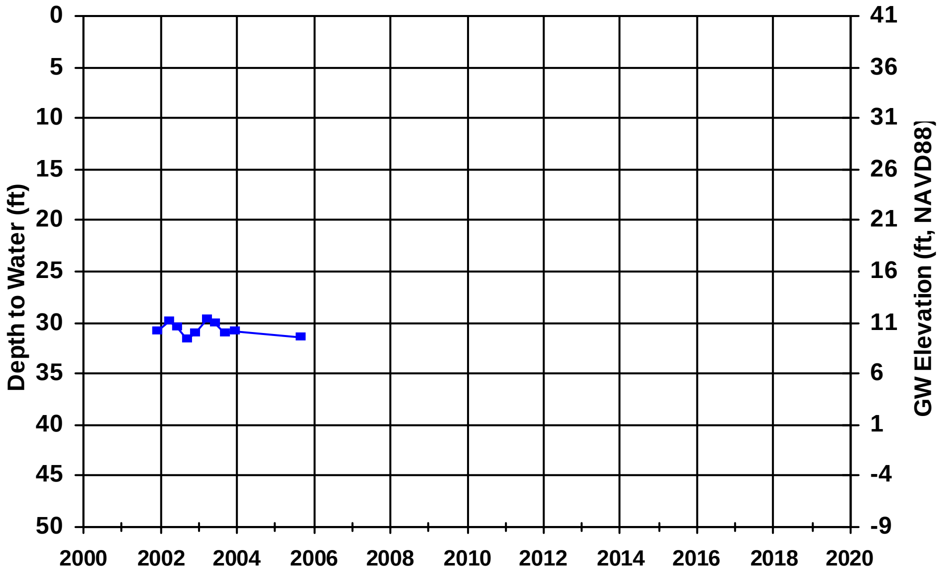
WellID: T0601300807-IP-2
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



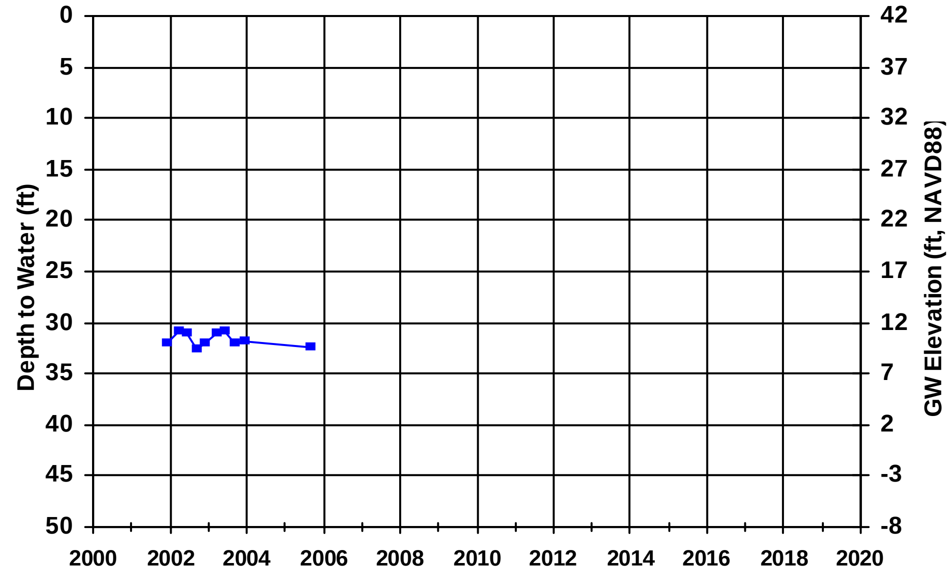

WellID: T0601300807-MW-1
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300807-MW-2
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300807-MW-3
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

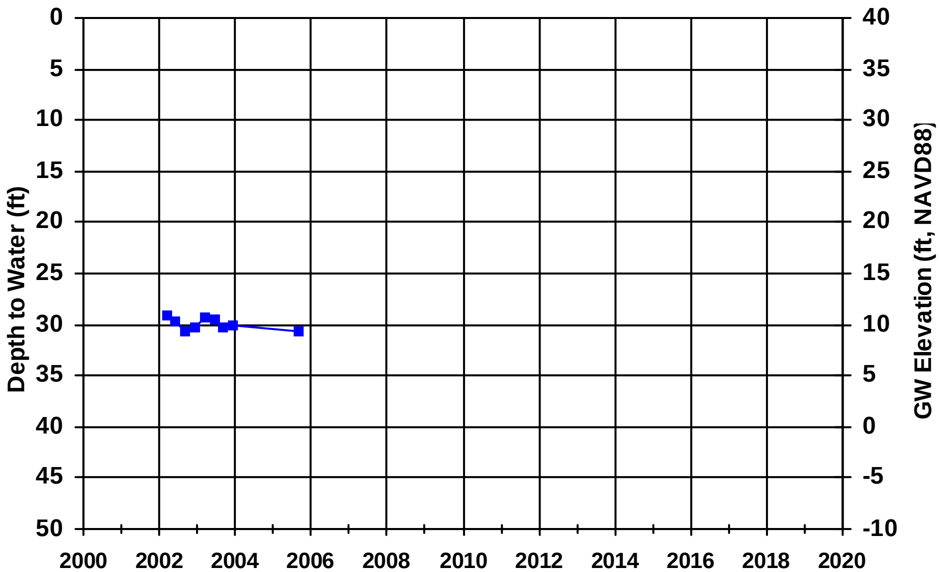



{R_WLhyd88}

WellID: T0601300807-MW-4

Zone: Shallow

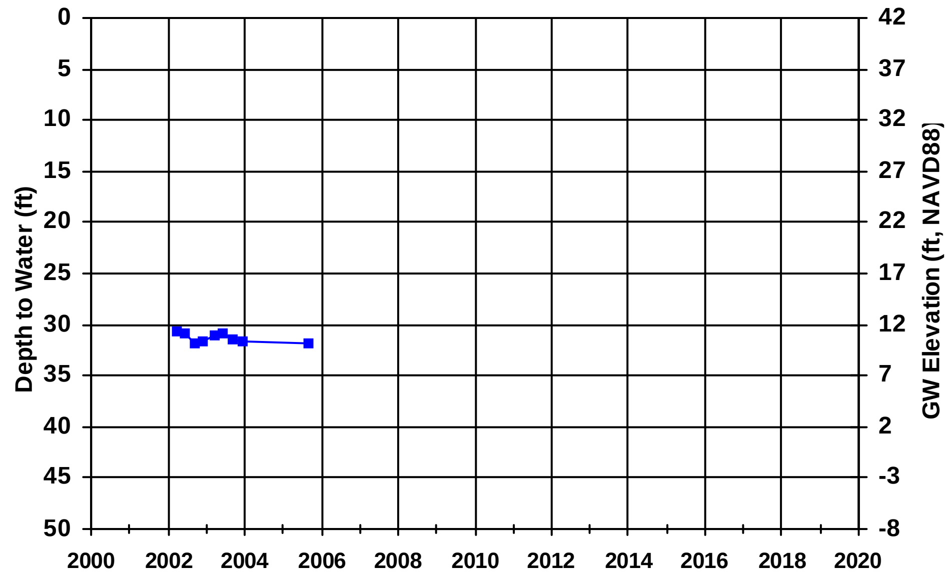
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300807-MW-5

Zone: Shallow

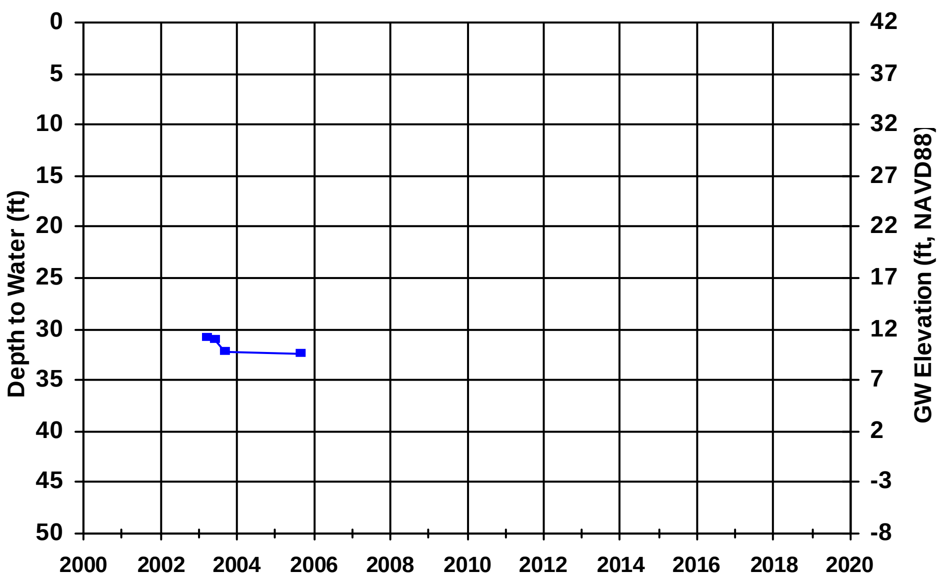
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300807-MW-5B

Zone: Shallow

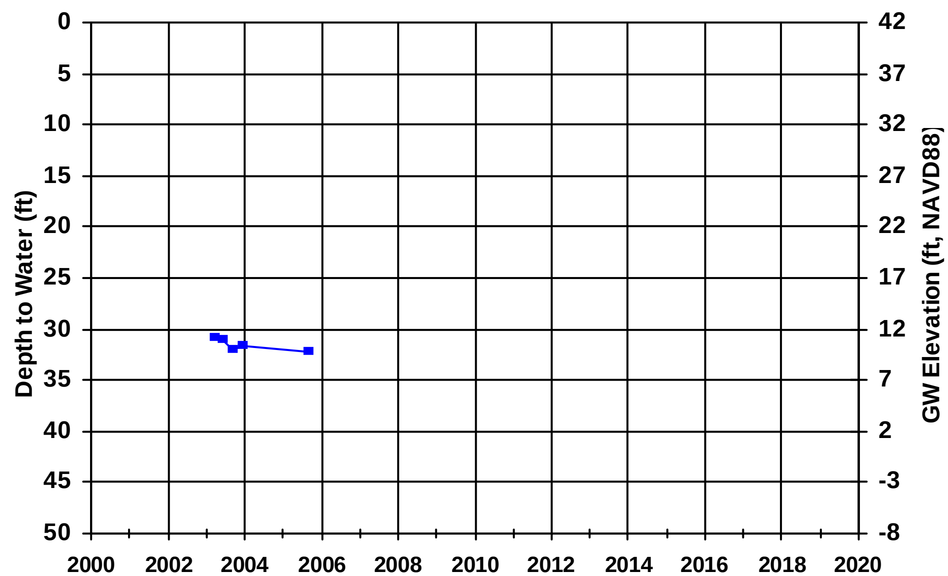
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300807-MW-5C

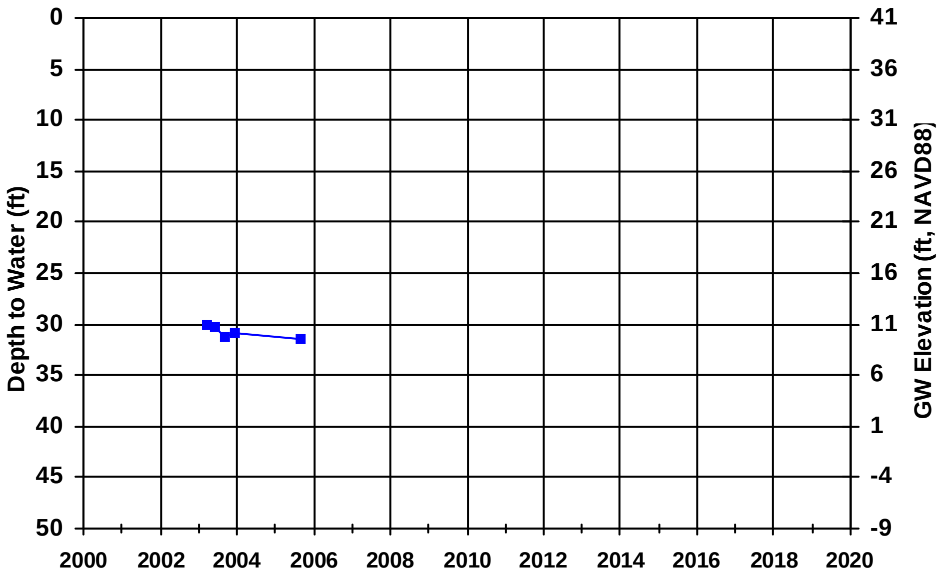
Zone: Shallow

Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

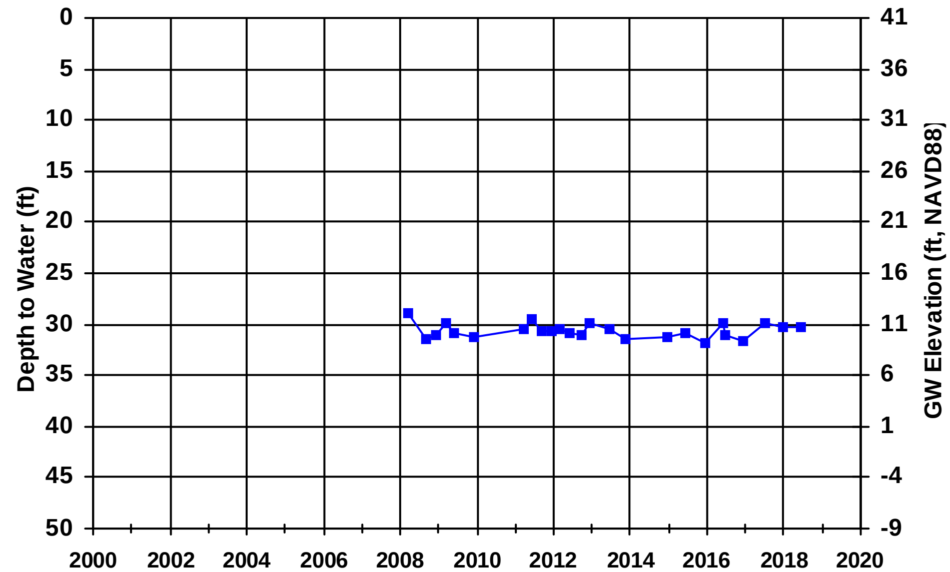



{R_WLhyd88}

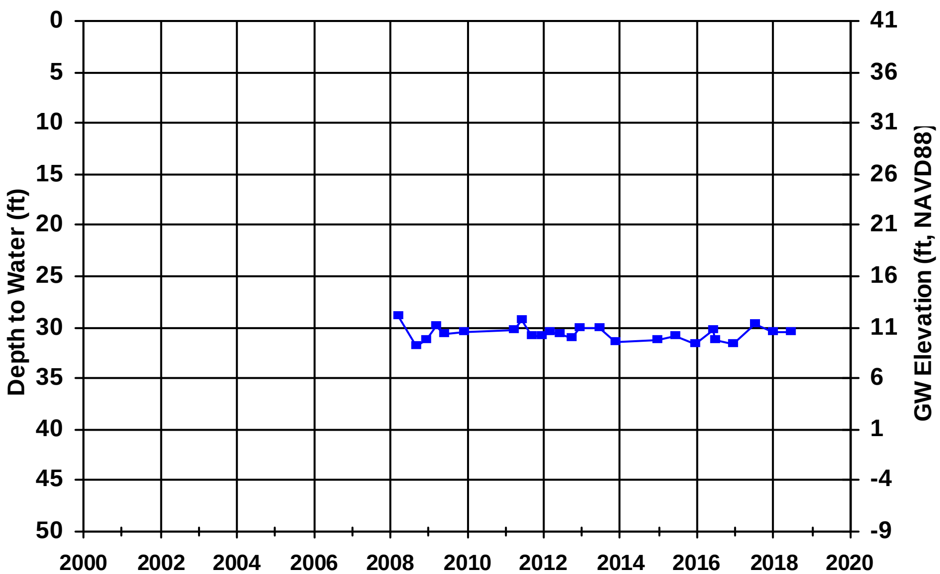
**WellID:** T0601300807-MW-6
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



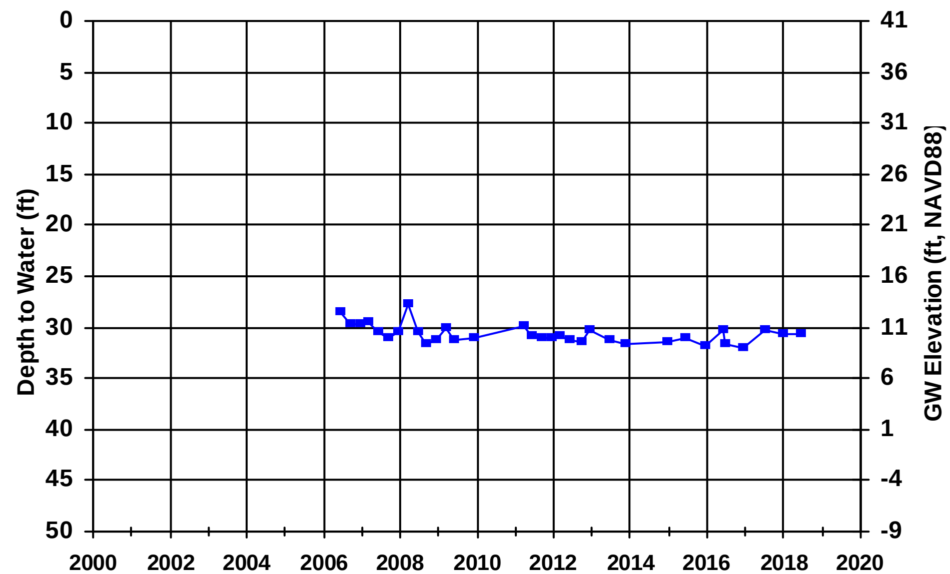

**WellID:** T0601300807-OW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300807-OW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

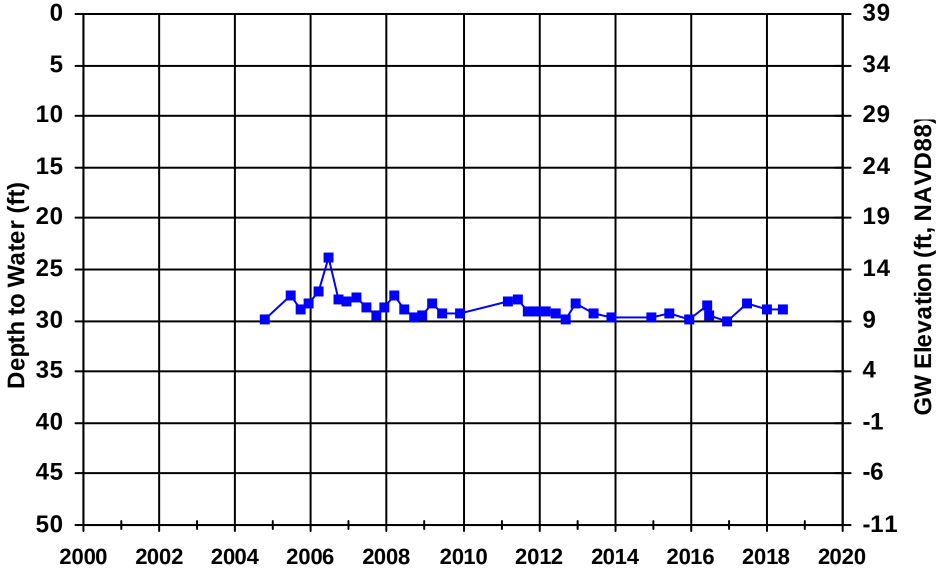



**WellID:** T0601300807-S-11
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

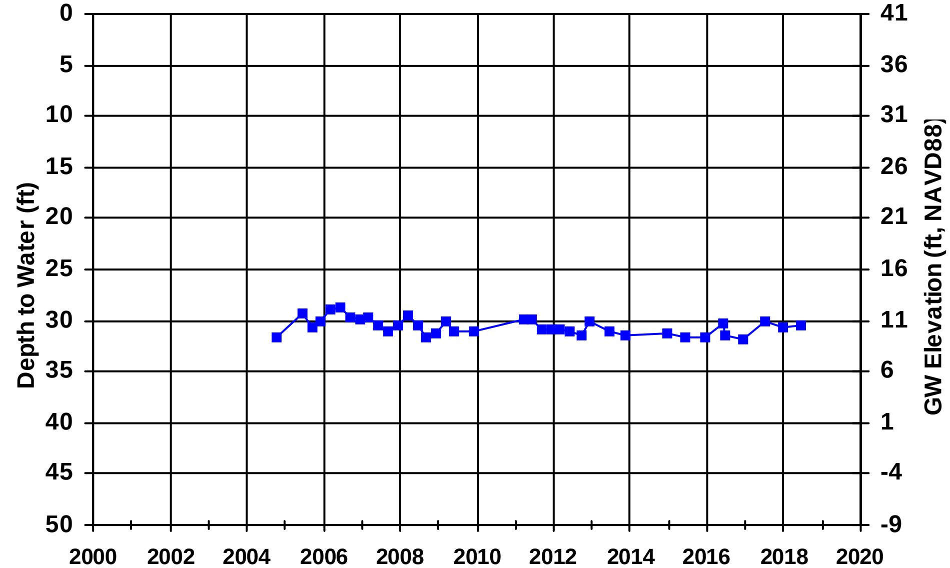



{R_WLhyd88}

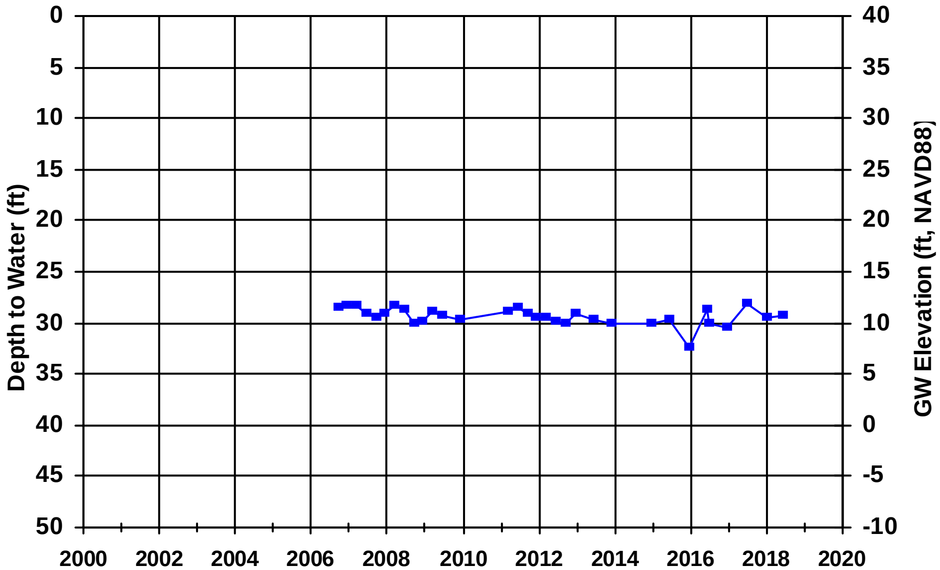
**WellID:** T0601300807-S-12
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



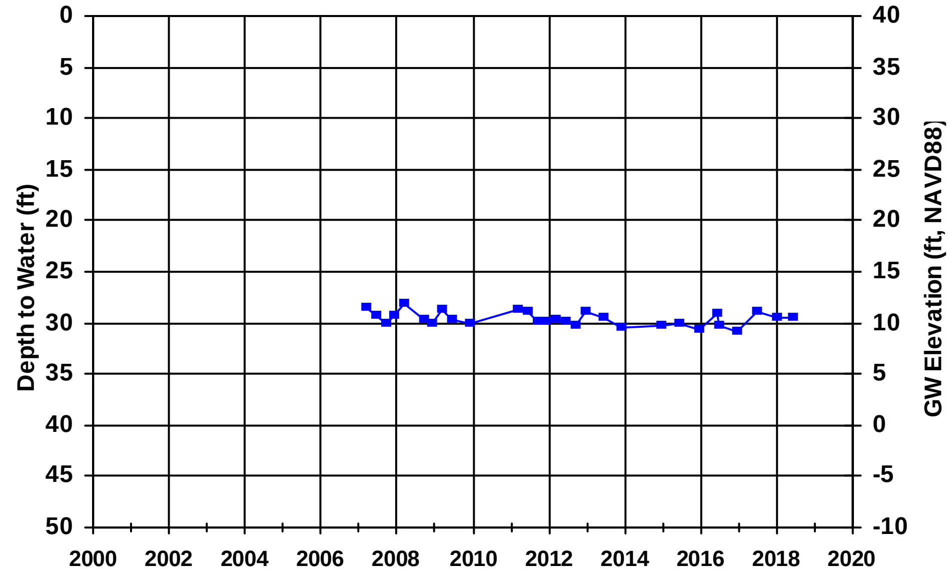

**WellID:** T0601300807-S-13
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601300807-S-14
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

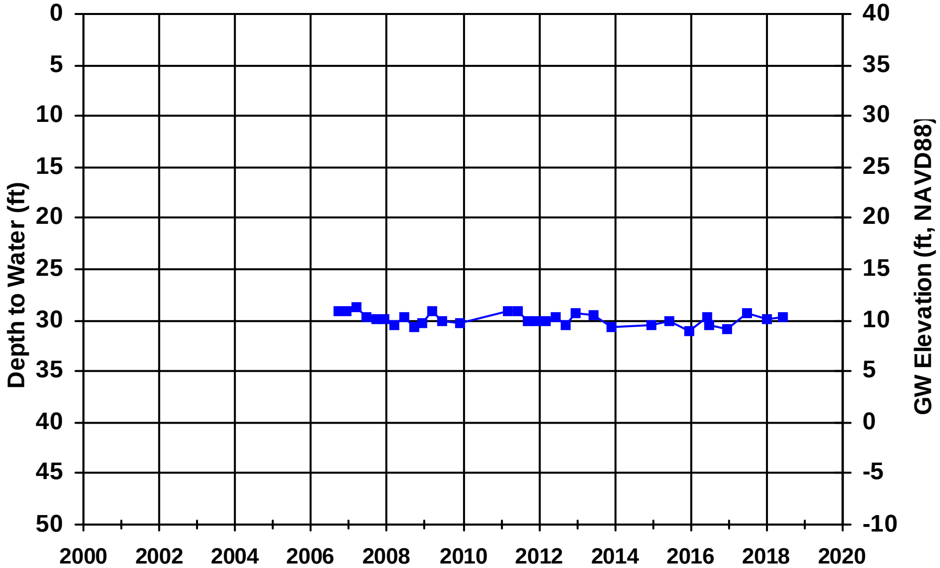



**WellID:** T0601300807-S-15
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

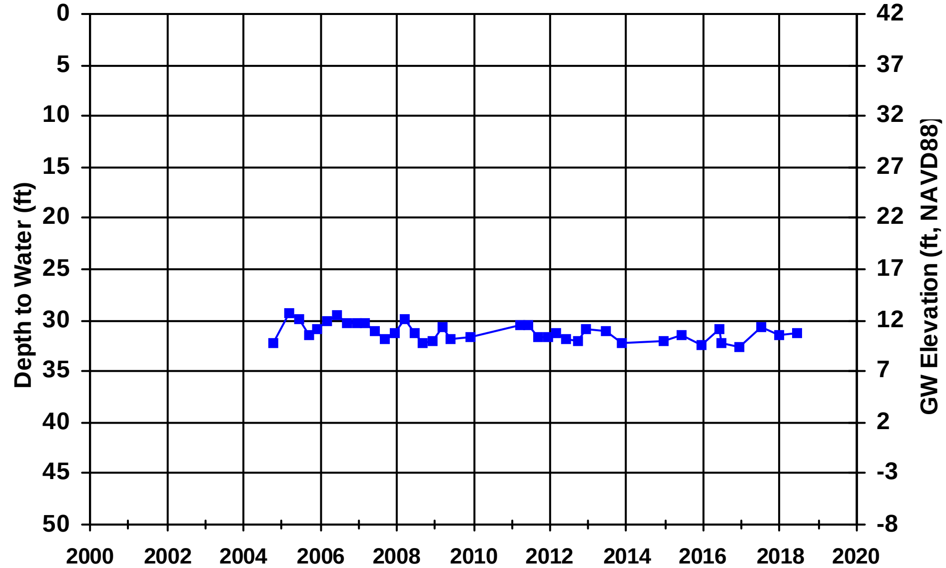



{R_WLhyd88}

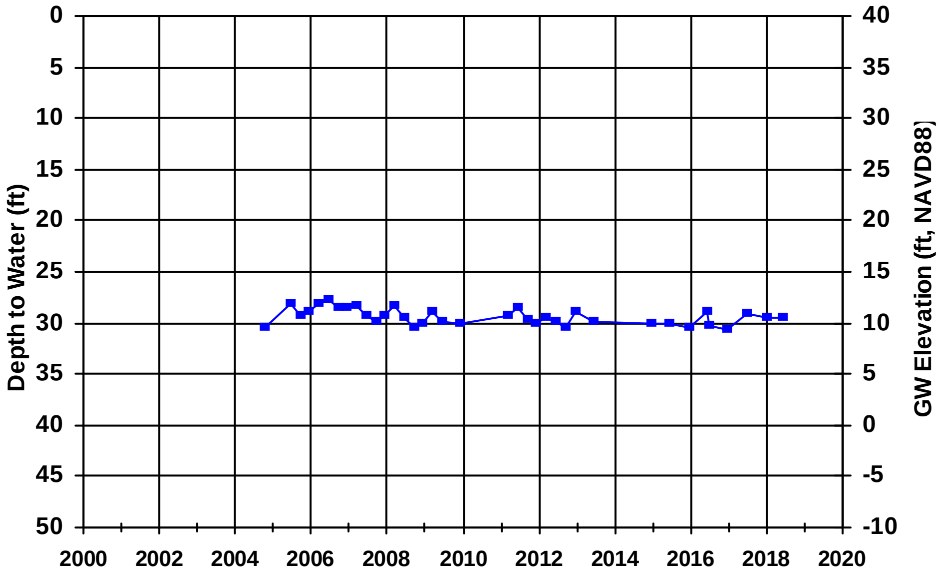
**WellID:** T0601300807-S-17
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



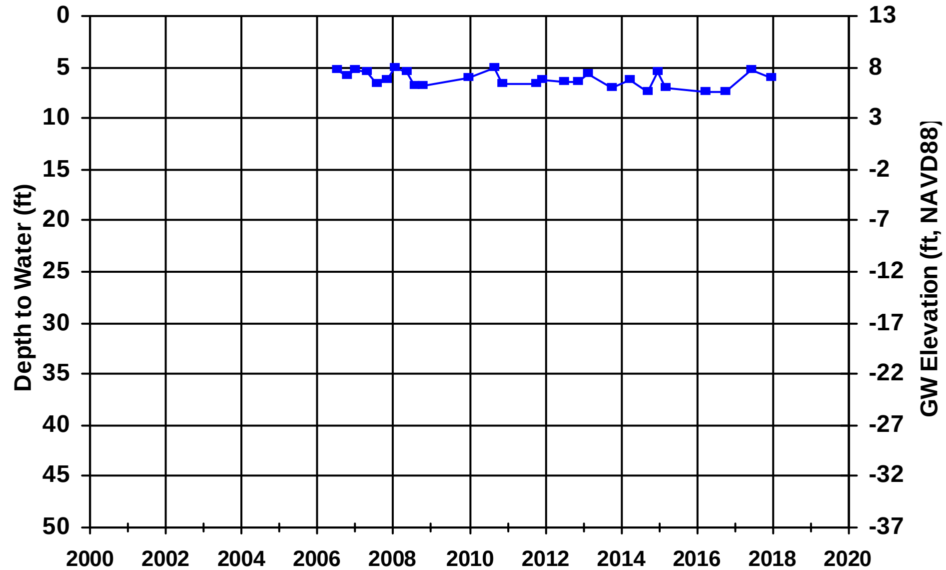

**WellID:** T0601300807-S-7
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601300807-S-8
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

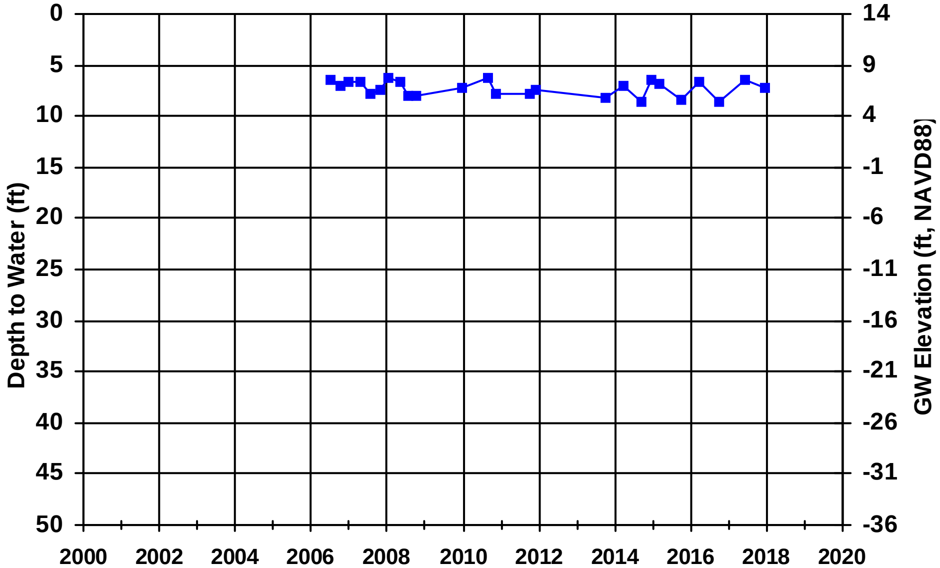



**WellID:** T0601300809-MW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

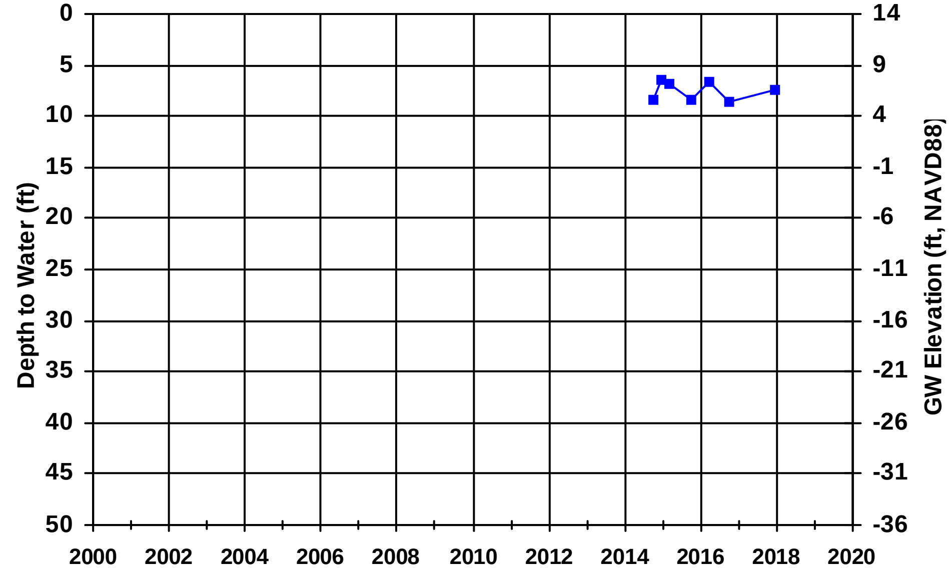



{R_WLhyd88}

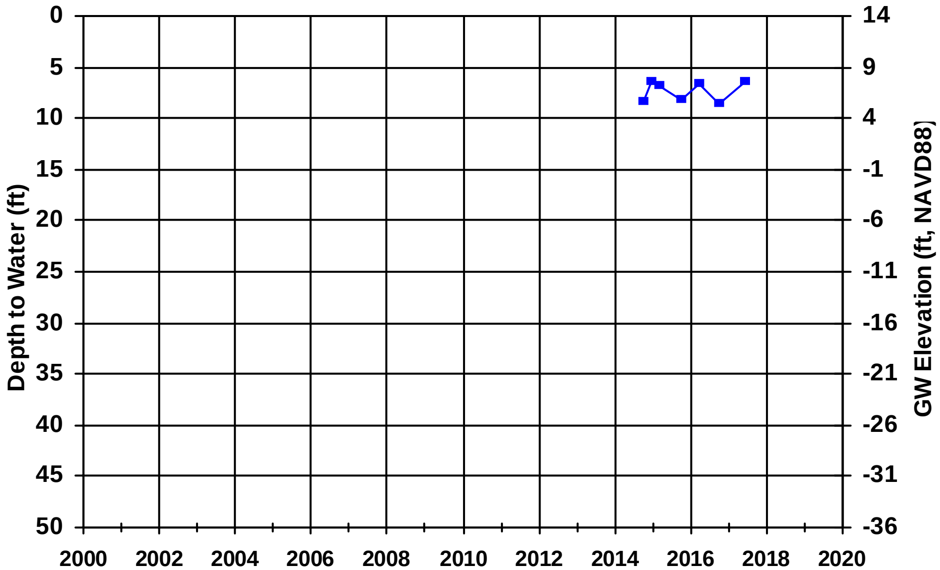
WellID: T0601300809-MW-10
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



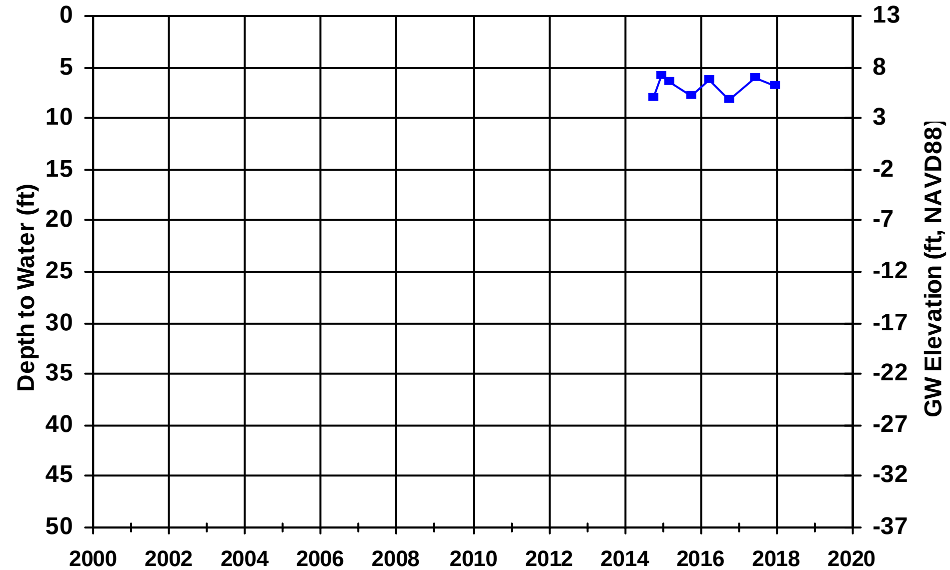

WellID: T0601300809-MW-102
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300809-MW-103
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

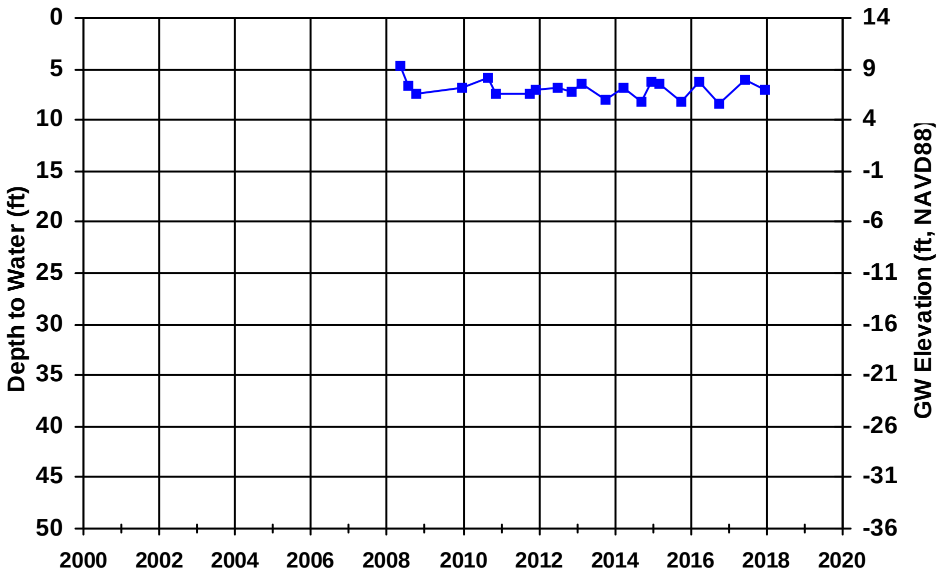



WellID: T0601300809-MW-104
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

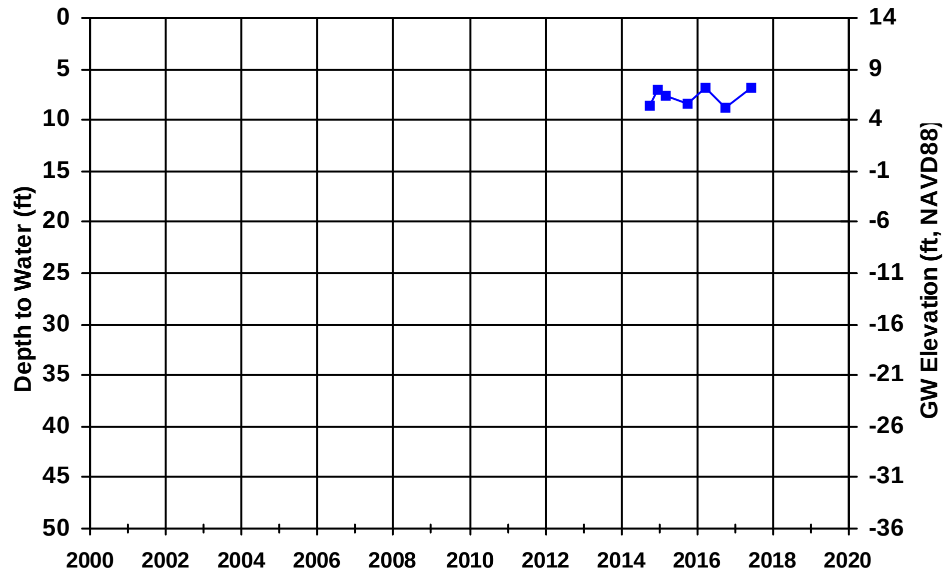



{R_WLhyd88}

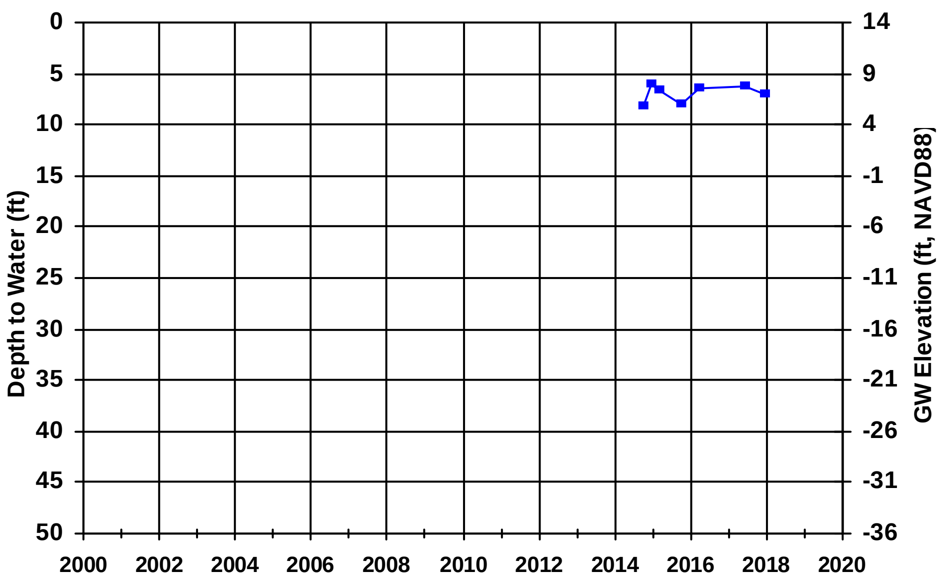
**WellID:** **T0601300809-MW-11**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



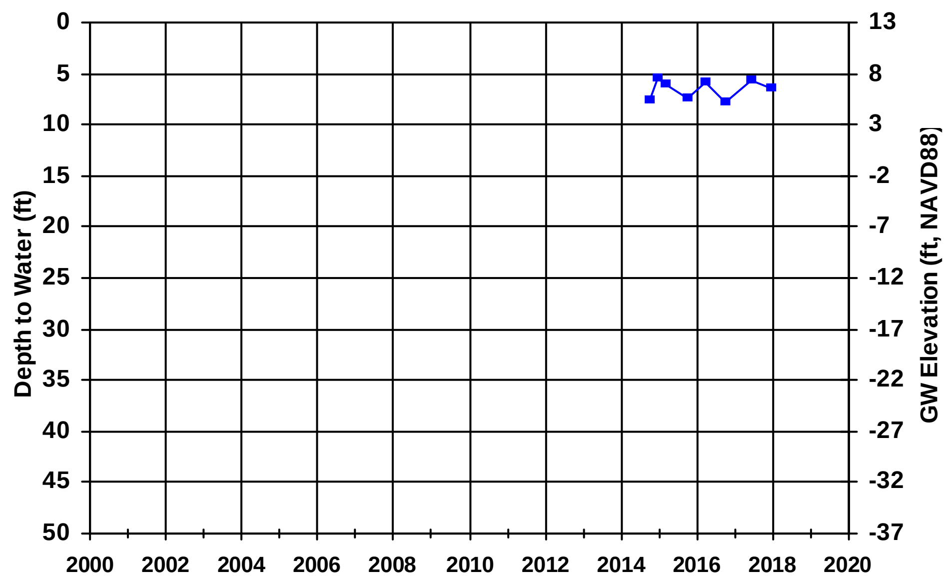

**WellID:** **T0601300809-MW-12**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601300809-MW-13**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

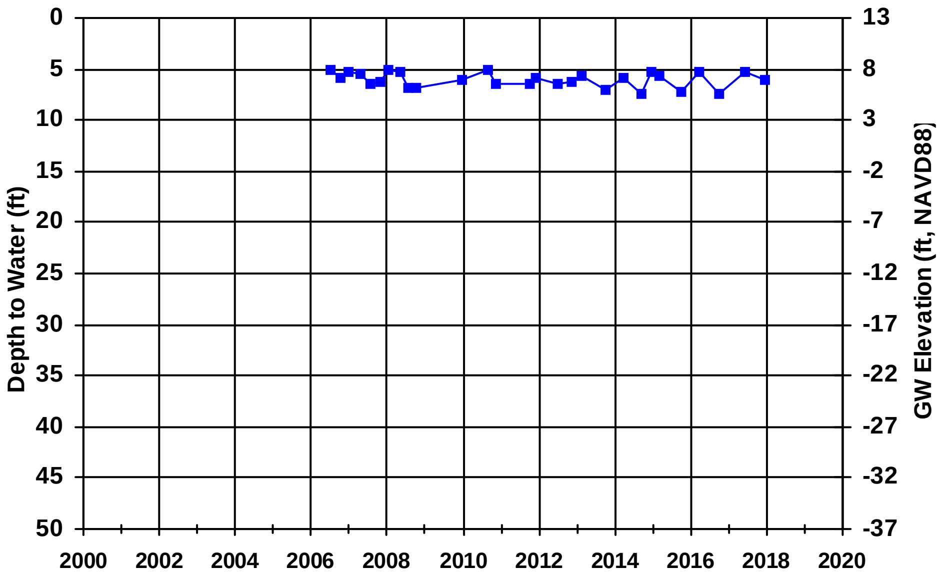



**WellID:** **T0601300809-MW-14**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

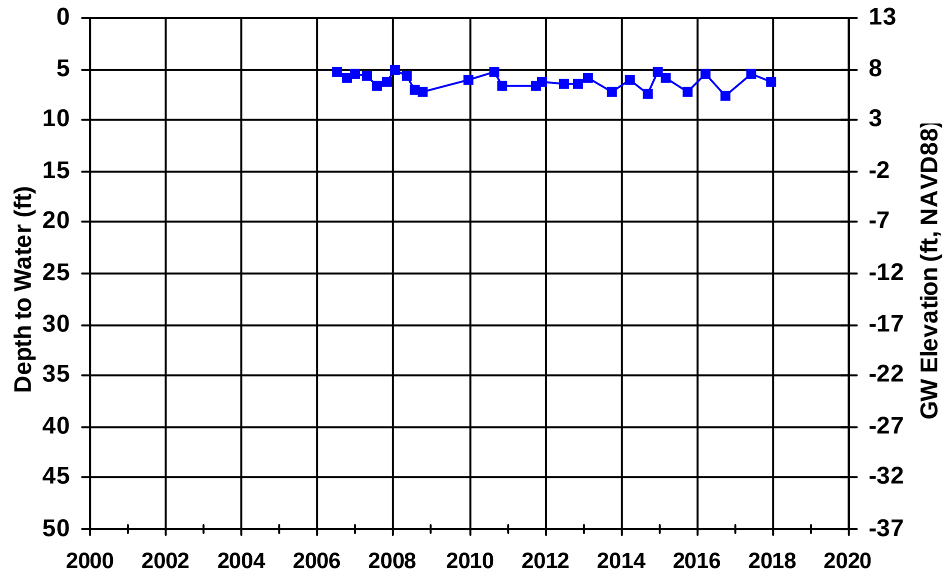



{R_WLhyd88}

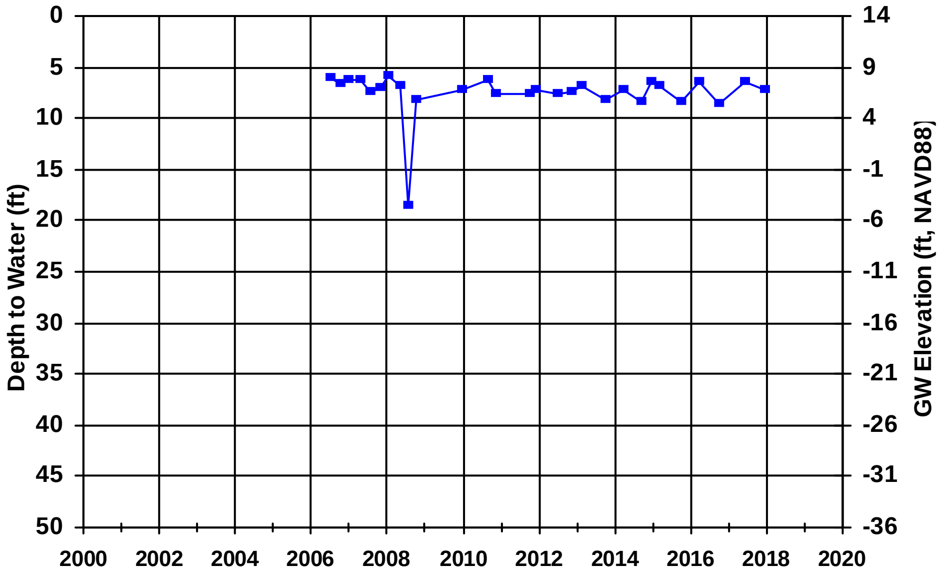
WellID: T0601300809-MW-2
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



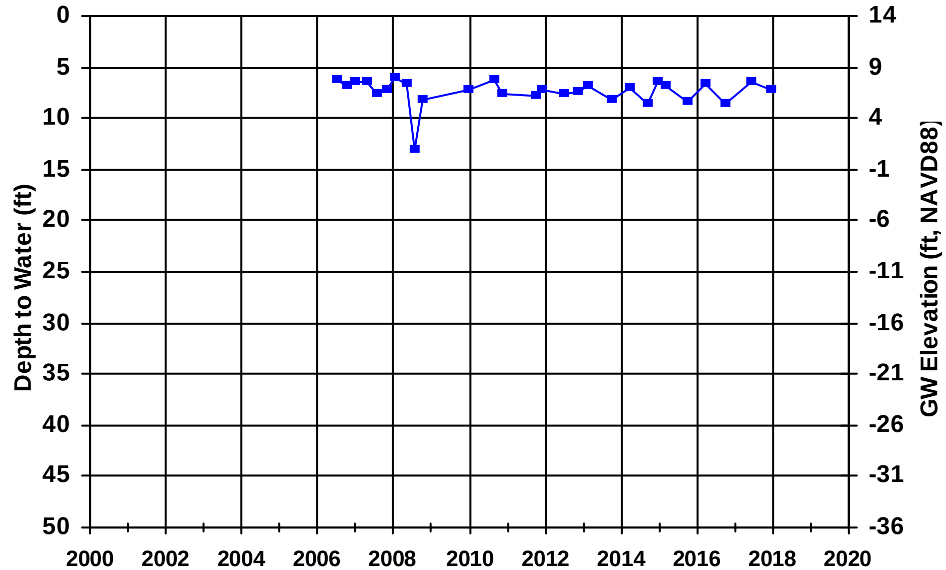

WellID: T0601300809-MW-3
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300809-MW-4
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

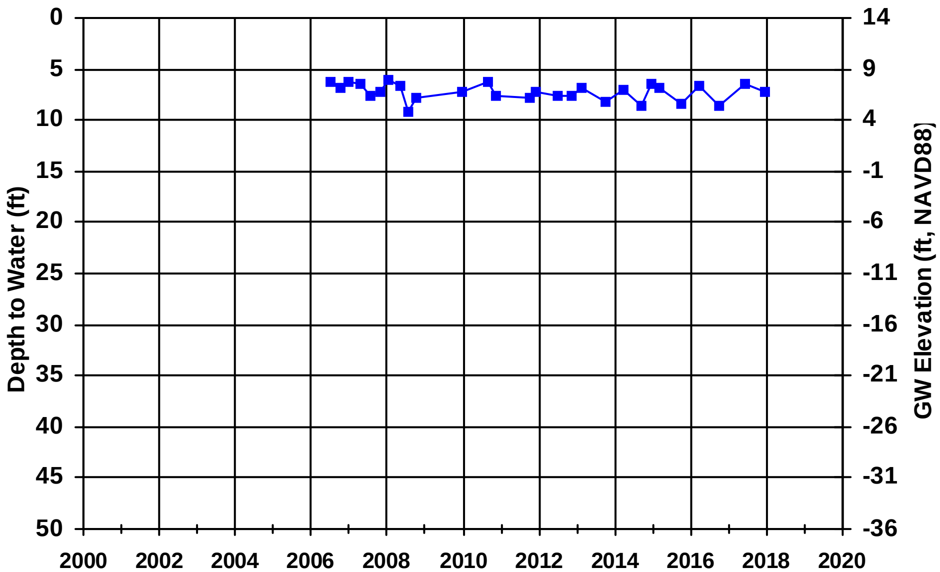



WellID: T0601300809-MW-5
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

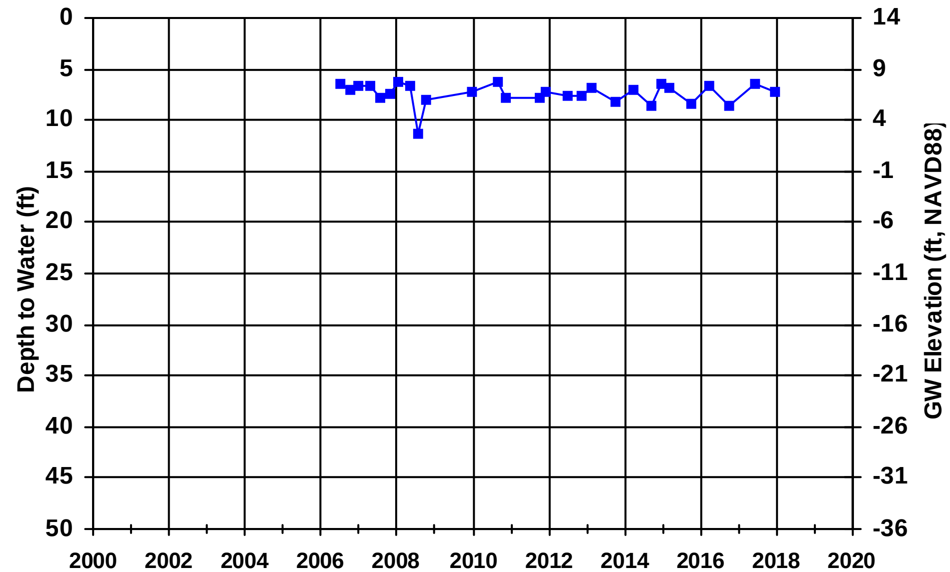



{R_WLhyd88}

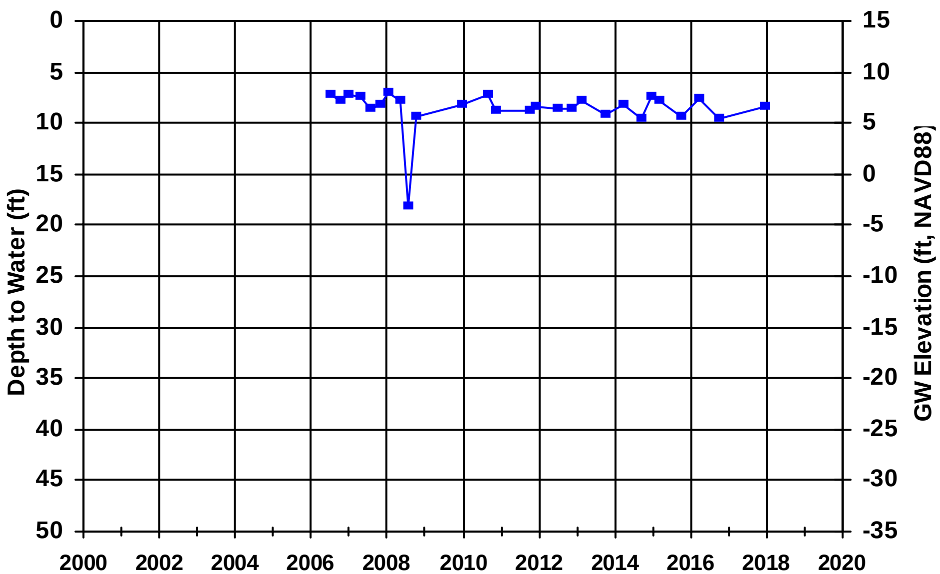
**WellID: T0601300809-MW-6**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



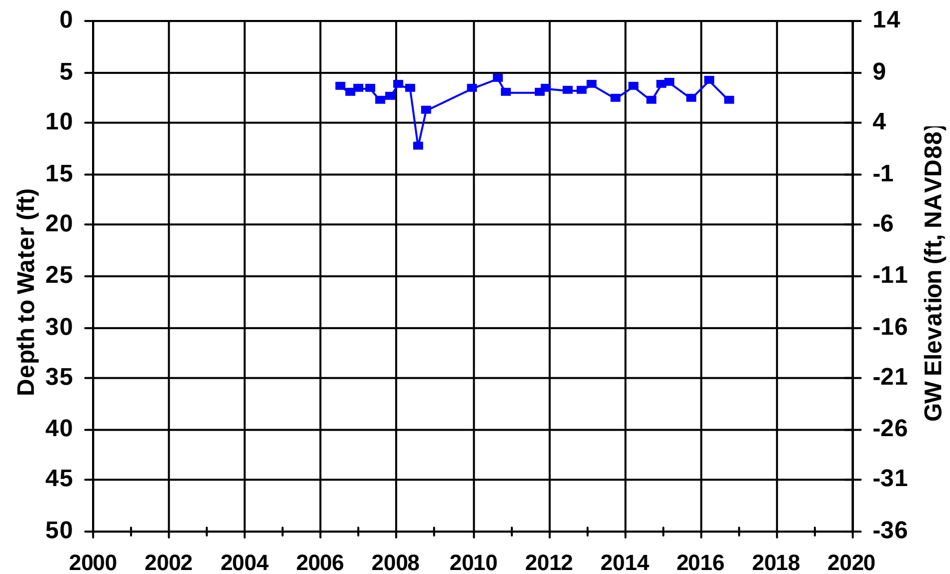

**WellID: T0601300809-MW-7**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID: T0601300809-MW-8**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

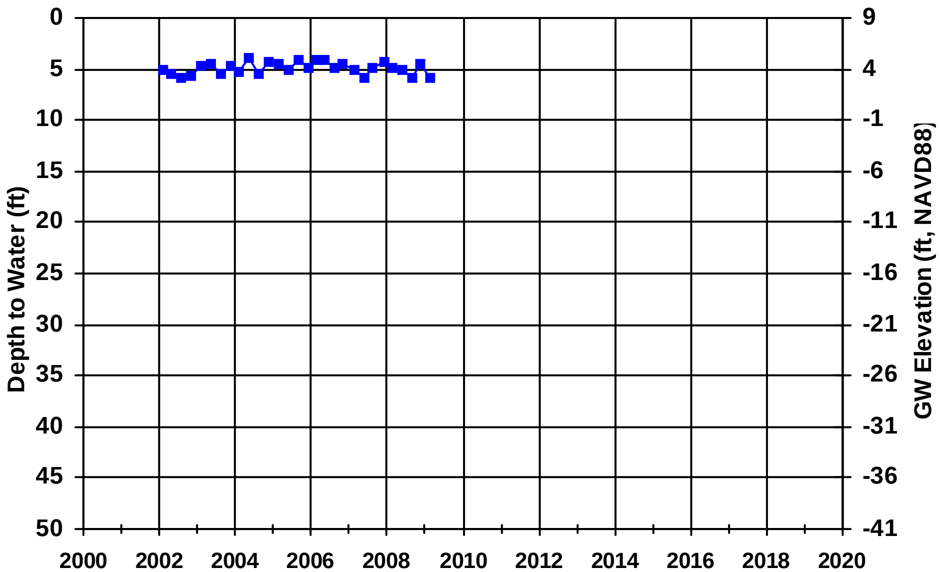



**WellID: T0601300809-MW-9**
**Zone: Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

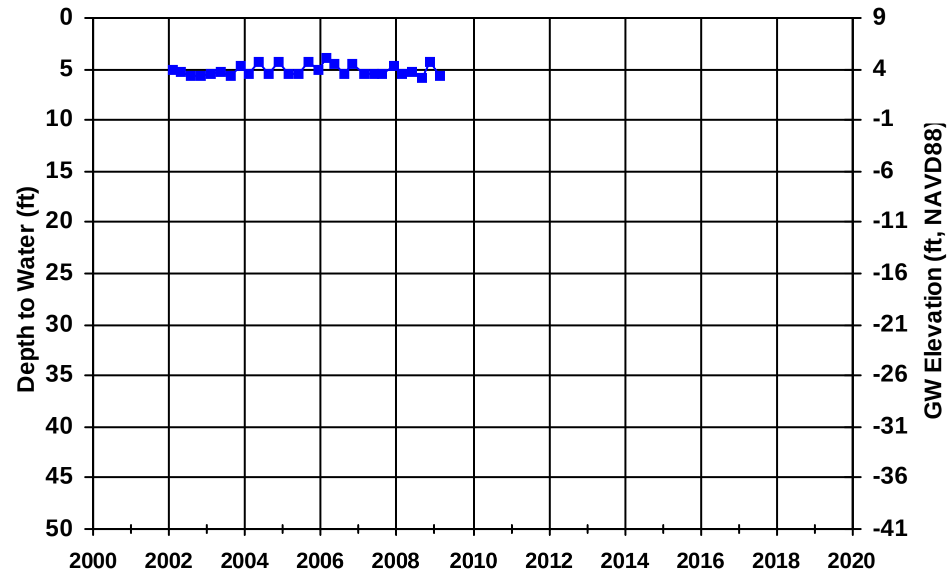



{R_WLhyd88}

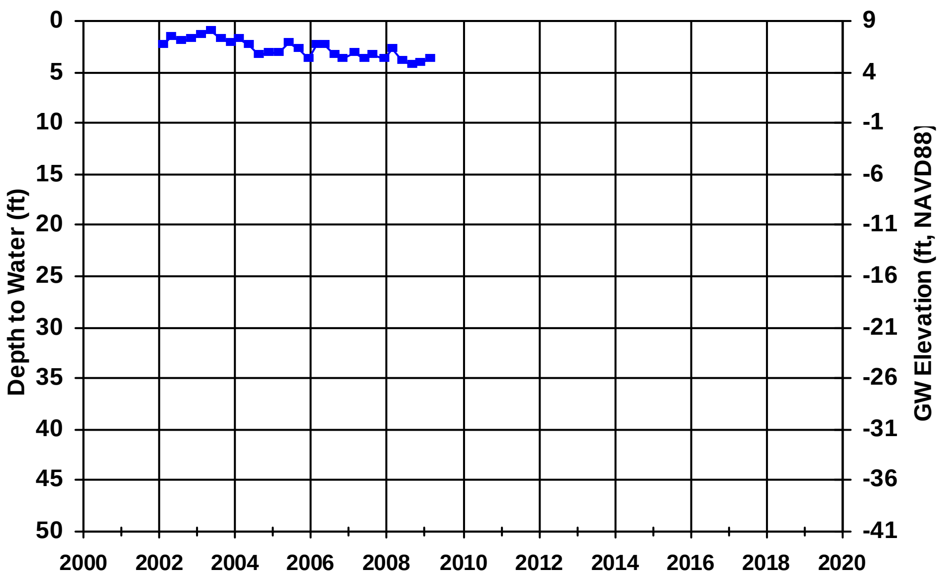
**WellID: T0601300810-MW-1**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



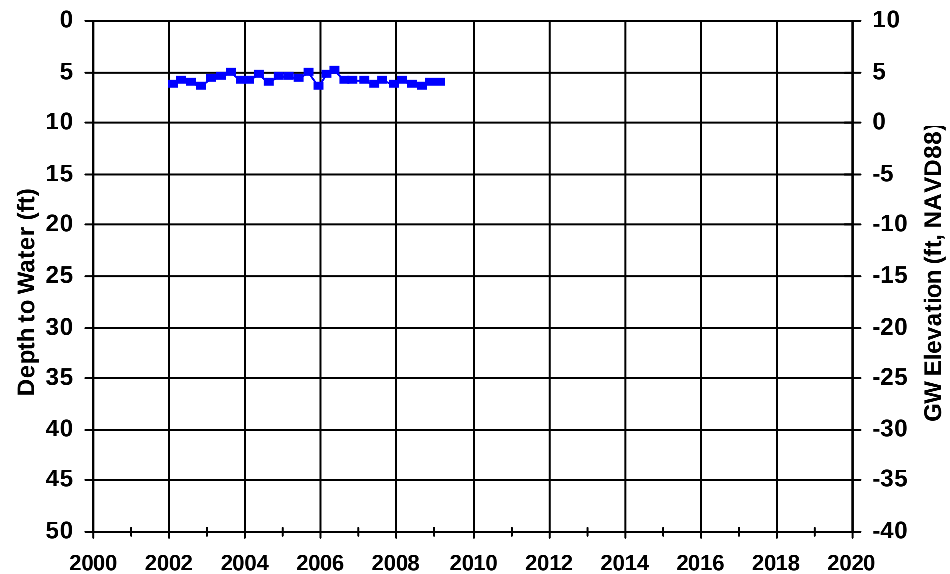

**WellID: T0601300810-MW-2**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID: T0601300810-MW-3**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

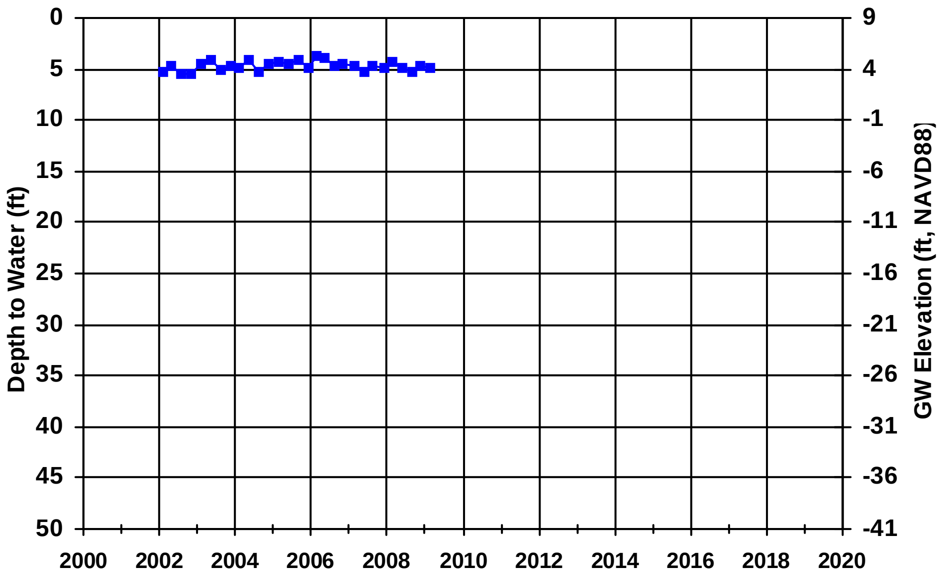



**WellID: T0601300810-MW-4**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

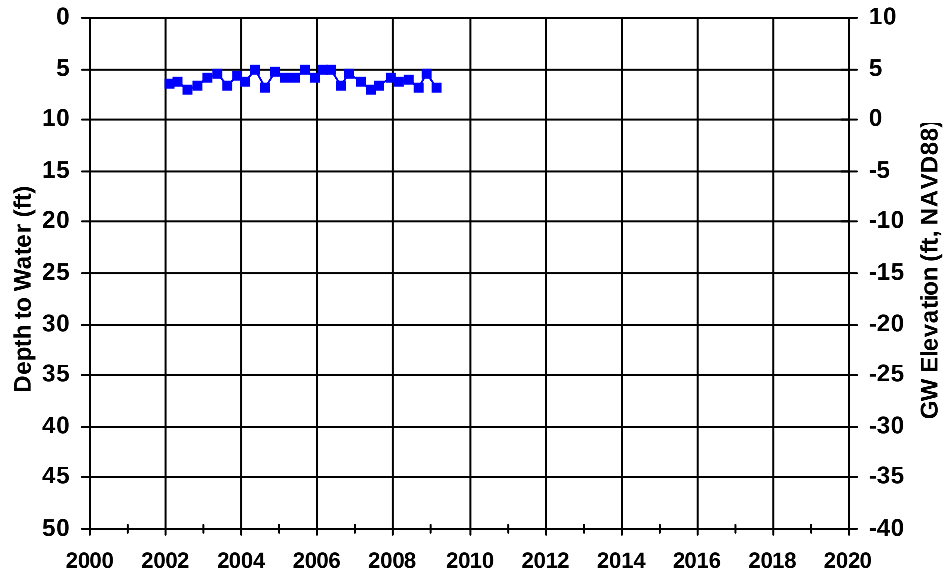



{R_WLhyd88}

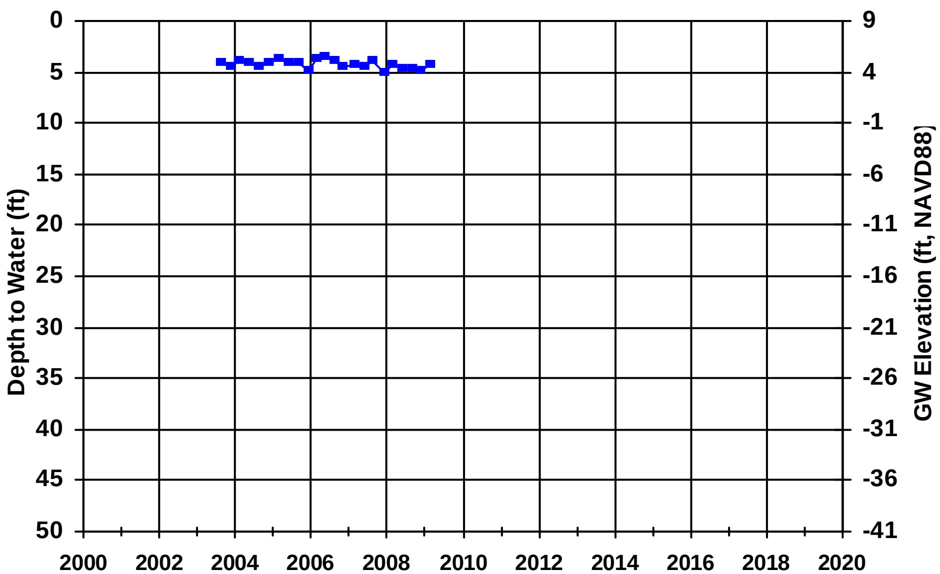
WellID: T0601300810-MW-5
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



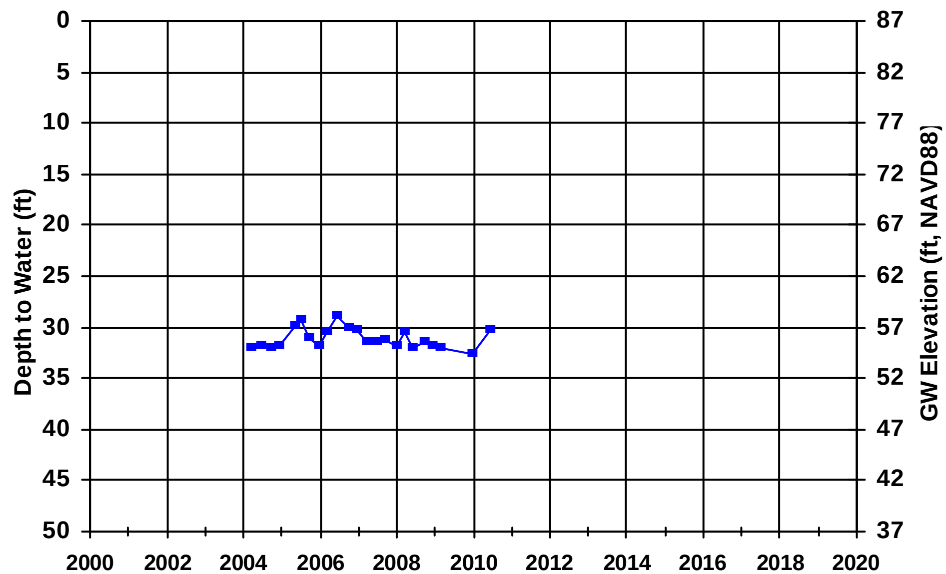

WellID: T0601300810-MW-6
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601300810-MW-7
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

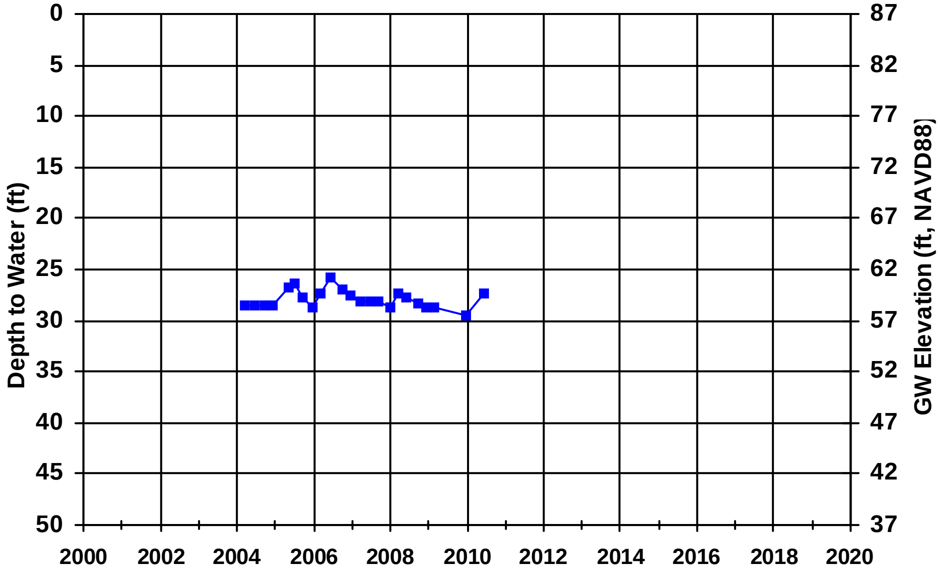



WellID: T0601306725-MW-1
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

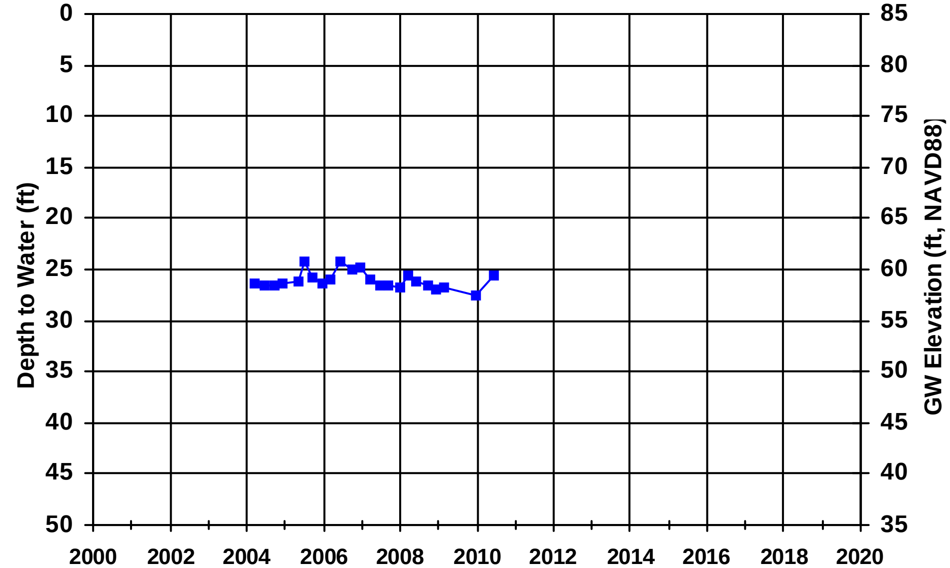



{R_WLhyd88}

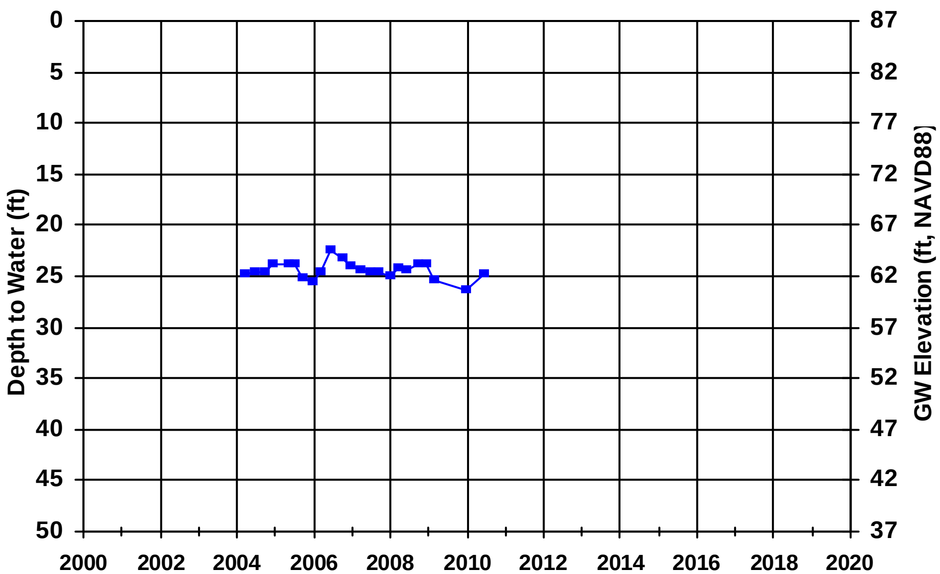
**WellID: T0601306725-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



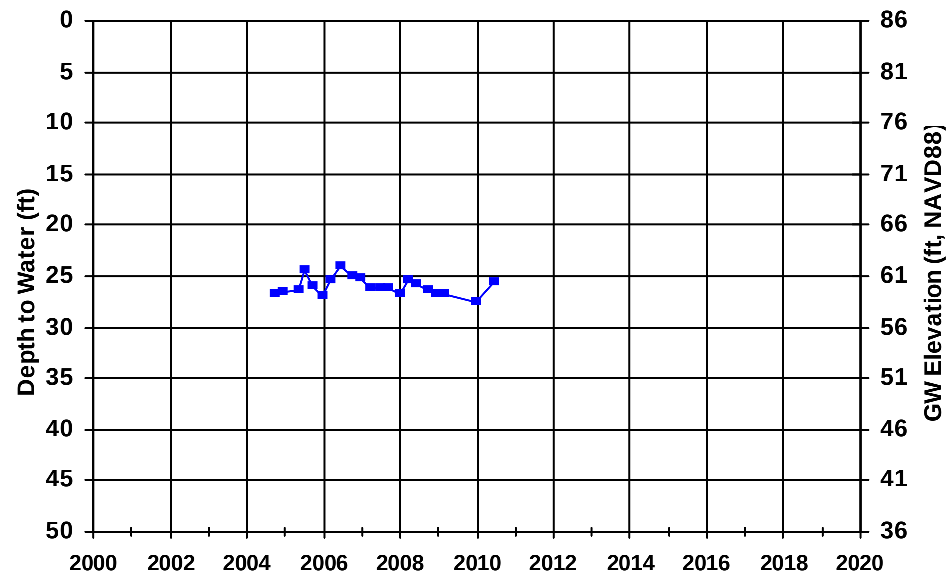

**WellID: T0601306725-MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601306725-MW-4**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

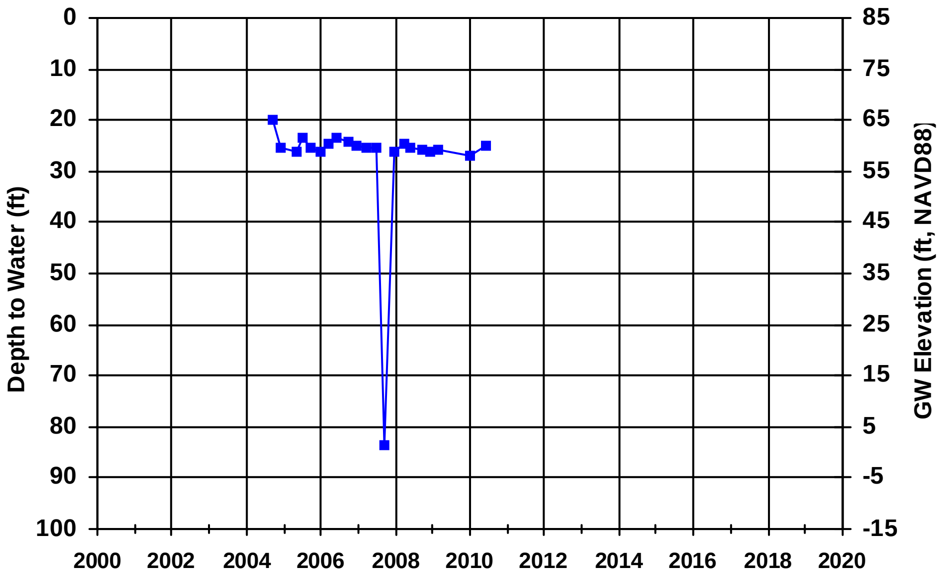



**WellID: T0601306725-MW-5**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

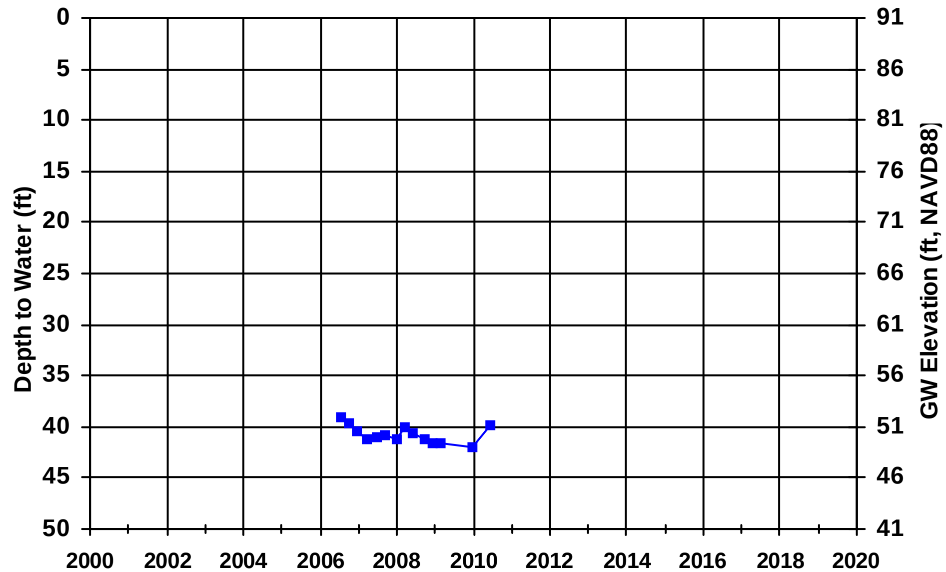



{R_WLhyd88}

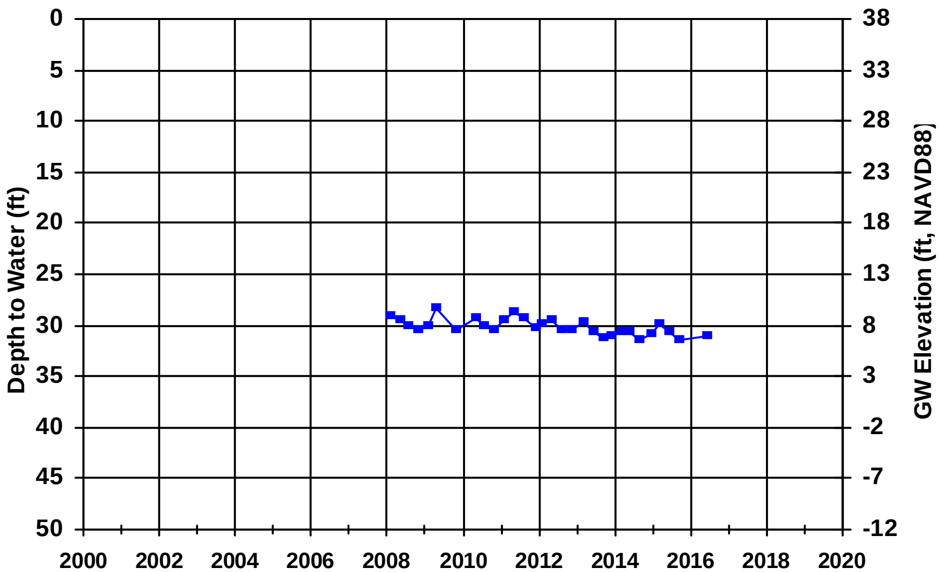
**WellID: T0601306725-MW-6**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



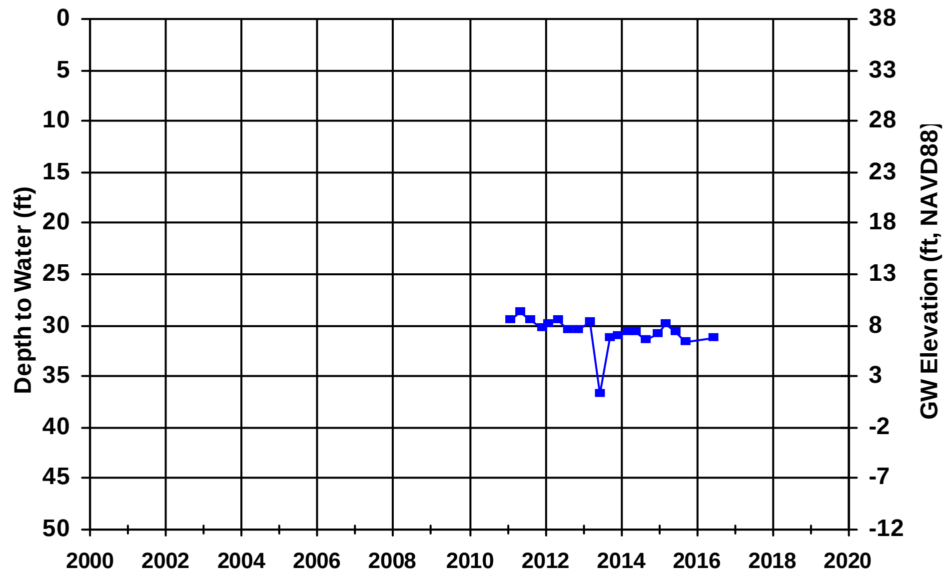

**WellID: T0601306725-MW-8**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601325015-MPE-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

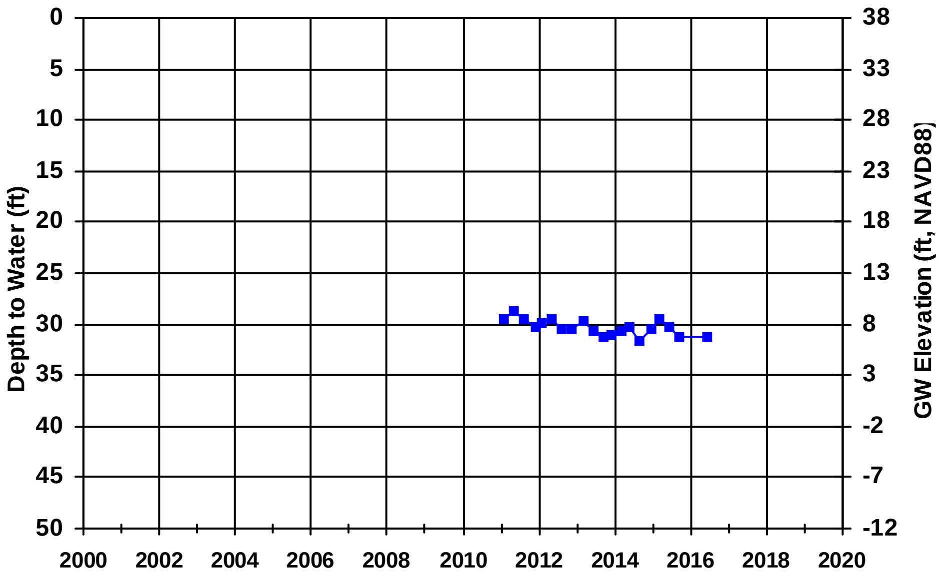



**WellID: T0601325015-MPE-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

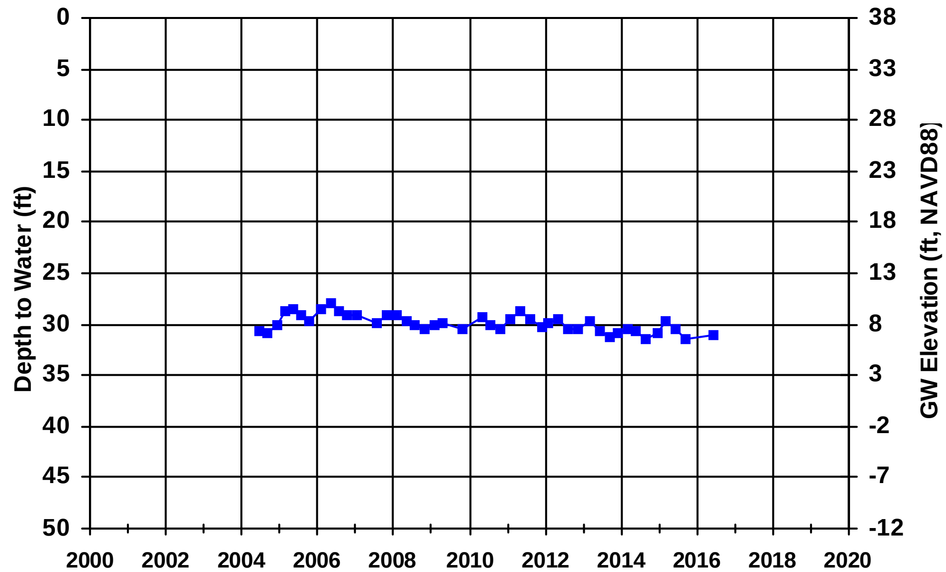



{R_WLhyd88}

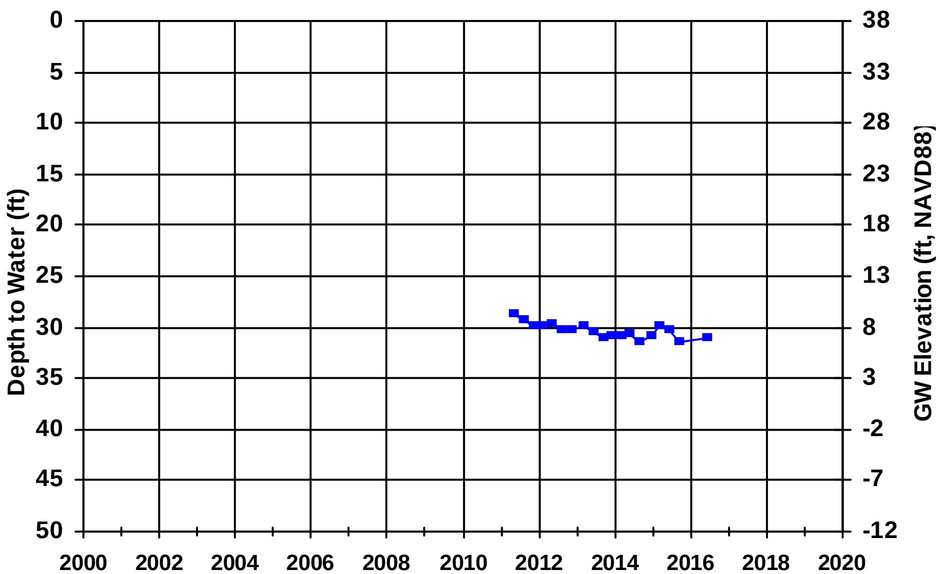
**WellID:** **T0601325015-MPE-3**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



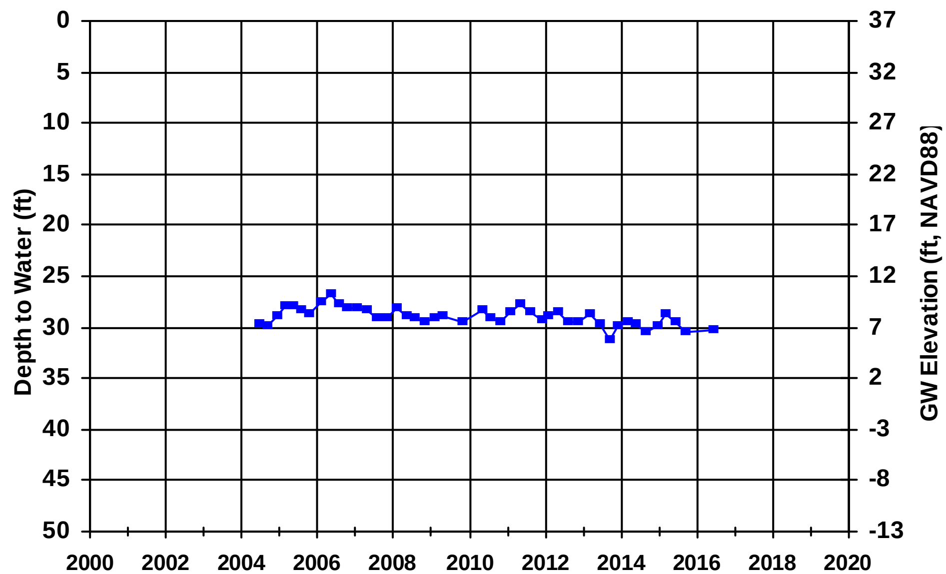

**WellID:** **T0601325015-MW-1**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T0601325015-MW-1D**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

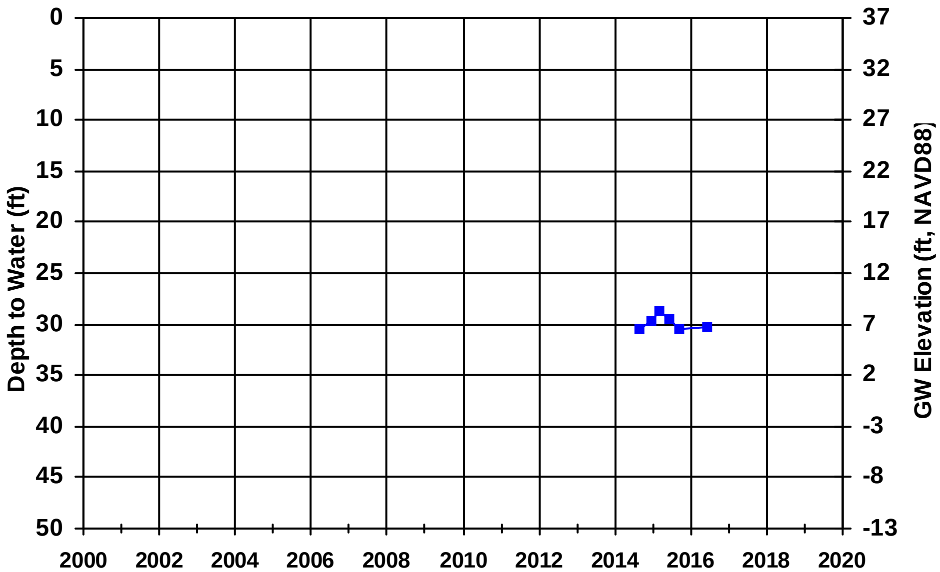



**WellID:** **T0601325015-MW-2**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

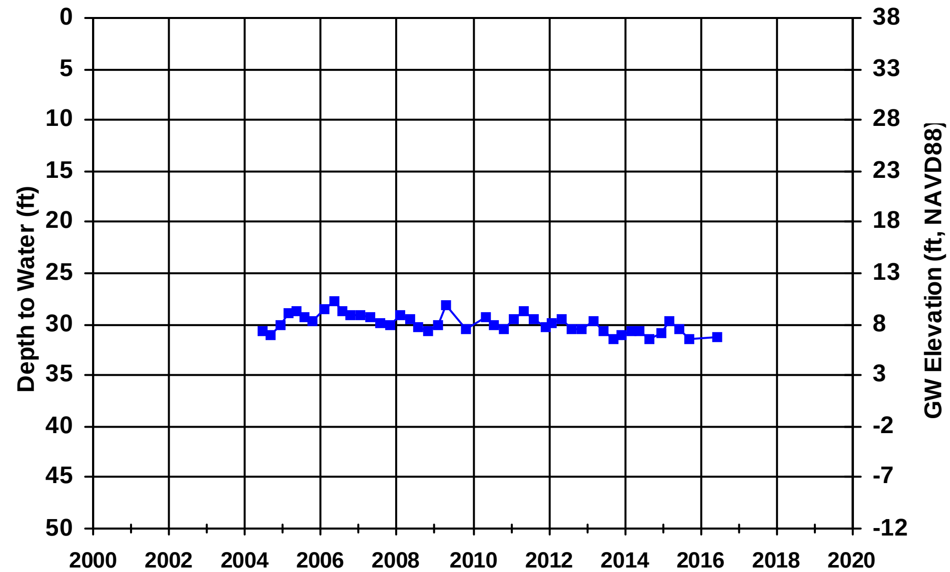



{R_WLhyd88}

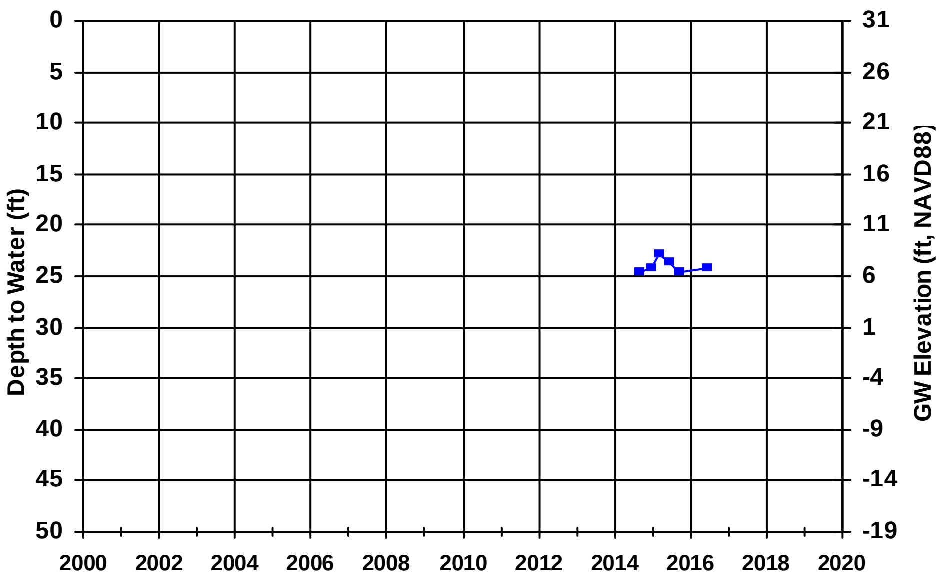
**WellID:** T0601325015-MW-2D
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



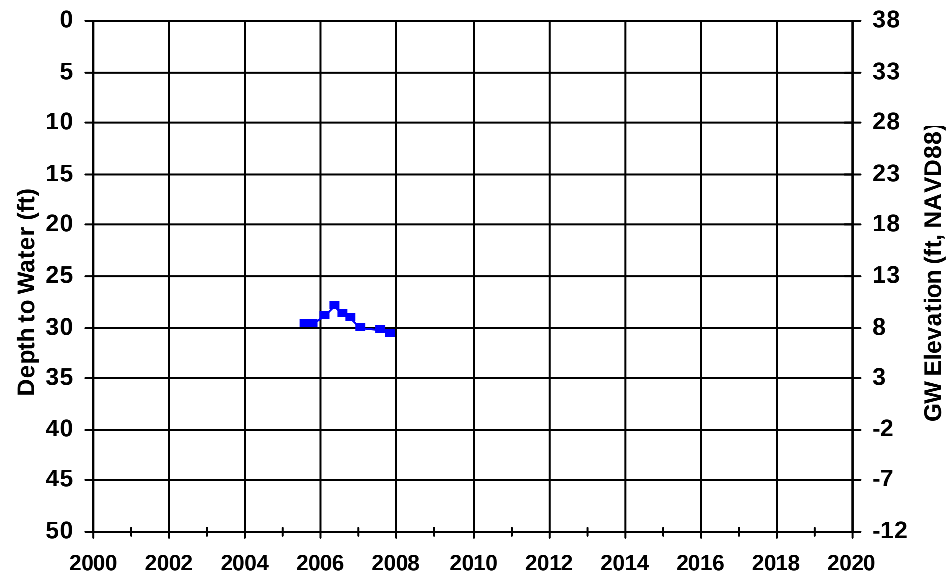

**WellID:** T0601325015-MW-3
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601325015-MW-3D
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

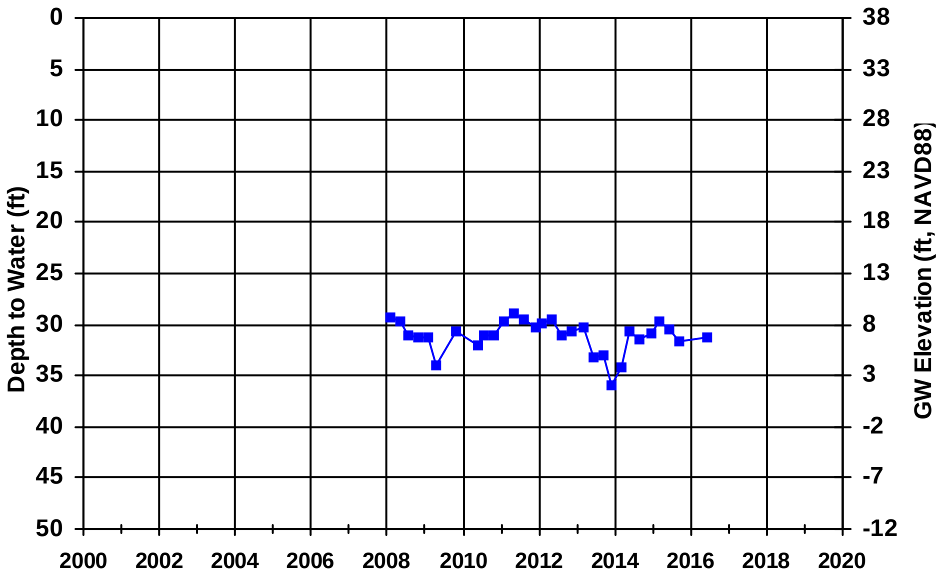



**WellID:** T0601325015-MW-4
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

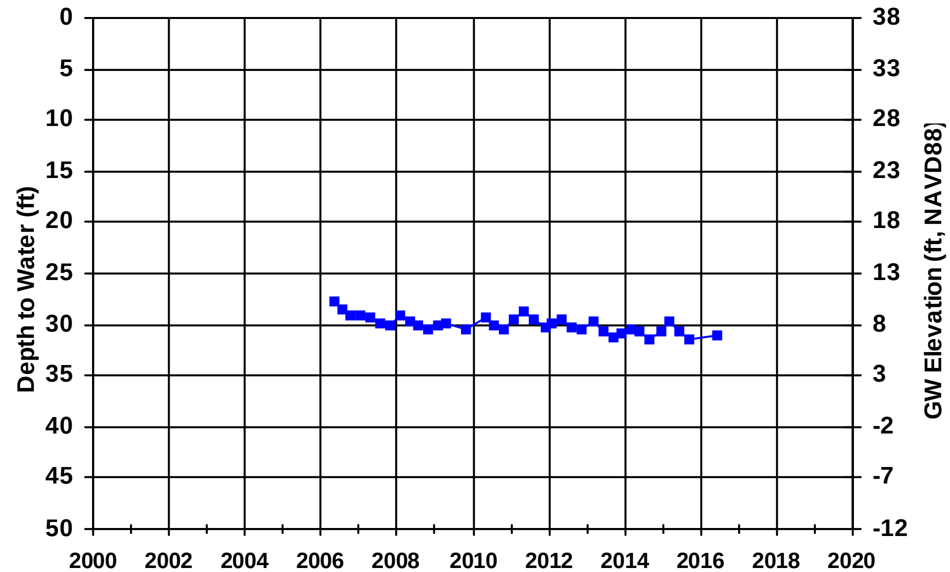



{R_WLhyd88}

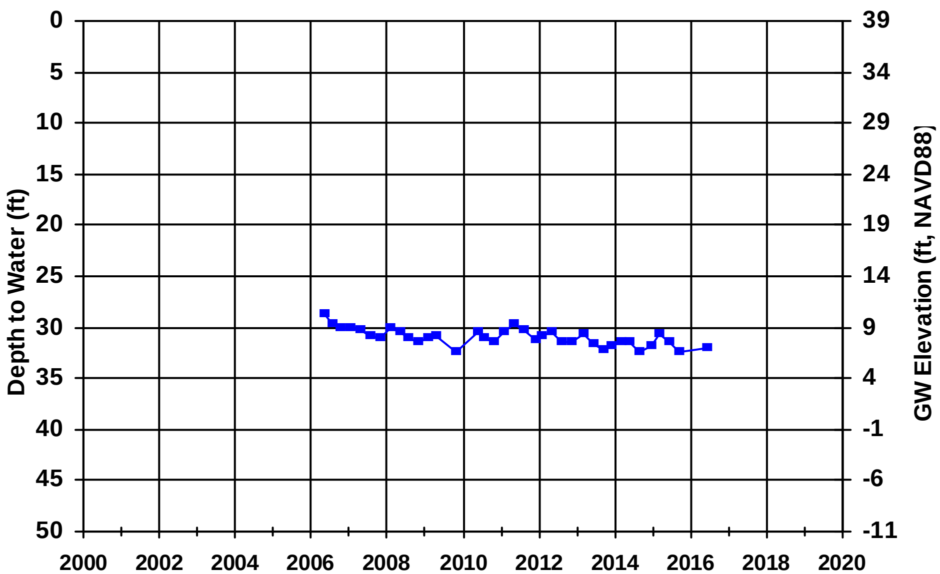
**WellID:** T0601325015-MW-4R
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



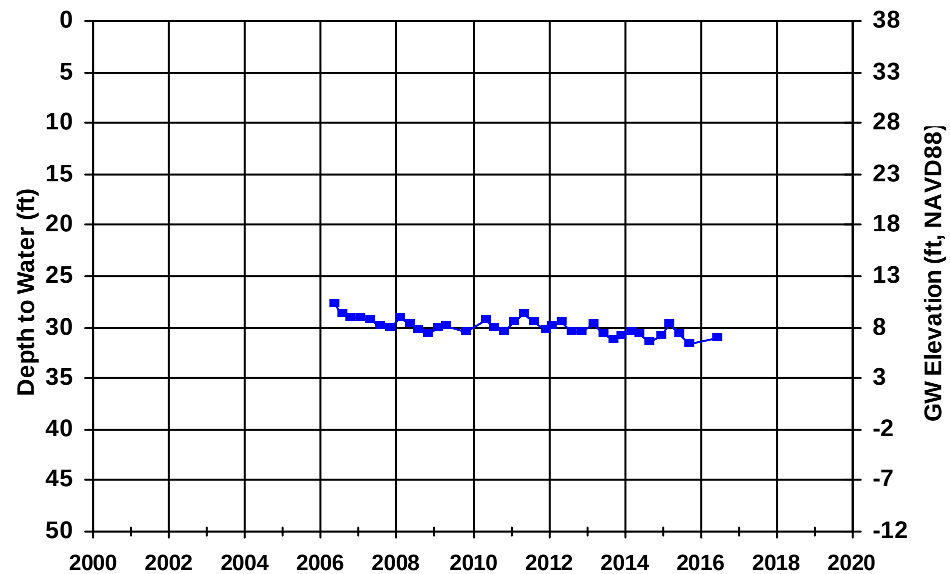

**WellID:** T0601325015-MW-5
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601325015-MW-6
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

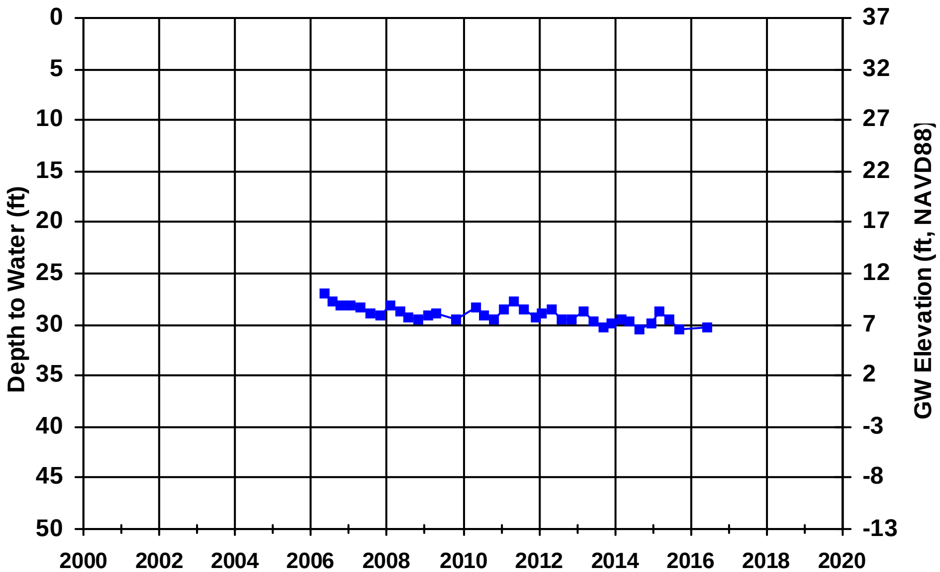



**WellID:** T0601325015-MW-7
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

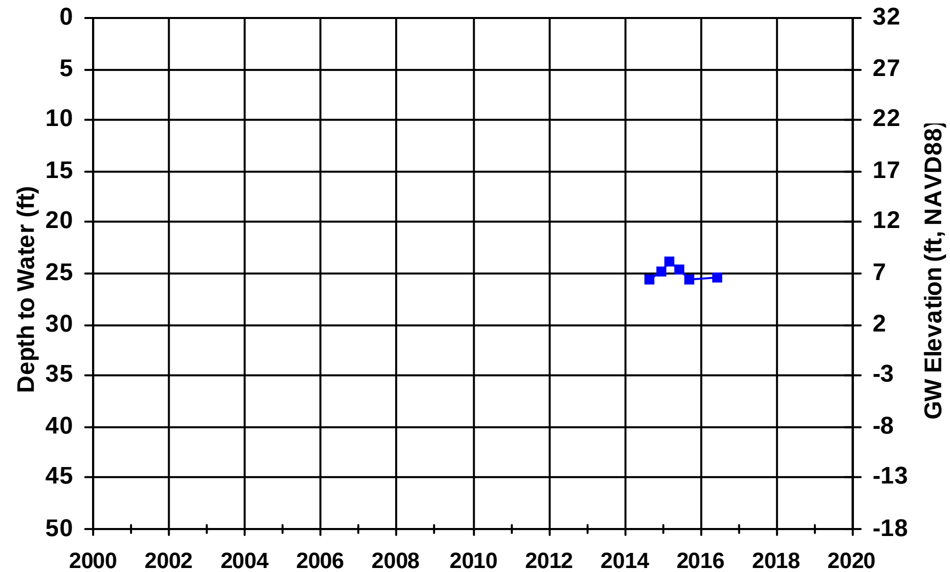



{R_WLhyd88}

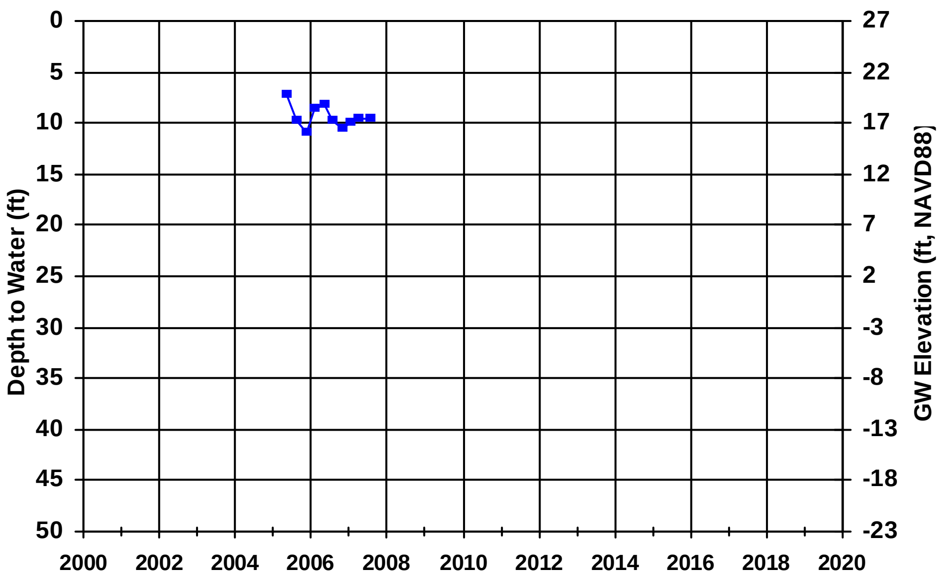
**WellID:** **T0601325015-MW-8**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



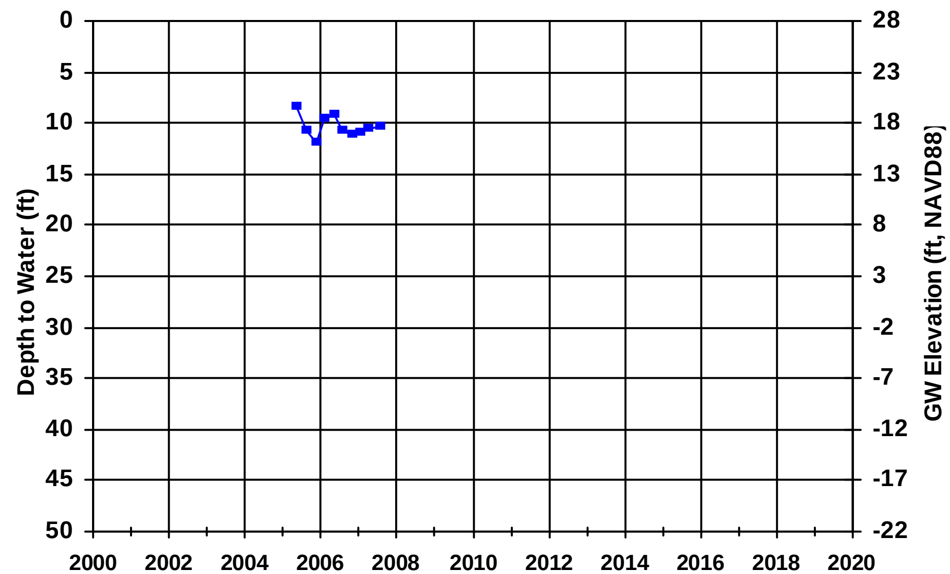

**WellID:** **T0601325015-MW-9**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601330032-MW1**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

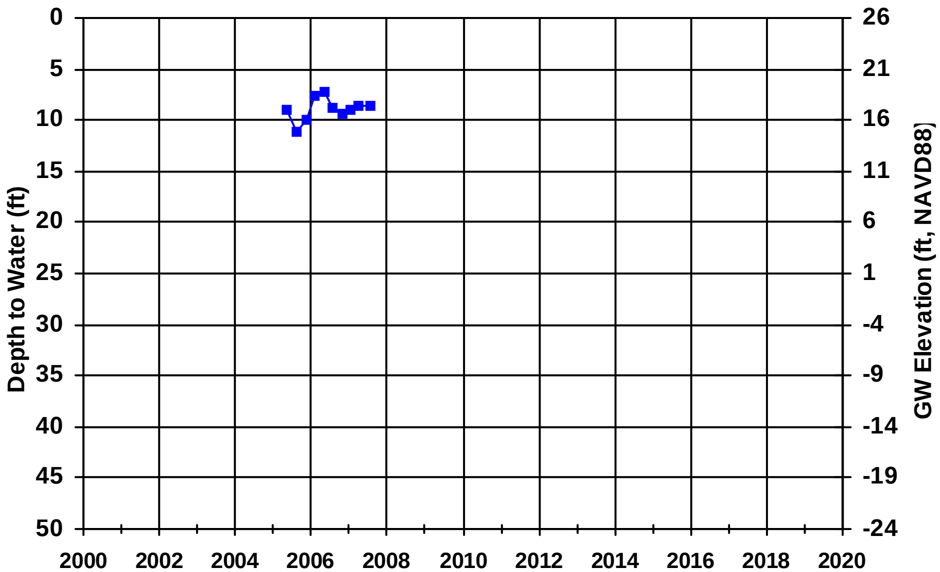



**WellID:** **T0601330032-MW2**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

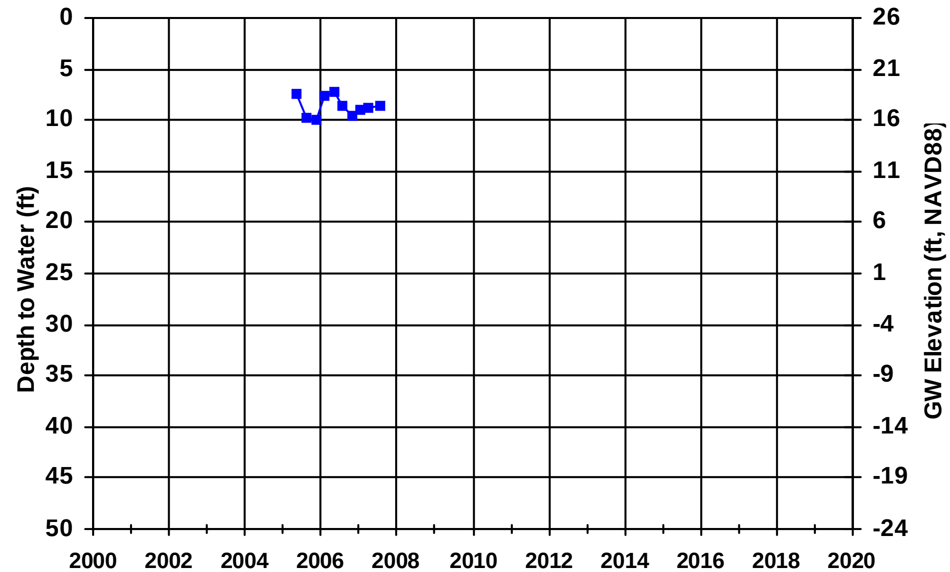



{R_WLhyd88}

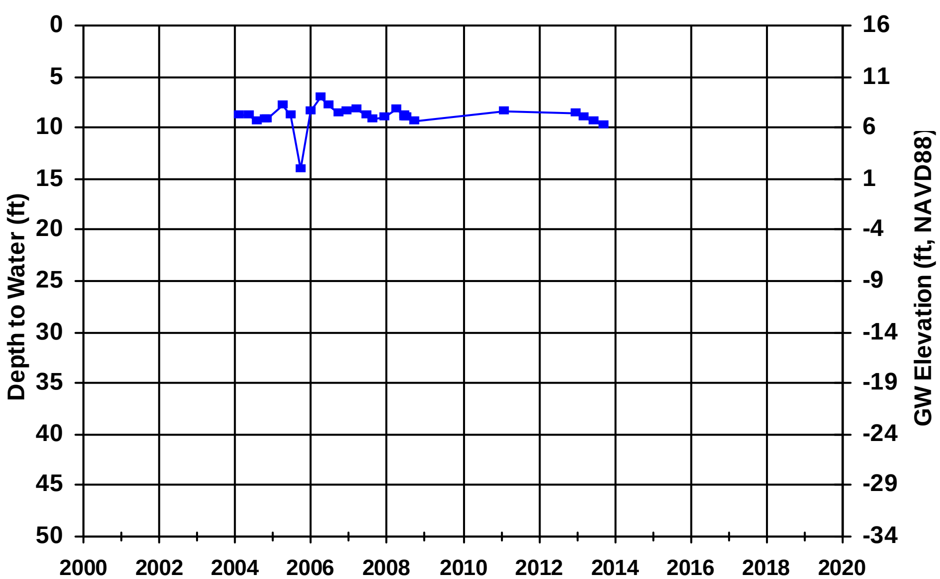
**WellID: T0601330032-MW3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



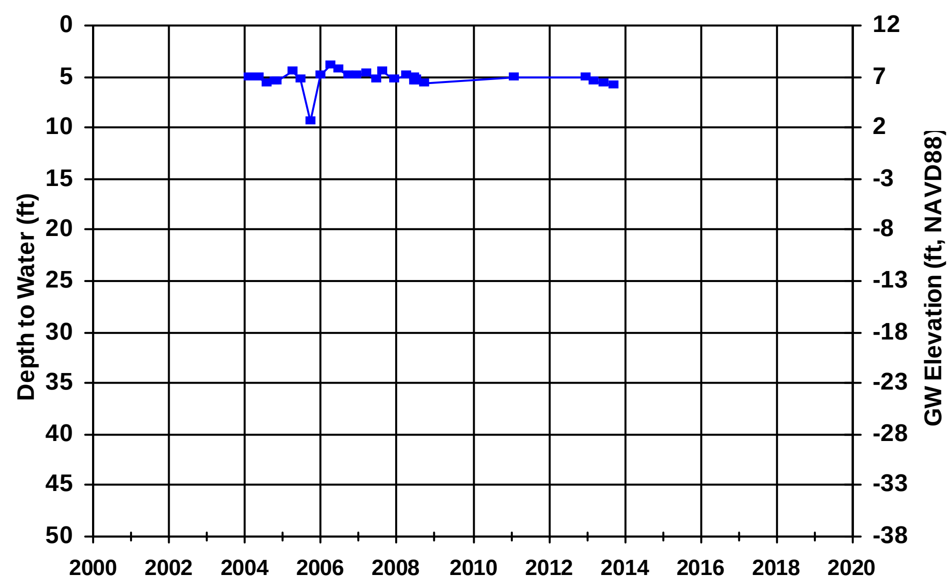

**WellID: T0601330032-MW4**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601341681-MW-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

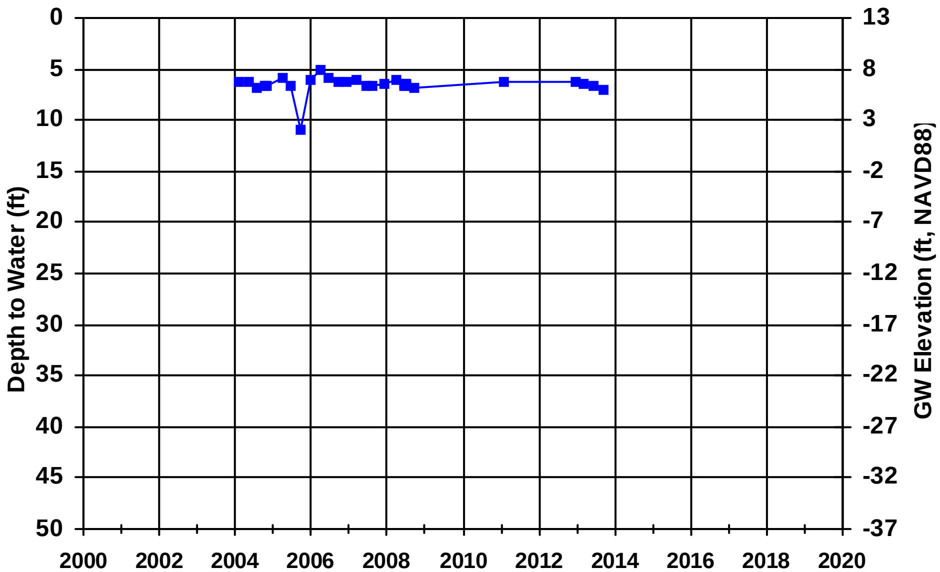



**WellID: T0601341681-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

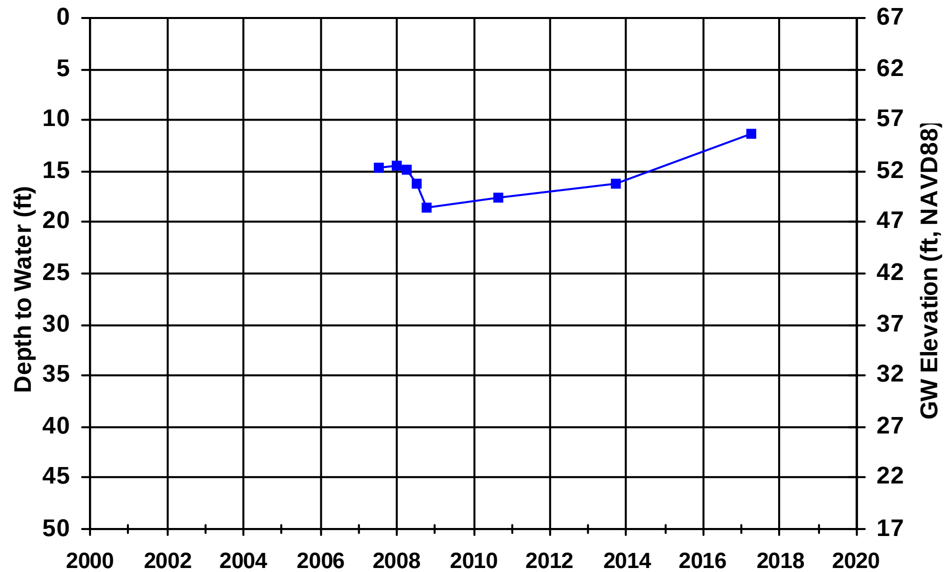



{R_WLhyd88}

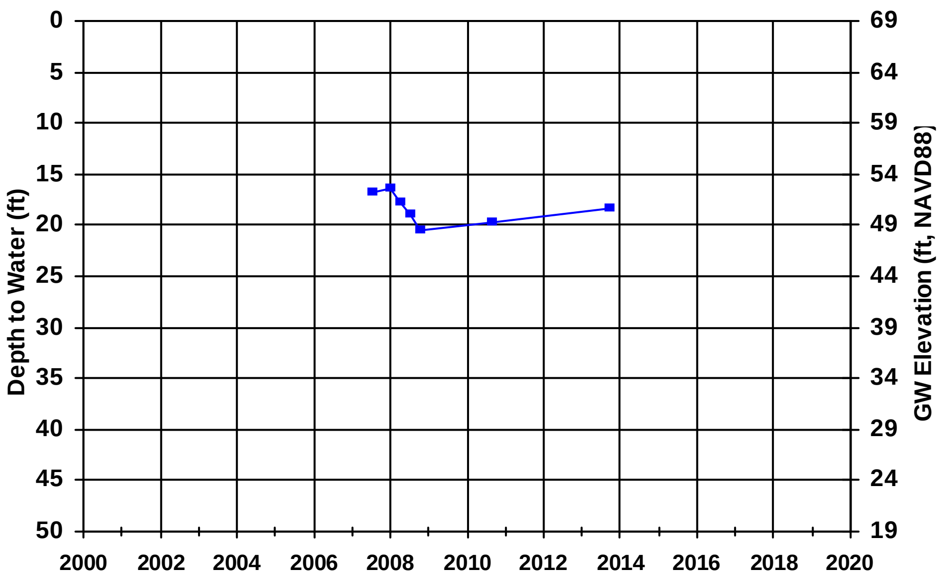
**WellID:** T0601341681-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



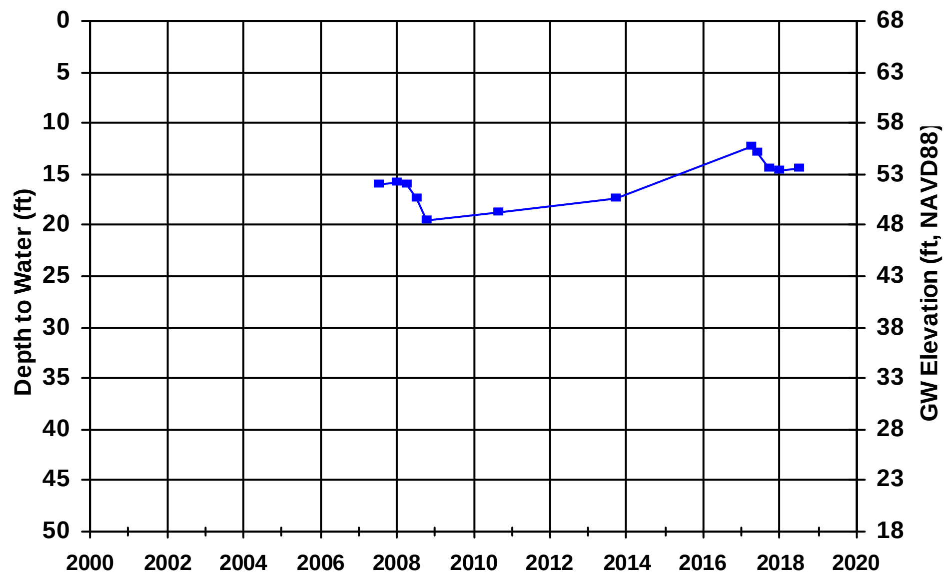

**WellID:** T0601343310-EW1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601343310-EW2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

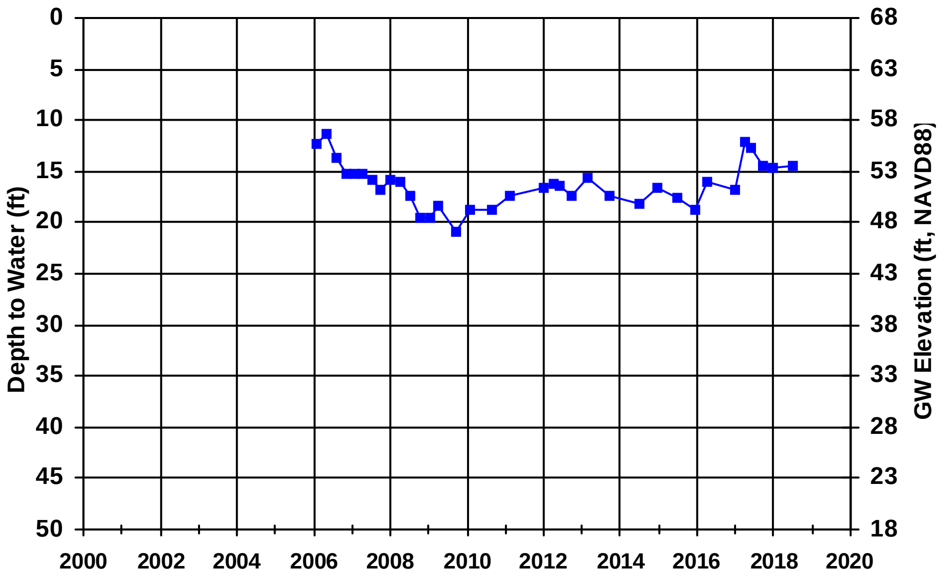



**WellID:** T0601343310-EW3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

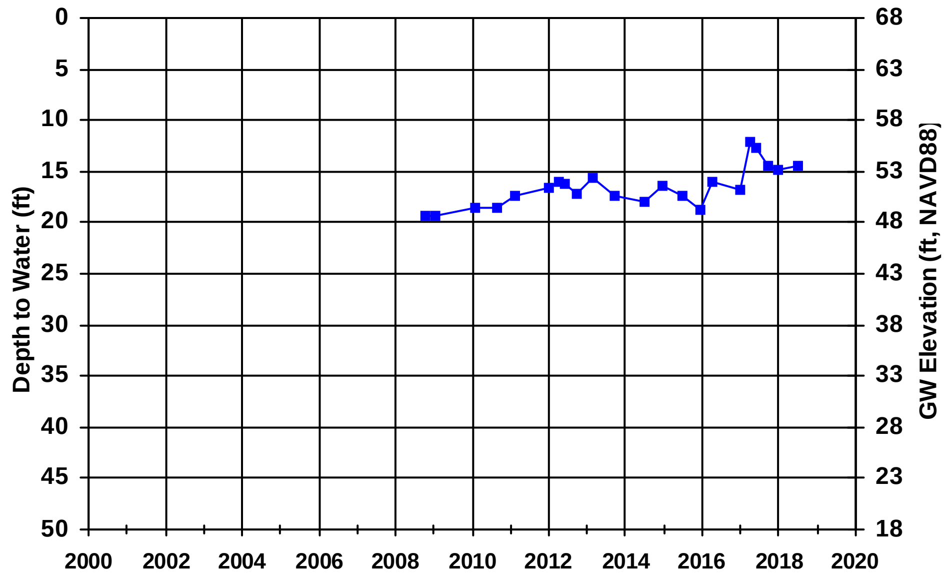



{R_WLhyd88}

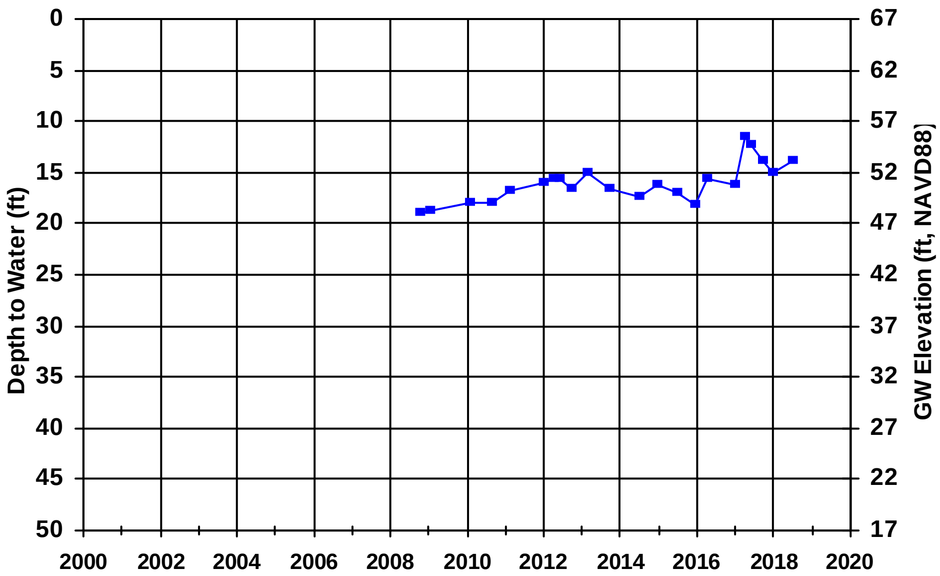
WellID: T0601343310-MW1
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



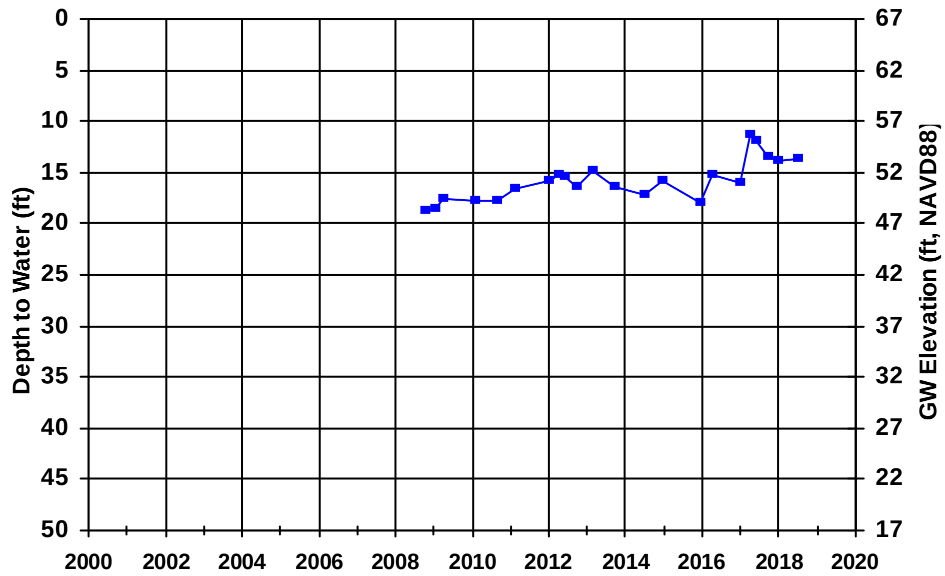

WellID: T0601343310-MW-10
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601343310-MW-11
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

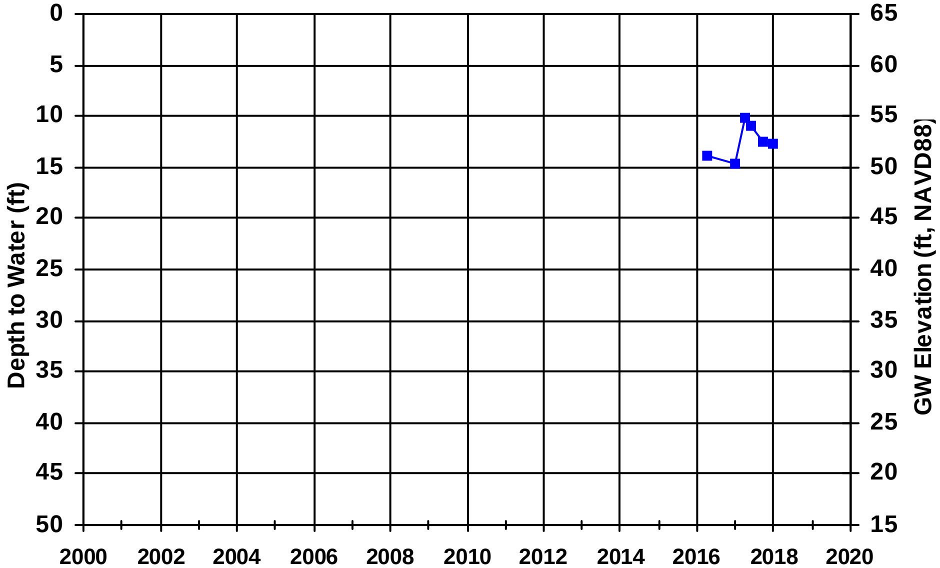



WellID: T0601343310-MW-12
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

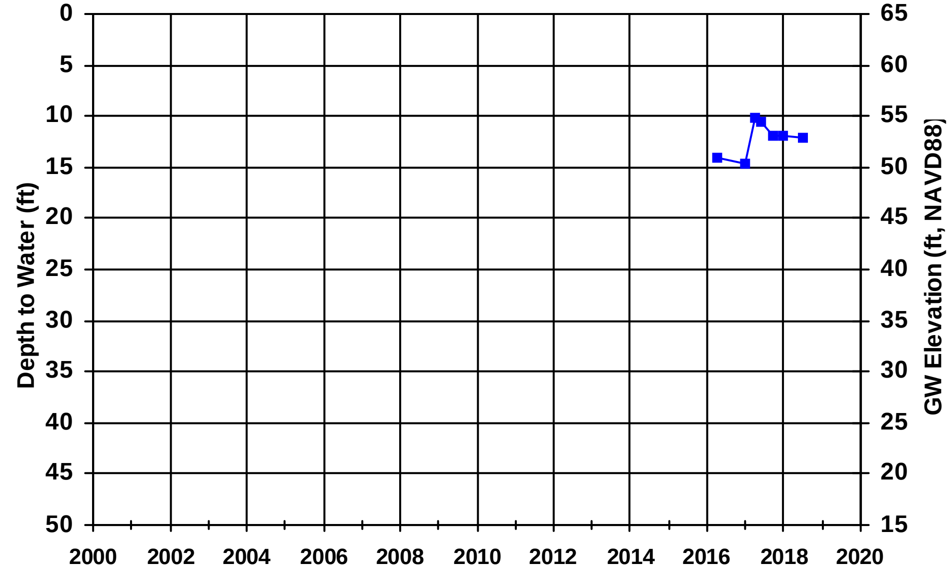



{R_WLhyd88}

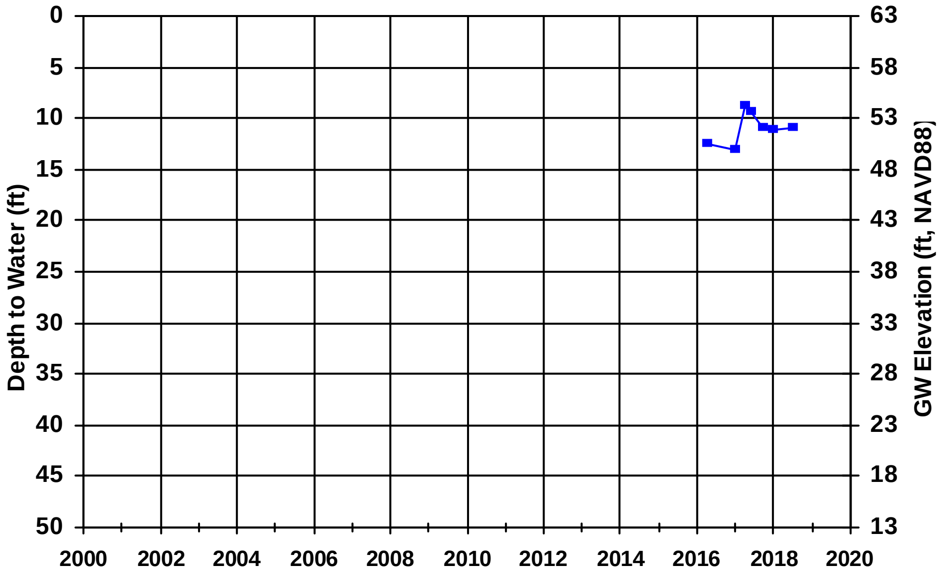
WellID: T0601343310-MW-13
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



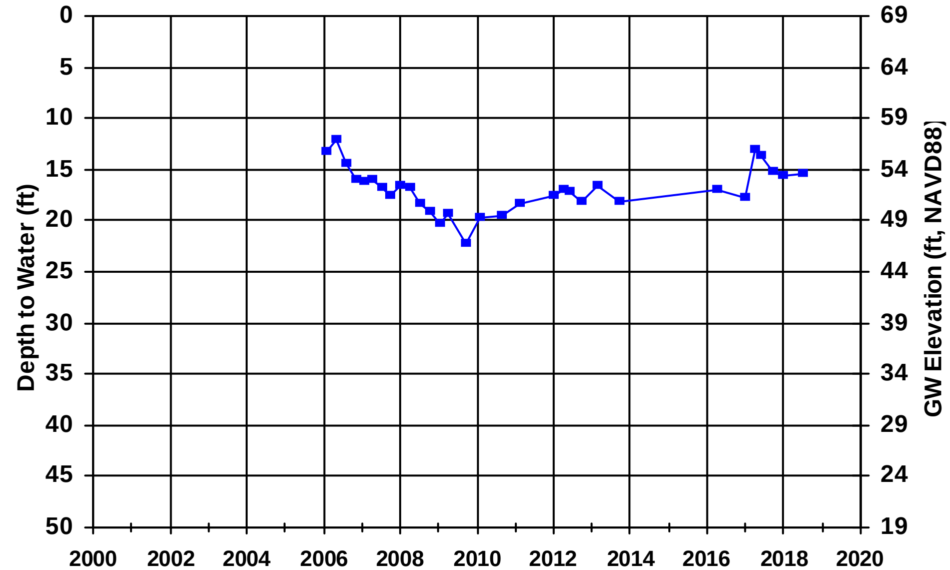

WellID: T0601343310-MW-14
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601343310-MW-15
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

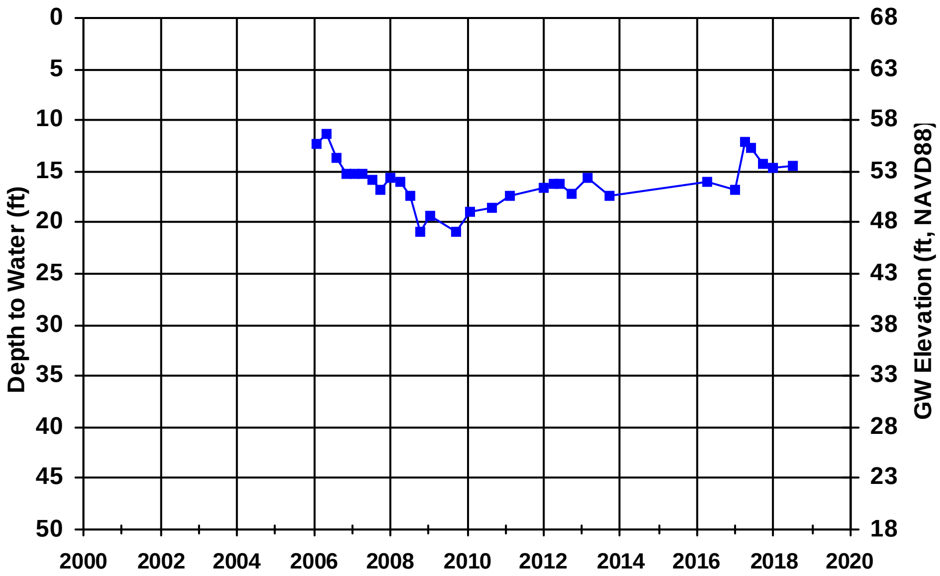



WellID: T0601343310-MW2
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

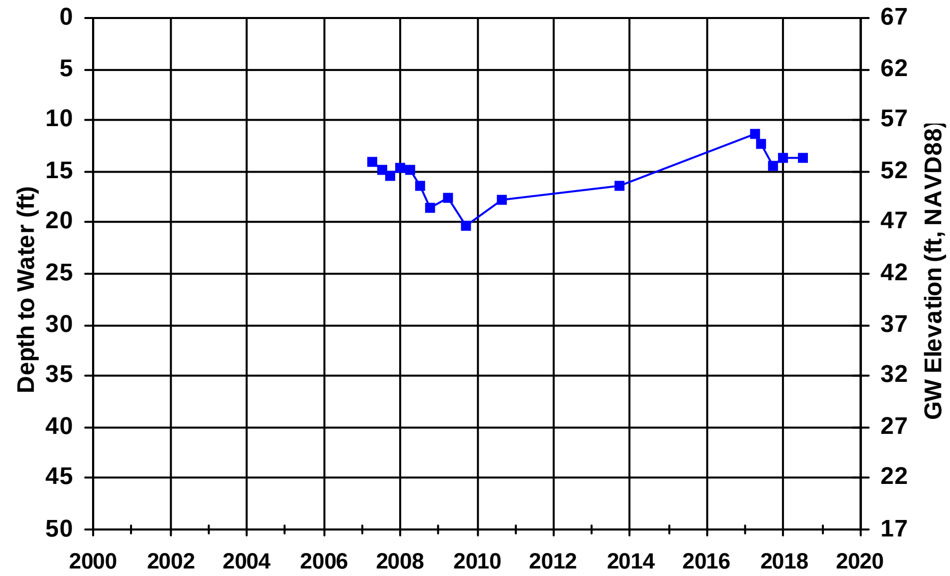



{R_WLhyd88}

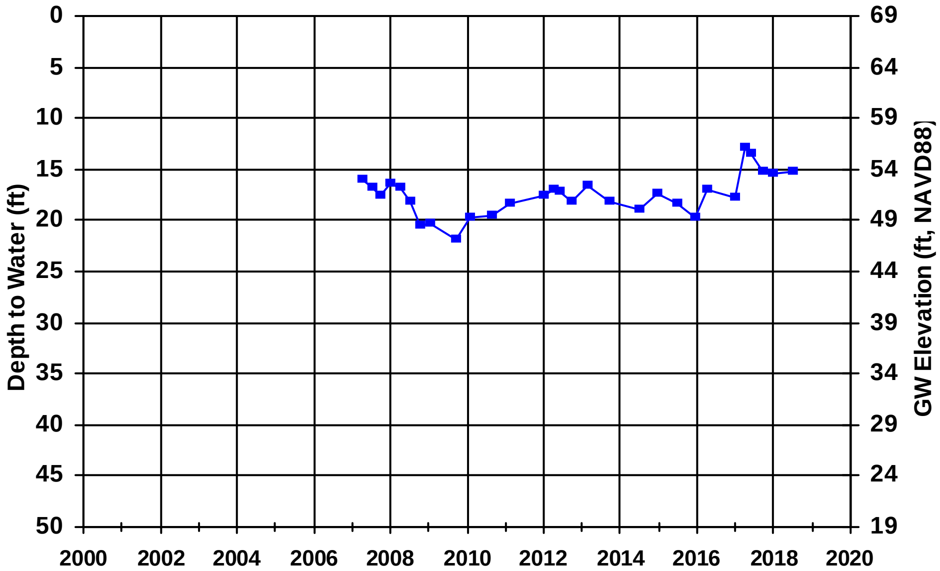
WellID: T0601343310-MW3
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



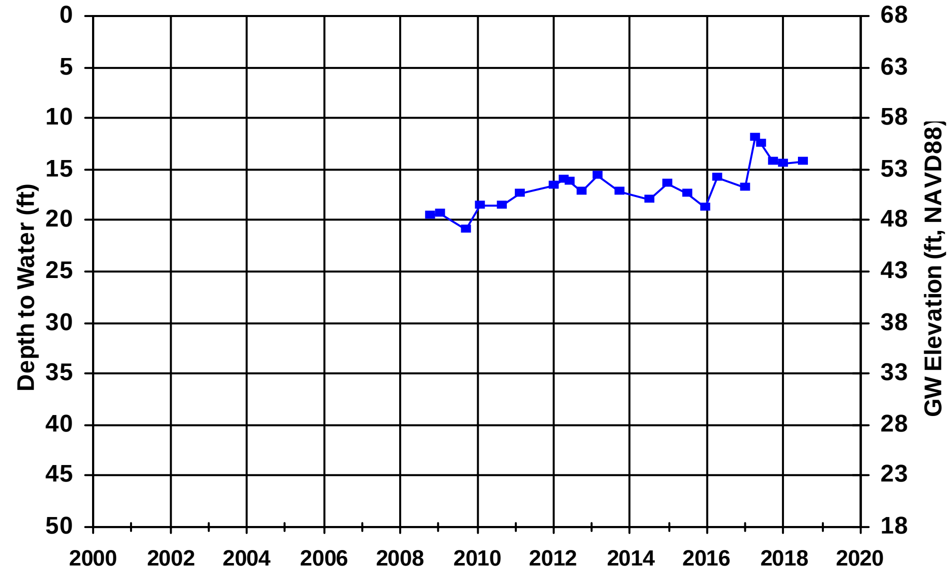

WellID: T0601343310-MW4
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T0601343310-MW-5
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

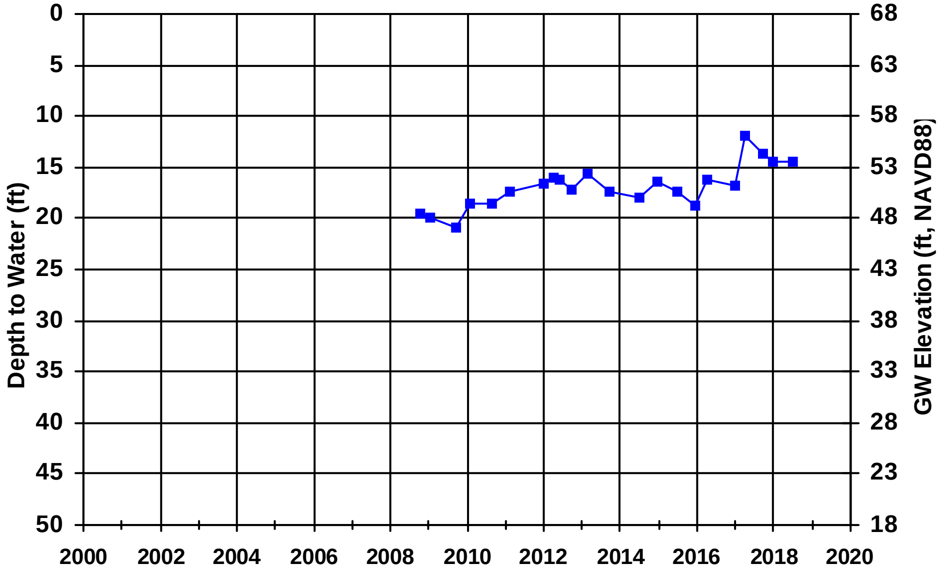



WellID: T0601343310-MW-6
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

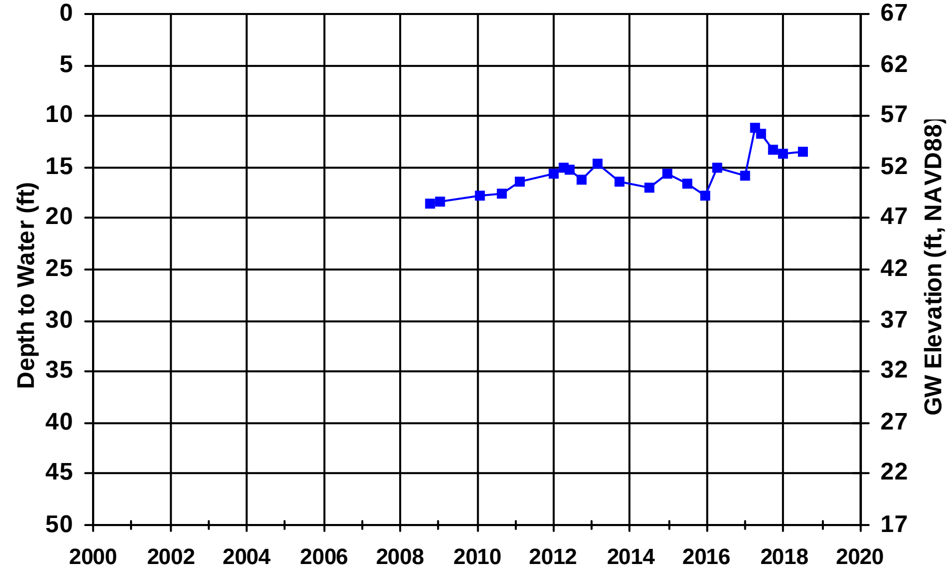



{R_WLhyd88}

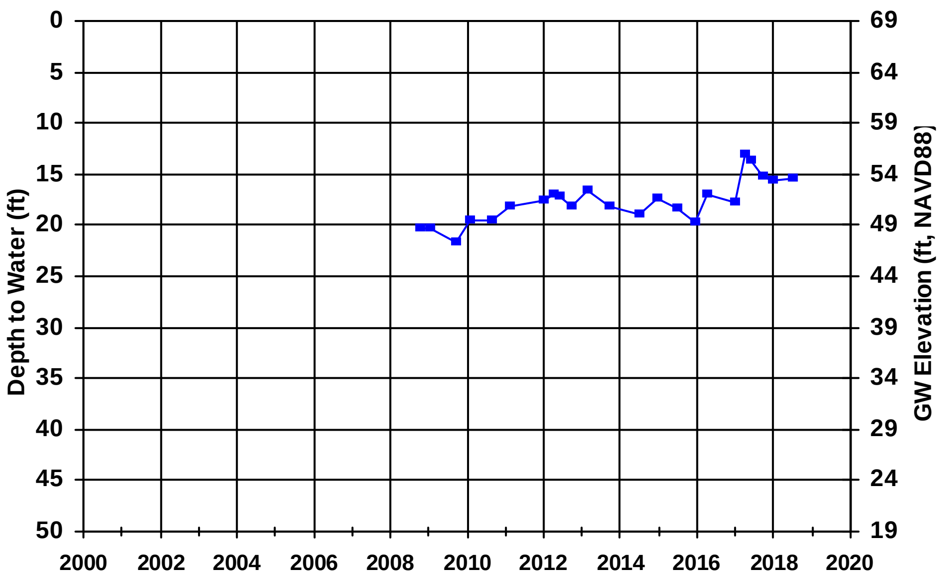
**WellID: T0601343310-MW-7**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



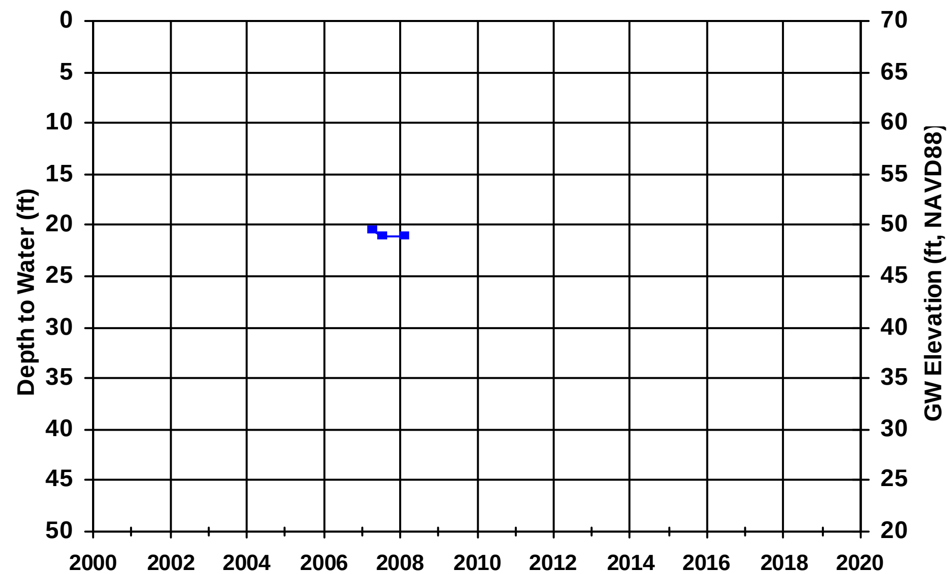

**WellID: T0601343310-MW-8**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID: T0601343310-MW-9**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

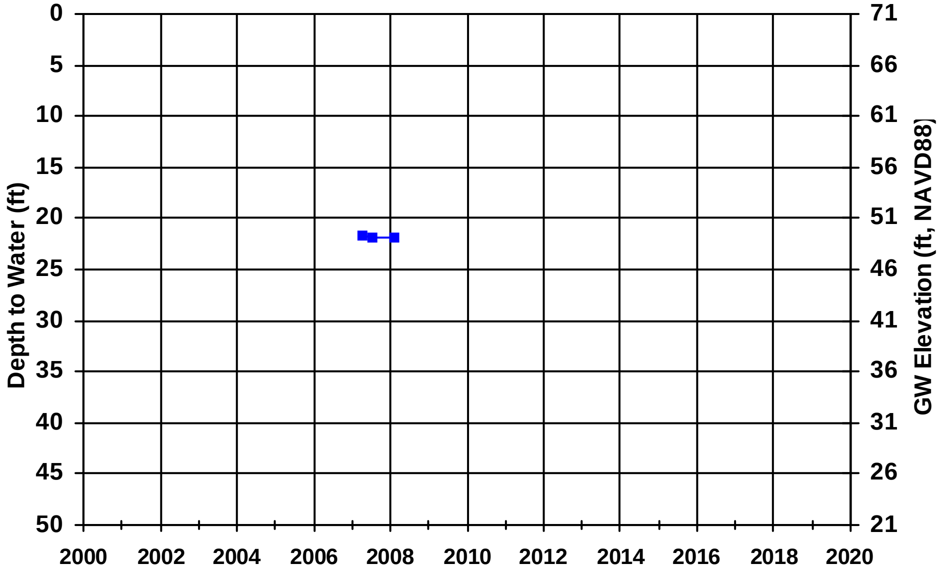



**WellID: T0601359254-MW-1**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

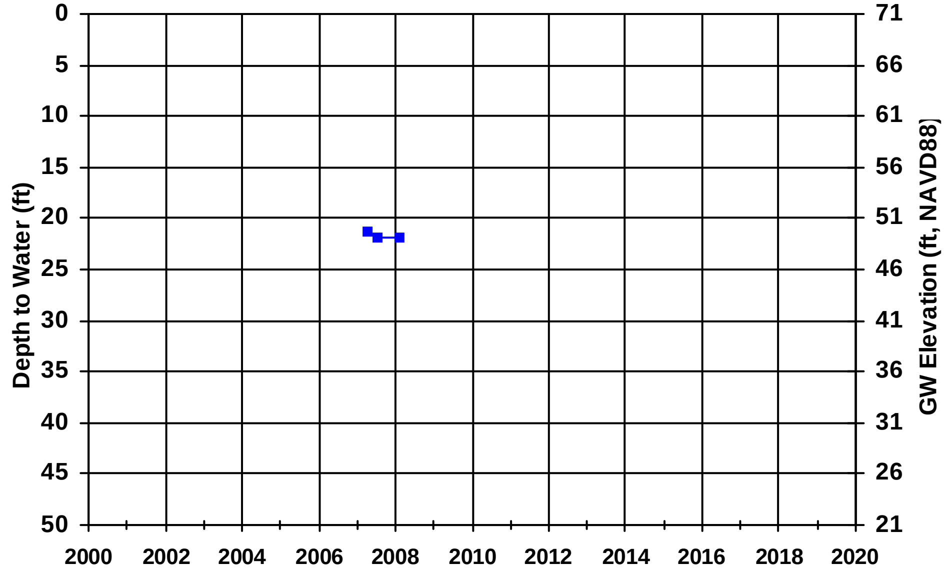



{R_WLhyd88}

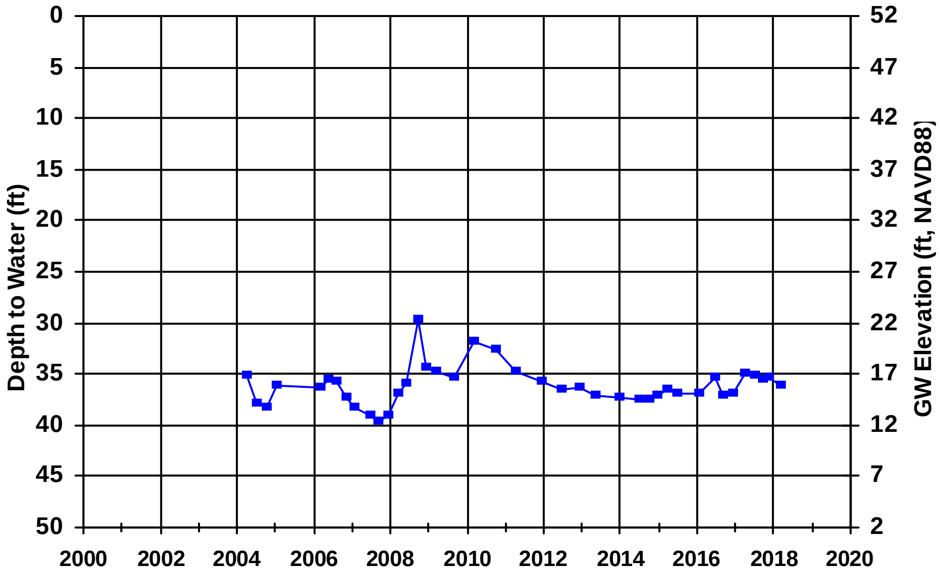
**WellID:** T0601359254-MW-2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



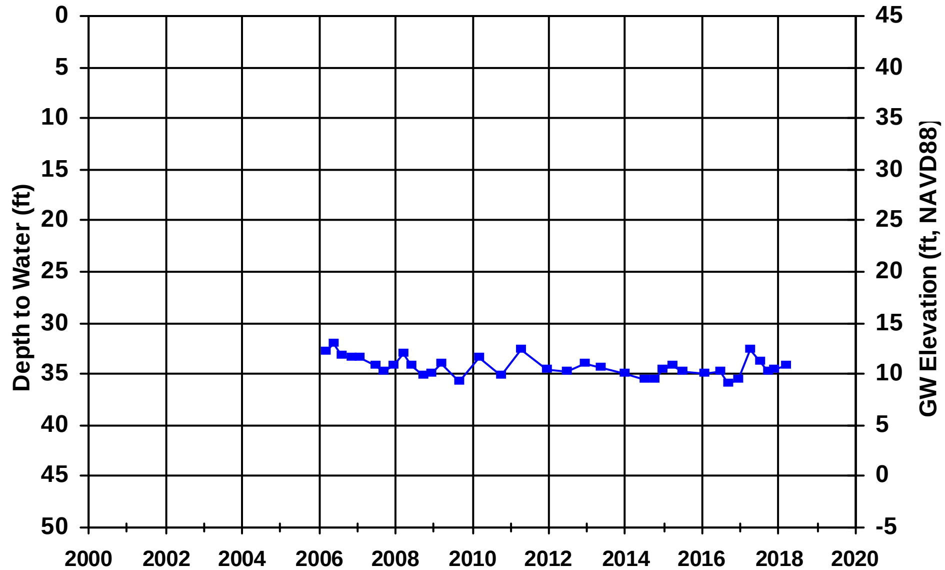

**WellID:** T0601359254-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601359797-MW-10
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

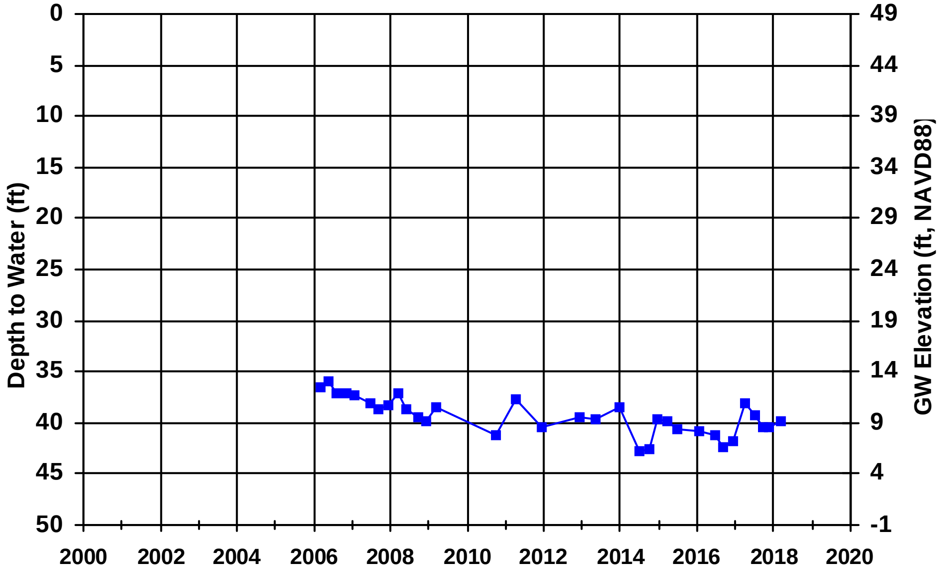



**WellID:** T0601359797-MW-13
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

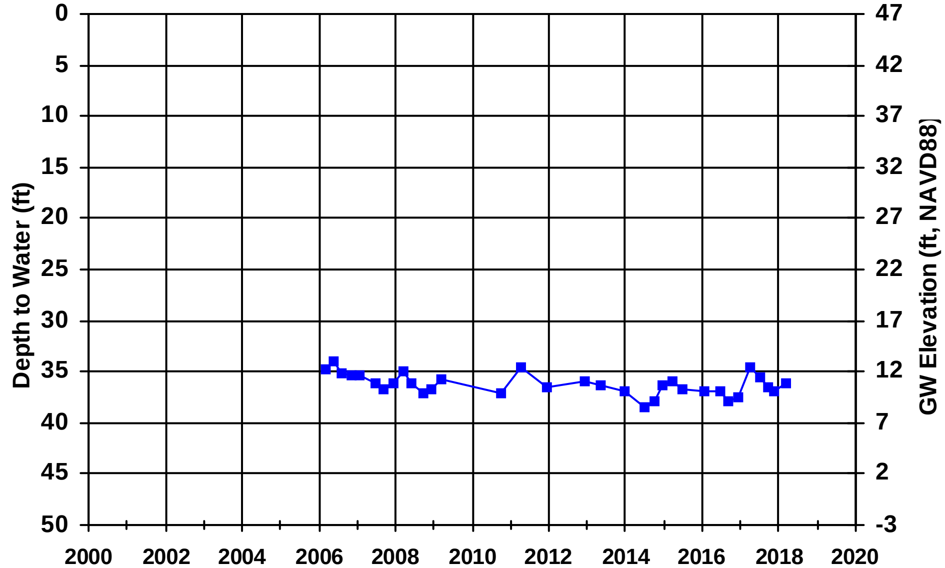



{R_WLhyd88}

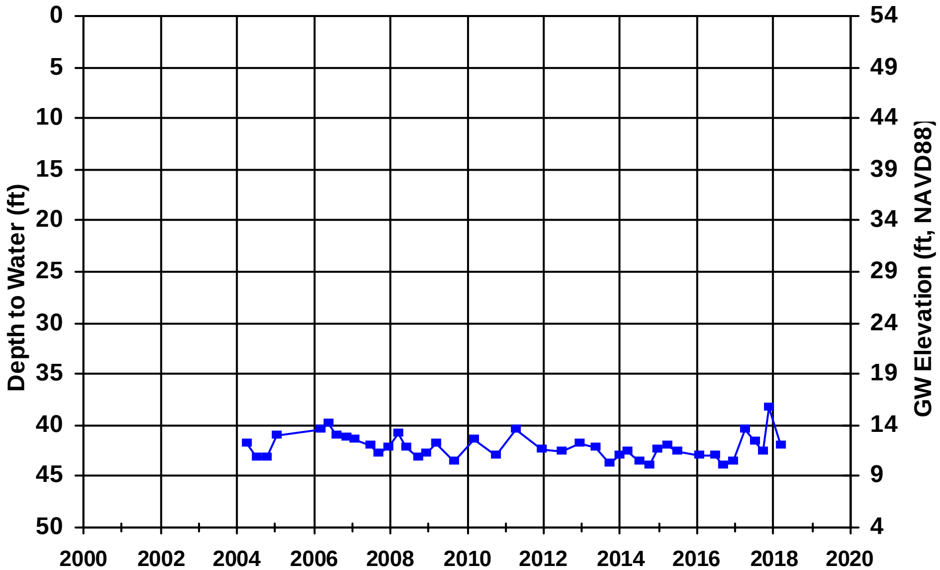
**WellID:** **T0601359797-MW-15**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



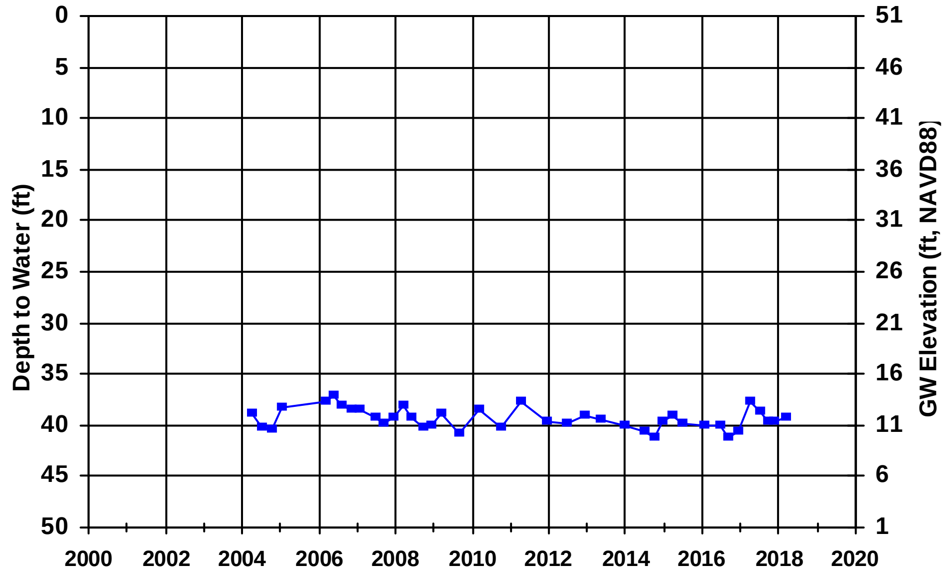

**WellID:** **T0601359797-MW-16**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601359797-MW-4**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

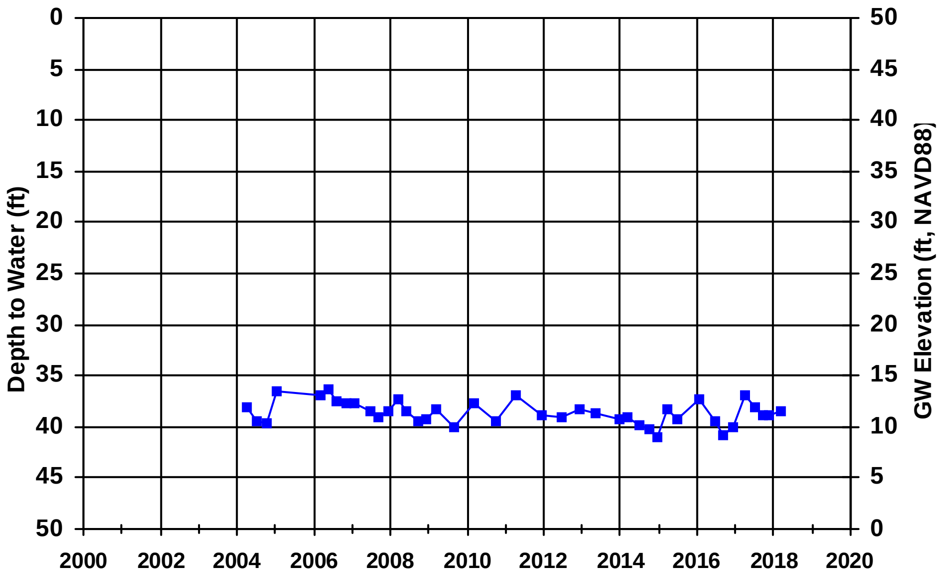



**WellID:** **T0601359797-MW-5**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

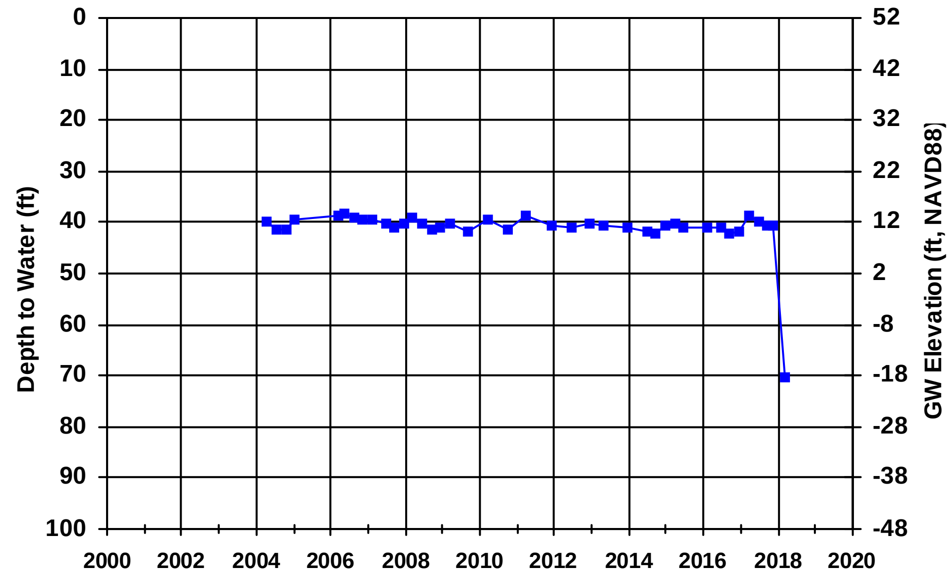



{R_WLhyd88}

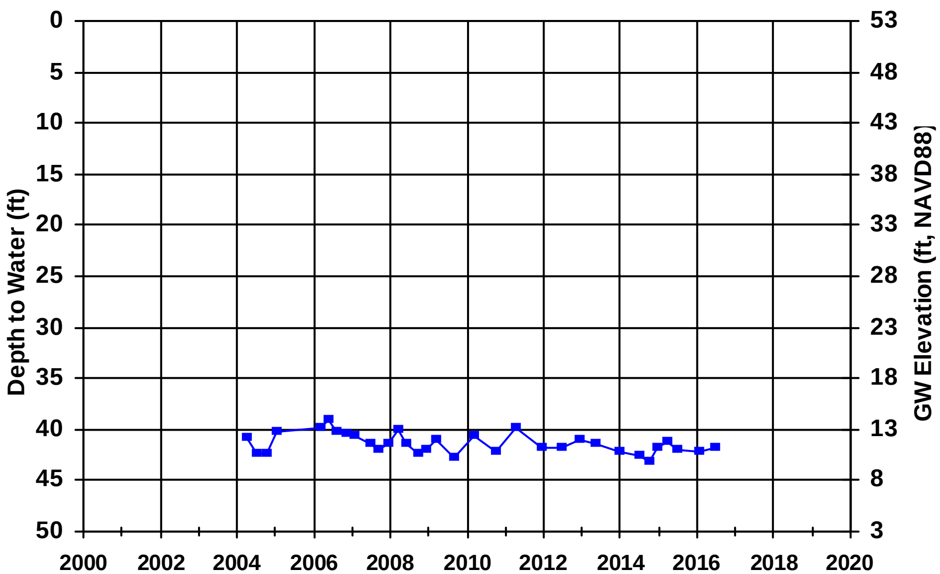
**WellID: T0601359797-MW-6**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



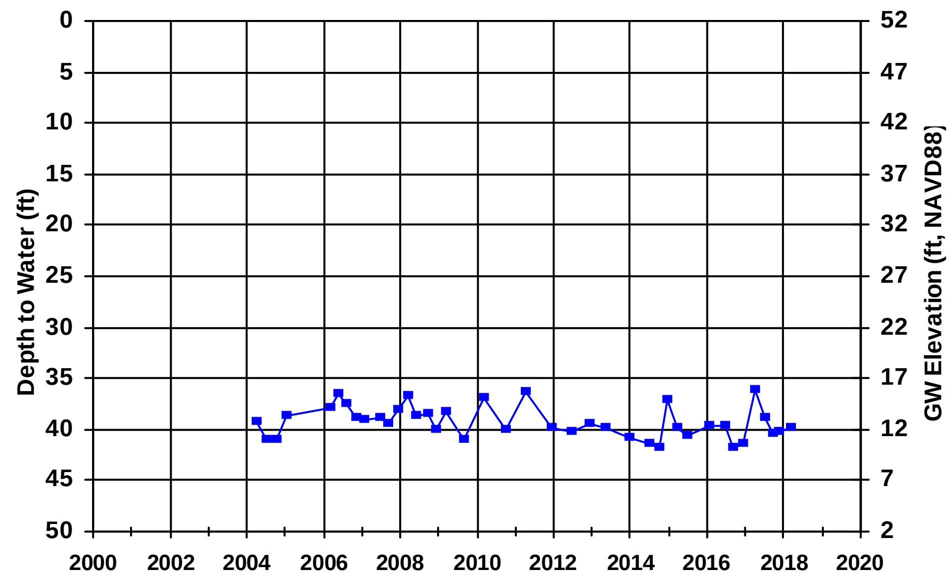

**WellID: T0601359797-MW-7**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601359797-MW-8**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

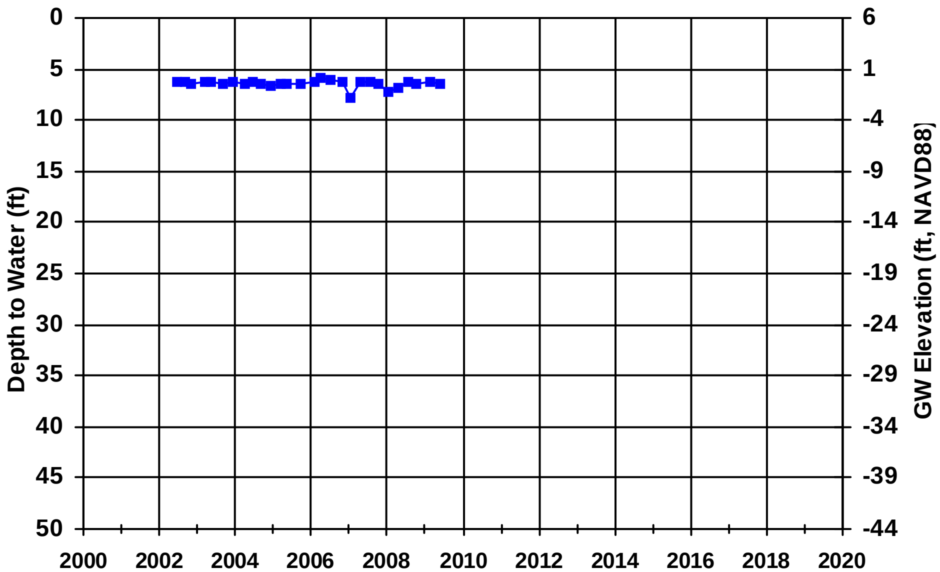



**WellID: T0601359797-MW-9**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

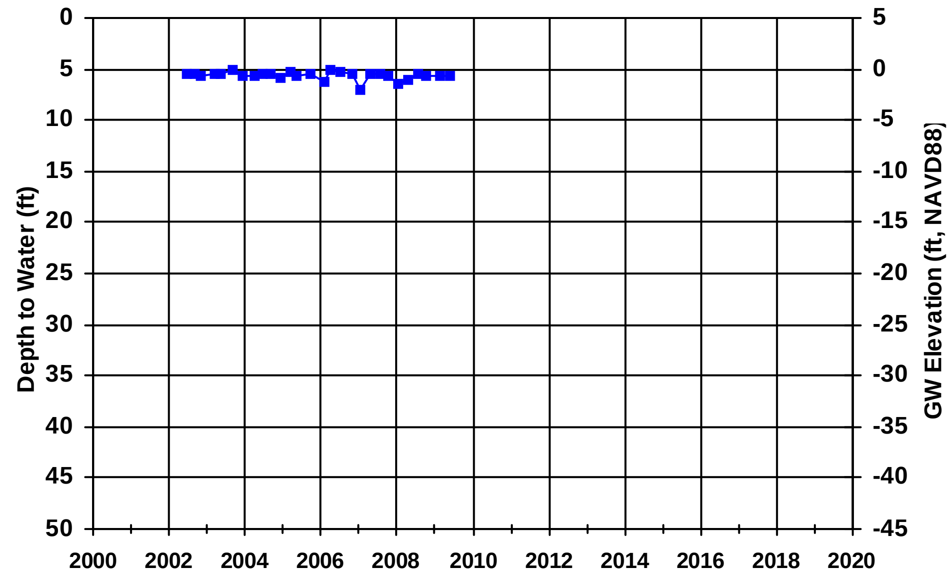



{R_WLhyd88}

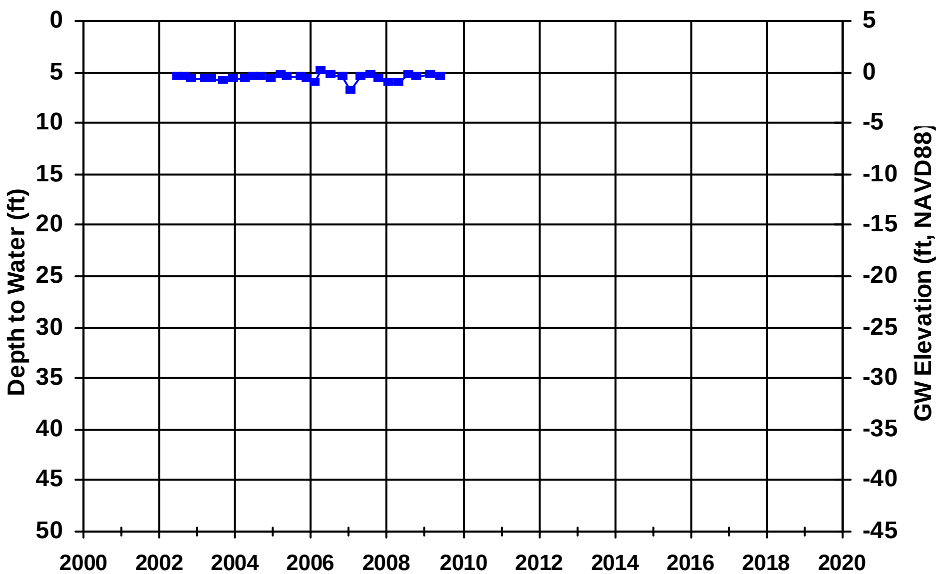
**WellID:** T0601376629-MW1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



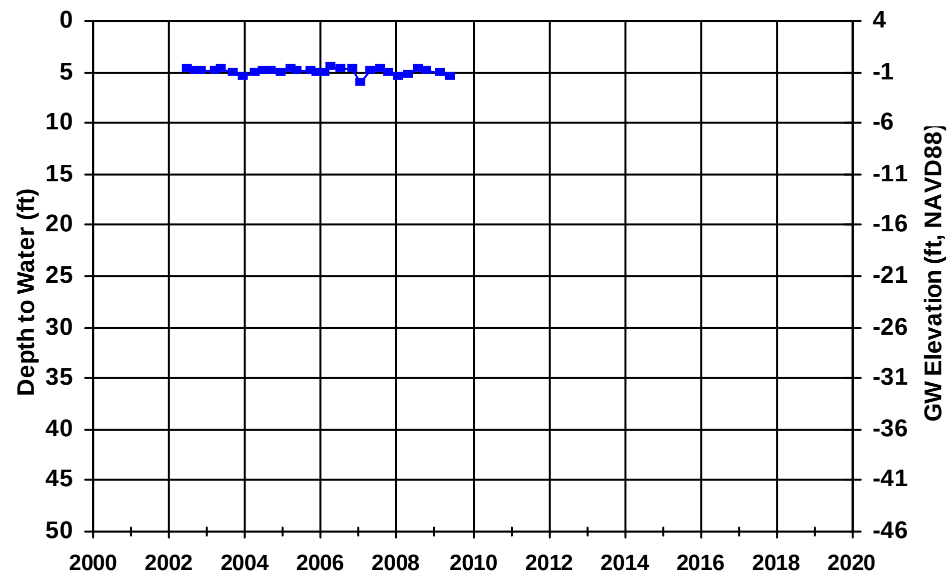

**WellID:** T0601376629-MW2
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T0601376629-MW3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

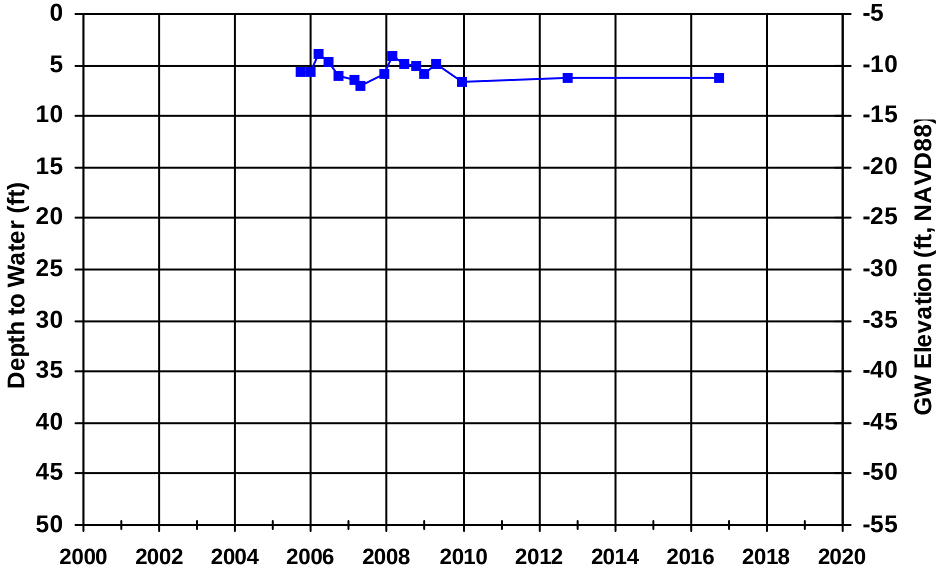



**WellID:** T0601376629-MW4
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

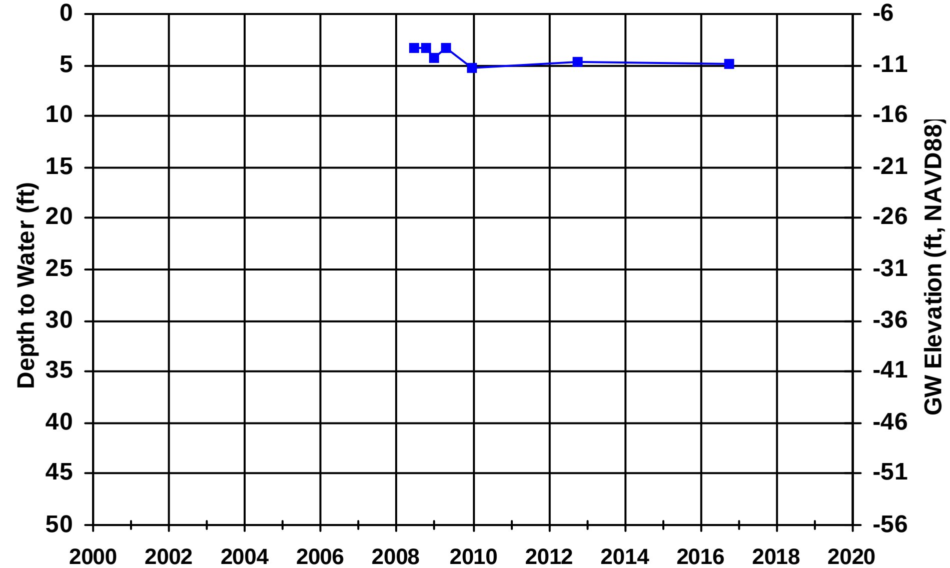



{R_WLhyd88}

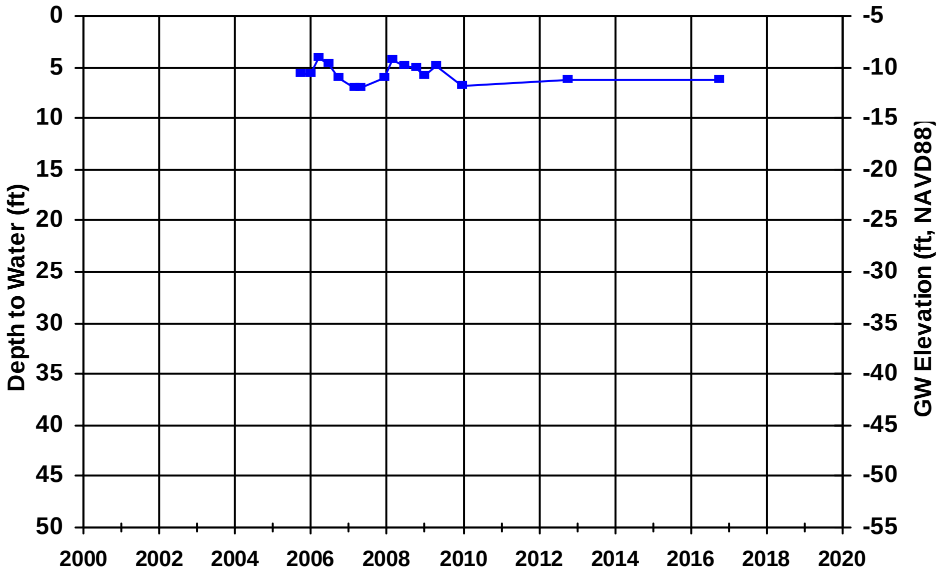
**WellID: T0601378938-MW-1**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



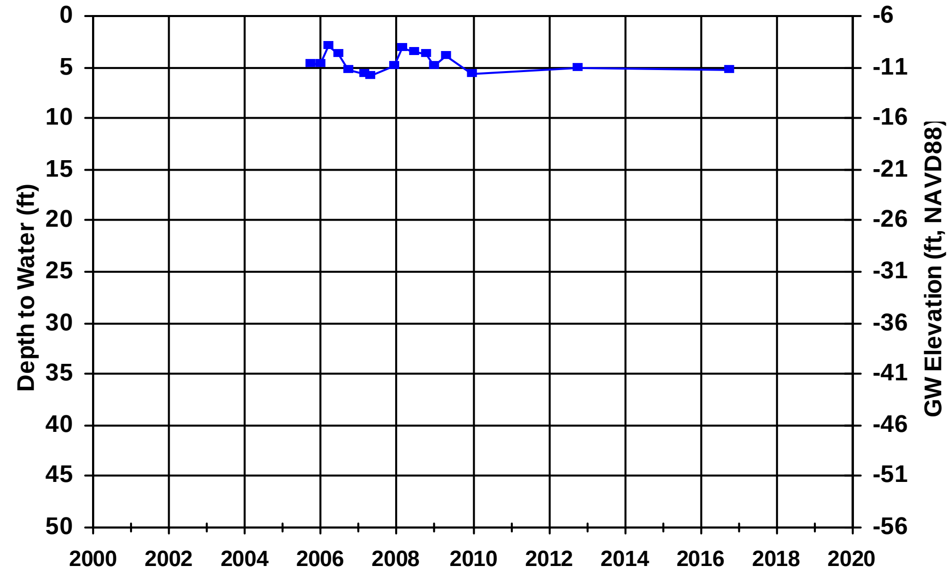

**WellID: T0601378938-MW-10**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID: T0601378938-MW-2**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

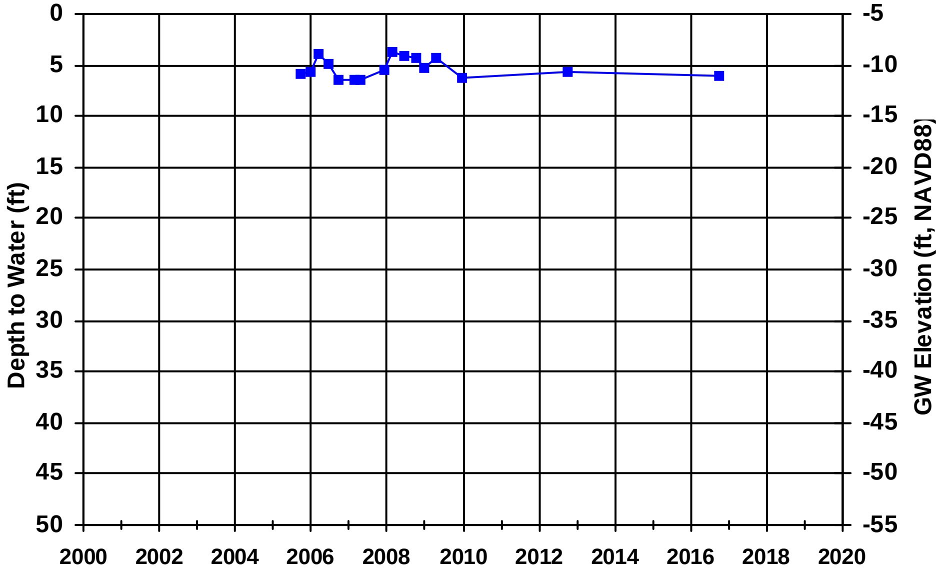



**WellID: T0601378938-MW-3**
**Zone: Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

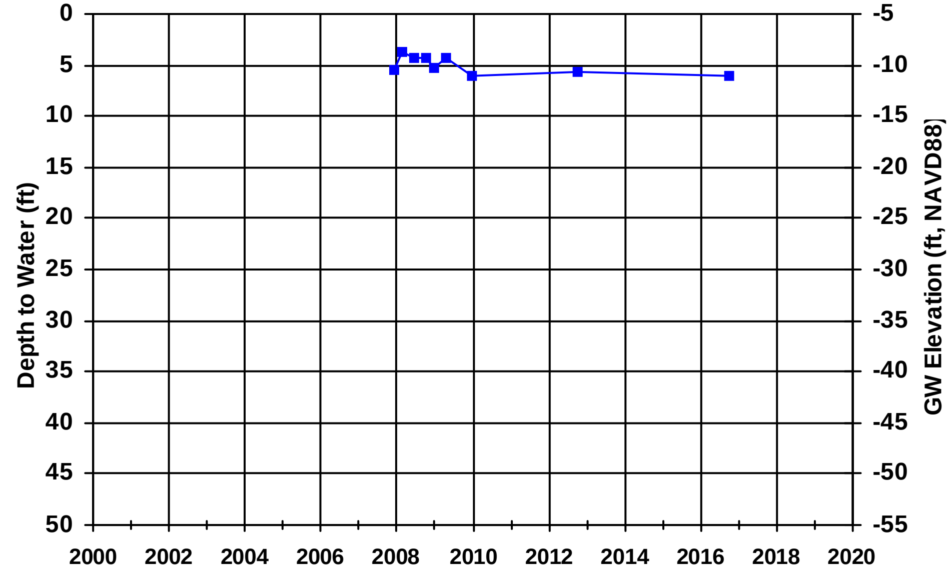



{R_WLhyd88}

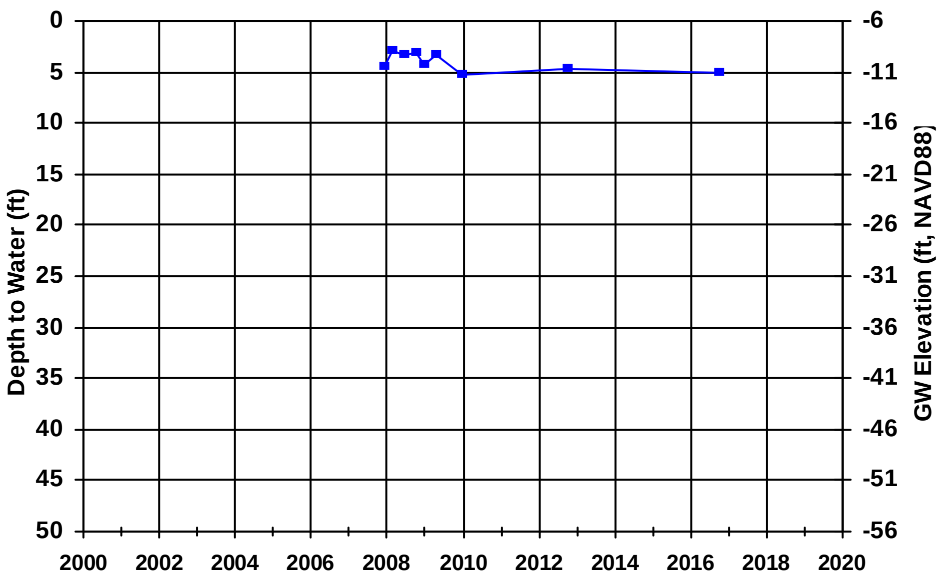
**WellID:** T0601378938-MW-4
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



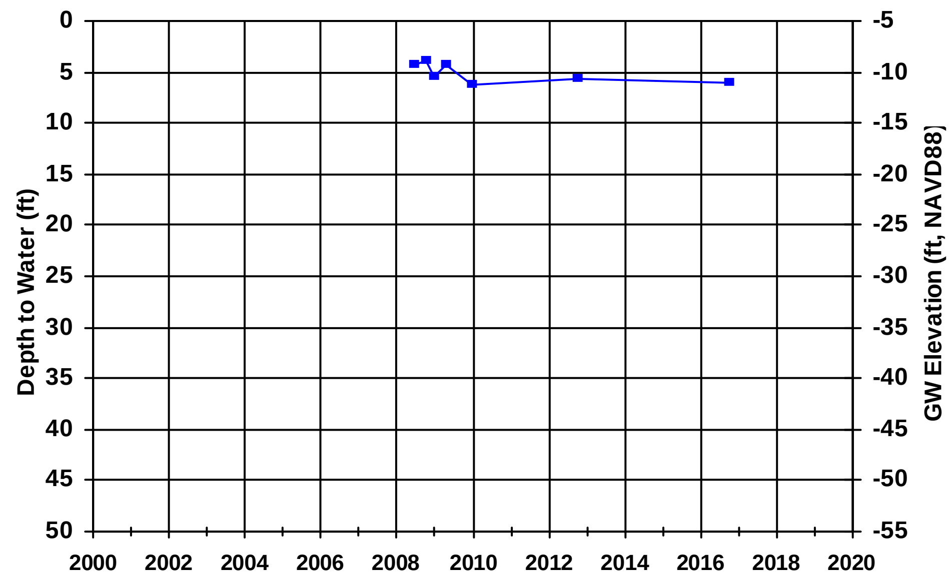

**WellID:** T0601378938-MW-5
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T0601378938-MW-6
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

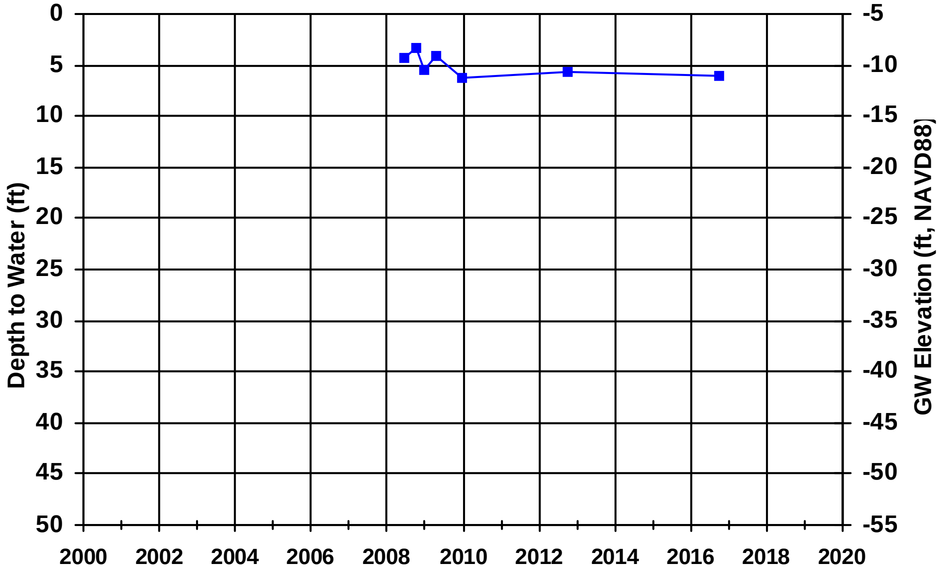



**WellID:** T0601378938-MW-7
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

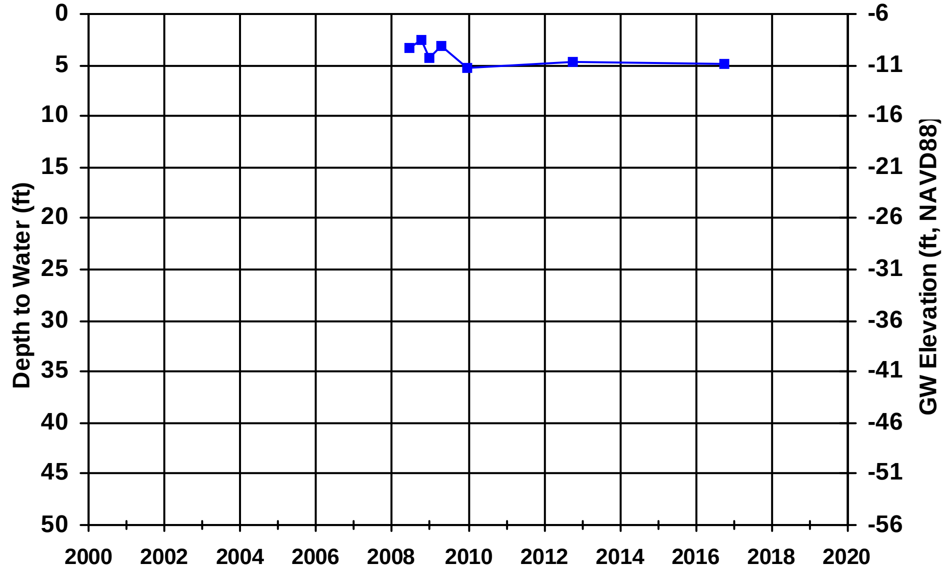



{R_WLhyd88}

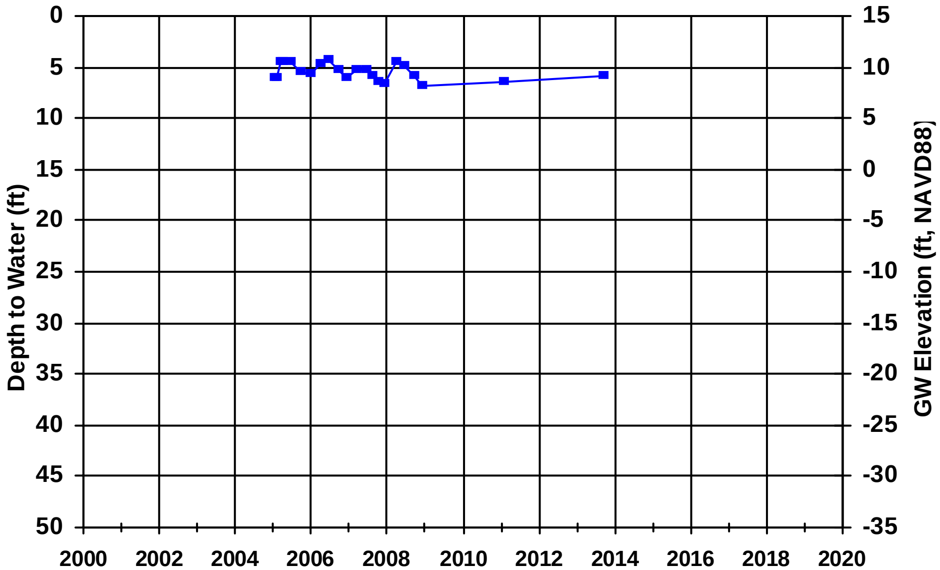
**WellID:** **T0601378938-MW-8**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



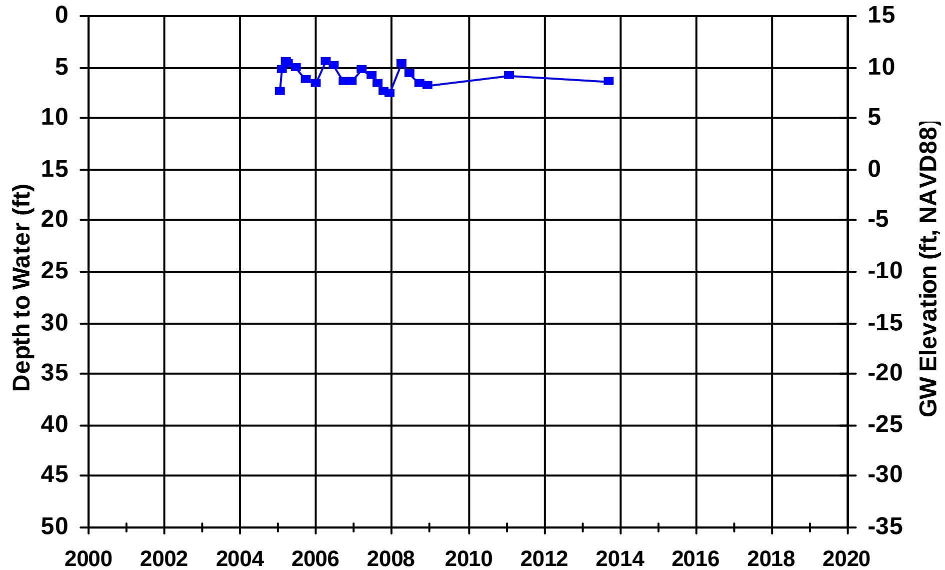

**WellID:** **T0601378938-MW-9**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601389036-MW-1**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

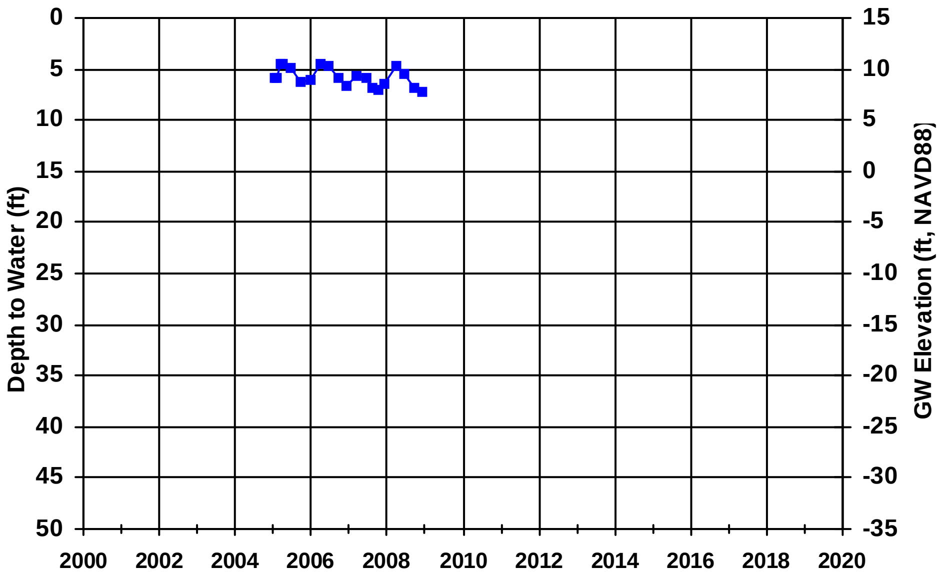



**WellID:** **T0601389036-MW-2**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

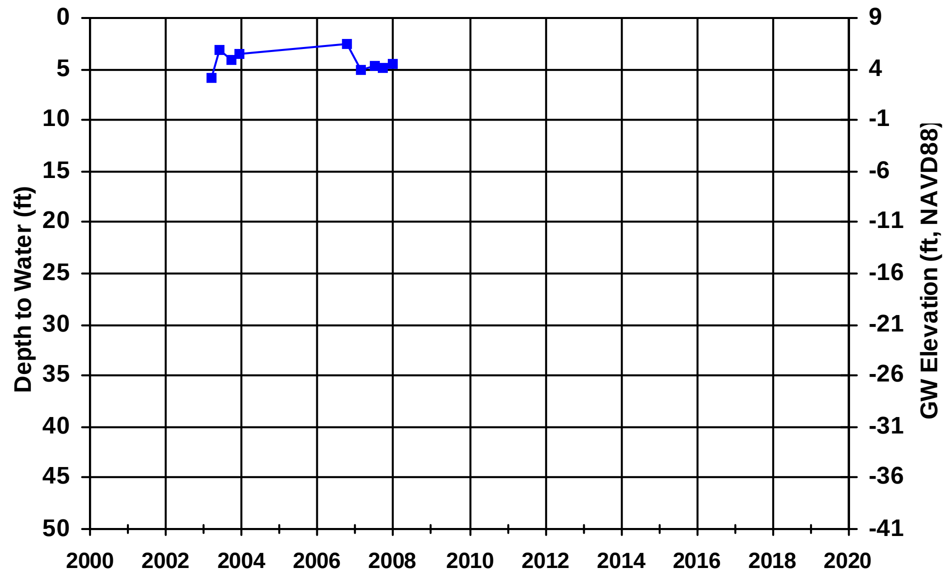



{R_WLhyd88}

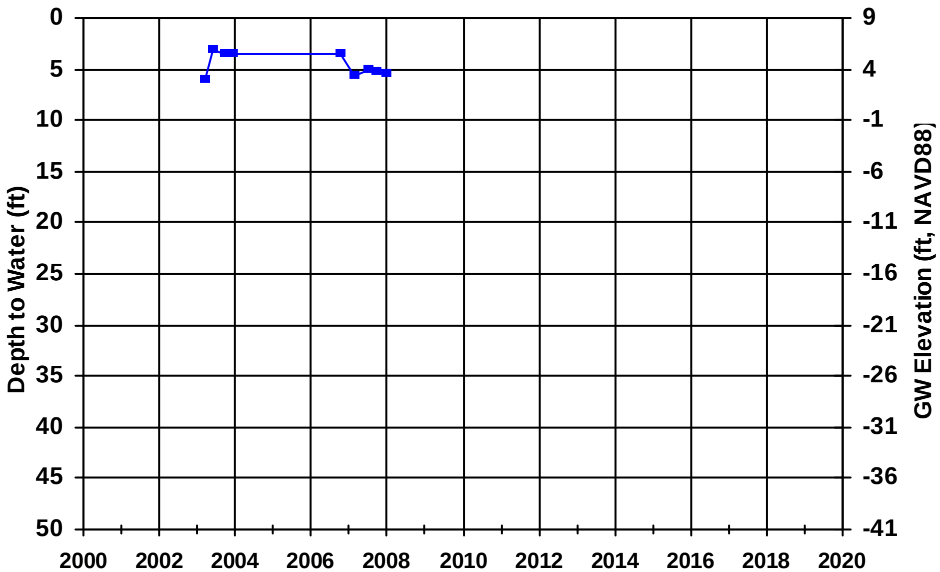
**WellID:** **T0601389036-MW-3**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



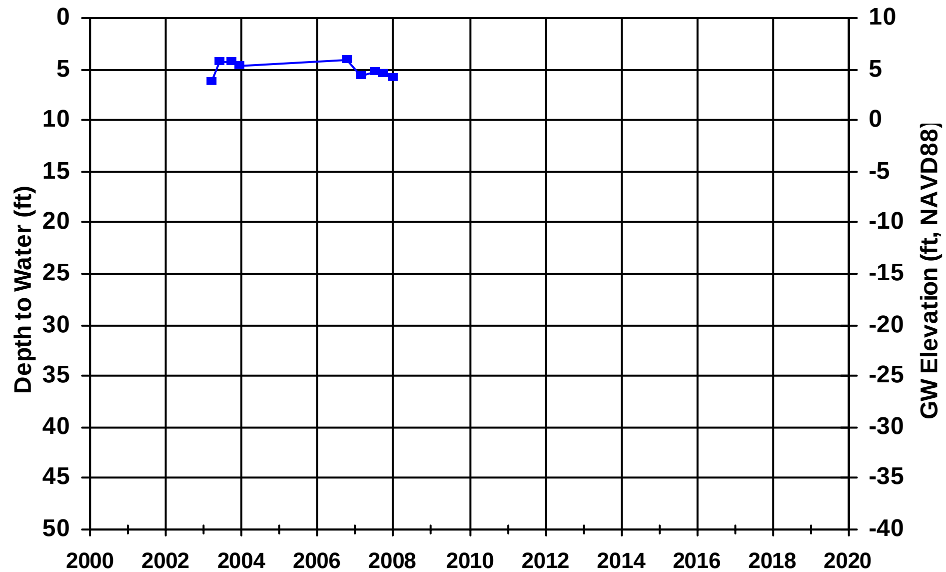

**WellID:** **T0601391419-MW-1**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** **T0601391419-MW-2**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

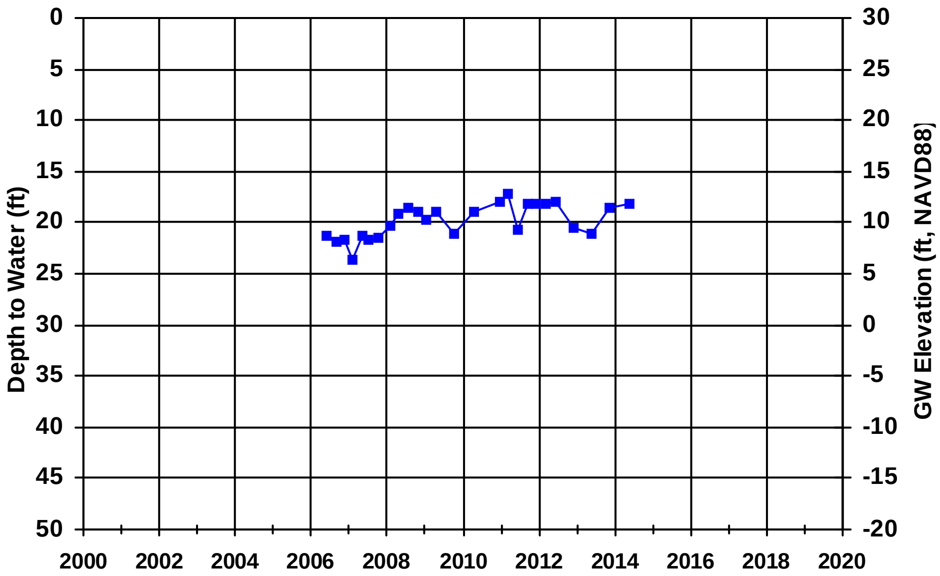



**WellID:** **T0601391419-MW-3**
**Zone:** **Shallow**
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

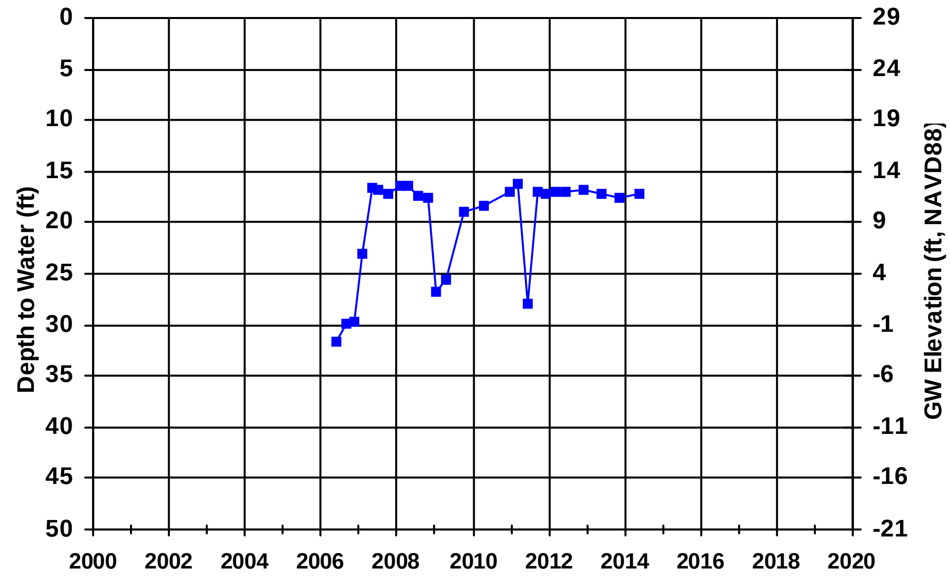



{R_WLhyd88}

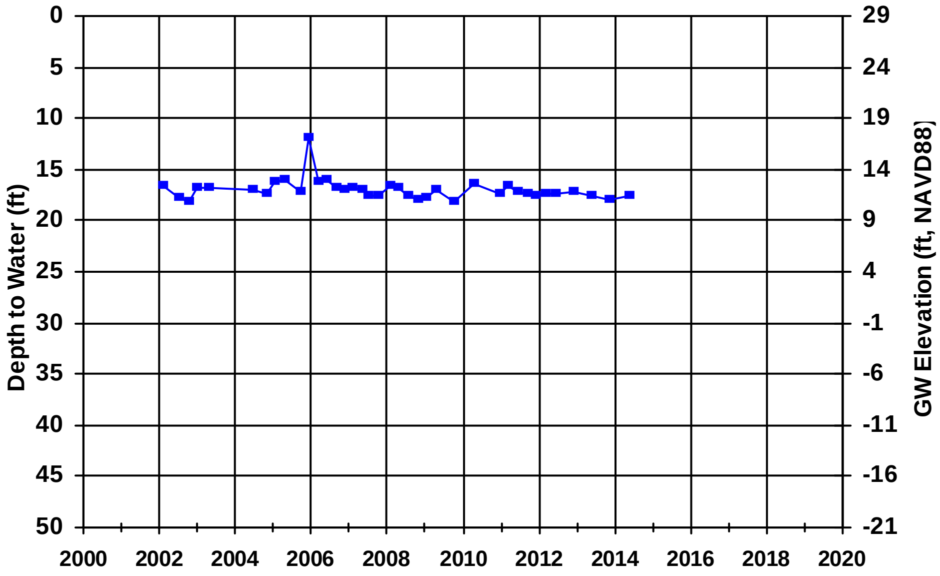
WellID: T0601391420-EX-1
Zone: Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



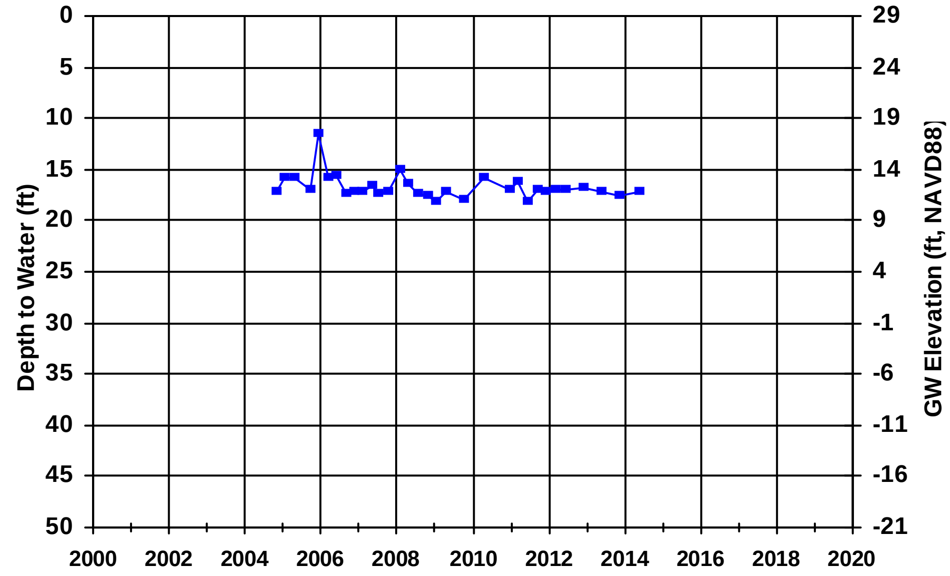

WellID: T0601391420-EX-2
Zone: Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




WellID: T0601391420-MW-1
Zone: Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

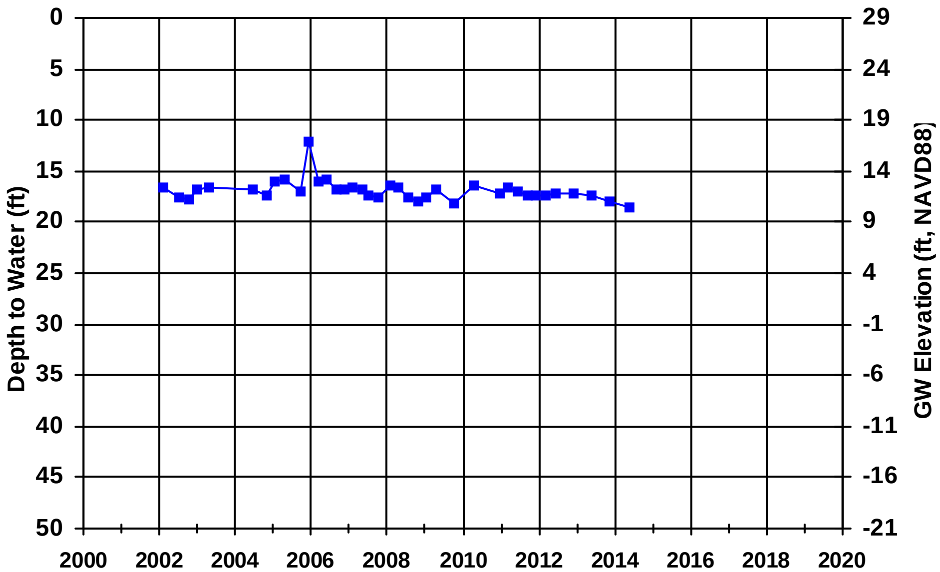



WellID: T0601391420-MW-1-I
Zone: Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

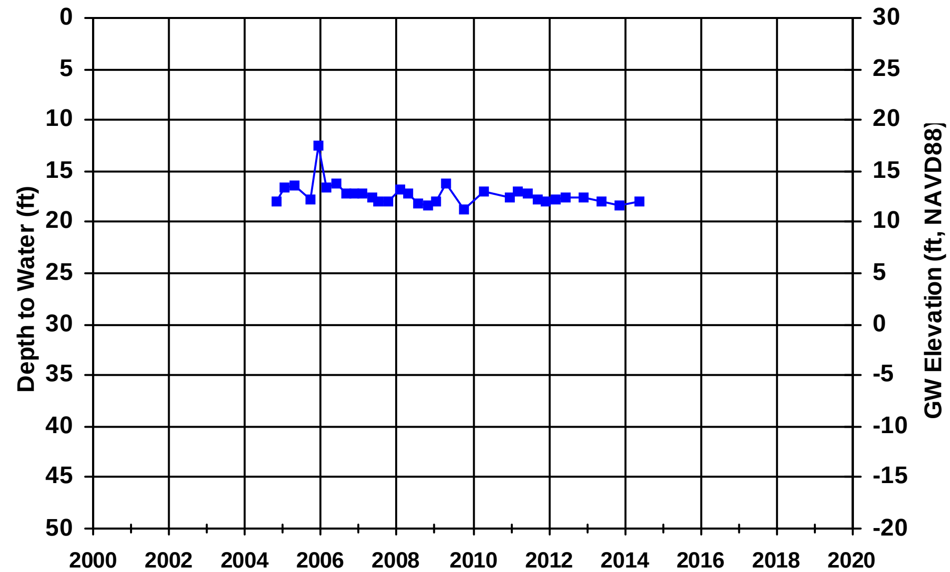



{R_WLhyd88}

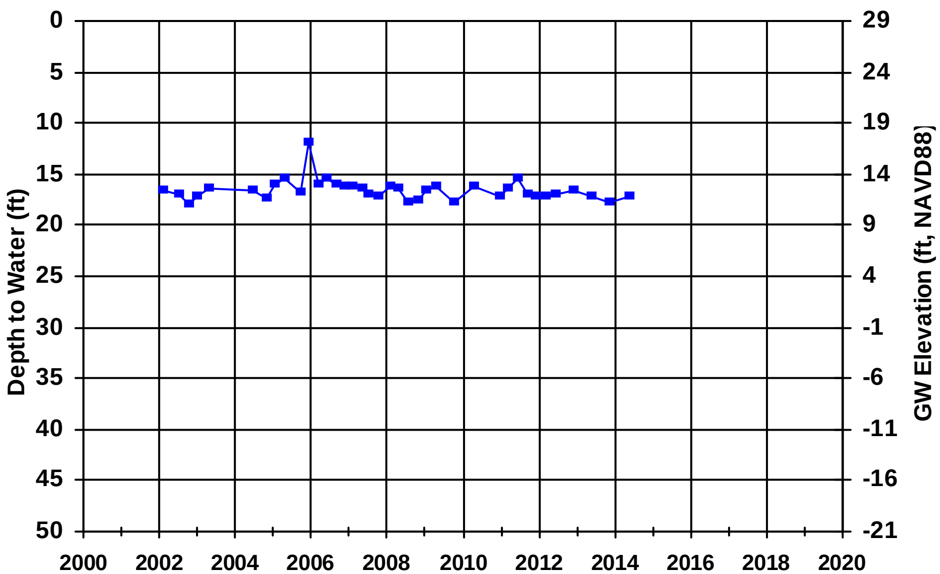
**WellID:** T0601391420-MW-2
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



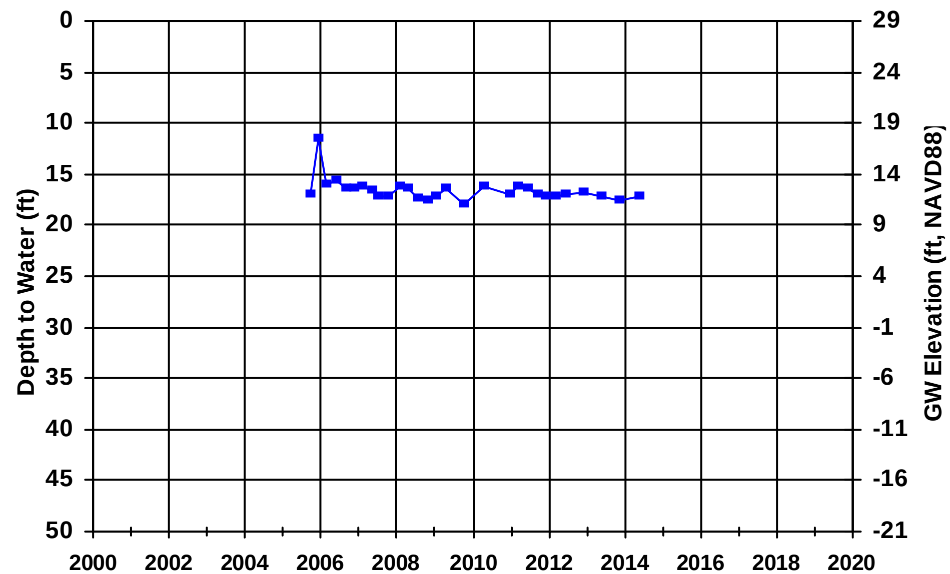

**WellID:** T0601391420-MW-2-I
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601391420-MW-3
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** T0601391420-MW-3-I
**Zone:** Shallow
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A

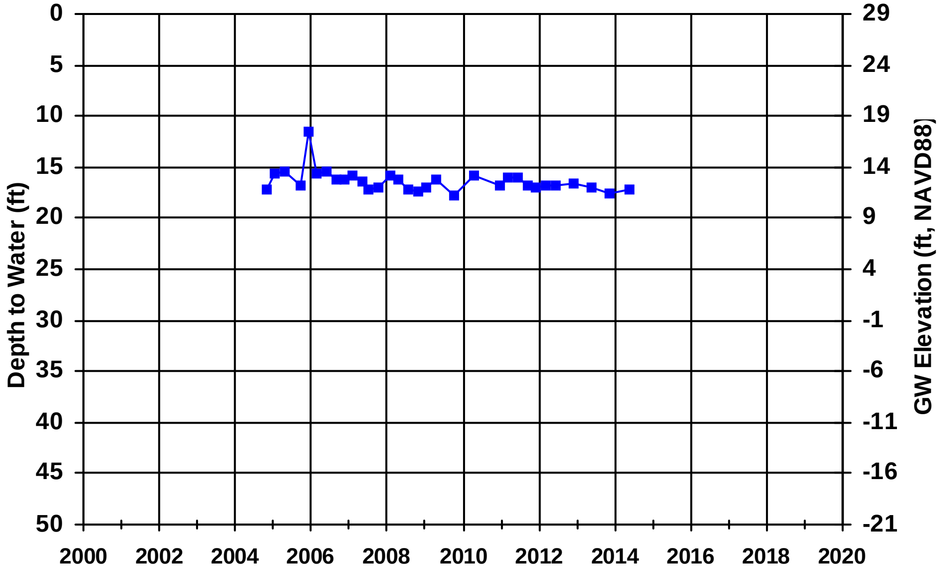



{R_WLhyd88}

**WellID:** **T0601391420-MW-4**

**Zone:** **Shallow**

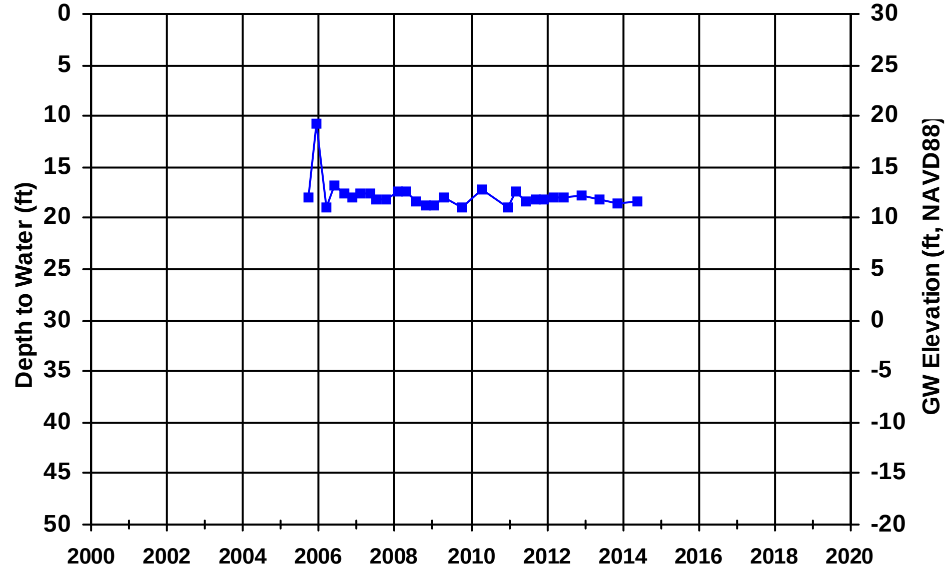
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601391420-MW-4-I**

**Zone:** **Shallow**

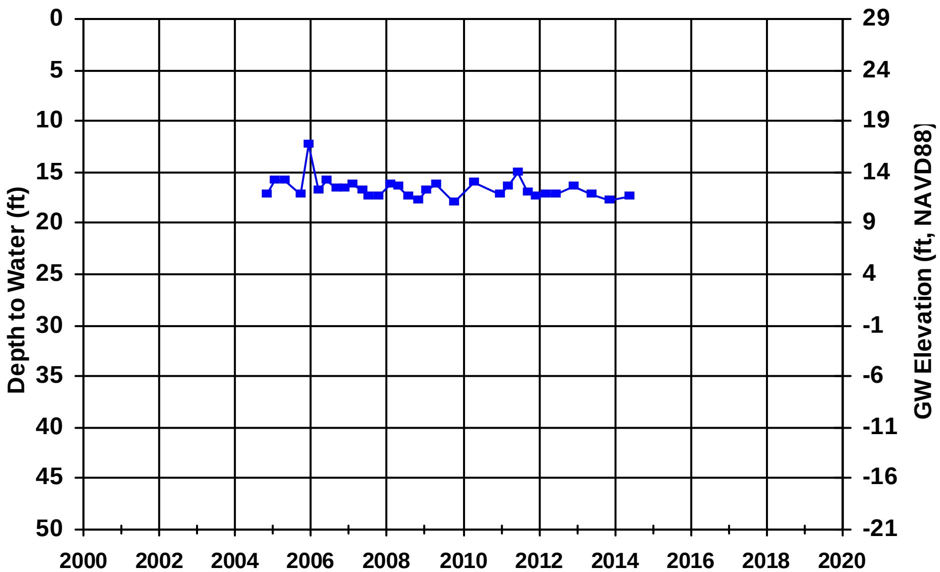
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601391420-MW-5**

**Zone:** **Shallow**

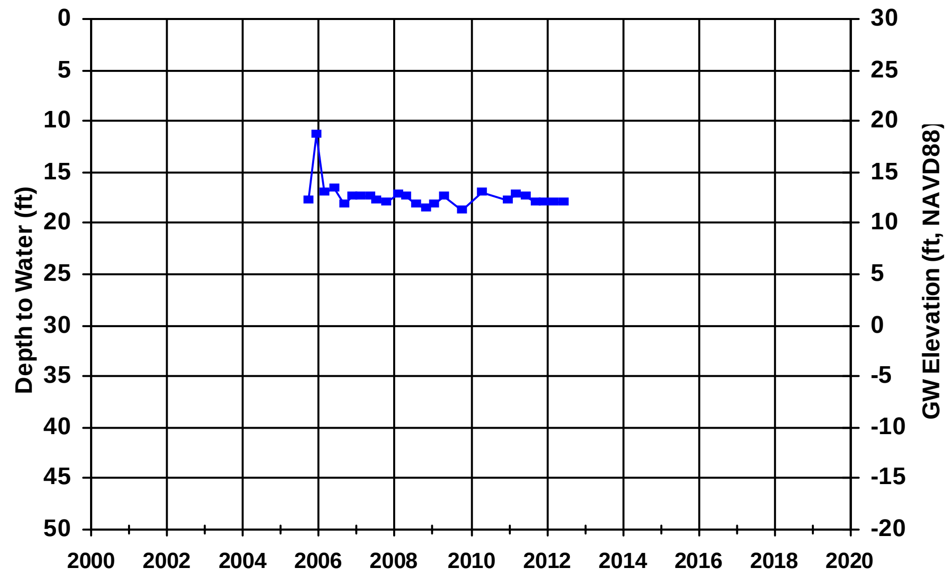
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601391420-MW-5-I**

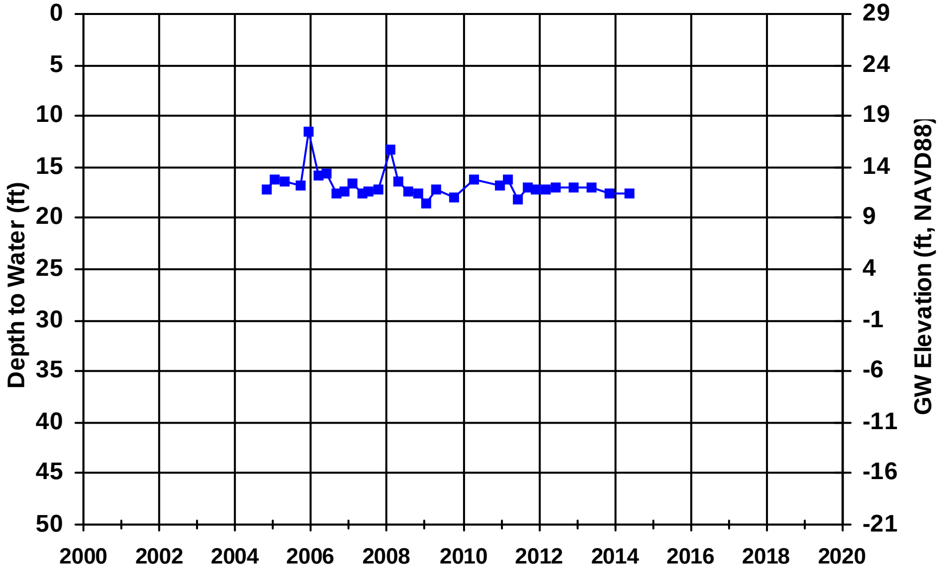
**Zone:** **Shallow**

Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

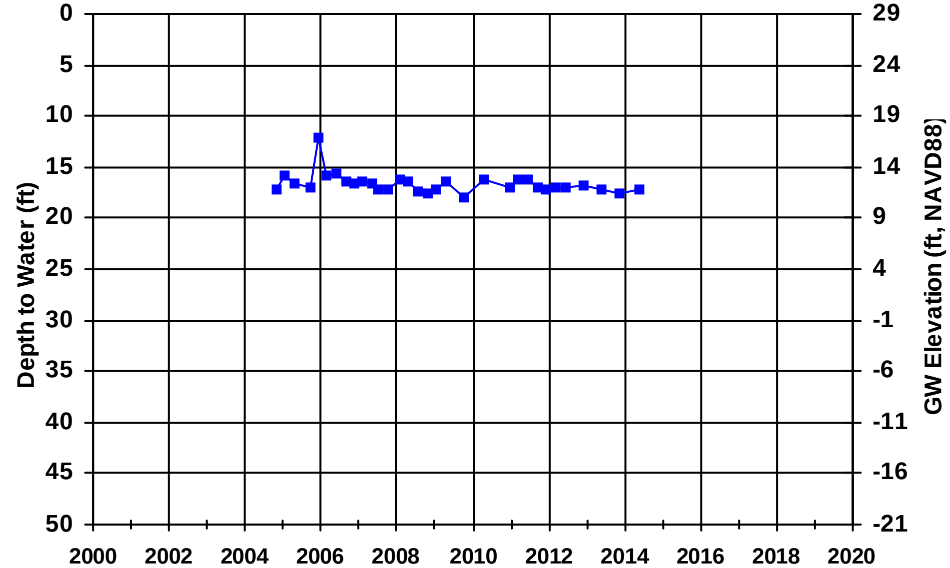



{R_WLhyd88}

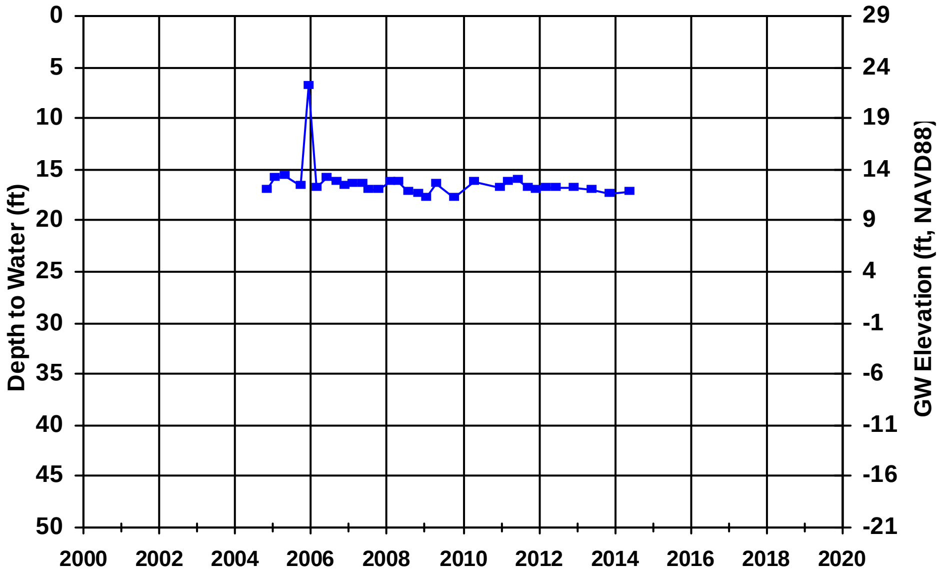
**WellID:** **T0601391420-MW-6**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A



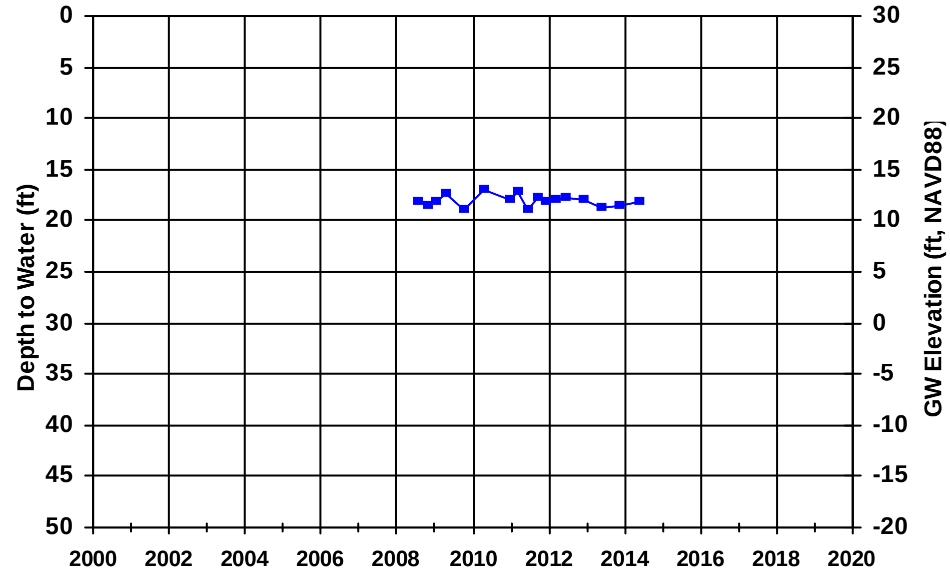

**WellID:** **T0601391420-MW-7**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** **T0601391420-MW-8**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

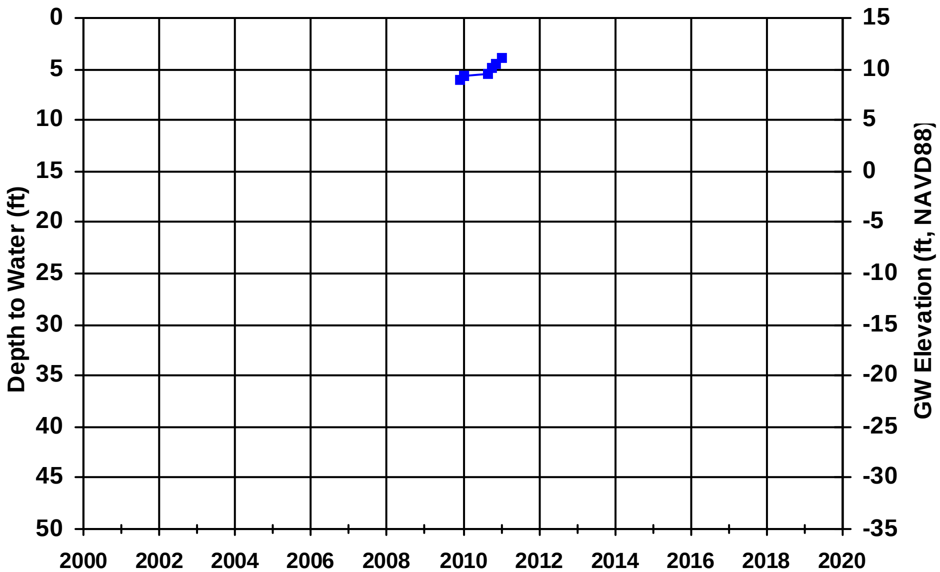



**WellID:** **T0601391420-MW-9**
**Zone:** **Shallow**
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

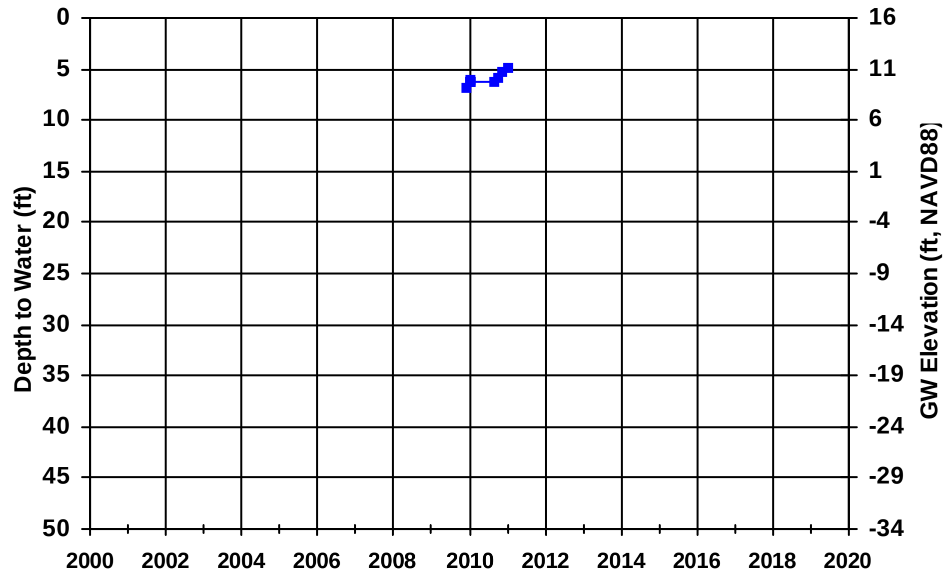



{R_WLhyd88}

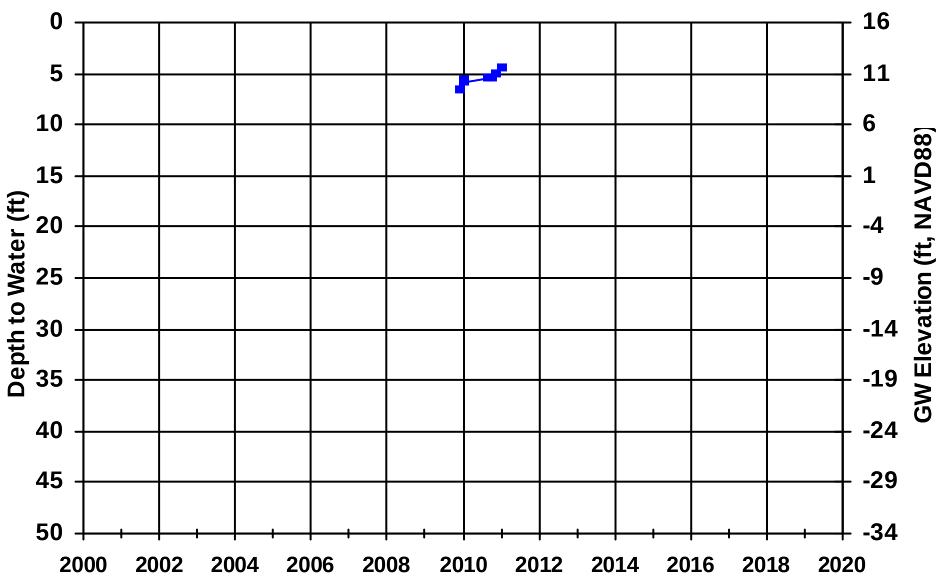
WellID: T10000000655-MW.01
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



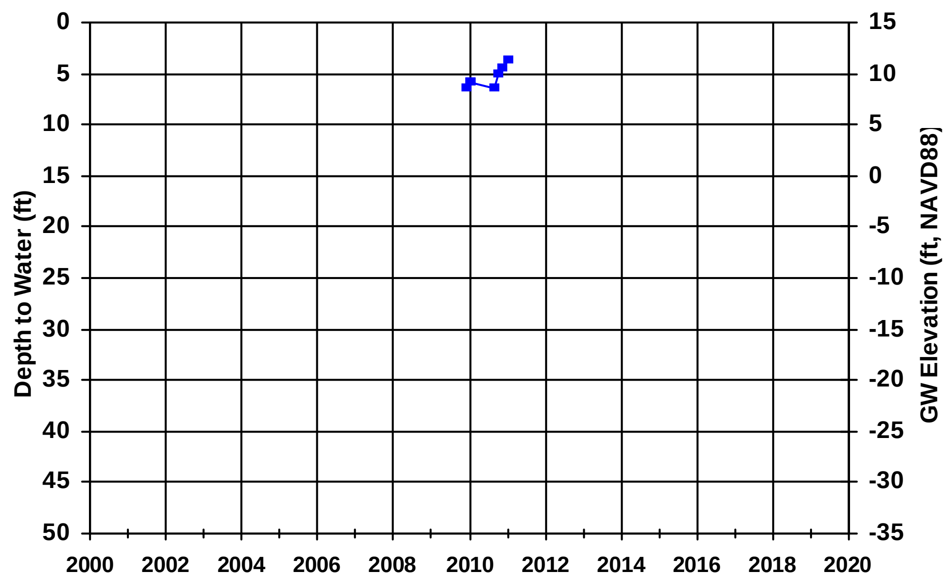

WellID: T10000000655-MW.02
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




WellID: T10000000655-MW.03
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

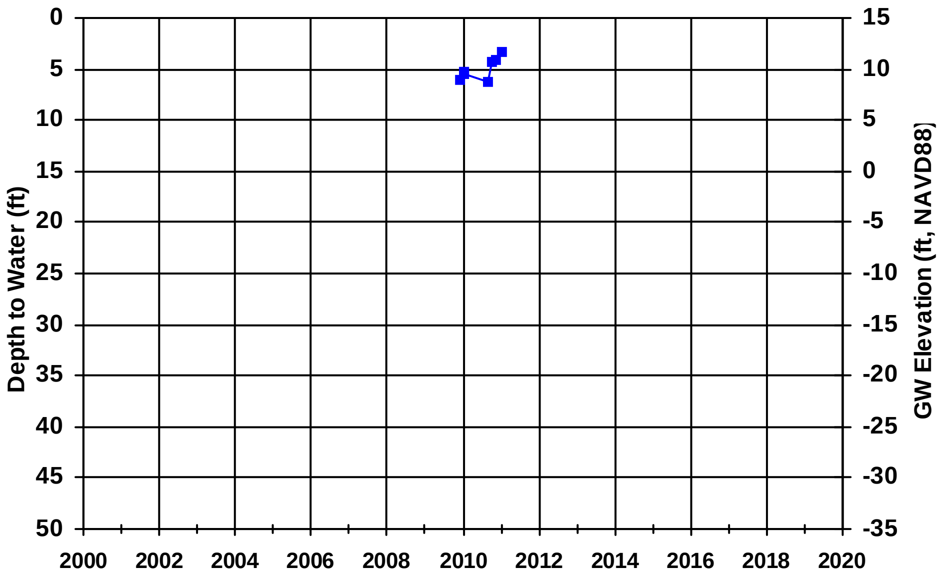



WellID: T10000000655-MW.04
Zone: Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

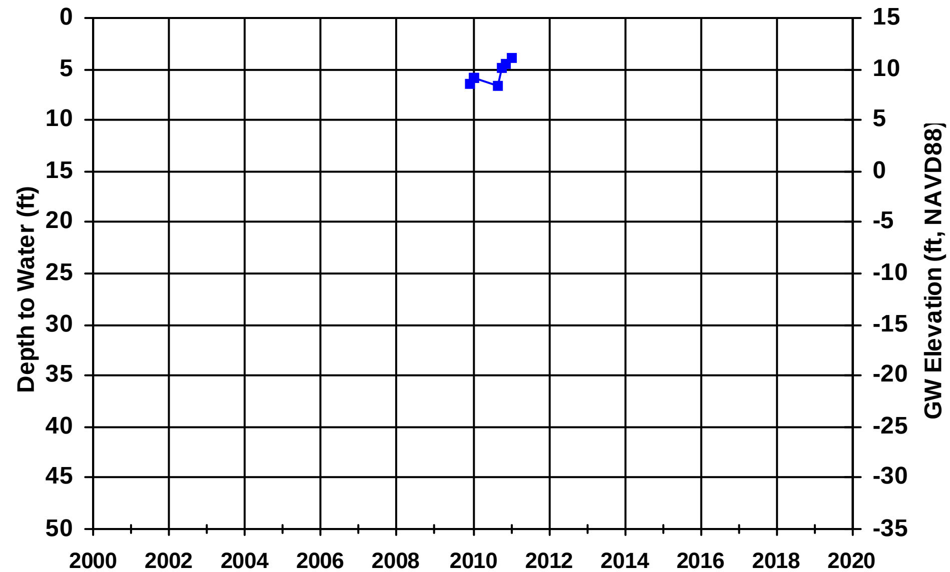



{R_WLhyd88}

**WellID:** T10000000655-MW.05
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T10000000655-MW.06
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A

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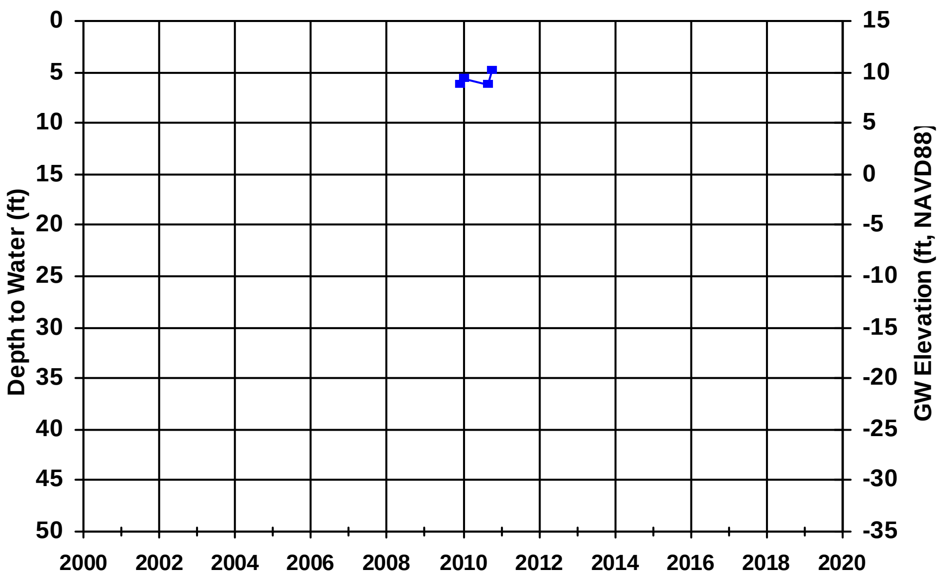
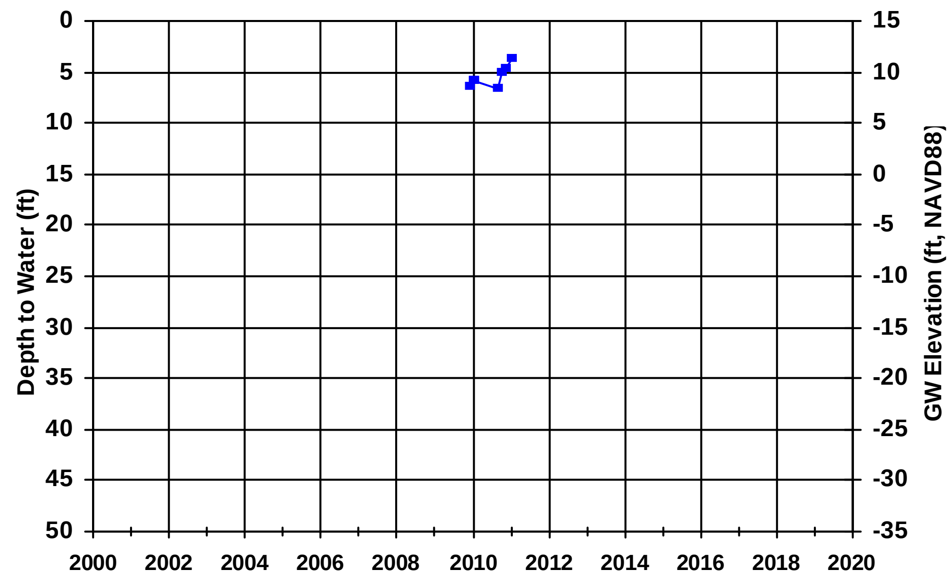
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T10000000655-MW.08
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




{R_WLhyd88}

**WellID: T10000000655-MW.09**

**Zone: Shallow**

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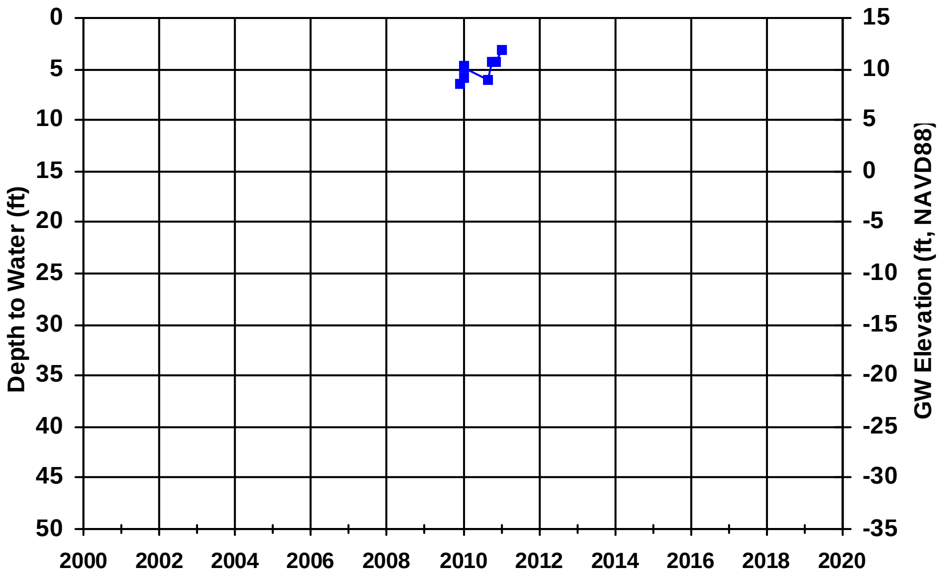


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**Zone: Shallow**

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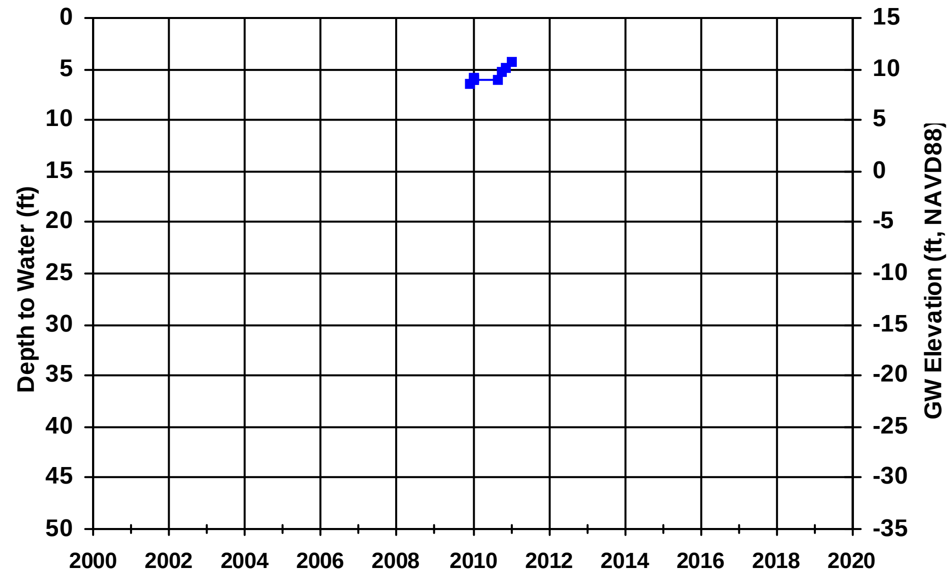
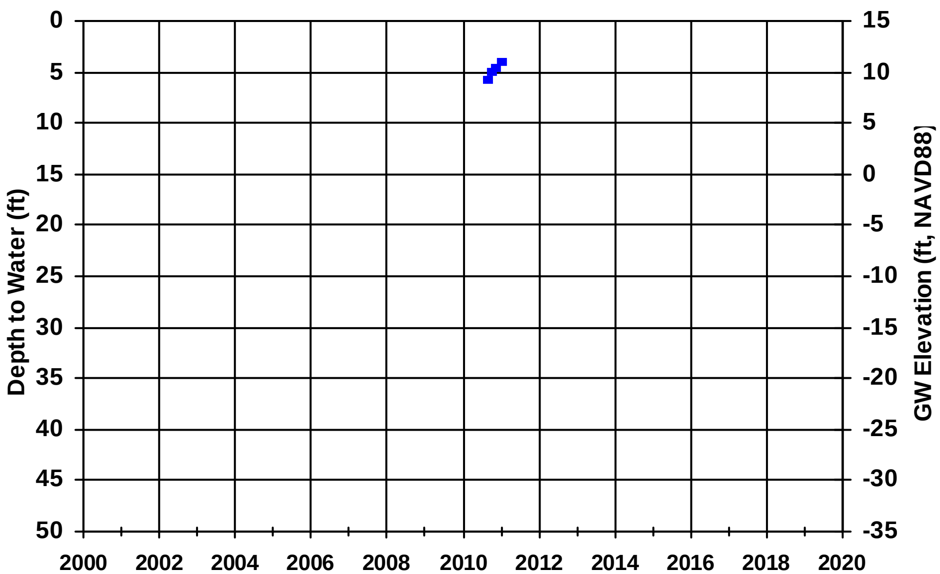



**WellID: T10000000655-MW.11**

**Zone: Shallow**

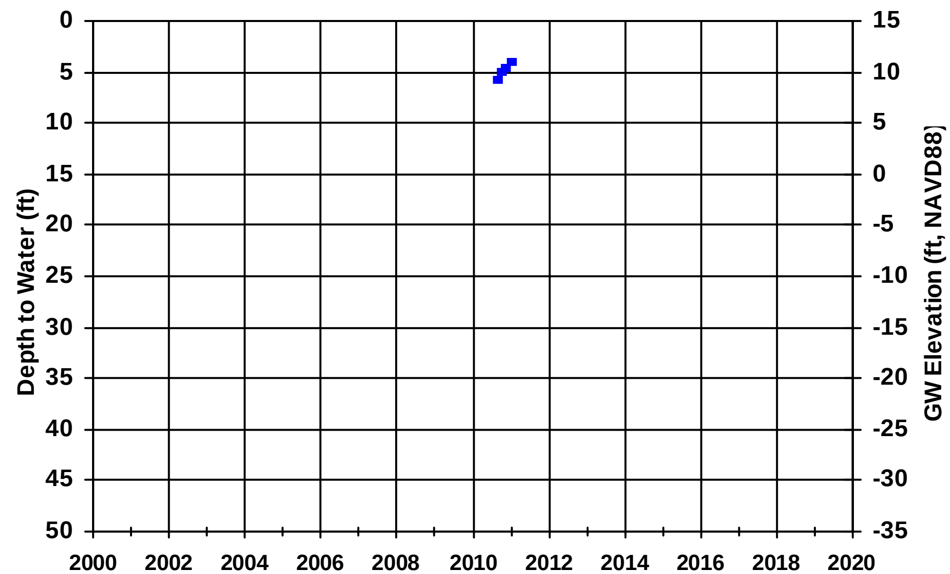
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



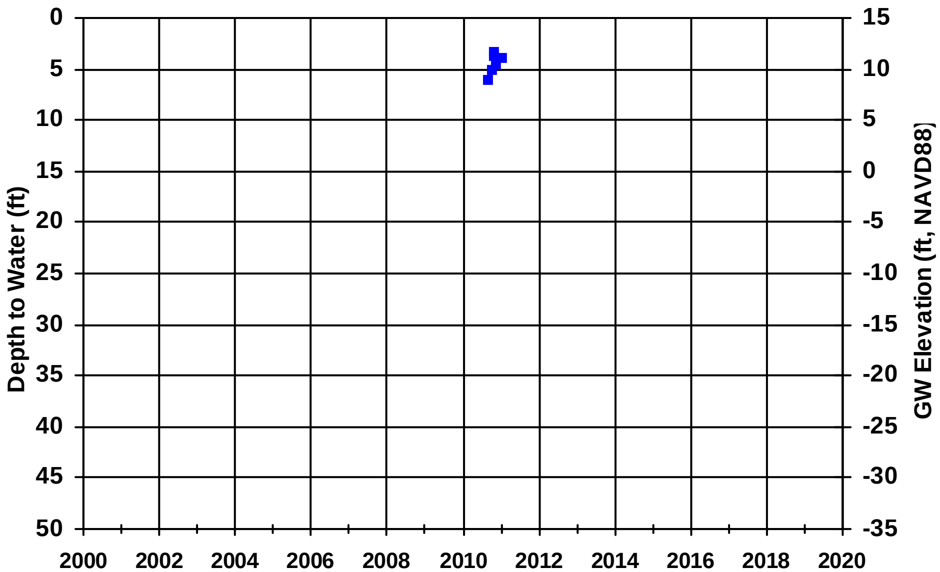

**WellID: T10000000655-MW.12**

**Zone: Shallow**

Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



**WellID:** **T10000000655-MW.13**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T10000000655-MW.14**
**Zone:** **Shallow**
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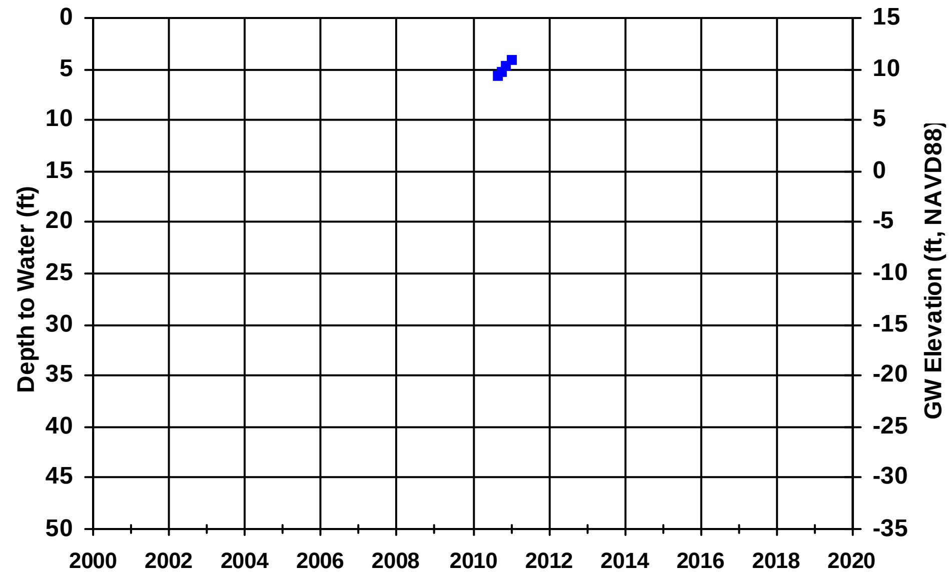
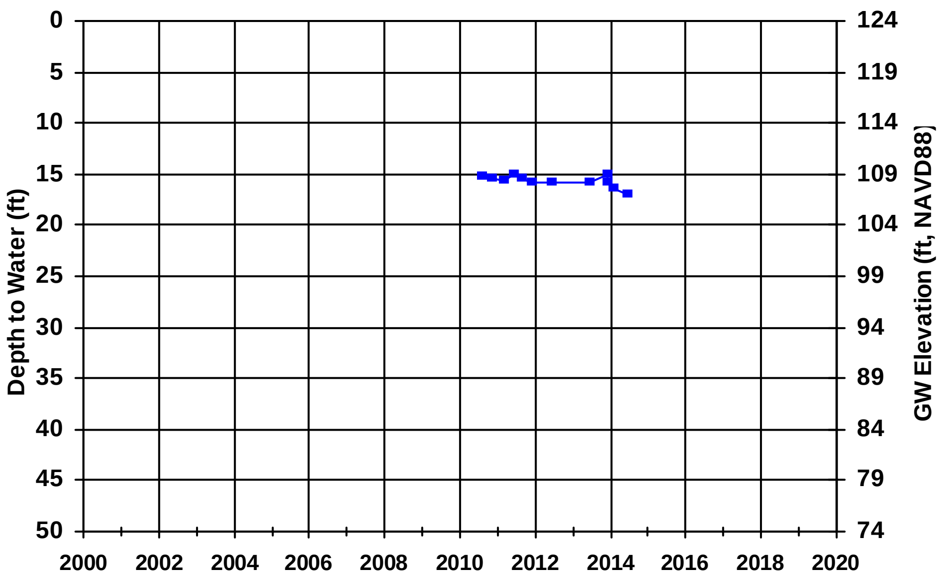



**WellID:** **T10000002015-MW-1**
**Zone:** **Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




**WellID:** **T10000002015-MW-2**
**Zone:** **Shallow**
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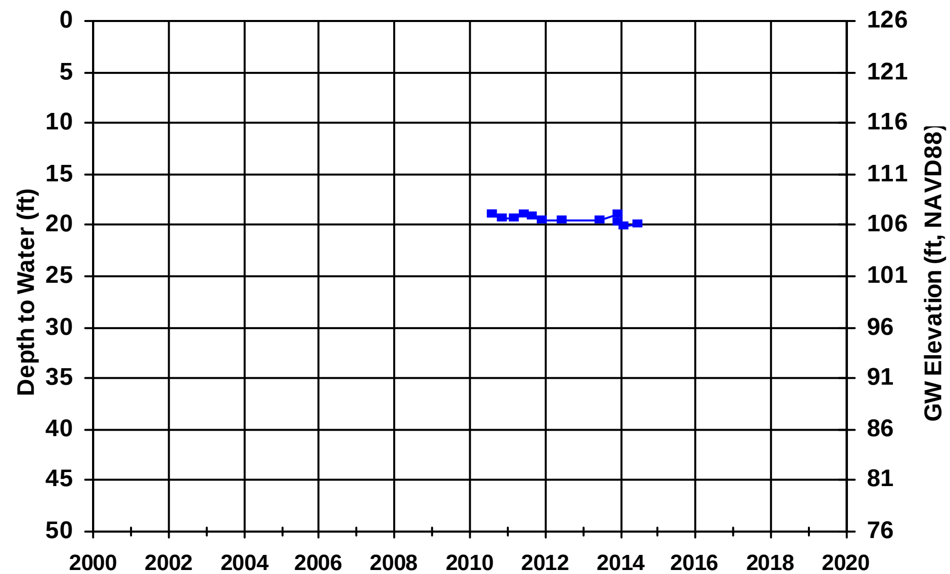
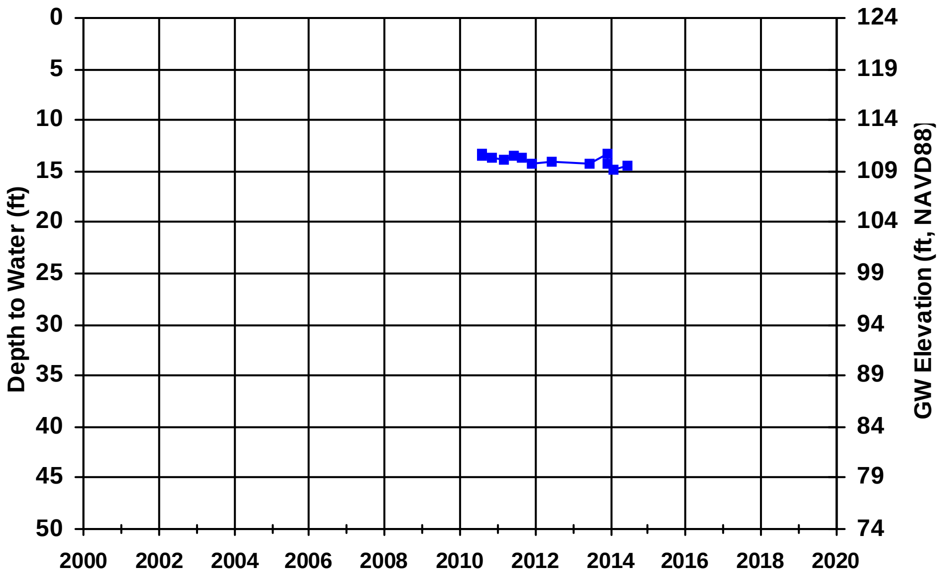
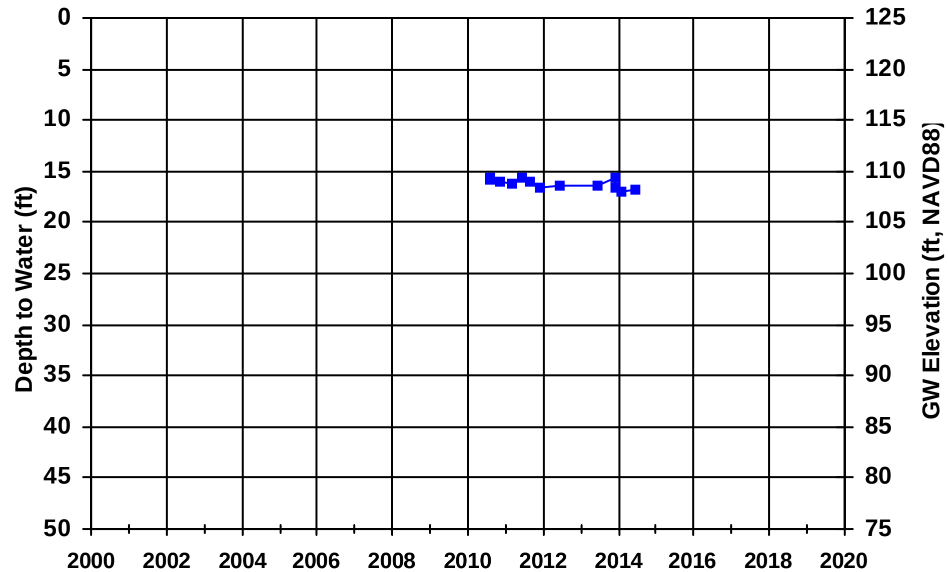



{R_WLhyd88}

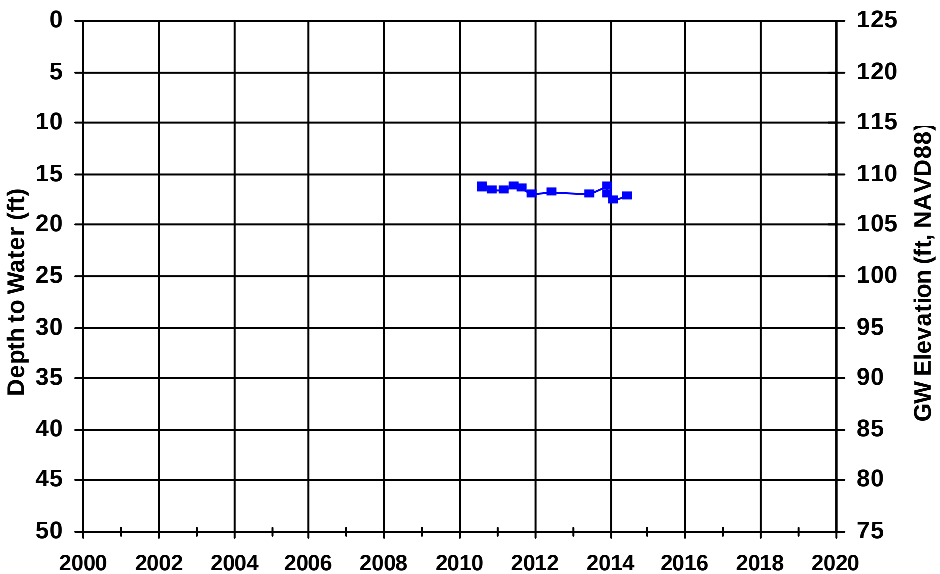
**WellID:** T10000002015-MW-3
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



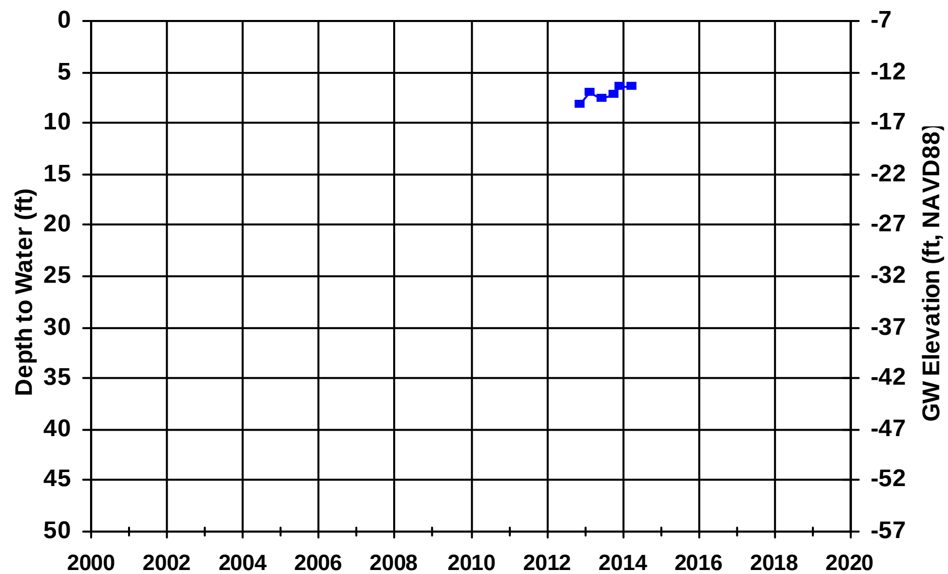

**WellID:** T10000002015-MW-4
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



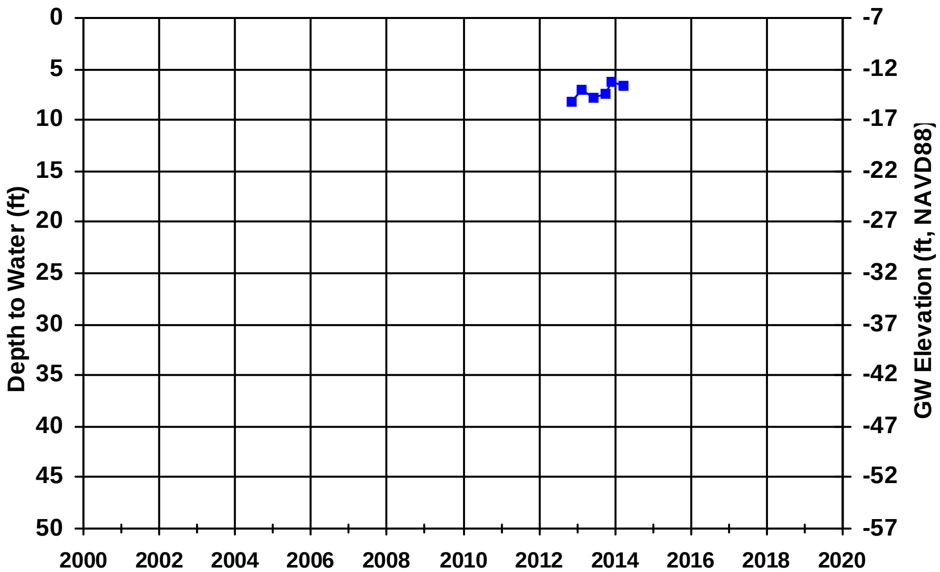

**WellID:** T10000002015-MW-5
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A




**WellID:** T10000003258-MW-1
**Zone:** Shallow
Source: Geotracker Perf Int (ft): N/A Well Depth (ft): N/A



**WellID:** T10000003258-MW-2
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A




**WellID:** T10000003258-MW-3
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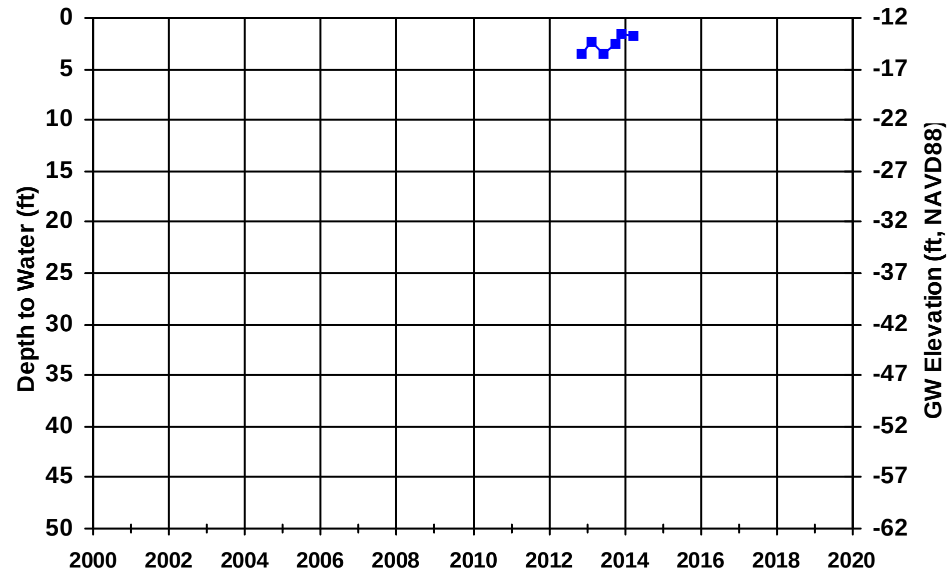


**WellID:** T10000003258-MW-4
**Zone:** Shallow
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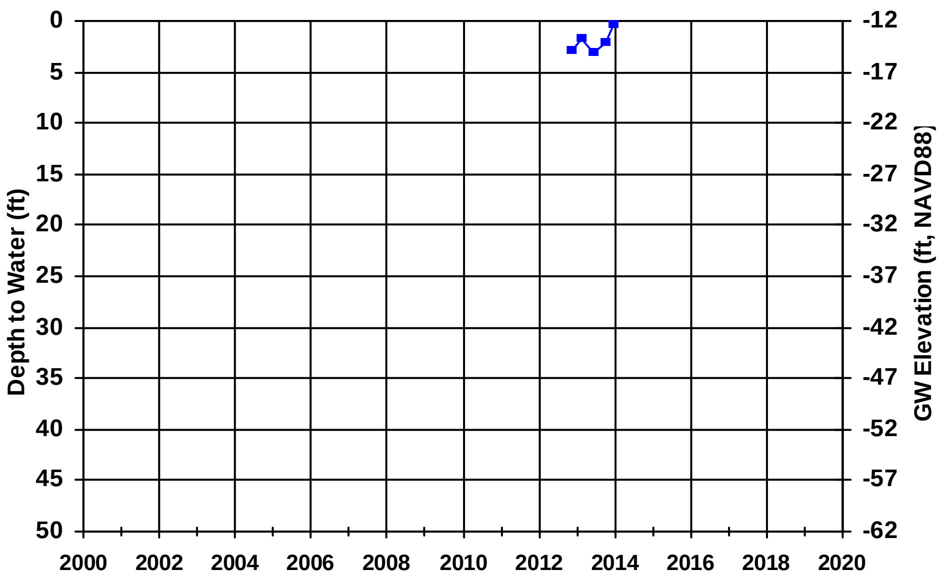
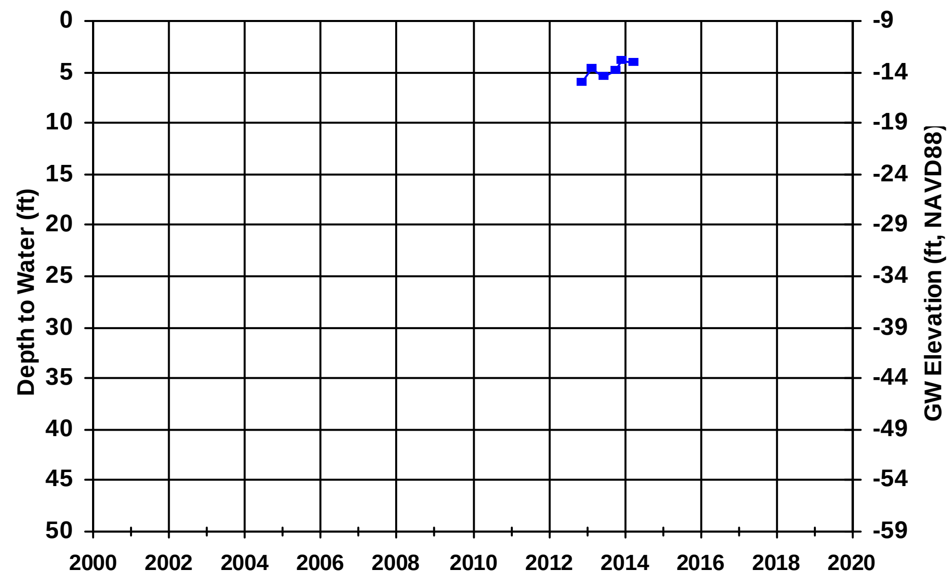
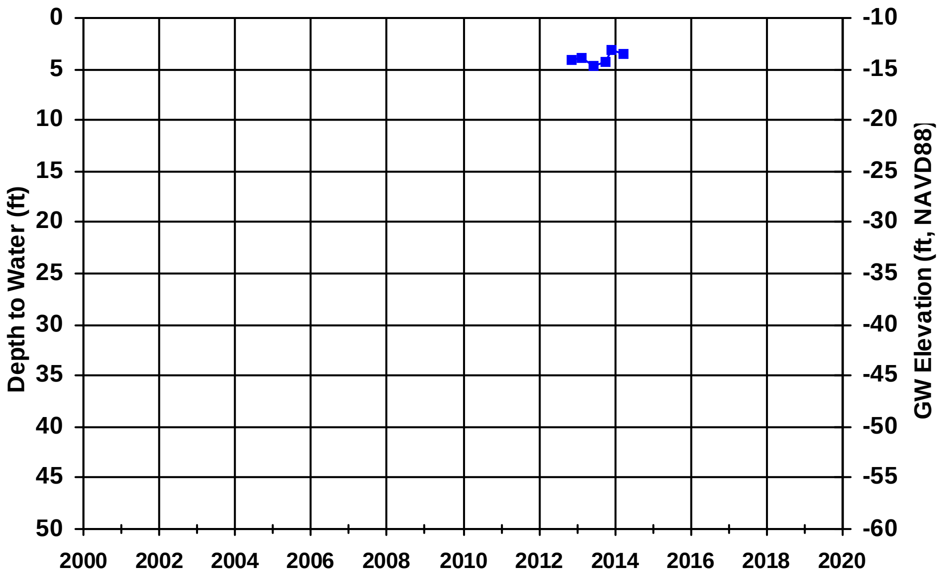



**WellID:** T10000003258-MW-5
**Zone:** Shallow
Source: Geotracker | Perf Int (ft): N/A | Well Depth (ft): N/A

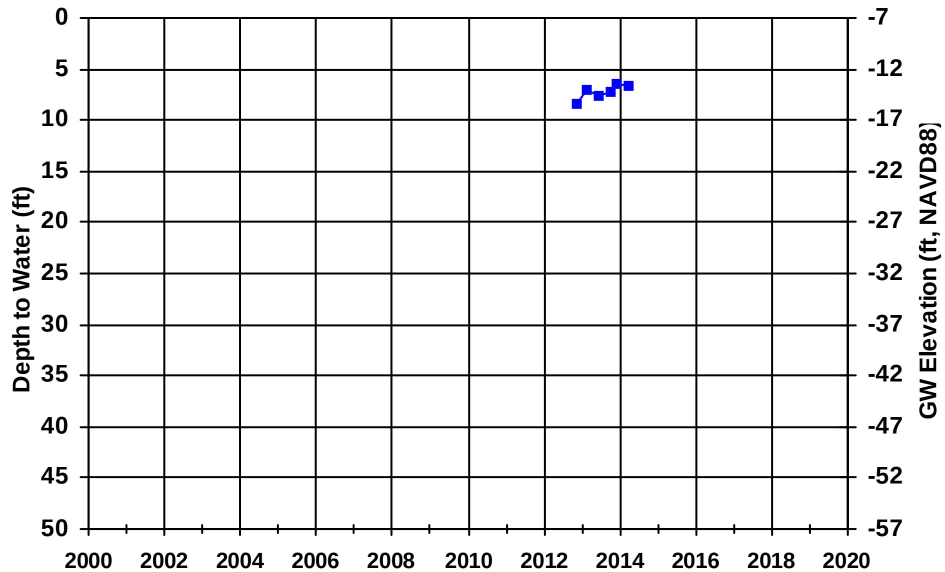



{R_WLhyd88}

**WellID: T10000003258-MW-6**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A



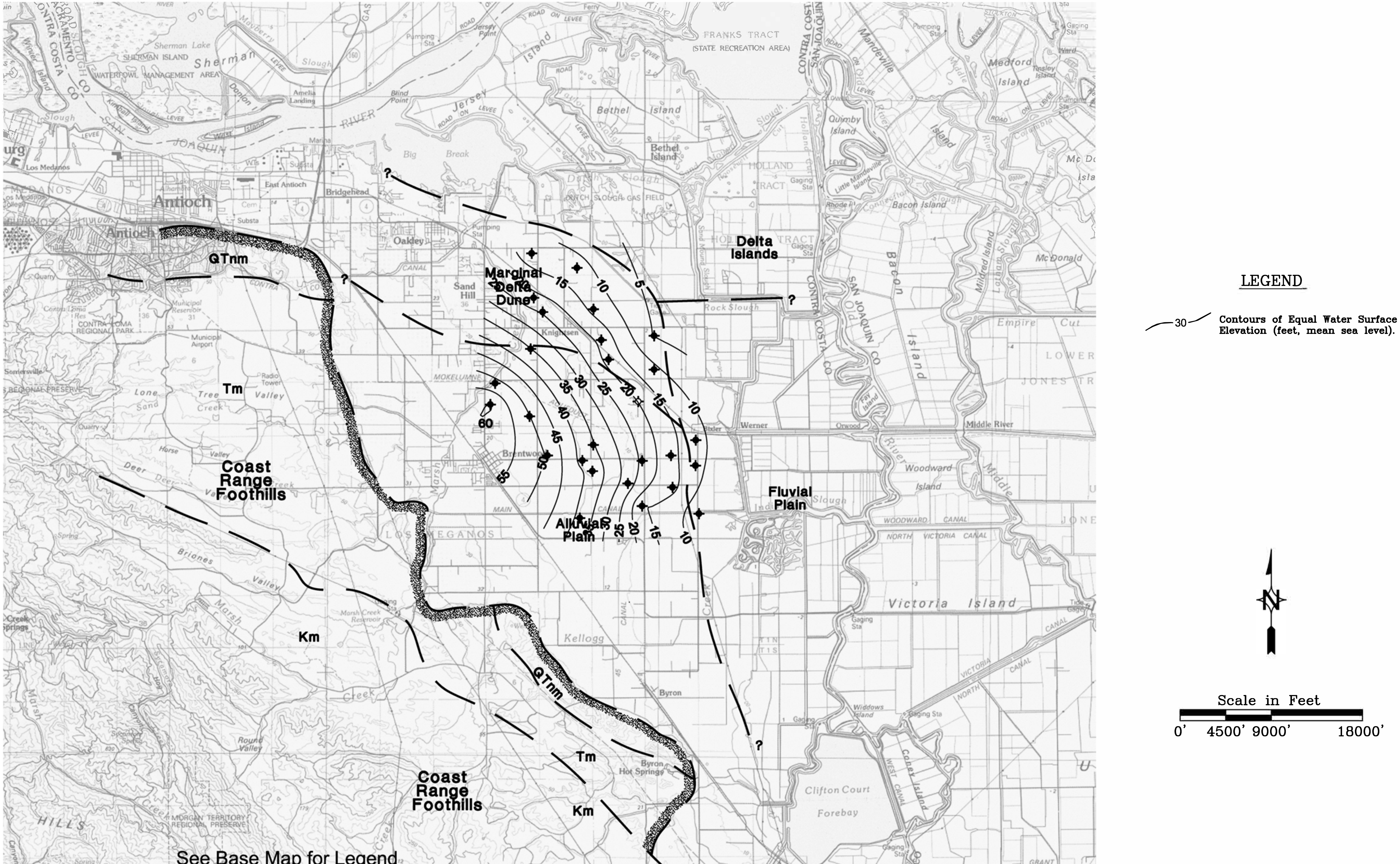

**WellID: T10000003258-MW-7**
**Zone: Shallow**
Source: Geotracker    Perf Int (ft): N/A    Well Depth (ft): N/A




{R_WLhyd88}

# APPENDIX 3e

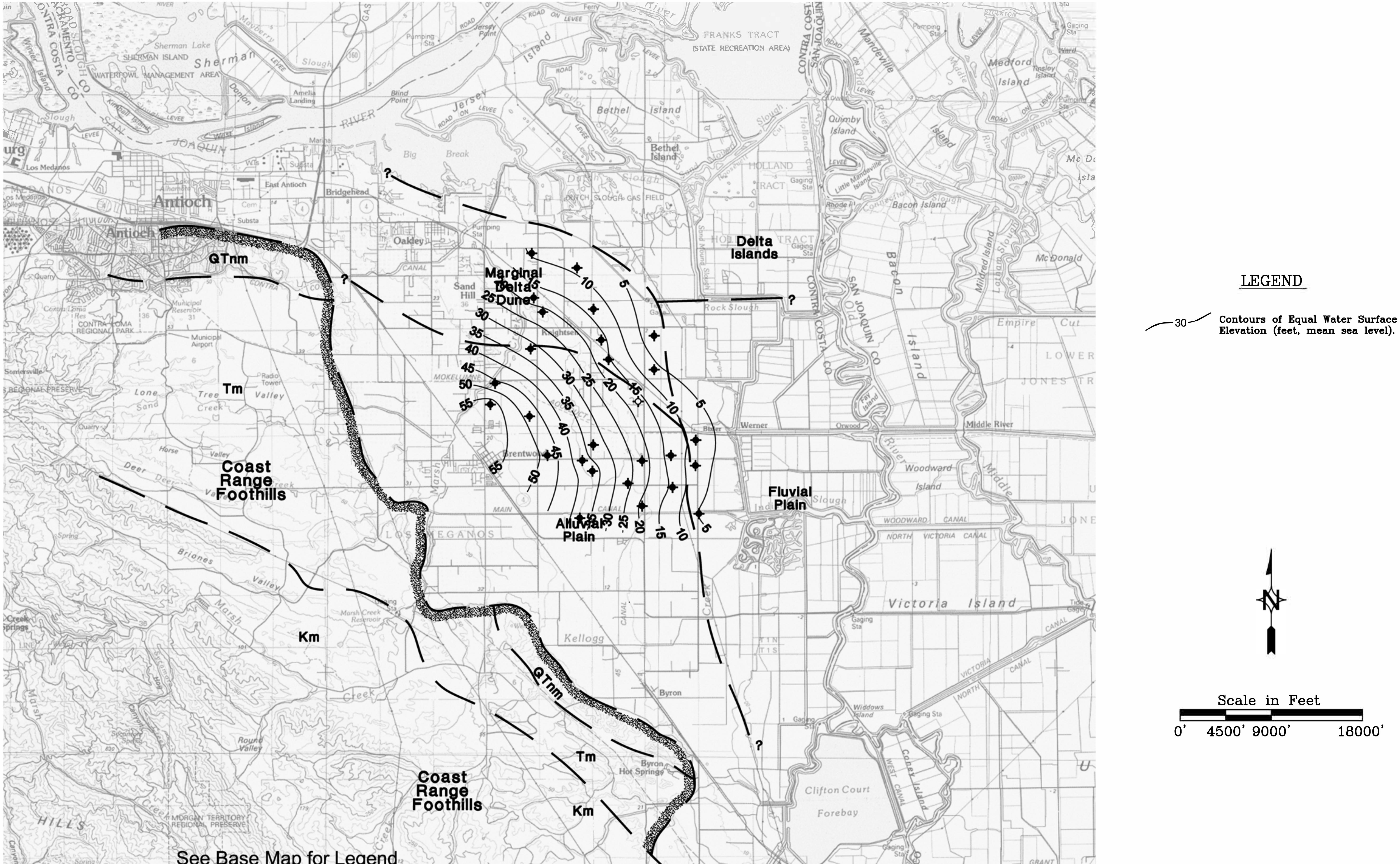
**Historical Groundwater Elevation Contour Maps**




East County Water Management Assoc./97-1-131/Spr1958wl.dwg

Luhdorff & Scalmanini Consulting Engineers

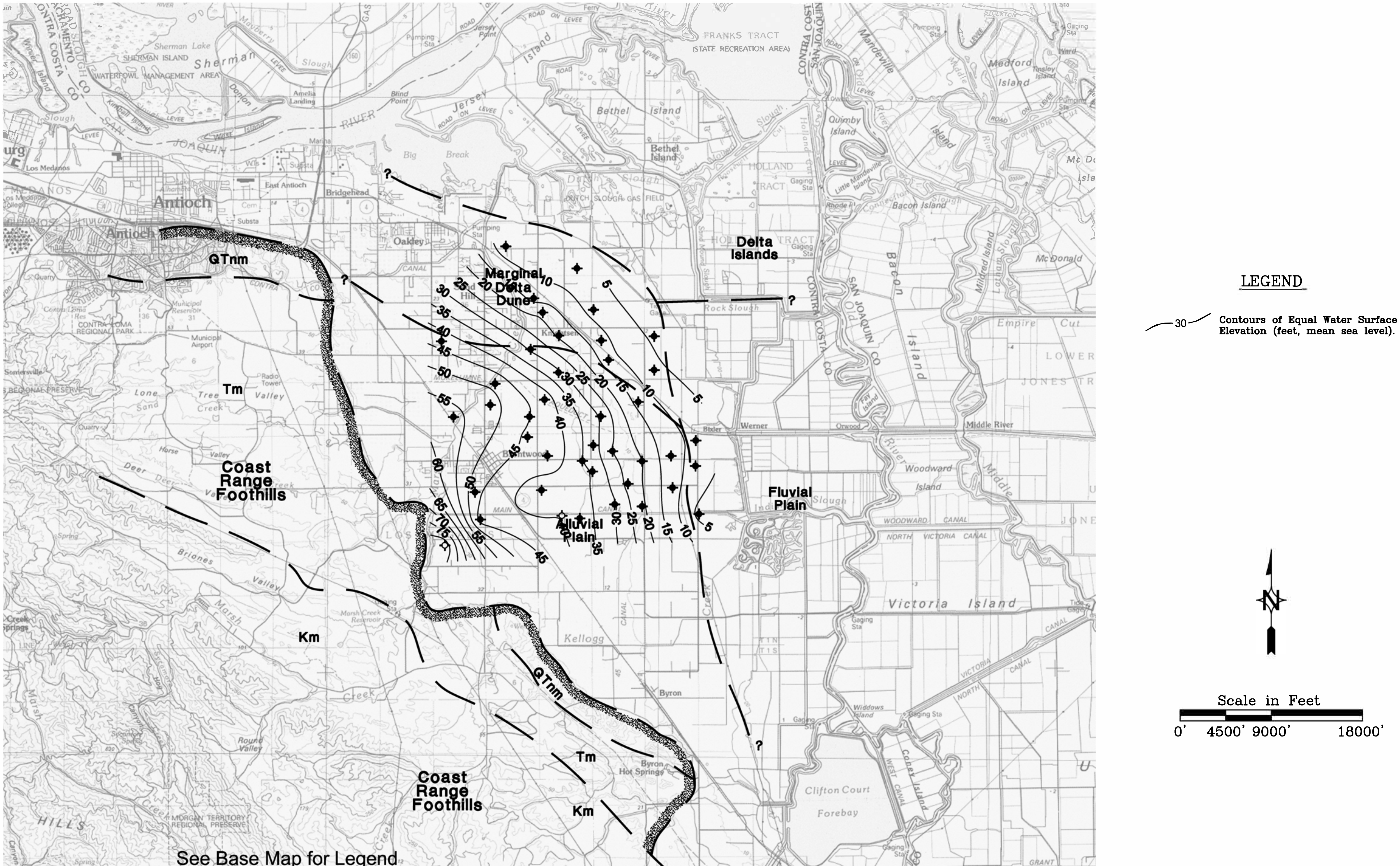
**Contours of Equal Ground-Water Elevation - Spring 1958**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




East County Water Management Assoc./97-1-131/Fall1958wl.dwg

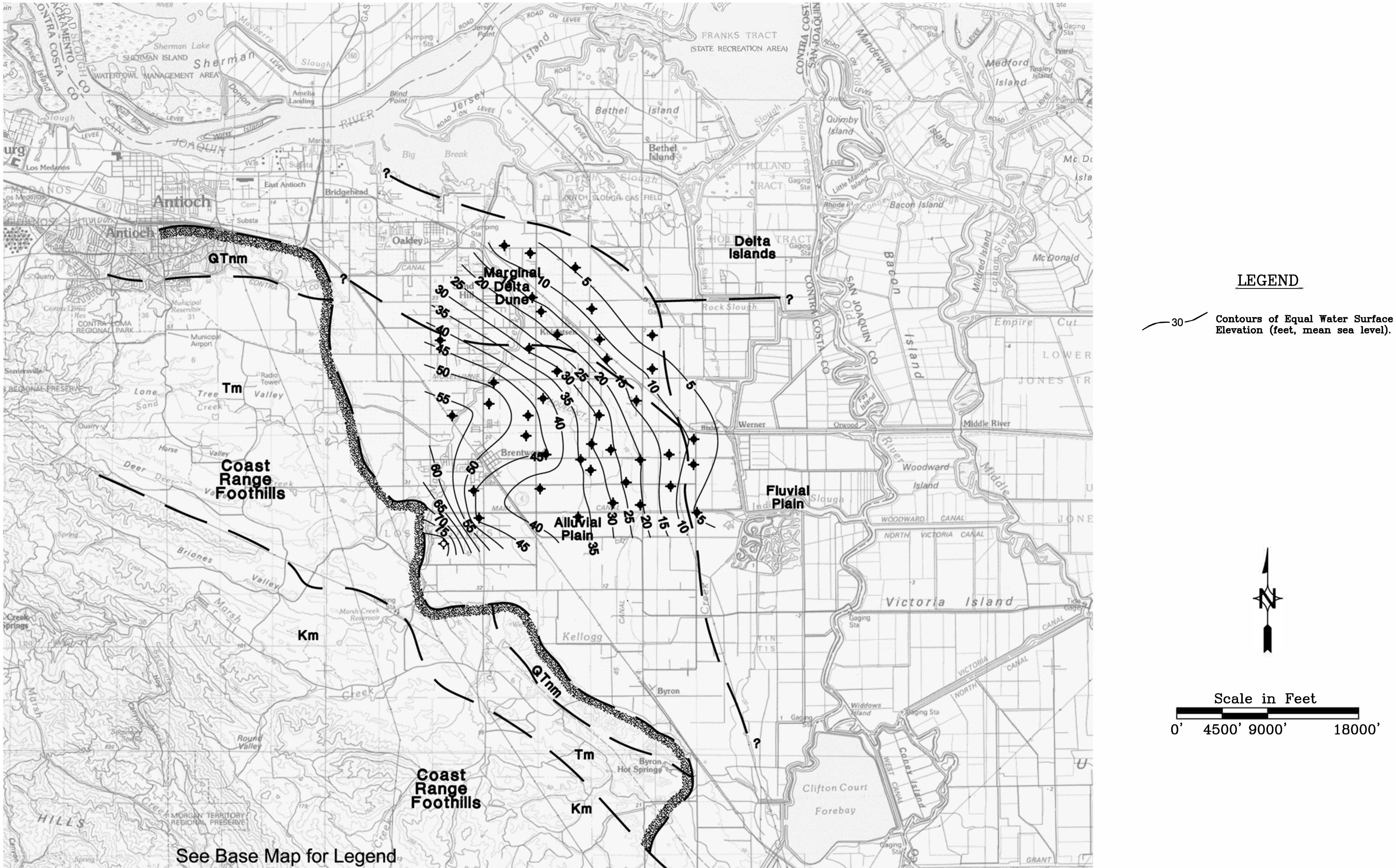
Luhdorff & Scalmanini Consulting Engineers

**Contours of Equal Ground-Water Elevation - Fall 1958 East Contra Costa Subbasin Groundwater Sustainability Plan Contra Costa County, California**



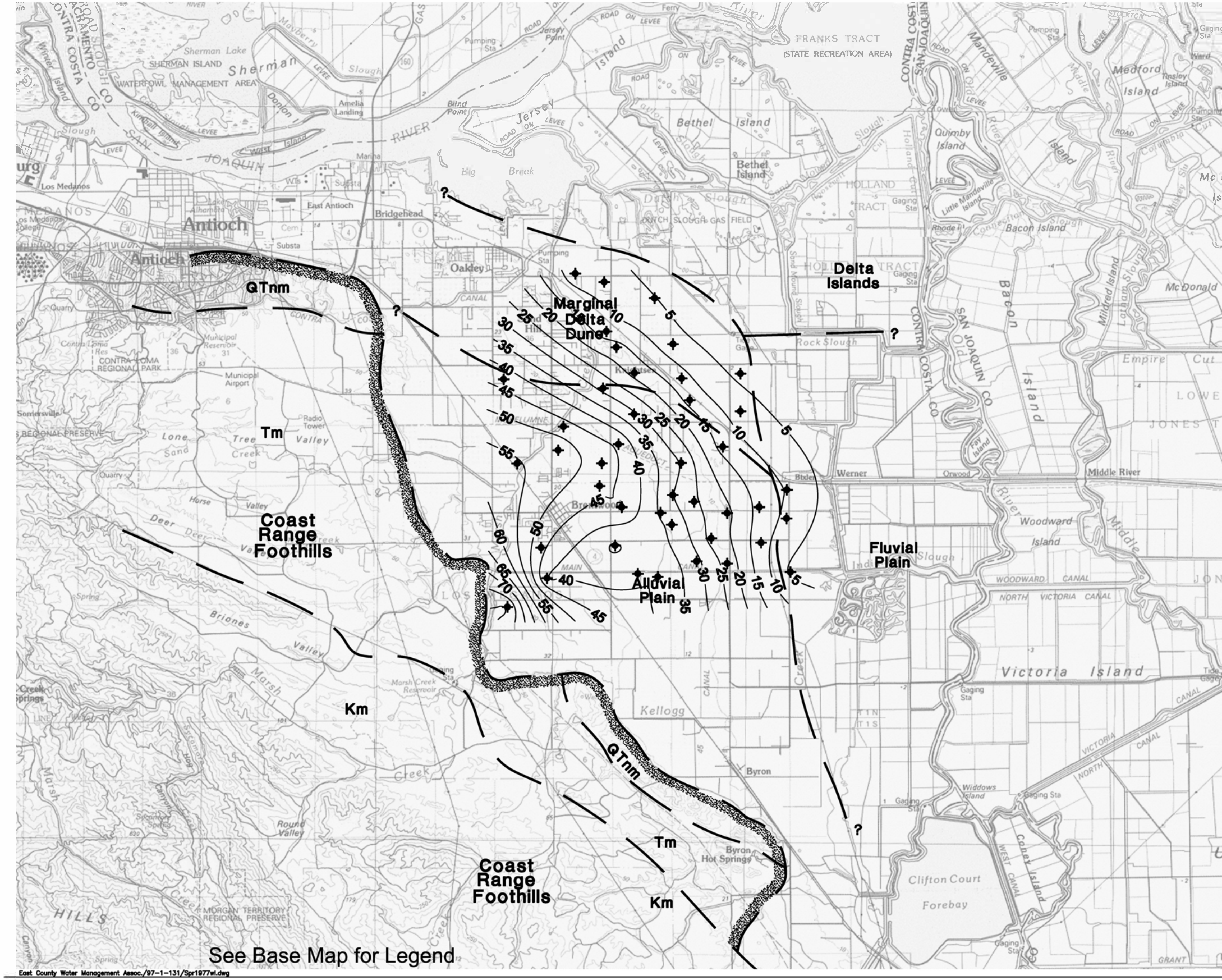

**Contours of Equal Ground-Water Elevation - Spring 1975**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**

Luhdorff & Scalmanini
Consulting Engineers




Luhdorff & Scalmanini Consulting Engineers

**Contours of Equal Ground-Water Elevation - Fall 1975 East**
**Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

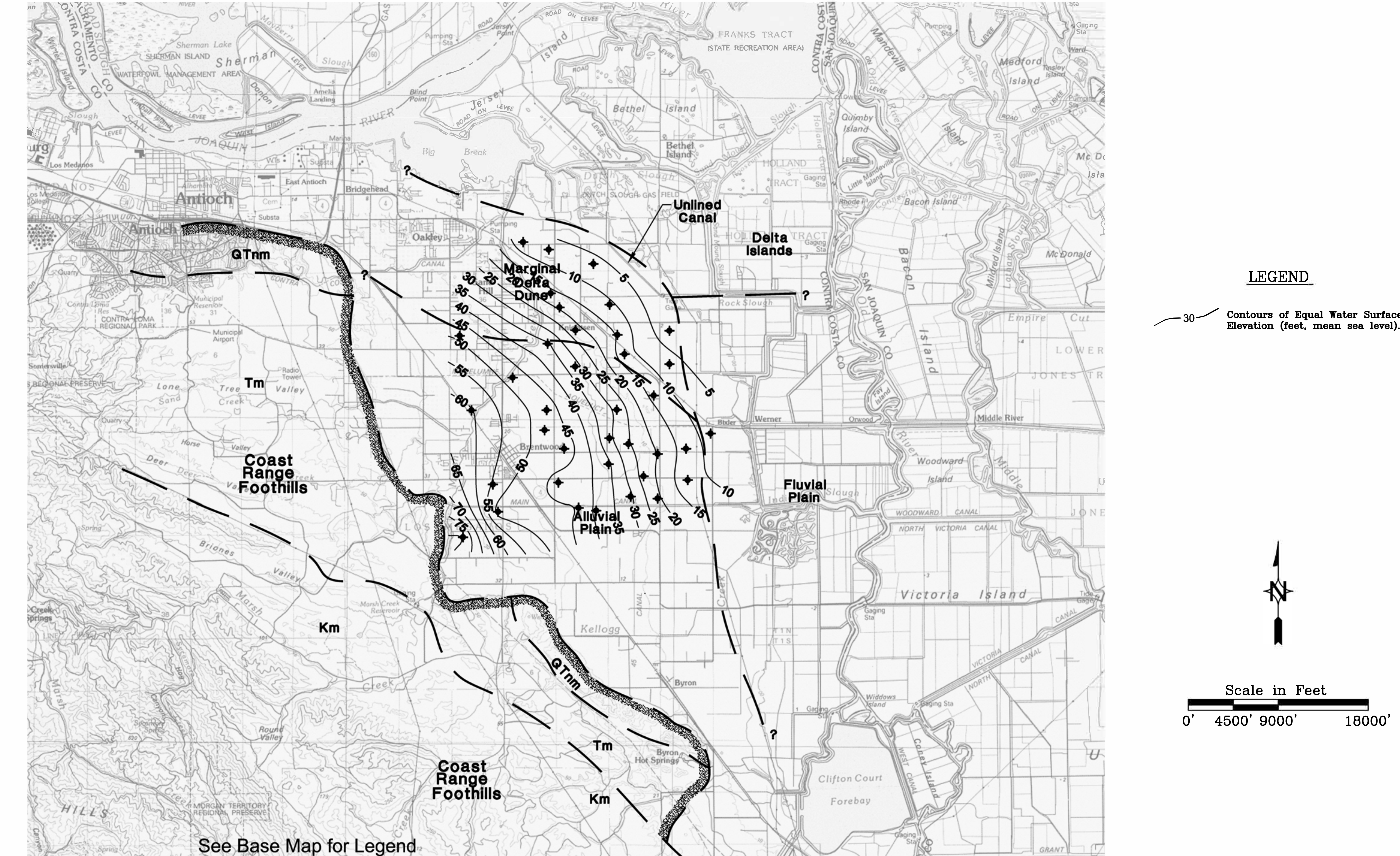
N

Scale in Feet

0' 4500' 9000' 18000'

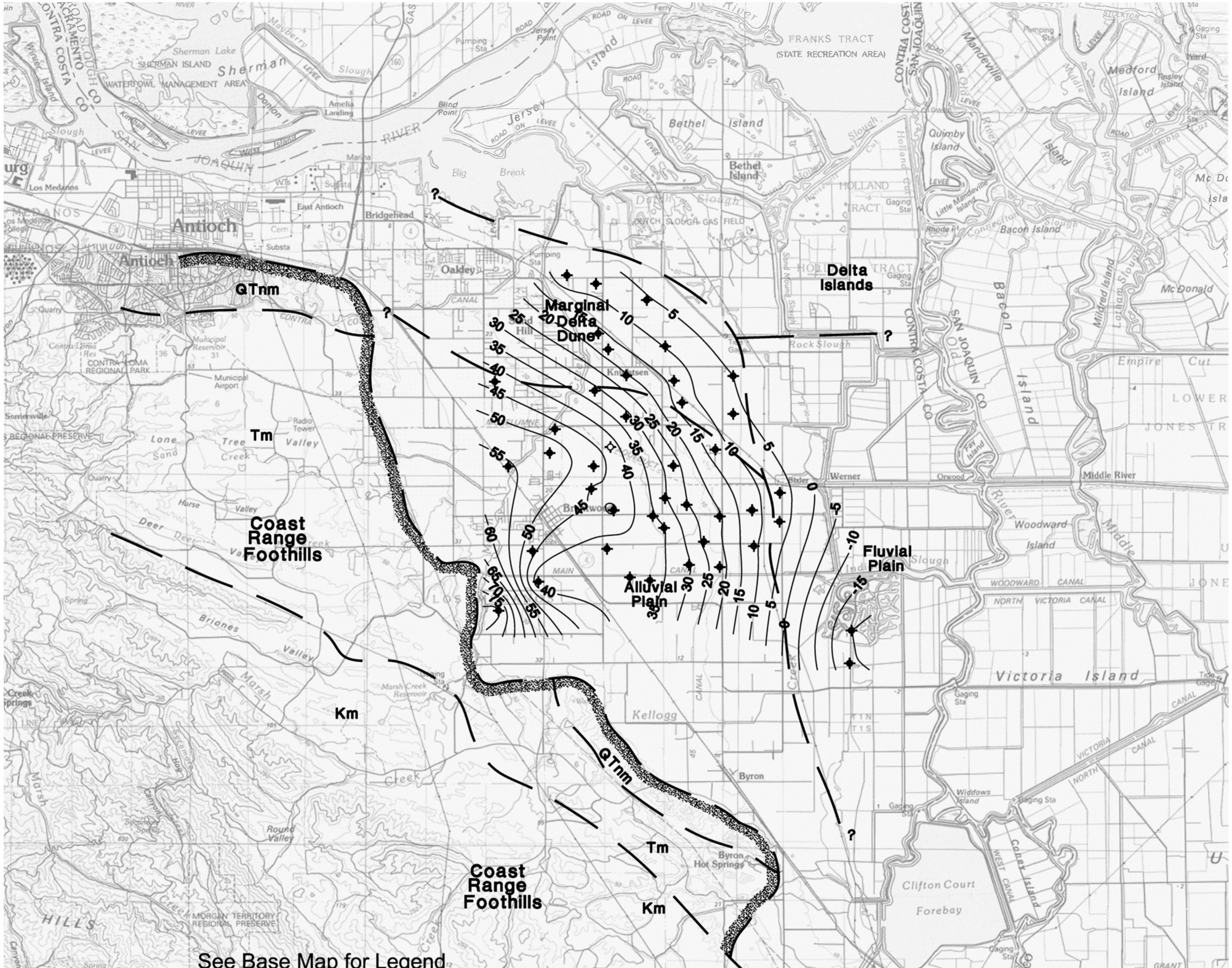
Luhdorff & Scalmanini
Consulting Engineers

**Contours of Equal Ground-Water Elevation - Spring 1977**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




**Contours of Equal Ground-Water Elevation - Fall 1986 East Contra Costa Subbasin Groundwater Sustainability Plan Contra Costa County, California**

Luhdorff & Scalmanini Consulting Engineers




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

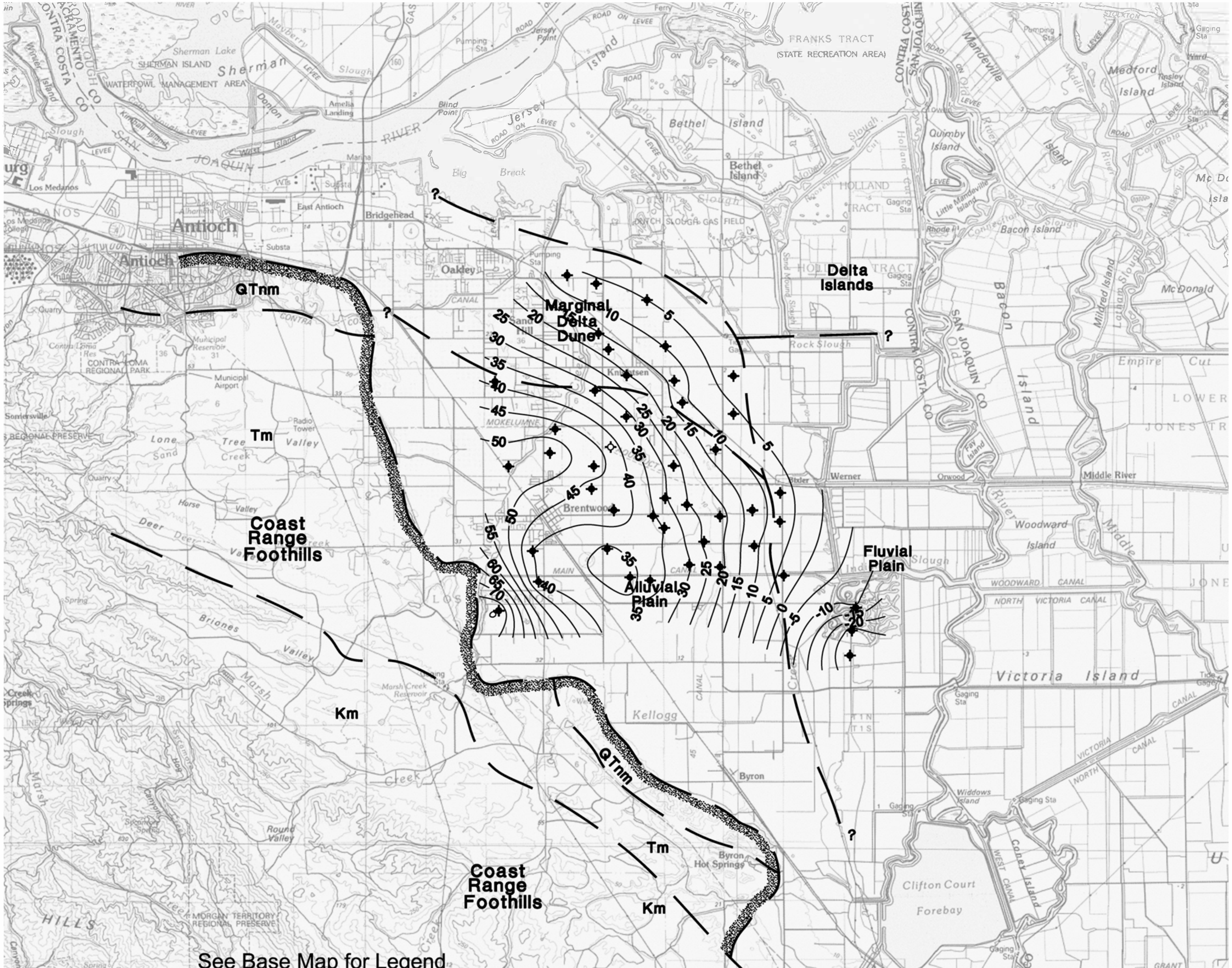
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Spr1991wl.dwg

Luhdorff & Scalmanini
Consulting Engineers

**Contours of Equal Ground-Water Elevation - Spring 1991**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




East County Water Management Assoc./97-1-131/Fall1991wl.dwg

LEGEND

—30— Contours of Equal Water Surface Elevation (feet, mean sea level).

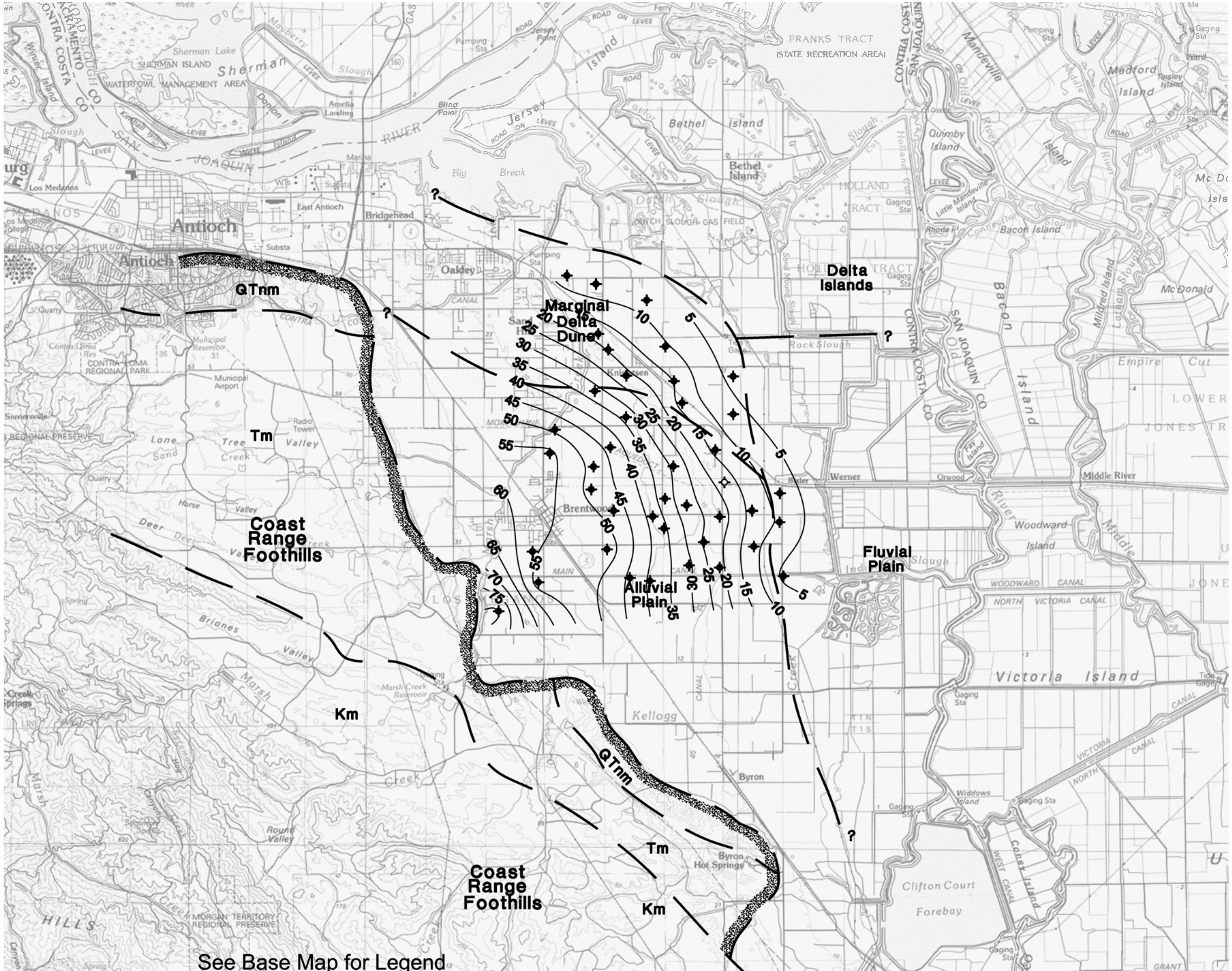
N

Scale in Feet

0' 4500' 9000' 18000'

Luhdorff & Scalmanini Consulting Engineers

**Contours of Equal Ground-Water Elevation - Fall 1991 East**
**Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




LEGEND

30 — Contours of Equal Water Surface Elevation (feet, mean sea level).

N

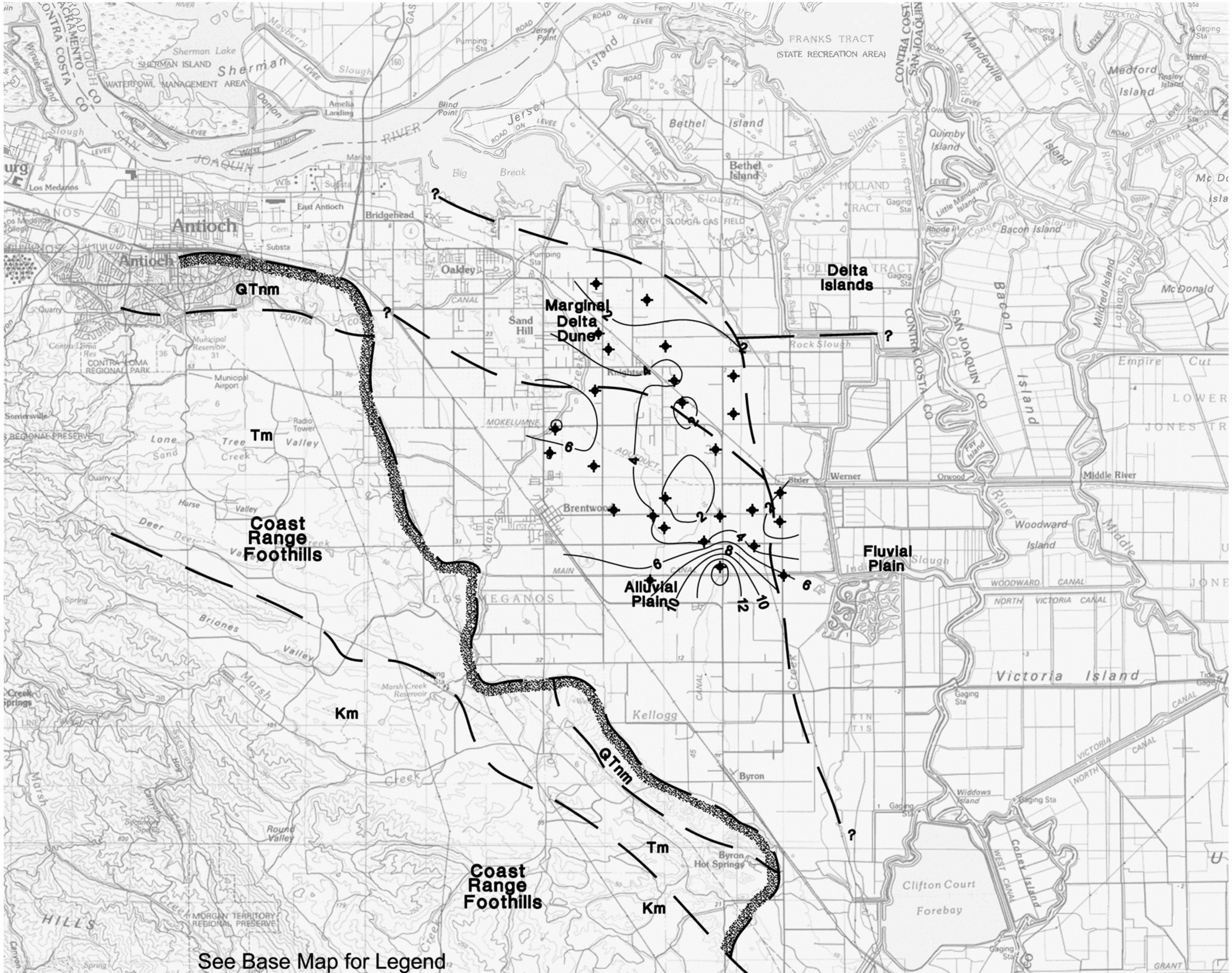
Scale in Feet

0' 4500' 9000' 18000'

East County Water Management Assoc./97-1-131/Fall1996wl.dwg

Luhdorff & Scalmanini Consulting Engineers

**Contours of Equal Ground-Water Elevation - Fall 1996 East Contra Costa Subbasin Groundwater Sustainability Plan Contra Costa County, California**




LEGEND

10 Contours of Depth to Water (feet).

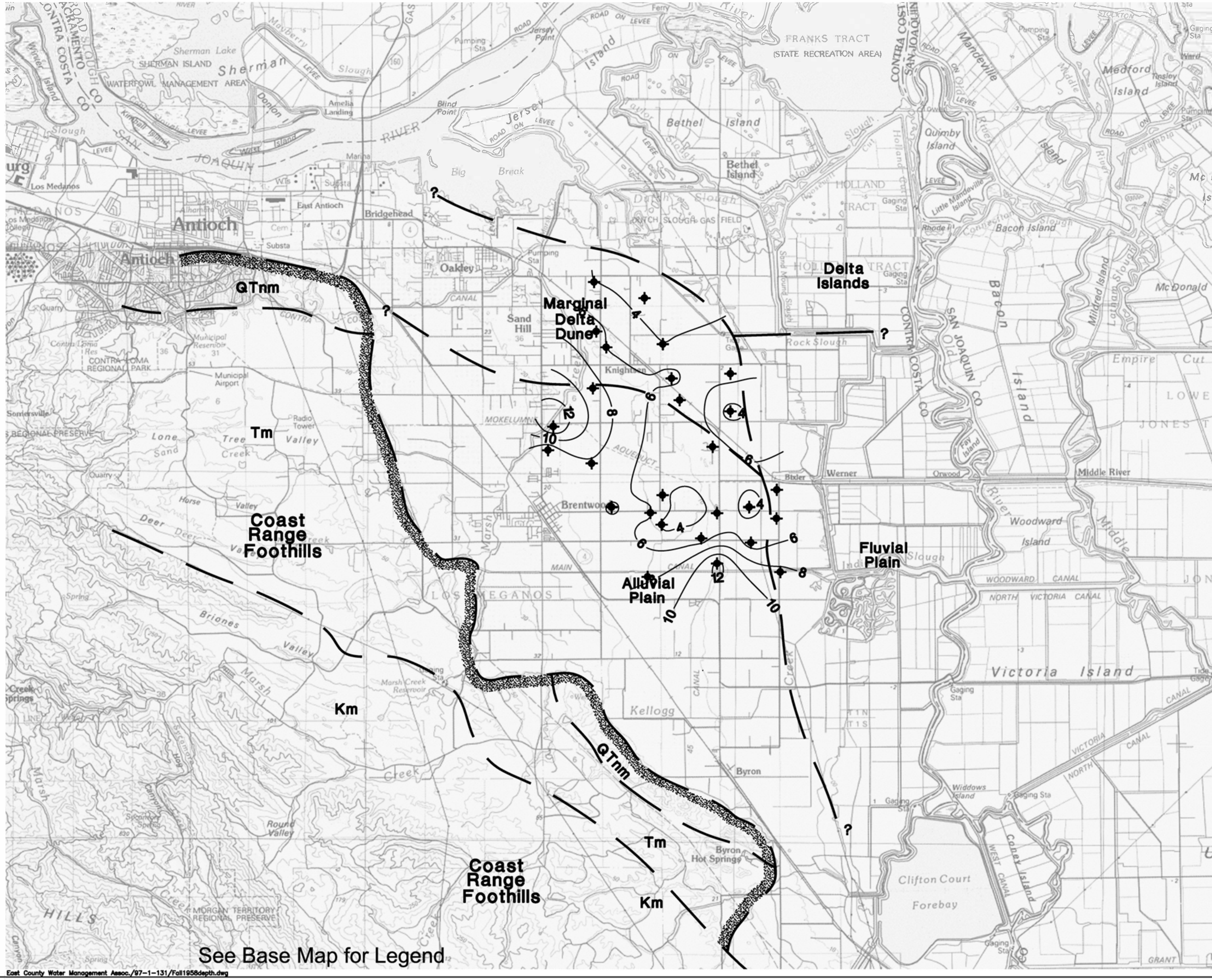
N

Scale in Feet

0' 4500' 9000' 18000'

Luhdorff & Scalmanini
Consulting Engineers

**Contours of Depth to Water - Spring 1958**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




LEGEND

10 — Contours of Depth to Water (feet).

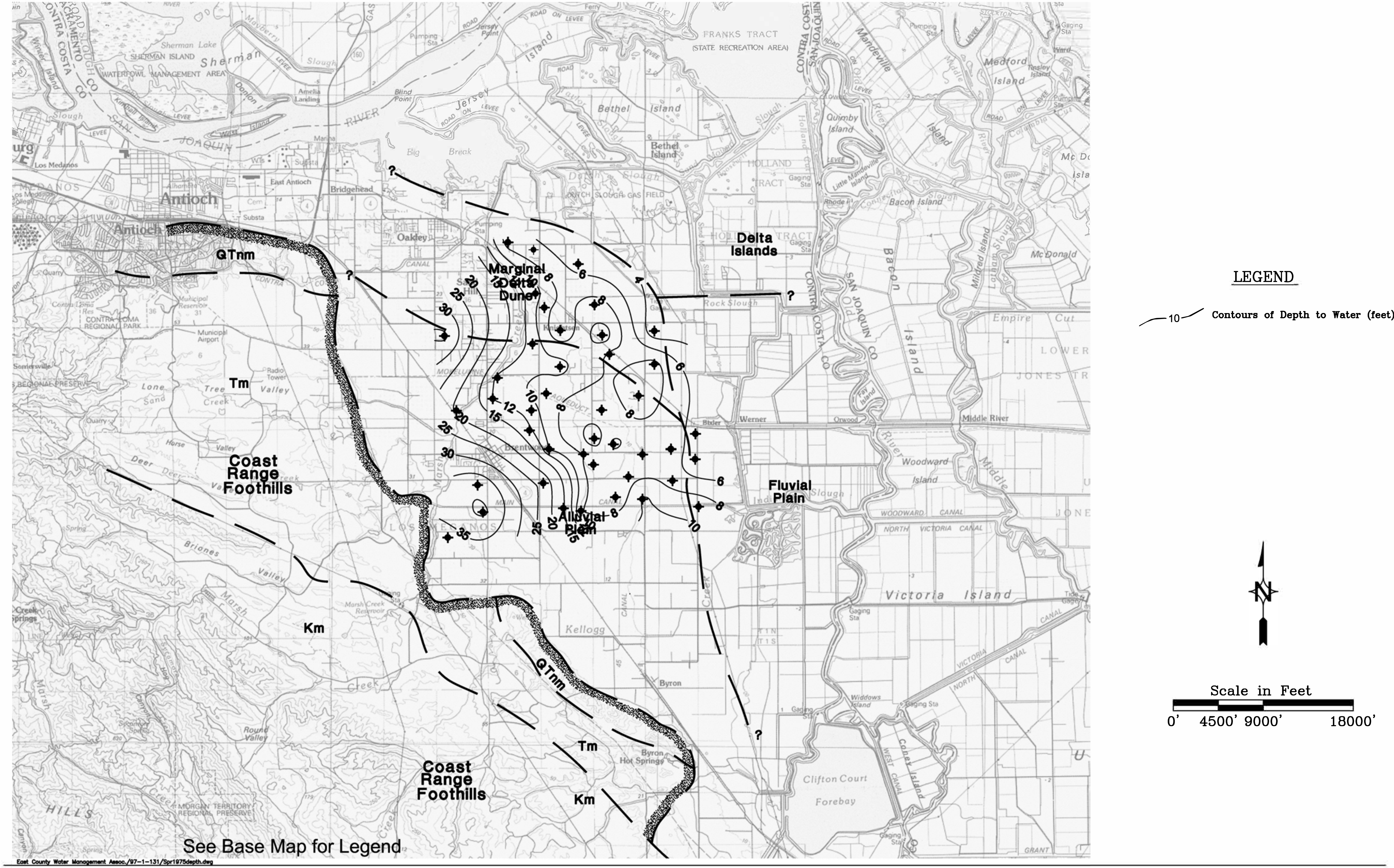
N

Scale in Feet

0' 4500' 9000' 18000'

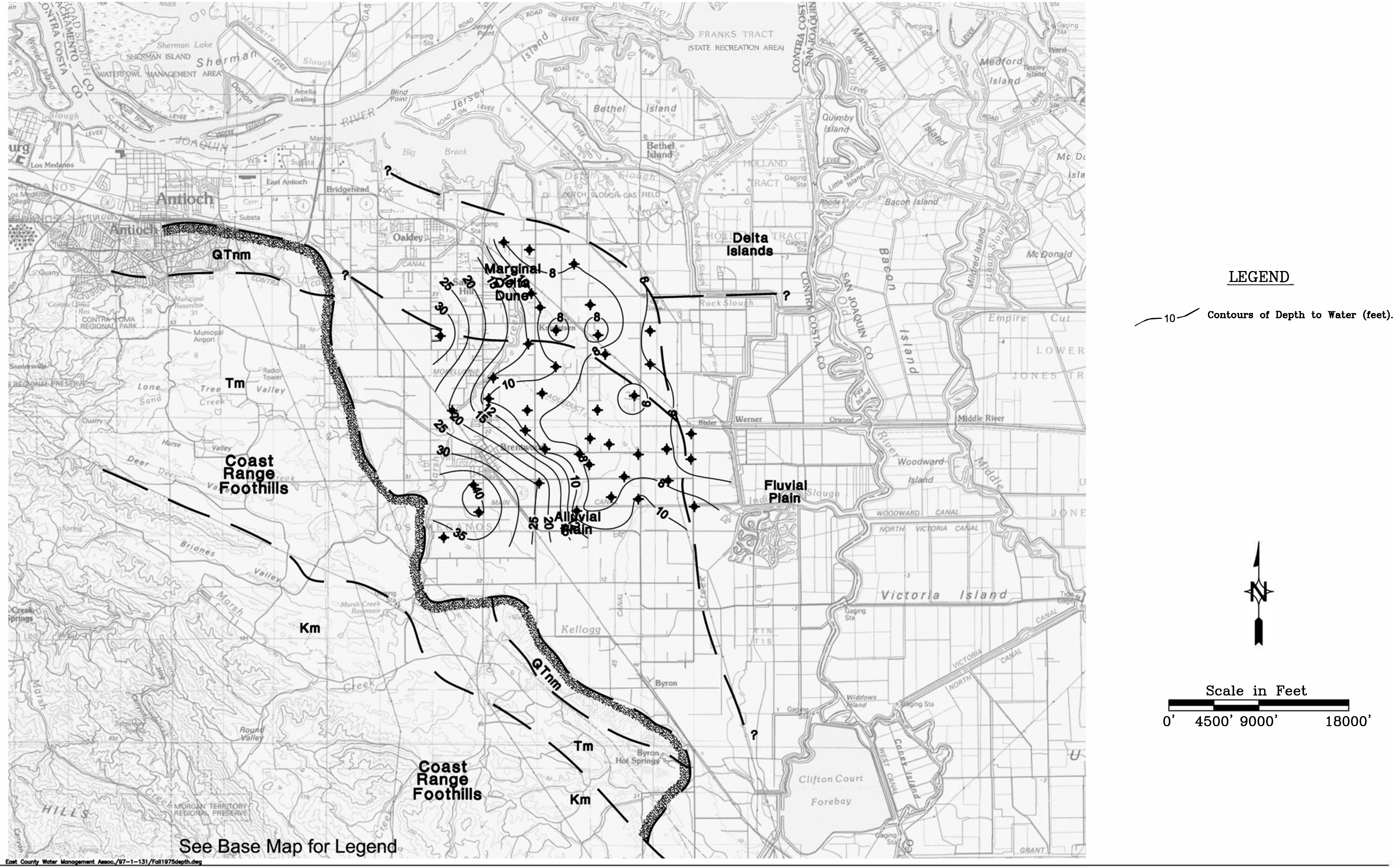
Luhdorff & Scalmanini Consulting Engineers

**Contours of Depth to Water - Fall 1958**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**



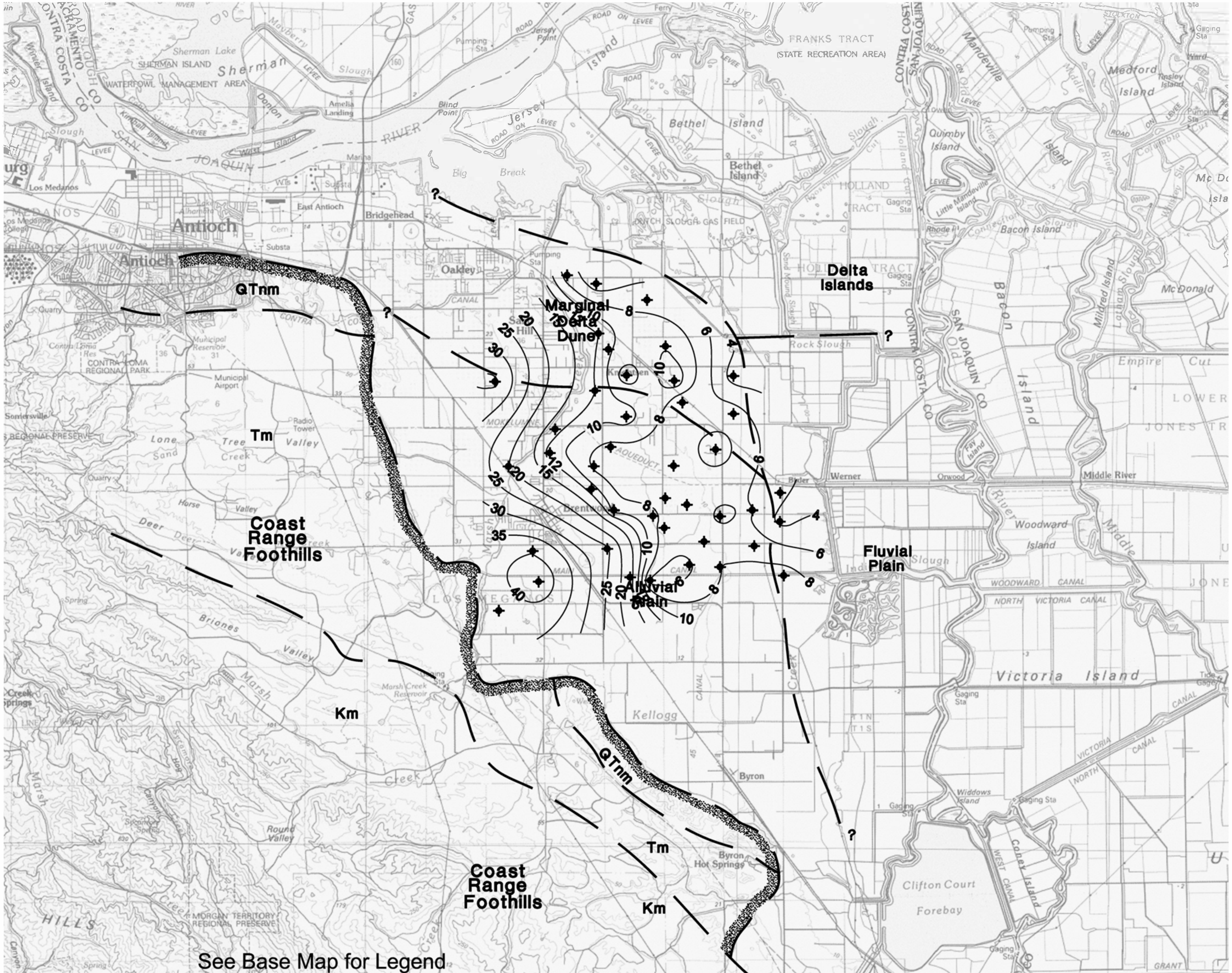

Luhdorff & Scalmanini Consulting Engineers

**Contours of Depth to Water - Spring 1975**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




Luhdorff & Scalmanini
Consulting Engineers

**Contours of Depth to Water - Fall 1975**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




LEGEND

10 Contours of Depth to Water (feet).

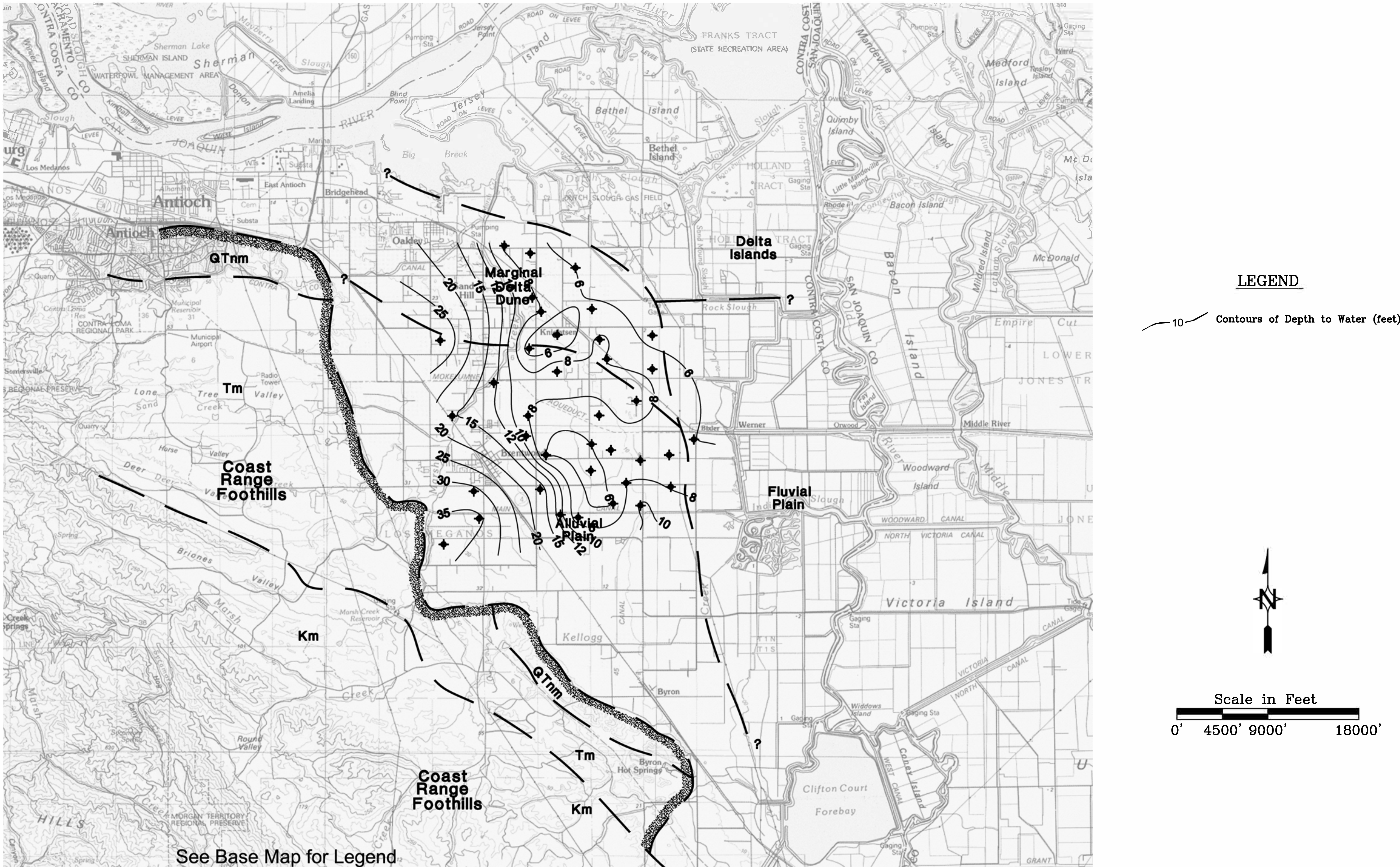
N

Scale in Feet

0' 4500' 9000' 18000'

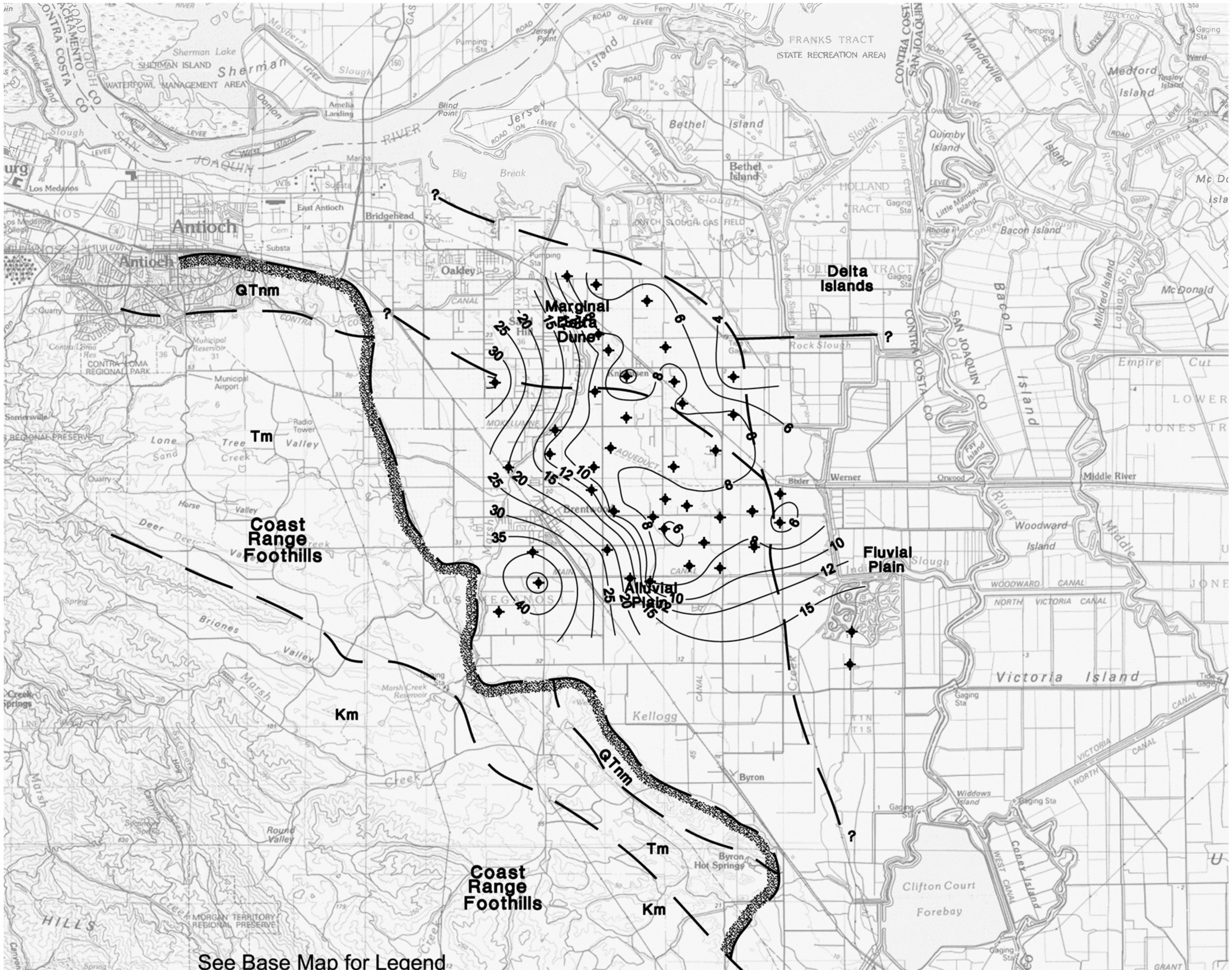
Luhdorff & Scalmanini Consulting Engineers

**Contours of Depth to Water - Spring 1977**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




Luhdorff & Scalmanini Consulting Engineers

**Contours of Depth to Water - Fall 1986**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




East County Water Management Assoc./97-1-131/Spr1991depth.dwg

LEGEND

10 Contours of Depth to Water (feet).

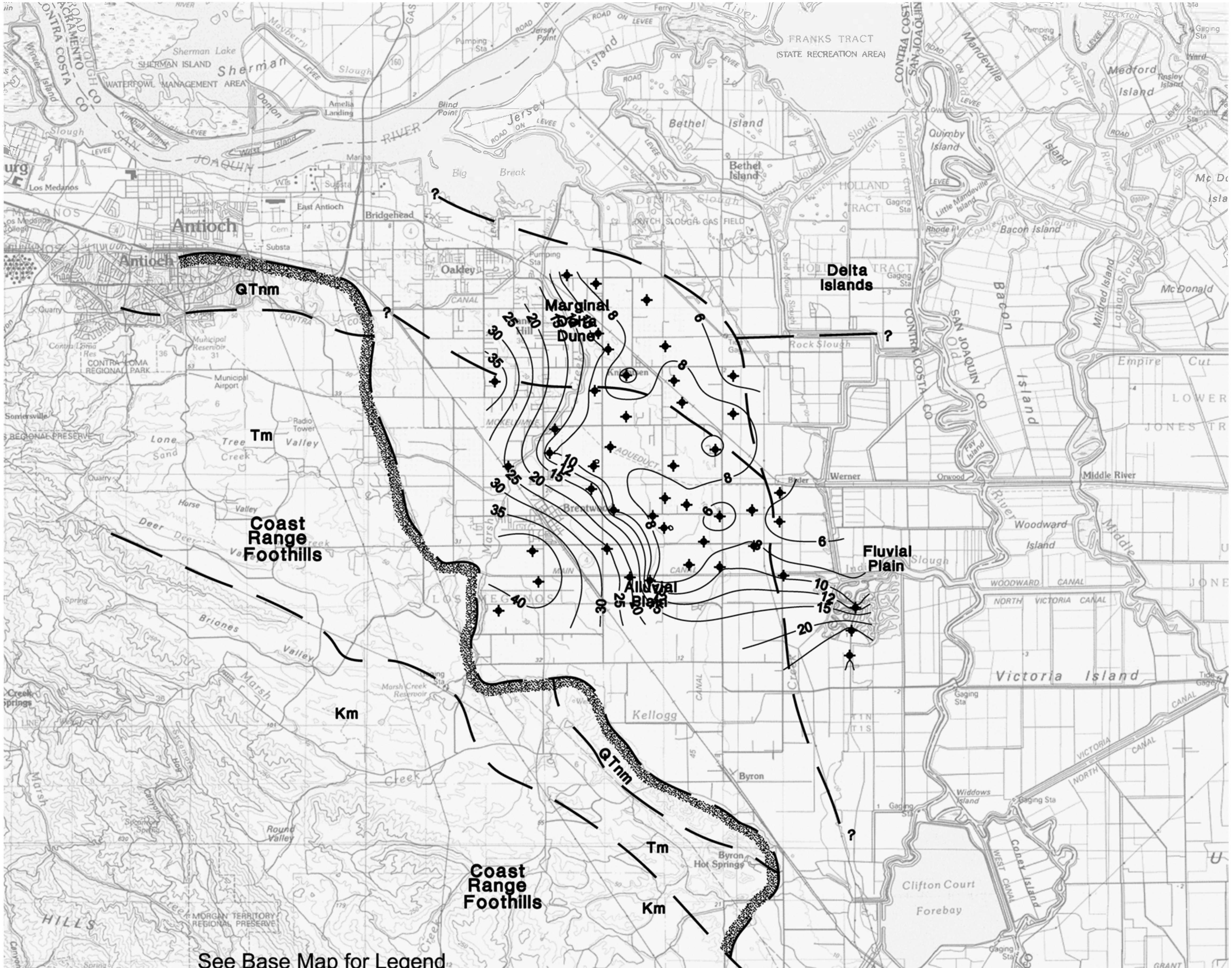
N

Scale in Feet

0' 4500' 9000' 18000'

Luhdorff & Scalmanini
Consulting Engineers

**Contours of Depth to Water - Spring 1991**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




LEGEND

10 Contours of Depth to Water (feet).

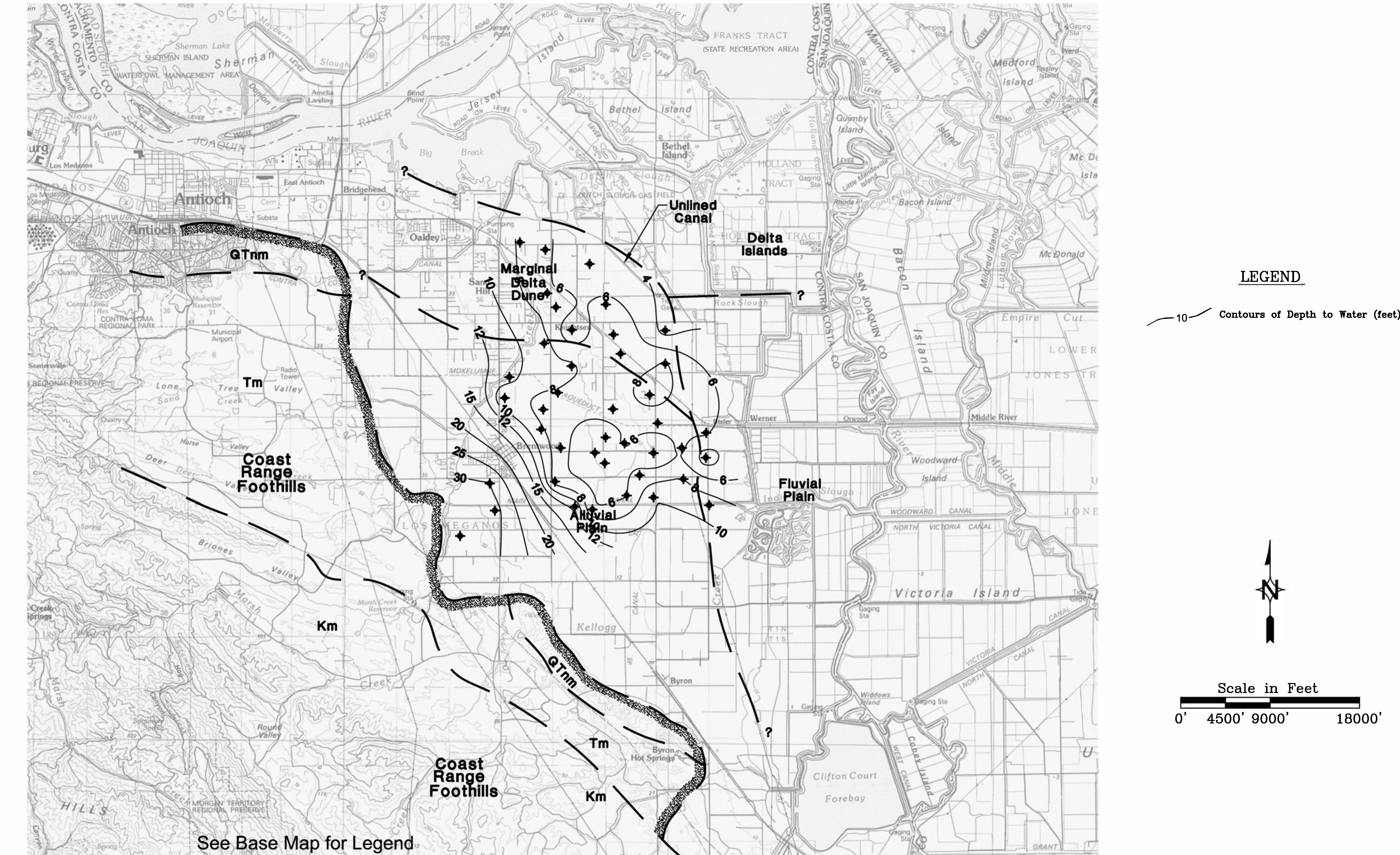
N

Scale in Feet

0' 4500' 9000' 18000'

Luhdorff & Scalmanini Consulting Engineers

**Contours of Depth to Water - Fall 1991**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**




Luhdorff & Scalmanini Consulting Engineers

**Contours of Depth to Water - Fall 1996**
**East Contra Costa Subbasin Groundwater Sustainability Plan**
**Contra Costa County, California**

# APPENDIX 3f

**Groundwater Quality Table**

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| BG-1 | 12/17/2008 | - | **1180** | - | - | 139 | 70 | 103 | 5 | 116 | **370** | - | **27.6** | - | - | <2 | 200 | - | 2 | - | <0.01 | 120 | **70** | - | <20 |
| BG-1 | 2/17/2009 | - | **1410** | - | - | 178 | 95 | 116 | 4 | 107 | **500** | - | **27.8** | - | - | <2 | 200 | - | 2 | - | <0.01 | 60 | **90** | - | <20 |
| BG-1 | 5/12/2009 | - | **1720** | - | - | 187 | 100 | 111 | 3 | 108 | **580** | - | **31.4** | - | - | <2 | 200 | - | 2 | - | <0.01 | 80 | 40 | - | <20 |
| BG-1 | 8/4/2009 | - | **1580** | - | - | 185 | 93 | 125 | 3 | 114 | **490** | - | **33.4** | - | - | <2 | 300 | - | 3 | - | <0.01 | 140 | **60** | - | <20 |
| BG-1 | 11/10/2009 | - | **1670** | - | - | 178 | 98 | 116 | 2 | 111 | **520** | - | **32.3** | - | - | <2 | 200 | - | 3 | - | <0.01 | <50 | <10 | - | <20 |
| BG-1 | 2/25/2010 | - | **1480** | - | - | 177 | 100 | 123 | 3 | 119 | **520** | - | **31.2** | - | - | <2 | 200 | - | 2 | - | <0.01 | 80 | <10 | - | <20 |
| BG-1 | 5/26/2010 | - | **1640** | - | - | 199 | 104 | 128 | 2 | 121 | **610** | - | **32.5** | - | - | <2 | 200 | - | 3 | - | <0.01 | 80 | 10 | - | <20 |
| BG-1 | 8/12/2010 | - | **1740** | - | - | 184 | 101 | 124 | 2 | 132 | **610** | - | **29.1** | - | - | <2 | 200 | - | 3 | - | <0.01 | 70 | <10 | - | 20 |
| BG-1 | 11/15/2010 | **3864** | **1520** | - | 160 | 157 | 81 | 114 | 2 | - | **403** | 190 | **31.4** | - | - | - | - | - | 3 | - | <0.001 | <50 | <10 | - | <0.84 |
| BG-1 | 2/24/2011 | **2251** | **1280** | - | 150 | 155 | 84 | 105 | 2 | - | **500** | 190 | **32.8** | - | - | - | - | - | 3 | - | <0.001 | <50 | <10 | - | <20 |
| BG-1 | 5/15/2011 | **2070** | **1420** | - | 150 | 151 | 81 | 108 | 2 | - | **470** | 190 | - | - | - | - | - | - | 3 | - | <0.001 | <50 | <10 | - | <20 |
| BG-1 | 8/23/2011 | **1927** | **1250** | - | - | - | - | 108 | - | - | **358** | - | **32** | - | - | - | 200 | - | - | - | - | - | - | - | - |
| BG-1 | 12/20/2011 | **1628** | **970** | - | 160 | 119 | 66 | 94 | 2 | - | **316** | 190 | **31** | - | - | <2 | - | - | 4 | - | <0.001 | <50 | <10 | - | <20 |
| BG-1 | 2/27/2012 | **1716** | **1080** | - | - | - | - | 105 | - | - | **305** | - | **32** | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-1 | 5/23/2012 | **1675** | **1020** | - | 163 | 121 | 64.6 | 153 | 1.52 | - | **294** | 199 | **29** | - | - | 2.31 | - | - | 3.65 | - | <0.001 | <50 | <10 | - | <20 |
| BG-1 | 8/13/2012 | **1598** | **1010** | - | - | - | - | 99 | - | - | 233 | - | **28** | - | - | - | 200 | - | - | - | - | - | - | - | - |
| BG-1 | 11/13/2012 | **1545** | **920** | - | 160 | 114 | 61 | 94 | 2 | - | 239 | 190 | **29** | - | - | 3 | - | - | 6 | - | <0.001 | <50 | <10 | - | <20 |
| BG-1 | 2/18/2013 | **1506** | **897** | - | - | - | - | 96.7 | - | - | 242 | - | **27.1** | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-1 | 5/15/2013 | **1490** | **944** | - | 170 | 111 | 58.3 | 93.4 | 1.48 | - | 235 | 208 | **27.1** | - | - | - | - | - | 3.44 | - | <0.001 | <50 | <10 | - | <20 |
| BG-1 | 8/15/2013 | **1479** | **925** | - | - | - | - | 87.7 | - | - | **266** | - | **28.7** | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-1 | 11/11/2013 | **1370** | **888** | - | 154 | 104 | 54.8 | 88.2 | 1.17 | - | 193 | 188 | **26.2** | - | - | - | - | - | - | - | - | <50 | <10 | - | <20 |
| BG-1 | 2/17/2014 | **1358** | **830** | - | - | - | - | 87.7 | - | - | 195 | - | **29.4** | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-1 | 5/15/2014 | **1367** | **914** | - | 145 | 92.7 | 50 | 79 | <1 | - | 201 | 176 | **21** | - | - | - | - | - | 4.08 | - | <0.001 | 104 | <10 | - | <20 |
| BG-1 | 8/14/2014 | - | **913** | - | - | - | - | 86 | - | - | 197 | - | **25.1** | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-1 | 11/11/2014 | **1317** | **842** | - | 141 | 92.7 | 48 | 79.8 | 1.22 | - | 190 | 172 | **27.1** | - | - | - | - | - | 4.56 | - | <0.001 | 99.4 | <10 | - | <20 |
| BG-1 | 2/16/2015 | - | **908** | - | - | - | - | 82.2 | - | - | **259** | - | **27.4** | - | - | - | 237 | - | - | - | - | - | - | - | - |
| BG-1 | 6/8/2015 | - | **749** | - | - | 86.2 | 43.5 | 76 | 1.18 | 97.1 | 169 | 161 | **26** | 0.122 | - | 3.38 | 220 | - | 3.48 | - | <0.001 | ND | 5.17 | - | 1.35 |
| BG-1 | 8/17/2015 | - | **919** | - | - | - | - | 79.7 | - | - | 171 | - | **26.9** | - | - | - | 253 | - | - | - | - | - | - | - | - |
| BG-1 | 12/7/2017 | - | **896** | - | - | 81.6 | 43.3 | 66.9 | 1.08 | 125 | 194 | 170 | **31** | 0.137 | - | 1.95 | 227 | - | 3.79 | - | 0.00153 | 134 | 18.2 | - | 8.75 |
| BG-2 | 2/17/2008 | - | **1520** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-2 | 12/17/2008 | - | **1550** | - | - | 185 | 88 | 198 | 8 | **390** | **290** | - | **28.7** | - | - | 2 | **1800** | - | 3 | - | <0.01 | 140 | **250** | - | <20 |
| BG-2 | 2/17/2009 | - | **1520** | - | - | 192 | 91 | 197 | 7 | **380** | **280** | - | **28.7** | - | - | 4 | **1900** | - | 2 | - | <0.01 | 60 | **130** | - | <20 |
| BG-2 | 5/12/2009 | - | **1520** | - | - | 180 | 86 | 185 | 6 | **380** | **270** | - | **30.5** | - | - | 3 | **1800** | - | 2 | - | <0.01 | 90 | **60** | - | <20 |
| BG-2 | 8/4/2009 | - | **1450** | - | - | 191 | 85 | 206 | 7 | **400** | **270** | - | **25.5** | - | - | 3 | **1900** | - | 2 | - | <0.01 | 160 | **70** | - | <20 |
| BG-2 | 11/10/2009 | - | **1440** | - | - | 172 | 84 | 185 | 6 | **370** | **280** | - | **19.8** | - | - | 3 | **1900** | - | 3 | - | <0.01 | <50 | 50 | - | <20 |
| BG-2 | 2/25/2010 | - | **1450** | - | - | 177 | 87 | 183 | 6 | **350** | **270** | - | **16.9** | - | - | 3 | **1900** | - | <0.001 | - | <0.01 | 60 | 40 | - | <20 |
| BG-2 | 5/26/2010 | - | **1520** | - | - | 184 | 87 | 178 | 6 | **390** | **280** | - | **16.7** | - | - | 2 | **1800** | - | 1 | - | <0.01 | 50 | 40 | - | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (μmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (μg/L) 1000[a] | As[2] (μg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (μg/L) 50[a] | Cr (VI) (μg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (μg/L) 50[b] | Se (μg/L) 50[a] | Zn (ug/L) 5000[a] |

## Shallow Aquifer

### City of Brentwood

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BG-2 | 8/12/2010 | - | **1550** | - | - | 188 | 89 | 175 | 6 | **440** | **310** | - | **15.4** | - | - | 2 | **1800** | - | 3 | - | <0.01 | 70 | 40 | - | <20 |
| BG-2 | 11/15/2010 | **4500** | - | - | 380 | 204 | 95 | 183 | 6 | - | **277** | 460 | - | - | - | - | - | - | 3 | - | <0.001 | 60 | 40 | - | <0.84 |
| BG-2 | 2/24/2011 | **2414** | - | - | 370 | 186 | 87 | 156 | 5 | - | **280** | 450 | - | - | - | - | - | - | 2 | - | <0.001 | 60 | 30 | - | <20 |
| BG-2 | 5/15/2011 | **2350** | - | - | 390 | 214 | 96 | 178 | 6 | - | **300** | 470 | - | - | - | - | - | - | 2 | - | <0.001 | 80 | 40 | - | <20 |
| BG-2 | 8/23/2011 | **2419** | **1600** | - | - | - | - | 187 | - | - | **260** | - | **14.7** | - | - | - | **1800** | - | - | - | - | - | - | - | - |
| BG-2 | 12/20/2011 | **2232** | **1570** | - | 410 | 189 | 88 | 163 | 6 | - | **280** | 500 | **15.9** | - | - | 2 | - | - | 2 | - | 0.001 | <50 | 30 | - | <20 |
| BG-2 | 2/27/2012 | **2431** | **1620** | - | - | - | - | 194 | - | - | **280** | - | **17.9** | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-2 | 5/23/2012 | **2418** | **1620** | - | 397 | 209 | 92.9 | 193 | 5.92 | - | **290** | 485 | **17.6** | - | - | 2.69 | - | - | 2.59 | - | <0.001 | <50 | 24.5 | - | <20 |
| BG-2 | 8/13/2012 | **2441** | **1600** | - | - | - | - | 192 | - | - | - | - | **16** | - | - | - | **1800** | - | - | - | - | - | - | - | - |
| BG-2 | 11/13/2012 | **2342** | **1580** | - | 400 | 208 | 93 | 188 | 6 | - | **270** | 490 | **66.7** | - | - | 6 | **1800** | - | 7 | - | 0.003 | <50 | 30 | - | <20 |
| BG-2 | 2/18/2013 | **2349** | **1580** | - | - | - | - | 195 | - | - | **284** | - | **63** | - | - | - | **1840** | - | - | - | - | - | - | - | - |
| BG-2 | 5/15/2013 | **2344** | **1590** | - | 442 | 205 | 90.5 | 184 | 5.49 | - | **278** | 539 | **55.3** | - | - | 2.17 | **1820** | - | 2.56 | - | 0.00102 | <50 | 23.3 | - | <20 |
| BG-2 | 8/15/2013 | **2305** | **1570** | - | - | - | - | 173 | - | - | **308** | - | **13.8** | - | - | - | **1870** | - | - | - | - | - | - | - | - |
| BG-2 | 11/11/2013 | **2290** | **1610** | - | 433 | 223 | 99.8 | 11 | 6.08 | - | 244 | 529 | **11.1** | - | - | - | **2030** | - | - | - | - | <50 | 25.4 | - | <20 |
| BG-2 | 2/17/2014 | **2328** | **1540** | - | - | - | - | 188 | - | - | **266** | - | 10 | - | - | - | **2070** | - | - | - | - | - | - | - | - |
| BG-2 | 5/15/2014 | **2275** | **1540** | - | 415 | 184 | 83.6 | 172 | 5.29 | - | **260** | 506 | **11.2** | - | - | 2.26 | **1930** | - | 4.2 | - | <0.001 | 102 | 21 | - | <20 |
| BG-2 | 8/14/2014 | - | **1540** | - | - | - | - | 172 | - | - | **255** | - | **40.5** | - | - | - | **1940** | - | - | - | - | - | - | - | - |
| BG-2 | 11/11/2014 | **2323** | **1580** | - | 440 | 200 | 87.9 | 171 | 5.38 | - | **270** | 536 | **36.9** | - | - | 2.32 | **1940** | - | 3.04 | - | 0.0341 | 162 | 21.4 | - | <20 |
| BG-2 | 2/15/2015 | - | **1610** | - | - | - | - | 174 | - | - | **278** | - | **33.1** | - | - | - | **2040** | - | - | - | - | - | - | - | - |
| BG-2 | 2/16/2015 | - | **1610** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-2 | 6/8/2015 | - | **1620** | - | - | 193 | 87.6 | 184 | 6.39 | 28.3 | 250 | 561 | 6.4 | 0.096 | - | 4.41 | **2030** | - | 3.45 | - | <0.001 | ND | 3.91 | - | 2.2 |
| BG-2 | 8/17/2015 | - | **1610** | - | - | - | - | 192 | - | - | **258** | - | 6.4 | - | - | - | **2020** | - | - | - | - | - | - | - | - |
| BG-2 | 12/7/2017 | - | **1580** | - | - | 165 | 72.7 | 176 | 4.59 | **404** | **292** | 585 | 5.2 | 0.115 | - | 2.62 | **1800** | - | 5.18 | - | 0.0023 | 38.1 | 7.2 | - | 4.83 |
| BG-3 | 2/17/2008 | - | **740** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BG-3 | 12/17/2008 | - | **710** | - | - | 76 | 35 | 147 | 16 | 109 | 152 | - | **14.1** | - | - | 4 | 900 | - | 32 | - | <0.01 | 120 | <10 | - | <20 |
| BG-3 | 2/17/2009 | - | **740** | - | - | 72 | 35 | 148 | 14 | 110 | 140 | - | **14.8** | - | - | 5 | 800 | - | 11 | - | <0.01 | <50 | 10 | - | <20 |
| BG-3 | 5/12/2009 | - | **780** | - | - | 90 | 49 | 135 | 5 | 135 | 148 | - | **16.6** | - | - | 3 | 900 | - | 3 | - | <0.01 | 100 | 50 | - | <20 |
| BG-3 | 8/4/2009 | - | **760** | - | - | 78 | 40 | 136 | 6 | 120 | 137 | - | **14.6** | - | - | 3 | 900 | - | 8 | - | <0.01 | 50 | <10 | - | <20 |
| BG-3 | 11/10/2009 | - | **770** | - | - | 76 | 40 | 132 | 5 | 117 | 139 | - | **14.1** | - | - | 4 | 900 | - | 6 | - | <0.01 | 50 | 10 | - | <20 |
| BG-3 | 2/25/2010 | - | **750** | - | - | 78 | 41 | 135 | 5 | 116 | 137 | - | **13.2** | - | - | 4 | 900 | - | 5 | - | <0.01 | <50 | 10 | - | <20 |
| BG-3 | 5/26/2010 | - | **770** | - | - | 84 | 43 | 124 | 3 | 119 | 142 | - | **13.4** | - | - | 4 | 900 | - | 3 | - | <0.01 | <50 | 10 | - | <20 |
| BG-3 | 11/16/2010 | **1300** | **790** | - | 290 | 87 | 40 | 139 | 5 | - | 144 | 350 | **11.1** | - | - | <2 | 1000 | - | 6 | - | <0.001 | <50 | 10 | - | <0.84 |
| BG-3 | 2/24/2011 | **1373** | **810** | - | 300 | 80 | 41 | 119 | 3 | - | 159 | 360 | **10.9** | - | - | 3 | 1000 | - | 5 | - | <0.001 | 80 | 36 | - | <20 |
| BG-3 | 5/15/2011 | **1360** | **810** | - | 300 | 90 | 44 | 130 | 5 | - | 158 | 360 | <0.1 | - | - | 3 | 1000 | - | 6 | - | <0.001 | 100 | <10 | - | <20 |
| BG-3 | 8/23/2011 | **1365** | **760** | - | - | - | - | 141 | - | - | 156 | - | 8.6 | - | - | - | **1100** | - | - | - | - | - | - | - | - |
| BG-3 | 12/20/2011 | **1279** | **750** | - | 310 | 79 | 41 | 124 | 4 | - | 164 | 380 | 7.8 | - | - | 3 | 1000 | - | 7 | - | <0.001 | <50 | <10 | - | <20 |
| BG-3 | 2/27/2012 | **1416** | **820** | - | - | - | - | 140 | - | - | 170 | - | 7.2 | - | - | - | **1100** | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) | Anions: Cl (mg/L) | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) | Anions: F (mg/L) | Trace Elements: Al (µg/L) | Trace Elements: As[2] (µg/L) | Trace Elements: B (ug/L) | Trace Elements: Ba (ug/L) | Trace Elements: Cr (µg/L) | Trace Elements: Cr (VI) (µg/L) | Trace Elements: Cu (mg/L) | Trace Elements: Fe (ug/L) | Trace Elements: Mn (µg/L) | Trace Elements: Se (µg/L) | Trace Elements: Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| BG-3 | 5/23/2012 | **1408** | **811** | - | 318 | 88 | 43.6 | 142 | <0.1 | - | 177 | 388 | 7.1 | - | - | 3.6 | **1060** | - | 8.85 | - | <0.001 | <50 | <10 | - | <20 |
| BG-3 | 8/13/2012 | **1384** | **780** | - | - | - | - | 153 | - | - | 159 | - | 5.4 | - | - | - | 1000 | - | - | - | - | - | - | - | - |
| BG-3 | 11/13/2012 | **1315** | **800** | - | 340 | 92 | 45 | 147 | 4 | - | 173 | 420 | **24.6** | - | - | 4 | **1100** | - | 12 | - | 0.001 | 80 | <10 | - | <20 |
| BG-3 | 2/18/2013 | **1336** | **819** | - | - | - | - | 150 | - | - | 189 | - | **21.9** | - | - | - | **1100** | - | - | - | - | - | - | - | - |
| BG-3 | 5/15/2013 | **1303** | **831** | - | 315 | 88 | 43.6 | 150 | 4.44 | - | 201 | 384 | <0.1 | - | - | 2.68 | **1120** | - | 5.6 | - | <0.001 | <50 | 13 | - | <20 |
| BG-3 | 8/15/2013 | **1366** | **828** | - | - | - | - | 149 | - | - | 226 | - | 8.5 | - | - | - | **1110** | - | - | - | - | - | - | - | - |
| BG-3 | 11/11/2013 | **1400** | **860** | - | 305 | 94.1 | 47.3 | 143 | 2.89 | - | 188 | 373 | 7.1 | - | - | - | **1150** | - | - | - | - | <50 | **11300** | - | <20 |
| BG-3 | 2/17/2014 | **1387** | **825** | - | - | - | - | 150 | - | - | 203 | - | 6.89 | - | - | - | **1250** | - | - | - | - | - | - | - | - |
| BG-3 | 5/15/2014 | **1385** | **865** | - | 288 | 83.1 | 41.2 | 137 | 4.07 | - | 201 | 352 | 7.74 | - | - | 2.63 | **1100** | - | 8.14 | - | <0.001 | ND | <10 | - | <20 |
| BG-3 | 8/14/2014 | - | **818** | - | - | - | - | 138 | - | - | 185 | - | **37** | - | - | - | **1080** | - | - | - | - | - | - | - | - |
| BG-3 | 11/11/2014 | **1399** | **770** | - | 271 | 81.2 | 40.2 | 133 | 4.1 | - | 206 | 330 | 6.7 | - | - | 2.68 | **1080** | - | 7.58 | - | 0.00152 | 82 | ND | - | <20 |
| BG-3 | 2/15/2015 | - | **844** | - | - | - | - | 138 | - | - | 227 | - | **24** | - | - | - | **1130** | - | - | - | - | - | - | - | - |
| BG-3 | 6/8/2015 | - | **858** | - | - | 86.6 | 41.5 | 138 | 4.46 | 98.3 | 215 | 332 | 4.9 | 0.098 | - | 4.49 | **1020** | - | 7.7 | - | 0.00133 | ND | 2.9 | - | 0.873 |
| BG-3 | 8/17/2015 | - | **893** | - | - | - | - | 144 | - | - | 214 | - | 5.1 | - | - | - | **1100** | - | - | - | - | - | - | - | - |
| BG-3 | 12/7/2017 | - | **978** | - | - | 94.5 | 46.2 | 141 | 4.28 | 113 | **267** | 408 | 8.4 | 0.106 | - | 2.90 | **1130** | - | 9.59 | - | 0.0017 | 17.1 | 5.19 | - | 3.77 |
| WELL 01 | 8/16/1990 | **2045** | **1166** | - | 306 | 132 | 68.2 | 140 | 5.1 | 155 | **337** | 306 | **11.4** | 0.31 | 184 | 10 | - | 113 | 16 | - | - | 100 | 10 | 5 | 50 |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1BMW-140 | 3/19/2013 | **2000** | **1100** | 7.56 | 470 | 61 | 59 | 290 | 2 | 61 | **360** | 470 | <0.45 | 0.44 | - | - | - | - | - | - | - | <100 | **570** | - | - |
| 4AMW-152 | 3/20/2013 | **6800** | **5000** | 7.21 | 300 | 460 | 320 | 480 | 2.5 | **320** | **2000** | 300 | <0.45 | 0.11 | - | - | - | - | - | - | - | - | - | - | - |
| 7MW-115 | 3/20/2013 | **6500** | **5400** | 7.34 | 280 | 400 | 260 | 630 | 3.9 | **310** | **1900** | 280 | <0.45 | 0.59 | - | - | - | - | - | - | - | - | - | - | - |
| BALDOCCHI WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 10/22/2002 | **1400** | **840** | - | 320 | 75 | 38 | 160 | 1.2 | 110 | 190 | 380 | 7.2 | 0.6 | <50 | <2 | - | <100 | <10 | - | - | 100 | <20 | <5 | 50 |
| Well Head | 7/7/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/6/2005 | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/11/2007 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/3/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/2/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/1/2010 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/7/2011 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/4/2012 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/19/2012 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/8/2013 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/8/2014 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/16/2015 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Shallow Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BALDOCCHI WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/19/2016 | - | - | - | - | - | - | - | - | - | - | - | 7.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/12/2017 | - | - | - | - | - | - | - | - | - | - | - | **17** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/16/2018 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/2/2019 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/10/2019 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Byron-Bethany Irrigation District | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 Binn | 8/9/1973 | **3090** | **1720** | 8 | 272 | 52 | 22 | 558 | 5.5 | 160 | **697** | - | 9.4 | - | - | - | **6500** | - | - | - | - | - | - | - | - |
| 5 Binn | 6/24/1975 | **3050** | - | 8.1 | 253 | - | - | 600 | - | - | **778** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 Binn | 7/20/1977 | **4200** | - | 7.9 | 224 | - | - | 780 | - | - | **1210** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 Binn | 8/3/1979 | **1860** | - | 8.5 | 274 | 27 | 10 | 358 | - | - | **358** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 Binn | 11/3/1980 | **2120** | - | 8.4 | 239 | 28 | 11 | - | - | - | **462** | - | - | - | - | - | **4200** | - | - | - | - | - | - | - | - |
| 5 Binn | 5/26/1981 | **1660** | - | 8.4 | 263 | 21 | 8 | - | - | - | **308** | - | - | - | - | - | **3400** | - | - | - | - | - | - | - | - |
| 5 Binn | 8/3/1981 | **2550** | - | 8 | 249 | 42 | 15 | 472 | - | - | **575** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 Binn | 6/8/1982 | **1980** | **1160** | 8.2 | 260 | 30 | 12 | 379 | 3 | 106 | **419** | - | - | - | - | - | **4100** | - | - | - | - | - | - | - | - |
| 5 Binn | 8/16/1983 | **1830** | **1060** | 8.1 | 258 | 26 | 11 | 339 | 2.8 | 102 | **363** | - | - | - | - | - | **3800** | - | - | - | - | - | - | - | - |
| 5 Binn | 8/1/1985 | **1970** | - | **8.6** | 258 | 30 | 12 | 370 | - | - | **395** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 Binn | 7/28/1987 | **1450** | - | 8.2 | 261 | 21 | 10 | 275 | - | - | 234 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 Binn | 9/14/1989 | **1620** | - | 8.4 | 262 | 21 | 9 | 316 | 1.4 | - | **286** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-14 Deep | 4/26/1999 | - | **740** | - | 230 | 73 | 34 | 140 | 4 | 230 | 87 | - | 2.07828 | 0.3 | - | - | **1300** | - | - | - | - | - | **100** | - | - |
| MW-14 Int. | 4/26/1999 | - | 460 | - | 220 | 64 | 24 | 62 | 2 | 56 | 77 | - | 2.14605 | 0.4 | - | - | 500 | - | - | - | - | - | **150** | - | - |
| Well 06 | 8/16/1990 | **1080** | - | - | 223 | 57.6 | 33.3 | 108 | 3.2 | 192 | 94.6 | 223 | 3.05 | 0.35 | 100 | 10 | - | 100 | 13 | - | - | 100 | 10 | 5 | 50 |
| Well 06 | 4/30/1991 | **960** | **640** | - | 225 | 73 | 33 | 95 | 3 | 99 | 126 | 274 | 2.9 | 0.3 | 100 | 10 | - | 100 | 10 | - | - | 100 | 30 | 5 | 50 |
| Well 06 | 1/7/1993 | **1200** | **793** | - | 217 | 93 | 39 | 3 | 110 | 204 | 133 | 265 | 2 | 0.2 | 85 | 5 | - | 20 | 14 | - | - | 50 | 30 | 5 | 50 |
| Well 06 | 5/2/1994 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 4/4/1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 6/30/1999 | **1450** | **930** | - | 230 | 94 | 45 | 156 | 3 | **269** | 184 | 280 | 3.3 | 0.3 | <50 | <2 | **1200** | 44.5 | 10 | - | - | <100 | <20 | 9 | <50 |
| Well 06 | 12/26/2000 | **1510** | - | - | 210 | 90 | 45 | 157 | 4 | **269** | 180 | 260 | 3.43 | 0.2 | <50 | <2 | **1200** | 40.1 | 9 | - | - | <100 | <20 | 6 | <50 |
| Well 06 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | 3.64 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 8/1/2001 | **1510** | **990** | - | 220 | 84 | 42 | 163 | 4 | **277** | 174 | 260 | 3.25 | 0.4 | <50 | <2 | **1190** | 42.7 | 10 | - | - | <100 | <20 | 8 | <50 |
| Well 06 | 2/27/2002 | - | - | - | - | - | - | - | - | - | - | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 9/11/2002 | **1530** | **1000** | - | 220 | 94 | 45 | 148 | 4 | 246 | 181 | 270 | 3.19 | 0.3 | 10 | 2 | **1210** | 44.6 | 10 | - | - | 50 | 10 | 8 | 20 |
| Well 06 | 4/17/2003 | **1560** | **970** | - | 220 | 93 | 44 | 171 | 4 | **291** | 205 | 260 | - | 0.2 | 10 | 2 | **1180** | 44.6 | 9 | - | - | 50 | 10 | 9 | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 06 | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 06 | 6/2/2004 | **1600** | **1000** | - | 210 | 95 | 44 | 173 | 4 | **275** | 215 | 260 | - | 0.7 | 10 | 2 | **1100** | 49.5 | 8 | - | - | 50 | 10 | 8 | 20 |
| Well 06 | 3/30/2005 | **1500** | - | - | 220 | 95 | 45 | 164 | 4 | **253** | 168 | 270 | 3.52 | 0.4 | 10 | 2 | **1300** | 42 | 10 | - | - | 50 | 10 | 9 | 20 |
| Well 06 | 3/29/2006 | **1590** | **1010** | - | 210 | 94 | 44 | 160 | 3 | **294** | 206 | 260 | 4.13 | 0.4 | 10 | 2 | **1200** | 40.3 | 7 | - | - | 50 | 10 | 8 | 20 |
| Well 06 | 3/20/2007 | **1490** | **920** | - | 220 | 79 | 36 | 218 | 3 | **260** | 179 | 260 | 4.13 | 0.4 | 10 | 2 | **1300** | 39 | 9 | - | - | 50 | 10 | 9 | 20 |
| Well 06 | 3/12/2008 | **1520** | - | - | 210 | 88 | 42 | 150 | 3 | 240 | 174 | 250 | 3.91 | 0.2 | 10 | 2 | **1200** | 42.3 | 10 | - | - | 60 | 10 | 10 | 20 |
| Well 06 | 4/9/2008 | - | - | - | - | - | - | - | - | - | - | - | 4.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 2/18/2009 | **1600** | **810** | - | 220 | 100 | 49 | 170 | 3.7 | **280** | 210 | 260 | 4.5 | 0.34 | 50 | 2 | - | 100 | 11 | - | - | 100 | 20 | 11 | 50 |
| Well 06 | 7/14/2010 | **1700** | **1100** | - | 210 | 110 | 53 | 180 | 3.7 | **300** | 230 | 260 | - | 0.34 | 50 | 2 | **1300** | 100 | 10 | - | - | 100 | 20 | 8.6 | 50 |
| Well 06 | 2/16/2011 | **1700** | **1100** | - | 210 | 110 | 52 | 180 | 3.8 | **290** | 220 | 260 | 5 | 0.31 | 50 | 2.5 | **1300** | 100 | 10 | - | - | 100 | 20 | 12 | 50 |
| Well 06 | 5/16/2012 | **1600** | **980** | - | 200 | 92 | 46 | 170 | 3.7 | **280** | 230 | 250 | 4.1 | 0.36 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 06 | 5/29/2013 | **1700** | - | - | 210 | 110 | 53 | 190 | 4 | **300** | 230 | 250 | 5.2 | 0.32 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 06 | 6/19/2014 | **1700** | **1100** | - | 190 | 100 | 50 | 170 | 3.8 | **290** | 220 | 230 | 5.2 | 0.34 | 50 | 2.4 | **1300** | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 06 | 4/14/2015 | **1600** | **1100** | - | 220 | 100 | 51 | 180 | 3.9 | **300** | 230 | 260 | 5.2 | 0.35 | 50 | 2 | **1300** | 100 | 10 | - | - | 100 | 20 | 14 | 50 |
| Well 06 | 5/13/2015 | - | - | - | - | - | - | - | - | - | - | - | 5.33 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 8/26/2015 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 11/18/2015 | - | - | - | - | - | - | - | - | - | - | - | 2.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 3/31/2016 | - | - | - | - | - | - | - | - | - | - | - | 5.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 5/31/2016 | **1600** | **1000** | - | 210 | 110 | 52 | 180 | 4.1 | **300** | 220 | 260 | 5.7 | 0.33 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 06 | 9/14/2016 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 12/7/2016 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 1/25/2017 | - | - | - | - | - | - | - | - | - | - | - | 2.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 5/10/2017 | - | - | - | - | - | - | - | - | - | - | - | 5.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 8/16/2017 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 8/24/2017 | **1700** | - | - | 220 | 110 | 51 | 180 | 4.1 | **290** | 220 | 270 | 5.7 | 0.35 | 50 | 2.6 | **1300** | 100 | 10 | - | - | 100 | 20 | 12 | 50 |
| Well 06 | 12/12/2017 | - | - | - | - | - | - | - | - | - | 237 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 12/13/2017 | - | - | - | - | - | - | - | - | - | - | - | 6.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 2/21/2018 | - | - | - | - | - | - | - | - | - | - | - | 5.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 5/7/2018 | **1600** | **1000** | - | 210 | 99 | 46 | 170 | 4 | **290** | 210 | 250 | 5.5 | 0.34 | 50 | 2 | **1200** | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 06 | 9/26/2018 | - | - | - | - | - | - | - | - | - | - | - | 4.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 11/7/2018 | - | - | - | - | - | - | - | - | - | - | - | 4.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 3/11/2019 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 5/6/2019 | - | **1100** | - | - | - | 51 | 180 | 4.4 | **320** | 240 | - | 6.3 | 0.31 | <50 | <2 | **1300** | - | <10 | - | - | <100 | <20 | 10 | <50 |
| Well 06 | 6/19/2019 | - | - | - | - | - | - | - | - | - | - | - | 5.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 06 | 8/7/2019 | - | - | - | - | - | - | - | - | - | - | - | 5.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 07 | 5/5/1988 | **986** | **660** | - | 230 | 62 | 33 | 110 | 3.2 | 150 | 64 | 230 | 2.7 | 0.2 | - | 4 | - | 31 | 10 | - | - | 50 | 10 | 3.2 | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |

## Deep Aquifer

### City of Brentwood

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well 07 | 8/16/1990 | **947** | **608** | - | 224 | 49.7 | 30.2 | 102 | 3.7 | 166 | 75.1 | 224 | 2.1 | 0.3 | 100 | 10 | - | 100 | 10 | - | - | 287 | 18 | 5 | 50 |
| Well 07 | 4/30/1991 | **940** | - | - | 206 | 60 | 29 | 100 | 3 | 112 | 99 | 251 | 1.8 | 0.3 | 100 | 10 | - | 100 | 10 | - | - | 100 | 30 | 5 | 50 |
| Well 07 | 1/7/1993 | **1000** | - | - | 220 | 75 | 32 | 3 | 110 | 146 | 99 | 268 | 0.5 | 0.2 | 217 | 5 | - | 20 | 10 | - | - | 50 | 30 | 5 | 50 |
| Well 07 | 5/2/1994 | - | - | - | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 07 | 4/4/1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 07 | 6/30/1999 | **1140** | - | - | 220 | 72 | 32 | 124 | 2 | 208 | 99 | 270 | 1.4 | 0.3 | <50 | <2 | **1400** | 32.7 | 9 | - | - | 110 | <20 | 7 | <50 |
| Well 07 | 12/20/2000 | **1200** | **740** | - | 210 | 66 | 32 | 133 | 3 | 238 | 102 | 260 | 1.6 | 0.2 | <50 | <2 | **1400** | 31.8 | 7 | - | - | <100 | <20 | 6 | <50 |
| Well 07 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 07 | 8/1/2001 | **1210** | - | - | 220 | 65 | 31 | 140 | 3 | 234 | 106 | 270 | 1.6 | 0.3 | <50 | <2 | **1340** | 35.3 | 9 | - | - | <100 | <20 | 8 | <50 |
| Well 07 | 2/27/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 07 | 9/11/2002 | **1160** | **760** | - | 220 | 68 | 32 | 120 | 3 | 184 | 105 | 270 | 1.4 | 0.2 | 10 | 2 | **1340** | 34.6 | 9 | - | - | 70 | 10 | 7 | 20 |
| Well 07 | 4/17/2003 | **1190** | **760** | - | 220 | 69 | 31 | 137 | 3 | 215 | 110 | 270 | 1.9 | 0.2 | 10 | 2 | **1380** | 35.1 | 8 | - | - | 50 | 10 | 8 | 20 |
| Well 07 | 3/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 07 | 3/29/2004 | **1270** | **760** | - | 220 | 82 | 37 | 138 | 3 | 218 | 131 | 270 | 2.33 | 0.3 | 10 | 2 | **1400** | 36.3 | 7 | - | - | 50 | 10 | 7 | 20 |
| Well 07 | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 07 | 5/12/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 07 | 3/30/2005 | **1370** | **880** | - | 220 | 80 | 36 | 161 | 3 | 222 | 155 | 260 | 1.2 | 0.4 | 10 | 2 | **1500** | 39.9 | 7 | - | - | 50 | 10 | 8 | 20 |
| Well 07 | 3/29/2006 | **1270** | **830** | - | 210 | 70 | 31 | 141 | 3 | 216 | 137 | 240 | 1.7 | 0.3 | 10 | 2 | **1400** | 32.6 | 5 | - | - | 50 | 10 | 6 | 20 |
| Well 07 | 10/10/2007 | **1380** | **880** | - | 210 | 74 | 33 | 182 | 3 | 240 | 171 | 260 | 2.1 | 0.4 | 10 | 2 | **1500** | 38.8 | 6 | - | - | 50 | 10 | 9 | 20 |
| Well 07 | 2/25/2008 | **1490** | **810** | - | 200 | 75 | 34 | 167 | 3 | 210 | 197 | 240 | 2 | 0.5 | 10 | 2 | **1400** | 41.8 | 6 | - | - | 50 | 10 | 10 | 20 |
| Well 07 | 2/18/2009 | **1300** | **730** | - | 210 | 75 | 35 | 160 | 3 | 230 | 150 | 260 | - | 0.35 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 9.2 | 50 |
| Well 07 | 2/10/2010 | **1300** | **840** | - | 210 | 76 | 35 | 160 | 3 | 220 | 160 | 250 | 2.5 | 0.33 | 50 | 2 | **1500** | 100 | 10 | - | - | 100 | 20 | 7.1 | 50 |
| Well 07 | 2/16/2011 | **1500** | **890** | - | 200 | 79 | 37 | 170 | 3.1 | 130 | 110 | 250 | 5.8 | 0.29 | 50 | 2.7 | **1500** | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 07 | 6/27/2012 | **1700** | **1100** | - | 180 | 82 | 39 | 220 | 3.2 | 250 | **290** | 220 | 1.2 | 0.38 | 50 | 2.5 | - | 100 | 10 | - | - | 100 | 20 | 9.7 | 50 |
| Well 07 | 5/29/2013 | **1400** | **900** | - | 180 | 78 | 36 | 180 | 3.2 | 230 | 180 | 210 | 2.9 | 0.31 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 07 | 6/17/2014 | **1400** | **860** | - | 180 | 73 | 34 | 180 | 3.4 | 220 | 200 | 210 | 2.7 | 0.33 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 10 | 50 |
| Well 07 | 4/14/2015 | **1400** | **900** | - | 200 | 76 | 35 | 160 | 2.9 | 240 | 190 | 250 | 2.9 | 0.33 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 14 | 50 |
| Well 07 | 5/31/2016 | **1300** | - | - | 200 | 78 | 36 | 170 | 3.3 | 220 | 170 | 240 | 3.2 | 0.32 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 9 | 50 |
| Well 07 | 8/24/2017 | **1400** | **890** | - | 210 | 80 | 37 | 160 | 3 | 220 | 180 | 250 | 3.4 | 0.34 | 50 | 2.4 | **1500** | 100 | 10 | - | - | 100 | 20 | 9.5 | 50 |
| Well 07 | 5/7/2018 | **1400** | - | - | 200 | 77 | 34 | 160 | 3.3 | 220 | 180 | 250 | 3.4 | 0.32 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 9.6 | 50 |
| Well 07 | 5/6/2019 | - | **920** | - | - | 84 | 38 | 180 | 3.8 | 240 | 230 | - | 3.3 | 0.3 | <50 | <2 | **1500** | - | <10 | - | - | <100 | <20 | 10 | <50 |
| Well 08 | 6/14/1993 | **1000** | **510** | - | 230 | 86 | 13 | 100 | - | 140 | 70 | - | 4.1 | 0.32 | <50 | <2 | - | <100 | <10 | - | - | 130 | <20 | 6 | 20 |
| Well 08 | 2/15/1994 | - | - | - | - | - | - | - | - | - | - | - | 1.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 08 | 12/20/1994 | **1024** | - | - | 221 | 63 | 32 | 90 | 3 | 168 | 80 | 221 | <1.02 | 0.34 | 250 | <2 | - | <100 | <10 | - | - | 223 | <20 | <5 | <50 |
| Well 08 | 7/7/1999 | **1340** | **840** | - | 240 | 90 | 41 | 137 | 4 | 228 | 146 | 290 | 1.2 | 0.3 | <50 | <2 | **1300** | 46.8 | 8 | - | - | <100 | <20 | 8 | <50 |
| Well 08 | 8/1/2001 | **1400** | - | - | 220 | 87 | 39 | 149 | 4 | **260** | 156 | 270 | 1.1 | 0.3 | <50 | <2 | **1360** | 48.3 | 7 | - | - | <100 | <20 | 7 | <50 |
| Well 08 | 3/6/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |

## Deep Aquifer

### City of Brentwood

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well 08 | 8/21/2002 | **1350** | **890** | - | 220 | 81 | 38 | 145 | 3 | 217 | 153 | 270 | 1 | 0.2 | 10 | 2 | **1320** | 43.7 | 7 | - | - | 50 | 10 | 7 | 20 |
| Well 08 | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 08 | 3/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 08 | 3/29/2004 | **1330** | **840** | - | 220 | 84 | 38 | 148 | 3 | 216 | 158 | 270 | - | 0.3 | 10 | 2 | **1500** | 38.6 | 6 | - | - | 50 | 10 | 7 | 20 |
| Well 08 | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 08 | 5/12/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 08 | 6/2/2005 | **1200** | **750** | - | 220 | 76 | 31 | 130 | 3.4 | 190 | 140 | 270 | 0.93 | 0.2 | <50 | <2 | **1500** | <100 | <10 | 5.3 | - | **3300** | **78** | <5 | 50 |
| Well 08 | 7/18/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - |
| Well 08 | 9/22/2005 | **1330** | **820** | - | 200 | 76 | 34 | 157 | 3 | 197 | 173 | 250 | 0.99 | 0.3 | 10 | 2 | **1400** | 40.6 | 9 | - | - | 50 | 10 | 6 | 20 |
| Well 08 | 3/29/2006 | **1300** | **840** | - | 210 | 72 | 32 | 141 | 3 | 204 | 162 | 250 | 0.99 | 0.2 | 20 | 2 | **1400** | 35.2 | 5 | - | - | 50 | 10 | 5 | 20 |
| Well 08 | 3/20/2007 | **1330** | **850** | - | 220 | 74 | 33 | 165 | 3 | 203 | 168 | 260 | 0.93 | 0.3 | 10 | 2 | **1410** | 37.8 | 6 | - | - | 50 | 10 | 7 | 20 |
| Well 08 | 9/27/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | 10 | - | - |
| Well 08 | 12/4/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | 10 | - | - |
| Well 08 | 4/9/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.95 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 08 | 4/16/2008 | **1170** | - | - | 210 | 67 | 31 | 137 | 3 | 185 | 122 | 250 | 0.99 | 0.4 | 10 | 2 | **1400** | 34 | 7 | - | - | 70 | 10 | 6 | 20 |
| Well 08 | 6/6/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | 10 | - | - |
| Well 08 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.84 | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 08 | 12/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 08 | 2/18/2009 | **1400** | **760** | - | 210 | 80 | 37 | 160 | 3.1 | 200 | 180 | 260 | 0.97 | 0.27 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 7.8 | 50 |
| Well 08 | 6/3/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 08 | 12/16/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 08 | 2/10/2010 | **1500** | **890** | - | 210 | 87 | 40 | 170 | 3.3 | 210 | 220 | 250 | 0.9 | 0.25 | 50 | 2 | **1500** | 100 | 10 | - | - | 100 | 20 | 6.5 | 50 |
| Well 08 | 5/10/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 08 | 8/18/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 08 | 9/15/2010 | - | - | - | - | - | - | - | - | - | - | - | 0.95 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 08 | 11/3/2010 | - | - | - | - | - | - | - | - | - | - | - | 0.953 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 08 | 12/8/2010 | - | - | - | - | - | - | - | - | - | - | - | 0.95 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 08 | 1/5/2011 | - | - | - | - | - | - | - | - | - | - | - | 0.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 08 | 1/23/2013 | **1600** | **960** | - | 200 | 95 | 46 | 170 | 3.6 | 200 | **260** | 250 | 0.72 | 0.22 | 50 | 2.6 | **1500** | 100 | 10 | - | - | 100 | 20 | 6.8 | 50 |
| Well 08 | 5/29/2013 | **1600** | - | - | 200 | 97 | 46 | 190 | 3.8 | 220 | **280** | 240 | 1.1 | 0.26 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 10 | 50 |
| Well 08 | 6/17/2014 | **1600** | **1000** | - | 180 | 84 | 39 | 180 | 3.8 | 200 | **280** | 220 | - | 0.25 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 8.8 | 50 |
| Well 08 | 4/14/2015 | **1700** | **1000** | - | 200 | 94 | 44 | 190 | 3.5 | 210 | **300** | 250 | 0.79 | 0.25 | 50 | 2 | **1500** | 100 | 10 | - | - | 100 | 20 | 13 | 50 |
| Well 08 | 5/31/2016 | **1700** | - | - | 190 | 97 | 45 | 220 | 3.7 | 220 | **340** | 230 | 0.84 | 0.24 | 50 | 2 | **1700** | 100 | 10 | - | - | 100 | 20 | 11 | 50 |
| Well 08 | 9/7/2017 | **1700** | **1000** | - | 200 | 89 | 41 | 200 | 3.3 | 200 | **300** | 250 | 0.79 | 0.27 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 7.1 | 50 |
| Well 08 | 5/9/2018 | **1700** | **1100** | - | 200 | 90 | 41 | 200 | 3.6 | 200 | **310** | 240 | 0.79 | 0.27 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 13 | 50 |
| Well 08 | 5/6/2019 | - | **1000** | - | - | 96 | 44 | 200 | - | 220 | **330** | - | 0.82 | - | <50 | <2 | **1600** | <100 | <10 | - | - | <100 | <20 | 6.9 | <50 |
| Well 09 | 7/19/2004 | **1370** | **850** | - | 250 | 101 | 42 | 108 | 3 | 143 | 187 | 310 | 8.15 | 0.3 | 10 | 2 | **1300** | 44.6 | 10 | - | - | 50 | 10 | 5 | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2 [a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 09 | 3/30/2005 | **1380** | **870** | - | 250 | 109 | 47 | 112 | 3 | 136 | 186 | 310 | 8.1 | 0.3 | 10 | 2 | **1400** | 47.5 | 11 | - | - | 50 | 10 | 4 | 40 |
| Well 09 | 6/28/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 7/12/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 8/9/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 8/23/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 9/14/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 9/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 10/11/2005 | - | - | - | - | - | - | - | - | - | - | - | 1.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 10/25/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 11/22/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 12/16/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 12/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 1/10/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 1/24/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 2/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 3/1/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 3/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 3/29/2006 | **1360** | **860** | - | 250 | 103 | 44 | 108 | 2 | 142 | 192 | 280 | 8.1 | 0.1 | 10 | 2 | **1400** | 45.8 | 11 | - | - | 50 | 10 | 5 | 40 |
| Well 09 | 5/17/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 6/21/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 8/15/2006 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 9/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 11/21/2006 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 1/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 2/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 4/17/2007 | **1350** | **830** | - | 250 | 106 | 44 | 122 | 2 | 141 | 188 | 300 | 8.09 | 0.3 | 10 | 2 | **1510** | 36.8 | 8 | - | - | 60 | 10 | 4 | 30 |
| Well 09 | 4/18/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 5/16/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 9/18/2007 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 10/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 11/14/2007 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 2/6/2008 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 3/5/2008 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 3/19/2008 | **1390** | **750** | - | 230 | 99 | 43 | 110 | 2 | 137 | 179 | 280 | - | 0.3 | 10 | 2 | **1400** | 47 | 10 | - | - | 50 | 10 | 4 | 20 |
| Well 09 | 4/2/2008 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 5/7/2008 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 09 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 09 | 2/18/2009 | **1300** | **840** | - | 250 | 110 | 47 | 110 | 2.6 | 130 | 190 | 300 | 8.6 | 0.26 | 50 | 2 | - | 100 | 14 | - | - | 100 | 20 | 5 | 50 |
| Well 09 | 2/10/2010 | **1400** | **810** | - | 260 | 110 | 48 | 120 | 2.6 | 140 | 190 | 310 | 7.9 | 0.25 | 50 | 2 | **1600** | 100 | 11 | - | - | 100 | 20 | 5 | 50 |
| Well 09 | 2/16/2011 | **1400** | **810** | - | 250 | 110 | 47 | 110 | 2.6 | 140 | 190 | 300 | 7.9 | 0.23 | 50 | 2 | **1500** | 100 | 11 | - | - | 100 | 20 | 5.6 | 50 |
| Well 09 | 5/16/2012 | **1400** | **800** | - | 240 | 100 | 46 | 110 | 2.6 | **390** | 200 | 290 | **22** | 0.28 | 50 | 2 | - | 100 | 12 | - | - | 100 | 20 | 5 | 50 |
| Well 09 | 5/29/2013 | **1400** | **840** | - | 230 | 100 | 46 | 120 | 2.5 | 140 | 190 | 280 | 7.9 | 0.28 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 09 | 6/19/2014 | **1400** | **840** | - | 210 | 110 | 45 | 110 | 2.6 | 140 | 190 | 250 | 8.1 | 0.26 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 5.7 | 50 |
| Well 09 | 4/15/2015 | **1400** | - | - | 240 | 100 | 45 | 110 | 2.5 | 150 | 190 | 300 | 8.4 | 0.25 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 5.7 | 50 |
| Well 09 | 6/1/2016 | **1400** | **850** | - | 240 | 110 | 47 | 110 | 2.6 | 160 | 210 | 290 | 8.8 | 0.25 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 11 | 5/5/1995 | **1109** | **645** | 7.5 | 235 | 82 | 37 | 110 | 1.2 | 114 | 127 | 235 | 3.66 | 0.25 | <50 | <2 | - | <100 | <10 | - | - | <100 | <20 | <5 | <50 |
| Well 11 | 10/26/1995 | **1325** | **688** | - | 275 | 159.4 | 10.2 | 156.6 | 3.2 | 155 | 152.7 | 275 | 5.6 | 0.3 | <50 | <2 | **1500** | 184 | <10 | - | - | <100 | <20 | <5 | <50 |
| Well 11 | 6/30/1999 | **1370** | **850** | - | 270 | 108 | 47 | 110 | 4 | 164 | 168 | 330 | 7.25 | 0.2 | 20 | <2 | **1400** | 63 | 9 | - | - | <100 | <20 | 3 | <50 |
| Well 11 | 12/20/2000 | **1620** | **980** | - | 290 | 123 | 58 | 117 | 5 | 203 | 214 | 350 | 9.13 | 0.2 | <50 | <2 | **1300** | 72.8 | 6 | - | - | <100 | <20 | 5 | <50 |
| Well 11 | 5/21/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/25/2001 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/1/2001 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/10/2001 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/13/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/28/2001 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/6/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/12/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/19/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/26/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/1/2001 | **1450** | **950** | - | 280 | 109 | 50 | 113 | 4 | 186 | 187 | 340 | 7.86 | 0.3 | <50 | <2 | **1360** | 67.2 | 9 | - | - | <100 | <20 | 3 | <50 |
| Well 11 | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/13/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/28/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/10/2001 | **1440** | **890** | - | 280 | 121 | 53 | 103 | 5 | 174 | 190 | 340 | 7.9 | 0.2 | - | - | **1510** | - | - | - | - | 50 | 10 | - | 20 |
| Well 11 | 10/12/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/27/2001 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/13/2001 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/18/2001 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/8/2002 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/22/2002 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/12/2002 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/26/2002 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/13/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 11 | 5/8/2002 | - | - | - | - | - | - | - | - | - | - | - | 8.72 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/22/2002 | - | - | - | - | - | - | - | - | - | - | - | 7.84 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/11/2002 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/24/2002 | **1430** | **890** | - | 280 | 107 | 48 | 109 | 4 | 157 | 176 | 340 | 7.41 | 0.2 | 10 | 2 | **1310** | 67.4 | 8 | - | - | 50 | 10 | 3 | 20 |
| Well 11 | 8/13/2002 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/14/2002 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/9/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/28/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/11/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/27/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/13/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/27/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/8/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/17/2003 | **1540** | **960** | - | 280 | 122 | 54 | 120 | 5 | 192 | 215 | 350 | 9.53 | 0.2 | 10 | 2 | **1390** | 70 | 9 | - | - | 50 | 10 | 4 | 20 |
| Well 11 | 4/22/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/5/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/8/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/23/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/14/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/9/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/14/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/28/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/13/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/11/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/23/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/15/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/28/2004 | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/26/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/11/2004 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/13/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/27/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/11/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/12/2004 | **1470** | **940** | - | 270 | 114 | 50 | 108 | 4 | 192 | 190 | 330 | - | 0.3 | 10 | 2 | **1400** | 62.3 | 8 | - | - | 80 | 10 | 4 | 20 |
| Well 11 | 5/25/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/8/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |

## Deep Aquifer

### City of Brentwood

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well 11 | 7/13/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/27/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/10/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/24/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/14/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/28/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/12/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/26/2004 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/16/2004 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/23/2004 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/11/2005 | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/23/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/8/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/22/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/30/2005 | **1510** | **990** | - | 280 | 126 | 55 | 119 | 4 | 186 | 187 | 350 | 8.4 | 0.3 | 10 | 2 | **1400** | 58.4 | 8 | - | - | 50 | 10 | 4 | 20 |
| Well 11 | 4/12/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/26/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/10/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/24/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/14/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/28/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/12/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/9/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/23/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/14/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/11/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/25/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/22/2005 | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/16/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/10/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/24/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/1/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 11 | 3/29/2006 | **1650** | **1020** | - | 290 | 132 | 58 | 119 | 4 | 220 | 224 | 360 | - | 0.2 | 10 | 2 | **1300** | 66.2 | 7 | - | - | 50 | 10 | 5 | 20 |
| Well 11 | 4/11/2006 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/25/2006 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/17/2006 | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/21/2006 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/15/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/18/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/21/2007 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/18/2007 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/8/2007 | - | - | - | - | - | - | - | - | - | - | - | **10.5** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/23/2007 | - | - | - | - | - | - | - | - | - | - | - | 9.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/30/2007 | - | - | - | - | - | - | - | - | - | - | - | 9.69 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/12/2007 | - | - | - | - | - | - | - | - | - | - | - | 9.83 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/19/2007 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/17/2007 | - | - | - | - | - | - | - | - | - | - | - | **10.2** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 10/10/2007 | **1480** | **950** | - | 280 | 118 | 51 | 126 | 4 | 194 | 192 | 340 | 8.52 | 0.3 | 10 | 2 | **1400** | 57.6 | 9 | - | - | 50 | 10 | 4 | 20 |
| Well 11 | 10/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/14/2007 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/5/2008 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 3/12/2008 | **1660** | **950** | - | 280 | 132 | 58 | 110 | 4 | 200 | 207 | 340 | - | 0.3 | 10 | 2 | **1400** | 66.3 | 9 | - | - | 80 | 10 | 4 | 20 |
| Well 11 | 4/2/2008 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/7/2008 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/3/2008 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/4/2008 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/4/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/19/2009 | **1700** | **1100** | - | 290 | 150 | 64 | 120 | 4.6 | 230 | 220 | 350 | 10 | 0.27 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 11 | 4/1/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/6/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/3/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/8/2009 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/15/2009 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 11 | 8/12/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/18/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/2/2009 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/6/2010 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/10/2010 | **1700** | **1100** | - | 290 | 150 | 65 | 120 | 4.7 | 240 | 230 | 350 | **11** | 0.29 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 11 | 2/17/2010 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/12/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 6/16/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/14/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 8/18/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 9/15/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 11/3/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 12/8/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 1/5/2011 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 2/16/2011 | **1800** | **1100** | - | 290 | 150 | 67 | 120 | 4.8 | 140 | 140 | 350 | 6.3 | 0.26 | 50 | 2 | **1300** | 100 | 10 | - | - | 100 | 20 | 6.2 | 50 |
| Well 11 | 3/2/2011 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 4/27/2011 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 5/18/2011 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 11 | 7/30/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5.2 | - | - | - | - | - |
| Well 12 | 12/18/1997 | 840 | 500 | - | 200 | 59 | 23 | 80 | 3 | 110 | 88 | 240 | 1.2 | 0.2 | <50 | <2 | **1800** | 32 | 8 | - | - | <100 | <20 | 3 | <50 |
| Well 12 | 7/7/1999 | 864 | **510** | - | 200 | 61 | 24 | 85 | 4 | 103 | 89 | 250 | 1.2 | 0.2 | <50 | <2 | **1700** | 36.7 | 10 | - | - | <100 | <20 | 3 | <50 |
| Well 12 | 12/20/2000 | 894 | - | - | 190 | 60 | 25 | 90 | 3 | 113 | 100 | 240 | 1.6 | 0.1 | <50 | <2 | **1800** | 36 | 8 | - | - | <100 | <20 | 3 | <50 |
| Well 12 | 8/1/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | <2 | - | 37.3 | 10 | - | - | - | - | 3 | - |
| Well 12 | 8/8/2001 | 842 | 500 | - | 190 | 58 | 23 | 79 | 3 | 109 | 88 | 230 | 1.2 | 0.2 | - | - | **1800** | - | - | - | - | 110 | <20 | - | <50 |
| Well 12 | 7/24/2002 | 872 | **530** | - | 200 | 60 | 24 | 86 | 3 | 100 | 96 | 250 | 1.3 | 0.1 | 10 | 2 | **1670** | 43.6 | 9 | - | - | 50 | 10 | 3 | 20 |
| Well 12 | 8/14/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 12 | 4/17/2003 | 889 | **530** | - | 200 | 61 | 24 | 84 | 3 | 113 | 97 | 240 | 1.7 | 0.1 | 10 | 2 | **1780** | 37.8 | 9 | - | - | 50 | 10 | 3 | 20 |
| Well 12 | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 12 | 3/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 12 | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 12 | 5/12/2004 | 880 | **550** | - | 200 | 60 | 24 | 81 | 3 | 107 | 97 | 240 | 1.6 | 0.2 | 10 | 2 | **1700** | 36.3 | 9 | - | - | 70 | 10 | 3 | 20 |
| Well 12 | 3/30/2005 | 886 | **540** | - | 200 | 65 | 25 | 86 | 3 | 101 | 89 | 240 | 1.5 | 0.2 | 10 | 2 | **1800** | 37.4 | 10 | - | - | 50 | 10 | 2 | 20 |
| Well 12 | 3/20/2007 | 895 | **540** | - | 200 | 61 | 23 | 87 | 2 | 106 | 99 | 240 | 1.7 | 0.2 | 10 | 2 | **1740** | 34.2 | 9 | - | - | 50 | 10 | 2 | 20 |
| Well 12 | 3/19/2008 | 878 | 470 | - | 180 | 55 | 22 | 77 | 3 | 100 | 93 | 220 | 1.3 | 0.1 | 10 | 2 | **1700** | 37.7 | 9 | - | - | 50 | 10 | 3 | 20 |
| Well 12 | 4/16/2008 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 12 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 12 | 2/19/2009 | 870 | **530** | - | 190 | 61 | 24 | 84 | 2.7 | 100 | 94 | 230 | 1.6 | 0.19 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 12 | 2/10/2010 | 900 | **540** | - | 200 | 65 | 26 | 86 | 2.8 | 100 | 99 | 240 | 2 | 0.2 | 50 | 2 | **1900** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 12 | 2/16/2011 | **920** | **530** | - | 190 | 63 | 26 | 84 | 2.8 | 100 | 100 | 240 | 2 | 0.18 | 50 | 2 | **1900** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 12 | 5/16/2012 | 900 | **530** | - | 190 | 63 | 26 | 85 | 2.8 | 110 | 100 | 230 | 2.3 | 0.22 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 12 | 5/29/2013 | **910** | **570** | - | 190 | 63 | 26 | 88 | 2.7 | 110 | 100 | 230 | 2.2 | 0.2 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 12 | 6/19/2014 | **920** | **560** | - | 160 | 64 | 26 | 85 | 2.9 | 110 | 100 | 200 | 2.2 | 0.19 | 50 | 2 | **1800** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 12 | 7/30/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - |
| Well 12 | 4/15/2015 | 860 | **520** | - | 180 | 57 | 24 | 82 | 2.8 | 110 | 97 | 220 | 1.7 | 0.18 | 50 | 2 | **1700** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 12 | 6/1/2016 | **920** | **580** | - | 190 | 65 | 27 | 90 | 3 | 110 | 110 | 230 | 2.4 | 0.18 | 50 | 2 | **2100** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 12/17/1997 | 720 | 440 | - | 120 | 33 | 10 | 99 | 4 | 110 | 68 | 150 | 0.93 | 0.1 | <50 | <2 | **1700** | 29 | 11 | - | - | 150 | <20 | 3 | <50 |
| Well 13 | 3/12/1998 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 18.5 | 1.5 | - | - | - | - | - |
| Well 13 | 7/7/1999 | 767 | 470 | - | 180 | 42 | 14 | 88 | 3 | 107 | 72 | 190 | 1.2 | 0.1 | <50 | <2 | **1600** | 32 | 14 | - | - | <100 | <20 | 3 | <50 |
| Well 13 | 6/8/2000 | 800 | 490 | - | 170 | 45 | 15 | 92 | 3 | 108 | 74 | 200 | 1.3 | 0.1 | <50 | <2 | **1700** | 34.6 | 14 | - | - | <100 | <20 | 3 | <50 |
| Well 13 | 8/29/2001 | 775 | 460 | - | 170 | 47 | 16 | 97 | 4 | 111 | 73 | 200 | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - |
| Well 13 | 2/21/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 13 | 8/21/2002 | 776 | - | - | 170 | 46 | 15 | 102 | 4 | 113 | 82 | 210 | 1.2 | 0.1 | 10 | 2 | **1590** | 33.7 | 13 | - | - | 50 | 10 | 4 | 20 |
| Well 13 | 4/17/2003 | 791 | 490 | - | 170 | 45 | 15 | 96 | 4 | 118 | 78 | 210 | 1.4 | 0.1 | 10 | 2 | **1680** | 33.1 | 13 | - | - | 50 | 10 | 3 | 20 |
| Well 13 | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 13 | 3/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 13 | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 13 | 5/12/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 13 | 6/2/2004 | 788 | 500 | - | 170 | 46 | 15 | 94 | 3 | 112 | 79 | 210 | 1.4 | 0.2 | 20 | 2 | **1600** | 34.9 | 13 | - | - | 50 | 10 | 3 | 20 |
| Well 13 | 3/30/2005 | 797 | **510** | - | 170 | 48 | 16 | 97 | 3 | 105 | 74 | 210 | 1.3 | 0.2 | 10 | 2 | **1700** | 33.6 | 14 | - | - | 50 | 10 | 3 | 20 |
| Well 13 | 3/29/2006 | 805 | **550** | - | 200 | 61 | 15 | 90 | 3 | 105 | 84 | 230 | 1.6 | 0.1 | 10 | 2 | **1800** | 32.7 | 13 | - | - | 50 | 10 | 3 | 20 |
| Well 13 | 3/20/2007 | 821 | 490 | - | 170 | 47 | 16 | 99 | 3 | 112 | 85 | 210 | 1.7 | 0.2 | 10 | 2 | **1640** | 32.9 | 12 | - | - | 100 | 10 | 3 | 20 |
| Well 13 | 3/12/2008 | 827 | - | - | 160 | 46 | 15 | 90 | 3 | 105 | 82 | 200 | 2 | 0.1 | 10 | 2 | **1600** | 35 | 14 | - | - | 50 | 10 | 3 | 20 |
| Well 13 | 4/16/2008 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 13 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | 100 | 20 | - | - |
| Well 13 | 2/19/2009 | 810 | 460 | - | 180 | 50 | 17 | 97 | 3.3 | 110 | 83 | 220 | 1.7 | 0.14 | 50 | 2 | - | 100 | 12 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 2/10/2010 | 820 | 490 | - | 170 | 49 | 17 | 97 | 3.2 | 110 | 83 | 210 | 1.8 | 0.15 | 50 | 2 | **1800** | 100 | 13 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 2/16/2011 | 830 | 490 | - | 180 | 48 | 17 | 100 | 3.5 | 110 | 81 | 220 | 1.7 | 0.15 | 50 | 2.3 | **1900** | 100 | 17 | - | - | 150 | 20 | 5 | 50 |
| Well 13 | 5/16/2012 | 820 | 490 | - | 170 | 48 | 18 | 96 | 3.3 | 120 | 91 | 200 | 2.1 | 0.16 | 50 | 2 | - | 100 | 13 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 5/29/2013 | 840 | **520** | - | 170 | 50 | 18 | 100 | 3.3 | 110 | 88 | 200 | 2.1 | 0.16 | 50 | 2 | - | 100 | 14 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 6/19/2014 | 860 | **520** | - | 160 | 51 | 18 | 95 | 3.2 | 110 | 91 | 200 | 2.2 | 0.15 | 50 | 2 | **1700** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 4/15/2015 | 860 | - | - | 180 | 52 | 19 | 99 | 3.3 | 120 | 91 | 220 | 2.3 | 0.15 | 50 | 2 | **1800** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 8/16/2017 | **920** | **570** | - | 180 | 60 | 22 | 96 | 3.3 | 110 | 100 | 220 | 2.9 | 0.16 | 50 | 2 | **1800** | 100 | 10 | - | - | 100 | 33 | 5 | 50 |
| Well 13 | 5/9/2018 | 850 | **520** | - | 170 | 51 | 18 | 93 | 3.2 | 110 | 90 | 200 | 2.2 | 0.15 | 50 | 2 | **1700** | 100 | 12 | - | - | 100 | 20 | 5 | 50 |
| Well 13 | 5/9/2019 | - | **510** | - | - | 52 | 18 | 94 | 3.5 | 110 | 89 | - | 2.2 | 0.16 | <50 | <2 | **1700** | <100 | 12 | - | - | <100 | - | <5 | <50 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 b | 500 b | 6.5/8.5 b | | | | | | 250 b | 250 b | | 10 a | 2 a | 1000 a | 10 a | 1000 c | 1000 a | 50 a | | 1.3 a | 300 b | 50 b | 50 a | 5000 a |

## Deep Aquifer

### City of Brentwood

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well 14 | 11/3/2000 | **1400** | **880** | - | 210 | 75 | 38 | 190 | 3.5 | **300** | 120 | - | 1.2 | 0.4 | <50 | <2 | **1400** | <100 | <10 | - | - | 100 | 30 | <5 | 50 |
| Well 14 | 2/27/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 14 | 3/6/2002 | **1430** | **900** | - | 210 | 65 | 31 | 181 | 3 | **308** | 129 | 260 | 1.7 | 0.2 | 10 | 4 | **1190** | 33.6 | 9 | - | - | 50 | 10 | 11 | 50 |
| Well 14 | 6/4/2002 | **1370** | - | - | 220 | 68 | 33 | 177 | 4 | **313** | 123 | 270 | 1.6 | 0.3 | 50 | 3 | **1120** | 30.1 | 7 | - | - | 180 | 10 | 11 | 20 |
| Well 14 | 9/11/2002 | **1430** | **950** | - | 220 | 72 | 34 | 174 | 5 | **269** | 123 | 260 | 1.7 | 0.3 | 10 | 4 | **1240** | 32.2 | 8 | - | - | 50 | 10 | 11 | 20 |
| Well 14 | 12/11/2002 | **1440** | - | - | 220 | 70 | 33 | 192 | 4 | **310** | 139 | 260 | 2.51 | 0.4 | 10 | 3 | **1270** | 32.8 | 7 | - | - | 50 | 10 | 14 | 20 |
| Well 14 | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - |
| Well 14 | 3/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 14 | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - |
| Well 14 | 5/12/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| Well 14 | 6/2/2004 | **1500** | **940** | - | 210 | 73 | 34 | 194 | 3 | **313** | 154 | 250 | 2.82 | 0.6 | 20 | 3 | **1300** | 32.1 | 5 | - | - | 50 | 10 | 11 | 20 |
| Well 14 | 3/30/2005 | **1560** | **1030** | - | 210 | 80 | 37 | 208 | 3 | **308** | 169 | 250 | 2.64 | 0.4 | 10 | 3 | **1300** | 33.8 | 6 | - | - | 80 | 10 | 13 | 20 |
| Well 14 | 3/29/2006 | **1580** | **1010** | - | 140 | 75 | 34 | 188 | 3 | **314** | 183 | 170 | 3.5 | 0.4 | 10 | 3 | **1300** | 31.2 | 4 | - | - | 50 | 10 | 12 | 20 |
| Well 14 | 3/20/2007 | **1600** | **1040** | - | 200 | 74 | 36 | 222 | 4 | **310** | 192 | 250 | 3.98 | 0.5 | 10 | 3 | **1400** | 32.6 | 5 | - | - | 50 | 10 | 14 | 20 |
| Well 14 | 3/12/2008 | **1680** | **1000** | - | 190 | 78 | 36 | 210 | 3 | **300** | 204 | 230 | 3.46 | 0.4 | 10 | 4 | **1300** | 36 | 6 | - | - | 60 | 10 | 17 | 20 |
| Well 14 | 4/9/2008 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 14 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 4.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 14 | 2/24/2009 | **1500** | **1300** | - | 270 | 71 | 34 | 180 | 3.4 | **310** | 190 | 330 | 4.5 | 0.34 | 50 | 4 | - | 100 | 10 | - | - | 100 | 20 | 18 | 50 |
| Well 14 | 2/10/2010 | **1600** | **930** | - | 200 | 81 | 38 | 200 | 3.3 | **300** | 190 | 240 | 4.3 | 0.38 | 50 | 3.3 | **1400** | 100 | 10 | - | - | 100 | 20 | 15 | 50 |
| Well 14 | 2/16/2011 | **1600** | **980** | - | 200 | 79 | 39 | 190 | 3.3 | 170 | 100 | 240 | 2.5 | 0.35 | 50 | 4.1 | **1300** | 100 | 10 | - | - | 100 | 20 | 18 | 50 |
| Well 14 | 5/16/2012 | **1400** | **930** | - | 200 | 78 | 38 | 170 | 3.2 | **310** | 180 | 240 | - | 0.39 | 50 | 3.4 | - | 100 | 10 | - | - | 100 | 20 | 17 | 50 |
| Well 14 | 5/29/2013 | **1500** | **990** | - | 170 | 82 | 40 | 200 | 3.5 | **300** | 180 | 210 | - | 0.35 | 50 | 3 | - | 100 | 10 | - | - | 100 | 20 | 20 | 50 |
| Well 14 | 6/19/2014 | **1500** | **960** | - | 180 | 78 | 38 | 180 | 3.3 | **280** | 180 | 220 | 4.3 | 0.38 | 50 | 3.8 | **1200** | 100 | 10 | - | - | 100 | 20 | 16 | 50 |
| Well 14 | 4/14/2015 | **1400** | - | - | 200 | 77 | 37 | 170 | 3.2 | **290** | 170 | 240 | 4.1 | 0.4 | 50 | 3 | **1100** | 100 | 10 | - | - | 100 | 20 | 20 | 50 |
| Well 14 | 10/5/2016 | **1600** | **980** | - | 200 | 77 | 37 | 180 | 3.2 | **290** | 190 | 240 | 4 | 0.37 | 50 | 3.5 | **1100** | 100 | 10 | - | - | 100 | 20 | 18 | 50 |
| Well 14 | 9/7/2017 | **1500** | **940** | - | 200 | 78 | 39 | 180 | 3.2 | **280** | 180 | 250 | 4.2 | 0.39 | 50 | 2.9 | **1200** | 100 | 10 | - | - | 100 | 20 | 13 | 50 |
| Well 14 | 5/10/2018 | **1500** | **1000** | - | 200 | 84 | 40 | 170 | 3.5 | **300** | 180 | 240 | 4.2 | 0.37 | 50 | 3.4 | **1100** | 100 | 10 | - | - | 100 | 20 | 21 | 50 |
| Well 14 | 5/9/2019 | - | **990** | - | - | 89 | - | 180 | 3.8 | **320** | 180 | - | 4 | - | <50 | 3.2 | **1200** | <100 | <10 | - | - | <100 | <20 | 16 | <50 |
| Well 15 | 7/26/2006 | **1030** | **630** | - | 230 | 67 | 29 | 98 | 2 | 132 | 101 | 280 | 2.37 | 0.3 | 10 | 2 | **1500** | 30.5 | 6 | - | - | 50 | 10 | 4 | 20 |
| Well 15 | 8/15/2006 | - | - | - | - | - | - | - | - | - | - | - | 2.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 9/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 10/18/2006 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 12/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 1/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 2/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 4/17/2007 | **1210** | **740** | - | 230 | 91 | 40 | 113 | 3 | 150 | 148 | 280 | 6.12 | 0.3 | 10 | 2 | **1500** | 32.7 | 9 | - | - | 80 | 10 | 4 | 20 |
| Well 15 | 4/18/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 15 | 5/2/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.08 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 6/27/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.01 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 7/24/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.44 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 8/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 10/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 11/14/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 1/23/2008 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 2/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 5.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 4/16/2008 | **1640** | **950** | - | 180 | 79 | 37 | 210 | 3 | **290** | 200 | 200 | 3.5 | 0.5 | 10 | 4 | **1300** | 34.7 | 6 | - | - | 60 | 10 | 18 | 20 |
| Well 15 | 4/30/2008 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 2/24/2009 | **1200** | **980** | - | 200 | 69 | 33 | 120 | 3.1 | 170 | 160 | 240 | 4.3 | 0.25 | 93 | 2 | - | 100 | 10 | - | - | 100 | 20 | 6.3 | 50 |
| Well 15 | 2/10/2010 | **1000** | **590** | - | 230 | 71 | 32 | 99 | 2.4 | 54 | 40 | 280 | 0.99 | 0.3 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 15 | 9/15/2010 | - | - | - | - | - | - | - | - | - | - | - | 2.58 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 12/8/2010 | - | - | - | - | - | - | - | - | - | - | - | 4.25 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 1/5/2011 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 2/16/2011 | **1100** | **650** | - | 230 | 74 | 34 | 100 | 2.6 | 130 | 110 | 280 | 2.73 | 0.25 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 5.7 | 50 |
| Well 15 | 3/2/2011 | - | - | - | - | - | - | - | - | - | - | - | 2.28 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 4/27/2011 | - | - | - | - | - | - | - | - | - | - | - | 2.42 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 5/16/2012 | **1100** | - | - | 220 | 75 | 35 | 100 | 2.6 | 160 | 140 | 260 | 2.5 | 0.29 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5.6 | 50 |
| Well 15 | 5/29/2013 | **1100** | - | - | 210 | 73 | 34 | 110 | 2.5 | 140 | 120 | 260 | 2.7 | 0.29 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5.9 | 50 |
| Well 15 | 6/30/2014 | **1100** | - | - | 220 | 80 | 34 | 99 | 2.6 | 140 | 120 | 260 | 3.8 | 0.27 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 5.3 | 50 |
| Well 15 | 4/15/2015 | **1400** | **840** | - | 220 | 96 | 44 | 120 | 2.7 | 180 | 200 | 270 | 6.8 | 0.24 | 50 | 2 | **1400** | 100 | 10 | - | - | 100 | 20 | 6.5 | 50 |
| Well 15 | 6/1/2016 | **1100** | **710** | - | 220 | 79 | 36 | 110 | 2.6 | 140 | 120 | 270 | 3.4 | 0.26 | 50 | 2 | **1700** | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Well 15 | 9/14/2016 | - | - | - | - | - | - | - | - | - | - | - | 3.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 12/7/2016 | - | - | - | - | - | - | - | - | - | - | - | 4.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 3/27/2017 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 5/10/2017 | - | - | - | - | - | - | - | - | - | - | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 8/16/2017 | - | - | - | - | - | - | - | - | - | - | - | 4.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 9/7/2017 | **1100** | **670** | - | 230 | 78 | 34 | 99 | 2.6 | 140 | 120 | 280 | 3.2 | 0.28 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 6.7 | 50 |
| Well 15 | 12/12/2017 | - | - | - | - | - | - | - | - | - | 178 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 12/13/2017 | - | - | - | - | - | - | - | - | - | - | - | 6.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 2/21/2018 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 5/10/2018 | **1000** | **660** | - | 220 | 73 | 32 | 96 | 2.4 | 140 | 110 | 270 | 3 | 0.29 | 50 | 2 | **1600** | 100 | 10 | - | - | 100 | 20 | 7.4 | 50 |
| Well 15 | 9/26/2018 | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 11/7/2018 | - | - | - | - | - | - | - | - | - | - | - | 2.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 3/11/2019 | - | - | - | - | - | - | - | - | - | - | - | 2.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 5/9/2019 | - | **720** | - | - | 83 | 36 | 120 | 2.9 | 150 | 150 | - | 3 | 0.26 | <50 | <2 | **1600** | <100 | <10 | - | - | <100 | - | 6.4 | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 15 | 6/19/2019 | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 15 | 12/9/2019 | - | - | - | - | - | - | - | - | - | - | - | 2.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Diablo Water District | | | | | | | | | | | | | | | | | | | | | | | | | |
| CREEKSIDE MW | 4/25/2003 | - | **910** | 7.9 | 199 | 80 | 46 | 170 | 3.9 | **270** | 210 | - | 0.94878 | 0.4 | - | - | - | - | - | - | - | - | **64** | - | - |
| Glen Park Well | 5/4/2004 | **930** | - | - | 240 | 60 | 31 | 100 | 2 | 160 | 72 | - | <0.5 | 0.3 | 50 | 3 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Glen Park Well | 7/5/2006 | **993** | **620** | - | - | - | - | - | - | - | - | - | - | - | - | - | **1200** | - | - | 1.4 | - | - | - | - | - |
| Glen Park Well | 10/19/2006 | **1000** | **620** | - | 230 | 67 | 32 | 107 | 2.3 | 170 | 80 | 230 | 0.54 | 0.1 | 50 | 2 | **1400** | 100 | 10 | 1.6 | - | 100 | 38 | 5 | 50 |
| Glen Park Well | 12/26/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 1/23/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1400** | - | - | 1.6 | - | - | - | - | - |
| Glen Park Well | 4/18/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1200** | - | - | 1.6 | - | - | - | - | - |
| Glen Park Well | 6/23/2010 | **1100** | - | 7.6 | 230 | 52 | 36 | 100 | 2.7 | 180 | 100 | 230 | 0.93 | 0.3 | 50 | 3.7 | - | 100 | 10 | - | - | 100 | 34 | 5 | 50 |
| Glen Park Well | 6/22/2011 | - | - | - | - | - | - | - | - | - | - | - | 1.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 7/26/2011 | **1082** | **661** | - | - | - | - | - | - | - | 108 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 6/20/2012 | - | - | - | - | - | - | - | - | - | - | - | 0.81 | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 6/19/2013 | **1000** | - | - | 230 | 70 | 36 | 100 | 2.4 | 160 | 90 | 230 | 1.6 | 0.2 | 50 | 2.6 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Glen Park Well | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | 1.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 7/30/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - |
| Glen Park Well | 8/12/2014 | - | - | - | - | 21 | 14 | 82 | 3.3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 3/18/2015 | - | - | - | - | - | - | - | - | - | - | - | 0.79 | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 3/23/2016 | - | - | - | - | - | - | - | - | - | - | - | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 6/22/2016 | **1018** | **690** | - | 226 | 72 | 37 | 110 | - | 180 | 110 | 226 | - | - | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Glen Park Well | 3/20/2019 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Glen Park Well | 6/19/2019 | - | **695** | - | - | 71 | 37 | 120 | - | 170 | 120 | - | 1.4 | 0.3 | ND | ND | - | ND | ND | - | - | ND | 23 | ND | ND |
| South Park PW | 6/6/2006 | **940** | **560** | - | 270 | 56 | 24 | 100 | 1.4 | 110 | 88 | 330 | ND | 0.3 | <50 | <2 | **1800** | 63 | <10 | ND | - | 210 | **140** | <5 | 50 |
| South Park PW | 10/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| South Park PW | 3/18/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| South Park PW | 6/17/2015 | **950** | **570** | ND | 270 | 64 | 29 | 120 | 1.9 | 100 | 92 | 270 | - | 0.3 | 50 | 2 | - | 100 | 10 | - | - | **310** | **140** | 5 | 50 |
| South Park PW | 6/22/2016 | - | **690** | - | - | 72 | 37 | 110 | - | 180 | 110 | - | - | - | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| South Park PW | 6/21/2017 | - | - | - | - | 60 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Stonecreek PW | 5/10/2010 | **1000** | **640** | - | 210 | 58 | 33 | 110 | 2.2 | 180 | 85 | 256 | 0.77 | 0.33 | 50 | 4.8 | **1300** | 100 | 10 | - | - | 100 | 47 | 5 | 50 |
| Stonecreek PW | 7/26/2011 | **1151** | **742** | - | - | - | - | - | - | - | 123 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Stonecreek PW | 5/23/2012 | **1100** | **730** | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | **120** | - | - |
| Stonecreek PW | 6/19/2013 | **1200** | - | - | 210 | 78 | 41 | 130 | 2.9 | 190 | 130 | 210 | 1.9 | 0.2 | 50 | 4.3 | - | 100 | 10 | - | - | 100 | **100** | 5 | 50 |
| Stonecreek PW | 7/10/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **93** | - | - |
| Stonecreek PW | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | 1.9 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diablo Water District | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stonecreek PW | 7/30/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| Stonecreek PW | 3/23/2016 | - | - | - | - | - | - | - | - | - | - | - | 1.91 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stonecreek PW | 6/22/2016 | **1146** | - | - | 220 | 77 | 40 | 130 | - | 190 | 150 | 220 | - | - | 50 | 3.9 | - | 100 | 10 | - | - | 100 | **99** | 5 | 50 |
| Stonecreek PW | 12/20/2017 | - | - | - | - | 62 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Stonecreek PW | 3/20/2019 | - | - | - | - | - | - | - | - | - | - | - | 0.91 | - | - | - | - | - | - | - | - | - | - | - | - |
| Stonecreek PW | 6/19/2019 | - | **734** | - | - | 64 | 37 | 120 | - | 180 | 130 | - | 1.3 | 0.3 | ND | 3.9 | - | ND | ND | - | - | ND | **100** | ND | - |
| Glen Park MW | 10/23/2000 | - | **570** | 7.8 | - | 58 | 34 | 100 | 2.3 | 160 | 74 | - | 0.74547 | 0.3 | - | - | - | - | - | - | - | - | - | - | - |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1BMW-343 | 3/19/2013 | **1000** | **590** | 7.86 | 330 | 25 | 12 | 180 | 1.5 | 52 | 86 | 330 | <0.45 | 0.22 | - | - | - | - | - | - | - | <100 | **120** | - | - |
| 4AMW-357 | 3/20/2013 | **1000** | **580** | 7.62 | 250 | 64 | 31 | 120 | 1.5 | 110 | 120 | 250 | <0.45 | 0.32 | - | - | - | - | - | - | - | <100 | **120** | - | - |
| 6MW-250 | 3/19/2013 | **1100** | **650** | 7.84 | 430 | 11 | 7.4 | 250 | 1.3 | 33 | 84 | 430 | <0.45 | 0.36 | - | - | - | - | - | - | - | <100 | **120** | - | - |
| 6MW-350 | 3/19/2013 | **1000** | **550** | 7.84 | 350 | 29 | 14 | 190 | 1.8 | 44 | 88 | 350 | <0.45 | 0.29 | - | - | - | - | - | - | - | <100 | **100** | - | - |
| 7MW-330 | 3/20/2013 | **950** | **540** | 7.93 | 280 | 26 | 17 | 170 | 1.4 | 96 | 85 | 280 | <0.45 | 0.46 | - | - | - | - | - | - | - | <100 | **190** | - | - |
| WELL 01B | 3/28/1995 | - | - | - | - | - | - | - | - | - | - | - | 0.36 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 5/9/1996 | 900 | **550** | - | - | 42 | 18 | 130 | 1.7 | 84 | 90 | 300 | - | 0.26 | <50 | <2 | - | 110 | <10 | - | - | 210 | **140** | <5 | <50 |
| WELL 01B | 3/10/1997 | **920** | **670** | - | 290 | 40 | 19 | 160 | 2 | 94 | 100 | 360 | ND | ND | - | - | **2100** | - | - | - | - | 80 | **140** | - | <50 |
| WELL 01B | 5/10/1999 | 892 | **592** | - | 260 | 39 | 23 | 126 | - | 79 | 78 | 260 | <0.05 | 0.3 | 24 | 2 | - | 110 | 2 | - | - | 110 | **120** | 1 | 50 |
| WELL 01B | 5/17/2000 | 864 | **598** | - | 288 | 41 | 19 | 119 | - | 88 | 80 | 288 | <0.1 | - | 50 | - | - | - | - | - | - | 77 | **125** | - | 50 |
| WELL 01B | 7/10/2001 | **920** | **560** | - | 260 | 45 | 18 | 130 | 2 | 66 | 76 | 260 | <2.3 | - | <50 | <2 | - | 110 | - | - | - | <100 | **130** | <5 | <50 |
| WELL 01B | 5/28/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2200** | - | - | ND | - | - | - | - | - |
| WELL 01B | 10/16/2002 | 900 | - | - | 290 | 41 | 18 | 140 | 1.7 | 83 | 80 | 354 | ND | 0.37 | <50 | <2 | - | - | - | - | - | - | - | - | - |
| WELL 01B | 10/29/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2100** | - | - | ND | - | - | - | - | - |
| WELL 01B | 3/18/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 130 | **140** | - | - |
| WELL 01B | 6/3/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 6/10/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 6/17/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 01B | 6/24/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 7/1/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 01B | 7/8/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 01B | 7/15/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **140** | - | - |
| WELL 01B | 7/23/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 7/29/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 8/5/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **140** | - | - |
| WELL 01B | 8/12/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Cations** | | | | **Anions** | | | | | **Trace Elements** | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50 [b] | 50[a] | 5000[a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 01B | 8/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 9/23/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 11/25/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 220 | **460** | - | - |
| WELL 01B | 1/28/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 200 | **120** | - | - |
| WELL 01B | 4/7/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 01B | 4/21/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 120 | **130** | - | - |
| WELL 01B | 5/26/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **122** | - | - |
| WELL 01B | 6/9/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **120** | - | - |
| WELL 01B | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **116** | - | - |
| WELL 01B | 6/30/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **124** | - | - |
| WELL 01B | 7/7/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **92.8** | - | - |
| WELL 01B | 7/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **108** | - | - |
| WELL 01B | 7/21/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **125** | - | - |
| WELL 01B | 7/28/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **127** | - | - |
| WELL 01B | 8/4/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **120** | - | - |
| WELL 01B | 8/11/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **121** | - | - |
| WELL 01B | 8/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **114** | - | - |
| WELL 01B | 8/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **122** | - | - |
| WELL 01B | 9/1/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **121** | - | - |
| WELL 01B | 9/8/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **120** | - | - |
| WELL 01B | 9/15/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **118** | - | - |
| WELL 01B | 9/22/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **122** | - | - |
| WELL 01B | 9/29/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **120** | - | - |
| WELL 01B | 10/6/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **124** | - | - |
| WELL 01B | 10/13/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **123** | - | - |
| WELL 01B | 10/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **115** | - | - |
| WELL 01B | 12/29/2004 | 898 | **550** | - | 270 | 43 | 18 | 128 | 2 | 89 | 85 | 330 | - | 0.3 | 50 | 2 | **2300** | 115 | 1 | - | - | 220 | **120** | 2 | 20 |
| WELL 01B | 5/4/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **121** | - | - |
| WELL 01B | 10/12/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **120** | - | - |
| WELL 01B | 12/19/2005 | **906** | **540** | - | 270 | 43 | 18 | 125 | 2 | 85 | 82 | 330 | <0.09 | 0.3 | 10 | 2 | **2200** | 114 | 1 | - | - | 80 | **130** | 2 | 20 |
| WELL 01B | 12/21/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **780** | **140** | - | - |
| WELL 01B | 1/25/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **120** | - | - |
| WELL 01B | 2/8/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **120** | - | - |
| WELL 01B | 2/22/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **130** | - | - |
| WELL 01B | 3/15/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **130** | - | - |
| WELL 01B | 4/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **120** | - | - |
| WELL 01B | 5/3/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **130** | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 01B | 5/17/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 150 | **130** | - | - |
| WELL 01B | 5/31/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **130** | - | - |
| WELL 01B | 6/27/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **120** | - | - |
| WELL 01B | 7/12/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **130** | - | - |
| WELL 01B | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **100** | - | - |
| WELL 01B | 7/26/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 140 | **110** | - | - |
| WELL 01B | 8/23/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 130 | **140** | - | - |
| WELL 01B | 9/13/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **140** | - | - |
| WELL 01B | 9/28/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **130** | - | - |
| WELL 01B | 10/4/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | 110 | **140** | - | - |
| WELL 01B | 10/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **130** | - | - |
| WELL 01B | 10/25/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **130** | - | - |
| WELL 01B | 11/8/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **130** | - | - |
| WELL 01B | 10/7/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | 0.3 | <50 | <2 | - | 110 | <10 | - | - | - | - | <5 | - |
| WELL 01B | 3/10/2009 | 890 | **560** | - | 260 | 42 | 18 | 130 | 2 | 85 | 86 | 320 | ND | 0.19 | <50 | <2 | - | 120 | <10 | - | - | <100 | **130** | <5 | <50 |
| WELL 01B | 8/25/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 01B | 3/3/2010 | **930** | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 12/29/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 01B | 11/8/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 11/20/2012 | **936** | **550** | - | 260 | 48 | 19 | 135 | 2 | 84 | 81 | 320 | <0.09 | 0.2 | 20 | 2 | **2100** | 120 | 4 | - | - | 150 | **140** | 2 | 20 |
| WELL 01B | 7/8/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 11/26/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 12/17/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 01B | 3/11/2015 | **941** | **560** | - | 260 | 40 | 17 | 124 | 2 | 82 | 82 | 310 | 0.09 | 0.2 | 10 | 2 | **2200** | 121 | 1 | - | - | 240 | **130** | 1 | 60 |
| WELL 01B | 4/27/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01B | 6/14/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| WELL 01B | 4/13/2018 | **937** | **540** | - | 260 | 43 | 19 | 138 | 2 | 88.2 | 86 | 320 | 0.4 | 0.2 | 50 | 2 | **2200** | 116 | 10 | - | - | 100 | **130** | 5 | 50 |
| WELL 01B | 5/23/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 11/19/1986 | 600 | **532** | - | 420 | 31.5 | 14.1 | 193 | 1.8 | 65 | 95 | 512 | <0.02 | 0.33 | - | 1 | - | 100 | 20 | - | - | 120 | **123** | 1 | 10 |
| WELL 02 | 9/12/1989 | **929** | **605** | - | 270 | 49.2 | 19.5 | 111 | 2.4 | 83.7 | 118 | 279 | <0.2 | 0.29 | 100 | 10 | - | 100 | 10 | - | - | 144 | **120** | 5 | 50 |
| WELL 02 | 1/20/1993 | **1000** | **560** | - | 293 | 28 | 14 | 2 | 170 | 74 | 96 | 357 | - | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 120 | **200** | <5 | <50 |
| WELL 02 | 3/28/1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 5/8/1996 | - | - | - | - | - | - | - | - | - | - | - | 0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 3/10/1997 | **960** | - | - | 290 | 50 | 20 | 170 | 1 | 92 | 120 | 350 | ND | 0.1 | - | - | **2000** | - | - | - | - | 150 | **120** | - | <50 |
| WELL 02 | 5/10/1999 | **921** | - | - | 274 | 42 | 19 | 134 | - | 86 | 81 | 274 | <0.05 | 0.26 | 23 | 2 | - | 100 | 2 | - | - | 120 | **130** | 1 | 50 |
| WELL 02 | 5/17/2000 | 886 | **592** | - | 291 | 42 | 17 | 118 | - | 88 | 84 | 291 | <0.1 | - | 76 | - | - | - | - | - | - | 175 | **134** | - | 50 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

## Deep Aquifer

### Town of Discovery Bay

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 02 | 7/10/2001 | **940** | **560** | - | 280 | 44 | 18 | 140 | 2 | 66 | 83 | 280 | <2.3 | - | <50 | <2 | - | 110 | - | - | - | 120 | **140** | <5 | <50 |
| WELL 02 | 5/28/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2000** | - | - | ND | - | - | - | - | - |
| WELL 02 | 12/11/2002 | 890 | **570** | - | 300 | 42 | 19 | 160 | 1.6 | 74 | 87 | 366 | ND | 0.31 | <50 | <2 | **2200** | 110 | <10 | ND | - | 140 | **140** | <5 | <50 |
| WELL 02 | 3/18/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 200 | **140** | - | - |
| WELL 02 | 3/25/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **130** | - | - |
| WELL 02 | 4/2/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 130 | **130** | - | - |
| WELL 02 | 4/8/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 120 | **130** | - | - |
| WELL 02 | 4/15/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 140 | **130** | - | - |
| WELL 02 | 4/22/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 02 | 4/29/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 02 | 5/6/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 02 | 5/20/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **130** | - | - |
| WELL 02 | 5/27/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 02 | 10/27/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **116** | - | - |
| WELL 02 | 12/29/2004 | **942** | **570** | - | 290 | 40 | 18 | 142 | 2 | 85 | 96 | 350 | - | 0.3 | 10 | 2 | **2100** | 131 | 1 | - | - | 90 | **120** | 2 | 30 |
| WELL 02 | 12/19/2005 | **925** | **560** | - | 280 | 39 | 17 | 136 | 2 | 74 | 87 | 340 | <0.09 | 0.3 | 10 | 2 | **2200** | 106 | 1 | - | - | 90 | **120** | 2 | 20 |
| WELL 02 | 10/4/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 10/7/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | 0.39 | <50 | 2.4 | - | 100 | <10 | - | - | - | - | <5 | - |
| WELL 02 | 3/10/2009 | **950** | **590** | - | 270 | 40 | 18 | 140 | 2 | 80 | 100 | 330 | ND | 0.19 | <50 | <2 | - | 110 | <10 | - | - | <100 | **120** | <5 | 54 |
| WELL 02 | 8/25/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 02 | 3/3/2010 | **980** | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 12/29/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 02 | 11/8/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 11/20/2012 | **982** | **550** | - | 280 | 43 | 18 | 153 | 2 | 77 | 90 | 340 | <0.09 | 0.1 | 10 | 2 | **2100** | 110 | 4 | - | - | 170 | **140** | 2 | 30 |
| WELL 02 | 7/8/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 11/26/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | 0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 12/17/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 02 | 3/11/2015 | **964** | **560** | - | 270 | 33 | 16 | 145 | 1 | 65 | 86 | 330 | <0.09 | 0.2 | 10 | 2 | **2200** | 100 | 1 | - | - | 140 | **110** | 1 | 20 |
| WELL 02 | 4/27/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/14/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| WELL 02 | 4/13/2018 | **959** | **550** | - | 290 | 35 | 17 | 159 | 2 | 71.7 | 88 | 350 | 0.4 | 0.2 | 50 | 3 | **2300** | 100 | 10 | - | - | 130 | **120** | 5 | 50 |
| WELL 02 | 5/23/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 8/1/1996 | **1000** | - | - | - | 49 | 23 | 110 | 1 | 97 | 84 | 270 | ND | 0.37 | <50 | <2 | - | <100 | <10 | - | - | 60 | **90** | <5 | <50 |
| WELL 04A | 3/10/1997 | **1000** | **590** | - | 340 | 20 | 10 | 230 | ND | 80 | 130 | 420 | - | 0.2 | - | - | **3000** | - | - | - | - | 170 | **80** | - | <50 |
| WELL 04A | 5/10/1999 | **905** | **600** | - | 244 | 52 | 24 | 110 | - | 99 | 84 | 244 | - | 0.31 | 42 | 2 | - | 100 | 2 | - | - | 100 | **100** | 1 | 50 |
| WELL 04A | 5/17/2000 | 874 | **602** | - | 265 | 48 | 26 | 106 | - | 105 | 85 | 265 | <0.1 | - | 50 | - | - | - | - | - | - | 62 | **95** | - | 50 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 04A | 7/10/2001 | **910** | **600** | - | 250 | 56 | 26 | 120 | 2 | 86 | 80 | 250 | <2.3 | - | <50 | 2 | - | <100 | - | - | - | <100 | **110** | <5 | <50 |
| WELL 04A | 5/28/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2100** | - | - | ND | - | - | - | - | - |
| WELL 04A | 8/20/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 10/16/2002 | **910** | **520** | - | 260 | 51 | 26 | 120 | 1.4 | 100 | 87 | 317 | ND | 0.42 | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 10/23/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 10/24/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 10/29/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2000** | - | - | ND | - | <100 | **110** | - | - |
| WELL 04A | 10/30/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 11/5/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 11/6/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **99** | - | - |
| WELL 04A | 11/12/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 11/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 04A | 11/20/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 12/3/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 12/10/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 12/17/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 12/23/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 12/30/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 1/7/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 1/14/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 1/21/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 2/11/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 150 | **110** | - | - |
| WELL 04A | 2/18/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 2/25/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **88** | - | - |
| WELL 04A | 3/5/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 120 | **120** | - | - |
| WELL 04A | 3/11/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 3/18/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **330** | **110** | - | - |
| WELL 04A | 3/25/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 4/2/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 4/8/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **100** | - | - |
| WELL 04A | 4/15/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 4/22/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 4/29/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 5/6/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 5/20/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 5/27/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 6/3/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 6/10/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |

## Deep Aquifer

### Town of Discovery Bay

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 04A | 6/17/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 6/24/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 7/1/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 7/8/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 7/15/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 7/23/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 7/29/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 8/5/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 04A | 8/12/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 8/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 9/23/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **120** | - | - |
| WELL 04A | 11/25/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 1/28/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **97** | - | - |
| WELL 04A | 4/7/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **110** | - | - |
| WELL 04A | 4/21/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | <20 | - | - |
| WELL 04A | 5/26/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **102** | - | - |
| WELL 04A | 6/9/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **98.4** | - | - |
| WELL 04A | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **98.5** | - | - |
| WELL 04A | 6/30/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **99.9** | - | - |
| WELL 04A | 7/7/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **88.4** | - | - |
| WELL 04A | 7/14/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **93.7** | - | - |
| WELL 04A | 7/21/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **105** | - | - |
| WELL 04A | 7/28/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **104** | - | - |
| WELL 04A | 8/4/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **102** | - | - |
| WELL 04A | 8/11/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **101** | - | - |
| WELL 04A | 8/18/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **94.8** | - | - |
| WELL 04A | 8/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **99.7** | - | - |
| WELL 04A | 9/1/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **149** | - | - |
| WELL 04A | 9/8/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **101** | - | - |
| WELL 04A | 9/15/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **98.9** | - | - |
| WELL 04A | 9/22/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **100** | - | - |
| WELL 04A | 9/29/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **137** | - | - |
| WELL 04A | 10/6/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **150** | - | - |
| WELL 04A | 10/13/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | **137** | - | - |
| WELL 04A | 10/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **92** | - | - |
| WELL 04A | 10/27/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **101** | - | - |
| WELL 04A | 12/29/2004 | **924** | **590** | - | 260 | 50 | 24 | 116 | 1 | 100 | 94 | 320 | <0.09 | 0.3 | 10 | 2 | **2100** | 94.4 | 1 | - | - | 60 | **110** | 2 | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 04A | 5/4/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **100** | - | - |
| WELL 04A | 9/21/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **100** | - | - |
| WELL 04A | 10/12/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | 40 | - | - |
| WELL 04A | 12/19/2005 | **930** | **580** | - | 260 | 50 | 24 | 111 | 1 | 97 | 90 | 320 | <0.09 | 0.3 | 10 | 2 | **2100** | 76.1 | 1 | - | - | 60 | **110** | 2 | 20 |
| WELL 04A | 12/21/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **380** | **110** | - | - |
| WELL 04A | 1/25/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2770** | **400** | - | - |
| WELL 04A | 2/8/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **100** | - | - |
| WELL 04A | 2/22/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 260 | **110** | - | - |
| WELL 04A | 3/15/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **730** | **80** | - | - |
| WELL 04A | 4/5/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | 50 | - | - |
| WELL 04A | 4/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 150 | **100** | - | - |
| WELL 04A | 5/3/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **110** | - | - |
| WELL 04A | 5/17/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 140 | **110** | - | - |
| WELL 04A | 5/31/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60 | **110** | - | - |
| WELL 04A | 6/27/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **160** | - | - |
| WELL 04A | 7/12/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **100** | - | - |
| WELL 04A | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **100** | - | - |
| WELL 04A | 7/26/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 90 | **110** | - | - |
| WELL 04A | 8/23/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | **110** | - | - |
| WELL 04A | 9/13/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **110** | - | - |
| WELL 04A | 9/28/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **100** | - | - |
| WELL 04A | 10/4/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **110** | - | - |
| WELL 04A | 10/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | **110** | - | - |
| WELL 04A | 10/25/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 110 | **100** | - | - |
| WELL 04A | 11/8/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80 | **100** | - | - |
| WELL 04A | 10/7/2008 | - | - | - | - | - | - | - | - | - | - | - | - | 0.4 | <50 | <2 | - | <100 | <10 | - | - | - | - | <5 | - |
| WELL 04A | 3/10/2009 | **920** | **580** | - | 250 | 50 | 25 | 120 | 2 | 96 | 94 | 300 | - | 0.26 | <50 | 2.7 | - | <100 | <10 | - | - | <100 | **110** | <5 | <50 |
| WELL 04A | 8/25/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | **98** | - | - |
| WELL 04A | 3/3/2010 | **960** | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 8/2/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 11/19/2012 | **963** | **580** | - | 250 | 51 | 26 | 124 | 2 | 98 | 96 | 300 | <0.09 | 0.3 | 10 | 2 | **2100** | 81.5 | 1 | - | - | 50 | **110** | 3 | 20 |
| WELL 04A | 7/8/2013 | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 11/26/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 12/18/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 04A | 3/12/2015 | **954** | - | - | 250 | 50 | 24 | 111 | 1 | 98 | 97 | 300 | 0.1 | 1.5 | 10 | 2 | **2200** | 80.3 | 1 | - | - | 40 | **100** | 3 | 20 |
| WELL 04A | 4/27/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 04A | 6/14/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | 1 | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 04A | 4/13/2018 | **1000** | **600** | - | 250 | 53 | 27 | 126 | 1 | 108 | 105 | 300 | 0.4 | 0.3 | 50 | 3 | **2200** | 100 | 10 | - | - | 100 | **110** | 5 | 50 |
| WELL 04A | 5/23/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 3/28/1990 | **985** | **753** | - | 307 | 26.3 | 17.8 | 138 | 2.3 | 84.4 | 98.9 | 307 | <0.2 | 0.4 | 100 | 10 | - | 100 | 10 | - | - | 131 | **146** | 5 | 50 |
| WELL 05A | 1/20/1993 | 820 | **570** | - | 303 | 23 | 13 | 190 | 2 | 83 | 99 | 370 | ND | 0.3 | <50 | <2 | - | <100 | <10 | - | - | 70 | **140** | <5 | <50 |
| WELL 05A | 3/28/1995 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 6/14/1996 | **1000** | **590** | - | 340 | 29 | 15 | 180 | 0.41 | 85 | 71 | 340 | - | - | - | - | - | - | - | - | - | <100 | 0.13 | - | <50 |
| WELL 05A | 3/10/1997 | **1000** | **630** | - | 310 | 30 | 17 | 200 | ND | 89 | 120 | 380 | ND | 0.2 | - | - | **2700** | - | - | - | - | 50 | **150** | - | <50 |
| WELL 05A | 5/10/1999 | **1010** | **667** | - | 310 | 30 | 17 | 174 | - | 79 | 95 | 310 | <0.05 | 0.39 | 25 | 2 | - | 100 | 2 | - | - | 140 | **140** | 1 | 50 |
| WELL 05A | 5/17/2000 | **977** | **660** | - | 318 | 29 | 18 | 163 | - | 86 | 113 | 318 | <0.1 | - | 50 | - | - | - | - | - | - | 106 | **141** | - | 50 |
| WELL 05A | 7/10/2001 | **1100** | **640** | - | 320 | 34 | 17 | 180 | 2 | 79 | 100 | 320 | <2.3 | - | <50 | 3 | - | <100 | - | - | - | <100 | **150** | <5 | <50 |
| WELL 05A | 5/28/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **3100** | - | - | ND | - | - | - | - | - |
| WELL 05A | 10/16/2002 | **930** | **530** | - | 270 | 51 | 26 | 120 | 1.4 | 100 | 91 | 329 | ND | 0.43 | <50 | <2 | - | <100 | <10 | - | - | **380** | **57** | <5 | <50 |
| WELL 05A | 10/29/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **2000** | - | - | ND | - | - | - | - | - |
| WELL 05A | 12/29/2004 | **1190** | **750** | - | 370 | 36 | 18 | 203 | 1 | 79 | 130 | 450 | <0.09 | 0.4 | 10 | 4 | **3400** | 94.2 | 1 | - | - | 80 | 50 | 2 | 20 |
| WELL 05A | 12/19/2005 | **949** | **580** | - | 260 | 49 | 24 | 117 | 1 | 97 | 100 | 310 | <0.09 | 0.3 | 10 | 2 | **2100** | 82.2 | 1 | - | - | 150 | 10 | 2 | 20 |
| WELL 05A | 10/4/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 10/7/2008 | - | - | - | - | - | - | - | - | - | - | - | <0.7 | 0.46 | <50 | 3.3 | - | <100 | <10 | - | - | - | - | <5 | - |
| WELL 05A | 6/9/2009 | **970** | **560** | - | 260 | 49 | 24 | 120 | 2 | 96 | 96 | 320 | ND | 0.33 | <50 | 2.7 | - | <100 | <10 | - | - | 110 | <20 | <5 | <50 |
| WELL 05A | 3/3/2010 | **1000** | - | - | - | - | - | - | - | - | - | - | 0.81 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 12/29/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 05A | 8/2/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 11/19/2012 | **2220** | **1240** | - | 340 | 71 | 35 | 401 | 3 | 74 | **480** | 410 | <0.09 | 0.2 | 10 | 5 | **4000** | 225 | 2 | - | - | 160 | **140** | 9 | 20 |
| WELL 05A | 3/20/2013 | **2200** | **1100** | 7.97 | 350 | 65 | 38 | 360 | 2.2 | 81 | **470** | 350 | <0.45 | 0.32 | - | - | - | - | - | - | - | <100 | 13 | - | - |
| WELL 05A | 4/24/2013 | **2840** | **1520** | - | - | - | - | - | - | - | - | - | 0.014 | - | - | - | - | - | - | - | - | 50 | **312** | - | - |
| WELL 05A | 7/8/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 11/26/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 12/18/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 05A | 3/12/2015 | **2190** | - | - | 300 | 80 | 39 | 293 | 2 | 85 | **480** | 370 | 0.2 | 0.1 | 10 | 4 | **3500** | 206 | 1 | - | - | 190 | 50 | 6 | 20 |
| WELL 05A | 4/27/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 05A | 6/14/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| WELL 05A | 4/13/2018 | **2660** | **1470** | - | 350 | 75 | 41 | 442 | 3 | 83 | **594** | 430 | 0.4 | 0.3 | 50 | 5 | **4100** | 302 | 10 | - | - | 100 | **560** | 8 | 50 |
| WELL 05A | 5/23/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 8/24/2009 | **930** | - | - | 310 | 32 | 15 | 160 | 2 | 62 | 90 | 360 | ND | 0.3 | <50 | <2 | - | 100 | <10 | - | - | <100 | **110** | <5 | <50 |
| WELL 06 | 12/29/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 06 | 7/20/2011 | 900 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 11/8/2011 | **950** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 11/30/2011 | **980** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town of Discovery Bay | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 06 | 2/28/2012 | 900 | **520** | - | 290 | 31 | 14 | 160 | ND | 59 | 89 | 360 | ND | 0.34 | <50 | <2 | - | 120 | <10 | - | - | <100 | **100** | <5 | <50 |
| WELL 06 | 11/20/2012 | **974** | **570** | - | 260 | 34 | 15 | 172 | 2 | 50 | 92 | 310 | - | 0.2 | 10 | 2 | **2500** | 97 | 4 | - | - | 70 | **110** | 2 | 20 |
| WELL 06 | 7/17/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 11/26/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | 0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 12/17/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 06 | 3/11/2015 | **978** | **560** | - | 300 | 27 | 13 | 161 | 2 | 47 | 89 | 370 | - | 0.2 | 10 | 2 | **2600** | 93.9 | 1 | - | - | 100 | **100** | 1 | 20 |
| WELL 06 | 4/27/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 06 | 6/14/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | 1 | - | - | - | - | - |
| WELL 06 | 4/13/2018 | **1000** | - | - | 320 | 29 | 14 | 189 | 2 | 40.8 | 97 | 400 | 0.4 | 0.3 | 50 | 2 | **3000** | 100 | 10 | - | - | 100 | **100** | 5 | 50 |
| WELL 06 | 5/23/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 07 | 7/30/2015 | **951** | **580** | - | 240 | 33 | 18 | 153 | 1 | 82 | 88 | 290 | 0.1 | 0.5 | 10 | 2 | **2500** | 73.1 | 1 | - | - | 100 | **170** | 1 | 20 |
| WELL 07 | 8/26/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 07 | 7/20/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 07 | 6/14/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 07 | 7/26/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| WELL 07 | 4/13/2018 | **1250** | **720** | - | 300 | 45 | 25 | 193 | 2 | 85.2 | 165 | 370 | 0.4 | 0.4 | 50 | 3 | **2900** | 110 | 10 | - | - | 140 | **210** | 5 | 50 |
| WELL 07 | 7/24/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| WELL 07 | 5/23/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 07 | 7/9/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <1 | - | - | - | - | - |
| BEACON WEST | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 1 | 6/17/2009 | **1500** | - | - | 260 | 37 | 25 | 240 | 3.1 | 140 | 250 | 260 | - | 0.1 | - | **28** | - | 120 | 10 | - | - | 100 | **180** | 5 | 50 |
| Well 1 | 5/23/2012 | **1300** | - | - | 220 | 27 | 23 | 24 | 3.2 | 150 | **260** | 220 | - | 0.1 | 50 | **35** | - | 150 | 10 | - | - | 100 | **250** | 5 | 50 |
| Well 1 | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| Well 1 | 6/17/2015 | **1400** | - | - | 230 | 37 | 23 | 230 | 2.8 | 140 | 240 | 230 | - | ND | 50 | **33** | - | 120 | 10 | - | - | 100 | **200** | 5 | 50 |
| Well 1 | 3/23/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 | 12/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 | 4/17/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | - | - |
| KNIGHTSEN COMMUNITY WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Knightsen Town Well | 10/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Knightsen Town Well | 6/17/2009 | 890 | - | - | 200 | 59 | 29 | 87 | 1.9 | 140 | 69 | 200 | 1.2 | 0.2 | - | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Knightsen Town Well | 6/23/2010 | - | - | - | - | - | - | - | - | - | - | - | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Knightsen Town Well | 6/22/2011 | - | - | - | - | - | - | - | - | - | - | - | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Knightsen Town Well | 5/23/2012 | 790 | - | - | 230 | 43 | 24 | 85 | 2.1 | 140 | 68 | 230 | 0.99 | 0.3 | 170 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Knightsen Town Well | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | 0.59 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| KNIGHTSEN COMMUNITY WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Knightsen Town Well | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.6 | - | - | - | - | - |
| Knightsen Town Well | 3/18/2015 | - | - | - | - | - | - | - | - | - | - | - | 0.47 | - | - | - | - | - | - | - | - | - | - | - | - |
| Knightsen Town Well | 6/17/2015 | 850 | **550** | - | 240 | 60 | 26 | 89 | 1.9 | 120 | 59 | 240 | - | 0.5 | 50 | 2 | - | 100 | 10 | - | - | 100 | 20 | 5 | 50 |
| Knightsen Town Well | 3/23/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.62 | - | - | - | - | - | - | - | - | - | - | - | - |
| Knightsen Town Well | 12/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.45 | - | - | - | - | - | - | - | - | - | - | - | - |
| Knightsen Town Well | 6/20/2018 | - | - | - | - | 61 | 26 | 84 | 1.8 | 120 | 62 | - | 0.43 | 0.3 | <50 | <2 | - | <100 | <10 | - | - | <100 | <20 | <5 | <50 |
| KNIGHTSEN ELEMENTARY SCHOOL | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 3 | 6/18/2007 | 880 | - | - | 240 | 30 | 10 | 130 | 1.2 | 110 | 59 | 300 | - | 0.2 | <50 | **12.5** | - | <100 | <10 | - | - | <100 | **92** | <5 | <50 |
| WELL 3 | 12/6/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/20/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 7/7/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/23/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/15/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/11/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/10/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/10/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/3/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/3/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 4/7/2010 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/3/2010 | 890 | - | - | 240 | 29 | 10 | 140 | 1.3 | 110 | 59 | 290 | - | 0.3 | 50 | 10 | - | 100 | 1 | - | - | 100 | **100** | <5 | <50 |
| WELL 3 | 9/9/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/1/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/9/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/13/2011 | 860 | - | - | 220 | 30 | 11 | 140 | 1.5 | 110 | 60 | 270 | - | 0.3 | 50 | **12** | - | 100 | 1 | - | - | <100 | **94** | <5 | <50 |
| WELL 3 | 9/7/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/5/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/1/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/5/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/5/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12.7** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/10/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/11/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12.3** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/9/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/12/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/6/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/4/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/4/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| KNIGHTSEN ELEMENTARY SCHOOL | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 3 | 12/8/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/23/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/25/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/14/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 10/19/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/14/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 1/27/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 3/9/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12.8** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 4/6/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 6/6/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12.6** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 7/12/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 9/13/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 10/17/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/12/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - |
| WELL 3 | 1/18/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 12/13/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| SUGAR BARGE MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bethel Island | 1/17/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/22/2004 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/24/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/23/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/22/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/10/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/12/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/14/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/9/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/8/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/21/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/4/2016 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/11/2017 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Bethel Island | 1/17/2018 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WILLOW MOBILE HOME PARK | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/11/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/24/2006 | **1100** | **660** | - | 340 | 96 | 64 | 38 | 0.7 | 78 | 110 | 420 | 9 | 0.19 | - | <2 | - | - | - | - | - | 100 | 20 | <5 | 50 |
| Well Head | 6/17/2009 | **1900** | - | - | 220 | 51 | 28 | 270 | 3.9 | 120 | **350** | 220 | <0.5 | 0.1 | - | 2 | - | 160 | 10 | - | - | 100 | **150** | 5 | 50 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| WILLOW MOBILE HOME PARK | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 6/23/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | - | - | 100 | 1 | - | - | - | - | - | - |
| Well Head | 7/31/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/15/2015 | **1700** | **1000** | - | 220 | 49 | 25 | 280 | 4.3 | 130 | **340** | 260 | ND | 0.1 | 50 | <2 | - | 190 | <10 | - | - | <100 | **160** | <5 | <50 |
| Well Head | 7/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.44 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/10/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/7/2018 | **1700** | **1000** | - | 210 | 48 | 24 | 300 | 4.1 | 130 | **340** | 260 | ND | ND | <50 | 2.1 | - | 170 | <10 | - | - | <100 | **130** | <5 | <50 |
| WILLOW PARK MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| East Well | 6/17/2009 | **1500** | - | - | 250 | 24 | 12 | 260 | 2.7 | 130 | 200 | 250 | <0.5 | 0.1 | - | 10 | - | 100 | 10 | - | - | 100 | **110** | 5 | 50 |
| East Well | 6/23/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 6/22/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 5/23/2012 | **1300** | - | - | 260 | 17 | 12 | 220 | 3 | 140 | 210 | 260 | <0.5 | 0.1 | 50 | **12** | - | 100 | 10 | - | - | 110 | **140** | 5 | 50 |
| East Well | 6/19/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| East Well | 3/18/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 6/17/2015 | **1400** | **840** | - | 270 | 24 | 13 | 260 | 2.6 | 130 | 200 | 270 | - | 0.2 | 50 | **12** | - | 100 | 10 | - | - | 100 | **120** | 5 | 50 |
| East Well | 3/23/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 12/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 6/20/2018 | - | **842** | - | - | 24 | 12 | 240 | - | 130 | 200 | - | <0.4 | 0.15 | <50 | - | - | <100 | <10 | - | - | 110 | **120** | <5 | <50 |
| East Well | 3/20/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 6/14/2009 | **1300** | - | - | 300 | - | - | - | - | 120 | 170 | 300 | <0.5 | 0.1 | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 6/17/2009 | **1300** | - | - | 300 | 23 | 13 | 240 | 2.7 | 120 | 170 | 300 | <0.5 | 0.1 | - | 10 | - | 100 | 10 | - | - | 100 | **100** | 5 | 50 |
| West Well | 6/23/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 6/22/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 5/23/2012 | **1100** | - | - | 260 | 16 | 12 | 220 | 3 | 120 | 180 | 260 | <0.5 | 0.1 | 50 | **12** | - | 100 | 10 | - | - | 100 | **130** | 5 | 50 |
| West Well | 6/19/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 8/20/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| West Well | 3/18/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 6/17/2015 | **1300** | **760** | - | 270 | 22 | 12 | 230 | 2.5 | 120 | 170 | 270 | - | 0.2 | 50 | 10 | - | 100 | 10 | - | - | 110 | **110** | 5 | 50 |
| West Well | 3/23/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 12/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 6/20/2018 | - | **772** | - | - | 23 | 12 | 210 | 2.6 | 120 | 170 | - | <0.4 | 0.15 | <50 | **12** | - | <100 | <10 | - | - | - | **110** | <5 | <50 |
| **Composite Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Composite Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| City of Brentwood | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-14 Shallow | 4/26/1999 | - | 390 | - | 210 | 61 | 21 | 54 | 1 | 39 | 68 | - | 2.07828 | 0.4 | - | - | 400 | - | - | - | - | - | **140** | - | - |
| WELL 02 | 8/16/1990 | **1530** | **934** | - | 304 | 96.9 | 53.8 | 96.6 | 2.7 | 153 | 226 | 304 | 9.53 | 0.35 | 143 | 10 | - | 100 | 15 | - | - | 102 | 10 | 5 | 50 |
| WELL 04 | 8/16/1990 | **1460** | **939** | - | 242 | 94.7 | 49.9 | 96.2 | 3 | 186 | 203 | 242 | 9.15 | 0.33 | 139 | 10 | - | 100 | 10 | - | - | 100 | 10 | 5 | 50 |
| Well 10A | 6/29/1994 | **1700** | **900** | - | 230 | 130 | 49 | 130 | - | **310** | 170 | - | 3.2 | 0.45 | 140 | <2 | - | <100 | 9 | - | - | 220 | 20 | <5 | 250 |
| Well 10A | 11/10/1994 | **1895** | **1289** | - | 305 | 168 | 77 | 142 | - | **339** | 245 | - | 1.99 | 0.42 | 52 | <2 | - | 49 | <10 | - | - | 44 | <20 | <5 | 55 |
| Well 10A | 7/7/1999 | **1730** | **1180** | - | 300 | 129 | 68 | 135 | 13 | **324** | 189 | 370 | 5.35 | 0.4 | 60 | 8 | **1400** | 53.2 | 2 | - | - | 100 | <20 | 8 | <50 |
| Well 10A | 12/27/2000 | **1740** | **1140** | - | 270 | 122 | 71 | 137 | 14 | **349** | 201 | 330 | 5.72 | 0.2 | 10 | 8 | **1400** | 54.4 | 3 | - | - | 100 | <20 | 7 | <50 |
| Well 10A | 8/1/2001 | **1780** | **1230** | - | 300 | 119 | 67 | 139 | 13 | **335** | 187 | 370 | 5.67 | 0.3 | <50 | 6 | **1350** | 52.1 | 4 | - | - | <100 | <20 | 6 | 20 |
| Well 10A | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - |
| Well 10A | 3/30/2005 | **1760** | **1190** | - | 330 | 138 | 73 | 141 | 12 | **310** | 175 | 400 | 5.6 | 0.3 | 10 | 6 | **1400** | 50.5 | 3 | - | - | 50 | 10 | 5 | 20 |
| Well 10A | 6/15/2005 | **1800** | **1250** | - | 320 | 136 | 73 | 139 | 13 | **362** | 198 | 390 | 5.6 | 0.3 | - | - | **1400** | - | - | - | - | 260 | 10 | - | 20 |
| Well 10A | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 8/9/2005 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 8/23/2005 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 10/11/2005 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 10/25/2005 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 12/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 1/10/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 1/24/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 2/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 3/1/2006 | - | - | - | - | - | - | - | - | - | - | - | 5.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 3/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 4/11/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 4/25/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 5/17/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 6/21/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 9/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 10/18/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 11/21/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 12/20/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 1/17/2007 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 2/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 3/21/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 4/18/2007 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 6/19/2007 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 9/18/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |

## Composite Aquifer

### City of Brentwood

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well 10A | 3/19/2008 | **1840** | **1120** | - | 320 | 130 | 71 | 138 | 12 | **320** | 182 | 390 | 5.9 | 0.3 | 10 | 7 | **1400** | 53.5 | 3 | - | - | 50 | 10 | 7 | 20 |
| Well 10A | 4/2/2008 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 5/7/2008 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 8/27/2008 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 10A | 2/18/2009 | **1800** | **940** | - | 320 | 140 | 76 | 150 | 13 | **350** | 180 | 390 | 6.3 | 0.26 | 50 | 7.2 | - | 100 | 10 | - | - | 100 | 20 | 8.8 | 50 |
| Well 10A | 2/10/2010 | **1800** | **1200** | - | 320 | 140 | 74 | 150 | 13 | **370** | 190 | 390 | 6.3 | 0.28 | - | 7 | **1500** | 100 | 10 | - | - | 100 | 20 | 7.3 | 50 |
| Well 10A | 2/16/2011 | **1800** | **1200** | - | 300 | 140 | 75 | 140 | 13 | 210 | 110 | 370 | 3.6 | 0.24 | 50 | 7.8 | **1500** | 100 | 10 | - | - | 100 | 20 | 10 | 50 |

### Diablo Water District

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CORP YARD WELL 01 | 4/18/1991 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CORP YARD WELL 01 | 1/7/1992 | **1400** | **940** | 7.4 | 240 | 70 | 43 | 140 | 4.4 | **350** | 130 | 240 | 1 | 1.1 | 0.002 | 2.2 | 800 | <100 | <10 | - | - | 52 | **145.4** | 2.4 | <50 |
| CORP YARD WELL 01 | 7/13/1992 | **1750** | **1090** | 7.48 | 240 | 110 | 57 | 170 | 5.1 | **430** | 160 | 240 | 3.4 | 0.3 | 0.003 | <2 | 900 | <100 | <10 | - | - | <100 | **76** | <5 | 20 |
| CORP YARD WELL 01 | 10/6/1992 | - | **1040** | 7.5 | 243 | 69 | 51 | 180 | 5.2 | **420** | 150 | 243 | 3.2 | 0.32 | 7.7 | 3.3 | 900 | <100 | <10 | - | - | <100 | **58** | <5 | <50 |
| CORP YARD WELL 01 | 4/5/1993 | **1440** | **920** | 7.8 | 230 | 88 | 43 | 140 | 4.7 | **360** | 140 | 230 | 1.5 | ND | <50 | 2.1 | <100 | <100 | <10 | - | - | <100 | **71** | <5 | 34 |
| CORP YARD WELL 01 | 7/20/1993 | **1550** | **1030** | 7.57 | 247 | 74 | 46 | 178 | 4.8 | **420** | 150 | 247 | 1.5 | ND | <50 | 3.9 | 700 | <100 | <10 | - | - | 25 | **180** | <5 | 23 |
| CORP YARD WELL 01 | 10/5/1993 | **1490** | **970** | 7.62 | 239 | 85 | 60 | 140 | 4.6 | **390** | 140 | 239 | 1.3 | ND | <50 | 3.1 | 740 | <100 | <10 | - | - | <100 | **150** | <5 | <50 |
| CORP YARD WELL 01 | 1/4/1994 | **1460** | **930** | 7.68 | 236 | 82 | 37 | 160 | 4.7 | **360** | 140 | 236 | 0.75 | 0.21 | 0.004 | 5.2 | 860 | <100 | <10 | - | - | <100 | **270** | <5 | <50 |
| CORP YARD WELL 01 | 4/5/1994 | **1470** | **890** | 7.72 | 240 | 81 | 48 | 150 | 4.4 | **320** | 140 | 240 | 1.2 | 0.26 | 0.002 | 3.7 | 650 | <100 | <10 | - | - | <100 | **240** | <5 | <50 |
| CORP YARD WELL 01 | 12/8/1997 | **1780** | **1020** | - | 245 | 85 | 53 | 150 | 4 | **390** | 180 | 245 | 2.33 | 0.34 | 6.6 | 2 | 920 | 100 | 1 | - | - | 100 | **62** | 5 | 50 |
| CORP YARD WELL 01 | 7/13/1999 | **1730** | **1120** | 7.63 | 240 | 130 | 55 | 180 | 5 | **400** | 190 | 240 | 2.9 | ND | - | - | 780 | <100 | - | - | - | <100 | - | - | <50 |
| CORP YARD WELL 01 | 8/8/2000 | **1680** | **1080** | 7.7 | 234 | 119 | 58 | 184 | 6 | **360** | 200 | 234 | 1.5 | 0.33 | 50 | 4.2 | 900 | 100 | 10 | - | - | 100 | **62** | 5 | 50 |
| CORP YARD WELL 01 | 4/10/2001 | - | - | 7.93 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CORP YARD WELL 01 | 6/18/2008 | **2400** | - | 7.6 | 290 | 190 | 83 | 190 | 6.5 | **570** | 240 | 290 | <0.5 | 1.5 | 50 | 4.5 | - | 130 | 10 | - | - | 100 | **400** | 5 | 50 |
| CORP YARD WELL 01 | 6/23/2010 | - | - | - | - | - | - | - | - | - | - | - | 5.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| CORP YARD WELL 01 | 6/19/2013 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| CORP YARD WELL 01 | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| CORP YARD WELL 01 | 3/18/2015 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| CORP YARD WELL 01 | 6/21/2017 | **2200** | - | - | 330 | 150 | 72 | 250 | 5.5 | **550** | 220 | 400 | 4.3 | 0.28 | 50 | 5.4 | - | 100 | 10 | - | - | 100 | **370** | 5 | 50 |
| CORP YARD WELL 01 | 3/20/2019 | - | - | - | - | - | - | - | - | - | - | - | 2.6 | - | - | - | - | - | - | - | - | - | - | - | - |

### Byron-Bethany Irrigation District

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 Byer | 7/18/1974 | **1050** | **608** | 8.4 | 279 | 32 | 16 | 176 | 3.1 | 114 | 91 | - | 0.1 | - | - | 1 | **2500** | - | 1 | - | - | 0.58 | 0.3 | - | 490 |
| 6 Byer | 6/15/1976 | **1060** | - | 8.3 | 258 | - | - | 170 | - | - | 96 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 Byer | 8/22/1978 | **1050** | - | 8.5 | 287 | - | - | 178 | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 Byer | 7/24/1980 | **1060** | - | **8.8** | 279 | 30 | 16 | 180 | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 Byer | 11/4/1980 | **1060** | - | 8.5 | 281 | 33 | 16 | - | - | - | 102 | - | - | - | - | - | **3300** | - | - | - | - | - | - | - | - |
| 6 Byer | 5/6/1981 | **1060** | - | 8.4 | 280 | 31 | 15 | 183 | - | - | 101 | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Composite Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Byron-Bethany Irrigation District | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 Byer | 11/17/1982 | **1080** | - | 8.1 | 287 | 34 | 17 | 183 | 2.2 | - | 111 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 Byer | 8/14/1984 | **1150** | **691** | 8.4 | 246 | 25 | 19 | 189 | 2.2 | 157 | 116 | - | - | - | - | - | **3100** | - | - | - | - | - | - | - | - |
| 6 Byer | 9/11/1986 | 885 | - | 8.2 | 324 | 42 | 35 | 109 | - | - | 55 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 Byer | 7/15/1988 | **940** | - | 8.2 | 322 | 50 | 38 | 113 | - | - | 77 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 Byer | 8/16/1990 | 892 | - | 8.2 | 259 | 43 | 36 | 95 | 1.2 | - | 105 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| KNIGHTSEN ELEMENTARY SCHOOL | | | | | | | | | | | | | | | | | | | | | | | | | |
| NORTH WELL | 9/20/2001 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 3/14/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 9/9/2002 | - | - | - | - | - | - | - | - | - | - | - | 0.77 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 4/29/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 7/16/2003 | - | - | - | - | - | - | - | - | - | - | - | 0.54 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 9/30/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | - | - | <100 | - | - | - | - | - | - | - |
| NORTH WELL | 1/21/2004 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 4/15/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 6/30/2004 | **1500** | **910** | - | 320 | 99 | 62 | 120 | 2.6 | 210 | 180 | 390 | 0.97 | 0.1 | <50 | 4.1 | - | 160 | <10 | - | - | 120 | **650** | <5 | 50 |
| NORTH WELL | 1/19/2005 | - | - | - | - | - | - | - | - | - | - | - | 0.43 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 3/16/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 4/14/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 7/19/2005 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 8/9/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| NORTH WELL | 11/14/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 9/20/2001 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 3/14/2002 | - | - | - | - | - | - | - | - | - | - | - | 3.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 9/9/2002 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 12/2/2002 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 4/29/2003 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 7/16/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 10/13/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 4/15/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 6/30/2004 | **1500** | **880** | - | 320 | 100 | 62 | 120 | 2.6 | 210 | 180 | 390 | 0.95 | 0.1 | <50 | 2.5 | - | 158 | <10 | - | - | 150 | **650** | <5 | 50 |
| SOUTH WELL | 7/29/2004 | - | - | - | - | - | - | - | - | - | - | - | 5.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 10/18/2004 | - | - | - | - | - | - | - | - | - | - | - | 3.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 1/27/2005 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 3/21/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 8/9/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 11/14/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |

## Composite Aquifer

### KNIGHTSEN ELEMENTARY SCHOOL

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOUTH WELL | 7/22/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| SOUTH WELL | 3/7/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 3/28/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 4/10/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.9 | - | - | 3.6 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 6/13/2017 | - | - | - | - | - | - | - | - | - | - | - | 2.21 | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 8/9/2017 | - | - | - | - | - | - | - | - | - | - | - | 2.7 | 0.15 | 50 | <2 | - | 110 | <10 | - | - | - | - | <5 | - |
| SOUTH WELL | 9/12/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 10/17/2017 | - | - | - | - | - | - | - | - | - | - | - | 2.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 1/16/2018 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 3/7/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 4/25/2018 | - | - | - | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 6/12/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 7/11/2018 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 9/18/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 10/10/2018 | - | - | - | - | - | - | - | - | - | - | - | 2.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 12/19/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 3/27/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 4/10/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 8/1/2019 | - | - | - | - | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 9/11/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - |
| SOUTH WELL | 12/19/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - |

## Unknown Aquifer

### Town of Discovery Bay

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 01 | 11/19/1986 | 700 | **628** | - | 430 | 25.7 | 12.5 | 236 | 1.52 | 58 | 110 | 525 | 0.02 | 0.3 | - | 3.5 | - | 100 | 20 | - | - | 200 | **146** | 1 | 10 |
| WELL 01 | 9/12/1989 | **1105** | **726** | - | 356 | 37 | 16 | 152 | 2.1 | 70.4 | 128 | 356 | 0.2 | 0.34 | 100 | 10 | - | 100 | 10 | - | - | 260 | **153** | 50 | 50 |
| WELL 01 | 1/20/1993 | **940** | **540** | - | 284 | 37 | 16 | 159 | 2 | 78 | 84 | 346 | ND | 0.2 | 110 | <2 | - | <100 | <10 | - | - | **440** | **140** | <5 | <50 |
| WELL 01 | 3/28/1995 | - | - | - | - | - | - | - | - | - | - | - | 0.36 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 03 | 11/19/1986 | 600 | **528** | - | 400 | 31.7 | 14.8 | 199 | 1.84 | 72 | 95 | 488 | <0.02 | 0.33 | - | 1 | - | 100 | 20 | - | - | 92 | **120** | 3 | 10 |
| WELL 03 | 9/12/1989 | **939** | **691** | - | 293 | 41.2 | 16.6 | 125 | 2.5 | 79.7 | 115 | 293 | <0.2 | 0.34 | 100 | 10 | - | 104 | 10 | - | - | 100 | **122** | 5 | 50 |
| WELL 03 | 1/20/1993 | **960** | **530** | - | 288 | 30 | 14 | 172 | 2 | 67 | 90 | 351 | ND | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 170 | **120** | <5 | <50 |
| WELL 03 | 3/28/1995 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 03 | 3/10/1997 | **1000** | **570** | - | 300 | 30 | 16 | 190 | 1 | 79 | 130 | 370 | ND | 0.2 | - | - | **2300** | - | - | - | - | **310** | **120** | - | <50 |
| WELL 04 | 1/20/1993 | **920** | **600** | - | 300 | 26 | 13 | 189 | 2 | 80 | 100 | 366 | ND | 0.3 | <50 | <2 | - | <100 | <10 | - | - | 100 | **80** | <5 | <50 |

### ANCHOR MARINA

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |

## Unknown Aquifer

### ANCHOR MARINA

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 7/9/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

### ANGLER S RANCH #3

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 02 | 6/27/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 7/1/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | 0.1 | <50 | 8 | - | <100 | - | - | - | - | - | <5 | - |
| WELL 02 | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 8/25/2004 | **1400** | **800** | - | 210 | 48 | 27 | 200 | 2.4 | 160 | 200 | 260 | - | - | - | - | - | - | - | - | - | 100 | **180** | - | 50 |
| WELL 02 | 6/23/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 7/25/2005 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | <50 | 8 | - | <100 | 2.9 | - | - | - | - | <5 | 50 |
| WELL 02 | 6/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 9/5/2007 | **1400** | **870** | - | 210 | 60 | 26 | 200 | 2.4 | 160 | 220 | 250 | - | - | - | - | - | - | - | - | - | <100 | **160** | - | <50 |
| WELL 02 | 6/30/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/27/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/27/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 9/20/2012 | **1600** | - | - | 210 | 57 | 30 | 210 | 2.9 | 180 | **270** | 250 | ND | 0.1 | 50 | 7.3 | - | 100 | 1 | - | - | <100 | **220** | <5 | <50 |
| WELL 02 | 6/25/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/24/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 9/30/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 02 | 6/29/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/30/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/29/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 7/24/2017 | **1600** | **950** | - | 210 | 63 | 29 | 220 | 2.8 | 180 | **290** | 250 | ND | 0.1 | 50 | 7.6 | - | 100 | <10 | ND | - | <100 | **210** | <5 | <50 |
| WELL 02 | 6/28/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 02 | 6/25/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

### ANGLERS SUBDIVISION 4

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 1 - 1696 Taylor | 2/13/2002 | - | - | - | - | - | - | 235 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 8/7/2002 | - | - | - | - | - | - | 258 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 2/5/2003 | - | - | - | - | - | - | 251 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 8/6/2003 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/21/2004 | **1770** | **1080** | - | 220 | 90 | 47 | 196 | 4 | 182 | **344** | 260 | <0.09 | 0.2 | 10 | 3 | **2000** | 127 | 1 | - | - | 140 | **340** | 3 | 60 |
| WELL 1 - 1696 Taylor | 8/11/2004 | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 9/15/2004 | - | - | - | - | - | - | 208 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 6/1/2005 | - | - | - | - | - | - | 184 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 6/22/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/27/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 8/24/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |

## Unknown Aquifer

### ANGLERS SUBDIVISION 4

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 1 - 1696 Taylor | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 2/7/2007 | - | - | - | - | - | - | 189 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/5/2007 | **1770** | **1090** | - | 210 | 86 | 44 | 211 | 4 | 197 | **357** | 260 | 0.1 | 0.1 | 10 | 3 | **1840** | 116 | 1 | - | - | 190 | **320** | 4 | 20 |
| WELL 1 - 1696 Taylor | 2/15/2008 | - | - | - | - | - | - | 225 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/3/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.25 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 9/11/2008 | - | - | - | - | - | - | 248 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/17/2009 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/20/2010 | **1610** | **980** | - | 200 | 81 | 41 | 204 | 4 | 166 | **298** | 250 | 0.1 | 0.1 | 10 | 3 | **1900** | 127 | 1 | - | - | 220 | **290** | 4 | 130 |
| WELL 1 - 1696 Taylor | 7/20/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/26/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/9/2013 | **2130** | - | - | 200 | 117 | 61 | 248 | 4 | 216 | **510** | 240 | <0.09 | 0.1 | 10 | 4 | **2000** | 164 | 1 | - | - | 220 | **450** | 4 | 20 |
| WELL 1 - 1696 Taylor | 11/10/2014 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 12/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/8/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 8/9/2016 | **1900** | **1260** | - | 180 | 89 | 43 | 267 | 4 | 213 | **328** | 220 | 0.5 | 0.2 | 10 | 9 | **2400** | 171 | 1 | - | - | 280 | **130** | 5 | 320 |
| WELL 1 - 1696 Taylor | 12/29/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 8/21/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 - 1696 Taylor | 7/22/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | - | - | 186 | <10 | - | - | - | - | 10 | - |
| WELL 1 - 1696 Taylor | 11/21/2019 | - | **1430** | - | - | 122 | 69 | 239 | 4 | 209 | - | - | <0.4 | - | - | - | **2000** | - | - | - | - | 240 | **520** | - | <50 |
| WELL 2 - 1398 Taylor | 12/5/2001 | - | - | - | - | - | - | 252 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 12/4/2002 | - | - | - | - | - | - | 232 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 6/11/2003 | - | - | - | - | - | - | 209 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 8/6/2003 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/21/2004 | **1160** | **730** | - | 240 | 54 | 28 | 149 | 3 | 145 | 149 | 290 | <0.09 | 0.2 | 10 | 2 | **2000** | 83.1 | 1 | - | - | 140 | **200** | 2 | 20 |
| WELL 2 - 1398 Taylor | 12/17/2004 | - | - | - | - | - | - | 257 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 5/18/2005 | - | - | - | - | - | - | 248 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 6/22/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/27/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 8/17/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/5/2007 | **1510** | **920** | - | 220 | 70 | 35 | 188 | 3 | 170 | **278** | 260 | <0.09 | 0.1 | 10 | 2 | **1830** | 95.8 | 1 | - | - | 130 | **270** | 2 | 20 |
| WELL 2 - 1398 Taylor | 7/3/2008 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/17/2009 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/20/2010 | **1600** | **980** | - | 200 | 80 | 40 | 202 | 4 | 166 | **298** | 250 | <0.09 | 0.1 | 10 | 3 | **2000** | 133 | 1 | - | - | 180 | **310** | 4 | 20 |
| WELL 2 - 1398 Taylor | 7/20/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/26/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 8/13/2013 | **1640** | **970** | - | 210 | 78 | 40 | 201 | 4 | 198 | **365** | 250 | <0.09 | 0.1 | 10 | 2 | **1800** | 117 | 2 | - | - | 120 | **300** | 3 | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

## Unknown Aquifer

### ANGLERS SUBDIVISION 4

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELL 2 - 1398 Taylor | 8/12/2014 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 9/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.05 | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/8/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 8/9/2016 | **1760** | **1100** | - | 190 | 89 | 45 | 205 | 4 | 154 | **312** | 230 | 0.1 | 0.1 | 10 | 3 | **1900** | 137 | 1 | - | - | 150 | **350** | 5 | 20 |
| WELL 2 - 1398 Taylor | 12/29/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 8/21/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 1398 Taylor | 7/22/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | 4 | - | 159 | <10 | - | - | - | - | 7 | - |
| WELL 2 - 1398 Taylor | 11/21/2019 | - | - | - | - | 92 | 52 | 209 | 3 | 182 | **364** | - | <0.4 | 0.1 | - | - | **2000** | - | - | - | - | **760** | **360** | - | 80 |
| WELL 3 - 1698 Taylor | 11/7/2001 | - | - | - | - | - | - | 241 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 5/8/2002 | - | - | - | - | - | - | 245 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 5/7/2003 | - | - | - | - | - | - | 264 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/21/2004 | **2220** | **1340** | - | 200 | 115 | 57 | 254 | 4 | 204 | **508** | 240 | <0.09 | 0.2 | 10 | 10 | **2200** | 96.3 | 1 | - | - | 150 | **290** | 5 | 20 |
| WELL 3 - 1698 Taylor | 6/22/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/27/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 8/17/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/19/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 5/23/2007 | - | - | - | - | - | - | 191 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/5/2007 | **1840** | **1120** | - | 200 | 87 | 43 | 224 | 4 | 189 | **385** | 250 | 0.1 | 0.1 | 10 | 6 | **1880** | 87.1 | 1 | - | - | 100 | **240** | 4 | 20 |
| WELL 3 - 1698 Taylor | 7/17/2009 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/20/2010 | **1620** | **980** | - | 200 | 81 | 40 | 205 | 4 | 167 | **305** | 250 | 0.2 | 0.2 | 10 | 3 | **2000** | 124 | 1 | - | - | 100 | **240** | 5 | 20 |
| WELL 3 - 1698 Taylor | 7/26/2012 | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/9/2013 | **2180** | **1320** | - | 190 | 102 | 50 | 272 | 3 | 230 | **490** | 240 | 0.5 | 0.1 | 10 | 10 | **2200** | 93.6 | 1 | - | - | 280 | **260** | 3 | 20 |
| WELL 3 - 1698 Taylor | 8/12/2014 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 9/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.05 | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/8/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 8/9/2016 | **2040** | **1200** | - | 160 | 111 | 58 | 233 | 4 | 169 | **384** | 190 | 0.1 | 0.2 | 10 | 4 | **2000** | 0.2 | 1 | - | - | **340** | **340** | 6 | 20 |
| WELL 3 - 1698 Taylor | 12/29/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 8/21/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 7/22/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | 6 | - | 138 | - | - | - | - | - | - | - |
| WELL 3 - 1698 Taylor | 11/21/2019 | - | - | - | - | - | 71 | 248 | 4 | 207 | **520** | - | <0.4 | 0.1 | - | - | **2100** | - | - | - | - | <100 | **220** | - | <50 |

### BAY STANDARDS

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 6/23/2004 | **1430** | **870** | - | 320 | 109 | 46 | 128 | 2 | 147 | 193 | 390 | 4.83 | 0.4 | 10 | 2 | **3100** | 67.5 | 4 | - | - | 60 | 10 | 3 | 20 |
| Well Head | 6/1/2005 | - | - | - | - | - | - | - | - | - | - | - | 4.79 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/6/2008 | - | - | - | - | - | - | - | - | - | - | - | 4.04 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/1/2010 | **1420** | **870** | - | 310 | 107 | 45 | 143 | 2 | 141 | 183 | 380 | - | 0.4 | 10 | 2 | **3300** | 61.7 | 3 | - | - | 120 | 10 | 3 | 20 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | 900 b | 500 b | 6.5/8.5 b | | | | | | 250 b | 250 b | | 10 a | 2 a | 1000 a | 10 a | 1000 c | 1000 a | 50 a | | 1.3 a | 300 b | 50 b | 50 a | 5000 a |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BAY STANDARDS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 6/14/2011 | - | - | - | - | - | - | - | - | - | - | - | 4.99 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/5/2012 | - | - | - | - | - | - | - | - | - | - | - | 5.22 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/4/2013 | **1420** | **870** | - | 310 | 97 | 41 | 136 | 3 | 130 | 169 | 380 | 5.04 | 0.2 | 10 | 2 | **3100** | 60.8 | 7 | - | - | 50 | 10 | 3 | 20 |
| Well Head | 6/10/2014 | - | - | - | - | - | - | - | - | - | - | - | 5.26 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/8/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - |
| Well Head | 6/2/2015 | - | - | - | - | - | - | - | - | - | - | - | 5.33 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/6/2016 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/29/2016 | - | - | - | - | - | - | - | - | - | - | - | 5.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/1/2017 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/4/2018 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| BETHEL BAPTIST CHURCH | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/19/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/22/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/18/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/24/2004 | **1400** | **830** | - | 220 | 36 | 22 | 240 | 2.9 | 160 | 220 | 260 | ND | ND | <50 | <2 | - | 141 | <10 | - | - | 100 | **190** | <5 | 50 |
| Well Head | 11/17/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/27/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/15/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/13/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/16/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/10/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/9/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/12/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/9/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/10/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/15/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/7/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/5/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/4/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/4/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| BETHEL HARBOR | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 1/23/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/26/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/20/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/25/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BETHEL HARBOR | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 1/24/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/10/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/12/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/20/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/23/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/28/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/20/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/21/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/13/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/17/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/17/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/9/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| BETHEL ISLAND GOLF & RESORT | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELLHEAD | 11/30/2001 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 11/26/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 11/19/2003 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 11/17/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/12/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.85 | - | - | - | - | - | - | - | - | - | - | - | - |
| BETHEL ISLAND MUTUAL WATER CO | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 1 | 12/27/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 | 11/19/2003 | **1100** | **730** | - | 270 | 23 | 11 | 240 | 2 | 120 | 160 | 330 | ND | 0.3 | <50 | 7 | - | <100 | <10 | - | - | <100 | **120** | <5 | 50 |
| WELL 1 | 12/19/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 | 7/27/2016 | **1200** | **730** | - | 270 | 21 | 10 | 220 | 2 | 110 | 150 | 330 | ND | 0.2 | <50 | 9.6 | - | 100 | <10 | ND | - | <100 | **80** | <5 | 180 |
| WELL 1 | 8/30/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 | 11/30/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 | 7/31/2019 | - | **780** | - | - | 21 | 11 | 240 | 2.2 | - | 150 | - | ND | - | ND | 9 | - | ND | ND | - | - | ND | **96** | ND | <50 |
| BETHEL MARKET | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELLHEAD | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/23/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/22/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/19/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/15/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/14/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | |
| BETHEL MARKET | | | | | | | | | | | | | | |
| WELLHEAD | 6/8/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/11/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/5/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/11/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/4/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/6/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/26/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| WELLHEAD | 6/26/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| BETHEL MISSIONARY BAPTIST | | | | | | | | | | | | | | |
| Well Head | 10/4/2001 | - | - | - | - | - | - | - | - | - | - | - | **21** | - |
| Well Head | 8/6/2002 | - | - | - | - | - | - | - | - | - | - | - | 2 | - |
| Well Head | 10/3/2002 | - | - | - | - | - | - | - | - | - | - | - | 10 | - |
| Well Head | 10/2/2003 | - | - | - | - | - | - | - | - | - | - | - | **11** | - |
| Well Head | 6/30/2004 | **1800** | **1100** | - | 290 | 130 | 62 | 160 | 3.9 | 220 | **280** | 350 | **12** | 0.3 |
| Well Head | 10/4/2004 | - | - | - | - | - | - | - | - | - | - | - | **11** | - |
| Well Head | 10/3/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - |
| Well Head | 10/2/2006 | - | - | - | - | - | - | - | - | - | - | - | 4.5 | - |
| Well Head | 10/1/2007 | - | - | - | - | - | - | - | - | - | - | - | **13** | - |
| Well Head | 10/1/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - |
| Well Head | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | 4.1 | - |
| Well Head | 10/3/2011 | - | - | - | - | - | - | - | - | - | - | - | 4.3 | - |
| Well Head | 10/1/2012 | - | - | - | - | - | - | - | - | - | - | - | 3.4 | - |
| Well Head | 12/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/21/2017 | - | - | - | - | - | - | - | - | - | - | - | 1.9 | 0.21 |
| Well Head | 7/17/2018 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - |
| Well Head | 10/1/2018 | - | - | - | - | - | - | - | - | - | - | - | 5.1 | - |
| BIG OAK MOBILE HOME PARK WATER | | | | | | | | | | | | | | |
| Well Head - West well | 6/23/2004 | **1470** | **950** | - | 260 | 105 | 50 | 145 | 5 | **251** | 154 | 320 | - | 0.4 |
| Well Head - West well | 6/8/2005 | - | - | - | - | - | - | - | - | - | - | - | 9.47 | - |
| Well Head - West well | 6/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.84 | - |
| Well Head - West well | 6/15/2007 | **1660** | **1120** | - | 280 | 120 | 55 | 171 | 5 | **300** | 169 | 320 | 6.03 | 0.3 |
| Well Head - West well | 8/9/2011 | **1600** | **1000** | - | 260 | 110 | 50 | 160 | 4.1 | **280** | 160 | 320 | 8.6 | 0.2 |
| Well Head - West well | 7/27/2016 | **1600** | - | - | 270 | 110 | 52 | 140 | 4.3 | **300** | 170 | 320 | 8.8 | 0.24 |
| Well Head - West well | 9/12/2017 | - | - | - | - | - | - | - | - | - | - | - | 9.6 | - |
| Well Head - West well | 9/10/2018 | - | - | - | - | - | - | - | - | - | - | - | 8.9 | - |

| Well Name | Date | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | |
| BETHEL MARKET | | | | | | | | | | | | |
| WELLHEAD | 6/8/2011 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/11/2012 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/5/2013 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/11/2014 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/4/2015 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/6/2016 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/26/2017 | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 6/26/2018 | - | - | - | - | - | - | - | - | - | - | - |
| BETHEL MISSIONARY BAPTIST | | | | | | | | | | | | |
| Well Head | 10/4/2001 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/6/2002 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/3/2002 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/2/2003 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/30/2004 | <50 | <2 | - | <100 | <10 | - | - | 100 | 20 | <5 | 50 |
| Well Head | 10/4/2004 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/3/2005 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/2/2006 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/1/2007 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/1/2008 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/3/2011 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/1/2012 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/9/2014 | - | - | - | - | - | 1 | - | - | - | - | - |
| Well Head | 11/21/2017 | - | <2 | - | <100 | <10 | ND | - | - | - | <5 | - |
| Well Head | 7/17/2018 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/1/2018 | - | - | - | - | - | - | - | - | - | - | - |
| BIG OAK MOBILE HOME PARK WATER | | | | | | | | | | | | |
| Well Head - West well | 6/23/2004 | 10 | 4 | 800 | 58.3 | 1 | - | - | 50 | **110** | 7 | 20 |
| Well Head - West well | 6/8/2005 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West well | 6/14/2006 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West well | 6/15/2007 | 10 | 4 | 550 | 53.2 | 1 | - | - | 50 | **150** | 6 | 20 |
| Well Head - West well | 8/9/2011 | 50 | 4.5 | - | 100 | 1 | - | - | 100 | **110** | <5 | 50 |
| Well Head - West well | 7/27/2016 | 50 | 3.5 | - | <100 | <10 | ND | - | <100 | **93** | <5 | <50 |
| Well Head - West well | 9/12/2017 | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West well | 9/10/2018 | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BIG OAK MOBILE HOME PARK WATER | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head - West well | 8/14/2019 | - | **1200** | - | - | 130 | 56 | 140 | 5.1 | **310** | 180 | - | 8.7 | - | 20 | 4 | - | ND | ND | - | - | ND | **110** | 5.6 | ND |
| Wellhead- East well | 6/23/2004 | **1330** | **850** | - | 260 | 91 | 44 | 135 | 4 | 189 | 149 | 320 | 7.07 | 0.4 | 10 | 4 | 800 | 64.4 | 1 | - | - | 50 | **130** | 6 | 20 |
| Wellhead- East well | 6/8/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.55 | - | - | - | - | - | - | - | - | - | - | - | - |
| Wellhead- East well | 6/14/2006 | - | - | - | - | - | - | - | - | - | - | - | 6.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Wellhead- East well | 6/15/2007 | **1340** | **850** | - | 250 | 84 | 39 | 145 | 4 | 197 | 130 | 310 | 6.28 | 0.3 | 10 | 4 | 580 | 57.4 | 1 | - | - | 50 | **130** | 5 | 20 |
| Wellhead- East well | 6/6/2008 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Wellhead- East well | 8/9/2011 | **1400** | **890** | - | 240 | 88 | 39 | 140 | 3.9 | 210 | 140 | 290 | 9.5 | 0.2 | 50 | 4 | - | 100 | 1 | - | - | 100 | **130** | <5 | <50 |
| Wellhead- East well | 7/27/2016 | **1500** | **1000** | - | 260 | 98 | 46 | 130 | 4.3 | **260** | 140 | 320 | 9.5 | 0.3 | 50 | 2.9 | - | 100 | <10 | ND | - | <100 | **150** | <5 | 50 |
| Wellhead- East well | 8/30/2017 | - | - | - | - | - | - | - | - | - | - | - | 9.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Wellhead- East well | 9/10/2018 | - | - | - | - | - | - | - | - | - | - | - | 9.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Wellhead- East well | 8/14/2019 | - | **990** | - | - | 94 | - | 130 | 4.4 | 250 | - | - | 8.7 | 0.2 | - | 4 | - | <100 | ND | - | - | - | **150** | 6 | ND |
| BLUE TIP TRAILER PARK WATER | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL HEAD | 2/4/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.63 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 8/29/2018 | - | - | - | - | - | - | - | - | - | - | - | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| BON GUSTOS | | | | | | | | | | | | | | | | | | | | | | | | | |
| TREATMENT | 8/25/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| TREATMENT | 8/10/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| TREATMENT | 11/15/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| TREATMENT | 5/8/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| TREATMENT | 3/1/2019 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| TREATMENT | 11/19/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/31/2004 | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/31/2005 | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/31/2006 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/30/2007 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/28/2007 | - | - | - | - | - | - | - | - | - | - | - | **17** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/17/2008 | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/9/2008 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/31/2009 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/26/2010 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/30/2011 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/21/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/29/2018 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/14/2018 | - | - | - | - | - | - | - | - | - | - | - | **18** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/20/2019 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BON GUSTOS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 4/25/2019 | - | **650** | - | - | 51 | 25 | 150 | 2.88 | 110 | 202 | - | ND | 0.44 | 295 | 2.02 | - | 160 | ND | - | - | **386** | **212** | ND | 75 |
| BRENTWOOD CREEK FARM | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 2 - CAMP 1 | 8/17/2004 | **960** | - | - | 280 | 49 | 23 | 130 | 1.7 | 84 | 91 | 340 | - | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 140 | **190** | <5 | 50 |
| WELL 3 - CAMP 2 | 8/17/2004 | **1000** | - | - | 350 | 28 | 15 | 180 | 1.6 | 51 | 88 | 430 | - | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 100 | **140** | <5 | 50 |
| BRENTWOOD MISSIONARY BAPTIST | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 6/3/2002 | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/2/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/30/2004 | **1300** | **770** | - | 310 | 100 | 46 | 120 | 3.4 | 130 | 150 | 370 | 0.95 | 1.2 | <50 | <2 | - | <100 | <10 | - | - | 100 | <20 | <5 | 50 |
| Well Head | 6/2/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/5/2006 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/11/2007 | **1200** | - | - | 250 | 81 | 31 | 110 | 1.5 | 97 | 150 | 310 | 7 | 0.3 | 50 | 2.4 | - | 100 | 10 | - | - | <100 | <20 | <5 | <50 |
| Well Head | 6/2/2008 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/1/2009 | - | - | - | - | - | - | - | - | - | - | - | 6.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/7/2010 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/8/2013 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/7/2014 | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/7/2015 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/5/2016 | - | - | - | - | - | - | - | - | - | - | - | 7.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/10/2017 | - | - | - | - | - | - | - | - | - | - | - | 9.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/9/2019 | - | - | - | - | - | - | - | - | - | - | - | 8.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| BRIDGEHEAD CAFE | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/13/2001 | - | - | - | - | - | - | - | - | - | - | - | 4.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/12/2002 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/13/2002 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/10/2002 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/19/2002 | - | - | - | - | - | - | - | - | - | - | - | 5.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/11/2003 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/20/2003 | - | - | - | - | - | - | - | - | - | - | - | 2.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/18/2003 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/11/2003 | - | - | - | - | - | - | - | - | - | - | - | 5.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/10/2004 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/12/2004 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BRIDGEHEAD CAFE | | | | | | | | | | | | | | | | | | | | | | | | | |
| BYRON AIRPORT | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 5/7/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/6/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/4/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/5/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/3/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/8/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/5/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/12/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/12/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/7/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/9/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/21/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/31/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/25/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/14/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/19/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| BYRON CORNERS INC | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 8/4/2004 | - | - | - | - | - | - | - | - | - | - | - | **18** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | **22.6** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/30/2006 | - | - | - | - | - | - | - | - | - | - | - | **22.6** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/3/2006 | - | - | - | - | - | - | - | - | - | - | - | **21** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/30/2006 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/28/2007 | - | - | - | - | - | - | - | - | - | - | - | **17** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/23/2008 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/26/2009 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/28/2009 | - | - | - | - | - | - | - | - | - | - | - | 4.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/31/2009 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/30/2009 | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/25/2010 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/25/2010 | - | - | - | - | - | - | - | - | - | - | - | 3.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/26/2010 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/13/2010 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/28/2011 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BYRON CORNERS INC | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 5/31/2011 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/30/2011 | - | - | - | - | - | - | - | - | - | - | - | 1.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/30/2011 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/28/2012 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/30/2012 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/29/2012 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/28/2013 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/27/2013 | - | - | - | - | - | - | - | - | - | - | - | 2.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/21/2013 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/19/2014 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/14/2014 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/18/2014 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/13/2014 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/11/2015 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/17/2015 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/11/2015 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/11/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/10/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/24/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/22/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/16/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/28/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.03 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/25/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/10/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/8/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/29/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/14/2018 | - | - | - | - | - | - | - | - | - | - | - | 9.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/20/2019 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/1/2019 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/14/2019 | - | - | - | - | - | - | - | - | - | - | - | 9.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/19/2019 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| BYRON INN | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 2/7/2002 | - | - | - | - | - | - | - | - | - | - | - | 2.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/13/2003 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/6/2006 | - | - | - | - | - | - | - | - | - | - | - | 2.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/14/2008 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| BYRON INN | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 2/10/2010 | - | - | - | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/17/2011 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/13/2013 | - | - | - | - | - | - | - | - | - | - | - | 1.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/10/2014 | - | - | - | - | - | - | - | - | - | - | - | 1.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/5/2015 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/17/2016 | - | - | - | - | - | - | - | - | - | - | - | 2.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/2/2017 | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/16/2018 | - | - | - | - | - | - | - | - | - | - | - | 3.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/21/2019 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| BYRON UNITED METHODIST | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL HEAD | 3/19/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.54 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 3/25/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 3/5/2009 | - | - | - | - | - | - | - | - | - | - | - | 0.59 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 10/15/2009 | - | - | - | - | - | - | - | - | - | - | - | 0.56 | 0.4 | 50 | 2.9 | - | 100 | 18 | - | - | - | - | <5 | - |
| WELL HEAD | 4/1/2010 | - | - | - | - | - | - | - | - | - | - | - | 0.66 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/7/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/6/2011 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/8/2013 | - | - | - | - | - | - | - | - | - | - | - | 0.63 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/6/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.72 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/10/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.76 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/23/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/8/2019 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| CALIENTE ISLE WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELLHEAD | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 8/24/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| CAMINO MOBILEHOME | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 3/3/2004 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 3/22/2006 | **1140** | **730** | - | 310 | 20 | 10 | 201 | 1 | 115 | 103 | 360 | <0.09 | 0.1 | 10 | 2 | **2500** | 52.2 | 1 | - | - | 150 | **110** | 2 | 60 |
| WELL | 3/7/2007 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 3/5/2008 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/15/2009 | **1100** | **720** | - | 320 | 22 | 11 | 220 | 1.2 | 110 | 100 | 390 | ND | 0.1 | - | - | - | - | - | - | - | **500** | **110** | - | <50 |
| WELL | 8/9/2011 | **1200** | **680** | - | 300 | 22 | 9.6 | 210 | 1.3 | 110 | 100 | 370 | ND | 0.2 | 50 | 2 | - | 100 | 1 | - | - | 150 | **110** | <5 | 50 |
| WELL | 7/27/2016 | **1100** | **710** | - | 300 | 21 | 9.6 | 210 | 1.3 | 110 | 99 | 370 | ND | 0.3 | 50 | 2 | - | <100 | <10 | ND | - | 130 | **110** | <5 | 50 |
| WELL | 9/10/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| CAMINO MOBILEHOME | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 9/18/2019 | - | **750** | - | - | 21 | 9.46 | 220 | 1.4 | 110 | 100 | - | - | 0.19 | ND | 2.4 | - | ND | ND | - | - | 200 | - | - | <50 |
| CARSON SWIM SCHOOL | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL HEAD | 4/14/2004 | - | - | - | - | - | - | - | - | - | - | - | **14.1** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/13/2005 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 4/20/2007 | - | - | - | - | - | - | - | - | - | - | - | **18** | - | - | - | - | - | - | - | - | - | - | - | - |
| CASA DEL RIO WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 10/17/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/15/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/20/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/20/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/19/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| CECCHINI WATER | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 6/29/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/28/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 8/30/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 | 8/30/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| CHURCH OF JESUS CHRIST | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/15/2004 | **3100** | - | - | 200 | 160 | 78 | 370 | 8.7 | **990** | 250 | 250 | - | 0.7 | <50 | <2 | - | <100 | <10 | - | - | 140 | 34 | <5 | 50 |
| Well Head | 7/11/2007 | **3000** | - | - | 210 | 170 | 74 | 360 | 8.7 | **1000** | **260** | 260 | - | 0.9 | 50 | 2.4 | - | 100 | 10 | - | - | 220 | 39 | 5 | <50 |
| COLONIA SANTA MARIA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 4/22/2002 | **1300** | **800** | - | 320 | 90 | 37 | 150 | 2.2 | 120 | 170 | - | 5.6 | 0.3 | <50 | <2 | - | <100 | <10 | - | - | 100 | <20 | <5 | 50 |
| Well Head | 11/25/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/2/2004 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/1/2005 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/18/2006 | **1300** | - | - | 310 | 75 | 33 | 150 | 2 | 120 | 160 | 380 | - | 0.4 | <50 | 2 | - | 42 | 5.1 | - | - | 100 | <20 | 5 | 50 |
| Well Head | 11/1/2006 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/1/2007 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/3/2008 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/2/2009 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/1/2010 | - | - | - | - | - | - | - | - | - | - | - | 5.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/2/2011 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| COLONIA SANTA MARIA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/1/2012 | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/3/2014 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/1/2014 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/2/2015 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/2/2016 | - | - | - | - | - | - | - | - | - | - | - | 5.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/2/2017 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | 0.24 | <50 | <2 | - | <100 | 10 | 4.6 | - | - | - | <5 | - |
| Well Head | 11/6/2017 | - | - | - | - | - | - | - | - | - | - | - | 5.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/12/2018 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| CRUISER HAVEN MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 12/28/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/31/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/31/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/29/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/27/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/19/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/17/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/22/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/20/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/2/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/26/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/30/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/16/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| D ANNA YACHT CENTER | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/25/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/28/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/30/2007 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/24/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/24/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/30/2009 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| DAVIS CAMP *CL 10/08 | | | | | | | | | | | | | | | | | | | | | | | | | |
| east well (south) | 10/18/2001 | - | - | - | - | - | - | - | - | - | - | - | 3.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 10/23/2001 | **1900** | - | - | 410 | 180 | 69 | 210 | 3.3 | **370** | **290** | - | 3.6 | 0.3 | <50 | 5 | - | <100 | <10 | - | - | 100 | 20 | <5 | 50 |
| east well (south) | 1/24/2002 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 7/18/2002 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 b | 500 b | 6.5/8.5 b | | | | | | 250 b | 250 b | | 10 a | 2 a | 1000 a | 10 a | 1000 c | 1000 a | 50 a | | 1.3 a | 300 b | 50 b | 50 a | 5000 a |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| DAVIS CAMP *CL 10/08 | | | | | | | | | | | | | | | | | | | | | | | | | |
| east well (south) | 1/27/2003 | - | - | - | - | - | - | - | - | - | - | - | 2.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 4/24/2003 | - | - | - | - | - | - | - | - | - | - | - | 3.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 7/17/2003 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 10/21/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 1/27/2004 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 4/22/2004 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 7/15/2004 | **2400** | **1500** | - | 380 | 170 | 74 | 220 | 2.3 | **410** | **320** | 470 | 4.1 | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 100 | 20 | <5 | 50 |
| east well (south) | 1/28/2005 | - | - | - | - | - | - | - | - | - | - | - | 3.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 4/20/2005 | - | - | - | - | - | - | - | - | - | - | - | 4.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 7/25/2005 | - | - | - | - | - | - | - | - | - | - | - | 3.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| east well (south) | 10/19/2005 | - | - | - | - | - | - | - | - | - | - | - | 3.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 10/18/2001 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 10/23/2001 | **1700** | - | - | 330 | 170 | 67 | 140 | 2.5 | 240 | 220 | - | **11** | 0.3 | <50 | 5 | - | <100 | <10 | - | - | <100 | <20 | <5 | 50 |
| west well (north) | 7/18/2002 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 10/14/2002 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 7/17/2003 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 10/21/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 4/22/2004 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 7/29/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 8/18/2004 | **1600** | **1000** | - | 320 | 140 | 53 | 140 | 1.4 | 230 | 220 | 400 | 7.2 | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 100 | 20 | <5 | 50 |
| west well (north) | 4/20/2005 | - | - | - | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 7/25/2005 | - | - | - | - | - | - | - | - | - | - | - | 6.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| west well (north) | 10/19/2005 | - | - | - | - | - | - | - | - | - | - | - | 6.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| DELTA KIDS CENTER *CL 2/07 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 6/11/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/20/2003 | - | - | - | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/30/2003 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | 0.4 | <50 | <2 | - | <100 | - | - | - | - | - | <5 | - |
| Well Head | 6/2/2004 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/6/2005 | - | - | - | - | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/5/2006 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| DELTA MUTUAL WATER COMPANY | | | | | | | | | | | | | | | | | | | | | | | | | |
| East Well | 11/12/2003 | **1500** | **870** | - | 270 | 40 | 21 | 250 | 2.6 | 140 | 230 | 320 | ND | 0.2 | <50 | 10 | - | <100 | <10 | - | - | <100 | **220** | <5 | <50 |
| East Well | 11/16/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 11/8/2006 | **1500** | **880** | - | 260 | 41 | 24 | 260 | 2.7 | 150 | 250 | 320 | ND | 0.1 | 50 | 8.7 | - | 100 | 10 | - | - | 100 | **230** | 5 | 50 |
| East Well | 11/19/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| DELTA MUTUAL WATER COMPANY | | | | | | | | | | | | | | | | | | | | | | | | | |
| East Well | 11/18/2009 | **1500** | **950** | - | 270 | 41 | 23 | 250 | 2.7 | 140 | 250 | 330 | ND | 0.2 | 50 | **11** | - | 100 | 3.1 | - | - | 100 | **260** | <5 | 50 |
| East Well | 1/20/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| East Well | 4/22/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.7 | - | - | - | - | - | - | - | - | - |
| East Well | 7/19/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| East Well | 10/18/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| East Well | 1/12/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 4/14/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 7/20/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| East Well | 10/19/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| East Well | 1/11/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.5 | - | - | - | - | - | - | - | - | - |
| East Well | 4/9/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.9 | - | - | - | - | - | - | - | - | - |
| East Well | 7/16/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 10/31/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.4 | - | - | - | - | - | - | - | - | - |
| East Well | 11/14/2012 | **1500** | **940** | - | 260 | 42 | 25 | 270 | 2.9 | 160 | **270** | 320 | ND | 0.3 | - | 9.8 | - | 100 | 1 | - | - | <100 | **260** | <5 | <50 |
| East Well | 1/24/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - | - | - | - |
| East Well | 4/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 7/24/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - |
| East Well | 10/9/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.2 | - | - | - | - | - | - | - | - | - |
| East Well | 1/30/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.3 | - | - | - | - | - | - | - | - | - |
| East Well | 4/28/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - |
| East Well | 8/14/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| East Well | 11/3/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| East Well | 1/26/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| East Well | 4/15/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.1 | - | - | - | - | - | - | - | - | - |
| East Well | 7/30/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.8 | - | - | - | - | - | - | - | - | - |
| East Well | 10/28/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.6 | - | - | - | - | - | - | - | - | - |
| East Well | 1/28/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - |
| East Well | 4/11/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.1 | - | - | - | - | - | - | - | - | - |
| East Well | 5/26/2016 | **1600** | **970** | - | 260 | 41 | 23 | 260 | 2.6 | 160 | **270** | 320 | ND | ND | <50 | 8.9 | - | 100 | <10 | - | - | <100 | **240** | <5 | <50 |
| East Well | 7/29/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - |
| East Well | 10/24/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - |
| East Well | 2/1/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **10.6** | - | - | - | - | - | - | - | - | - |
| East Well | 4/24/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 10/31/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - |
| East Well | 1/31/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| East Well | 5/2/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 8/1/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| East Well | 10/24/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| DELTA MUTUAL WATER COMPANY | | | | | | | | | | | | | | | | | | | | | | | | | |
| East Well | 10/29/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 11/26/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| East Well | 4/8/2019 | - | **870** | - | - | 46 | 25 | 262 | 3 | 149 | **257** | - | - | - | - | <2 | **3600** | 169 | <10 | - | - | <100 | <20 | <5 | <50 |
| East Well | 7/29/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| East Well | 10/14/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| West Well | 3/21/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 11/12/2003 | **1200** | **690** | - | 270 | 29 | 16 | 210 | 2.3 | 110 | 150 | 330 | ND | 0.2 | <50 | **11** | - | <100 | <10 | - | - | <100 | **160** | <5 | <50 |
| West Well | 11/8/2006 | **1200** | **740** | - | 270 | 36 | 21 | 240 | 2.6 | 120 | 170 | 330 | ND | 0.2 | 50 | 9.3 | - | 100 | 10 | - | - | 100 | **190** | 5 | 50 |
| West Well | 11/14/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 11/18/2009 | **1300** | **720** | - | 280 | 29 | 17 | 210 | 2.4 | 120 | 170 | 340 | ND | 0.2 | 50 | 10 | - | 100 | 6.6 | - | - | 100 | **180** | <5 | 50 |
| West Well | 11/24/2009 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| West Well | 2/17/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - |
| West Well | 5/19/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.8 | - | - | - | - | - | - | - | - | - |
| West Well | 8/18/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| West Well | 2/9/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| West Well | 5/19/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.7 | - | - | - | - | - | - | - | - | - |
| West Well | 8/18/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| West Well | 2/8/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - |
| West Well | 5/17/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| West Well | 8/14/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.9 | - | - | - | - | - | - | - | - | - |
| West Well | 11/14/2012 | **1300** | **760** | - | 270 | 31 | 17 | 230 | 2.5 | 130 | 180 | 330 | ND | 0.2 | - | **10.5** | - | 100 | 1 | - | - | <100 | **180** | <5 | <50 |
| West Well | 11/30/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | 9.9 | - | - | - | - | - | - | - | - | - |
| West Well | 2/21/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.6 | - | - | - | - | - | - | - | - | - |
| West Well | 5/23/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| West Well | 8/19/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| West Well | 11/11/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | 10 | - | - | - | - | - | - | - | - | - |
| West Well | 2/24/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| West Well | 5/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.2 | - | - | - | - | - | - | - | - | - |
| West Well | 8/14/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | ND | - | - | - | - | - |
| West Well | 11/20/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - |
| West Well | 2/18/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| West Well | 5/28/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.7 | - | - | - | - | - | - | - | - | - |
| West Well | 8/25/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| West Well | 11/30/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.8 | - | - | - | - | - | - | - | - | - |
| West Well | 2/17/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | - | - | - | - | - | - | - | - | - |
| West Well | 5/16/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| West Well | 5/26/2016 | **1600** | **960** | - | 260 | 41 | 23 | 270 | 2.6 | 150 | **270** | 320 | ND | ND | <50 | 8.5 | - | 100 | <10 | - | - | <100 | **230** | <5 | <50 |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |

## Unknown Aquifer

### DELTA MUTUAL WATER COMPANY

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| West Well | 8/30/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.5 | - | - | - | - | - | - | - | - | - |
| West Well | 11/22/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | 9 | - | - | - | - | - | - | - | - | - |
| West Well | 2/23/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.7 | - | - | - | - | - | - | - | - | - |
| West Well | 5/17/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - |
| West Well | 7/31/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - |
| West Well | 8/16/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **10.6** | - | - | - | - | - | - | - | - | - |
| West Well | 11/27/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| West Well | 2/21/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - |
| West Well | 5/31/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - |
| West Well | 8/30/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - |
| West Well | 11/26/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | **12** | - | - | - | - | - | - | - | - | - |
| West Well | 4/8/2019 | - | **710** | - | - | 27 | 16 | 182 | 3 | 121 | - | - | <0.4 | 0.1 | <50 | **12** | **2900** | <100 | <10 | - | - | <100 | **160** | <5 | <50 |
| West Well | 7/29/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - |
| West Well | 10/14/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |

### DELTA SPORTSMAN

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 11/7/2001 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/16/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/3/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/30/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/15/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/9/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/29/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/14/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/12/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/4/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/8/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/6/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/20/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/11/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

### DUTCH SLOUGH WATER WORKS

| Well Name | Date | EC | TDS | pH | Total Alkalinity | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ | $NO_3$ | F | Al | As | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 7/21/2004 | **1060** | - | - | 260 | 49 | 23 | 138 | 2 | 112 | 111 | 300 | <0.09 | 0.2 | 10 | 2 | **2000** | 83.5 | 1 | - | - | 70 | **170** | 2 | 20 |
| Well Head | 7/27/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/2/2007 | **1060** | **650** | - | 260 | 47 | 21 | 146 | 2 | 121 | 128 | 310 | <0.09 | 0.1 | 10 | 2 | **1820** | 14.2 | 2 | - | - | 70 | **160** | 2 | 30 |
| Well Head | 7/3/2008 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/17/2009 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| DUTCH SLOUGH WATER WORKS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/20/2010 | **1050** | **620** | - | 250 | 49 | 22 | 149 | 2 | 109 | 119 | 300 | - | 0.1 | 10 | 2 | **2000** | 93.9 | 1 | - | - | 90 | **170** | 2 | 20 |
| Well Head | 7/20/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/3/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/30/2013 | **1090** | - | - | 240 | 49 | 23 | 140 | 2 | 116 | 129 | 300 | <0.09 | 0.1 | 10 | 2 | **1900** | 89.8 | 1 | - | - | 50 | **170** | 2 | 20 |
| Well Head | 7/8/2014 | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - |
| Well Head | 7/8/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/12/2016 | **1090** | **670** | - | 240 | 50 | 23 | 146 | 2 | 116 | 128 | 290 | 0.1 | 0.1 | 10 | 2 | **2000** | 84.8 | 2 | - | - | 30 | **180** | 1 | 20 |
| Well Head | 7/11/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/10/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/15/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/9/2019 | - | **630** | - | - | 47 | 22 | 130 | 7 | 114 | 119 | - | <0.4 | 0.1 | - | - | **1900** | - | - | - | - | 200 | **160** | - | - |
| EBRPD ROUND VALLEY WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 8/19/2015 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/11/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/17/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/7/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| EXCELSIOR MIDDLE SCHOOL | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 9/7/1999 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | - | - | - | - | - | - | - |
| Well Head | 10/4/2001 | - | - | - | - | - | - | - | - | - | - | - | 0.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/6/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - |
| Well Head | 10/3/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/2/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <100 | - | - | - | - | - | - | - |
| Well Head | 3/24/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 4/10/2003 | **1100** | **670** | - | 300 | 23 | 10 | 210 | 1.3 | 120 | 100 | 370 | ND | 0.3 | <50 | <2 | - | <100 | <10 | - | - | 170 | **54** | <5 | 50 |
| Well Head | 10/8/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/7/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 4/6/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/12/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/4/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/6/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/28/2009 | **1200** | **730** | - | 320 | 21 | 10 | 200 | 1.3 | 120 | 100 | 390 | ND | 0.4 | 50 | 3 | - | 100 | 5.6 | - | - | <100 | 46 | <5 | <50 |
| Well Head | 10/5/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/6/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/5/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

## Unknown Aquifer

### EXCELSIOR MIDDLE SCHOOL

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 10/3/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 4/9/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/8/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 4/3/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/3/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.45 | - | - | - | - | - |
| Well Head | 10/8/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/1/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/5/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/15/2017 | - | - | - | - | - | - | - | - | 120 | 100 | - | 0.4 | 0.2 | <50 | <2 | - | <100 | <10 | - | - | - | - | 5 | - |
| Well Head | 6/18/2018 | **1120** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/22/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/21/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

### FARRAR PARK PROPERTY OWNERS

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 12/27/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/30/2002 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/23/2003 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| Well Head | 8/25/2004 | **1200** | **690** | - | 250 | 35 | 19 | 200 | 2.8 | 130 | 130 | 300 | ND | 0.2 | - | 8.2 | - | - | - | - | - | 130 | **130** | <5 | 50 |
| Well Head | 12/29/2004 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/5/2007 | **1100** | **710** | - | 250 | 36 | 17 | 180 | 2.9 | 130 | 130 | 300 | ND | 0.1 | - | - | - | - | - | - | - | 120 | **96** | - | <50 |
| Well Head | 9/1/2010 | **1200** | **720** | - | 250 | 36 | 18 | 190 | 3 | 130 | 130 | 310 | ND | 0.1 | 50 | 9.6 | - | 100 | 1 | - | - | 130 | **110** | <5 | <50 |
| Well Head | 12/28/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/5/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/30/2016 | **1100** | **680** | - | 240 | 35 | 17 | 190 | 3 | 130 | 130 | 300 | ND | 0.1 | <50 | 6.9 | - | 100 | <10 | - | - | 130 | **130** | <5 | <50 |
| Well Head | 8/30/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| Well Head | 12/19/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/20/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/19/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

### FLAMINGO MOBILE MANOR

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Head | 6/20/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/19/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/22/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/27/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | - | - | 222 | <10 | - | - | - | **400** | <5 | 50 |
| Well Head | 6/23/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| FLAMINGO MOBILE MANOR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 9/5/2007 | **1300** | **750** | - | 250 | 65 | 29 | 150 | 2.7 | 75 | 200 | 310 | ND | ND | - | - | - | - | - | - | - | 190 | **400** | - | <50 |
| Well Head | 6/18/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/1/2010 | **1300** | **750** | - | 250 | 63 | 30 | 160 | 3.7 | 76 | 220 | 310 | - | ND | 50 | 6.4 | - | 270 | 1 | - | - | 180 | **410** | <5 | <50 |
| Well Head | 6/25/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/13/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/21/2016 | **1300** | **750** | - | 240 | 59 | 28 | 170 | 2.8 | 81 | 210 | 290 | ND | ND | 50 | 6.4 | - | 280 | <10 | ND | - | 180 | **390** | <5 | <50 |
| Well Head | 7/17/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/17/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/16/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/13/2019 | - | - | - | - | 56 | 25 | 160 | 2.6 | 97 | 210 | - | ND | ND | ND | 8 | - | 280 | - | - | - | 160 | **380** | ND | ND |
| FRANKS MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| New Well | 10/15/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 3/9/2009 | **1300** | **820** | - | 210 | 24 | 14 | 220 | 2.1 | 160 | 170 | 260 | ND | 0.1 | 50 | <2 | - | 100 | 2.9 | - | - | <100 | **140** | <5 | <50 |
| New Well | 10/19/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 10/14/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 10/12/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 10/4/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 10/3/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 7/16/2014 | **1200** | **740** | - | 200 | 27 | 13 | 230 | 2.4 | 150 | 170 | 250 | ND | ND | <50 | <2 | - | 120 | <10 | - | - | <100 | **140** | <5 | <50 |
| New Well | 10/9/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 7/8/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 7/6/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| New Well | 7/11/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 7/19/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 9/27/2017 | **1300** | **780** | - | 210 | 27 | 13 | 240 | 2.2 | 160 | 190 | 250 | ND | ND | <50 | <2 | - | 110 | <10 | - | - | <100 | **140** | <5 | <50 |
| New Well | 7/10/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| New Well | 7/16/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/22/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/17/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/18/2002 | **1200** | **720** | - | 200 | 28 | 15 | 230 | 2.3 | 130 | 180 | 250 | ND | ND | <50 | <2 | - | 130 | <10 | - | - | <100 | **140** | <5 | 50 |
| Well Head | 10/22/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/25/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/20/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/2/2006 | **1200** | **750** | - | 210 | 27 | 14 | 220 | 2.1 | 160 | 170 | 250 | ND | ND | 50 | <2 | - | 100 | 10 | - | - | 110 | **120** | <5 | 50 |
| GAS N SAVE | | | | | | | | | | | | | | | | | | | | | | | | | |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| GAS N SAVE | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/30/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/3/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/10/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| GENOS DELI STATION | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 6/3/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/2/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/30/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/29/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/30/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/13/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/22/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| HOLLAND RIVERSIDE MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| well 2 - East Well | 12/28/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 12/31/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 12/31/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 12/29/2004 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 12/27/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 12/20/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 9/20/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 12/2/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 9/26/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 9/20/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 8/27/2014 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 11/10/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 9/22/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 9/12/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| well 2 - East Well | 9/4/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/28/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/31/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/31/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/29/2004 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/20/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/16/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/15/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations: Ca | Mg | Na | K | Anions: $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Trace Elements: Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOLLAND RIVERSIDE MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head - West Well | 9/20/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 12/2/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 9/26/2011 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 9/20/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head - West Well | 11/10/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| HOLY CROSS CEMETERY | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/11/2002 | - | - | - | - | - | - | - | - | - | - | - | 1.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/15/2003 | - | - | - | - | - | - | - | - | - | - | - | 1.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/7/2004 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/7/2005 | - | - | - | - | - | - | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/10/2006 | - | - | - | - | - | - | - | - | - | - | - | 1.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/7/2008 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/15/2009 | - | - | - | - | - | - | - | - | - | - | - | 2.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/14/2010 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/18/2012 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/22/2013 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/21/2014 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/18/2016 | - | - | - | - | - | - | - | - | - | - | - | 3.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 3.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/18/2018 | - | - | - | - | - | - | - | - | - | - | - | 3.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/22/2019 | - | - | - | - | - | - | - | - | - | - | - | 3.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| JOES ISLAND RESTAURANT | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELLHEAD | 9/18/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 10/26/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 10/29/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 10/9/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| LAST RESORT & MARINA LLC | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/23/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/31/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/28/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/21/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/24/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| LIGHTHOUSE BAPTIST CHURCH | | | | | | | | | | | | | | | | | | | | | | | | | |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| LIGHTHOUSE BAPTIST CHURCH | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 6/6/2002 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/5/2003 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| LINDQUIST LANDING MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 12/28/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/24/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/31/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/27/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/27/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/29/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/10/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/15/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/28/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/4/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/9/2015 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/2/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/20/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/2/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/8/2019 | - | - | - | - | - | - | - | - | - | - | - | <0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| LITTORNO & PANFILI WATER SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL HEAD | 8/5/2004 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | 2.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 8/8/2006 | - | - | - | - | - | - | - | - | - | - | - | 2.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| LOS VAQUEROS INTERPRETIVE CENTER | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOURCE | 10/21/2009 | 420 | - | - | 100 | 20 | 12 | 37 | - | 34 | 47 | 100 | - | 0.1 | 160 | 2.2 | - | 140 | 10 | - | - | 100 | 20 | 5 | 50 |
| SOURCE | 2/17/2010 | 410 | - | - | 100 | - | - | 36 | - | 31 | 45 | - | - | 0.1 | - | - | - | - | - | - | - | 120 | 20 | - | - |
| SOURCE | 10/6/2010 | 400 | - | 8 | 100 | 27 | 12 | 37 | 3.1 | 30 | 46 | 100 | - | 0.1 | 120 | 2 | - | 130 | 10 | - | - | 150 | 20 | 5 | 50 |
| SOURCE | 10/21/2011 | 440 | - | - | 110 | 23 | 12 | 37 | 2.9 | 33 | 50 | 110 | - | 0.1 | 230 | 2 | - | 180 | 10 | - | - | 140 | 20 | 5 | 50 |
| SOURCE | 9/12/2012 | 350 | - | - | 90 | - | - | 36 | - | 26 | 49 | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/2/2012 | 350 | - | 7.5 | 90 | 25 | 11 | 38 | 2.6 | 26 | 52 | 90 | - | 0.1 | 100 | 2 | - | 160 | 10 | - | - | 130 | 20 | 5 | 50 |
| SOURCE | 10/8/2013 | 430 | - | 8 | 78 | - | - | - | - | 42 | 51 | 78 | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/7/2014 | 450 | - | 7.9 | 100 | - | - | - | - | 26 | 56 | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 7/5/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations: Ca | Mg | Na | K | Anions: SO4 | Cl | HCO3 [1] | NO3 [1] | F | Trace Elements: Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| LOS VAQUEROS INTERPRETIVE CENTER | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOURCE | 10/4/2016 | - | - | - | 100 | 26 | 11 | 37 | 2.4 | - | - | - | - | - | 160 | 2 | - | 140 | 10 | - | - | 180 | 20 | 5 | 50 |
| SOURCE | 1/10/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 4/4/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/3/2017 | 440 | - | - | - | 31 | 11 | 37 | 2.4 | 28 | 53 | - | 0.4 | - | 50 | 2 | - | 130 | 10 | 1 | - | 100 | 20 | 5 | 50 |
| LOS VAQUEROS MARINA BLDG | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOURCE | 10/21/2009 | 420 | - | - | 100 | 20 | 12 | 37 | - | 34 | 47 | 100 | - | 0.1 | 160 | 2.2 | - | 140 | 10 | - | - | 100 | 20 | 5 | 50 |
| SOURCE | 2/17/2010 | 410 | - | - | 100 | - | - | 36 | - | 31 | 45 | - | - | 0.1 | - | - | - | - | - | - | - | 120 | 20 | - | - |
| SOURCE | 10/6/2010 | 400 | - | 8 | 100 | 27 | 12 | 37 | 3.1 | 30 | 46 | 100 | - | 0.1 | 120 | 2 | - | 130 | 10 | - | - | 150 | 20 | 5 | 50 |
| SOURCE | 10/21/2011 | 440 | - | - | 110 | 23 | 12 | 37 | 2.9 | 33 | 50 | 110 | - | 0.1 | 230 | 2 | - | 180 | 10 | - | - | 140 | 20 | 5 | 50 |
| SOURCE | 9/12/2012 | 350 | - | - | 90 | - | - | 36 | - | 26 | 49 | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/2/2012 | 350 | - | 7.5 | 90 | 25 | 11 | 38 | 2.6 | 26 | 52 | 90 | - | 0.1 | 100 | 2 | - | 160 | 10 | - | - | 130 | 20 | 5 | 50 |
| SOURCE | 10/8/2013 | 430 | - | 8 | 78 | - | - | - | - | 42 | 51 | 78 | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/7/2014 | 450 | - | 7.9 | 100 | - | - | - | - | 26 | 56 | - | - | 0.2 | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 7/5/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/4/2016 | - | - | - | 100 | 26 | 11 | 37 | 2.4 | - | - | - | - | - | 160 | 2 | - | 140 | 10 | - | - | 180 | 20 | 5 | 50 |
| SOURCE | 1/10/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 4/4/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOURCE | 10/3/2017 | 440 | - | - | - | 31 | 11 | 37 | 2.4 | 28 | 53 | - | 0.4 | - | 50 | 2 | - | 130 | 10 | 1 | - | 100 | 20 | 5 | 50 |
| LUNDBORG LANDING *CL 2/09 | | | | | | | | | | | | | | | | | | | | | | | | | |
| well | 11/16/2005 | **1370** | **780** | - | 190 | 31 | 15 | 205 | 2 | 115 | 250 | 230 | <0.09 | 0.1 | 10 | 2 | **1500** | 182 | 1 | - | - | **320** | **140** | 2 | 20 |
| well | 10/4/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| well | 10/26/2007 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| MACS OLD HOUSE | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 9/17/2001 | - | - | - | - | - | - | - | - | - | - | - | 5.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/18/2001 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/14/2002 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/13/2002 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/12/2002 | - | - | - | - | - | - | - | - | - | - | - | 6.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/17/2002 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/20/2003 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/30/2003 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/17/2004 | - | - | - | - | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/15/2004 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| MARINA MOBILE MANOR | | | | | | | | | | | | | | | | | | | | | | | | | |
| NEW WELL | 9/14/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW WELL | 9/20/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW WELL | 7/18/2013 | **1400** | - | - | 290 | 85 | 47 | 150 | 3.3 | 100 | 200 | 350 | ND | ND | <50 | <2 | - | 100 | <10 | - | - | 190 | **380** | <5 | <50 |
| NEW WELL | 9/16/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW WELL | 9/15/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | ND | - | - | - | - | - |
| NEW WELL | 9/16/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW WELL | 7/6/2016 | **1300** | - | - | 290 | 75 | 37 | 140 | 2.9 | 110 | 200 | 350 | ND | ND | 50 | <2 | - | 100 | <10 | - | - | 170 | **370** | <5 | <50 |
| NEW WELL | 7/27/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW WELL | 7/23/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW WELL | 8/1/2019 | - | **840** | - | - | 76 | 42 | 140 | 3.1 | 110 | 190 | - | ND | ND | ND | 3 | - | - | ND | - | - | 200 | **370** | ND | ND |
| Well Head | 12/27/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 4/28/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | 0.1 | <50 | 6.6 | - | <100 | <10 | - | - | - | - | <5 | - |
| Well Head | 7/26/2004 | **1100** | **670** | - | 160 | 38 | 20 | 170 | 2.4 | 95 | 130 | 190 | ND | - | - | - | - | - | - | - | - | 130 | **170** | - | 50 |
| Well Head | 12/28/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/25/2007 | **1100** | **710** | - | 300 | 35 | 19 | 180 | 2.4 | 80 | 120 | 370 | ND | 0.19 | 50 | 6.4 | - | 100 | 10 | - | - | 120 | **180** | 5 | <50 |
| Well Head | 12/28/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/23/2008 | - | - | - | - | - | - | - | - | - | - | - | 0.56 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/22/2009 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/19/2010 | **1100** | **700** | - | 300 | 36 | 19 | 170 | 2.4 | 91 | 130 | 370 | - | 0.1 | 50 | 6.9 | - | 100 | 1 | - | - | <100 | **170** | <5 | <50 |
| Well Head | 8/26/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/23/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| MARINER COVE MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/29/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/27/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/18/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/27/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/27/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/24/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/30/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/23/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/28/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/29/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/25/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/23/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/29/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) 10[a] | Anions: F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| MARINER COVE MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/21/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/20/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/11/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NEIGHBORHOOD CHURCH | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 5/23/2002 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/14/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/13/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/16/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/8/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/7/2007 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/7/2009 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/6/2010 | - | - | - | - | - | - | - | - | - | - | - | 9.3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/9/2011 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/14/2012 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/2/2013 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/1/2014 | - | - | - | - | - | - | - | - | - | - | - | 9.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/2/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.6 | - | - | - | - | - |
| Well Head | 5/3/2016 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/2/2017 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/14/2017 | **1600** | **1100** | - | 280 | 160 | 60 | 140 | 2.7 | 230 | 240 | 340 | **11** | 0.23 | 190 | <2 | - | 100 | 10 | 8.6 | - | <100 | <20 | 5 | 180 |
| Well Head | 5/31/2018 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/11/2018 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| NEW DOCS MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 3/27/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/27/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/22/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/21/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/24/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/25/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/24/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/22/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/28/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/18/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 5/31/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/4/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| NEW DOCS MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 11/25/2019 | - | - | - | - | - | - | - | - | - | - | - | 0.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| OAKLEY MUTUAL WATER COMPANY | | | | | | | | | | | | | | | | | | | | | | | | | |
| NORTH WELL - 4384 SANDMOUND | 6/21/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/20/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/21/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 1/29/2007 | 1200 | 880 | - | 290 | 16 | 11 | 230 | 1.6 | 84 | 150 | 360 | ND | 0.1 | - | - | - | - | - | - | - | <100 | 130 | - | <50 |
| NORTH WELL - 4384 SANDMOUND | 6/27/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/12/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/22/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/17/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/15/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/20/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 10/28/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.21 | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 7/1/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 6/13/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 7/6/2016 | 1200 | 690 | - | 290 | 18 | 10 | 220 | 1.7 | 81 | 140 | 350 | 0.4 | ND | <50 | 13 | - | 100 | <10 | - | - | <100 | 140 | <5 | <50 |
| NORTH WELL - 4384 SANDMOUND | 8/16/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| NORTH WELL - 4384 SANDMOUND | 7/30/2019 | - | 730 | - | - | 19 | 11 | - | 1.9 | 79 | 140 | - | <0.4 | ND | ND | 13 | - | <100 | ND | - | - | ND | 140 | <5 | <50 |
| SOUTH WELL - 4508 SANDMOUND | 3/20/2002 | 960 | 580 | - | 290 | 60 | 28 | 110 | 2 | 100 | 85 | - | <0.5 | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 140 | 170 | <5 | 50 |
| SOUTH WELL - 4508 SANDMOUND | 6/21/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/20/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/21/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 1/29/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | 12 | - | 100 | 10 | - | - | - | - | 5 | - |
| SOUTH WELL - 4508 SANDMOUND | 6/27/2007 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/12/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/22/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 2/17/2010 | 1200 | 710 | - | 290 | 19 | 11 | 210 | 1.7 | 83 | 150 | 360 | ND | 0.1 | 50 | 12 | - | 100 | 8.1 | - | - | 100 | 140 | <5 | <50 |
| SOUTH WELL - 4508 SANDMOUND | 6/17/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/15/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/20/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 6/18/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 10/28/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 7/1/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations: Ca | Mg | Na | K | Anions: $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Trace Elements: Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| OAKLEY MUTUAL WATER COMPANY | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOUTH WELL - 4508 SANDMOUND | 6/13/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 7/6/2016 | **1200** | - | - | 290 | 19 | 11 | 220 | 1.7 | 81 | 140 | 350 | ND | ND | <50 | **13** | - | 100 | <10 | - | - | <100 | **140** | <5 | <50 |
| SOUTH WELL - 4508 SANDMOUND | 8/16/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SOUTH WELL - 4508 SANDMOUND | 8/1/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 | 8/21/2019 | - | - | - | - | 20 | 11 | 200 | 1.8 | 76 | - | - | ND | ND | ND | - | - | ND | ND | - | - | ND | **160** | <5 | <50 |
| ORIN ALLEN YOUTH REHAB FACILITY | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 1/27/2004 | **1300** | - | - | 400 | 7.3 | 5 | 270 | 0.6 | 96 | 110 | 480 | - | - | <50 | 2.6 | - | <100 | <10 | - | - | **430** | **79** | <5 | <50 |
| WELL | 2/17/2010 | **1200** | - | - | 320 | 18 | 7.1 | 240 | 0.9 | 120 | 130 | 400 | - | 0.7 | 50 | 4.4 | - | 100 | 13 | - | - | **310** | 38 | <5 | <50 |
| WELL | 2/11/2013 | **1200** | - | - | 330 | 18 | 8.5 | 260 | 1.2 | 120 | 140 | 400 | - | 0.45 | 50 | 2.5 | - | 100 | 1 | - | - | **750** | **130** | <5 | 50 |
| WELL | 4/13/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | 0.32 | <50 | 4.3 | - | 100 | <10 | - | - | - | - | <5 | - |
| Well 2 | 8/15/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| Well 2 | 1/16/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 2 | 2/5/2019 | - | **880** | - | - | 20 | 9.8 | 300 | 1.1 | 120 | 190 | - | ND | 0.5 | ND | 6 | - | <100 | ND | - | - | 290 | **80** | ND | <50 |
| ORWOOD RESORT | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 2 - WEST WELL | 9/30/2002 | **910** | **510** | - | 270 | 58 | 24 | 110 | 1.7 | 98 | 78 | - | ND | 0.3 | - | <2 | - | - | - | - | - | 210 | **150** | <5 | 91 |
| WELL 2 - WEST WELL | 6/28/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/28/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/20/2006 | **910** | **570** | - | 280 | 57 | 23 | 100 | 1.4 | 92 | 80 | 340 | ND | 0.2 | 50 | <2 | - | 100 | 10 | - | - | 160 | **160** | <5 | 50 |
| WELL 2 - WEST WELL | 6/28/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/17/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/16/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/28/2010 | **920** | **570** | - | 270 | 56 | 24 | 100 | 1.5 | 110 | 78 | 330 | - | 0.2 | 50 | <2 | - | 100 | 1 | - | - | 200 | **140** | <5 | <50 |
| WELL 2 - WEST WELL | 6/19/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/18/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/17/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 6/13/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - WEST WELL | 7/24/2017 | **920** | **570** | - | 270 | 53 | 23 | 110 | 1.6 | 100 | 76 | 330 | ND | 0.1 | 50 | <2 | - | 100 | <10 | ND | - | 190 | **140** | <5 | <50 |
| WELL 2 - WEST WELL | 7/2/2018 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - PICNIC AREA | 9/30/2002 | **910** | **540** | - | 260 | 59 | 24 | 110 | 1.6 | 100 | 78 | - | ND | 0.2 | <50 | <2 | - | <100 | <10 | - | - | 100 | **160** | <5 | 40 |
| WELL 3 - PICNIC AREA | 6/28/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - PICNIC AREA | 6/28/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - PICNIC AREA | 6/20/2006 | **910** | **560** | - | 270 | 55 | 22 | 110 | 1.5 | 100 | 80 | 330 | ND | 0.2 | 50 | <2 | - | 100 | 10 | - | - | 190 | **150** | <5 | 50 |
| WELL 3 - PICNIC AREA | 6/28/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - PICNIC AREA | 6/17/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity [1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$ [1] (mg/L) | $NO_3$ [1] (mg/L) | F (mg/L) | Al (µg/L) | As [2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (ug/L) | Se (µg/L) | Zn (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORWOOD RESORT | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 3 - PICNIC AREA | 6/15/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - PICNIC AREA | 6/28/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - PICNIC AREA | 8/26/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| PARK MARINA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 5/25/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/29/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/1/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/15/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/10/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/21/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/27/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/19/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/23/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 6/25/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| PLEASANTIMES MUTUAL WATER CO | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 2 - 4520 STONE | 5/21/2003 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 6/23/2004 | **1380** | **830** | - | 220 | 34 | 15 | 238 | 2 | 162 | 212 | 260 | <0.09 | 0.1 | - | - | **2600** | - | - | - | - | 200 | **150** | - | 20 |
| WELL 2 - 4520 STONE | 5/18/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 6/1/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 5/9/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 9 | - | 182 | 1 | - | - | - | - | 2 | - |
| WELL 2 - 4520 STONE | 11/21/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 7/24/2007 | **1400** | **870** | - | 230 | 32 | 14 | 240 | 1.9 | 150 | 200 | 280 | ND | - | - | - | - | - | - | - | - | 110 | **160** | - | <50 |
| WELL 2 - 4520 STONE | 5/24/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | ND | 50 | 5 | - | 120 | 1 | - | - | - | - | <5 | - |
| WELL 2 - 4520 STONE | 6/28/2010 | **1400** | **850** | - | 220 | 32 | 14 | 240 | 2 | 160 | 210 | 260 | - | - | - | - | - | - | - | - | - | <100 | **140** | - | <50 |
| WELL 2 - 4520 STONE | 5/23/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 5/20/2013 | **1700** | **940** | - | 200 | 41 | 21 | 270 | 2.9 | 98 | **340** | 240 | ND | ND | <50 | <2 | - | 140 | 5 | - | - | <100 | **160** | <5 | <50 |
| WELL 2 - 4520 STONE | 5/19/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 8/25/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 2 - 4520 STONE | 5/18/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 5/23/2016 | **1400** | **850** | - | 210 | 30 | 14 | 250 | 2 | 160 | 200 | 260 | ND | ND | <50 | 4.3 | - | 170 | <10 | - | - | 100 | **140** | <5 | <50 |
| WELL 2 - 4520 STONE | 5/22/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 - 4520 STONE | 5/6/2019 | - | **840** | - | - | 32 | 15 | 260 | 2.4 | - | 230 | - | ND | - | ND | 5 | - | 160 | ND | - | - | ND | - | <5 | ND |
| WELL 2 - 4520 STONE | 5/20/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/21/2003 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| PLEASANTIMES MUTUAL WATER CO | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well 1 - 4282 STONE | 6/23/2004 | **1410** | **850** | - | 220 | 32 | 18 | 235 | 2 | 156 | 223 | 270 | <0.09 | 0.1 | - | - | **2600** | - | - | - | - | 80 | **130** | - | 20 |
| Well 1 - 4282 STONE | 5/18/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 6/1/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/9/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | 20 | 6 | - | 149 | 1 | - | - | - | - | 2 | - |
| Well 1 - 4282 STONE | 11/21/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5.3 | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 7/24/2007 | **1400** | **860** | - | 240 | 30 | 16 | 250 | 1.9 | 140 | 210 | 290 | ND | - | - | - | - | - | - | - | - | 160 | **140** | - | <50 |
| Well 1 - 4282 STONE | 5/26/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/24/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | ND | 50 | 4 | - | 150 | 1 | - | - | - | - | <5 | - |
| Well 1 - 4282 STONE | 6/28/2010 | **1400** | **860** | - | 240 | 30 | 16 | 250 | 2 | 150 | 220 | 290 | - | - | - | - | - | - | - | - | - | <100 | **120** | - | <50 |
| Well 1 - 4282 STONE | 5/23/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/21/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/20/2013 | **1400** | **840** | - | 220 | 30 | 16 | 250 | 2.5 | 150 | 210 | 270 | ND | ND | <50 | 5.7 | - | 120 | 5 | - | - | 210 | **120** | <5 | <50 |
| Well 1 - 4282 STONE | 5/19/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 8/25/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/18/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/23/2016 | **1400** | - | - | 220 | 30 | 17 | 250 | 2.1 | 150 | 220 | 270 | ND | ND | <50 | 5 | - | 120 | <10 | - | - | 100 | **120** | <5 | 50 |
| Well 1 - 4282 STONE | 5/22/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 12/17/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well 1 - 4282 STONE | 5/6/2019 | - | **860** | - | - | 30 | - | 260 | 2.3 | 160 | 250 | - | - | ND | ND | 6 | - | 120 | ND | - | - | ND | - | <5 | ND |
| Well 1 - 4282 STONE | 5/20/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/21/2003 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 6/23/2004 | **1560** | **880** | - | 200 | 38 | 20 | 250 | 2 | 114 | **316** | 240 | <0.09 | 0.3 | - | - | **1700** | - | - | - | - | 120 | **170** | - | 140 |
| WELL 3 - 4441 WILLOW | 5/18/2005 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 6/1/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/9/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.09 | - | 10 | 2 | - | 144 | 1 | - | - | - | - | 2 | - |
| WELL 3 - 4441 WILLOW | 11/21/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 7/24/2007 | **1600** | **960** | - | 200 | 37 | 19 | 270 | 2.3 | 94 | **310** | 240 | ND | - | - | - | - | - | - | - | - | <100 | **180** | - | <50 |
| WELL 3 - 4441 WILLOW | 5/24/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | ND | 50 | <2 | - | 140 | 1 | - | - | - | - | <5 | - |
| WELL 3 - 4441 WILLOW | 6/28/2010 | **1700** | **920** | - | 200 | 40 | 21 | 270 | 2.4 | 100 | **350** | 250 | - | - | - | - | - | - | - | - | - | <100 | **170** | - | <50 |
| WELL 3 - 4441 WILLOW | 5/23/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/21/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/20/2013 | **1400** | **810** | - | 230 | 32 | 15 | 250 | 2.5 | 160 | 210 | 280 | ND | ND | <50 | 5.2 | - | 150 | 5 | - | - | 110 | **140** | <5 | <50 |
| WELL 3 - 4441 WILLOW | 5/19/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 8/25/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/18/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/23/2016 | **1600** | - | - | 190 | 37 | 20 | 280 | 2.5 | 100 | **350** | 240 | ND | ND | <50 | <2 | - | 140 | <10 | - | - | 100 | **170** | <5 | <50 |
| WELL 3 - 4441 WILLOW | 5/22/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| PLEASANTIMES MUTUAL WATER CO | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 3 - 4441 WILLOW | 12/17/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 3 - 4441 WILLOW | 5/6/2019 | - | **980** | - | - | 40 | 21 | 290 | 2.7 | 100 | **380** | - | ND | ND | ND | ND | - | 140 | ND | - | - | - | **170** | <5 | ND |
| RIVERVIEW MARINA SWS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 10/22/2001 | **1200** | - | - | 190 | 31 | 16 | 220 | 2.5 | 150 | 200 | - | ND | ND | <50 | <2 | - | 200 | <10 | - | - | 100 | **140** | <5 | 50 |
| Well Head | 6/22/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/4/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| RIVERVIEW WATER ASSOCIATION | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 1 BEACON HARBOR | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 7/15/2004 | **1800** | **1100** | - | 210 | 49 | 24 | 280 | 3.1 | 94 | **310** | 260 | ND | ND | <50 | <2 | - | 148 | <10 | - | - | 100 | **160** | <5 | 50 |
| WELL 1 BEACON HARBOR | 6/23/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/22/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/28/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 7/25/2007 | **1800** | **1100** | - | 220 | 50 | 28 | 290 | 3.4 | 110 | **380** | 260 | ND | 0.1 | 50 | 2 | - | 165 | 10 | - | - | <100 | **180** | 5 | <50 |
| WELL 1 BEACON HARBOR | 6/16/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/8/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/7/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 9/1/2010 | **2300** | **1300** | - | 210 | 64 | 35 | 300 | 4 | 55 | **540** | 250 | ND | ND | 50 | 3.4 | - | 100 | 1 | - | - | <100 | **220** | <5 | - |
| WELL 1 BEACON HARBOR | 6/20/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/5/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 9/22/2013 | - | **1000** | - | 230 | 49 | 25 | 270 | 3.6 | 120 | **390** | 280 | - | 0.1 | 50 | 2 | - | 180 | 10 | - | - | 100 | **170** | 5 | 50 |
| WELL 1 BEACON HARBOR | 6/9/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 8/6/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/1/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 11/30/2016 | **1800** | **1000** | - | 210 | 45 | 24 | 280 | 3.5 | 120 | **350** | 260 | 0.4 | ND | <50 | <2 | - | 170 | <10 | - | - | <100 | **150** | <5 | <50 |
| WELL 1 BEACON HARBOR | 6/7/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/12/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 1 BEACON HARBOR | 9/18/2019 | - | **1300** | - | - | 61 | 32 | 320 | 4.4 | 78 | **490** | - | 0.5 | ND | ND | 4 | - | 190 | ND | - | - | ND | **100** | <5 | <50 |
| WELL 2 END OF WILLOW RD | 6/23/2004 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 7/15/2004 | **1600** | **930** | - | 340 | 65 | 39 | 210 | 2.9 | 31 | **320** | 410 | ND | ND | <50 | <2 | - | 155 | <10 | - | - | 100 | **250** | <5 | 50 |
| WELL 2 END OF WILLOW RD | 6/23/2005 | - | - | - | - | - | - | - | - | - | - | - | 0.61 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/22/2006 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 7/25/2007 | **2200** | **1200** | - | 240 | 68 | 40 | 300 | 3.4 | 39 | **500** | 300 | ND | ND | 50 | 2.7 | - | 207 | 10 | - | - | 120 | **280** | 5 | <50 |
| WELL 2 END OF WILLOW RD | 6/16/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/7/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (ug/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| RIVERVIEW WATER ASSOCIATION | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 2 END OF WILLOW RD | 9/1/2010 | **2400** | - | - | 210 | 72 | 37 | 330 | 3.9 | 47 | **560** | 260 | ND | ND | 50 | 5.9 | - | 180 | 1 | - | - | 100 | **250** | <5 | <50 |
| WELL 2 END OF WILLOW RD | 6/20/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/6/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/5/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 9/22/2013 | - | **1200** | - | 230 | 71 | 40 | 300 | 3.8 | 47 | **550** | 290 | - | 0.1 | 50 | 5.5 | - | 220 | 10 | - | - | 100 | **280** | 5 | 50 |
| WELL 2 END OF WILLOW RD | 6/9/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 8/6/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/1/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 11/30/2016 | **2500** | **1300** | - | 210 | 69 | 36 | 320 | 4.1 | 44 | **550** | 250 | ND | ND | 50 | 4.7 | - | 210 | <10 | - | - | 100 | **260** | <5 | <50 |
| WELL 2 END OF WILLOW RD | 6/7/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/12/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 2 END OF WILLOW RD | 9/18/2019 | - | **1600** | - | - | 67 | 35 | 340 | 4.5 | 48 | **580** | - | - | ND | ND | 6 | - | 190 | ND | - | - | ND | **270** | - | - |
| RUSSOS MOBILE PARK | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 10/22/2003 | **1400** | - | - | 220 | 36 | 20 | 230 | 2.9 | 160 | 230 | 260 | - | ND | <50 | <2 | - | <100 | <10 | - | - | <100 | **160** | <5 | 50 |
| Well Head | 9/22/2006 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 10/18/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | <50 | 2 | - | 150 | <10 | - | - | - | - | <5 | - |
| Well Head | 10/13/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | - | - | 160 | 10 | - | - | - | - | - | - |
| Well Head | 10/15/2009 | **1400** | - | - | 220 | 42 | 20 | 250 | 2.6 | 150 | 240 | 260 | - | 0.1 | - | <2 | - | - | - | - | - | 110 | **170** | <5 | <50 |
| Well Head | 11/14/2012 | **1400** | - | - | 210 | 37 | 19 | 260 | 2.8 | 170 | **270** | 260 | - | ND | 50 | <2 | - | 160 | 1 | - | - | <100 | **180** | <5 | <50 |
| Well Head | 8/2/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/13/2017 | **1500** | - | - | 210 | 36 | 19 | 310 | 3.1 | 160 | 250 | 260 | ND | ND | 50 | <2 | - | 170 | <10 | ND | - | <100 | **170** | <5 | <50 |
| Well Head | 8/6/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SANDMOUND MUTUAL | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3160 STONE ROAD WELL | 2/26/2003 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | <50 | <2 | - | 172 | <10 | - | - | - | - | <5 | - |
| 3160 STONE ROAD WELL | 7/26/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 3/22/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 9/1/2009 | **1300** | **800** | - | 310 | 75 | 40 | 140 | 2.5 | 110 | 180 | 380 | ND | 0.1 | - | <2 | - | - | - | - | - | 250 | **330** | <5 | <50 |
| 3160 STONE ROAD WELL | 7/11/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 9/20/2012 | **1500** | **800** | - | 310 | 76 | 44 | 150 | 3 | 130 | 220 | 380 | ND | 0.2 | 50 | <2 | - | 180 | 1 | - | - | 240 | **390** | <5 | <50 |
| 3160 STONE ROAD WELL | 7/15/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 7/9/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 7/9/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 7/12/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 7/31/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SANDMOUND MUTUAL | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3160 STONE ROAD WELL | 7/31/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3160 STONE ROAD WELL | 9/19/2018 | **1500** | **910** | - | 290 | 87 | 44 | 170 | 3.2 | 130 | 230 | 360 | ND | ND | 50 | <2 | - | 200 | <10 | - | - | 180 | **360** | <5 | 50 |
| 3160 STONE ROAD WELL | 7/29/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 2/26/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | ND | <50 | **15** | - | 160 | <10 | - | - | - | - | <5 | - |
| 3810 STONE ROAD WELL | 6/22/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 3/28/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <2 | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 7/19/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/21/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 7/20/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 7/26/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/23/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/23/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 7/22/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 9/1/2009 | **1800** | **1100** | - | 300 | 44 | 24 | 320 | 2.6 | 190 | **320** | 370 | ND | ND | 50 | **14** | - | 130 | 6.8 | - | - | 190 | **140** | <5 | <50 |
| 3810 STONE ROAD WELL | 6/10/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 7/14/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 11/17/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | 9 | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/13/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/11/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 9/20/2012 | **2000** | **1100** | - | 250 | 41 | 26 | 310 | 2.8 | 200 | **340** | 310 | ND | ND | 50 | **16** | - | 100 | 1 | - | - | 130 | **150** | <5 | <50 |
| 3810 STONE ROAD WELL | 6/17/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/12/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/4/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/6/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/12/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 6/26/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 3810 STONE ROAD WELL | 9/19/2018 | **1800** | **1100** | - | 240 | 46 | 23 | 330 | 2.9 | 200 | **320** | 300 | ND | ND | <50 | **16** | - | 120 | <10 | - | - | 120 | **140** | <5 | <50 |
| 3810 STONE ROAD WELL | 6/5/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| SANDY POINT MOBILE HOME PARK | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 12/27/2001 | - | - | - | - | - | - | - | - | - | - | - | 0.61 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/18/2002 | - | - | - | - | - | - | - | - | - | - | - | 0.66 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 3/24/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | 0.2 | <50 | <2 | - | 129 | 5 | - | - | - | - | <5 | - |
| Well Head | 12/15/2003 | - | - | - | - | - | - | - | - | - | - | - | 0.56 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/24/2004 | **1300** | **720** | - | 290 | 57 | 39 | 150 | 2.6 | 110 | 150 | 360 | - | - | - | - | - | - | - | - | - | 180 | **300** | - | 50 |
| Well Head | 12/20/2004 | - | - | - | - | - | - | - | - | - | - | - | 0.77 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900 [b] | 500 [b] | 6.5/8.5 [b] | | | | | | 250 [b] | 250 [b] | | 10 [a] | 2 [a] | 1000 [a] | 10 [a] | 1000 [c] | 1000 [a] | 50 [a] | | 1.3 [a] | 300 [b] | 50 [b] | 50 [a] | 5000 [a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SANDY POINT MOBILE HOME PARK | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 12/20/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | 0.61 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 9/5/2007 | **1300** | **830** | - | 300 | 73 | 40 | 150 | 2.7 | 120 | 180 | 370 | ND | 0.2 | - | - | - | - | - | - | - | 180 | **290** | - | <50 |
| Well Head | 12/19/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.47 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/15/2008 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/22/2009 | - | - | - | - | - | - | - | - | - | - | - | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 12/27/2012 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/20/2013 | **1600** | **970** | - | 280 | 96.8 | 48.7 | 170 | 3.2 | 160 | 250 | 340 | ND | ND | <50 | <2 | - | 150 | <10 | - | - | 210 | **420** | <5 | <50 |
| Well Head | 12/30/2013 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 11/20/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - |
| Well Head | 12/29/2015 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/24/2016 | **1600** | **1000** | - | 300 | 95 | 52 | 160 | 3.3 | 170 | 240 | 370 | ND | ND | <50 | <2 | - | 170 | <10 | - | - | 230 | **470** | <5 | <50 |
| Well Head | 7/31/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/31/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/6/2019 | - | **1200** | - | - | - | 58 | 170 | 3.5 | 190 | **300** | - | <0.4 | ND | <50 | ND | - | 170 | ND | - | - | 200 | **490** | ND | ND |
| SANTIAGO ISLAND VILLAGE | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 01 | 4/28/1998 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 5/24/2001 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 8/1/2002 | **2000** | **1300** | - | 620 | 24 | 28 | 430 | 1.9 | 160 | 220 | 760 | 8.6 | **2.4** | <50 | 7 | - | <100 | <10 | - | - | 100 | <20 | <5 | 50 |
| WELL 01 | 10/21/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 5/28/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 7/29/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 7/13/2005 | **1700** | **1100** | - | 220 | 50 | 24 | 300 | 2.6 | 210 | **320** | 270 | ND | 0.1 | <50 | <2 | - | <100 | 2.8 | - | - | 100 | **210** | <5 | 50 |
| WELL 01 | 7/21/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 7/17/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL 01 | 4/1/2009 | **1800** | **1100** | - | 230 | 43 | 22 | 280 | 2.7 | 210 | **280** | 280 | ND | 0.2 | 50 | 2 | - | 100 | 4.8 | - | - | <100 | **210** | <5 | <50 |
| WELL 01 | 7/15/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 10/19/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 1/13/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 4/15/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 7/8/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | **8** | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 10/20/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 1/10/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **160** | - | - |
| WELL 01 | 4/13/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 7/13/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 10/10/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 1/5/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (ug/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SANTIAGO ISLAND VILLAGE | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL 01 | 4/4/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 5/3/2012 | **1700** | - | - | 230 | 43 | 24 | 310 | 2.7 | 210 | **310** | 280 | ND | ND | 50 | 5 | - | 100 | 1 | - | - | <100 | **210** | <5 | 60 |
| WELL 01 | 7/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 10/17/2012 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 1/15/2013 | - | - | - | - | - | - | - | - | - | - | - | - | 0.12 | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 4/8/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 7/16/2013 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 10/7/2013 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 1/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 4/9/2014 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 7/15/2014 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 10/22/2014 | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 1/14/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **170** | - | - |
| WELL 01 | 4/13/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 5/13/2015 | **1700** | **1000** | - | 230 | 40 | 20 | 300 | 2.9 | 190 | **290** | 280 | - | 0.29 | <50 | <2 | - | <100 | <10 | ND | - | <100 | **160** | <5 | 50 |
| WELL 01 | 7/13/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **170** | - | - |
| WELL 01 | 10/15/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 1/11/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **160** | - | - |
| WELL 01 | 4/4/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | **170** | - | - |
| WELL 01 | 7/11/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **170** | - | - |
| WELL 01 | 10/5/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **160** | - | - |
| WELL 01 | 1/16/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **160** | - | - |
| WELL 01 | 4/17/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 7/20/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 10/23/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **160** | - | - |
| WELL 01 | 1/23/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **170** | - | - |
| WELL 01 | 4/24/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 6/6/2018 | **1700** | **1000** | - | 220 | 40 | 20 | 300 | 2.9 | 200 | **300** | 270 | ND | ND | <50 | <2 | - | <100 | <10 | - | - | <100 | **190** | <5 | <50 |
| WELL 01 | 7/16/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 10/8/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 1/9/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| WELL 01 | 4/2/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | - | - |
| WELL 01 | 7/10/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **180** | - | - |
| WELL 01 | 10/8/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | - |
| SUNSET HARBOR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/19/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/20/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUNSET HARBOR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 7/28/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/26/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/21/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/31/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/29/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/10/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/16/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/18/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/27/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/23/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 7/8/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| TONYS FAMILY RESTAURANT | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL HEAD | 6/28/2002 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 6/25/2003 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 6/24/2004 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 6/29/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 6/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL HEAD | 11/5/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| TUGS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 1/29/2004 | - | - | - | - | - | - | - | - | - | - | - | 3.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/31/2005 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/30/2006 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/29/2007 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/29/2008 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/27/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/28/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/27/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/30/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/31/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/22/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/28/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/27/2016 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 2/1/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 1/24/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Well Head | 8/1/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| TUGS | | | | | | | | | | | | | | | | | | | | | | | | | |
| Well Head | 1/24/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| VILLA DE GUADALUPE | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 4/22/2002 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 4/1/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/1/2003 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/8/2003 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/6/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 4/5/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/1/2004 | - | - | - | - | - | - | - | - | - | - | - | 8.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/4/2004 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/3/2005 | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 4/4/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/6/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.6 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/4/2005 | - | - | - | - | - | - | - | - | - | - | - | 8.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/4/2006 | - | - | - | - | - | - | - | - | - | - | - | 9.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 3/2/2006 | **1400** | **840** | - | 390 | 80 | 57 | 150 | 1.8 | 120 | 140 | 470 | 10 | 0.4 | 50 | <2 | - | 100 | 7 | - | - | 100 | <20 | <5 | 50 |
| WELL | 4/4/2006 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/6/2006 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/19/2007 | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/11/2007 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/3/2007 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/3/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 2/28/2008 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 3/4/2008 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 5/1/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 6/5/2008 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/2/2008 | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 8/5/2008 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 9/3/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/13/2008 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 11/19/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 12/10/2008 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/5/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 2/2/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 3/2/2009 | **1400** | **900** | - | 380 | 81 | 57 | 150 | 1.8 | 130 | 140 | 460 | **13** | 0.5 | 50 | <2 | - | 100 | 17 | - | - | <100 | <20 | <5 | <50 |
| WELL | 4/1/2009 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 5/4/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations: Ca | Mg | Na | K | Anions: $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Trace Elements: Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown Aquifer** | | | | | | | | | | | | | | | | | | | | | | | | | |
| VILLA DE GUADALUPE | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELL | 6/1/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 7/2/2009 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 8/4/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 9/3/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 10/12/2009 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 11/9/2009 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 1/7/2010 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 2/3/2010 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| WELL | 4/15/2010 | **1470** | - | - | 211 | 75 | 49 | 140 | 7 | 170 | 230 | 211 | - | 0.29 | 230 | 4.5 | - | 37 | 1.2 | - | - | 220 | <20 | 8.2 | 16 |
| WELL | 8/30/2017 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WILLOWEST MARINA WS | | | | | | | | | | | | | | | | | | | | | | | | | |
| WELLHEAD | 12/27/2006 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/26/2007 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/8/2008 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/30/2009 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/28/2010 | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/27/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/20/2012 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/9/2013 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/16/2014 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/16/2015 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/19/2016 | - | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/13/2017 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/26/2018 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| WELLHEAD | 12/4/2019 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Public Supply and Monitoring Wells

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900 b | 500 b | 6.5/8.5 b | | | | | | 250 b | 250 b | | 10 a | 2 a | 1000 a | 10 a | 1000 c | 1000 a | 50 a | | 1.3 a | 300 b | 50 b | 50 a | 5000 a |

1. HCO3 and Total Alkalinity reported as CaCO3; NO3 reported as N

a) Primary Drinking Water Standards for California and Federal Maximum Contaminant Levels

b) Secondary Drinking Water Standards for California and Federal Maximum Contaminant Levels

c) California State Notification Level

2 Samples were filtered in the field

"-" Not Analyzed; ND = Non-Detect (Reporting Limit unknown)
For repeated sampling within a day, the maximum result for each constituent for the day is shown
Bold indicates value exceeds Water Quality Limit

# Summary of Groundwater Quality Laboratory Results - Surface Water

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FALSE R NR OAKLEY CA | 6/23/1994 | 612 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| FALSE R NR OAKLEY CA | 9/22/1994 | **991** | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| FALSE R NR OAKLEY CA | 12/1/1994 | **2840** | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| FALSE R NR OAKLEY CA | 3/29/1995 | 336 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| FALSE R NR OAKLEY CA | 5/26/1995 | 158 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| FALSE R NR OAKLEY CA | 6/26/1996 | 114 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| HOLLAND CUT NR BETHEL ISLAND CA | 9/10/2015 | - | - | | | - | - | - | - | - | - | | 0.133 | | - | - | | - | - | - | | - |
| HOLLAND CUT NR BETHEL ISLAND CA | 9/14/2015 | - | - | | | - | - | - | - | - | - | | 0.138 | | - | - | | - | - | - | | - |
| HOLLAND CUT NR BETHEL ISLAND CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.135 | | - | - | | - | - | - | | - |
| HOLLAND CUT NR BETHEL ISLAND CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.339 | | - | - | | - | - | - | | - |
| HOLLAND CUT NR BETHEL ISLAND CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.04 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/3/1960 | 535 | - | | | - | - | - | - | - | 98 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/7/1960 | 529 | - | | | - | - | - | - | - | 82 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/12/1960 | 818 | - | | | - | - | - | - | - | 155 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/9/1961 | 863 | - | | | - | - | - | - | - | 156 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/13/1961 | **1040** | - | | | - | - | - | - | - | 198 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/7/1961 | **1130** | - | | | - | - | - | - | - | 204 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/11/1961 | 463 | - | | | - | - | - | - | - | 65 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/2/1961 | 226 | 141 | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/5/1961 | 233 | - | | | - | - | - | - | - | 20 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/10/1961 | 330 | - | | | - | - | - | - | - | 44 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/3/1961 | 805 | - | | | - | - | - | - | - | 186 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/11/1961 | 638 | 332 | | | - | - | - | - | - | 132 | | 0.136 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/6/1961 | 452 | - | | | - | - | - | - | - | 72 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/6/1961 | 459 | - | | | - | - | - | - | - | 66 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/12/1961 | 799 | - | | | - | - | - | - | - | 135 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/11/1962 | **1220** | - | | | - | - | - | - | - | 212 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/15/1962 | **1610** | - | | | - | - | - | - | - | **326** | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/8/1962 | 898 | - | | | - | - | - | - | - | 158 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/11/1962 | 592 | - | | | - | - | - | - | - | 88 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/8/1962 | 304 | 174 | | | - | - | - | - | - | 39 | | 0.226 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/6/1962 | 415 | - | | | - | - | - | - | - | 64 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/10/1962 | 231 | - | | | - | - | - | - | - | 24 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/7/1962 | 293 | - | | | - | - | - | - | - | 40 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/6/1962 | 336 | 199 | | | - | - | - | - | - | 51 | | 0.294 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/4/1962 | 394 | - | | | - | - | - | - | - | 61 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/13/1962 | 869 | - | | | - | - | - | - | - | 154 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/10/1962 | 729 | - | | | - | - | - | - | - | 125 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/7/1963 | 722 | - | | | - | - | - | - | - | 134 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/6/1963 | 751 | - | | | - | - | - | - | - | 127 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/13/1963 | 721 | - | | | - | - | - | - | - | 123 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/10/1963 | 631 | - | | | - | - | - | - | - | 100 | | - | | - | - | | - | - | - | | - |

# Summary of Groundwater Quality Laboratory Results - Surface Water

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | Trace Elements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | Al | As [2] | B | Ba | Cr | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/2/1963 | 601 | - | | | - | - | - | - | - | 113 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/7/1963 | 506 | 281 | | | - | - | - | - | - | 88 | | 0.113 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/15/1963 | 371 | - | | | - | - | - | - | - | 56 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/22/1963 | 265 | - | | | - | - | - | - | - | 37 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/29/1963 | 183 | - | | | - | - | - | - | - | 24 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/5/1963 | 153 | - | | | - | - | - | - | - | 19 | | 0.407 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/12/1963 | 262 | - | | | - | - | - | - | - | 38 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/19/1963 | 243 | - | | | - | - | - | - | - | 34 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/26/1963 | 163 | - | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/3/1963 | 230 | - | | | - | - | - | - | - | 28 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/9/1963 | 249 | - | | | - | - | - | - | - | 31 | | 0.497 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/17/1963 | 223 | - | | | - | - | - | - | - | 24 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/24/1963 | 221 | - | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/31/1963 | 217 | - | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/6/1963 | 231 | - | | | - | - | - | - | - | 23 | | 0.136 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/14/1963 | 243 | - | | | - | - | - | - | - | 26 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/21/1963 | 262 | - | | | - | - | - | - | - | 30 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/28/1963 | 273 | - | | | - | - | - | - | - | 32 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/4/1963 | 281 | - | | | - | - | - | - | - | 34 | | 0.203 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/10/1963 | 305 | 171 | | | - | - | - | - | - | 34 | | 0.452 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/18/1963 | 311 | - | | | - | - | - | - | - | 37 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/25/1963 | 380 | - | | | - | - | - | - | - | 49 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/2/1963 | 405 | - | | | - | - | - | - | - | 52 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/8/1963 | 342 | - | | | - | - | - | - | - | 38 | | 0.52 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/16/1963 | 413 | - | | | - | - | - | - | - | 55 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/23/1963 | 406 | - | | | - | - | - | - | - | 49 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 10/30/1963 | 399 | - | | | - | - | - | - | - | 53 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/5/1963 | 425 | - | | | - | - | - | - | - | 59 | | 0.813 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/14/1963 | 457 | - | | | - | - | - | - | - | 66 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/20/1963 | 462 | - | | | - | - | - | - | - | 71 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/27/1963 | 577 | - | | | - | - | - | - | - | 103 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/3/1963 | 558 | - | | | - | - | - | - | - | 99 | | 0.542 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/11/1963 | 554 | - | | | - | - | - | - | - | 90 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/18/1963 | 591 | - | | | - | - | - | - | - | 86 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/2/1964 | 573 | - | | | - | - | - | - | - | 98 | | 1.06 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/10/1964 | 579 | - | | | - | - | - | - | - | 100 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/15/1964 | 590 | - | | | - | - | - | - | - | 97 | | 1.49 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/23/1964 | 700 | - | | | - | - | - | - | - | 109 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/29/1964 | 755 | - | | | - | - | - | - | - | 124 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/4/1964 | 749 | - | | | - | - | - | - | - | 123 | | 1.6 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/13/1964 | 792 | - | | | - | - | - | - | - | 130 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/20/1964 | 798 | - | | | - | - | - | - | - | 129 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/27/1964 | 844 | - | | | - | - | - | - | - | 132 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/5/1964 | 631 | - | | | - | - | - | - | - | 86 | | - | | - | - | | - | - | - | | - |

# Summary of Groundwater Quality Laboratory Results - Surface Water

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/12/1964 | 463 | - | | | - | - | - | - | - | 62 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/19/1964 | 398 | - | | | - | - | - | - | - | 51 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/26/1964 | 390 | - | | | - | - | - | - | - | 52 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/2/1964 | 438 | - | | | - | - | - | - | - | 54 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/9/1964 | 386 | - | | | - | - | - | - | - | 44 | | 0.723 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/16/1964 | 328 | - | | | - | - | - | - | - | 36 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/23/1964 | 300 | - | | | - | - | - | - | - | 34 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/30/1964 | 273 | - | | | - | - | - | - | - | 28 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/7/1964 | 270 | 151 | | | - | - | - | - | - | 28 | | 0.361 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/14/1964 | 263 | - | | | - | - | - | - | - | 28 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/21/1964 | 250 | - | | | - | - | - | - | - | 26 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/28/1964 | 271 | - | | | - | - | - | - | - | 31 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/4/1964 | 260 | - | | | - | - | - | - | - | 27 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/11/1964 | 342 | - | | | - | - | - | - | - | 47 | | 0.271 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/18/1964 | 261 | - | | | - | - | - | - | - | 23 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/25/1964 | 252 | - | | | - | - | - | - | - | 21 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/2/1964 | 248 | - | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/9/1964 | 269 | - | | | - | - | - | - | - | 27 | | 0.361 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 8/6/1964 | 469 | 240 | | | - | - | - | - | - | 88 | | 0.587 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/3/1964 | 541 | 295 | | | - | - | - | - | - | 106 | | 0.384 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 11/5/1964 | 440 | 231 | | | - | - | - | - | - | 62 | | 0.542 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 12/3/1964 | 613 | 309 | | | - | - | - | - | - | 92 | | 0.565 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 1/8/1965 | 751 | - | | | - | - | - | - | - | 121 | | 1.11 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 2/3/1965 | 653 | - | | | - | - | - | - | - | 116 | | 0.858 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 3/3/1965 | 531 | 296 | | | - | - | - | - | - | 90 | | 0.52 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 4/8/1965 | 492 | - | | | - | - | - | - | - | 73 | | 1.17 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 5/6/1965 | 268 | 159 | | | - | - | - | - | - | 34 | | 0.113 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 6/17/1965 | 165 | 86 | | | - | - | - | - | - | 22 | | 0.745 | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 7/15/1965 | 253 | - | | | - | - | - | - | - | 32 | | - | | - | - | | - | - | - | | - |
| ITALIAN SLOUGH A MOUTH NR BYRON CA | 9/17/1965 | 345 | 205 | | | - | - | - | - | - | 43 | | 0.881 | | - | - | | - | - | - | | - |
| Marsh Creek | 12/17/2008 | - | **530** | | | 53 | 21 | 82 | 4 | 206 | 77 | | 0.8 | | <2 | 300 | | <0.001 | 290 | <10 | | <20 |
| Marsh Creek | 2/17/2009 | - | 260 | | | 29 | 11 | 47 | 3 | 96 | 34 | | 0.5 | | <2 | 200 | | <0.001 | <50 | <10 | | <20 |
| Marsh Creek | 5/12/2009 | - | **770** | | | 91 | 39 | 114 | 4 | 230 | 129 | | 1.6 | | 3 | 1000 | | 3 | <50 | 10 | | <20 |
| Marsh Creek | 8/4/2009 | - | **800** | | | 85 | 37 | 147 | 6 | **260** | 159 | | <0.1 | | <2 | 600 | | <0.001 | 120 | 50 | | <20 |
| Marsh Creek | 11/10/2009 | - | **1690** | | | 186 | 75 | 259 | 8 | **810** | 240 | | <0.1 | | <2 | 800 | | <0.001 | <50 | 20 | | <20 |
| Marsh Creek | 2/25/2010 | - | **530** | | | 47 | 27 | 82 | 5 | 153 | 71 | | 0.6 | | <2 | **1300** | | <0.001 | 80 | <10 | | <20 |
| Marsh Creek | 5/26/2010 | - | **550** | | | 53 | 20 | 82 | 4 | 169 | 71 | | 1.1 | | <2 | 500 | | <0.001 | <50 | 20 | | <20 |
| Marsh Creek | 8/12/2010 | - | **670** | | | 74 | 30 | 116 | 5 | 234 | 107 | | <0.1 | | 3 | 400 | | 1 | <50 | **150** | | 20 |
| Marsh Creek | 11/16/2010 | - | **830** | | | 78 | 30 | 166 | 12 | **260** | 144 | | 3.1 | | 2 | 800 | | <0.001 | <50 | **140** | | <20 |
| Marsh Creek | 2/24/2011 | - | **580** | | | 57 | 32 | 81 | 3 | 158 | 81 | | 0.7 | | <2 | **1700** | | <0.001 | <50 | 10 | | <20 |
| OLD R A CLIFTON COURT FERRY CA | 10/3/1960 | 488 | - | | | - | - | - | - | - | 84 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 11/7/1960 | 855 | - | | | - | - | - | - | - | 153 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 12/12/1960 | 811 | - | | | - | - | - | - | - | 140 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 1/9/1961 | 821 | - | | | - | - | - | - | - | 142 | | - | | - | - | | - | - | - | | - |

# Summary of Groundwater Quality Laboratory Results - Surface Water

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3^1$ (mg/L) | Anions: $NO_3^1$ (mg/L) 10[a] | Trace Elements: Al (µg/L) 1000[a] | Trace Elements: As[2] (µg/L) 10[a] | Trace Elements: B (ug/L) 1000[c] | Trace Elements: Ba (ug/L) 1000[a] | Trace Elements: Cr (µg/L) 50[a] | Trace Elements: Fe (ug/L) 300[b] | Trace Elements: Mn (µg/L) 50[b] | Trace Elements: Se (µg/L) 50[a] | Trace Elements: Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OLD R A CLIFTON COURT FERRY CA | 2/13/1961 | **1020** | - | | | - | - | - | - | - | 178 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 3/7/1961 | 886 | - | | | - | - | - | - | - | 136 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 4/11/1961 | 315 | - | | | - | - | - | - | - | 39 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/2/1961 | 214 | 131 | | | - | - | - | - | - | 21 | | 0.023 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 6/5/1961 | 241 | - | | | - | - | - | - | - | 21 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 7/10/1961 | 327 | - | | | - | - | - | - | - | 44 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 8/3/1961 | 760 | - | | | - | - | - | - | - | 169 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 9/11/1961 | 585 | 312 | | | - | - | - | - | - | 120 | | 0.203 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 10/6/1961 | 430 | - | | | - | - | - | - | - | 65 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 11/6/1961 | **914** | - | | | - | - | - | - | - | 155 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 12/12/1961 | **1070** | - | | | - | - | - | - | - | 184 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 1/10/1962 | **1330** | - | | | - | - | - | - | - | 236 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 2/15/1962 | 506 | - | | | - | - | - | - | - | 73 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 3/8/1962 | 553 | - | | | - | - | - | - | - | 73 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 4/11/1962 | 526 | - | | | - | - | - | - | - | 76 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/8/1962 | 377 | 211 | | | - | - | - | - | - | 56 | | 0.068 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 6/5/1962 | 412 | - | | | - | - | - | - | - | 62 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 7/10/1962 | 225 | - | | | - | - | - | - | - | 26 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 8/7/1962 | 291 | - | | | - | - | - | - | - | 39 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 9/6/1962 | 336 | 198 | | | - | - | - | - | - | 50 | | 0.361 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 10/4/1962 | 387 | - | | | - | - | - | - | - | 58 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 11/13/1962 | 768 | - | | | - | - | - | - | - | 129 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 12/11/1962 | 464 | - | | | - | - | - | - | - | 72 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 1/7/1963 | 611 | - | | | - | - | - | - | - | 128 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 2/6/1963 | 189 | - | | | - | - | - | - | - | 23 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 3/13/1963 | 614 | - | | | - | - | - | - | - | 90 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 4/10/1963 | 299 | - | | | - | - | - | - | - | 38 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/7/1963 | 249 | 147 | | | - | - | - | - | - | 30 | | 0.181 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 6/5/1963 | 140 | - | | | - | - | - | - | - | 16 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 7/9/1963 | 230 | - | | | - | - | - | - | - | 27 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 8/7/1963 | 228 | - | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 9/10/1963 | 749 | 418 | | | - | - | - | - | - | 126 | | 0.203 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 10/8/1963 | 645 | - | | | - | - | - | - | - | 102 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 11/5/1963 | 528 | - | | | - | - | - | - | - | 84 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 12/3/1963 | 411 | - | | | - | - | - | - | - | 58 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 1/10/1964 | 489 | - | | | - | - | - | - | - | 76 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 2/4/1964 | 694 | - | | | - | - | - | - | - | 102 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 3/5/1964 | 513 | - | | | - | - | - | - | - | 69 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 4/9/1964 | 376 | - | | | - | - | - | - | - | 44 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/8/1964 | 379 | 208 | | | - | - | - | - | - | 53 | | 0.474 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 6/11/1964 | 257 | - | | | - | - | - | - | - | 26 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 7/6/1964 | 359 | - | | | - | - | - | - | - | 46 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 8/6/1964 | 427 | - | | | - | - | - | - | - | 75 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 9/3/1964 | 826 | 448 | | | - | - | - | - | - | 155 | | 0.497 | | - | - | | - | - | - | | - |

# Summary of Groundwater Quality Laboratory Results - Surface Water

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OLD R A CLIFTON COURT FERRY CA | 10/8/1964 | 400 | - | | | - | - | - | - | - | 50 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 11/11/1964 | 779 | - | | | - | - | - | - | - | 126 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 12/10/1964 | 631 | - | | | - | - | - | - | - | 96 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 1/7/1965 | 230 | - | | | - | - | - | - | - | 24 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 2/3/1965 | 291 | - | | | - | - | - | - | - | 36 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 3/4/1965 | 325 | - | | | - | - | - | - | - | 46 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 4/8/1965 | 305 | - | | | - | - | - | - | - | 43 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/6/1965 | 300 | 178 | | | - | - | - | - | - | 40 | | 0.136 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 6/17/1965 | 146 | - | | | - | - | - | - | - | 19 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 7/15/1965 | 236 | - | | | - | - | - | - | - | 28 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 8/12/1965 | 307 | - | | | - | - | - | - | - | 40 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 9/16/1965 | 313 | 183 | | | - | - | - | - | - | 36 | | 0.678 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 10/7/1965 | 418 | - | | | - | - | - | - | - | 60 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 11/3/1965 | 411 | - | | | - | - | - | - | - | 64 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 12/2/1965 | 320 | - | | | - | - | - | - | - | 40 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 1/4/1966 | 215 | - | | | - | - | - | - | - | 24 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 2/8/1966 | 552 | - | | | - | - | - | - | - | 79 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 3/7/1966 | 583 | - | | | - | - | - | - | - | 90 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 4/5/1966 | 505 | - | | | - | - | - | - | - | 71 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/2/1966 | 328 | 187 | | | - | - | - | - | - | 44 | | 0.316 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 6/7/1966 | 238 | - | | | - | - | - | - | - | 22 | | - | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 9/18/2017 | - | - | | | - | - | - | - | - | - | | 0.271 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 5/15/2018 | - | - | | | - | - | - | - | - | - | | 0.315 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 7/24/2018 | - | - | | | - | - | - | - | - | - | | 0.081 | | - | - | | - | - | - | | - |
| OLD R A CLIFTON COURT FERRY CA | 10/19/2018 | - | - | | | - | - | - | - | - | - | | 0.305 | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 9/28/1994 | 694 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 11/30/1994 | 580 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 3/29/1995 | 401 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 5/26/1995 | 162 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 6/26/1996 | 160 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 9/10/2015 | - | - | | | - | - | - | - | - | - | | 0.187 | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 9/14/2015 | - | - | | | - | - | - | - | - | - | | 0.172 | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.197 | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.371 | | - | - | | - | - | - | | - |
| OLD R A QUIMBY ISLAND NR BETHEL ISLAND CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.05 | | - | - | | - | - | - | | - |
| OLD RIVER A FAY ISLAND NR MIDDLE RIVER CA | 9/10/2015 | - | - | | | - | - | - | - | - | - | | 0.107 | | - | - | | - | - | - | | - |
| OLD RIVER A FAY ISLAND NR MIDDLE RIVER CA | 9/14/2015 | - | - | | | - | - | - | - | - | - | | 0.116 | | - | - | | - | - | - | | - |
| OLD RIVER A FAY ISLAND NR MIDDLE RIVER CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.158 | | - | - | | - | - | - | | - |
| OLD RIVER A FAY ISLAND NR MIDDLE RIVER CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.432 | | - | - | | - | - | - | | - |
| OLD RIVER A FAY ISLAND NR MIDDLE RIVER CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.053 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY ISLAND NR OAKLEY CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.407 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY ISLAND NR OAKLEY CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.313 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY ISLAND NR OAKLEY CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.192 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 9/27/2016 | - | - | | | - | - | - | - | - | - | | 0.198 | | - | - | | - | - | - | | - |

# Summary of Groundwater Quality Laboratory Results - Surface Water

| | | | | | | Cations | | | | Anions | | | | Trace Elements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| SAN JOAQUIN R A JERSEY POINT CA | 10/25/2016 | - | - | | | - | - | - | - | - | - | | 0.335 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 11/16/2016 | - | - | | | - | - | - | - | - | - | | 0.475 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 12/13/2016 | - | - | | | - | - | - | - | - | - | | 0.462 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 3/14/2017 | - | - | | | - | - | - | - | - | - | | 0.344 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 4/13/2017 | - | - | | | - | - | - | - | - | - | | 0.199 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 5/2/2017 | - | - | | | - | - | - | - | - | - | | 0.11 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 5/16/2017 | - | - | | | - | - | - | - | - | - | | 0.12 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 6/15/2017 | - | - | | | - | - | - | - | - | - | | 0.146 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 7/17/2017 | - | - | | | - | - | - | - | - | - | | 0.039 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 7/20/2017 | - | - | | | - | - | - | - | - | - | | 0.037 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 8/17/2017 | - | - | | | - | - | - | - | - | - | | 0.182 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 9/19/2017 | - | - | | | - | - | - | - | - | - | | 0.202 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 9/26/2017 | - | - | | | - | - | - | - | - | - | | 0.164 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 10/31/2017 | - | - | | | - | - | - | - | - | - | | 0.259 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 11/30/2017 | - | - | | | - | - | - | - | - | - | | 0.455 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 12/19/2017 | - | - | | | - | - | - | - | - | - | | 0.46 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 1/25/2018 | - | - | | | - | - | - | - | - | - | | 0.619 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 2/15/2018 | - | - | | | - | - | - | - | - | - | | 0.549 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 3/20/2018 | - | - | | | - | - | - | - | - | - | | 0.509 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 3/26/2018 | - | - | | | - | - | - | - | - | - | | 0.387 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 4/26/2018 | - | - | | | - | - | - | - | - | - | | 0.27 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 5/17/2018 | - | - | | | - | - | - | - | - | - | | 0.269 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 6/5/2018 | - | - | | | - | - | - | - | - | - | | 0.251 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 7/26/2018 | - | - | | | - | - | - | - | - | - | | 0.114 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 9/4/2018 | - | - | | | - | - | - | - | - | - | | 0.176 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 10/4/2018 | - | - | | | - | - | - | - | - | - | | 0.192 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 10/17/2018 | - | - | | | - | - | - | - | - | - | | 0.26 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 11/1/2018 | - | - | | | - | - | - | - | - | - | | 0.28 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 1/29/2019 | - | - | | | - | - | - | - | - | - | | 0.694 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 3/27/2019 | - | - | | | - | - | - | - | - | - | | 0.36 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A JERSEY POINT CA | 4/23/2019 | - | - | | | - | - | - | - | - | - | | 0.147 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 3/27/2012 | 300 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 4/3/2012 | 235 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 4/10/2012 | 223 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 4/17/2012 | 223 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 4/24/2012 | 221 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 5/1/2012 | 226 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 5/8/2012 | 197 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 5/15/2012 | 217 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 5/22/2012 | 481 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A KIMBALL ISLAND NR ANTIOCH CA | 5/29/2012 | 456 | - | | | - | - | - | - | - | - | | - | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A TWITCHELL ISLAND NR RIO VISTA CA | 9/10/2015 | - | - | | | - | - | - | - | - | - | | 0.256 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A TWITCHELL ISLAND NR RIO VISTA CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.413 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R A TWITCHELL ISLAND NR RIO VISTA CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.322 | | - | - | | - | - | - | | - |

# Summary of Groundwater Quality Laboratory Results - Surface Water

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAN JOAQUIN R A TWITCHELL ISLAND NR RIO VISTA CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.145 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R AB FALSE NR BETHEL ISLAND CA | 9/10/2015 | - | - | | | - | - | - | - | - | - | | 0.274 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R AB FALSE NR BETHEL ISLAND CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.391 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R AB FALSE NR BETHEL ISLAND CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.32 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R AB FALSE NR BETHEL ISLAND CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.185 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R BL MOKELUMNE R NR TERMINOUS CA | 9/10/2015 | - | - | | | - | - | - | - | - | - | | 0.254 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R BL MOKELUMNE R NR TERMINOUS CA | 10/21/2015 | - | - | | | - | - | - | - | - | - | | 0.405 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R BL MOKELUMNE R NR TERMINOUS CA | 4/18/2016 | - | - | | | - | - | - | - | - | - | | 0.324 | | - | - | | - | - | - | | - |
| SAN JOAQUIN R BL MOKELUMNE R NR TERMINOUS CA | 7/13/2016 | - | - | | | - | - | - | - | - | - | | 0.125 | | - | - | | - | - | - | | - |

1. HCO3 and Total Alkalinity reported as CaCO3; NO3 reported as N

a) Primary Drinking Water Standards for California and Federal Maximum Contaminant Levels

b) Secondary Drinking Water Standards for California and Federal Maximum Contaminant Levels

c) California State Notification Level

2 Samples were filtered in the field

"-" Not Analyzed; ND = Non-Detect (Reporting Limit unknown)
For repeated sampling within a day, the maximum result for each constituent for the day is shown
Bold indicates value exceeds Water Quality Limit

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01N03E17E001M | 8/9/1973 | **1080** | **612** | 7.8 | 228 | 68 | 34 | 108 | 0.3 | 97 | 139 | - | 3.6 | - | - | - | **1600** | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 6/24/1975 | **1200** | - | 8.2 | 259 | - | - | 118 | - | - | 160 | - | - | - | - | 1 | - | - | - | - | - | 0.09 | 1 | - | 1.2 |
| 01N03E17E001M | 7/20/1977 | **1270** | - | 8 | 240 | - | - | 113 | - | - | 216 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 8/3/1979 | **1360** | - | 8.4 | 233 | 94 | 44 | 121 | - | - | 227 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 8/3/1981 | **1220** | - | 7.9 | 238 | 87 | 39 | 114 | - | - | 184 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 8/16/1983 | **1210** | **730** | 8 | 239 | 82 | 38 | 116 | 0.8 | 102 | 185 | - | - | - | - | - | **1500** | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 8/1/1985 | **1270** | - | **8.7** | 230 | 90 | 40 | 113 | - | - | 191 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 7/28/1987 | **1300** | - | 8.1 | 245 | 95 | 52 | 123 | - | - | 209 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N03E17E001M | 9/14/1989 | **1400** | - | 8.2 | 258 | 97 | 47 | 128 | 0.4 | - | 218 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N001M | 10/13/1978 | - | - | 6.5 | - | - | - | - | - | - | 104 | - | 0.07 | - | - | - | 500 | - | - | - | - | - | - | - | - |
| 01S04E09N001M | 4/8/1981 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 500 | - | - | - | - | - | - | - | - |
| SL0601346154-94MW-2 | 7/30/2009 | - | - | 7.18 | - | - | - | - | - | 2.1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL0601346154-94MW-25 | 7/30/2009 | - | - | 7.85 | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL0601346154-94MW-3 | 7/30/2009 | - | - | 7.26 | - | - | - | - | - | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL0601346154-94SP-4 | 7/30/2009 | - | - | **9.04** | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7EW-1 | 7/12/2013 | - | **1200** | - | - | 98.8 | 75.6 | 119 | 1.28 | **330** | 140 | - | 4.3 | 0.33 | - | 2.63 | - | - | <0.01 | ND | ND | 50.5 | **1730** | ND | - |
| SL186102968-7EW-2 | 7/12/2013 | - | **1360** | - | - | 115 | 77.5 | 134 | 1.36 | **520** | 150 | - | 4.7 | 0.5 | - | 2.58 | - | - | <0.01 | ND | ND | 53.6 | **208** | ND | - |
| SL186102968-7EW-2 | 8/21/2013 | - | **7960** | - | - | 597 | 381 | 661 | 5.04 | **1500** | 120 | - | 5.2 | ND | - | ND | - | - | - | - | - | ND | **277** | 3.45 | - |
| SL186102968-7EW-2 | 9/17/2013 | - | **925** | - | - | 70.5 | 45.6 | 123 | 2.1 | **290** | 81 | - | ND | 0.34 | - | **14.3** | - | - | - | - | - | **1270** | **1790** | ND | - |
| SL186102968-7EW-4 | 7/12/2013 | - | **740** | - | - | 65.2 | 40.5 | 74.2 | 3.48 | 150 | 86 | - | 0.18 | 0.31 | - | 4.76 | - | - | <0.01 | ND | ND | ND | **839** | ND | - |
| SL186102968-7EW-4 | 8/21/2013 | - | **3480** | - | - | 564 | 402 | 1060 | 8.84 | **2400** | 79 | - | 1.1 | ND | - | 1.25 | - | - | - | - | - | ND | **1930** | 5.09 | - |
| SL186102968-7EW-4 | 9/17/2013 | - | **10100** | - | - | 850 | 624 | 2580 | 14.2 | **4000** | 65 | - | 5.1 | ND | - | ND | - | - | - | - | - | ND | **2530** | 8.06 | - |
| SL186102968-7EW-4 | 10/22/2013 | - | **815** | - | - | 72.2 | 35.9 | 108 | 6.9 | **290** | 61 | - | ND | 0.17 | - | 5.43 | - | - | - | - | - | **515** | **3260** | 1.56 | - |
| SL186102968-7EW-4 | 11/19/2013 | - | **1160** | - | - | 103 | 52.3 | 136 | 9.16 | **410** | 62 | - | ND | 0.24 | - | 3.38 | - | - | - | - | - | 243 | **4150** | ND | - |
| SL186102968-7EW-4 | 12/17/2013 | - | **1040** | - | - | 76.8 | 40.9 | 117 | 8.05 | **280** | 64 | - | 0.42 | 0.14 | - | 2.5 | - | - | - | - | - | **2070** | **4610** | ND | - |
| SL186102968-7EW-4 | 1/21/2014 | - | **1020** | - | - | 94.8 | 57.2 | 149 | 4.09 | **310** | 120 | - | **16** | 0.27 | - | 5.3 | - | - | - | - | - | ND | 2.09 | ND | - |
| SL186102968-7EW-4 | 2/18/2014 | - | **3120** | - | - | 250 | 157 | 497 | 15.2 | **2200** | 77 | - | ND | 0.25 | - | 3.02 | - | - | - | - | - | 57.7 | **7980** | 1.83 | - |
| SL186102968-7EW-4 | 3/19/2014 | - | - | - | - | - | - | - | - | **4100** | 69 | - | 0.94 | 0.26 | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7EW-6 | 7/12/2013 | - | **1110** | - | - | 62.7 | 38.5 | 93.4 | 152 | 170 | 98 | - | ND | 0.34 | - | 6.58 | - | - | <0.01 | ND | ND | **6250** | **591** | ND | - |
| SL186102968-7EW-6 | 8/21/2013 | - | **645** | - | - | 39.3 | 19.7 | 71.4 | 87.6 | 100 | 59 | - | ND | 0.37 | - | 4.89 | - | - | - | - | - | **1070** | **1130** | ND | - |
| SL186102968-7EW-6 | 9/17/2013 | - | **590** | - | - | 34 | 17.3 | 63.6 | 57.6 | 71 | 47 | - | ND | 0.45 | - | 4.22 | - | - | - | - | - | **575** | **1060** | ND | - |
| SL186102968-7EW-6 | 10/22/2013 | - | - | - | - | - | - | - | - | 44 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-1 | 4/12/2013 | - | 400 | - | - | - | - | - | - | 88 | - | - | - | - | - | - | - | - | 2 | 1.6 | 1.6 | - | - | - | - |
| SL186102968-7MW-1 | 5/28/2013 | - | **925** | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | 29.5 | ND | ND | - | - | - | - |
| SL186102968-7MW-1 | 7/12/2013 | - | **1230** | - | - | 102 | 60.6 | 148 | 4.81 | **300** | 97 | - | 7.2 | 0.21 | - | 5.4 | - | - | - | ND | ND | ND | **85.4** | 1.19 | - |
| SL186102968-7MW-1 | 8/21/2013 | - | **915** | - | - | 85.6 | 49.8 | 134 | 4.98 | **320** | 110 | - | 2.8 | 0.16 | - | 5.45 | - | - | <0.01 | ND | ND | ND | **68.1** | ND | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL186102968-7MW-1 | 9/17/2013 | - | **995** | - | - | 88.8 | 47.5 | 137 | 4.91 | **310** | 110 | - | 0.95 | 0.15 | - | 3.65 | - | - | - | ND | ND | ND | 7.74 | ND | - |
| SL186102968-7MW-1 | 10/22/2013 | - | **995** | - | - | 86.9 | 47.8 | 139 | 4.92 | **310** | 120 | - | 2.5 | ND | - | 4.81 | - | - | <0.001 | ND | ND | ND | **81.1** | 1.44 | - |
| SL186102968-7MW-1 | 11/19/2013 | - | **950** | - | - | 90.5 | 54.7 | 134 | 4.05 | **300** | 120 | - | 4.2 | 0.16 | - | 4.61 | - | - | <0.001 | ND | ND | ND | 47.3 | ND | - |
| SL186102968-7MW-1 | 12/17/2013 | - | **840** | - | - | 79.5 | 50.7 | 128 | 4.2 | 220 | 91 | - | **13** | 0.14 | - | 4.78 | - | - | <0.001 | ND | ND | ND | 39.9 | 6.33 | - |
| SL186102968-7MW-1 | 1/21/2014 | - | **835** | - | - | 86.2 | 49.7 | 104 | 4.46 | 210 | 90 | - | **12** | 0.23 | - | 4.17 | - | - | <0.001 | ND | ND | ND | **51.6** | 4.26 | - |
| SL186102968-7MW-1 | 2/18/2014 | - | **825** | - | - | 88.1 | 50 | 91.4 | 5.22 | 210 | 88 | - | **12** | 0.17 | - | 3.97 | - | - | <0.001 | ND | ND | ND | **61.8** | 4.05 | - |
| SL186102968-7MW-1 | 3/19/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-1 | 5/27/2014 | - | **705** | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | <0.001 | ND | ND | - | - | - | - |
| SL186102968-7MW-1 | 8/19/2014 | - | **819** | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | <0.16 | ND | ND | - | - | - | - |
| SL186102968-7MW-1 | 12/9/2014 | - | **610** | - | - | - | - | - | - | 131 | - | - | - | - | - | - | - | - | <0.21 | ND | ND | - | - | - | - |
| SL186102968-7MW-1 | 3/10/2015 | - | 293 | - | - | - | - | - | - | 68.3 | - | - | - | - | - | - | - | - | 2.7 | - | - | - | - | - | - |
| SL186102968-7MW-1 | 6/9/2015 | - | 420 | - | - | - | - | - | - | 108 | - | - | - | - | - | - | - | - | 1.7 | - | - | - | - | - | - |
| SL186102968-7MW-1 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.5 | 1.5 | - | - | - | - |
| SL186102968-7MW-1 | 8/11/2015 | - | **660** | - | - | - | - | - | - | 188 | - | - | - | - | - | - | - | - | <1 | ND | ND | - | - | - | - |
| SL186102968-7MW-10 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 1.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-10 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 1.4 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-10 | 4/12/2013 | - | **605** | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | 5.98 | 4.9 | 4.9 | - | - | - | - |
| SL186102968-7MW-10 | 5/28/2013 | - | **820** | - | - | - | - | - | - | 150 | - | - | - | - | - | - | - | - | 5.43 | 5.1 | 5.1 | - | - | - | - |
| SL186102968-7MW-10 | 3/10/2015 | - | **504** | - | - | - | - | - | - | 81.3 | - | - | - | - | - | - | - | - | 7.4 | 8.8 | 8.8 | - | - | - | - |
| SL186102968-7MW-10 | 6/9/2015 | - | 376 | - | - | - | - | - | - | 40.5 | - | - | - | - | - | - | - | - | 6.8 | - | - | - | - | - | - |
| SL186102968-7MW-10 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.7 | 6.7 | - | - | - | - |
| SL186102968-7MW-11 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-11 | 4/12/2013 | - | **1460** | - | - | - | - | - | - | **550** | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 5/28/2013 | - | **1640** | - | - | - | - | - | - | **600** | - | - | - | - | - | - | - | - | <0.001 | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 7/12/2013 | - | **1620** | - | - | 124 | 101 | 208 | 1.82 | **580** | 190 | - | 9.7 | 0.34 | - | 2.77 | - | - | <0.01 | ND | ND | ND | 5.39 | ND | - |
| SL186102968-7MW-11 | 8/21/2013 | - | **1560** | - | - | 106 | 81.5 | 210 | 1.94 | **510** | 190 | - | 9.1 | 0.33 | - | 3.46 | - | - | <0.01 | ND | ND | ND | 3.49 | ND | - |
| SL186102968-7MW-11 | 9/17/2013 | - | **1420** | - | - | 107 | 86.7 | 221 | 1.81 | **470** | 160 | - | 9.3 | 0.36 | - | 2.61 | - | - | 1.71 | ND | ND | ND | 4.97 | ND | - |
| SL186102968-7MW-11 | 10/22/2013 | - | **1060** | - | - | 79.7 | 61.3 | 205 | 2 | **330** | 120 | - | 3.2 | 0.21 | - | 3.1 | - | - | 1.05 | ND | ND | ND | **63.8** | ND | - |
| SL186102968-7MW-11 | 11/19/2013 | - | **1120** | - | - | 80.1 | 65.4 | 178 | 1.95 | **360** | 110 | - | 7.2 | 0.31 | - | 3.8 | - | - | <0.001 | ND | ND | ND | 18.6 | 1.01 | - |
| SL186102968-7MW-11 | 12/17/2013 | - | **735** | - | - | 41.4 | 35.5 | 131 | 1.41 | 220 | 92 | - | 6.7 | 0.3 | - | 2.55 | - | - | 1.18 | ND | ND | ND | 6.24 | ND | - |
| SL186102968-7MW-11 | 1/21/2014 | - | **1000** | - | - | 76.6 | 62.2 | 184 | 1.77 | **400** | 130 | - | 7.3 | 0.35 | - | 2.58 | - | - | <0.001 | ND | ND | ND | 19 | ND | - |
| SL186102968-7MW-11 | 2/18/2014 | - | 295 | - | - | 29.7 | 22.7 | 68.1 | 1.66 | 130 | 47 | - | 4.1 | 0.3 | - | 1.52 | - | - | <0.001 | ND | ND | ND | 4.47 | ND | - |
| SL186102968-7MW-11 | 3/19/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 5/27/2014 | - | **870** | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 8/19/2014 | - | **1100** | - | - | - | - | - | - | **376** | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 12/9/2014 | - | **1160** | - | - | - | - | - | - | **374** | - | - | - | - | - | - | - | - | <0.52 | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 3/10/2015 | - | **1150** | - | - | - | - | - | - | **425** | - | - | - | - | - | - | - | - | <0.81 | - | - | - | - | - | - |
| SL186102968-7MW-11 | 6/9/2015 | - | **1010** | - | - | - | - | - | - | **383** | - | - | - | - | - | - | - | - | <0.28 | - | - | - | - | - | - |
| SL186102968-7MW-11 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-11 | 8/11/2015 | - | **1320** | - | - | - | - | - | - | **456** | - | - | - | - | - | - | - | - | <1 | 0.2 | 0.2 | - | - | - | - |
| SL186102968-7MW-12 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL186102968-7MW-12 | 7/12/2013 | - | **590** | - | - | 42.8 | 32.3 | 103 | 0.794 | 110 | 39 | - | **11** | 0.54 | - | 4.89 | - | - | <0.01 | 1.6 | 1.6 | ND | 5.38 | ND | - |
| SL186102968-7MW-12 | 8/21/2013 | - | **570** | - | - | 36.3 | 26.6 | 88.4 | 0.967 | 110 | 36 | - | **11** | 0.54 | - | 5.34 | - | - | <0.01 | 1.6 | 1.6 | ND | 2.42 | ND | - |
| SL186102968-7MW-12 | 9/17/2013 | - | **655** | - | - | 39.7 | 30.2 | 101 | 0.993 | 130 | 42 | - | **12** | 0.52 | - | 4.88 | - | - | 2.13 | 1.6 | 1.6 | ND | 2.62 | ND | - |
| SL186102968-7MW-12 | 10/22/2013 | - | **625** | - | - | 40 | 28.5 | 105 | 1.15 | 120 | 38 | - | **12** | 0.38 | - | 6.68 | - | - | 1.49 | 1.7 | 1.7 | ND | 4.23 | ND | - |
| SL186102968-7MW-12 | 11/19/2013 | - | **670** | - | - | 41.2 | 30.9 | 98.1 | 1.03 | 130 | 36 | - | **13** | 0.47 | - | 7.05 | - | - | 2.35 | 1.5 | 1.5 | ND | 7.05 | ND | - |
| SL186102968-7MW-12 | 12/17/2013 | - | **715** | - | - | 40.3 | 31.2 | 124 | 1.02 | 140 | 47 | - | **12** | 0.5 | - | 5.8 | - | - | 1.98 | 1.3 | 1.3 | ND | 7.95 | ND | - |
| SL186102968-7MW-12 | 1/21/2014 | - | **630** | - | - | 43.3 | 32.3 | 109 | 1.06 | 150 | 44 | - | **13** | 0.57 | - | 5.42 | - | - | - | 1.6 | 1.6 | ND | 5.25 | ND | - |
| SL186102968-7MW-12 | 2/18/2014 | - | **655** | - | - | 47.5 | 33.7 | 98.1 | 1.09 | 160 | 49 | - | **12** | 0.61 | - | 4.08 | - | - | 1.78 | 1.3 | 1.3 | ND | 5.84 | ND | - |
| SL186102968-7MW-12 | 3/19/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.1 | 1.1 | - | - | - | - |
| SL186102968-7MW-12 | 5/27/2014 | - | **845** | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - | - | 3.01 | 2.6 | 2.6 | - | - | - | - |
| SL186102968-7MW-12 | 8/19/2014 | - | **591** | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | 2 | 2.6 | 2.6 | - | - | - | - |
| SL186102968-7MW-12 | 12/9/2014 | - | **622** | - | - | - | - | - | - | 136 | - | - | - | - | - | - | - | - | 2.1 | 2.5 | 2.5 | - | - | - | - |
| SL186102968-7MW-12 | 3/10/2015 | - | **567** | - | - | - | - | - | - | 114 | - | - | - | - | - | - | - | - | 2.8 | - | - | - | - | - | - |
| SL186102968-7MW-12 | 6/9/2015 | - | **544** | - | - | - | - | - | - | 99.3 | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - |
| SL186102968-7MW-12 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.3 | 2.3 | - | - | - | - |
| SL186102968-7MW-12 | 8/11/2015 | - | **613** | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | 2.3 | 2.2 | 2.2 | - | - | - | - |
| SL186102968-7MW-13 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 7.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-13 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.9 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-13 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-13 | 7/12/2013 | - | **800** | - | - | 61.3 | 43.1 | 107 | 1.28 | 210 | 93 | - | 9.9 | 0.5 | - | 4.78 | - | - | <0.01 | 2.3 | 2.3 | ND | 2.65 | ND | - |
| SL186102968-7MW-13 | 8/21/2013 | - | **830** | - | - | 64.3 | 42.2 | 131 | 1.15 | 250 | 94 | - | **11** | 0.56 | - | 6.2 | - | - | <0.01 | 1.8 | 1.8 | ND | 1.99 | ND | - |
| SL186102968-7MW-13 | 9/17/2013 | - | **860** | - | - | 64.9 | 42.3 | 129 | 1.45 | 240 | 98 | - | 9.5 | 0.52 | - | 4.24 | - | - | - | 1.8 | 1.8 | ND | 2.6 | ND | - |
| SL186102968-7MW-13 | 10/22/2013 | - | **910** | - | - | 67.4 | 42.6 | 135 | 1.76 | 210 | 110 | - | 9.1 | 0.28 | - | 6.02 | - | - | - | 2.1 | 2.1 | ND | 1.96 | ND | - |
| SL186102968-7MW-13 | 11/19/2013 | - | **865** | - | - | 70.9 | 48.3 | 131 | 1.33 | 240 | 110 | - | 9.9 | 0.45 | - | 6.9 | - | - | 3 | 2 | 2 | ND | 1.62 | 1.13 | - |
| SL186102968-7MW-13 | 12/17/2013 | - | **880** | - | - | 63.6 | 46.1 | 152 | 1.2 | 250 | 100 | - | 10 | 0.46 | - | 5.62 | - | - | 21.6 | 1.7 | 1.7 | ND | 1.68 | ND | - |
| SL186102968-7MW-13 | 1/21/2014 | - | **885** | - | - | 73.4 | 50.1 | 150 | 1.29 | 250 | 100 | - | 9.7 | 0.48 | - | 4.88 | - | - | 2.67 | 1.7 | 1.7 | ND | 2.22 | ND | - |
| SL186102968-7MW-13 | 2/18/2014 | - | **845** | - | - | 75 | 49.8 | 124 | 1.76 | 230 | 95 | - | 9.2 | 0.47 | - | 5.2 | - | - | 3.15 | 2.4 | 2.4 | ND | 1.64 | ND | - |
| SL186102968-7MW-13 | 3/19/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | - | - | - | - |
| SL186102968-7MW-13 | 5/27/2014 | - | **635** | - | - | - | - | - | - | 150 | - | - | - | - | - | - | - | - | 1.81 | 1.8 | 1.8 | - | - | - | - |
| SL186102968-7MW-13 | 8/19/2014 | - | **864** | - | - | - | - | - | - | 236 | - | - | - | - | - | - | - | - | 1.6 | 2.1 | 2.1 | - | - | - | - |
| SL186102968-7MW-13 | 12/9/2014 | - | **919** | - | - | - | - | - | - | **262** | - | - | - | - | - | - | - | - | 1.3 | 1.5 | 1.5 | - | - | - | - |
| SL186102968-7MW-13 | 3/10/2015 | - | **864** | - | - | - | - | - | - | 228 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-13 | 6/9/2015 | - | 169 | - | - | - | - | - | - | 218 | - | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - |
| SL186102968-7MW-13 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.5 | 1.5 | - | - | - | - |
| SL186102968-7MW-13 | 8/11/2015 | - | **882** | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | 1.1 | 1.6 | 1.6 | - | - | - | - |
| SL186102968-7MW-14 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.68 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-14 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-14 | 7/12/2013 | - | 375 | - | - | 28.6 | 14.9 | 39.3 | 4.02 | 18 | 36 | - | ND | 0.17 | - | ND | - | - | - | ND | ND | **900** | **695** | ND | - |
| SL186102968-7MW-14 | 8/21/2013 | - | 450 | - | - | 42.6 | 18.4 | 61.6 | 5.31 | 77 | 37 | - | 2.5 | ND | - | 1.14 | - | - | - | - | - | 256 | **820** | ND | - |
| SL186102968-7MW-14 | 9/17/2013 | - | **595** | - | - | 72.1 | 30 | 81.2 | 6.49 | 130 | 85 | - | 2.5 | ND | - | 1.33 | - | - | - | - | - | **952** | **1590** | ND | - |
| SL186102968-7MW-14 | 10/22/2013 | - | **805** | - | - | 86.4 | 35.5 | 102 | 8.14 | 190 | 97 | - | 2.9 | ND | - | 1.55 | - | - | - | - | - | **2120** | **2020** | ND | - |
| SL186102968-7MW-14 | 11/19/2013 | - | **1220** | - | - | 143 | 65.1 | 129 | 9.57 | **500** | 100 | - | 1 | ND | - | ND | - | - | - | - | - | **3250** | **3350** | ND | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity [1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: SO4 (mg/L) | Cl (mg/L) | HCO3 [1] (mg/L) | NO3 [1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As [2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL186102968-7MW-14 | 12/17/2013 | - | **1490** | - | - | 142 | 76.6 | 125 | 10.1 | **690** | 77 | - | 0.89 | ND | - | 5.47 | - | - | - | - | - | **31800** | **7100** | ND | - |
| SL186102968-7MW-14 | 1/21/2014 | - | **870** | - | - | 72.1 | 34.2 | 113 | 7.14 | **340** | 66 | - | 2.1 | ND | - | 2.08 | - | - | - | - | - | **13000** | **3110** | ND | - |
| SL186102968-7MW-14 | 2/18/2014 | - | **980** | - | - | 88.1 | 41.3 | 117 | 8.8 | **420** | 61 | - | 2.8 | ND | - | ND | - | - | - | - | - | **11200** | **2660** | ND | - |
| SL186102968-7MW-14 | 3/19/2014 | - | - | - | - | - | - | - | - | **410** | 52 | - | 1.7 | 0.12 | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-2 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-2 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-2 | 7/29/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-2 | 7/12/2013 | - | **795** | - | - | 98.6 | 51.4 | 67.7 | 2.99 | 10 | 45 | - | ND | 0.33 | - | 2.93 | - | - | - | ND | ND | 192 | **6950** | ND | - |
| SL186102968-7MW-2 | 10/22/2013 | - | - | - | - | - | - | - | - | **550** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-2 | 12/17/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4.23 | - | - | - | - | - | - |
| SL186102968-7MW-3 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-3 | 7/12/2013 | - | **910** | - | - | 79.2 | 61.7 | 110 | 0.875 | 180 | 85 | - | ND | 0.65 | - | 2.92 | - | - | <0.01 | ND | ND | 102 | **1790** | ND | - |
| SL186102968-7MW-4 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-4 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.11 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-5 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-5 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 0.18 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-5 | 7/29/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-5 | 7/12/2013 | - | 340 | - | - | 32.5 | 15.5 | 15.6 | 6.08 | 80 | 11 | - | 5.7 | 0.59 | - | 2.82 | - | - | <0.01 | ND | ND | **567** | **2880** | ND | - |
| SL186102968-7MW-5 | 10/22/2013 | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-6 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-6 | 4/12/2013 | - | **940** | - | - | - | - | - | - | **310** | 140 | - | **13** | ND | - | - | - | - | - | 1.6 | 1.6 | - | - | - | - |
| SL186102968-7MW-6 | 5/28/2013 | - | **1060** | - | - | - | - | - | - | **310** | - | - | - | - | - | - | - | - | - | 1.3 | 1.3 | - | - | - | - |
| SL186102968-7MW-6 | 7/12/2013 | - | **1090** | - | - | 89.1 | 60.7 | 130 | 2.89 | **260** | 110 | - | **11** | 0.24 | - | 4.09 | - | - | - | 1.1 | 1.1 | ND | 3.78 | 4.36 | - |
| SL186102968-7MW-6 | 8/21/2013 | - | **800** | - | - | 63 | 41.3 | 121 | 2.52 | 150 | 110 | - | 6.1 | 0.24 | - | 4.23 | - | - | <0.01 | ND | ND | ND | ND | ND | - |
| SL186102968-7MW-6 | 9/17/2013 | - | **935** | - | - | 70.9 | 47.6 | 133 | 2.45 | 170 | 180 | - | 1.8 | 0.32 | - | 2.79 | - | - | 1.62 | ND | ND | ND | 3.67 | ND | - |
| SL186102968-7MW-6 | 10/22/2013 | - | **805** | - | - | 65.4 | 41.8 | 123 | 2.34 | 130 | 140 | - | 1.1 | 0.15 | - | 4.58 | - | - | 1.06 | ND | ND | ND | ND | ND | - |
| SL186102968-7MW-6 | 11/19/2013 | - | **590** | - | - | 61.4 | 40.7 | 95.4 | 2.11 | 110 | 100 | - | 1.3 | 0.25 | - | 4.39 | - | - | 1.29 | ND | ND | ND | ND | ND | - |
| SL186102968-7MW-6 | 12/17/2013 | - | **685** | - | - | 45 | 32.4 | 98 | 1.86 | 120 | 76 | - | 1.2 | 0.2 | - | 4.61 | - | - | 1.51 | ND | ND | ND | ND | ND | - |
| SL186102968-7MW-6 | 1/21/2014 | - | **530** | - | - | 40.2 | 26.8 | 84.5 | 1.78 | 120 | 71 | - | 1.2 | 0.29 | - | 4.45 | - | - | 2.7 | ND | ND | ND | ND | ND | - |
| SL186102968-7MW-6 | 2/18/2014 | - | 500 | - | - | 41.2 | 27.2 | 74.6 | 2.16 | 99 | 72 | - | 0.97 | 0.28 | - | 4.48 | - | - | 1.27 | ND | ND | ND | ND | ND | - |
| SL186102968-7MW-6 | 3/19/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-6 | 5/27/2014 | - | **620** | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | 1.09 | ND | ND | - | - | - | - |
| SL186102968-7MW-6 | 8/19/2014 | - | **782** | - | - | - | - | - | - | 197 | - | - | - | - | - | - | - | - | - | 0.59 | 0.59 | - | - | - | - |
| SL186102968-7MW-6 | 12/9/2014 | - | **848** | - | - | - | - | - | - | 181 | - | - | - | - | - | - | - | - | <0.68 | ND | ND | - | - | - | - |
| SL186102968-7MW-6 | 3/10/2015 | - | **503** | - | - | - | - | - | - | 106 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-6 | 6/9/2015 | - | 412 | - | - | - | - | - | - | 76.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-6 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-6 | 8/11/2015 | - | 249 | - | - | - | - | - | - | 37.5 | - | - | - | - | - | - | - | - | 1.5 | 1.4 | 1.4 | - | - | - | - |
| SL186102968-7MW-7 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 8.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-7 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL186102968-7MW-8 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-8 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-8 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-8 | 4/12/2013 | - | **1100** | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - | - | <0.001 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 5/28/2013 | - | **1160** | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | <0.001 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 7/12/2013 | - | **1060** | - | - | 128 | 78 | 131 | 1.51 | 170 | 91 | - | ND | 0.36 | - | 4.13 | - | - | <0.01 | ND | ND | ND | **1410** | ND | - |
| SL186102968-7MW-8 | 8/21/2013 | - | **1080** | - | - | 104 | 62 | 117 | 1.49 | 250 | 100 | - | 0.12 | 0.37 | - | 3.21 | - | - | <0.01 | ND | ND | ND | **943** | ND | - |
| SL186102968-7MW-8 | 9/17/2013 | - | **1280** | - | - | 123 | 73.9 | 152 | 1.62 | **410** | 150 | - | ND | 0.41 | - | 2.49 | - | - | <0.001 | ND | ND | ND | **767** | ND | - |
| SL186102968-7MW-8 | 10/22/2013 | - | **1350** | - | - | 120 | 70.3 | 160 | 1.7 | **390** | 150 | - | ND | 0.24 | - | 4.01 | - | - | - | ND | ND | ND | **1040** | ND | - |
| SL186102968-7MW-8 | 11/19/2013 | - | **1280** | - | - | 136 | 81.8 | 150 | 1.79 | **490** | 160 | - | ND | 0.35 | - | 3.76 | - | - | - | ND | ND | ND | **762** | ND | - |
| SL186102968-7MW-8 | 12/17/2013 | - | **1340** | - | - | 128 | 84.1 | 174 | 1.94 | **440** | 150 | - | ND | 0.35 | - | 3.69 | - | - | <0.001 | ND | ND | ND | **1030** | ND | - |
| SL186102968-7MW-8 | 1/21/2014 | - | **1300** | - | - | 118 | 70.7 | 141 | 1.52 | **410** | 140 | - | ND | 0.43 | - | 3.4 | - | - | <0.001 | ND | ND | ND | **1220** | ND | - |
| SL186102968-7MW-8 | 2/18/2014 | - | **1300** | - | - | 140 | 83.9 | 144 | 2.1 | **450** | 150 | - | ND | 0.4 | - | 2.89 | - | - | - | ND | ND | ND | **450** | ND | - |
| SL186102968-7MW-8 | 3/19/2014 | - | **1100** | - | - | - | - | - | - | **400** | 130 | - | ND | 0.36 | - | - | - | - | <0.001 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 4/21/2014 | - | **1140** | - | - | - | - | - | - | **310** | - | - | - | - | - | - | - | - | <0.001 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 5/27/2014 | - | **875** | - | - | - | - | - | - | 170 | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 6/17/2014 | - | **960** | - | - | - | - | - | - | **290** | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 7/22/2014 | - | **1200** | - | - | - | - | - | - | **394** | - | - | - | - | - | - | - | - | - | 2.5 | 2.5 | - | - | - | - |
| SL186102968-7MW-8 | 8/19/2014 | - | **1260** | - | - | - | - | - | - | **424** | - | - | - | - | - | - | - | - | <0.26 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 9/11/2014 | - | **1520** | - | - | - | - | - | - | **447** | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 10/14/2014 | - | **1420** | - | - | - | - | - | - | **529** | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 11/11/2014 | - | **1460** | - | - | - | - | - | - | **512** | - | - | - | - | - | - | - | - | <0.2 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 12/9/2014 | - | **1510** | - | - | - | - | - | - | **556** | - | - | - | - | - | - | - | - | <0.17 | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 1/6/2015 | - | **1290** | - | - | - | - | - | - | **413** | - | - | - | - | - | - | - | - | 1.4 | 1.1 | 1.1 | - | - | - | - |
| SL186102968-7MW-8 | 2/3/2015 | - | **875** | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | 3.4 | 4 | 4 | - | - | - | - |
| SL186102968-7MW-8 | 2/11/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.8 | 2.8 | - | - | - | - |
| SL186102968-7MW-8 | 3/10/2015 | - | **1140** | - | - | - | - | - | - | **343** | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - |
| SL186102968-7MW-8 | 4/7/2015 | - | **1170** | - | - | - | - | - | - | **362** | - | - | - | - | - | - | - | - | 1.4 | 1.9 | 1.9 | - | - | - | - |
| SL186102968-7MW-8 | 5/5/2015 | - | **1080** | - | - | - | - | - | - | **317** | - | - | - | - | - | - | - | - | 1.5 | 1.5 | 1.5 | - | - | - | - |
| SL186102968-7MW-8 | 6/9/2015 | - | **1130** | - | - | - | - | - | - | **360** | - | - | - | - | - | - | - | - | 1.6 | - | - | - | - | - | - |
| SL186102968-7MW-8 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| SL186102968-7MW-8 | 8/11/2015 | - | **1080** | - | - | - | - | - | - | **314** | - | - | - | - | - | - | - | - | 1.2 | 1.3 | 1.3 | - | - | - | - |
| SL186102968-7MW-8 | 11/9/2015 | - | **1210** | - | - | - | - | - | - | **435** | - | - | - | - | - | - | - | - | <0.13 | ND | ND | - | - | - | - |
| SL186102968-7MW-9 | 5/9/2007 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-9 | 8/3/2007 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-9 | 7/28/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | - |
| SL186102968-7MW-9 | 4/12/2013 | - | **815** | - | - | - | - | - | - | 170 | - | - | - | - | - | - | - | - | 6.16 | 4.8 | 4.8 | - | - | - | - |
| SL186102968-7MW-9 | 5/28/2013 | - | **870** | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | 5.64 | 5.7 | 5.7 | - | - | - | - |
| SL186102968-7MW-9 | 7/12/2013 | - | **815** | - | - | 54.8 | 43.5 | 122 | 0.8 | 110 | 89 | - | 8.4 | 0.74 | - | 6.19 | - | - | <0.01 | 5.3 | 5.3 | ND | 7.6 | ND | - |
| SL186102968-7MW-9 | 8/21/2013 | - | **755** | - | - | 47.2 | 35.6 | 116 | 0.883 | 120 | 74 | - | 9.9 | 0.42 | - | 6.48 | - | - | <0.01 | 6.5 | 6.5 | ND | 9.64 | ND | - |
| SL186102968-7MW-9 | 9/17/2013 | - | **775** | - | - | 50.6 | 41 | 129 | 0.959 | 120 | 71 | - | 8.6 | 0.57 | - | 5.11 | - | - | 9.94 | 7.4 | 7.4 | ND | 9.44 | ND | - |
| SL186102968-7MW-9 | 10/22/2013 | - | **745** | - | - | 53 | 39.7 | 146 | 1.05 | 110 | 76 | - | 8 | 0.33 | - | 6.94 | - | - | 7.1 | 6.5 | 6.5 | ND | 9.55 | ND | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations: Ca | Mg | Na | K | Anions: SO4 | Cl | HCO3[1] | NO3[1] | F | Trace Elements: Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL186102968-7MW-9 | 11/19/2013 | - | **740** | - | - | 54.6 | 41.6 | 123 | 1 | 130 | 82 | - | 7.6 | 0.36 | - | 6.66 | - | - | 6.19 | 5 | 5 | ND | 7.63 | ND | - |
| SL186102968-7MW-9 | 12/17/2013 | - | **805** | - | - | 55.6 | 47.6 | 143 | 1.16 | 130 | 92 | - | 9 | 0.37 | - | 5.98 | - | - | 6.59 | 5.7 | 5.7 | ND | 12.4 | ND | - |
| SL186102968-7MW-9 | 1/21/2014 | - | **840** | - | - | 58.5 | 45.6 | 136 | 0.971 | 150 | 95 | - | 9.4 | 0.54 | - | 5.26 | - | - | 6.06 | 5.7 | 5.7 | ND | 23.3 | ND | - |
| SL186102968-7MW-9 | 2/18/2014 | - | **830** | - | - | 61.8 | 48.1 | 116 | 1.13 | 140 | 94 | - | **11** | 0.44 | - | 5.68 | - | - | - | 5.1 | 5.1 | ND | 19.7 | ND | - |
| SL186102968-7MW-9 | 3/19/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4.4 | 4.4 | - | - | - | - |
| SL186102968-7MW-9 | 5/27/2014 | - | **975** | - | - | - | - | - | - | 150 | - | - | - | - | - | - | - | - | 6.31 | 5.3 | 5.3 | - | - | - | - |
| SL186102968-7MW-9 | 8/19/2014 | - | **1100** | - | - | - | - | - | - | 202 | - | - | - | - | - | - | - | - | - | 7.8 | 7.8 | - | - | - | - |
| SL186102968-7MW-9 | 12/9/2014 | - | **1020** | - | - | - | - | - | - | 193 | - | - | - | - | - | - | - | - | 4.5 | 4.2 | 4.2 | - | - | - | - |
| SL186102968-7MW-9 | 3/10/2015 | - | **1060** | - | - | - | - | - | - | 193 | - | - | - | - | - | - | - | - | 3.3 | 3.7 | 3.7 | - | - | - | - |
| SL186102968-7MW-9 | 6/9/2015 | - | **1160** | - | - | - | - | - | - | 193 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL186102968-7MW-9 | 6/16/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5.6 | 5.6 | - | - | - | - |
| SL186102968-7MW-9 | 8/11/2015 | - | **1200** | - | - | - | - | - | - | 211 | - | - | - | - | - | - | - | - | 7.7 | 6.6 | 6.6 | - | - | - | - |
| SL205032990-GCC-1 | 5/5/2005 | - | - | - | - | - | - | - | - | 240 | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-GCC-2 | 5/5/2005 | - | - | - | - | - | - | - | - | 210 | 88 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-GCC-3 | 5/5/2005 | - | - | - | - | - | - | - | - | 130 | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-GCC-4 | 5/5/2005 | - | - | - | - | - | - | - | - | 190 | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-GPG-1 | 2/11/2005 | - | - | - | - | - | - | - | - | **750** | 130 | - | - | - | - | 10 | - | - | - | - | - | ND | ND | - | - |
| SL205032990-GPG-2 | 2/11/2005 | - | - | - | - | - | - | - | - | **620** | 140 | - | - | - | - | 8.3 | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-01 | 2/10/2005 | - | - | - | - | - | - | - | - | **930** | 52 | - | - | - | - | ND | - | - | <10 | - | - | ND | **620** | - | - |
| SL205032990-W-01 | 6/29/2006 | - | - | - | - | - | - | - | - | **900** | 42 | - | - | - | - | ND | - | - | 11 | - | - | ND | **840** | - | - |
| SL205032990-W-01 | 5/21/2007 | - | - | - | - | - | - | - | - | **850** | 33 | - | **11** | - | - | ND | - | - | 9.2 | - | - | ND | **520** | - | - |
| SL205032990-W-01 | 5/28/2008 | - | - | - | - | - | - | - | - | **780** | 30 | - | **11** | - | - | 7.2 | - | - | 13 | - | - | ND | **860** | - | - |
| SL205032990-W-02 | 2/11/2005 | - | - | - | - | - | - | - | - | **1400** | 240 | - | - | - | - | 6.8 | - | - | <10 | - | - | **600** | 30 | - | - |
| SL205032990-W-02 | 6/30/2006 | - | - | - | - | - | - | - | - | **1100** | 200 | - | - | - | - | 7.7 | - | - | <10 | - | - | ND | 19 | - | - |
| SL205032990-W-02 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 5/21/2007 | - | - | - | - | - | - | - | - | **740** | 150 | - | **43** | - | - | ND | - | - | <5 | - | - | ND | 18 | - | - |
| SL205032990-W-02 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 5/28/2008 | - | - | - | - | - | - | - | - | **470** | 200 | - | **22** | - | - | 8.1 | - | - | - | - | - | ND | 20 | - | - |
| SL205032990-W-02 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 5/27/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 5/26/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-02 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-03 | 2/11/2005 | - | - | - | - | - | - | - | - | 190 | 91 | - | - | - | - | 6.9 | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-03 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-03 | 6/30/2006 | - | - | - | - | - | - | - | - | 180 | 82 | - | - | - | - | 6.4 | - | - | <10 | - | - | ND | ND | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205032990-W-03 | 5/22/2007 | - | - | - | - | - | - | - | - | 210 | 74 | - | 2 | - | - | ND | - | - | <5 | - | - | ND | ND | - | - |
| SL205032990-W-03 | 5/28/2008 | - | - | - | - | - | - | - | - | 220 | 64 | - | 1.5 | - | - | **11** | - | - | <5 | - | - | ND | ND | - | - |
| SL205032990-W-04 | 2/10/2005 | - | - | - | - | - | - | - | - | **890** | **300** | - | **32** | - | - | 8.5 | - | - | <10 | - | - | ND | **110** | - | - |
| SL205032990-W-04 | 6/29/2006 | - | - | - | - | - | - | - | - | **1600** | 170 | - | - | - | - | 6.4 | - | - | - | - | - | ND | **110** | - | - |
| SL205032990-W-04 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 5/21/2007 | - | - | - | - | - | - | - | - | **38000** | **3500** | - | **1400** | - | - | ND | - | - | 14 | - | - | ND | **110** | - | - |
| SL205032990-W-04 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 5/28/2008 | - | - | - | - | - | - | - | - | **1300** | 100 | - | **47** | - | - | **25** | - | - | 5.4 | - | - | ND | **420** | - | - |
| SL205032990-W-04 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 5/27/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 5/25/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 12/20/2018 | - | - | - | - | - | - | - | - | **2200** | - | - | **185** | - | - | - | - | - | 25 | - | - | - | **5300** | - | - |
| SL205032990-W-04 | 6/21/2019 | - | - | - | - | 110 | 130 | 140 | 14 | **2100** | 70 | - | **106** | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-04 | 9/30/2019 | - | **2400** | - | - | 130 | 130 | - | - | **1800** | 66 | - | **165** | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 2/10/2005 | - | - | - | - | - | - | - | - | **1700** | **260** | - | **14** | - | - | ND | - | - | <10 | - | - | **620** | **9600** | - | - |
| SL205032990-W-05 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | 260 | **9700** | - | - |
| SL205032990-W-05 | 6/29/2006 | - | - | - | - | - | - | - | - | **2100** | 230 | - | - | - | - | **20** | - | - | <10 | - | - | **1000** | **13000** | - | - |
| SL205032990-W-05 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 5/21/2007 | - | - | - | - | - | - | - | - | **3100** | 210 | - | **67** | - | - | ND | - | - | - | - | - | **1400** | **12000** | - | - |
| SL205032990-W-05 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 5/28/2008 | - | - | - | - | - | - | - | - | **2200** | 180 | - | **58** | - | - | **28** | - | - | 5.5 | - | - | **1800** | **7800** | - | - |
| SL205032990-W-05 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 5/27/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 5/25/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-05 | 12/20/2018 | - | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | 4.1 | - | - | **2300** | **2300** | - | - |
| SL205032990-W-05 | 6/21/2019 | - | **1400** | - | - | 47 | 25 | 110 | 14 | **1800** | 160 | - | **88.1** | - | - | - | - | - | - | - | - | <1 | - | - | - |
| SL205032990-W-05 | 9/30/2019 | - | - | - | - | 31 | 18 | 110 | 9.3 | - | 160 | - | **61** | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 2/10/2005 | - | - | - | - | - | - | - | - | **320** | 220 | - | **18** | - | - | ND | - | - | <10 | - | - | ND | **450** | - | - |
| SL205032990-W-06 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | 6.9 | - | - | ND | - | - | - | - | - | 110 | **320** | - | - |
| SL205032990-W-06 | 6/29/2006 | - | - | - | - | - | - | - | - | **270** | **290** | - | - | - | - | ND | - | - | <10 | - | - | ND | **300** | - | - |
| SL205032990-W-06 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 5/21/2007 | - | - | - | - | - | - | - | - | **380** | 230 | - | **45** | - | - | ND | - | - | <5 | - | - | ND | **340** | - | - |
| SL205032990-W-06 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205032990-W-06 | 5/28/2008 | - | - | - | - | - | - | - | - | **430** | 120 | - | **30** | - | - | ND | - | - | <5 | - | - | ND | **360** | - | - |
| SL205032990-W-06 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 5/27/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 5/26/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-06 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 2/10/2005 | - | - | - | - | - | - | - | - | **1800** | 200 | - | **21** | - | - | **12** | - | - | <10 | - | - | ND | **6400** | - | - |
| SL205032990-W-07 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | **12** | - | - | 8.4 | - | - | - | - | - | ND | **7200** | - | - |
| SL205032990-W-07 | 6/30/2006 | - | - | - | - | - | - | - | - | **1600** | 190 | - | - | - | - | 7.2 | - | - | <10 | - | - | ND | **7900** | - | - |
| SL205032990-W-07 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 5/21/2007 | - | - | - | - | - | - | - | - | **1200** | 230 | - | **16** | - | - | ND | - | - | 5.4 | - | - | ND | **9600** | - | - |
| SL205032990-W-07 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 5/28/2008 | - | - | - | - | - | - | - | - | **600** | 220 | - | **20** | - | - | 9.6 | - | - | <5 | - | - | ND | **4200** | - | - |
| SL205032990-W-07 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 6/24/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 5/26/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-07 | 12/20/2018 | - | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | <0.01 | - | - | - | **6800** | - | - |
| SL205032990-W-07 | 6/21/2019 | - | - | - | - | - | 43 | - | - | **880** | 210 | - | **21** | - | - | - | - | - | - | - | - | <1 | - | - | - |
| SL205032990-W-07 | 9/30/2019 | - | - | - | - | 43 | 46 | 150 | 7.4 | **780** | 200 | - | **19** | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-08 | 6/29/2006 | - | - | - | - | - | - | - | - | **640** | **260** | - | - | - | - | ND | - | - | - | - | - | ND | **8900** | - | - |
| SL205032990-W-08 | 5/27/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-09 | 2/11/2005 | - | - | - | - | - | - | - | - | 100 | 16 | - | - | - | - | 9.2 | - | - | - | - | - | ND | ND | - | - |
| SL205032990-W-10 | 2/10/2005 | - | - | - | - | - | - | - | - | **570** | 160 | - | **26** | - | - | ND | - | - | - | - | - | ND | **940** | - | - |
| SL205032990-W-10 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | **22** | - | - | ND | - | - | - | - | - | **4400** | **770** | - | - |
| SL205032990-W-10 | 6/29/2006 | - | - | - | - | - | - | - | - | **640** | 220 | - | - | - | - | ND | - | - | <10 | - | - | ND | **960** | - | - |
| SL205032990-W-10 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 5/21/2007 | - | - | - | - | - | - | - | - | **620** | 200 | - | **23** | - | - | ND | - | - | <5 | - | - | 160 | **1100** | - | - |
| SL205032990-W-10 | 12/21/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 5/28/2008 | - | - | - | - | - | - | - | - | **580** | 200 | - | **23** | - | - | ND | - | - | <5 | - | - | ND | **1200** | - | - |
| SL205032990-W-10 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 6/3/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 12/8/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 5/27/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-10 | 5/26/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205032990-W-10 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 2/11/2005 | - | - | - | - | - | - | - | - | **1600** | **270** | - | - | - | - | ND | - | - | <10 | - | - | ND | **4400** | - | - |
| SL205032990-W-12 | 5/22/2007 | - | - | - | - | - | - | - | - | **1500** | 230 | - | **22** | - | - | ND | - | - | <5 | - | - | ND | **3700** | - | - |
| SL205032990-W-12 | 5/28/2008 | - | - | - | - | - | - | - | - | **1300** | 200 | - | **18** | - | - | **20** | - | - | <5 | - | - | **470** | **3400** | - | - |
| SL205032990-W-12 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 6/3/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 12/8/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 5/26/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 5/26/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-12 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-13 | 2/11/2005 | - | - | - | - | - | - | - | - | **1100** | **1300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-13 | 6/30/2006 | - | - | - | - | - | - | - | - | **1100** | **1100** | - | - | - | - | 10 | - | - | <10 | - | - | ND | **1700** | - | - |
| SL205032990-W-13 | 5/22/2007 | - | - | - | - | - | - | - | - | **1600** | **300** | - | 6.8 | - | - | ND | - | - | <5 | - | - | ND | **3800** | - | - |
| SL205032990-W-13 | 5/28/2008 | - | - | - | - | - | - | - | - | **1400** | **300** | - | **14** | - | - | 7.4 | - | - | <5 | - | - | ND | **2800** | - | - |
| SL205032990-W-16 | 2/14/2005 | - | - | - | - | - | - | - | - | 210 | **300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-18 | 2/11/2005 | - | - | - | - | - | - | - | - | **1100** | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-19 | 2/10/2005 | - | - | - | - | - | - | - | - | **1400** | **270** | - | 7.4 | - | - | ND | - | - | <10 | - | - | ND | **9100** | - | - |
| SL205032990-W-19 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-19 | 6/30/2006 | - | - | - | - | - | - | - | - | **310** | 57 | - | - | - | - | 5.9 | - | - | <10 | - | - | 190 | **1500** | - | - |
| SL205032990-W-19 | 5/22/2007 | - | - | - | - | - | - | - | - | **1100** | 200 | - | **14** | - | - | ND | - | - | <5 | - | - | ND | **8900** | - | - |
| SL205032990-W-19 | 5/28/2008 | - | - | - | - | - | - | - | - | **440** | 110 | - | 2.1 | - | - | 8.7 | - | - | <5 | - | - | **6200** | **5600** | - | - |
| SL205032990-W-20 | 2/11/2005 | - | - | - | - | - | - | - | - | 180 | 130 | - | - | - | - | ND | - | - | <10 | - | - | ND | **970** | - | - |
| SL205032990-W-20 | 6/30/2006 | - | - | - | - | - | - | - | - | 230 | 84 | - | - | - | - | ND | - | - | <10 | - | - | ND | **920** | - | - |
| SL205032990-W-20 | 5/22/2007 | - | - | - | - | - | - | - | - | 220 | 79 | - | 5.3 | - | - | ND | - | - | <5 | - | - | **2100** | **780** | - | - |
| SL205032990-W-20 | 5/29/2008 | - | - | - | - | - | - | - | - | 170 | 78 | - | 2.7 | - | - | ND | - | - | <5 | - | - | **2700** | **650** | - | - |
| SL205032990-W-21 | 2/11/2005 | - | - | - | - | - | - | - | - | **310** | **310** | - | - | - | - | 9.4 | - | - | <10 | - | - | ND | **250** | - | - |
| SL205032990-W-22 | 2/11/2005 | - | - | - | - | - | - | - | - | 170 | 70 | - | - | - | - | 9.1 | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-22 | 6/29/2006 | - | - | - | - | - | - | - | - | 110 | 73 | - | - | - | - | ND | - | - | 21 | - | - | ND | ND | - | - |
| SL205032990-W-23 | 2/11/2005 | - | - | - | - | - | - | - | - | **490** | **350** | - | - | - | - | ND | - | - | 12 | - | - | **2100** | **3300** | - | - |
| SL205032990-W-23 | 6/29/2006 | - | - | - | - | - | - | - | - | 170 | 220 | - | - | - | - | ND | - | - | 12 | - | - | ND | **630** | - | - |
| SL205032990-W-23 | 5/22/2007 | - | - | - | - | - | - | - | - | 200 | 220 | - | 6.5 | - | - | ND | - | - | - | - | - | **310** | **750** | - | - |
| SL205032990-W-23 | 5/29/2008 | - | - | - | - | - | - | - | - | 190 | 240 | - | 5 | - | - | ND | - | - | 10 | - | - | 140 | **650** | - | - |
| SL205032990-W-24 | 2/14/2005 | - | - | - | - | - | - | - | - | **1100** | **410** | - | - | - | - | ND | - | - | <10 | - | - | 100 | **5000** | - | - |
| SL205032990-W-24 | 6/29/2006 | - | - | - | - | - | - | - | - | **820** | **310** | - | - | - | - | ND | - | - | <10 | - | - | **690** | **5600** | - | - |
| SL205032990-W-24 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 5/22/2007 | - | - | - | - | - | - | - | - | **680** | **340** | - | 2.1 | - | - | ND | - | - | <5 | - | - | **3300** | **6900** | - | - |
| SL205032990-W-24 | 12/21/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations: Ca | Mg | Na | K | Anions: $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Trace Elements: Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205032990-W-24 | 5/29/2008 | - | - | - | - | - | - | - | - | **680** | **280** | - | 3.1 | - | - | ND | - | - | - | - | - | 110 | **3900** | - | - |
| SL205032990-W-24 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 6/3/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 12/8/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 5/26/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 5/25/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-24 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-25 | 2/11/2005 | - | - | - | - | - | - | - | - | 140 | **350** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-26 | 2/10/2005 | - | - | - | - | - | - | - | - | 180 | **270** | - | 7.6 | - | - | 6.5 | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-26 | 6/30/2006 | - | - | - | - | - | - | - | - | 230 | **300** | - | - | - | - | 8.3 | - | - | <10 | - | - | ND | **400** | - | - |
| SL205032990-W-26 | 5/22/2007 | - | - | - | - | - | - | - | - | 230 | **300** | - | 3.7 | - | - | ND | - | - | <5 | - | - | ND | **360** | - | - |
| SL205032990-W-27 | 2/11/2005 | - | - | - | - | - | - | - | - | **570** | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-27 | 6/30/2006 | - | - | - | - | - | - | - | - | 230 | 180 | - | - | - | - | ND | - | - | <10 | - | - | ND | **760** | - | - |
| SL205032990-W-27 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-27 | 5/22/2007 | - | - | - | - | - | - | - | - | **300** | 140 | - | 8.4 | - | - | ND | - | - | <5 | - | - | ND | **840** | - | - |
| SL205032990-W-27 | 12/21/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-27 | 5/29/2008 | - | - | - | - | - | - | - | - | **260** | 140 | - | 6.2 | - | - | ND | - | - | <5 | - | - | ND | **610** | - | - |
| SL205032990-W-28 | 2/14/2005 | - | - | - | - | - | - | - | - | **8800** | 310 | - | - | - | - | ND | - | - | 29 | - | - | 290 | **4000** | - | - |
| SL205032990-W-28 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | **110** | - | - | **7800** | **3400** | - | - |
| SL205032990-W-28 | 6/29/2006 | - | - | - | - | - | - | - | - | **580** | 200 | - | - | - | - | ND | - | - | 11 | - | - | 110 | **1100** | - | - |
| SL205032990-W-28 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 5/22/2007 | - | - | - | - | - | - | - | - | **620** | 170 | - | **12** | - | - | ND | - | - | 15 | - | - | **340** | **1200** | - | - |
| SL205032990-W-28 | 12/21/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 5/29/2008 | - | - | - | - | - | - | - | - | **430** | 140 | - | 6.6 | - | - | ND | - | - | 9.3 | - | - | **1200** | **1800** | - | - |
| SL205032990-W-28 | 12/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 6/4/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 12/8/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 5/26/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 5/25/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-28 | 12/20/2018 | - | - | - | - | - | - | - | - | **420** | **280** | - | 1.5 | - | - | - | - | - | 40 | - | - | **3900** | - | - | - |
| SL205032990-W-28 | 6/21/2019 | - | **770** | - | - | 17 | 15 | 160 | 1.3 | 180 | - | - | **17** | - | - | - | - | - | - | - | - | <1 | - | - | - |
| SL205032990-W-28 | 9/30/2019 | - | **1100** | - | - | 52 | 30 | 200 | 2.1 | **640** | **280** | - | 1.1 | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-29 | 2/11/2005 | - | - | - | - | - | - | - | - | 87 | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-30 | 2/11/2005 | - | - | - | - | - | - | - | - | 200 | **390** | - | - | - | - | ND | - | - | <10 | - | - | ND | **820** | - | - |
| SL205032990-W-31 | 2/11/2005 | - | - | - | - | - | - | - | - | **580** | 53 | - | - | - | - | 6.3 | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-31 | 6/30/2006 | - | - | - | - | - | - | - | - | **590** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205032990-W-31 | 5/23/2007 | - | - | - | - | - | - | - | - | **600** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-31 | 5/29/2008 | - | - | - | - | - | - | - | - | **600** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-32 | 2/14/2005 | - | - | - | - | - | - | - | - | **1700** | **290** | - | - | - | - | ND | - | - | <10 | - | - | ND | **2800** | - | - |
| SL205032990-W-32 | 6/30/2006 | - | - | - | - | - | - | - | - | **1300** | - | - | - | - | - | - | - | - | - | - | - | - | **5300** | - | - |
| SL205032990-W-32 | 5/22/2007 | - | - | - | - | - | - | - | - | **1200** | - | - | - | - | - | - | - | - | - | - | - | - | **5100** | - | - |
| SL205032990-W-32 | 5/29/2008 | - | - | - | - | - | - | - | - | **960** | - | - | - | - | - | - | - | - | - | - | - | - | **5400** | - | - |
| SL205032990-W-33 | 2/14/2005 | - | - | - | - | - | - | - | - | **730** | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-34 | 2/14/2005 | - | - | - | - | - | - | - | - | **380** | **350** | - | - | - | - | 9.9 | - | - | - | - | - | ND | ND | - | - |
| SL205032990-W-34 | 8/3/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5.4 | - | - | 11 | - | - | ND | ND | - | - |
| SL205032990-W-34 | 6/29/2006 | - | - | - | - | - | - | - | - | **480** | **480** | - | - | - | - | ND | - | - | <10 | - | - | ND | ND | - | - |
| SL205032990-W-34 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-34 | 5/22/2007 | - | - | - | - | - | - | - | - | **770** | **520** | - | **91** | - | - | 5.8 | - | - | - | - | - | ND | ND | - | - |
| SL205032990-W-34 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-34 | 5/29/2008 | - | - | - | - | - | - | - | - | **700** | **390** | - | **91** | - | - | 5.9 | - | - | 14 | - | - | ND | ND | - | - |
| SL205032990-W-35 | 2/11/2005 | - | - | - | - | - | - | - | - | 240 | 240 | - | - | - | - | 8.4 | - | - | - | - | - | ND | ND | - | - |
| SL205032990-W-36 | 2/11/2005 | - | - | - | - | - | - | - | - | **660** | 190 | - | - | - | - | **11** | - | - | <10 | - | - | ND | **2800** | - | - |
| SL205032990-W-36 | 6/29/2006 | - | - | - | - | - | - | - | - | **630** | 180 | - | - | - | - | ND | - | - | - | - | - | ND | **3700** | - | - |
| SL205032990-W-36 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-36 | 5/22/2007 | - | - | - | - | - | - | - | - | **650** | 200 | - | **23** | - | - | ND | - | - | - | - | - | ND | **2700** | - | - |
| SL205032990-W-36 | 12/21/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-36 | 5/29/2008 | - | - | - | - | - | - | - | - | **630** | 210 | - | **23** | - | - | 5.1 | - | - | - | - | - | ND | **2300** | - | - |
| SL205032990-W-37 | 2/14/2005 | - | - | - | - | - | - | - | - | **900** | 62 | - | - | - | - | ND | - | - | <10 | - | - | 110 | **4200** | - | - |
| SL205032990-W-37 | 6/30/2006 | - | - | - | - | - | - | - | - | **910** | 52 | - | - | - | - | ND | - | - | <10 | - | - | ND | **6900** | - | - |
| SL205032990-W-37 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 5/22/2007 | - | - | - | - | - | - | - | - | **450** | 130 | - | **16** | - | - | ND | - | - | <5 | - | - | ND | **1400** | - | - |
| SL205032990-W-37 | 12/20/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 5/29/2008 | - | - | - | - | - | - | - | - | **610** | 21 | - | 1.2 | - | - | ND | - | - | - | - | - | **1800** | **2300** | - | - |
| SL205032990-W-37 | 12/29/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 6/3/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 12/7/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 5/26/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 11/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 5/25/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-37 | 11/3/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-38 | 2/14/2005 | - | - | - | - | - | - | - | - | **460** | 130 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-40 | 2/11/2005 | - | - | - | - | - | - | - | - | **540** | **270** | - | - | - | - | ND | - | - | <10 | - | - | **430** | **1300** | - | - |
| SL205032990-W-40 | 6/30/2006 | - | - | - | - | - | - | - | - | **270** | 210 | - | - | - | - | 6.8 | - | - | <10 | - | - | **360** | **3300** | - | - |
| SL205032990-W-40 | 12/1/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-40 | 5/22/2007 | - | - | - | - | - | - | - | - | 120 | 150 | - | **29** | - | - | ND | - | - | <5 | - | - | 190 | **520** | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205032990-W-40 | 12/21/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SL205032990-W-40 | 5/29/2008 | - | - | - | - | - | - | - | - | 100 | 170 | - | **29** | - | - | 10 | - | - | 9.4 | - | - | **1800** | **260** | - | - |
| SL205092993-MW-11A | 11/22/2005 | - | - | - | - | - | - | - | - | 240 | - | - | 0.24 | - | - | - | - | - | - | - | - | **11000** | **690** | - | - |
| SL205092993-MW-11A | 12/5/2006 | - | - | - | - | - | - | - | - | 120 | - | - | 0.2 | - | - | - | - | - | - | - | - | ND | **700** | - | - |
| SL205092993-MW-11A | 12/3/2007 | - | - | - | - | - | - | - | - | **300** | - | - | 0.3 | - | - | - | - | - | - | - | - | **2540** | **863** | - | - |
| SL205092993-MW-11A | 12/1/2016 | - | - | - | - | - | - | - | - | 95 | - | - | ND | - | - | - | - | - | - | - | - | **4670** | **758** | - | - |
| SL205092993-MW-12A | 12/5/2006 | - | - | - | - | - | - | - | - | 150 | - | - | 0.36 | - | - | - | - | - | - | - | - | **1400** | **140** | - | - |
| SL205092993-MW-12A | 12/1/2016 | - | - | - | - | - | - | - | - | 100 | - | - | 0.59 | - | - | - | - | - | - | - | - | **944** | **84** | - | - |
| SL205092993-MW-14A | 8/16/2005 | - | - | - | 650 | - | - | - | - | **260** | - | - | 6.7 | - | - | - | - | - | - | - | - | **16000** | **510** | - | - |
| SL205092993-MW-14A | 11/22/2005 | - | - | - | - | - | - | - | - | **360** | - | - | 4.5 | - | - | - | - | - | - | - | - | ND | **280** | - | - |
| SL205092993-MW-14A | 5/31/2006 | - | - | - | - | - | - | - | - | **360** | - | - | 3.1 | - | - | - | - | - | - | - | - | **1100** | **370** | - | - |
| SL205092993-MW-14A | 12/5/2006 | - | - | - | - | - | - | - | - | 230 | - | - | 9 | - | - | - | - | - | - | - | - | **1300** | ND | - | - |
| SL205092993-MW-14A | 6/22/2007 | - | - | - | - | - | - | - | - | **430** | - | - | 4.7 | - | - | - | - | - | - | - | - | **2900** | 7.5 | - | - |
| SL205092993-MW-14A | 12/3/2007 | - | - | - | - | - | - | - | - | **820** | - | - | 0.79 | - | - | - | - | - | - | - | - | **30400** | **1350** | - | - |
| SL205092993-MW-14A | 5/28/2009 | - | - | - | - | - | - | - | - | **570** | - | - | 2.9 | - | - | - | - | - | - | - | - | 107 | **815** | - | - |
| SL205092993-MW-14A | 6/9/2016 | - | - | - | - | - | - | - | - | **590** | - | - | 9.4 | - | - | - | - | - | - | - | - | **1030** | **577** | - | - |
| SL205092993-MW-14A | 12/1/2016 | - | - | - | - | - | - | - | - | **800** | - | - | 7.2 | - | - | - | - | - | - | - | - | ND | **623** | - | - |
| SL205092993-MW-17A | 12/1/2016 | - | - | - | - | - | - | - | - | 140 | - | - | 1.5 | - | - | - | - | - | - | - | - | **933** | 17 | - | - |
| SL205092993-MW-18A | 8/16/2005 | - | - | - | 250 | - | - | - | - | 120 | - | - | ND | - | - | - | - | - | - | - | - | **1400** | **160** | - | - |
| SL205092993-MW-18A | 11/22/2005 | - | - | - | - | - | - | - | - | 130 | - | - | 1.9 | - | - | - | - | - | - | - | - | ND | 41 | - | - |
| SL205092993-MW-18A | 5/31/2006 | - | - | - | - | - | - | - | - | 120 | - | - | 2.9 | - | - | - | - | - | - | - | - | **2200** | ND | - | - |
| SL205092993-MW-18A | 12/5/2006 | - | - | - | - | - | - | - | - | **310** | - | - | 5 | - | - | - | - | - | - | - | - | ND | **74** | - | - |
| SL205092993-MW-18A | 6/22/2007 | - | - | - | - | - | - | - | - | 180 | - | - | 1.8 | - | - | - | - | - | - | - | - | 100 | **156** | - | - |
| SL205092993-MW-18A | 12/3/2007 | - | - | - | - | - | - | - | - | 200 | - | - | 3.1 | - | - | - | - | - | - | - | - | 214 | **69** | - | - |
| SL205092993-MW-3A | 11/22/2005 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **88000** | **690** | - | - |
| SL205092993-MW-3A | 12/5/2006 | - | - | - | - | - | - | - | - | 0.97 | - | - | ND | - | - | - | - | - | - | - | - | **53000** | **510** | - | - |
| SL205092993-MW-3A | 12/4/2007 | - | - | - | - | - | - | - | - | 1.3 | - | - | 0.1 | - | - | - | - | - | - | - | - | **53700** | **366** | - | - |
| SL205092993-MW-3A | 12/1/2016 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **26100** | **142** | - | - |
| SL205092993-MW-5A | 8/16/2005 | - | - | - | 550 | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **62000** | **560** | - | - |
| SL205092993-MW-5A | 11/22/2005 | - | - | - | - | - | - | - | - | 220 | - | - | ND | - | - | - | - | - | - | - | - | **59000** | **720** | - | - |
| SL205092993-MW-5A | 5/31/2006 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **19000** | **260** | - | - |
| SL205092993-MW-5A | 12/5/2006 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | ND | **420** | - | - |
| SL205092993-MW-5A | 6/22/2007 | - | - | - | - | - | - | - | - | 1.9 | - | - | 0.1 | - | - | - | - | - | - | - | - | **34300** | **310** | - | - |
| SL205092993-MW-5A | 12/4/2007 | - | - | - | - | - | - | - | - | 1.7 | - | - | 0.1 | - | - | - | - | - | - | - | - | **26100** | **312** | - | - |
| SL205092993-MW-5A | 5/28/2009 | - | - | - | - | - | - | - | - | 13 | - | - | ND | - | - | - | - | - | - | - | - | **26400** | **299** | - | - |
| SL205092993-MW-5A | 6/9/2016 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **19300** | **142** | - | - |
| SL205092993-MW-5A | 12/1/2016 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **26300** | **165** | - | - |
| SL205092993-MW-5B | 11/22/2005 | - | - | - | - | - | - | - | - | 25 | - | - | ND | - | - | - | - | - | - | - | - | 300 | **150** | - | - |
| SL205092993-MW-5B | 12/5/2006 | - | - | - | - | - | - | - | - | 28 | - | - | ND | - | - | - | - | - | - | - | - | ND | **120** | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| SL205092993-MW-5B | 12/3/2007 | - | - | - | - | - | - | - | - | **580** | - | - | 0.2 | - | - | - | - | - | - | - | - | **1900** | **725** | - | - |
| SL205092993-MW-5B | 12/1/2016 | - | - | - | - | - | - | - | - | 130 | - | - | **15** | - | - | - | - | - | - | - | - | ND | 26.7 | - | - |
| SL205092993-MW-6A | 11/22/2005 | - | - | - | - | - | - | - | - | 200 | - | - | ND | - | - | - | - | - | - | - | - | **15000** | **6600** | - | - |
| SL205092993-MW-6A | 12/5/2006 | - | - | - | - | - | - | - | - | **270** | - | - | ND | - | - | - | - | - | - | - | - | **3400** | **1700** | - | - |
| SL205092993-MW-6A | 12/3/2007 | - | - | - | - | - | - | - | - | **280** | - | - | 0.1 | - | - | - | - | - | - | - | - | **2020** | **5240** | - | - |
| SL205092993-MW-6A | 12/1/2016 | - | - | - | - | - | - | - | - | 99 | - | - | ND | - | - | - | - | - | - | - | - | **1810** | **2960** | - | - |
| SL205092993-MW-8A | 8/16/2005 | - | - | - | 230 | - | - | - | - | 88 | - | - | 2.8 | - | - | - | - | - | - | - | - | **3200** | **3300** | - | - |
| SL205092993-MW-8A | 11/22/2005 | - | - | - | - | - | - | - | - | 110 | - | - | 0.45 | - | - | - | - | - | - | - | - | **2900** | **5500** | - | - |
| SL205092993-MW-8A | 5/31/2006 | - | - | - | - | - | - | - | - | 140 | - | - | ND | - | - | - | - | - | - | - | - | ND | **8700** | - | - |
| SL205092993-MW-8A | 12/5/2006 | - | - | - | - | - | - | - | - | 150 | - | - | 0.2 | - | - | - | - | - | - | - | - | **780** | **2000** | - | - |
| SL205092993-MW-8A | 6/22/2007 | - | - | - | - | - | - | - | - | 160 | - | - | 0.2 | - | - | - | - | - | - | - | - | **15100** | **6500** | - | - |
| SL205092993-MW-8A | 12/3/2007 | - | - | - | - | - | - | - | - | 170 | - | - | 0.2 | - | - | - | - | - | - | - | - | **5710** | **7280** | - | - |
| SL205092993-MW-8A | 5/28/2009 | - | - | - | - | - | - | - | - | 120 | - | - | ND | - | - | - | - | - | - | - | - | **1980** | **5450** | - | - |
| SL205092993-MW-8A | 6/9/2016 | - | - | - | - | - | - | - | - | 60 | - | - | ND | - | - | - | - | - | - | - | - | **2580** | **2320** | - | - |
| SL205092993-MW-8A | 12/1/2016 | - | - | - | - | - | - | - | - | 55 | - | - | ND | - | - | - | - | - | - | - | - | **4570** | **1990** | - | - |
| SL205383009-ORC-7 | 3/22/2006 | - | **1000** | - | - | - | - | - | - | 180 | - | - | 0.155871 | - | - | - | - | - | - | - | - | **2900** | - | - | - |
| SL205383009-ORC-7 | 3/12/2008 | - | **1000** | - | - | - | - | - | - | 230 | - | - | 1.4 | - | - | - | - | - | - | - | - | **5500** | - | - | - |
| SL205383009-ORC-8 | 3/12/2008 | - | **890** | - | - | - | - | - | - | 93 | - | - | ND | - | - | - | - | - | - | - | - | **4600** | - | - | - |
| SL205383009-ORC-9A | 3/12/2008 | - | **1000** | - | - | - | - | - | - | 180 | - | - | 0.34 | - | - | - | - | - | - | - | - | **39000** | - | - | - |
| SL205383009-SB-56 | 3/22/2006 | - | **920** | - | - | - | - | - | - | 98 | - | - | ND | - | - | - | - | - | - | - | - | **7200** | - | - | - |
| SL205383009-SB-56 | 3/12/2008 | - | **980** | - | - | - | - | - | - | 170 | - | - | 0.58 | - | - | - | - | - | - | - | - | **7100** | - | - | - |
| SL205383009-SB-57 | 3/12/2008 | - | **1000** | - | - | - | - | - | - | 190 | - | - | 0.98 | - | - | - | - | - | - | - | - | **15000** | - | - | - |
| SL205383009-SB-81A | 3/22/2006 | - | **1000** | - | - | - | - | - | - | 120 | - | - | ND | - | - | - | - | - | - | - | - | **32000** | - | - | - |
| SL205383009-SB-81A | 3/12/2008 | - | **950** | - | - | - | - | - | - | 200 | - | - | 0.59 | - | - | - | - | - | - | - | - | **150000** | - | - | - |
| SL205383009-SB-83A | 3/12/2008 | - | **1000** | - | - | - | - | - | - | 170 | - | - | 1.1 | - | - | - | - | - | - | - | - | **10000** | - | - | - |
| T0601300676-MW-16A | 6/15/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 5/26/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 11/9/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **190** | - | **1800** | **170** | ND | ND | - | - | ND | 580 |
| T0601300676-MW-16A | 11/17/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16A | 5/11/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 | <5 | <5 | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300676-MW-16A | 12/6/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.1 | <0.4 | <0.4 | - | - | - | - |
| T0601300676-MW-16A | 2/27/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **370** | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-16A | 3/14/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **81** | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-16A | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-16A | 10/28/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4.2 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-16B | 6/15/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16B | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16B | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16B | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16B | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.6 | 7.6 | - | - | - | - |
| T0601300676-MW-16B | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.5 | 1.5 | - | - | - | - |
| T0601300676-MW-16B | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16B | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16B | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8 | 8 | - | - | - | - |
| T0601300676-MW-16B | 5/26/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-16C | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.9 | 1.9 | - | - | - | - |
| T0601300676-MW-16C | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.6 | 7.6 | - | - | - | - |
| T0601300676-MW-16C | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 | 6 | - | - | - | - |
| T0601300676-MW-16C | 5/26/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5.4 | 5.4 | - | - | - | - |
| T0601300676-MW-17 | 11/5/2007 | - | - | - | - | - | - | - | - | 120 | - | - | ND | - | - | ND | - | 350 | - | ND | ND | **1400** | - | ND | ND |
| T0601300676-MW-17 | 12/3/2007 | - | - | - | - | - | - | - | - | 130 | - | - | ND | - | - | **62** | - | **3400** | **710** | ND | ND | **120000** | - | 18 | 1100 |
| T0601300676-MW-17 | 1/15/2008 | - | - | - | - | - | - | - | - | 130 | - | - | ND | - | - | 8.5 | - | 260 | <5 | ND | ND | **1200** | - | ND | ND |
| T0601300676-MW-17 | 6/14/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 5/25/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-17 | 11/9/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.1 | - | 370 | <5 | ND | ND | - | - | ND | ND |
| T0601300676-MW-22 | 11/8/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12** | - | 260 | 42 | ND | ND | - | - | ND | 470 |
| T0601300676-MW-22 | 11/15/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.3 | ND | ND | - | - | - | - |
| T0601300676-MW-22 | 5/10/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 13 | - | - | - | - | - | - |
| T0601300676-MW-22 | 12/5/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 47 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-22 | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **64** | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-22 | 10/29/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **100** | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-25B | 11/5/2007 | - | - | - | - | - | - | - | - | 54 | - | - | 3.3 | - | - | ND | - | 370 | <5 | ND | ND | ND | - | ND | ND |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) 10[a] | Anions: F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300676-MW-25B | 12/3/2007 | - | - | - | - | - | - | - | - | 94 | - | - | 6.6 | - | - | 7.8 | - | 540 | 47 | ND | ND | ND | - | 11 | ND |
| T0601300676-MW-25B | 1/15/2008 | - | - | - | - | - | - | - | - | 100 | - | - | 7.6 | - | - | ND | - | 400 | 12 | 2.6 | 2.6 | **830** | - | 8.5 | ND |
| T0601300676-MW-26 | 11/5/2007 | - | - | - | - | - | - | - | - | 190 | - | - | 6.8 | - | - | ND | - | 83 | 15 | 10 | 10 | ND | - | 7 | ND |
| T0601300676-MW-26 | 12/3/2007 | - | - | - | - | - | - | - | - | 150 | - | - | 5.5 | - | - | 6 | - | 150 | - | ND | ND | **2500** | - | 12 | ND |
| T0601300676-MW-26 | 1/15/2008 | - | - | - | - | - | - | - | - | 210 | - | - | 8 | - | - | 6.8 | - | 59 | 9.8 | 9.8 | 9.8 | **710** | - | 10 | ND |
| T0601300676-MW-26 | 11/17/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 10 | - | - | - | - |
| T0601300676-MW-26 | 5/11/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11 | 11 | - | - | - | - |
| T0601300676-MW-26 | 12/4/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 19 | - | - | - | - | - | - |
| T0601300676-MW-26 | 10/28/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.3 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-26B | 5/29/2007 | - | - | - | - | 140 | 53 | - | 3.9 | 67 | - | - | ND | - | **5200** | 5.5 | - | 280 | - | ND | ND | **3300** | **2000** | - | - |
| T0601300676-MW-26B | 11/5/2007 | - | - | - | - | - | - | - | - | 49 | - | - | 0.83 | - | - | ND | - | 360 | 14 | ND | ND | **550** | - | ND | ND |
| T0601300676-MW-26B | 12/3/2007 | - | - | - | - | - | - | - | - | 58 | - | - | 1.9 | - | - | 7.5 | - | 410 | - | ND | ND | **13000** | - | 8.7 | ND |
| T0601300676-MW-26B | 1/15/2008 | - | - | - | - | - | - | - | - | 60 | - | - | ND | - | - | 5.9 | - | 310 | <5 | ND | ND | **3200** | - | 5.4 | ND |
| T0601300676-MW-26B | 6/14/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-26B | 5/25/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-28 | 11/8/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | 240 | 12 | 6.8 | 6.8 | - | - | ND | 120 |
| T0601300676-MW-28 | 5/22/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-28 | 11/17/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4.2 | 4.2 | - | - | - | - |
| T0601300676-MW-28 | 5/10/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 43 | - | - | - | - | - | - |
| T0601300676-MW-28 | 12/5/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 29 | 7.1 | 7.1 | - | - | - | - |
| T0601300676-MW-28 | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.8 | 7.8 | - | - | - | - |
| T0601300676-MW-28 | 10/29/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.7 | - | - | - | - | - | - |
| T0601300676-MW-30A | 11/8/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | 730 | - | ND | ND | - | - | ND | 200 |
| T0601300676-MW-30A | 11/15/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <1 | ND | ND | - | - | - | - |
| T0601300676-MW-30A | 5/10/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | <0.5 | <0.5 | - | - | - | - |
| T0601300676-MW-30A | 12/5/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.1 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-30A | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | - | - | - | - | - | - |
| T0601300676-MW-30A | 10/29/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.8 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-31A | 11/9/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **16** | - | **1500** | 26 | ND | ND | - | - | ND | 85 |
| T0601300676-MW-31A | 11/17/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-31A | 5/11/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **110** | <1 | <1 | - | - | - | - |
| T0601300676-MW-31A | 12/4/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **56** | <0.2 | <0.2 | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) | F (mg/L) | Trace Elements: Al (µg/L) | As[2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300676-MW-31A | 1/25/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | - | - | - | - | - | - |
| T0601300676-MW-31A | 2/27/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.2 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-31A | 3/14/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5.1 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-31A | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <5 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-31A | 10/28/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.3 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-5A | 5/29/2007 | - | - | - | - | 180 | 76 | - | 5.6 | 98 | - | - | ND | - | **16000** | **100** | - | 570 | 42 | ND | ND | **90000** | **2800** | - | - |
| T0601300676-MW-5A | 11/5/2007 | - | - | - | - | - | - | - | - | 170 | - | - | ND | - | - | **46** | - | 370 | <5 | ND | ND | ND | - | ND | ND |
| T0601300676-MW-5A | 12/3/2007 | - | - | - | - | - | - | - | - | 120 | - | - | ND | - | - | **270** | - | 840 | **98** | ND | ND | **260000** | - | ND | ND |
| T0601300676-MW-5A | 1/15/2008 | - | - | - | - | - | - | - | - | 120 | - | - | ND | - | - | **38** | - | 380 | <5 | ND | ND | **16000** | - | ND | ND |
| T0601300676-MW-5A | 6/14/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 5/24/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 11/9/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **750** | - | **4900** | **620** | ND | ND | - | - | 11 | 390 |
| T0601300676-MW-5A | 11/17/2017 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5A | 5/11/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **170** | <0.5 | <0.5 | - | - | - | - |
| T0601300676-MW-5A | 12/6/2018 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 41 | - | - | - | - | - | - |
| T0601300676-MW-5A | 1/25/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **370** | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-5A | 2/27/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 270 | 270 | - | - | - | - |
| T0601300676-MW-5A | 3/14/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-5A | 6/6/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.1 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-5A | 10/28/2019 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 13 | <0.2 | <0.2 | - | - | - | - |
| T0601300676-MW-5B | 5/29/2007 | - | - | - | - | 220 | 97 | - | 5.1 | 17 | - | - | ND | - | - | **41** | - | 660 | 28 | ND | ND | **25000** | **3800** | - | - |
| T0601300676-MW-5B | 11/5/2007 | - | - | - | - | - | - | - | - | 17 | - | - | ND | - | - | **29** | - | 330 | - | ND | ND | ND | - | ND | ND |
| T0601300676-MW-5B | 12/3/2007 | - | - | - | - | - | - | - | - | 29 | - | - | ND | - | - | **35** | - | 680 | 33 | ND | ND | **22000** | - | ND | ND |
| T0601300676-MW-5B | 1/15/2008 | - | - | - | - | - | - | - | - | 34 | - | - | ND | - | - | **35** | - | 640 | 17 | ND | ND | **16000** | - | 5.5 | ND |
| T0601300676-MW-5B | 6/14/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300676-MW-5B | 5/24/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2 [a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50 [a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300676-MW-5C | 5/29/2007 | - | - | - | - | 110 | 49 | - | 5 | 190 | - | - | 3.8 | - | - | ND | - | 300 | 23 | 7300 | 7300 | **400** | **120** | - | - |
| T0601300676-MW-5C | 11/5/2007 | - | - | - | - | - | - | - | - | 210 | - | - | 5 | - | - | ND | - | 610 | 17 | 12 | 12 | ND | - | 5.9 | ND |
| T0601300676-MW-5C | 12/3/2007 | - | - | - | - | - | - | - | - | **260** | - | - | 5.2 | - | - | 5.2 | - | **2200** | 15 | ND | ND | **1500** | - | 6.8 | ND |
| T0601300676-MW-5C | 1/15/2008 | - | - | - | - | - | - | - | - | 200 | - | - | 5.8 | - | - | 5.7 | - | 490 | 11 | 11 | 11 | **430** | - | 8.4 | ND |
| T0601300676-MW-5C | 6/14/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.2 | 7.2 | - | - | - | - |
| T0601300676-MW-5C | 10/31/2011 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9 | 9 | - | - | - | - |
| T0601300676-MW-5C | 6/12/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 10 | - | - | - | - |
| T0601300676-MW-5C | 5/30/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.6 | 7.6 | - | - | - | - |
| T0601300676-MW-5C | 11/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.4 | 6.4 | - | - | - | - |
| T0601300676-MW-5C | 5/7/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 | 6 | - | - | - | - |
| T0601300676-MW-5C | 11/21/2014 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.8 | 2.8 | - | - | - | - |
| T0601300676-MW-5C | 5/6/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.7 | 6.7 | - | - | - | - |
| T0601300676-MW-5C | 11/17/2015 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.4 | 6.4 | - | - | - | - |
| T0601300676-MW-5C | 5/24/2016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.3 | 6.3 | - | - | - | - |
| T0601300676-MW-6 | 5/29/2007 | - | - | - | - | 55 | 26 | - | 17 | 41 | - | - | 5.5 | - | <200 | ND | - | 220 | 12 | 12000 | 12000 | ND | ND | - | - |
| T0601300744-W-1 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-1 | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-1 | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-1 | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-1 | 5/22/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-2 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-2 | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-2 | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-3 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-3 | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-3 | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-3 | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-4 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-4 | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-4 | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-4 | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-5B | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-5B | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-5B | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-5B | 5/22/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-6 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-6 | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-6 | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-6 | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300744-W-6 | 5/22/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-7B | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-7B | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-7B | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-7B | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-7B | 5/22/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-8 | 5/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-8 | 8/2/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-8 | 11/14/2001 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-8 | 2/19/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300744-W-8 | 5/22/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300747-MW-1 | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **50** | - | 150 | <0.5 | ND | ND | - | - | ND | ND |
| T0601300747-MW-1 | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **23** | - | 180 | - | ND | ND | - | - | ND | 48 |
| T0601300747-MW-2 | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | - | 400 | 18 | ND | ND | - | - | ND | 31 |
| T0601300747-MW-2 | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **110** | - | 300 | <0.5 | ND | ND | - | - | ND | 55 |
| T0601300747-MW-3 | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **46** | - | 160 | 1.7 | 1.5 | 1.5 | - | - | 1.2 | ND |
| T0601300747-MW-3 | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **74** | - | 200 | <0.5 | ND | ND | - | - | 0.92 | 42 |
| T0601300747-MW-4 | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **110** | - | 880 | 3.9 | ND | ND | - | - | 0.91 | 13 |
| T0601300747-MW-4 | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **90** | - | 630 | <0.5 | ND | ND | - | - | 0.63 | 45 |
| T0601300747-MW-5 | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **19** | - | 170 | <0.5 | ND | ND | - | - | ND | ND |
| T0601300747-MW-5 | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **30** | - | 250 | <0.5 | ND | ND | - | - | ND | 36 |
| T0601300747-MW-9 | 6/18/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **29** | - | 270 | - | ND | ND | - | - | ND | 6.6 |
| T0601300747-MW-9 | 7/2/2012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **31** | - | 430 | - | ND | ND | - | - | ND | 40 |
| T0601300764-MW-16 | 12/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-16 | 12/22/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | ND | ND | - | - | - | - |
| T0601300764-MW-16 | 12/29/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.3 | 1.3 | - | - | - | - |
| T0601300764-MW-16 | 1/5/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | 4.3 | 4.3 | - | - | - | - |
| T0601300764-MW-16 | 3/12/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-16 | 7/30/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **110** | ND | ND | - | - | - | - |
| T0601300764-MW-17 | 12/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-17 | 12/22/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-17 | 12/29/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-17 | 1/5/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **98** | ND | ND | - | - | - | - |
| T0601300764-MW-17 | 3/12/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.6 | ND | ND | - | - | - | - |
| T0601300764-MW-17 | 7/30/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 36 | ND | ND | - | - | - | - |
| T0601300764-MW-2 | 12/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-2 | 12/22/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300764-MW-2 | 12/29/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-2 | 1/5/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-2 | 3/12/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-2 | 7/30/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-3 | 12/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300764-MW-3 | 12/22/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-3 | 12/29/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-3 | 1/5/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-3 | 3/12/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300764-MW-3 | 7/30/2009 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T0601300766-IW10 | 6/28/2010 | - | - | - | - | - | - | - | - | - | - | - | **26** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-IW10 | 11/28/2012 | - | **1400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-IW9 | 6/28/2010 | - | - | - | - | - | - | - | - | - | - | - | **23** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-IW9 | 11/28/2012 | - | **1500** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW1 | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | **48** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW1 | 11/28/2012 | - | **1200** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW2 | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW2 | 11/28/2012 | - | **1200** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW3 | 6/30/2010 | - | **1940** | - | - | - | - | - | - | 130 | - | - | 0.56 | - | - | - | - | - | - | - | - | **7300** | - | - | - |
| T0601300766-MW3 | 10/18/2010 | - | - | - | - | - | - | - | - | - | - | - | **26** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW3 | 1/17/2011 | - | - | - | - | - | - | - | - | - | - | - | **22** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW3 | 11/29/2012 | - | **1400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW4 | 1/29/2007 | - | - | - | - | - | - | - | - | 24 | - | - | ).194274 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW4 | 2/25/2009 | - | **1230** | - | - | - | - | - | 1.8 | 19 | - | - | ND | - | - | - | - | - | - | - | - | **13000** | - | - | - |
| T0601300766-MW4 | 6/30/2010 | - | **1340** | - | - | - | - | - | - | 6.6 | - | - | ND | - | - | - | - | - | - | - | - | **24000** | - | - | - |
| T0601300766-MW4 | 10/18/2010 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW4 | 1/17/2011 | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW4 | 11/29/2012 | - | **1400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 8/4/2008 | - | **1650** | - | - | - | - | - | 15 | 180 | - | - | 4.4 | - | - | - | - | - | - | - | - | **770** | - | - | - |
| T0601300766-MW5 | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 9/25/2008 | - | - | - | - | - | - | - | - | - | - | - | 4.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 10/9/2008 | - | - | - | - | - | - | - | - | - | - | - | 5.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 10/23/2008 | - | - | - | - | - | - | - | - | - | - | - | 4.2 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 12/18/2008 | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 2/25/2009 | - | **1570** | - | - | - | - | - | 1.6 | 200 | - | - | 0.37 | - | - | - | - | - | - | - | - | **890** | - | - | - |
| T0601300766-MW5 | 6/30/2010 | - | **1340** | - | - | - | - | - | - | 190 | - | - | 0.38 | - | - | - | - | - | - | - | - | **5100** | - | - | - |
| T0601300766-MW5 | 10/18/2010 | - | - | - | - | - | - | - | - | - | - | - | **43** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 1/17/2011 | - | - | - | - | - | - | - | - | - | - | - | **19** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW5 | 11/29/2012 | - | **1700** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300766-MW6A | 11/29/2012 | - | **1500** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW6B | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | **62** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW6B | 11/29/2012 | - | **700** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW7A | 11/27/2012 | - | **2800** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW7B | 1/29/2007 | - | - | - | - | - | - | - | - | **260** | - | - | 9.9396 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW7B | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW7B | 11/27/2012 | - | **1500** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8A | 8/4/2008 | - | **1440** | - | - | - | - | - | 45 | 230 | - | - | **18** | - | - | - | - | - | - | - | - | ND | - | - | - |
| T0601300766-MW8A | 12/18/2008 | - | - | - | - | - | - | - | - | - | - | - | **14** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8A | 2/25/2009 | - | **1400** | - | - | - | - | - | 2.1 | 220 | - | - | **16** | - | - | - | - | - | - | - | - | **1200** | - | - | - |
| T0601300766-MW8A | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8A | 11/27/2012 | - | **1300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 8/4/2008 | - | **1160** | - | - | - | - | - | 1.3 | 210 | - | - | **20** | - | - | - | - | - | - | - | - | 170 | - | - | - |
| T0601300766-MW8B | 9/10/2008 | - | - | - | - | - | - | - | - | - | - | - | **20** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 9/25/2008 | - | - | - | - | - | - | - | - | - | - | - | **20** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 10/9/2008 | - | - | - | - | - | - | - | - | - | - | - | **21** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 10/23/2008 | - | - | - | - | - | - | - | - | - | - | - | **20** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 12/18/2008 | - | - | - | - | - | - | - | - | - | - | - | **18** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 2/25/2009 | - | **1150** | - | - | - | - | - | 1.2 | 200 | - | - | **19** | - | - | - | - | - | - | - | - | ND | - | - | - |
| T0601300766-MW8B | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | 3.7 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8B | 11/27/2012 | - | **1100** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 8/4/2008 | - | **1240** | - | - | - | - | - | 2.3 | **260** | - | - | **15** | - | - | - | - | - | - | - | - | **1700** | - | - | - |
| T0601300766-MW8C | 9/10/2008 | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 9/25/2008 | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 10/9/2008 | - | - | - | - | - | - | - | - | - | - | - | **16** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 10/23/2008 | - | - | - | - | - | - | - | - | - | - | - | **15** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 12/18/2008 | - | - | - | - | - | - | - | - | - | - | - | **13** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 2/25/2009 | - | **1160** | - | - | - | - | - | 2.3 | 250 | - | - | **13** | - | - | - | - | - | - | - | - | ND | - | - | - |
| T0601300766-MW8C | 6/29/2010 | - | - | - | - | - | - | - | - | - | - | - | 7 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 10/18/2010 | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 1/17/2011 | - | - | - | - | - | - | - | - | - | - | - | **11** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300766-MW8C | 11/27/2012 | - | **1200** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-1 | 9/3/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **7800** | - | - | ND |
| T0601300772-MW-1 | 10/14/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **7100** | - | - | 44 |
| T0601300772-MW-1 | 11/25/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **4200** | - | - | ND |
| T0601300772-MW-1 | 12/23/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **7400** | - | - | ND |
| T0601300772-MW-1 | 1/20/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | ND |
| T0601300772-MW-1 | 3/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **13000** | - | - | 52 |
| T0601300772-MW-1 | 5/5/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | - | - | - | ND |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) 10[a] | Anions: F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | Trace Elements: As[2] (µg/L) 10[a] | Trace Elements: B (ug/L) 1000[c] | Trace Elements: Ba (ug/L) 1000[a] | Trace Elements: Cr (µg/L) 50[a] | Trace Elements: Cr (VI) (µg/L) | Trace Elements: Cu (mg/L) 1.3[a] | Trace Elements: Fe (ug/L) 300[b] | Trace Elements: Mn (µg/L) 50[b] | Trace Elements: Se (µg/L) 50[a] | Trace Elements: Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300772-MW-1 | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **350** | - | - | 29 |
| T0601300772-MW-1 | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | ND | - | - | ND |
| T0601300772-MW-1 | 9/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **1500** | - | - | ND |
| T0601300772-MW-1 | 4/1/2011 | - | - | - | - | - | - | - | - | 57.9 | - | - | 0.160389 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-1 | 7/24/2012 | - | **1030** | - | - | 104 | - | - | - | 3.6 | - | - | ND | - | - | - | - | - | - | - | - | - | **1180** | - | - |
| T0601300772-MW-12 | 4/1/2011 | - | - | - | - | - | - | - | - | 202 | - | - | 4.0662 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-13 | 4/1/2011 | - | - | - | - | - | - | - | - | **259** | - | - | 0.40662 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-13 | 7/24/2012 | - | **1220** | - | - | 120 | - | - | - | 198 | - | - | ND | - | - | - | - | - | - | - | - | - | **2030** | - | - |
| T0601300772-MW-14 | 4/1/2011 | - | - | - | - | - | - | - | - | 175 | - | - | 0.6777 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-15 | 4/1/2011 | - | - | - | - | - | - | - | - | 86 | - | - | 1.08432 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-15 | 7/28/2011 | - | - | - | - | - | - | - | - | 99.3 | - | - | 1.10691 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-15 | 7/24/2012 | - | **942** | - | - | 80.3 | - | - | - | 107 | - | - | 1.15209 | - | - | - | - | - | - | - | - | - | **230** | - | - |
| T0601300772-MW-17 | 4/1/2011 | - | - | - | - | - | - | - | - | 117 | - | - | 1.15209 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-17 | 7/28/2011 | - | - | - | - | - | - | - | - | 99.7 | - | - | 0.29367 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-17 | 7/24/2012 | - | **952** | - | - | 63.3 | - | - | - | 146 | - | - | 0.72288 | - | - | - | - | - | - | - | - | - | **714** | - | - |
| T0601300772-MW-2 | 9/3/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **14000** | - | - | ND |
| T0601300772-MW-2 | 10/14/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **1100** | - | - | ND |
| T0601300772-MW-2 | 11/25/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | 170 | - | - | ND |
| T0601300772-MW-2 | 12/23/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 210 | - | - | ND |
| T0601300772-MW-2 | 1/20/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | - | - | - | ND |
| T0601300772-MW-2 | 3/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **7000** | - | - | 29 |
| T0601300772-MW-2 | 5/5/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | - | - | - | ND |
| T0601300772-MW-2 | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | ND | - | - | 32 |
| T0601300772-MW-2 | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | ND |
| T0601300772-MW-2 | 9/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | ND | - | - | ND |
| T0601300772-MW-2 | 4/1/2011 | - | - | - | - | - | - | - | - | 64.3 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-2 | 7/28/2011 | - | - | - | - | - | - | - | - | 34.5 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-2 | 7/24/2012 | - | **1440** | - | - | 133 | - | - | - | 51.6 | - | - | ND | - | - | - | - | - | - | - | - | - | **2450** | - | - |
| T0601300772-MW-3 | 9/3/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **5900** | - | - | ND |
| T0601300772-MW-3 | 10/14/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **4200** | - | - | ND |
| T0601300772-MW-3 | 11/25/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **5800** | - | - | ND |
| T0601300772-MW-3 | 12/23/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.005 | - | - | **9600** | - | - | ND |
| T0601300772-MW-3 | 1/20/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.1 | - | - | - | - | - | 34 |
| T0601300772-MW-3 | 3/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **20000** | - | - | ND |
| T0601300772-MW-3 | 5/5/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | - | - | - | ND |
| T0601300772-MW-3 | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **990** | - | - | ND |
| T0601300772-MW-3 | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **9500** | - | - | ND |
| T0601300772-MW-3 | 9/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **9800** | - | - | ND |
| T0601300772-MW-3 | 4/1/2011 | - | - | - | - | - | - | - | - | 3 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300772-MW-3 | 7/28/2011 | - | - | - | - | - | - | - | - | ND | - | - | 0.079065 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-3 | 7/24/2012 | - | **1340** | - | - | 146 | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | - | **3050** | - | - |
| T0601300772-MW-4 | 9/3/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **2200** | - | - | ND |
| T0601300772-MW-4 | 10/14/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **2500** | - | - | ND |
| T0601300772-MW-4 | 11/25/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | - | - | **4500** | - | - | ND |
| T0601300772-MW-4 | 12/23/2002 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | - | - | **890** | - | - | ND |
| T0601300772-MW-4 | 1/20/2003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.9 | - | - | - | - | - | ND |
| T0601300772-MW-4 | 3/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **15000** | - | - | 71 |
| T0601300772-MW-4 | 5/5/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | - | - | - | ND |
| T0601300772-MW-4 | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | ND | - | - | ND |
| T0601300772-MW-4 | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1500** | - | - | ND |
| T0601300772-MW-4 | 9/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **2900** | - | - | ND |
| T0601300772-MW-4 | 4/1/2011 | - | - | - | - | - | - | - | - | 4.6 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-4 | 7/28/2011 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-4 | 7/24/2012 | - | **1140** | - | - | 91.9 | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | - | **1250** | - | - |
| T0601300772-MW-5 | 4/1/2011 | - | - | - | - | - | - | - | - | 152 | - | - | 3.72735 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-6 | 4/1/2011 | - | - | - | - | - | - | - | - | 250 | - | - | 0.09036 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-7 | 3/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **3800** | - | - | ND |
| T0601300772-MW-7 | 4/6/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **1300** | - | - | ND |
| T0601300772-MW-7 | 5/5/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | - | - | - | ND |
| T0601300772-MW-7 | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | 270 | - | - | ND |
| T0601300772-MW-7 | 6/24/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **1600** | - | - | ND |
| T0601300772-MW-7 | 7/15/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **2000** | - | - | ND |
| T0601300772-MW-7 | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **1600** | - | - | ND |
| T0601300772-MW-7 | 9/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **2700** | - | - | ND |
| T0601300772-MW-7 | 4/1/2011 | - | - | - | - | - | - | - | - | 80.5 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-7 | 7/28/2011 | - | - | - | - | - | - | - | - | 80.9 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-7 | 7/24/2012 | - | **1150** | - | - | 113 | - | - | - | 48.7 | - | - | 0.065511 | - | - | - | - | - | - | - | - | - | **3580** | - | - |
| T0601300772-MW-8 | 3/25/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1400** | - | - | 25 |
| T0601300772-MW-8 | 4/6/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **450** | - | - | ND |
| T0601300772-MW-8 | 5/5/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| T0601300772-MW-8 | 6/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | ND | - | - | ND |
| T0601300772-MW-8 | 6/24/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **800** | - | - | ND |
| T0601300772-MW-8 | 7/15/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **940** | - | - | ND |
| T0601300772-MW-8 | 8/20/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **850** | - | - | ND |
| T0601300772-MW-8 | 9/3/2004 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <20 | - | - | **880** | - | - | ND |
| T0601300772-MW-8 | 4/1/2011 | - | - | - | - | - | - | - | - | 10.9 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-8 | 7/28/2011 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300772-MW-8 | 7/24/2012 | - | **892** | - | - | 83.9 | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | - | **2390** | - | - |
| T0601300776-CES-17 | 11/28/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300776-CES-18 | 11/28/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-KMW-10 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-KMW-10 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-KMW-11 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-KMW-8 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-KMW-8 | 12/16/2008 | - | - | - | - | - | - | - | - | **550** | - | - | ND | - | - | - | - | - | - | - | - | **10400** | **3170** | - | - |
| T0601300776-KMW-9 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-12 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-2 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-3 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-3 | 12/16/2008 | - | - | - | - | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | **29000** | **1510** | - | - |
| T0601300776-MW-5 | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-5 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-6 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-MW-6 | 12/16/2008 | - | - | - | - | - | - | - | - | **1240** | - | - | ND | - | - | - | - | - | - | - | - | 220 | **255** | - | - |
| T0601300776-MW-7A | 7/26/2005 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300776-SG-10 | 9/30/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-1 | 10/23/2008 | - | - | - | - | - | - | - | - | 24 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-11 | 10/23/2008 | - | - | - | - | - | - | - | - | 120 | - | - | 4.8 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-12 | 10/23/2008 | - | - | - | - | - | - | - | - | 170 | - | - | **27.108** | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-2 | 10/23/2008 | - | - | - | - | - | - | - | - | 46 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-3 | 10/23/2008 | - | - | - | - | - | - | - | - | 49 | - | - | 0.88101 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-6 | 10/23/2008 | - | - | - | - | - | - | - | - | 75 | - | - | 6.5511 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300782-MW-7 | 10/23/2008 | - | - | - | - | - | - | - | - | 24 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300788-MW-1 | 3/31/2005 | **6880** | **3630** | 6.86 | - | 260 | 280 | 1000 | 28 | 0.5 | **1600** | - | - | - | - | - | - | - | - | - | - | **28000** | **1300** | - | - |
| T0601300788-MW-2 | 3/31/2005 | **5010** | **3130** | 6.61 | - | 150 | 87 | 900 | 8.7 | 23 | **1800** | - | - | - | - | - | - | - | - | - | - | **52000** | **1100** | - | - |
| T0601300788-MW-3 | 3/31/2005 | **8520** | **4790** | 6.96 | - | 370 | 280 | 1000 | 12 | **1700** | **1400** | - | - | - | - | - | - | - | - | - | - | **34000** | **3600** | - | - |
| T0601300788-MW-4 | 4/1/2005 | **21300** | **12500** | 7.46 | - | 640 | 560 | 3500 | 20 | **4800** | **3400** | - | - | - | - | - | - | - | - | - | - | **29000** | **2900** | - | - |
| T0601300788-MW-5 | 4/1/2005 | **11500** | **6430** | 7.18 | - | 450 | 300 | 1700 | 27 | 1.6 | **3300** | - | - | - | - | - | - | - | - | - | - | **70000** | **3600** | - | - |
| T0601300800-BW-1 | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity [1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2 [a] | Trace Elements: Al (µg/L) 1000[a] | As [2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50 [a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300800-BW-1 | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-BW-1 | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-2 | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-3 | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | 12 | - | - | - | - |
| T0601300800-MW-4A | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | 12 | - | - | - | - |
| T0601300800-MW-4A | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4A | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Ca (Cations) | Mg (Cations) | Na (Cations) | K (Cations) | $SO_4$ (Anions) | Cl (Anions) | $HCO_3$[1] (Anions) | $NO_3$[1] (Anions) | F (Anions) | Al (Trace Elements) | As[2] (Trace Elements) | B (Trace Elements) | Ba (Trace Elements) | Cr (Trace Elements) | Cr (VI) (Trace Elements) | Cu (Trace Elements) | Fe (Trace Elements) | Mn (Trace Elements) | Se (Trace Elements) | Zn (Trace Elements) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300800-MW-4B | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 13 | 13 | - | - | - | - |
| T0601300800-MW-4B | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-4B | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-5B | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6A | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-6B | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 18 | 18 | - | - | - | - |
| T0601300800-MW-7B | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11 | 11 | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300800-MW-7B | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7B | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | 12 | - | - | - | - |
| T0601300800-MW-7BL | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11 | 11 | - | - | - | - |
| T0601300800-MW-7BL | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-7BL | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 10 | - | - | - | - |
| T0601300800-MW-8A | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 | 12 | - | - | - | - |
| T0601300800-MW-8A | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8A | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8A | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11 | 11 | - | - | - | - |
| T0601300800-MW-8A | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8A | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 10 | - | - | - | - |
| T0601300800-MW-8A | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8A | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8A | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8A | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 9/14/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 12/11/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 3/5/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 6/11/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 9/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 12/13/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 3/10/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 9/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300800-MW-8BL | 12/9/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | ND | - | - | - | - |
| T0601300807-IP-1 | 1/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **76.5** | - | - | <5 | - | - | **9150** | - | - | - |
| T0601300807-IP-1 | 2/21/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | 32.2 | - | - | - | - | - | - |
| T0601300807-IP-1 | 3/18/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-IP-1 | 5/14/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| T0601300807-IP-1 | 6/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) 10[a] | Anions: F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | Trace Elements: As[2] (µg/L) 10[a] | Trace Elements: B (ug/L) 1000[c] | Trace Elements: Ba (ug/L) 1000[a] | Trace Elements: Cr (µg/L) 50[a] | Trace Elements: Cr (VI) (µg/L) | Trace Elements: Cu (mg/L) 1.3[a] | Trace Elements: Fe (ug/L) 300[b] | Trace Elements: Mn (µg/L) 50[b] | Trace Elements: Se (µg/L) 50[a] | Trace Elements: Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601300807-IP-2 | 1/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **39.3** | - | - | <5 | - | - | **3490** | - | - | - |
| T0601300807-IP-2 | 2/21/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-IP-2 | 3/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-IP-2 | 5/14/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | - | - | - | - | - | - | - |
| T0601300807-IP-2 | 6/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-1 | 1/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **22.3** | - | - | <5 | - | - | **1760** | - | - | - |
| T0601300807-OW-1 | 2/21/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **19.9** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-1 | 3/18/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **21.8** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-1 | 5/14/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **46.6** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-1 | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **12.3** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-2 | 1/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **18.7** | - | - | - | - | - | **2430** | - | - | - |
| T0601300807-OW-2 | 2/21/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-2 | 3/18/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **21.5** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-2 | 5/14/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **39.3** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-OW-2 | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **42.5** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-11 | 1/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **32.6** | - | - | <5 | - | - | **6030** | - | - | - |
| T0601300807-S-11 | 2/21/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **16.8** | - | - | 26.1 | - | - | - | - | - | - |
| T0601300807-S-11 | 3/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **14.9** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-11 | 5/14/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **25** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-11 | 6/11/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **13.8** | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-15 | 1/17/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | **2180** | - | - | - |
| T0601300807-S-15 | 2/21/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-15 | 3/18/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-15 | 5/14/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300807-S-15 | 6/12/2008 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | - | - | <5 | - | - | - | - | - | - |
| T0601300810-MW-1 | 5/11/2004 | - | - | - | 840 | - | - | - | - | 1.6 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300810-MW-2 | 5/11/2004 | - | - | - | 210 | - | - | - | - | 55 | - | - | 1.96533 | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300810-MW-3 | 5/11/2004 | - | - | - | 310 | - | - | - | - | 240 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300810-MW-4 | 5/11/2004 | - | - | - | 660 | - | - | - | - | 56 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300810-MW-5 | 5/11/2004 | - | - | - | 610 | - | - | - | - | 5.2 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300810-MW-6 | 5/11/2004 | - | - | - | 1400 | - | - | - | - | ND | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601300810-MW-7 | 5/11/2004 | - | - | - | 480 | - | - | - | - | 12 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601325015-MPE-1 | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | - | - | - |
| T0601325015-MPE-2 | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| T0601325015-MPE-3 | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T0601325015-MW-2 | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 270 | - | - | - |
| T0601325015-MW-3 | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| T0601325015-MW-4R | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **1000** | - | - | - |
| T0601325015-MW-5 | 3/6/2013 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| T0601343310-EW1 | 7/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.04 | **69** | - | ND | <0.01 | - | - | - | - | ND | ND |
| T0601343310-EW1 | 10/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | 200 | - | - | - | - | - | ND | ND |
| T0601343310-EW2 | 7/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.04 | **96** | - | ND | <0.01 | - | - | - | - | ND | ND |
| T0601343310-EW2 | 10/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | 110 | 10 | - | - | - | - | ND | ND |
| T0601343310-EW3 | 7/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | **3600** | **170** | - | ND | <0.01 | - | - | - | - | ND | ND |
| T0601343310-EW3 | 10/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | 78 | 13 | - | - | - | - | ND | ND |
| T0601343310-MW4 | 7/12/2007 | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.04 | ND | - | ND | - | - | - | - | - | ND | ND |
| T0601343310-MW4 | 10/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ND | - | 130 | - | - | - | - | - | ND | 68 |
| T0601358660-MW1 | 12/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.4 | - | 49 | - | - | - | - | - | 1.6 | ND |
| T0601358660-MW2 | 12/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.5 | - | 83 | - | - | - | - | - | 2.6 | ND |
| T0601358660-MW3 | 12/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.5 | - | 22 | 7.2 | - | - | - | - | 1.5 | ND |
| T0601358660-MW4 | 12/19/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.4 | - | 55 | 1.3 | - | - | - | - | ND | ND |
| T0601359797-RW-2 | 9/25/2018 | - | **1440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T0601391420-EX-1 | 4/20/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.8 | - | - | - | - | - | - | - | - | - |
| T0601391420-EX-2 | 4/20/2006 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **130** | - | - | - | - | - | - | - | - | - |
| T10000000655-MW.01 | 12/1/2009 | **7780** | **6220** | 7.17 | - | 360 | 200 | 1200 | 20 | **2900** | **490** | - | ND | - | - | - | - | 63 | <0.5 | ND | ND | **760** | **2100** | - | - |
| T10000000655-MW.01 | 8/24/2010 | - | - | - | - | 340 | 93 | 360 | 7.5 | **1200** | 120 | - | ND | - | - | - | - | 47 | <0.5 | ND | ND | ND | **8000** | - | - |
| T10000000655-MW.01 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.79 | ND | ND | - | - | - | - |
| T10000000655-MW.01 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T10000000655-MW.02 | 12/1/2009 | **15800** | **12600** | 7.12 | - | 570 | 380 | 2800 | 31 | **4500** | **2300** | - | ND | - | - | - | - | 75 | 1.1 | ND | ND | **510** | **2000** | - | - |
| T10000000655-MW.02 | 8/24/2010 | - | - | - | - | 460 | 230 | 1200 | 12 | **3300** | **580** | - | ND | - | - | - | - | 45 | 11 | ND | ND | **1500** | **11000** | - | - |
| T10000000655-MW.02 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T10000000655-MW.02 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.8 | ND | ND | - | - | - | - |
| T10000000655-MW.03 | 12/1/2009 | **25800** | **20400** | 7.09 | - | 630 | 550 | 5300 | 40 | **8500** | **4900** | - | ND | - | - | - | - | 460 | <0.5 | ND | ND | ND | **5700** | - | - |
| T10000000655-MW.03 | 8/24/2010 | - | - | - | - | 440 | 330 | 2900 | 18 | **5700** | **1400** | - | ND | - | - | - | - | 38 | 8.6 | ND | ND | ND | **9000** | - | - |
| T10000000655-MW.03 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.6 | ND | ND | - | - | - | - |
| T10000000655-MW.03 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.84 | ND | ND | - | - | - | - |
| T10000000655-MW.04 | 12/1/2009 | **7070** | **5640** | 7.32 | - | 360 | 180 | 1100 | 16 | **2600** | **540** | - | ND | - | - | - | - | 76 | <0.5 | ND | ND | **4700** | **1300** | - | - |
| T10000000655-MW.04 | 8/24/2010 | - | - | - | - | 250 | 80 | 590 | 7.2 | **1000** | 120 | - | ND | - | - | - | - | 91 | 4.1 | 3.2 | 3.2 | ND | **2000** | - | - |
| T10000000655-MW.04 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.6 | 2.5 | 2.5 | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T10000000655-MW.04 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.7 | 6.8 | 6.8 | - | - | - | - |
| T10000000655-MW.05 | 12/1/2009 | **4310** | **2910** | 7.14 | - | 280 | 140 | 800 | 15 | **1000** | **590** | - | ND | - | - | - | - | 110 | <0.5 | ND | ND | 240 | **410** | - | - |
| T10000000655-MW.05 | 1/4/2010 | - | - | - | - | 170 | 63 | 250 | 8.1 | 80 | 70 | - | ND | - | - | - | - | 140 | <5 | ND | ND | **1000** | **2200** | - | - |
| T10000000655-MW.05 | 1/5/2010 | - | - | - | - | 170 | 57 | 220 | 6.6 | **260** | 66 | - | ND | - | - | - | - | 160 | <5 | ND | ND | **650** | **2000** | - | - |
| T10000000655-MW.05 | 1/7/2010 | - | - | - | - | 220 | 74 | 310 | 7.7 | 200 | 65 | - | ND | - | - | - | - | 110 | <0.5 | ND | ND | 53 | **980** | - | - |
| T10000000655-MW.05 | 1/11/2010 | - | - | - | - | 180 | 54 | 250 | 6.5 | **350** | 87 | - | ND | - | - | - | - | 120 | <5 | ND | ND | ND | **830** | - | - |
| T10000000655-MW.05 | 8/24/2010 | - | - | - | - | 130 | 37 | 150 | 5 | 11 | 51 | - | ND | - | - | - | - | 290 | 25 | 19 | 19 | 78 | **3500** | - | - |
| T10000000655-MW.05 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.7 | 6.1 | 6.1 | - | - | - | - |
| T10000000655-MW.05 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 17 | 16 | 16 | - | - | - | - |
| T10000000655-MW.06 | 12/1/2009 | **6790** | **5120** | 7.3 | - | 270 | 140 | 1100 | 15 | **1600** | **590** | - | ND | - | - | - | - | 93 | <0.5 | ND | ND | **1600** | **610** | - | - |
| T10000000655-MW.06 | 1/4/2010 | - | - | - | - | 320 | 130 | 1000 | 7.4 | **990** | 220 | - | ND | - | - | - | - | 60 | <5 | ND | ND | 250 | **1300** | - | - |
| T10000000655-MW.06 | 1/5/2010 | - | - | - | - | 260 | 110 | 920 | 7 | **3600** | **830** | - | ND | - | - | - | - | 120 | <5 | ND | ND | **650** | **1200** | - | - |
| T10000000655-MW.06 | 1/7/2010 | - | - | - | - | 300 | 130 | 950 | 8.5 | **790** | **260** | - | ND | - | - | - | - | 79 | <5 | ND | ND | **360** | **1100** | - | - |
| T10000000655-MW.06 | 1/11/2010 | - | - | - | - | 220 | 84 | 950 | 5.7 | **1800** | **300** | - | ND | - | - | - | - | 110 | <5 | ND | ND | **960** | **940** | - | - |
| T10000000655-MW.06 | 8/24/2010 | - | - | - | - | 99 | 36 | 350 | 4.4 | 190 | 100 | - | 0.29 | - | - | - | - | 180 | **63** | 67 | 67 | ND | **1200** | - | - |
| T10000000655-MW.06 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.1 | 0.7 | 0.7 | - | - | - | - |
| T10000000655-MW.06 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9.6 | 8.1 | 8.1 | - | - | - | - |
| T10000000655-MW.07 | 12/1/2009 | **1240** | **744** | 7.52 | - | 41 | 22 | 280 | 7 | 130 | 65 | - | ND | - | - | - | - | 49 | <0.5 | ND | ND | **800** | **270** | - | - |
| T10000000655-MW.07 | 1/4/2010 | - | - | - | - | 35 | 13 | 150 | 3.5 | 8.3 | 25 | - | ND | - | - | - | - | 63 | <5 | ND | ND | **760** | **470** | - | - |
| T10000000655-MW.07 | 1/5/2010 | - | - | - | - | 36 | 16 | 160 | 4.2 | 37 | 32 | - | ND | - | - | - | - | 63 | <5 | ND | ND | 250 | **360** | - | - |
| T10000000655-MW.07 | 1/7/2010 | - | - | - | - | 42 | 16 | 180 | 4.1 | 57 | **310** | - | ND | - | - | - | - | 63 | <5 | ND | ND | 130 | **410** | - | - |
| T10000000655-MW.07 | 1/11/2010 | - | - | - | - | 37 | 14 | 180 | 4 | 39 | 31 | - | ).164907 | - | - | - | - | 53 | <5 | ND | ND | 130 | **280** | - | - |
| T10000000655-MW.07 | 8/24/2010 | - | - | - | - | 24 | 8 | 110 | 3 | 8.2 | 33 | - | 0.13 | - | - | - | - | 69 | 3.1 | 2.9 | 2.9 | ND | **360** | - | - |
| T10000000655-MW.07 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.62 | 0.74 | 0.74 | - | - | - | - |
| T10000000655-MW.07 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5 | 4.6 | 4.6 | - | - | - | - |
| T10000000655-MW.08 | 12/1/2009 | **4060** | **2900** | 7.2 | - | 260 | 96 | 600 | 12 | **890** | **470** | - | ND | - | - | - | - | 120 | <0.5 | ND | ND | **420** | **1400** | - | - |
| T10000000655-MW.08 | 1/4/2010 | - | - | - | - | 180 | 44 | 150 | 5.4 | 170 | 97 | - | ND | - | - | - | - | 180 | <5 | ND | ND | **3300** | **3800** | - | - |
| T10000000655-MW.08 | 1/5/2010 | - | - | - | - | 190 | 45 | 170 | 4.7 | 130 | 100 | - | ND | - | - | - | - | 200 | <0.5 | ND | ND | **1600** | **3500** | - | - |
| T10000000655-MW.08 | 1/7/2010 | - | - | - | - | 180 | 39 | 150 | 4.7 | 140 | 100 | - | ND | - | - | - | - | 170 | <5 | ND | ND | **1900** | **3000** | - | - |
| T10000000655-MW.08 | 1/11/2010 | - | - | - | - | 190 | 40 | 150 | 4.6 | 140 | 100 | - | ND | - | - | - | - | 170 | <0.5 | ND | ND | **1400** | **3200** | - | - |
| T10000000655-MW.08 | 8/24/2010 | - | - | - | - | 120 | 26 | 120 | 4.6 | 16 | 71 | - | 0.12 | - | - | - | - | 310 | 6.2 | 6.6 | 6.6 | ND | **2800** | - | - |
| T10000000655-MW.08 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.1 | 0.95 | 0.95 | - | - | - | - |
| T10000000655-MW.08 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 18 | 18 | 18 | - | - | - | - |
| T10000000655-MW.09 | 12/1/2009 | **19900** | **13000** | 7.51 | - | 580 | 430 | 2500 | 23 | **5700** | **3000** | - | ND | - | - | - | - | 70 | 40 | ND | ND | **23000** | **460** | - | - |
| T10000000655-MW.09 | 1/4/2010 | - | - | - | - | 340 | 150 | 1000 | 11 | **2100** | **460** | - | 10 | - | - | - | - | 45 | <0.5 | ND | ND | ND | **620** | - | - |
| T10000000655-MW.09 | 1/5/2010 | - | - | - | - | 150 | 64 | 260 | 11 | **490** | 86 | - | 3.1 | - | - | - | - | 88 | **69** | 62 | 62 | **1400** | **2900** | - | - |
| T10000000655-MW.09 | 1/7/2010 | - | - | - | - | 130 | 46 | 170 | 10 | **290** | 46 | - | 0.38403 | - | - | - | - | 81 | 9.5 | 5.8 | 5.8 | **430** | **1600** | - | - |
| T10000000655-MW.09 | 1/11/2010 | - | - | - | - | 140 | 47 | 140 | 7.5 | **280** | 28 | - | ND | - | - | - | - | 81 | <0.5 | ND | ND | 130 | **1300** | - | - |
| T10000000655-MW.09 | 8/24/2010 | - | - | - | - | 95 | 27 | 110 | 5.8 | 58 | 26 | - | ND | - | - | - | - | 360 | 32 | 45 | 45 | ND | **920** | - | - |
| T10000000655-MW.09 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.5 | 0.66 | 0.66 | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5 [b] | Total Alkalinity[1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T10000000655-MW.09 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 16 | 17 | 17 | - | - | - | - |
| T10000000655-MW.10 | 12/1/2009 | **11400** | **9300** | 7.36 | - | 500 | 380 | 2200 | 18 | **4400** | **1000** | - | ND | - | - | - | - | 59 | <0.5 | ND | ND | ND | **2200** | - | - |
| T10000000655-MW.10 | 8/24/2010 | - | - | - | - | 480 | 290 | 1700 | 12 | **3600** | **790** | - | ND | - | - | - | - | 42 | 8.9 | ND | ND | ND | **3800** | - | - |
| T10000000655-MW.10 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6 | ND | ND | - | - | - | - |
| T10000000655-MW.10 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.59 | ND | ND | - | - | - | - |
| T10000000655-MW.11 | 8/24/2010 | - | - | - | - | 450 | 130 | 400 | 9.7 | **1700** | 140 | - | ND | - | - | - | - | 33 | 33 | ND | ND | 260 | **7400** | - | - |
| T10000000655-MW.11 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 30 | ND | ND | - | - | - | - |
| T10000000655-MW.11 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.54 | ND | ND | - | - | - | - |
| T10000000655-MW.12 | 8/24/2010 | - | - | - | - | 390 | 140 | 780 | 9 | **1700** | 150 | - | ND | - | - | - | - | 59 | <0.5 | ND | ND | 110 | **6700** | - | - |
| T10000000655-MW.12 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.88 | ND | ND | - | - | - | - |
| T10000000655-MW.12 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.87 | ND | ND | - | - | - | - |
| T10000000655-MW.13 | 8/24/2010 | - | - | - | - | 410 | 140 | 520 | 10 | **1300** | 150 | - | ND | - | - | - | - | 94 | <0.5 | ND | ND | ND | **4400** | - | - |
| T10000000655-MW.13 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T10000000655-MW.13 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.5 | 1 | 1 | - | - | - | - |
| T10000000655-MW.14 | 8/24/2010 | - | - | - | - | 190 | 34 | 310 | 4.6 | **470** | 180 | - | ND | - | - | - | - | 43 | <0.5 | ND | ND | **1000** | **2400** | - | - |
| T10000000655-MW.14 | 10/4/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T10000000655-MW.14 | 11/5/2010 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.5 | ND | ND | - | - | - | - |
| T10000002015-MW-1 | 11/9/2010 | - | **1200** | - | - | 140 | 62 | 210 | 1.4 | **480** | 170 | - | ND | 0.64 | - | - | - | - | - | - | - | - | **1300** | - | - |
| T10000002015-MW-1 | 3/2/2011 | - | **1200** | - | - | 130 | 60 | 200 | 1.5 | **430** | 150 | - | ND | 0.54 | - | - | - | - | - | - | - | **700** | - | - | - |
| T10000002015-MW-1 | 6/1/2011 | - | **1200** | - | - | 140 | 65 | 220 | 1.6 | **420** | 150 | - | ND | 0.61 | - | - | - | - | - | - | - | **710** | - | - | - |
| T10000002015-MW-1 | 8/31/2011 | - | **1200** | - | - | 120 | 59 | 200 | 1.4 | **460** | 140 | - | ND | 0.47 | - | - | - | - | - | - | - | **600** | - | - | - |
| T10000002015-MW-2 | 11/9/2010 | - | **1400** | - | - | 160 | 64 | 220 | 1.6 | **540** | 160 | - | ND | 0.53 | - | - | - | - | - | - | - | - | **2800** | - | - |
| T10000002015-MW-2 | 3/2/2011 | - | **1400** | - | - | 160 | 62 | 200 | 2 | **480** | 150 | - | ND | 0.47 | - | - | - | - | - | - | - | **820** | - | - | - |
| T10000002015-MW-2 | 6/1/2011 | - | **1300** | - | - | 150 | 62 | 210 | 1.6 | **460** | 140 | - | ND | 0.51 | - | - | - | - | - | - | - | **850** | - | - | - |
| T10000002015-MW-2 | 8/31/2011 | - | **1300** | - | - | 180 | 67 | 190 | 3.6 | **510** | 140 | - | ND | 0.4 | - | - | - | - | - | - | - | **660** | - | - | - |
| T10000002015-MW-3 | 11/8/2010 | - | **1300** | - | - | 150 | 57 | 210 | 2.7 | **510** | 160 | - | 3 | 0.55 | - | - | - | - | - | - | - | - | **530** | - | - |
| T10000002015-MW-3 | 3/2/2011 | - | **950** | - | - | 140 | 44 | 160 | 3.5 | **350** | 110 | - | 2 | 0.44 | - | - | - | - | - | - | - | **580** | - | - | - |
| T10000002015-MW-3 | 6/1/2011 | - | **1200** | - | - | 150 | 53 | 200 | 3 | **450** | 140 | - | 1.3 | 0.48 | - | - | - | - | - | - | - | **720** | - | - | - |
| T10000002015-MW-3 | 8/31/2011 | - | **1300** | - | - | 140 | 51 | 180 | 2.5 | **480** | 130 | - | 1.5 | 0.4 | - | - | - | - | - | - | - | **620** | - | - | - |
| T10000002015-MW-4 | 11/8/2010 | - | **1700** | - | - | 210 | 71 | 210 | 1.6 | **790** | 150 | - | 6.3 | 0.36 | - | - | - | - | - | - | - | - | **1100** | - | - |
| T10000002015-MW-4 | 3/2/2011 | - | **1600** | - | - | 230 | 74 | 210 | 3.2 | **650** | 140 | - | 5.9 | 0.32 | - | - | - | - | - | - | - | **920** | - | - | - |
| T10000002015-MW-4 | 6/1/2011 | - | **1600** | - | - | 220 | 75 | 210 | 1.8 | **680** | 140 | - | 5.7 | 0.35 | - | - | - | - | - | - | - | **1100** | - | - | - |
| T10000002015-MW-4 | 8/31/2011 | - | **1600** | - | - | 210 | 72 | 190 | 2.3 | **730** | 140 | - | 5.2 | 0.31 | - | - | - | - | - | - | - | **880** | - | - | - |
| T10000002015-MW-5 | 11/9/2010 | - | **1100** | - | - | 88 | 65 | 210 | 2.1 | 230 | 170 | - | ND | 0.77 | - | - | - | - | - | - | - | - | **390** | - | - |
| T10000002015-MW-5 | 3/2/2011 | - | **1100** | - | - | 97 | 70 | 220 | 2 | 220 | 150 | - | ND | 0.66 | - | - | - | - | - | - | - | **440** | - | - | - |
| T10000002015-MW-5 | 6/1/2011 | - | **1100** | - | - | 99 | 72 | 230 | 2.2 | 230 | 160 | - | ND | 0.65 | - | - | - | - | - | - | - | **460** | - | - | - |
| T10000002015-MW-5 | 8/31/2011 | - | **1100** | - | - | 97 | 65 | 200 | 2.2 | **260** | 150 | - | ND | 0.56 | - | - | - | - | - | - | - | **380** | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| T10000003258-MW-3 | 6/16/2014 | - | **530** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T10000003258-MW-5 | 6/16/2014 | - | **700** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| T10000003258-MW-6 | 6/16/2014 | - | **730** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-375106121372201 | 8/9/1973 | **4000** | **1720** | 7.8 | 271 | 52 | 22 | 560 | 5.5 | 160 | **700** | 330 | 2.12 | - | - | - | **6500** | - | - | - | - | - | - | - | - |
| USGS-375106121372201 | 6/24/1975 | **3750** | - | 7.6 | 254 | - | - | 600 | - | - | **780** | 310 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-375106121372201 | 7/20/1977 | **4050** | - | 7.5 | 221 | - | - | 780 | - | - | **1210** | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-375202121383101 | 6/5/1979 | **1110** | **640** | 7.6 | 270 | 64 | 29 | 110 | 1.9 | 84 | 140 | - | 3.39 | 0.3 | - | - | **1900** | - | - | - | - | - | - | - | - |
| USGS-375347121372201 | 5/1/1979 | **1790** | **1199** | 7.7 | 310 | 94 | 70 | 180 | 1 | 190 | **330** | - | ND | 0.6 | - | - | **3100** | - | - | - | - | - | - | - | - |
| USGS-375410121412401 | 5/2/1979 | **2030** | **1280** | 7.7 | 480 | 100 | 68 | 260 | 2.1 | 180 | **260** | - | **12** | 0.4 | 100 | 3 | **3800** | - | - | - | - | 30 | 10 | - | - |
| USGS-375427121422601 | 5/1/1979 | **1380** | **883** | 7.4 | 310 | 98 | 54 | 110 | 1.8 | 130 | 170 | - | 6.8 | 0.2 | 100 | 2 | **1800** | - | - | - | - | 10 | **140** | - | - |
| USGS-375449121435301 | 5/1/1979 | **4270** | **3523** | 7.2 | 530 | 260 | 130 | 700 | 12 | **1600** | **370** | - | 0.81 | 0.3 | - | - | **1800** | - | - | - | - | - | - | - | - |
| USGS-375600121402601 | 8/9/1973 | **1180** | **610** | 7.7 | 230 | 68 | 34 | 110 | 0.3 | 97 | 140 | 280 | 3.61 | - | - | - | **1600** | - | - | - | - | - | - | - | - |
| USGS-375600121402601 | 6/24/1975 | **1300** | - | 7.5 | 262 | - | - | 120 | - | - | 160 | 320 | - | - | - | 1 | - | - | - | - | - | 90 | 10 | - | 1200 |
| USGS-375600121402601 | 7/20/1977 | **1260** | - | 7.3 | 238 | - | - | 110 | - | - | 220 | 290 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-375601121415201 | 7/19/1974 | **1950** | **1090** | 7.7 | 246 | 130 | 55 | 150 | 3.5 | **310** | 210 | 300 | **10.8** | - | - | - | **1100** | - | - | - | - | - | - | - | - |
| USGS-375601121415201 | 6/15/1976 | **1520** | - | 7.4 | 213 | - | - | 140 | - | - | 190 | 260 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-375701121392901 | 5/2/1979 | **1600** | **994** | 7.5 | 250 | 92 | 52 | 180 | 1.5 | 210 | **260** | - | 4.7 | 0.2 | 100 | 3 | **2000** | - | - | - | - | 10 | 10 | - | - |
| USGS-375738121441501 | 5/1/1979 | **2200** | **1510** | 7.6 | 220 | 130 | 52 | 320 | 2.7 | **540** | **280** | - | 5.4 | 1.2 | 100 | 2 | **2400** | - | - | - | - | 20 | 10 | - | - |
| USGS-375753121422801 | 5/1/1979 | **1260** | **1020** | 7.5 | 250 | 120 | 54 | 150 | 6.2 | **270** | 190 | - | 8.4 | 0.5 | - | - | 700 | - | - | - | - | - | - | - | - |
| USGS-375831121424001 | 6/5/1979 | **1730** | **934** | 7.6 | 310 | 150 | 60 | 95 | 4.3 | 69 | **320** | - | 2.7 | 0.2 | - | - | 200 | - | - | - | - | - | - | - | - |
| USGS-375916121403401 | 6/5/1979 | **1860** | **1258** | 7.4 | 360 | 140 | 82 | 150 | 3.2 | **310** | 170 | - | **21** | 0.1 | 100 | 3 | **1700** | - | - | - | - | 10 | **300** | - | - |
| USGS-380012121461101 | 6/22/1972 | 863 | - | - | - | - | - | - | - | - | 76 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 7/19/1972 | 870 | - | - | - | - | - | - | - | - | 77 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 8/23/1972 | 862 | - | - | - | - | - | - | - | - | 74 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/20/1972 | 869 | - | - | - | - | - | - | - | - | 75 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 11/15/1972 | 847 | - | - | - | - | - | - | - | - | 73 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 12/19/1972 | 886 | - | - | - | - | - | - | - | - | 73 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 1/25/1973 | 854 | - | - | - | - | - | - | - | - | 72 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 2/20/1973 | 882 | - | - | - | - | - | - | - | - | 76 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 3/21/1973 | 882 | - | - | - | - | - | - | - | - | 76 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 5/23/1973 | 872 | - | - | - | - | - | - | - | - | 77 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 10/4/1973 | 876 | - | - | - | - | - | - | - | - | 78 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 3/11/1974 | 890 | - | - | - | - | - | - | - | - | 82 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/24/1974 | 892 | - | - | - | - | - | - | - | - | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/7/1975 | 900 | - | - | - | - | - | - | - | - | 93 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380012121461101 | 9/16/1975 | 891 | - | - | - | - | - | - | - | - | 90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/12/1976 | **907** | - | - | - | - | - | - | - | - | 89 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/15/1976 | 889 | - | - | - | - | - | - | - | - | 91 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/26/1977 | **962** | - | - | - | - | - | - | - | - | 93 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/13/1977 | **991** | - | - | - | - | - | - | - | - | 93 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/17/1978 | **949** | - | - | - | - | - | - | - | - | 95 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/25/1978 | 892 | - | - | - | - | - | - | - | - | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/17/1979 | 890 | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/24/1979 | 872 | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/10/1980 | **916** | - | - | - | - | - | - | - | - | 98 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/24/1980 | **911** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/21/1981 | **965** | - | 7.5 | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/17/1981 | **976** | - | 7.2 | - | - | - | - | - | - | 130 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 4/29/1982 | **976** | - | 7.2 | - | - | - | - | - | - | 130 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380012121461101 | 9/23/1982 | **1020** | - | 7 | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/20/1972 | 843 | - | - | - | - | - | - | - | - | 81 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 11/15/1972 | 833 | - | - | - | - | - | - | - | - | 82 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 12/20/1972 | 853 | - | - | - | - | - | - | - | - | 87 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 1/25/1973 | 854 | - | - | - | - | - | - | - | - | 90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 2/20/1973 | **902** | - | - | - | - | - | - | - | - | 96 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 3/21/1973 | **909** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 5/24/1973 | 865 | - | - | - | - | - | - | - | - | 90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 10/4/1973 | 800 | - | - | - | - | - | - | - | - | 78 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 3/11/1974 | 842 | - | - | - | - | - | - | - | - | 84 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/24/1974 | 811 | - | - | - | - | - | - | - | - | 77 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/7/1975 | 825 | - | - | - | - | - | - | - | - | 79 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/17/1975 | 780 | - | - | - | - | - | - | - | - | 76 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/12/1976 | 789 | - | - | - | - | - | - | - | - | 77 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/15/1976 | 755 | - | - | - | - | - | - | - | - | 75 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/26/1977 | 787 | - | - | - | - | - | - | - | - | 77 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/13/1977 | 883 | - | - | - | - | - | - | - | - | 91 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/17/1978 | 847 | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/25/1978 | 878 | - | - | - | - | - | - | - | - | 91 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/17/1979 | 876 | - | - | - | - | - | - | - | - | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/24/1979 | 818 | - | - | - | - | - | - | - | - | 87 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/10/1980 | 867 | - | - | - | - | - | - | - | - | 83 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/24/1980 | 859 | - | - | - | - | - | - | - | - | 92 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/21/1981 | 820 | - | 7.7 | - | - | - | - | - | - | 85 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/17/1981 | 847 | - | 7.9 | - | - | - | - | - | - | 91 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 4/29/1982 | 896 | - | 7.6 | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380016121454501 | 9/24/1982 | 877 | - | 7.5 | - | - | - | - | - | - | 99 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 6/22/1972 | **3260** | - | - | - | - | - | - | - | - | **560** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380017121443201 | 7/19/1972 | **3250** | - | - | - | - | - | - | - | - | **620** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 8/23/1972 | **3240** | - | - | - | - | - | - | - | - | **600** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/20/1972 | **3220** | - | - | - | - | - | - | - | - | **620** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 11/15/1972 | **3100** | - | - | - | - | - | - | - | - | **670** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 12/20/1972 | **3250** | - | - | - | - | - | - | - | - | **630** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 1/25/1973 | **3270** | - | - | - | - | - | - | - | - | **700** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 2/20/1973 | **3220** | - | - | - | - | - | - | - | - | **640** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 3/21/1973 | **3190** | - | - | - | - | - | - | - | - | **630** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 5/24/1973 | **3100** | - | - | - | - | - | - | - | - | **630** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 10/4/1973 | **3140** | - | - | - | - | - | - | - | - | **610** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 3/11/1974 | **3090** | - | - | - | - | - | - | - | - | **630** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/24/1974 | **3190** | - | - | - | - | - | - | - | - | **590** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 4/7/1975 | **3090** | - | - | - | - | - | - | - | - | **580** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/16/1975 | **3160** | - | - | - | - | - | - | - | - | **590** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 4/12/1976 | **3180** | - | - | - | - | - | - | - | - | **640** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/15/1976 | **3120** | - | - | - | - | - | - | - | - | **640** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 4/26/1977 | **3160** | - | - | - | - | - | - | - | - | **570** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/13/1977 | **3170** | - | - | - | - | - | - | - | - | **530** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 4/17/1978 | **2850** | - | - | - | - | - | - | - | - | **500** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/25/1978 | **2970** | - | - | - | - | - | - | - | - | **490** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 4/17/1979 | **2980** | - | - | - | - | - | - | - | - | **510** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/25/1979 | **2690** | - | - | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 9/24/1980 | **2660** | - | - | - | - | - | - | - | - | **600** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121443201 | 4/21/1981 | **2810** | - | 7.7 | - | - | - | - | - | - | 39 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 6/22/1972 | **1280** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 7/19/1972 | **1270** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 8/23/1972 | **1290** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/20/1972 | **1290** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 11/15/1972 | **1310** | - | - | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 2/20/1973 | **1430** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 3/21/1973 | **1370** | - | - | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 10/4/1973 | **1230** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 3/11/1974 | **1330** | - | - | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/24/1974 | **1260** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/7/1975 | **1410** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/17/1975 | **1280** | - | - | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/12/1976 | **1360** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/15/1976 | **1220** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/26/1977 | **1270** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/13/1977 | **1270** | - | - | - | - | - | - | - | - | 180 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/17/1978 | **1330** | - | - | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/25/1978 | **1240** | - | - | - | - | - | - | - | - | 170 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) 10[a] | Anions: F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380017121455901 | 4/17/1979 | 1220 | - | - | - | - | - | - | - | - | 180 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/24/1979 | 1330 | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/10/1980 | 1240 | - | - | - | - | - | - | - | - | 170 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/24/1980 | 1230 | - | - | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/21/1981 | 1250 | - | 7.7 | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/17/1981 | 2030 | - | 7.6 | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 4/29/1982 | 1330 | - | 7.4 | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380017121455901 | 9/24/1982 | 1350 | - | 7.4 | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 12/23/1970 | 1940 | - | - | - | - | - | - | - | - | 450 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 1/26/1971 | 2090 | - | - | - | - | - | - | - | - | 490 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 3/5/1971 | 1960 | - | - | - | - | - | - | - | - | 470 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 3/25/1971 | 1970 | - | - | - | - | - | - | - | - | 470 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/21/1971 | 2120 | - | - | - | - | - | - | - | - | 480 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 5/20/1971 | 2070 | - | - | - | - | - | - | - | - | 480 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 6/23/1971 | 2070 | - | - | - | - | - | - | - | - | 470 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 7/20/1971 | 1910 | - | - | - | - | - | - | - | - | 480 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 8/24/1971 | 1970 | - | - | - | - | - | - | - | - | 430 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/22/1971 | 2040 | - | - | - | - | - | - | - | - | 420 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 10/28/1971 | 2050 | - | - | - | - | - | - | - | - | 450 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 11/23/1971 | 2070 | - | - | - | - | - | - | - | - | 460 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 12/20/1971 | 2020 | - | - | - | - | - | - | - | - | 440 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 1/18/1972 | 2030 | - | - | - | - | - | - | - | - | 460 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 2/22/1972 | 2010 | - | - | - | - | - | - | - | - | 440 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 3/21/1972 | 1980 | - | - | - | - | - | - | - | - | 440 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/18/1972 | 1960 | - | - | - | - | - | - | - | - | 410 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 8/22/1972 | 1930 | - | - | - | - | - | - | - | - | 390 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/19/1972 | 1960 | - | - | - | - | - | - | - | - | 410 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 11/15/1972 | 1880 | - | - | - | - | - | - | - | - | 390 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 12/19/1972 | 1940 | - | - | - | - | - | - | - | - | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 1/24/1973 | 1930 | - | - | - | - | - | - | - | - | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 2/20/1973 | 1940 | - | - | - | - | - | - | - | - | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 3/21/1973 | 1940 | - | - | - | - | - | - | - | - | 380 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 5/23/1973 | 1880 | - | - | - | - | - | - | - | - | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 10/4/1973 | 1880 | - | - | - | - | - | - | - | - | 370 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 3/11/1974 | 1870 | - | - | - | - | - | - | - | - | 370 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/24/1974 | 1790 | - | - | - | - | - | - | - | - | 330 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/7/1975 | 1800 | - | - | - | - | - | - | - | - | 330 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/16/1975 | 1710 | - | - | - | - | - | - | - | - | 330 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/12/1976 | 1720 | - | - | - | - | - | - | - | - | 320 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/15/1976 | 1620 | - | - | - | - | - | - | - | - | 290 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/26/1977 | 1570 | - | - | - | - | - | - | - | - | 280 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/13/1977 | 1710 | - | - | - | - | - | - | - | - | 310 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5[b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380019121464601 | 4/17/1978 | 1680 | - | - | - | - | - | - | - | - | 320 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/25/1978 | 1730 | - | - | - | - | - | - | - | - | 300 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/17/1979 | 1700 | - | - | - | - | - | - | - | - | 313 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/24/1979 | 1640 | - | - | - | - | - | - | - | - | 310 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/10/1980 | 1690 | - | - | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/24/1980 | 1560 | - | - | - | - | - | - | - | - | 310 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/21/1981 | 1570 | - | 7.4 | - | - | - | - | - | - | 280 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/17/1981 | 1590 | - | 7.5 | - | - | - | - | - | - | 280 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 4/29/1982 | 1650 | - | 7.4 | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121464601 | 9/23/1982 | 1610 | - | 7.1 | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 1/25/1973 | 2450 | - | - | - | - | - | - | - | - | 380 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 2/20/1973 | 2520 | - | - | - | - | - | - | - | - | 380 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 3/21/1973 | 2650 | - | - | - | - | - | - | - | - | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 10/4/1973 | 2530 | - | - | - | - | - | - | - | - | 340 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 3/11/1974 | 2550 | - | - | - | - | - | - | - | - | 370 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/24/1974 | 2340 | - | - | - | - | - | - | - | - | 280 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/7/1975 | 2300 | - | - | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/16/1975 | 2230 | - | - | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/12/1976 | 2210 | - | - | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/15/1976 | 2150 | - | - | - | - | - | - | - | - | 270 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/26/1977 | 2220 | - | - | - | - | - | - | - | - | 260 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/13/1977 | 2190 | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/17/1978 | 2470 | - | - | - | - | - | - | - | - | 390 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/25/1978 | 2140 | - | - | - | - | - | - | - | - | 260 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/17/1979 | 1970 | - | - | - | - | - | - | - | - | 260 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/24/1979 | 1960 | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/10/1980 | 1820 | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/24/1980 | 1980 | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/21/1981 | 1860 | - | 7.7 | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/17/1981 | 2140 | - | 7.9 | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 4/28/1982 | 1640 | - | 7.7 | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380020121443901 | 9/24/1982 | 1690 | - | 8 | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 1/27/1971 | 2910 | - | - | - | - | - | - | - | - | 380 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 3/5/1971 | 2950 | - | - | - | - | - | - | - | - | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 3/25/1971 | 2960 | - | - | - | - | - | - | - | - | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/20/1971 | 3220 | - | - | - | - | - | - | - | - | 470 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/22/1971 | 3190 | - | - | - | - | - | - | - | - | 440 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 5/20/1971 | 3200 | - | - | - | - | - | - | - | - | 420 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 6/23/1971 | 3200 | - | - | - | - | - | - | - | - | 420 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 7/21/1971 | 2960 | - | - | - | - | - | - | - | - | 420 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 8/26/1971 | 3190 | - | - | - | - | - | - | - | - | 420 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/21/1971 | 3200 | - | - | - | - | - | - | - | - | 410 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Cations: Mg (mg/L) | Cations: Na (mg/L) | Cations: K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Anions: Cl (mg/L) 250[b] | Anions: $HCO_3$[1] (mg/L) | Anions: $NO_3$[1] (mg/L) 10[a] | Anions: F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | Trace Elements: As[2] (µg/L) 10[a] | Trace Elements: B (ug/L) 1000[c] | Trace Elements: Ba (ug/L) 1000[a] | Trace Elements: Cr (µg/L) 50[a] | Trace Elements: Cr (VI) (µg/L) | Trace Elements: Cu (mg/L) 1.3[a] | Trace Elements: Fe (ug/L) 300[b] | Trace Elements: Mn (µg/L) 50[b] | Trace Elements: Se (µg/L) 50[a] | Trace Elements: Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380025121471101 | 10/28/1971 | **3190** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 11/24/1971 | **3170** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 12/21/1971 | **3190** | - | - | - | - | - | - | - | - | **410** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 1/19/1972 | **3200** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 2/23/1972 | **3000** | - | - | - | - | - | - | - | - | **380** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 3/21/1972 | **3090** | - | - | - | - | - | - | - | - | **390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/18/1972 | **3140** | - | - | - | - | - | - | - | - | **390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 6/22/1972 | **3120** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 7/19/1972 | **3070** | - | - | - | - | - | - | - | - | **390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 8/21/1972 | **3060** | - | - | - | - | - | - | - | - | **390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/19/1972 | **3100** | - | - | - | - | - | - | - | - | **390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 11/14/1972 | **2870** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 12/19/1972 | **3120** | - | - | - | - | - | - | - | - | **390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 1/25/1973 | **2900** | - | - | - | - | - | - | - | - | **350** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 2/22/1973 | **2700** | - | - | - | - | - | - | - | - | **310** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 3/22/1973 | **2470** | - | - | - | - | - | - | - | - | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 5/23/1973 | **2890** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 10/3/1973 | **2460** | - | - | - | - | - | - | - | - | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 3/14/1974 | **2380** | - | - | - | - | - | - | - | - | **300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/12/1976 | **2390** | - | - | - | - | - | - | - | - | **320** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/15/1976 | **2260** | - | - | - | - | - | - | - | - | **320** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/27/1977 | **2330** | - | - | - | - | - | - | - | - | **330** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/13/1977 | **2300** | - | - | - | - | - | - | - | - | **320** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/25/1978 | **2200** | - | - | - | - | - | - | - | - | **320** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/17/1979 | **2280** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/20/1981 | **2460** | - | 7 | - | - | - | - | - | - | **440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/18/1981 | **1290** | - | 7.2 | - | - | - | - | - | - | **480** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 4/28/1982 | **2350** | - | 7.4 | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380025121471101 | 9/23/1982 | **2640** | - | 7.1 | - | - | - | - | - | - | **470** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 2/4/1957 | **1410** | **858** | 7.3 | 271 | 65 | 51 | 160 | 4.3 | 110 | 220 | 330 | 5.87 | ND | - | - | 390 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 8/19/1957 | **1490** | **918** | 8 | 271 | 73 | 64 | 150 | 4.5 | 130 | 250 | 330 | 5.42 | ND | - | - | 560 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 8/12/1958 | **1620** | **960** | 8 | 279 | 140 | 24 | 170 | 4.7 | 140 | **260** | 340 | 4.97 | 0.2 | - | - | 550 | - | - | - | - | ND | - | - | - |
| USGS-380043121461201 | 7/8/1959 | **1560** | **907** | 7.9 | 271 | 34 | 80 | 170 | 6 | 130 | 240 | 330 | 5.2 | 0.5 | - | - | 560 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 7/14/1960 | **1590** | **974** | 8.1 | 279 | 80 | 59 | 170 | 4.1 | 150 | **270** | 340 | 5.2 | 0.4 | - | - | 630 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/14/1960 | **1680** | **963** | 8 | 262 | 85 | 58 | 180 | 4 | 140 | **280** | 320 | 3.84 | ND | - | - | 590 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 6/12/1961 | **1740** | **1030** | 8.1 | 287 | 100 | 59 | 180 | 4.3 | 180 | **280** | 350 | 4.97 | 0.3 | - | - | 660 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 6/8/1962 | **1830** | **1090** | 8.2 | 287 | 85 | 68 | 200 | 4.4 | 200 | **300** | 350 | 5.2 | 0.3 | - | - | 670 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 6/6/1963 | **1290** | **872** | 8.3 | 248 | 60 | 54 | 180 | 4.8 | 140 | 240 | 290 | 6.1 | 0.1 | - | - | 600 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 6/24/1964 | **1480** | **872** | 8 | 279 | 69 | 58 | 150 | 4.5 | 110 | 220 | 340 | 8.81 | - | - | - | 400 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/15/1966 | **1500** | - | - | - | - | - | - | - | - | 220 | - | 7.23 | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 8/23/1967 | **1540** | - | - | - | - | - | - | - | - | 220 | - | **10.4** | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 7/31/1968 | **1460** | - | - | - | - | - | - | - | - | 230 | - | **10.6** | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380043121461201 | 7/20/1972 | **1730** | - | - | - | - | - | - | - | - | **270** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 8/23/1972 | **1720** | - | - | - | - | - | - | - | - | **270** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/20/1972 | **1670** | - | - | - | - | - | - | - | - | **270** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 11/15/1972 | **1540** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 12/20/1972 | **1610** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 1/24/1973 | **1620** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 2/20/1973 | **1610** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 3/22/1973 | **1620** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 5/24/1973 | **1580** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 8/3/1973 | **1700** | - | 7.6 | 271 | - | - | 180 | - | - | **260** | 330 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 10/4/1973 | **1610** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 3/12/1974 | **1610** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/24/1974 | **1550** | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/8/1975 | **1530** | - | - | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 6/24/1975 | **1680** | **950** | 7.3 | 271 | 77 | 55 | 160 | 4.9 | 140 | 220 | 330 | **12.4** | - | - | - | 500 | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/17/1975 | **1530** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/14/1976 | **1570** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/16/1976 | **1520** | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/26/1977 | **1530** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 7/20/1977 | **1550** | - | 7.3 | 287 | - | - | 160 | - | - | 250 | 350 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/13/1977 | **1560** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/25/1978 | **1630** | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/17/1979 | **1650** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/24/1979 | **1630** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/10/1980 | **1740** | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/26/1980 | **1680** | - | - | - | - | - | - | - | - | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/20/1981 | **1690** | - | 7 | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/17/1981 | **2130** | - | 7.4 | - | - | - | - | - | - | **360** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 4/28/1982 | **1750** | - | 7.2 | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380043121461201 | 9/24/1982 | **1730** | - | 7.4 | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/19/1972 | **2530** | - | - | - | - | - | - | - | - | **480** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 6/22/1972 | **2480** | - | - | - | - | - | - | - | - | **490** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 7/19/1972 | **2460** | - | - | - | - | - | - | - | - | **480** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 8/22/1972 | **2380** | - | - | - | - | - | - | - | - | **480** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/19/1972 | **2330** | - | - | - | - | - | - | - | - | **470** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 11/14/1972 | **2230** | - | - | - | - | - | - | - | - | **440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 12/19/1972 | **2300** | - | - | - | - | - | - | - | - | **440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 1/24/1973 | **2220** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 2/22/1973 | **2200** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 3/21/1973 | **2330** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 5/23/1973 | **2320** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 10/3/1973 | **2260** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Shallow** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380048121470701 | 3/11/1974 | **2340** | - | - | - | - | - | - | - | - | **420** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/25/1974 | **2380** | - | - | - | - | - | - | - | - | **410** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/8/1975 | **2470** | - | - | - | - | - | - | - | - | **490** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/16/1975 | **2150** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/12/1976 | **2340** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/15/1976 | **2500** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/27/1977 | **2490** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/20/1978 | **2860** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/25/1978 | **2420** | - | - | - | - | - | - | - | - | **320** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/24/1979 | **2240** | - | - | - | - | - | - | - | - | **300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/10/1980 | **2030** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/24/1980 | **2270** | - | - | - | - | - | - | - | - | **380** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 4/21/1981 | **2160** | - | 7.1 | - | - | - | - | - | - | **410** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121470701 | 9/17/1981 | **2710** | - | 7.3 | - | - | - | - | - | - | **500** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Deep** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-375437121355601 | 5/1/1979 | 900 | **588** | 7.8 | 270 | 43 | 19 | 140 | 1.5 | 83 | 86 | - | ND | 0.2 | 100 | 2 | **2600** | - | - | - | - | 20 | **140** | - | - |
| USGS-375600121410901 | 5/2/1979 | **1280** | **883** | 7.5 | 240 | - | - | - | - | 180 | 160 | - | 7.2 | 0.3 | - | - | **1500** | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 5/20/1971 | **2760** | - | - | - | - | - | - | - | - | **300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 6/23/1971 | **2800** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 7/20/1971 | **2580** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 8/26/1971 | **2690** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/22/1971 | **2800** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 10/28/1971 | **2800** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 11/23/1971 | **2780** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 12/21/1971 | **2820** | - | - | - | - | - | - | - | - | **290** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 1/19/1972 | **2870** | - | - | - | - | - | - | - | - | **300** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 3/21/1972 | **2780** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/18/1972 | **2800** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 6/21/1972 | **2790** | - | - | - | - | - | - | - | - | **310** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 7/19/1972 | **2790** | - | - | - | - | - | - | - | - | **290** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 8/22/1972 | **2780** | - | - | - | - | - | - | - | - | **290** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/19/1972 | **2800** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 11/14/1972 | **2940** | - | - | - | - | - | - | - | - | **350** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 12/19/1972 | **3180** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 1/24/1973 | **3130** | - | - | - | - | - | - | - | - | **380** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 2/22/1973 | **2940** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 3/21/1973 | **2960** | - | - | - | - | - | - | - | - | **470** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 5/23/1973 | **2730** | - | - | - | - | - | - | - | - | **280** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 10/4/1973 | **2830** | - | - | - | - | - | - | - | - | **270** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 3/11/1974 | **2750** | - | - | - | - | - | - | - | - | **660** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Deep** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380019121473401 | 9/24/1974 | **2820** | - | - | - | - | - | - | - | - | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/7/1975 | **2810** | - | - | - | - | - | - | - | - | **270** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/16/1975 | **2830** | - | - | - | - | - | - | - | - | **550** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/16/1976 | **2740** | - | - | - | - | - | - | - | - | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/27/1977 | **2920** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/13/1977 | **2830** | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/21/1978 | **2640** | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/25/1978 | **2720** | - | - | - | - | - | - | - | - | **590** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/17/1979 | **2590** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/24/1979 | **2440** | - | - | - | - | - | - | - | - | 90 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/11/1980 | **2450** | - | - | - | - | - | - | - | - | 190 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/24/1980 | **2330** | - | - | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/20/1981 | **2500** | - | 7.4 | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/17/1981 | **2470** | - | 7.6 | - | - | - | - | - | - | **440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 4/28/1982 | **2520** | - | 7.4 | - | - | - | - | - | - | 220 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380019121473401 | 9/23/1982 | **2690** | - | 6.9 | - | - | - | - | - | - | **580** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 12/23/1970 | **1900** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 1/27/1971 | **1940** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 3/4/1971 | **1910** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 3/25/1971 | **1920** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 4/21/1971 | **2020** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 5/20/1971 | **2020** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 6/23/1971 | **2000** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 7/21/1971 | **1860** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 8/25/1971 | **1890** | - | - | - | - | - | - | - | - | 80 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 9/21/1971 | **1980** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 10/28/1971 | **2000** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 11/23/1971 | **2030** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 12/20/1971 | **2080** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 1/18/1972 | **2120** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 2/22/1972 | **2080** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 3/21/1972 | **2050** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 4/19/1972 | **2010** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 6/21/1972 | **1990** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 7/18/1972 | **2000** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 8/22/1972 | **1970** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 9/19/1972 | **1980** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 11/14/1972 | **1960** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 12/19/1972 | 421 | - | - | - | - | - | - | - | - | 44 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 1/24/1973 | **2050** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 2/22/1973 | **2070** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 3/22/1973 | **2090** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity [1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$ [1] (mg/L) | $NO_3$ [1] (mg/L) | F (mg/L) | Al (µg/L) | As [2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Deep** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380024121490801 | 5/23/1973 | **1970** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 10/3/1973 | **2020** | - | - | - | - | - | - | - | - | 95 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 3/11/1974 | **2060** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 9/24/1974 | **1960** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 4/8/1975 | **2060** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 9/17/1975 | **1930** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490801 | 4/13/1976 | **2000** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 9/13/1977 | **1910** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 4/20/1978 | **1980** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 9/25/1978 | **2010** | - | - | - | - | - | - | - | - | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 4/17/1979 | **1950** | - | - | - | - | - | - | - | - | 114 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 9/24/1979 | **1880** | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 4/10/1980 | **2030** | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 9/24/1980 | **1920** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 4/21/1981 | **1990** | - | 7.5 | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 9/17/1981 | 103 | - | 7.4 | - | - | - | - | - | - | 130 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 4/29/1982 | **1970** | - | 7.4 | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121490803 | 9/23/1982 | **1930** | - | 7 | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 9/20/1972 | **2900** | - | - | - | - | - | - | - | - | **490** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 11/15/1972 | **2700** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 12/20/1972 | **2720** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 1/24/1973 | **2750** | - | - | - | - | - | - | - | - | **450** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 2/20/1973 | **2730** | - | - | - | - | - | - | - | - | **440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 3/22/1973 | **2700** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 10/4/1973 | **2640** | - | - | - | - | - | - | - | - | **420** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 3/12/1974 | **2560** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 9/24/1974 | **2560** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 4/8/1975 | **2550** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 9/17/1975 | **2540** | - | - | - | - | - | - | - | - | **410** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 4/14/1976 | **3250** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 9/16/1976 | **2560** | - | - | - | - | - | - | - | - | **410** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 4/26/1977 | **2630** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 9/13/1977 | **2790** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 9/25/1978 | **2730** | - | - | - | - | - | - | - | - | **370** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380048121460901 | 4/17/1979 | **3330** | - | - | - | - | - | - | - | - | **640** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380055121374001 | 6/5/1979 | **1330** | **711** | 8.1 | 270 | 63 | 35 | 140 | 3.8 | 73 | 200 | - | 0.02 | 0.0001 | - | - | 500 | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/19/1972 | 888 | - | - | - | - | - | - | - | - | 110 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 6/21/1972 | 605 | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 7/20/1972 | 897 | - | - | - | - | - | - | - | - | 140 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 8/22/1972 | **1460** | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/19/1972 | **1480** | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity[1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$[1] | $NO_3$[1] | F | Al | As[2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2[a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50[a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Deep** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-380102121480801 | 11/14/1972 | **1440** | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 5/23/1973 | **1080** | - | - | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 10/3/1973 | **1500** | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 3/11/1974 | **962** | - | - | - | - | - | - | - | - | 94 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/24/1974 | **1480** | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/8/1975 | **1230** | - | - | - | - | - | - | - | - | 140 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/17/1975 | 573 | - | - | - | - | - | - | - | - | 96 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/12/1976 | 826 | - | - | - | - | - | - | - | - | 150 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/26/1977 | **1200** | - | - | - | - | - | - | - | - | 230 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/13/1977 | **1110** | - | - | - | - | - | - | - | - | 240 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/20/1978 | **1240** | - | - | - | - | - | - | - | - | 150 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/25/1978 | **1490** | - | - | - | - | - | - | - | - | 160 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/17/1979 | **1440** | - | - | - | - | - | - | - | - | 155 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/24/1979 | 876 | - | - | - | - | - | - | - | - | 200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 4/10/1980 | **1360** | - | - | - | - | - | - | - | - | 140 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380102121480801 | 9/25/1980 | **1620** | - | - | - | - | - | - | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380218121380901 | 6/5/1979 | **2400** | **1324** | 7.9 | 190 | 84 | 40 | 340 | 4.7 | 51 | **610** | - | 0.02 | 0.0001 | 100 | 1 | **1800** | - | - | - | - | 10 | **320** | - | - |
| **Composite** | | | | | | | | | | | | | | | | | | | | | | | | | |
| USGS-375228121382001 | 7/18/1974 | **1120** | **610** | 7.9 | 282 | 32 | 16 | 180 | 3.1 | 110 | 91 | 330 | 0.023 | - | - | 1 | **2500** | - | ND | - | - | **580** | **300** | - | 490 |
| USGS-375228121382001 | 6/15/1976 | **1000** | - | 7.9 | 262 | - | - | 170 | - | - | 96 | 320 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-375619121353001 | 5/2/1979 | **916** | **561** | 7.7 | 300 | 35 | 19 | 140 | 1.3 | 66 | 90 | - | ND | 0.1 | - | - | **2400** | - | - | - | - | - | - | - | - |
| **Unknown** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01N02E01F001M | 5/1/1979 | - | **1080** | - | 250 | 120 | 54 | 150 | 6.2 | **270** | 190 | - | **37** | 0.5 | - | - | 700 | - | - | - | - | - | - | - | - |
| 01N02E03K001M | 5/1/1979 | - | **1600** | - | 220 | 130 | 52 | 320 | 2.7 | **540** | **280** | - | **24** | 1.2 | - | 1 | **2400** | - | - | - | - | 20 | 0.01 | - | - |
| 01N02E13H001M | 7/19/1974 | **1700** | **1090** | 7.9 | 246 | 134 | 55 | 152 | 3.5 | **307** | 212 | - | **48** | - | - | - | **1100** | - | - | - | - | - | - | - | - |
| 01N02E13H001M | 6/15/1976 | **1680** | - | 7.9 | 210 | - | - | 138 | - | - | 194 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N02E13H001M | 8/22/1978 | **1700** | - | 8.2 | 268 | - | - | 154 | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N02E13H001M | 7/24/1980 | **1710** | - | 8.5 | 192 | 134 | 58 | 158 | - | - | 210 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N02E13H001M | 11/17/1982 | **1690** | - | 7.7 | 260 | 127 | 57 | 157 | 3.3 | - | 211 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N02E13H001M | 8/14/1984 | **1620** | **1050** | 8 | 201 | 88 | 54 | 155 | 3.3 | **291** | 212 | - | - | - | - | - | **1200** | - | - | - | - | - | - | - | - |
| 01N02E13H001M | 7/15/1988 | 841 | - | 8.3 | 189 | 60 | 30 | 85 | - | - | 72 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01N02E24M001M | 6/15/1982 | **968** | **643** | 8 | 256 | 70 | 33 | 97 | 3.2 | 131 | 85 | - | - | - | - | - | **1900** | - | - | - | - | - | - | - | - |
| 01N02E24R002M | 6/15/1982 | **1450** | **891** | 8 | 282 | 83 | 52 | 114 | 4.4 | 124 | 187 | - | - | - | - | - | **2100** | - | - | - | - | - | - | - | - |
| 01N02E25F001M | 5/1/1979 | - | **886** | - | 310 | 98 | 54 | 110 | 1.8 | 130 | 170 | - | **30** | 0.2 | - | 1 | **1800** | - | - | - | - | 10 | 0.14 | - | - |
| 01N02E25G001M | 11/19/1980 | **1270** | - | 7.9 | 282 | 99 | 52 | 110 | - | - | 145 | - | - | - | - | - | **1400** | - | - | - | - | - | - | - | - |
| 01N02E25G001M | 5/26/1981 | **1290** | - | 8.1 | 314 | 96 | 51 | 108 | - | - | 148 | - | - | - | - | - | **1600** | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01N02E25G001M | 6/2/1982 | **1190** | **698** | 8.1 | 258 | 59 | 46 | 104 | 1.5 | 126 | 128 | - | - | - | - | - | **1700** | - | - | - | - | - | - | - | - |
| 01N02E26H001M | 11/19/1980 | **1740** | - | 8 | 274 | 137 | 66 | 140 | - | - | **251** | - | - | - | - | - | **1300** | - | - | - | - | - | - | - | - |
| 01N02E26H001M | 5/7/1981 | **1560** | - | 8.2 | 245 | 115 | 56 | 133 | - | - | 232 | - | - | - | - | - | **2100** | - | - | - | - | - | - | - | - |
| 01N03E06N001M | 10/19/1987 | **1080** | **630** | 7.6 | 240 | 75 | 34 | 110 | 2.4 | 150 | 94 | - | - | 0.2 | - | 1 | - | 50 | 1 | - | - | 60 | 1 | 1 | 30 |
| 01N03E06N002M | 5/5/1988 | **986** | **660** | 7.6 | 230 | 62 | 33 | 110 | 3.2 | 150 | 64 | - | - | 0.2 | - | 1 | - | 30 | 0.001 | - | - | 50 | 0.01 | 1 | 20 |
| 01N03E09E001M | 5/2/1979 | - | **1070** | - | 250 | 92 | 52 | 180 | 1.5 | 210 | **260** | - | **21** | 0.2 | - | 1 | **2000** | - | - | - | - | 10 | 0.001 | - | - |
| 01N03E13C001M | 5/2/1979 | - | **604** | - | 300 | 35 | 19 | 140 | 1.3 | 66 | 90 | - | **100** | 0.1 | - | - | **2400** | - | - | - | - | - | - | - | - |
| 01N03E18D001M | 9/17/1981 | **1190** | **836** | 7.7 | 246 | 98 | 53 | 99 | - | 167 | 134 | - | - | 0.4 | - | - | - | - | - | - | - | 0.13 | 1 | - | 20 |
| 01N03E18G001M | 5/2/1979 | - | **885** | - | 240 | - | - | - | - | 180 | 160 | - | **32** | 0.3 | - | - | **1500** | - | - | - | - | - | - | - | - |
| 01N03E25C001M | 5/1/1979 | - | **586** | - | 270 | 43 | 19 | 140 | 1.5 | 83 | 86 | - | 0.1 | 0.2 | - | 1 | **2600** | - | - | - | - | 20 | 0.14 | - | - |
| 01N03E26C002M | 11/20/1980 | **2120** | - | 8.2 | 521 | 47 | 46 | 378 | - | - | 250 | - | - | - | - | - | **8400** | - | - | - | - | - | - | - | - |
| 01N03E27Q003M | 11/19/1980 | **2040** | - | 8.3 | 554 | 52 | 38 | 361 | - | - | 208 | - | - | - | - | - | **8000** | - | - | - | - | - | - | - | - |
| 01N03E27Q003M | 5/7/1981 | **2020** | - | 8.4 | 547 | 54 | 39 | 360 | - | - | 210 | - | - | - | - | - | **8400** | - | - | - | - | - | - | - | - |
| 01N03E27R001M | 5/1/1979 | - | **1200** | - | 310 | 94 | 70 | 180 | 1 | 190 | **330** | - | 0.1 | 0.6 | - | - | **3100** | - | - | - | - | - | - | - | - |
| 01N03E28Q001M | 11/19/1980 | **1560** | - | 8.2 | 360 | 92 | 38 | 194 | - | - | 196 | - | - | - | - | - | **3000** | - | - | - | - | - | - | - | - |
| 01N03E28Q001M | 5/26/1981 | **1580** | - | 8.1 | 362 | 91 | 39 | 193 | - | - | 203 | - | - | - | - | - | **3000** | - | - | - | - | - | - | - | - |
| 01N03E29Q001M | 11/19/1980 | **1400** | - | 8.2 | 272 | 107 | 44 | 130 | - | - | 216 | - | - | - | - | - | **2600** | - | - | - | - | - | - | - | - |
| 01N03E29Q001M | 5/7/1981 | **1360** | - | 8.1 | 232 | 105 | 43 | 128 | 2.2 | - | 220 | - | - | - | - | - | **2800** | - | - | - | - | - | - | - | - |
| 01N03E29Q001M | 6/2/1982 | **1360** | **825** | 7.9 | 226 | 78 | 43 | 129 | 2.3 | 140 | 223 | - | - | - | - | - | **2900** | - | - | - | - | - | - | - | - |
| 01N03E30L001M | 5/2/1979 | - | **1280** | - | 480 | 100 | 68 | 260 | 2.1 | 180 | **260** | - | **53** | 0.4 | - | 1 | **3800** | - | - | - | - | 30 | 1 | - | - |
| 01N03E30L001M | 11/19/1980 | **2040** | - | 8.2 | 498 | 105 | 70 | 248 | - | - | **272** | - | - | - | - | - | **3400** | - | - | - | - | - | - | - | - |
| 01N03E30L001M | 5/15/1981 | **2060** | - | 8.2 | 474 | 108 | 72 | 253 | - | - | **295** | - | - | - | - | - | **3800** | - | - | - | - | - | - | - | - |
| 01N03E30L002M | 6/14/1982 | **1910** | **1240** | 8.1 | 405 | 86 | 69 | 202 | 2.7 | 154 | **272** | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |
| 01N03E30M001M | 6/14/1982 | **1670** | **1060** | 7.9 | 374 | 97 | 51 | 193 | 3.1 | 139 | 244 | - | - | - | - | - | **3800** | - | - | - | - | - | - | - | - |
| 01N03E31C001M | 11/19/1980 | **1390** | - | 8.2 | 381 | 60 | 36 | 207 | - | - | 144 | - | - | - | - | - | **4100** | - | - | - | - | - | - | - | - |
| 01N03E31C001M | 5/7/1981 | **1410** | - | 8.4 | 399 | 60 | 36 | - | - | - | 148 | - | - | - | - | - | **4500** | - | - | - | - | - | - | - | - |
| 01N03E31C001M | 6/2/1982 | **1400** | **801** | 8.1 | 355 | 31 | 35 | 212 | 1.8 | 134 | 150 | - | - | - | - | - | **4200** | - | - | - | - | - | - | - | - |
| 01N03E32C001M | 11/18/1980 | **2340** | - | - | 323 | 164 | 54 | 256 | - | - | **450** | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |
| 01N03E32C001M | 5/7/1981 | **2110** | - | 8 | 331 | 151 | 48 | - | - | - | **385** | - | - | - | - | - | **3300** | - | - | - | - | - | - | - | - |
| 01N03E33J001M | 11/20/1980 | **1680** | - | 8.2 | 349 | 74 | 50 | 222 | - | - | **270** | - | - | - | - | - | **2600** | - | - | - | - | - | - | - | - |
| 01N03E33J001M | 5/15/1981 | **1610** | - | 8.3 | 338 | 72 | 48 | - | - | - | **260** | - | - | - | - | - | **2800** | - | - | - | - | - | - | - | - |
| 01N03E33J001M | 6/10/1982 | **1620** | **968** | 8.1 | 326 | 72 | 50 | 206 | 0.4 | 98 | **275** | - | - | - | - | - | **2800** | - | - | - | - | - | - | - | - |
| 01N03E34A001M | 11/20/1980 | **1920** | - | 8 | 283 | 88 | 68 | 180 | - | - | **346** | - | - | - | - | - | **2900** | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01N03E34A001M | 5/26/1981 | **1690** | - | 8.3 | 313 | 88 | 65 | 176 | - | - | **280** | - | - | - | - | - | **2700** | - | - | - | - | - | - | - | - |
| 01N03E34A001M | 6/2/1982 | **1660** | **1080** | 8.1 | 285 | 73 | 65 | 176 | 1.4 | 170 | **291** | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |
| 01N03E35N001M | 11/20/1980 | **1440** | - | 8.3 | 458 | 46 | 37 | 230 | - | - | 136 | - | - | - | - | - | **3400** | - | - | - | - | - | - | - | - |
| 01N03E35N001M | 5/26/1981 | **1560** | - | 8.4 | 465 | 53 | 42 | - | - | - | 164 | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |
| 01S03E02N001M | 6/9/1982 | **1120** | **722** | 8.3 | 280 | 29 | 14 | 206 | 2.2 | 119 | 128 | - | - | - | - | - | **3800** | - | - | - | - | - | - | - | - |
| 01S03E02P001M | 11/5/1980 | **7790** | - | 8 | 356 | 252 | 140 | - | - | - | **2320** | - | - | - | - | - | **15000** | - | - | - | - | - | - | - | - |
| 01S03E02P001M | 5/5/1981 | **7420** | - | 7.9 | 363 | 240 | 149 | - | - | - | **2120** | - | - | - | - | - | **15000** | - | - | - | - | - | - | - | - |
| 01S03E03H001M | 6/10/1982 | **2060** | **1280** | 8.2 | 525 | 50 | 140 | 305 | 0.6 | 190 | **260** | - | - | - | - | - | **4800** | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 7/18/1974 | - | - | 8.4 | 279 | - | - | - | 3.1 | 114 | 91 | - | 0.02 | - | - | ND | **2500** | - | ND | - | - | - | **300** | - | 490 |
| 01S03E03M001M | 6/15/1976 | - | - | 8.3 | 258 | - | - | - | - | - | 96 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 8/22/1978 | - | - | 8.5 | 287 | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 7/24/1980 | - | - | **8.8** | 279 | - | - | - | - | - | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 11/4/1980 | - | - | 8.5 | 281 | - | 16 | - | - | - | 102 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 5/6/1981 | - | - | 8.4 | 280 | - | 15 | - | - | - | 101 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 11/17/1982 | - | - | 8.1 | 287 | - | 17 | - | 2.2 | - | 111 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E03M001M | 8/14/1984 | - | **691** | 8.4 | 246 | - | 19 | - | 2.2 | 157 | - | - | - | - | - | - | **3100** | - | - | - | - | - | - | - | - |
| 01S03E03M002M | 6/10/1982 | - | **753** | - | 310 | - | 34 | - | 0.7 | 90 | 146 | - | - | - | - | - | **2700** | - | - | - | - | - | - | - | - |
| 01S03E03M002M | 6/10/1982 | **1190** | **753** | 8.1 | 310 | 71 | 34 | 144 | 0.7 | 90 | 146 | - | - | - | - | - | **2700** | - | - | - | - | - | - | - | - |
| 01S03E03N002M | 11/6/1980 | **1310** | - | 8.3 | 333 | 90 | 51 | - | - | - | 155 | - | - | - | - | - | **2000** | - | - | - | - | - | - | - | - |
| 01S03E03N002M | 5/5/1981 | **1100** | - | 8.3 | 302 | 44 | 23 | 167 | - | - | 112 | - | - | - | - | - | **3100** | - | - | - | - | - | - | - | - |
| 01S03E03N003M | 11/6/1980 | **1030** | - | 8.5 | 278 | 28 | 12 | - | - | - | 98 | - | - | - | - | - | **3400** | - | - | - | - | - | - | - | - |
| 01S03E03N003M | 5/5/1981 | **1020** | - | 8.4 | 279 | 28 | 12 | 184 | - | - | 100 | - | - | - | - | - | **3400** | - | - | - | - | - | - | - | - |
| 01S03E03P001M | 6/8/1982 | **1950** | **1250** | 7.9 | 285 | 103 | 58 | 208 | 1.1 | 176 | **375** | - | - | - | - | - | **2900** | - | - | - | - | - | - | - | - |
| 01S03E03Q001M | 6/10/1982 | **2300** | **1470** | 8 | 286 | 125 | 71 | 257 | 1 | 184 | **492** | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |
| 01S03E03Q002M | 6/10/1982 | **3450** | **2430** | 8 | 376 | 138 | 113 | 439 | 0.7 | **412** | **738** | - | - | - | - | - | **6500** | - | - | - | - | - | - | - | - |
| 01S03E04Q001M | 11/17/1980 | 848 | - | 8.1 | 219 | 56 | 24 | 90 | 1.7 | - | 93 | - | - | - | - | - | **1900** | - | - | - | - | - | - | - | - |
| 01S03E04Q001M | 5/26/1981 | 842 | - | 8.2 | 219 | 54 | 23 | 90 | 1.6 | - | 90 | - | - | - | - | - | **2100** | - | - | - | - | - | - | - | - |
| 01S03E09A001M | 6/5/1979 | - | **642** | - | 270 | 64 | 29 | 110 | 1.9 | 84 | 140 | - | - | 0.3 | - | - | **1900** | - | - | - | - | - | - | - | - |
| 01S03E09A002M | 11/17/1980 | **1110** | - | 8.2 | 210 | 67 | 29 | 116 | - | - | 152 | - | - | - | - | - | **1200** | - | - | - | - | - | - | - | - |
| 01S03E09A002M | 5/5/1981 | 846 | - | 8.2 | 170 | 52 | 22 | 88 | 2 | - | 120 | - | - | - | - | - | **1200** | - | - | - | - | - | - | - | - |
| 01S03E10C001M | 6/8/1982 | **1200** | **773** | 8.2 | 265 | 66 | 30 | 153 | 1.9 | 119 | 161 | - | - | - | - | - | **2800** | - | - | - | - | - | - | - | - |
| 01S03E10C002M | 6/9/1982 | **2610** | **1750** | 8.1 | 416 | 152 | 88 | 287 | 1.1 | **292** | **460** | - | - | - | - | - | **4200** | - | - | - | - | - | - | - | - |
| 01S03E10G001M | 11/17/1980 | **2230** | - | 8.2 | 330 | 48 | 29 | 394 | - | - | **321** | - | - | - | - | - | **8400** | - | - | - | - | - | - | - | - |
| 01S03E10G001M | 5/5/1981 | **2260** | - | 8.2 | 331 | 51 | 74 | - | - | - | **330** | - | - | - | - | - | **9300** | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Ca | Mg | Na | K | $SO_4$ | Cl | $HCO_3$ [1] | $NO_3$ [1] | F | Al | As [2] | B | Ba | Cr | Cr (VI) | Cu | Fe | Mn | Se | Zn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
| | | (µmho/cm) | (mg/L) | | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (µg/L) | (µg/L) | (ug/L) | (ug/L) | (µg/L) | (µg/L) | (mg/L) | (ug/L) | (µg/L) | (µg/L) | (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01S03E10K001M | 11/17/1980 | 623 | - | 8.2 | 200 | 34 | 19 | 72 | 2 | - | 56 | - | - | - | - | - | 500 | - | - | - | - | - | - | - | - |
| 01S03E10K001M | 5/6/1981 | 715 | - | 8.4 | 215 | 39 | 22 | 80 | 2.1 | - | 74 | - | - | - | - | - | 600 | - | - | - | - | - | - | - | - |
| 01S03E14D001M | 11/3/1980 | **1030** | - | 8.5 | 238 | 20 | 8 | - | - | - | 144 | - | - | - | - | - | **2300** | - | - | - | - | - | - | - | - |
| 01S03E14D001M | 5/5/1981 | **1020** | - | 8.2 | 236 | 20 | 8 | - | - | - | 142 | - | - | - | - | - | **2200** | - | - | - | - | - | - | - | - |
| 01S03E14N001M | 6/8/1982 | **4800** | **2980** | 8.3 | 563 | 14 | 7 | 1060 | 6.3 | 170 | **1200** | - | - | - | - | - | **36000** | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 8/9/1973 | - | - | - | 272 | - | 22 | - | 5.5 | 160 | **697** | - | 2.1 | - | - | - | **6500** | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 6/24/1975 | - | - | 8.1 | - | - | - | - | - | - | **778** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 7/20/1977 | - | - | 7.9 | 224 | - | - | - | - | - | **1210** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 8/3/1979 | - | - | 8.5 | 274 | - | - | - | - | - | **358** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 11/3/1980 | - | - | - | 239 | - | 11 | - | - | - | **462** | - | - | - | - | - | **4200** | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 5/26/1981 | - | - | 8.4 | 263 | - | 8 | - | - | - | **308** | - | - | - | - | - | **3400** | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 8/3/1981 | - | - | 8 | 249 | - | 15 | - | - | - | **575** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 6/8/1982 | - | **1160** | 8.2 | 260 | - | 12 | - | 3 | 106 | **419** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 8/16/1983 | - | **1060** | 8.1 | 258 | - | 11 | - | 2.8 | 102 | **363** | - | - | - | - | - | **3800** | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 8/1/1985 | - | - | **8.6** | - | - | 12 | - | - | - | **395** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 7/28/1987 | - | - | - | 261 | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E15A001M | 9/14/1989 | - | - | 8.4 | 262 | - | 9 | - | - | - | **286** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E22H001M | 11/4/1980 | - | - | 8.5 | 288 | - | - | - | - | - | **251** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S03E22H001M | 11/4/1980 | **1460** | - | 8.5 | 288 | 24 | 23 | - | - | - | **251** | - | - | - | - | - | **6400** | - | - | - | - | - | - | - | - |
| 01S03E22H001M | 5/6/1981 | **1280** | - | 8.4 | 277 | 19 | 18 | - | - | - | 205 | - | - | - | - | - | **5400** | - | - | - | - | - | - | - | - |
| 01S03E22H002M | 11/4/1980 | 898 | - | 8.4 | 236 | 21 | 14 | - | - | - | 115 | - | - | - | - | - | **3100** | - | - | - | - | - | - | - | - |
| 01S03E22H002M | 5/28/1981 | 853 | - | 8.4 | 237 | 20 | 14 | - | - | - | 99 | - | - | - | - | - | **2800** | - | - | - | - | - | - | - | - |
| 01S03E23E001M | 11/5/1980 | **3310** | - | 8.3 | 289 | 49 | 43 | - | - | - | **858** | - | - | - | - | - | **14000** | - | - | - | - | - | - | - | - |
| 01S03E23E001M | 5/5/1981 | **3300** | - | 8.1 | 283 | 48 | 43 | - | - | - | **850** | - | - | - | - | - | **13000** | - | - | - | - | - | - | - | - |
| 01S03E23J001M | 11/5/1980 | **9450** | - | 8.2 | 781 | 29 | 44 | - | - | - | **2760** | - | - | - | - | - | **82000** | - | - | - | - | - | - | - | - |
| 01S03E23J001M | 5/5/1981 | **6570** | - | 8.3 | 847 | 11 | 16 | - | - | - | **1600** | - | - | - | - | - | **60000** | - | - | - | - | - | - | - | - |
| 01S03E26A001M | 11/3/1980 | **3420** | - | 8 | 236 | 145 | 99 | - | - | - | **875** | - | - | - | - | - | **3200** | - | - | - | - | - | - | - | - |
| 01S03E26A001M | 5/27/1981 | **3460** | - | 8.1 | 229 | 150 | 104 | - | - | - | **912** | - | - | - | - | - | **3300** | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 4/12/1978 | 768 | - | 7.8 | 247 | - | - | 76 | - | - | 77 | - | 0.3 | - | - | - | 600 | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 10/17/1978 | 615 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 4/17/1979 | 647 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 10/16/1979 | 647 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 4/9/1980 | 618 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 11/24/1980 | 559 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 500 | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 4/8/1981 | 532 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 11/9/1981 | 564 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E09N002M | 5/20/1982 | 574 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17A001M | 11/4/1980 | **2480** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC | TDS | pH | Total Alkalinity [1] | Cations | | | | Anions | | | | | Trace Elements | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EC (µmho/cm) | TDS (mg/L) | pH | Total Alkalinity [1] (mg/L) | Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | $SO_4$ (mg/L) | Cl (mg/L) | $HCO_3$ [1] (mg/L) | $NO_3$ [1] (mg/L) | F (mg/L) | Al (µg/L) | As [2] (µg/L) | B (ug/L) | Ba (ug/L) | Cr (µg/L) | Cr (VI) (µg/L) | Cu (mg/L) | Fe (ug/L) | Mn (µg/L) | Se (µg/L) | Zn (ug/L) |
| | | 900[b] | 500[b] | 6.5/8.5 [b] | | | | | | 250[b] | 250[b] | | 10[a] | 2 [a] | 1000[a] | 10[a] | 1000[c] | 1000[a] | 50 [a] | | 1.3[a] | 300[b] | 50[b] | 50[a] | 5000[a] |
| **Unknown** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01S04E17A001M | 4/8/1981 | **4400** | **2910** | 7.4 | 209 | 208 | 84 | 602 | 2.6 | **620** | **998** | - | - | - | - | - | **5000** | - | - | - | - | - | - | - | - |
| 01S04E17A001M | 11/9/1981 | **2540** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **4200** | - | - | - | - | - | - | - | - |
| 01S04E17A001M | 5/20/1982 | 696 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 4/12/1978 | **5630** | - | 8 | 393 | - | - | 729 | - | - | **1140** | - | **16** | - | - | - | **6300** | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 10/17/1978 | **6140** | **4310** | 8 | 493 | 391 | 147 | 835 | 6.8 | **973** | **1350** | - | **15** | - | - | - | **6500** | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 4/17/1979 | **6350** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 10/16/1979 | **2830** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **3600** | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 4/9/1980 | **5050** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **7200** | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 11/4/1980 | **1390** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 4/8/1981 | **5080** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **6300** | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 11/9/1981 | **1440** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17A002M | 5/20/1982 | **6100** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 4/12/1978 | **2260** | - | 8 | 161 | - | - | 208 | - | - | 130 | - | 2 | - | - | - | **2600** | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 10/17/1978 | **1870** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 4/17/1979 | **2400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 10/16/1979 | **1970** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 4/9/1980 | **2140** | **1760** | 7.8 | 169 | 243 | 52 | 190 | 1.4 | **848** | 147 | - | - | - | - | - | **2800** | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 11/4/1980 | **1950** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 4/8/1981 | **2270** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 11/9/1981 | **1620** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E17C001M | 5/20/1982 | **1750** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 4/12/1978 | **2750** | - | - | - | - | - | - | - | - | **499** | - | 3.1 | - | - | - | **7500** | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 10/17/1978 | **2640** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 4/17/1979 | **2700** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 10/15/1979 | **2530** | **1520** | 8.5 | 366 | 52 | 31 | 461 | 3 | 220 | **487** | - | - | - | - | - | **8800** | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 4/9/1980 | **2500** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **9000** | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 11/25/1980 | **2470** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **8700** | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 4/8/1981 | **2360** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 11/5/1981 | **2210** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 01S04E20K001M | 5/20/1982 | **2170** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 8/3/1973 | **1650** | - | 8.1 | 272 | - | - | 176 | - | - | **258** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 6/24/1975 | **1520** | **950** | 8.2 | 269 | 77 | 55 | 158 | 4.9 | 144 | 215 | - | **55** | - | - | - | 500 | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 7/20/1977 | **1560** | - | 8 | 287 | - | - | 156 | - | - | 250 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 8/3/1979 | **1650** | - | 8.5 | 282 | 88 | 62 | 174 | - | - | 241 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 8/3/1981 | **1730** | - | 7.8 | 284 | 86 | 62 | 187 | - | - | 233 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 8/16/1983 | **1640** | - | 8.2 | 275 | 80 | 58 | 180 | - | - | 219 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 7/25/1985 | **1650** | **1070** | 8.4 | 274 | 87 | 64 | 198 | 5.2 | 218 | 208 | - | - | - | - | - | 700 | - | - | - | - | - | - | - | - |
| 02N02E20A001M | 9/14/1989 | **1570** | - | 8.2 | 280 | 77 | 56 | 174 | 4.2 | - | 182 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 02N02E36M001M | 6/5/1979 | - | **931** | - | 310 | 150 | 60 | 95 | 4.3 | 69 | **320** | - | - | 0.2 | - | - | 200 | - | - | - | - | - | - | - | - |
| 02N03E10D001M | 6/5/1979 | - | **1320** | - | 190 | 84 | 40 | 340 | 47 | 51 | **610** | - | 0.1 | **100** | - | 1 | **1800** | - | - | - | - | 90 | 0.32 | - | - |

# Summary of Groundwater Quality Laboratory Results - Other Wells (DWR/Environmental/USGS)

| Well Name | Date | EC (µmho/cm) 900[b] | TDS (mg/L) 500[b] | pH 6.5/8.5[b] | Total Alkalinity[1] (mg/L) | Cations: Ca (mg/L) | Mg (mg/L) | Na (mg/L) | K (mg/L) | Anions: $SO_4$ (mg/L) 250[b] | Cl (mg/L) 250[b] | $HCO_3$[1] (mg/L) | $NO_3$[1] (mg/L) 10[a] | F (mg/L) 2[a] | Trace Elements: Al (µg/L) 1000[a] | As[2] (µg/L) 10[a] | B (ug/L) 1000[c] | Ba (ug/L) 1000[a] | Cr (µg/L) 50[a] | Cr (VI) (µg/L) | Cu (mg/L) 1.3[a] | Fe (ug/L) 300[b] | Mn (µg/L) 50[b] | Se (µg/L) 50[a] | Zn (ug/L) 5000[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Unknown** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 02N03E15Q001M | 6/5/1979 | - | **768** | - | 270 | 63 | 35 | 140 | 3.8 | 73 | 200 | - | - | 0.1 | - | - | 500 | - | - | - | - | - | - | - | - |
| 02N03E29M001M | 6/5/1979 | - | **1260** | - | 360 | 140 | 82 | 150 | 3.2 | **310** | 170 | - | **93** | 0.1 | - | 1 | **1700** | - | - | - | - | 1 | 0.3 | - | - |
| USGS-380024121471501 | 4/7/1975 | **2890** | - | - | - | - | - | - | - | - | **360** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 9/16/1975 | **2810** | - | - | - | - | - | - | - | - | **380** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 4/21/1978 | **2860** | - | - | - | - | - | - | - | - | **400** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 9/25/1979 | **2770** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 4/10/1980 | **2930** | - | - | - | - | - | - | - | - | **360** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 9/24/1980 | **2670** | - | - | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 4/20/1981 | **2730** | - | 7.4 | - | - | - | - | - | - | **430** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 9/18/1981 | **2680** | - | 7.4 | - | - | - | - | - | - | **260** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 4/28/1982 | **2630** | - | 7.3 | - | - | - | - | - | - | **460** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| USGS-380024121471501 | 9/23/1982 | **2550** | - | 7 | - | - | - | - | - | - | **380** | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

1. HCO3 and Total Alkalinity reported as CaCO3; NO3 reported as N

a) Primary Drinking Water Standards for California and Federal Maximum Contaminant Levels

b) Secondary Drinking Water Standards for California and Federal Maximum Contaminant Levels

c) California State Notification Level

2 Samples were filtered in the field

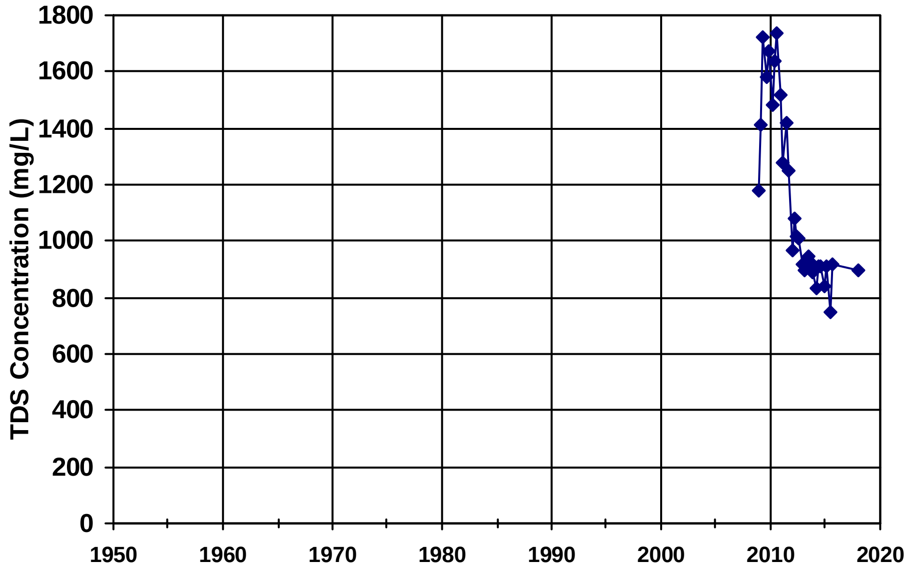
"-" Not Analyzed; ND = Non-Detect (Reporting Limit unknown)
For repeated sampling within a day, the maximum result for each constituent for the day is shown
Bold indicates value exceeds Water Quality Limit

# APPENDIX 3g

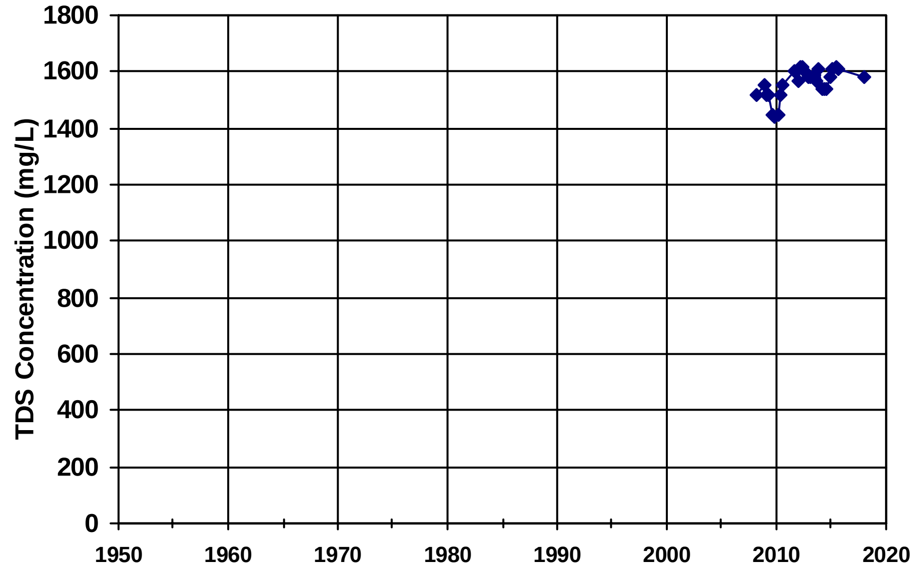
**Groundwater Quality Graphs (TDS, EC, Cl, NO3, As)**

# Total Dissolved Solids Graphs

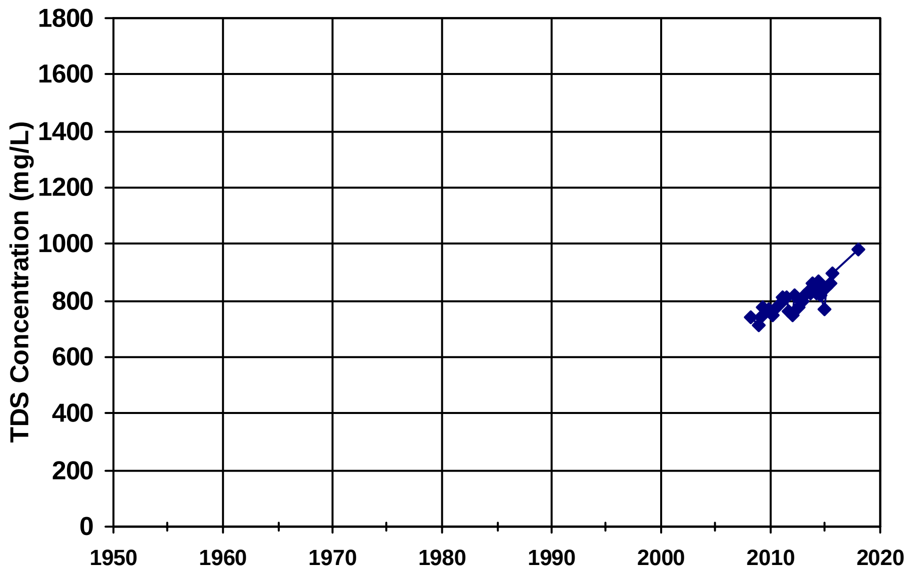
**WellID: BG-1**
**Zone: Shallow**
Well Depth: 55 Screened Int.: 40-55



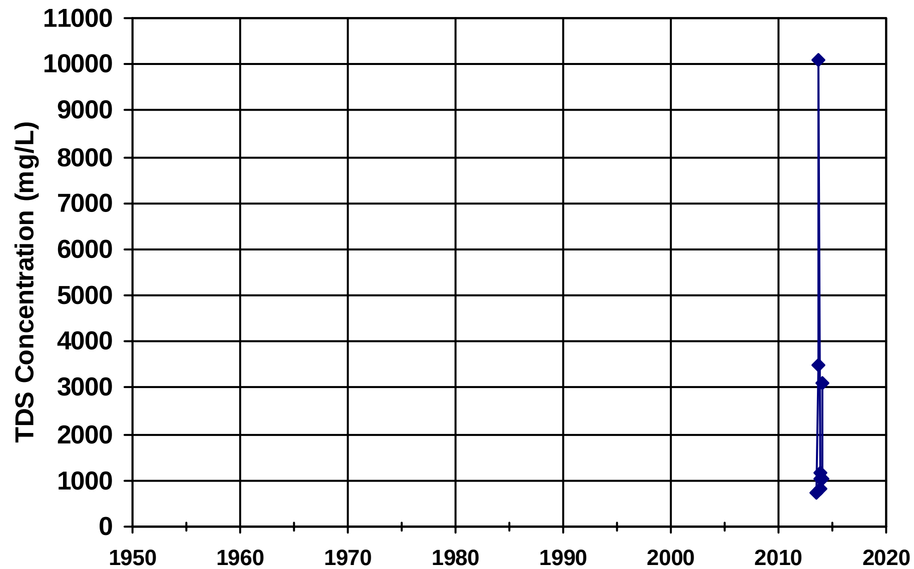

**WellID: BG-2**
**Zone: Shallow**
Well Depth: 37.5 Screened Int.: 22.5-37.5




**WellID: BG-3**
**Zone: Shallow**
Well Depth: 35 Screened Int.: 20-35

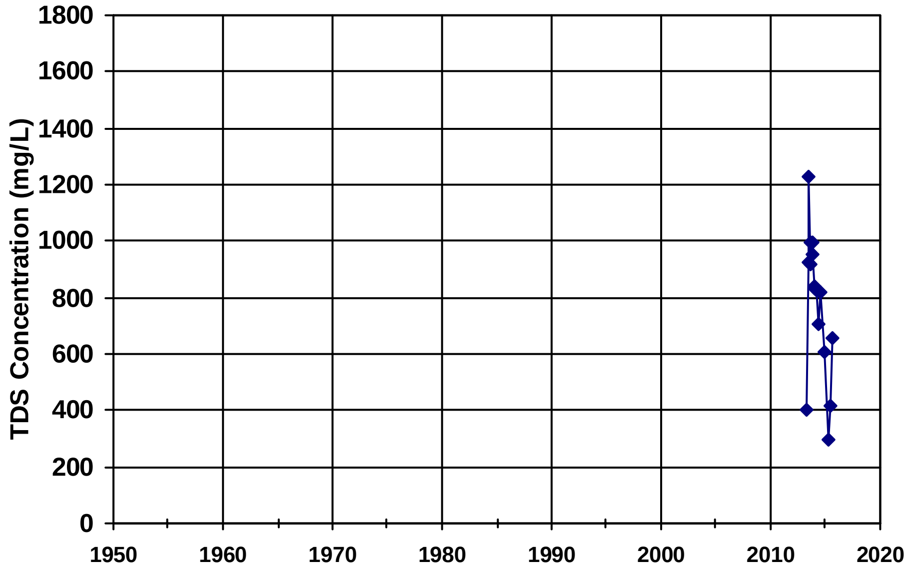



**WellID: SL186102968-7EW-4**
**Zone: Shallow**
Well Depth: Screened Int.:

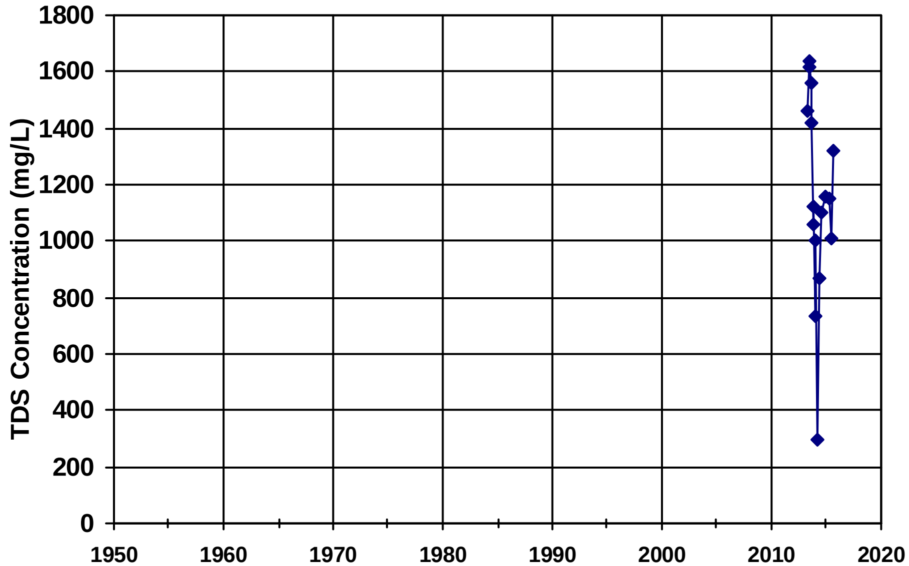



{R_WQ_TDSplots}

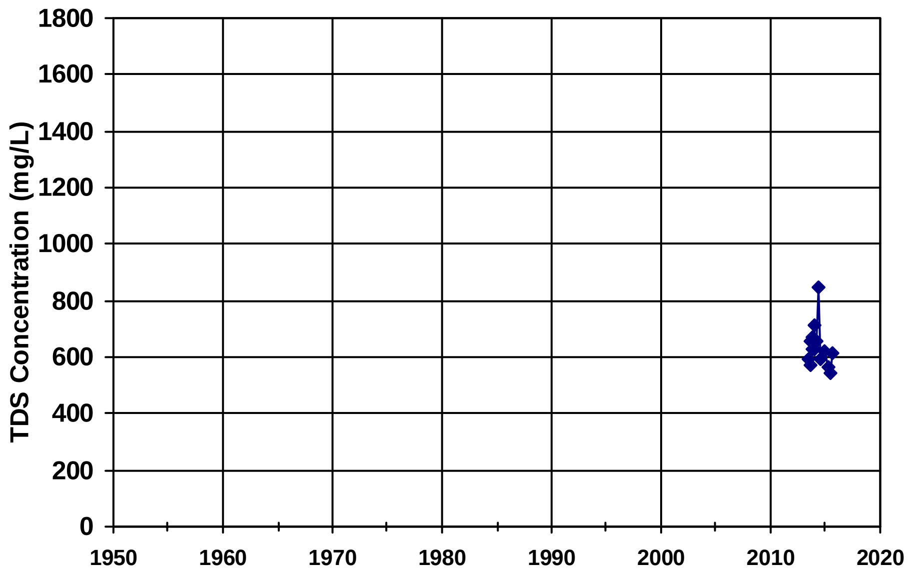
WellID: SL186102968-7MW-1
Zone: Shallow
Well Depth: Screened Int.:



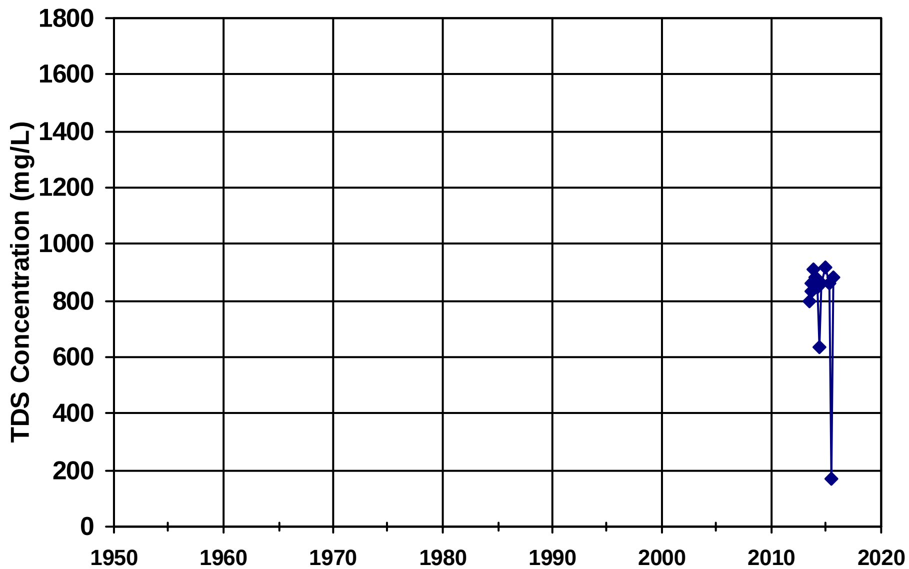

WellID: SL186102968-7MW-11
Zone: Shallow
Well Depth: Screened Int.:




WellID: SL186102968-7MW-12
Zone: Shallow
Well Depth: Screened Int.:

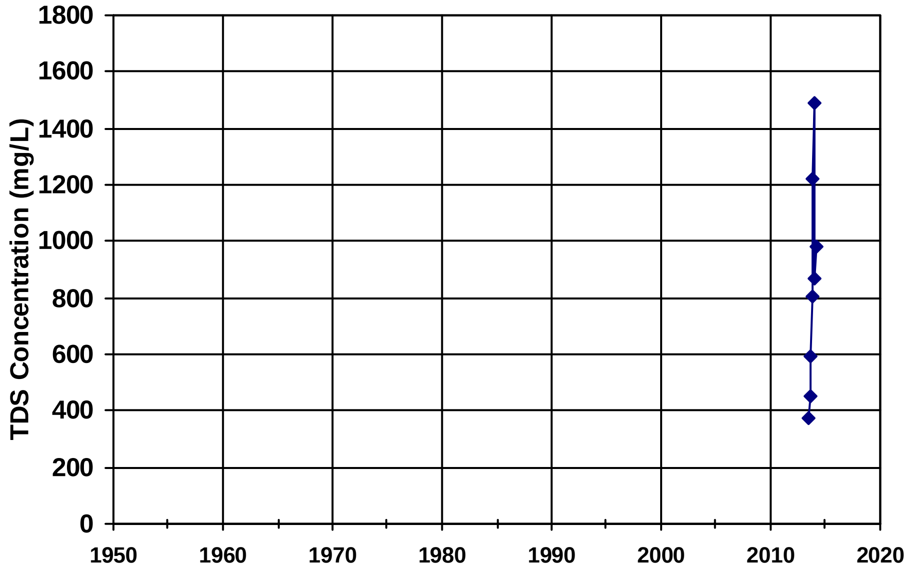



WellID: SL186102968-7MW-13
Zone: Shallow
Well Depth: Screened Int.:

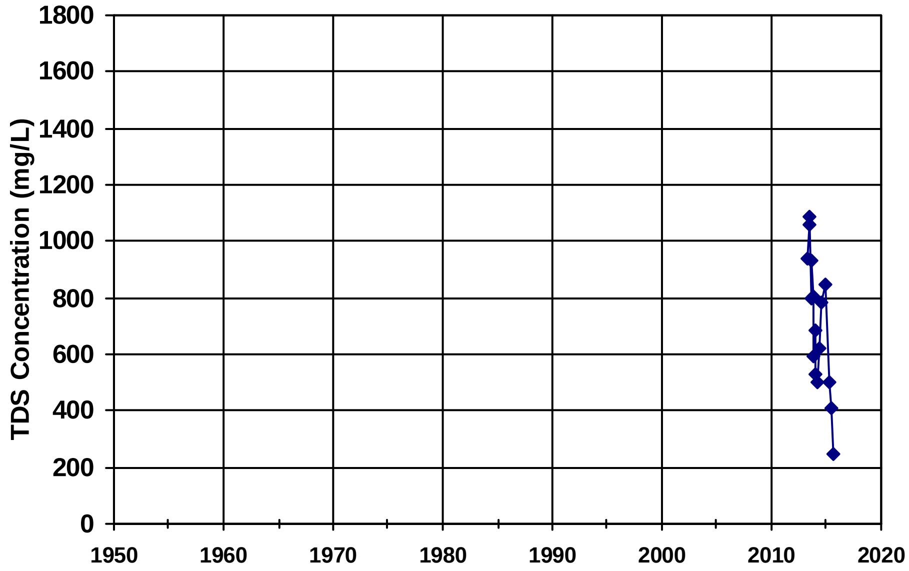



{R_WQ_TDSplots}

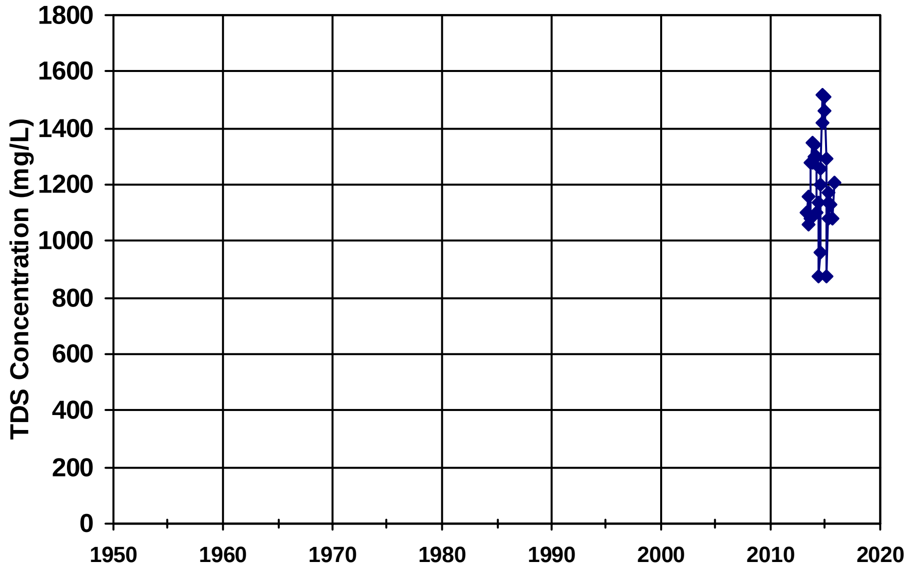
WellID: SL186102968-7MW-14
Zone: Shallow
Well Depth: Screened Int.:



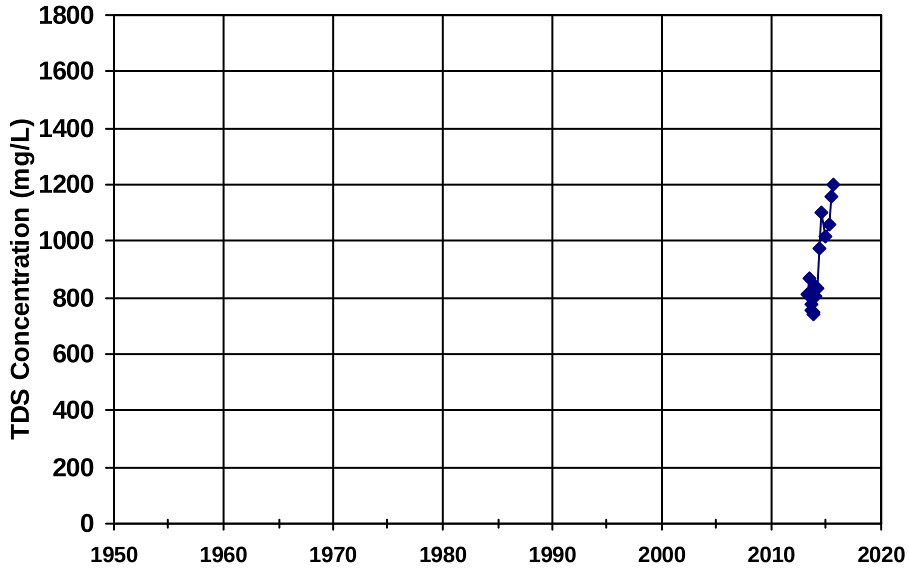

WellID: SL186102968-7MW-6
Zone: Shallow
Well Depth: Screened Int.:




WellID: SL186102968-7MW-8
Zone: Shallow
Well Depth: Screened Int.:

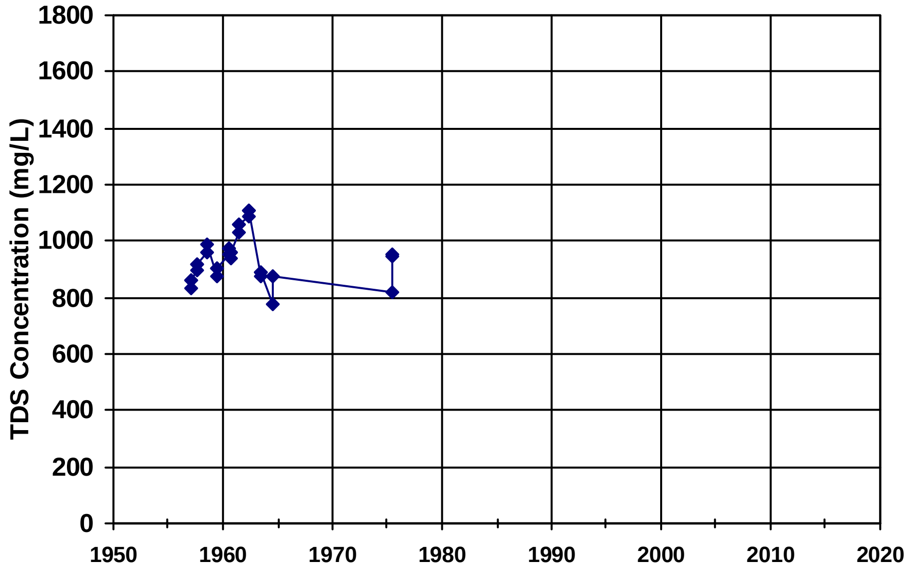



WellID: SL186102968-7MW-9
Zone: Shallow
Well Depth: Screened Int.:

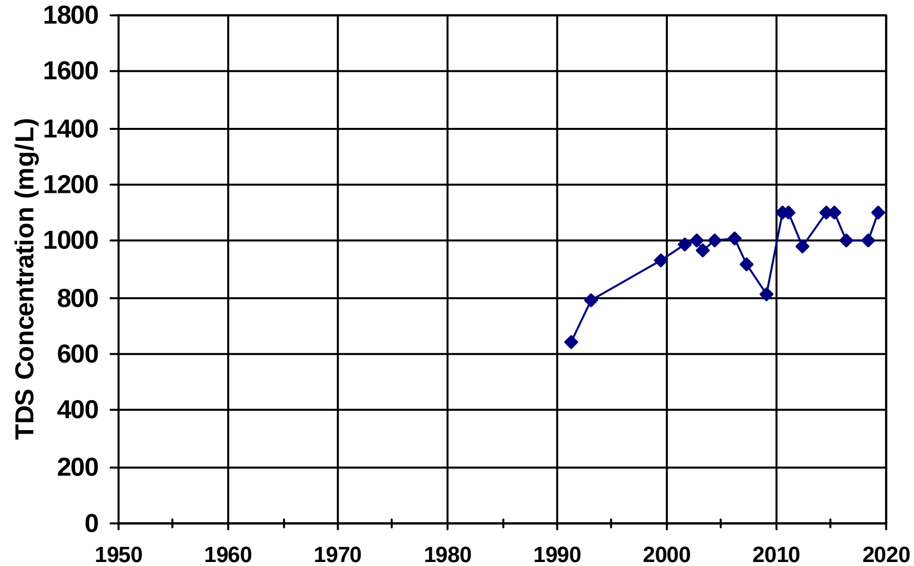



{R_WQ_TDSplots}

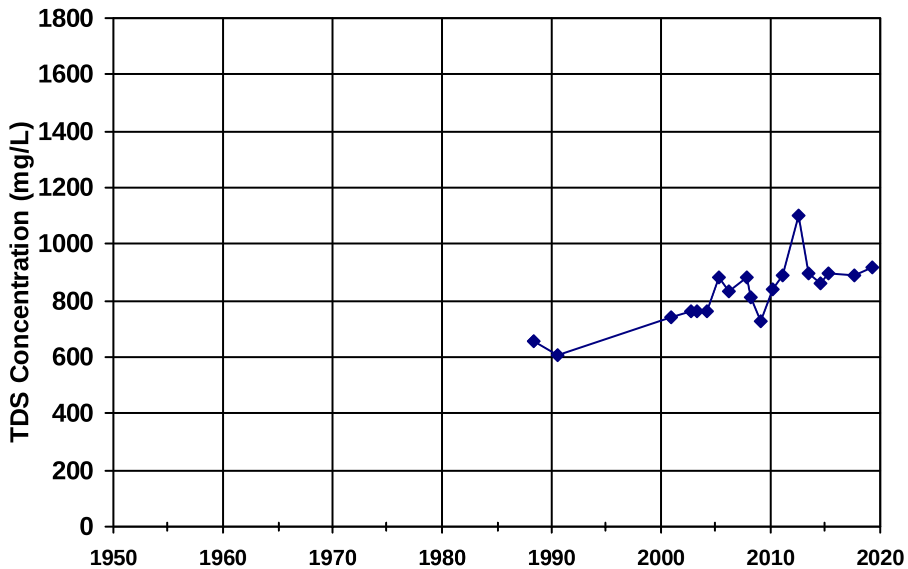
WellID: USGS-380043121461201
Zone: Shallow
Well Depth: 67 Screened Int.:



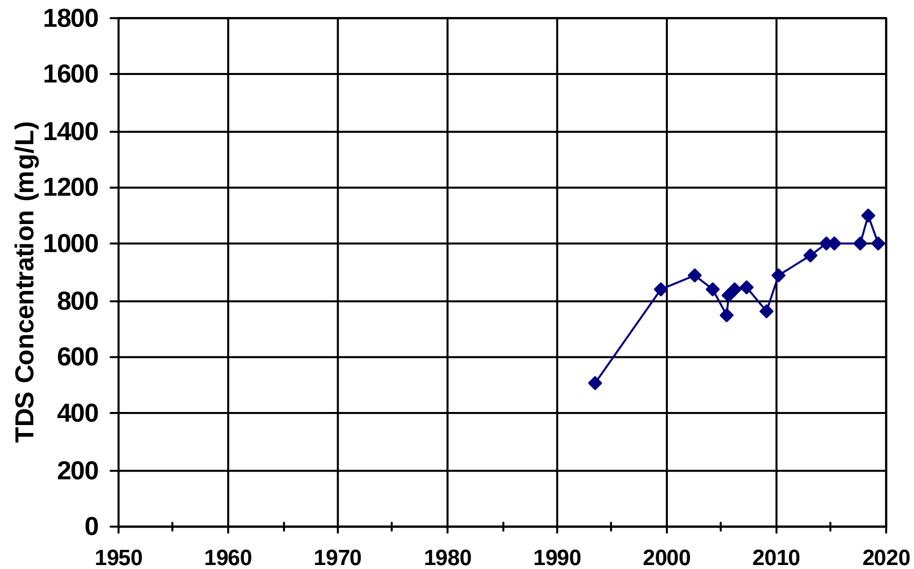

WellID: CITY OF BRENTWOOD-Well 06
Zone: Deep
Well Depth: 305 Screened Int.: 250-300




WellID: CITY OF BRENTWOOD-Well 07
Zone: Deep
Well Depth: 300 Screened Int.: 265-295

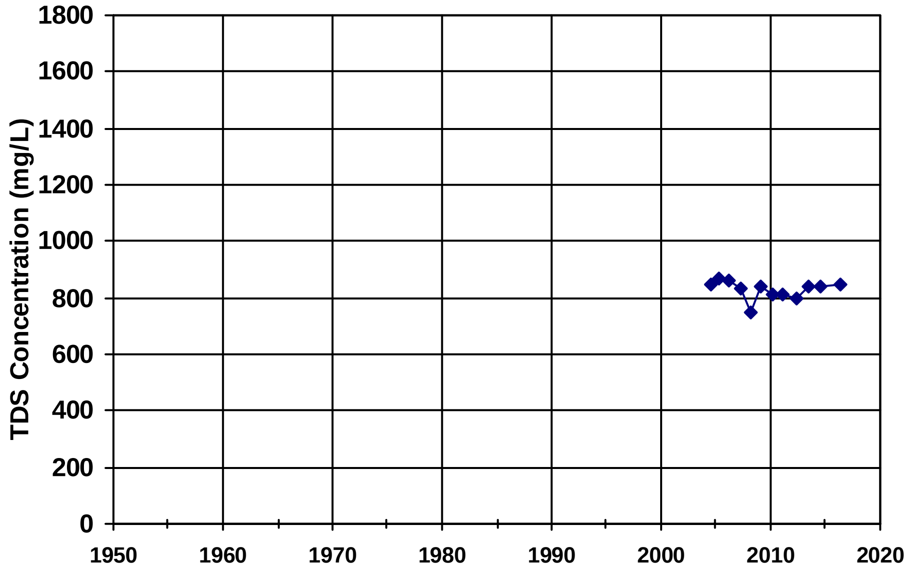



WellID: CITY OF BRENTWOOD-Well 08
Zone: Deep
Well Depth: 325 Screened Int.: 225-315

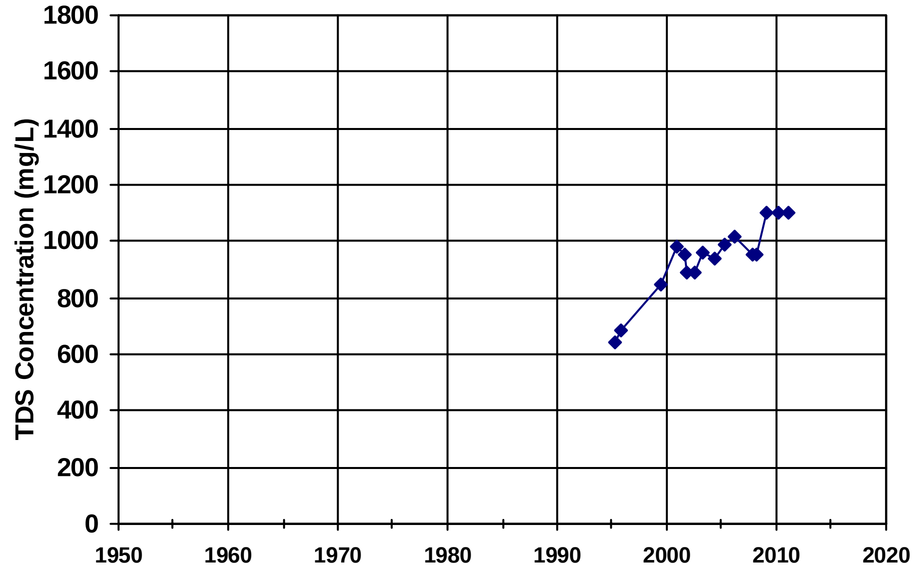



{R_WQ_TDSplots}

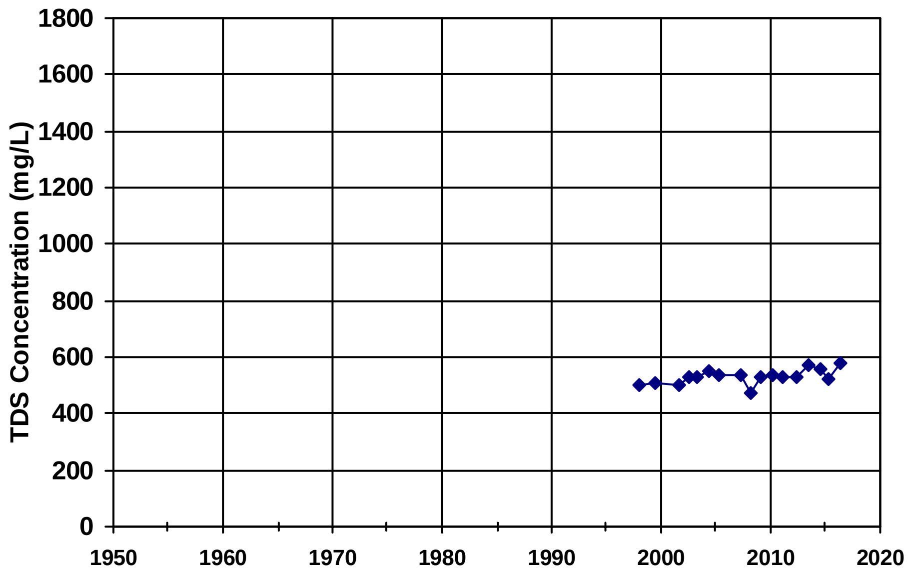
**WellID: CITY OF BRENTWOOD-Well 09**
**Zone: Deep**
Well Depth: 230 Screened Int.: 210-230



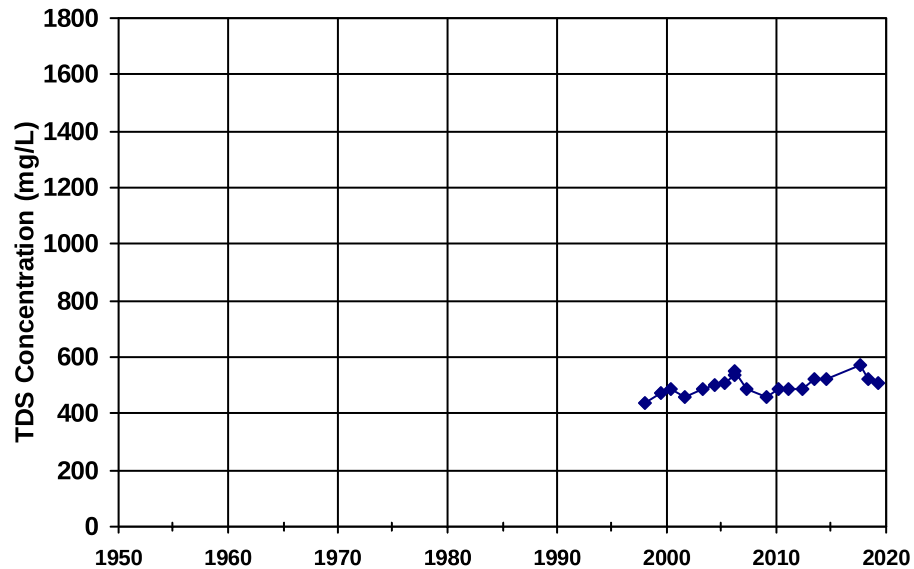

**WellID: CITY OF BRENTWOOD-Well 11**
**Zone: Deep**
Well Depth: Screened Int.: 255-365




**WellID: CITY OF BRENTWOOD-Well 12**
**Zone: Deep**
Well Depth: 610 Screened Int.: 350-380, 430-450

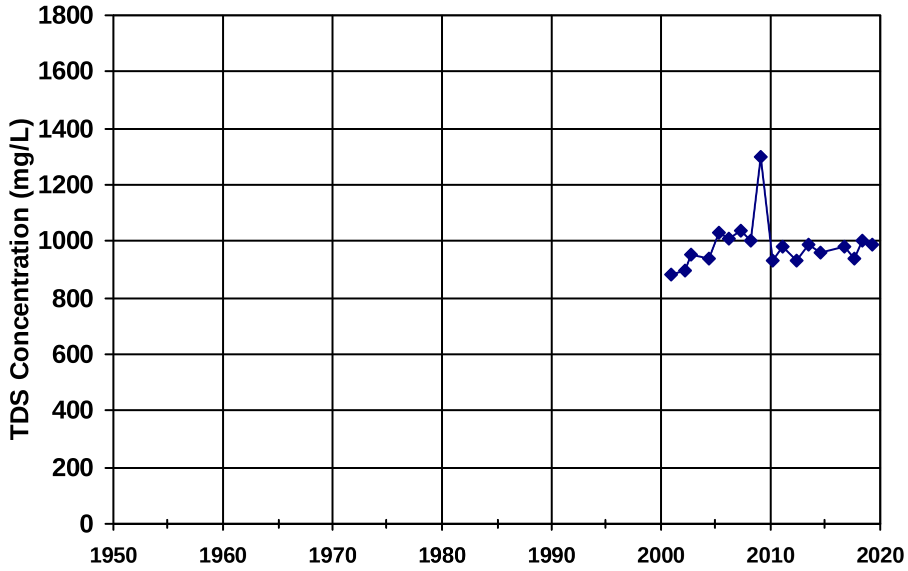



**WellID: CITY OF BRENTWOOD-Well 13**
**Zone: Deep**
Well Depth: 510 Screened Int.: 350-380, 430-480

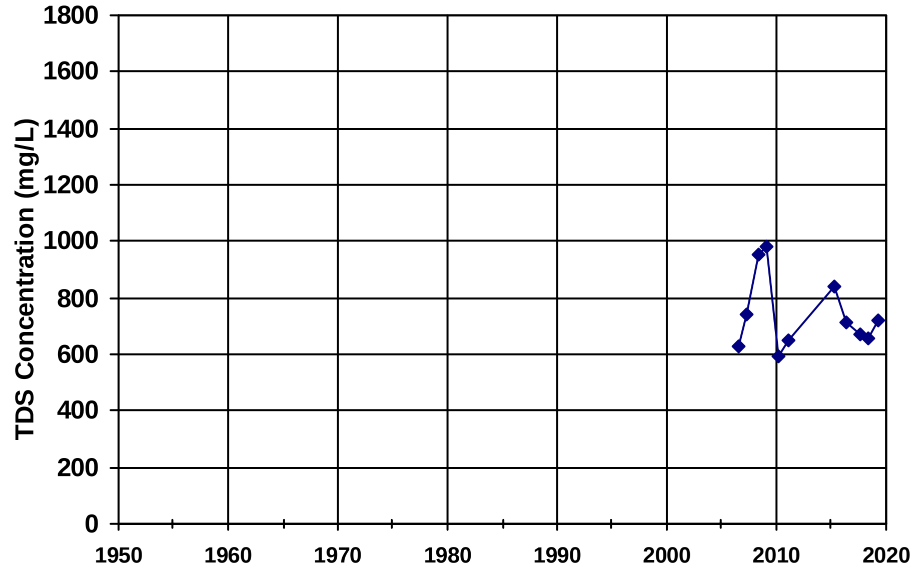



{R_WQ_TDSplots}

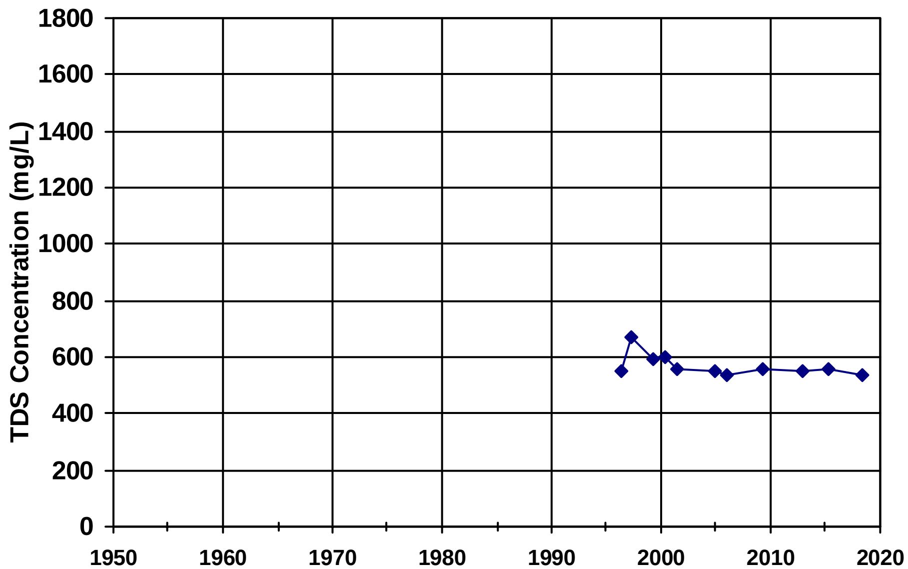
**WellID: CITY OF BRENTWOOD-Well 14**
**Zone: Deep**
Well Depth: 340 Screened Int.: 285-315



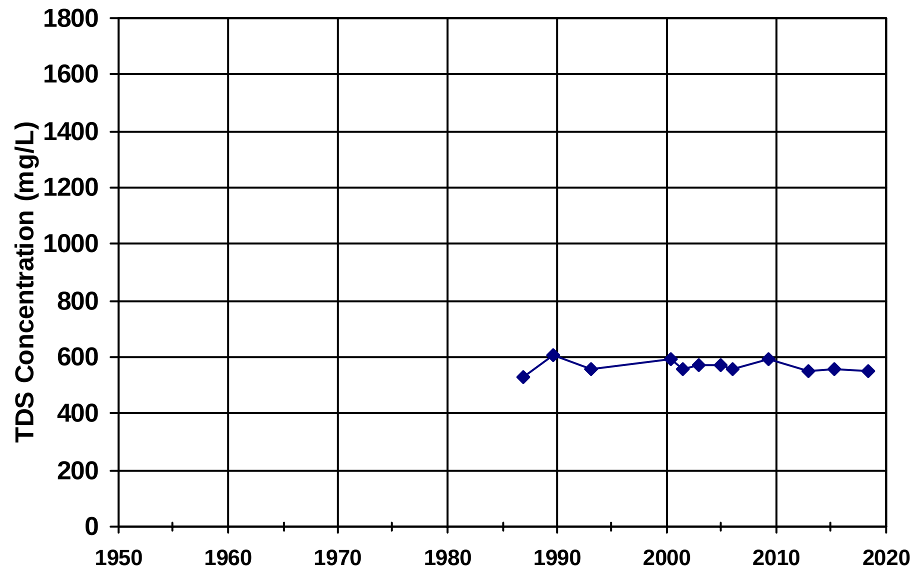

**WellID: CITY OF BRENTWOOD-Well 15**
**Zone: Deep**
Well Depth: 345 Screened Int.: 239-259,289-324




**WellID: TOWN OF DISCOVERY BAY-WELL 01B**
**Zone: Deep**
Well Depth: 350 Screened Int.: 271-289, 308-340

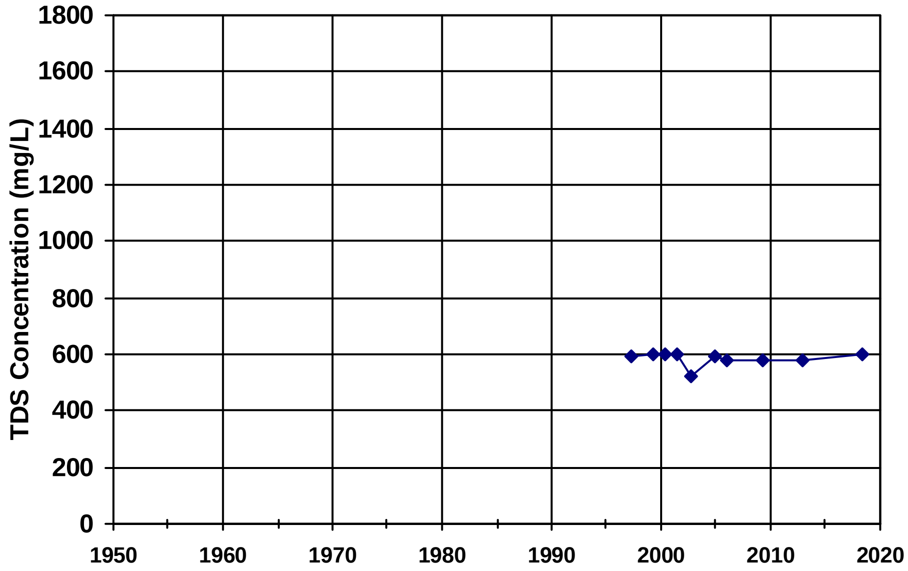



**WellID: TOWN OF DISCOVERY BAY-WELL 02**
**Zone: Deep**
Well Depth: 348 Screened Int.: 245-335

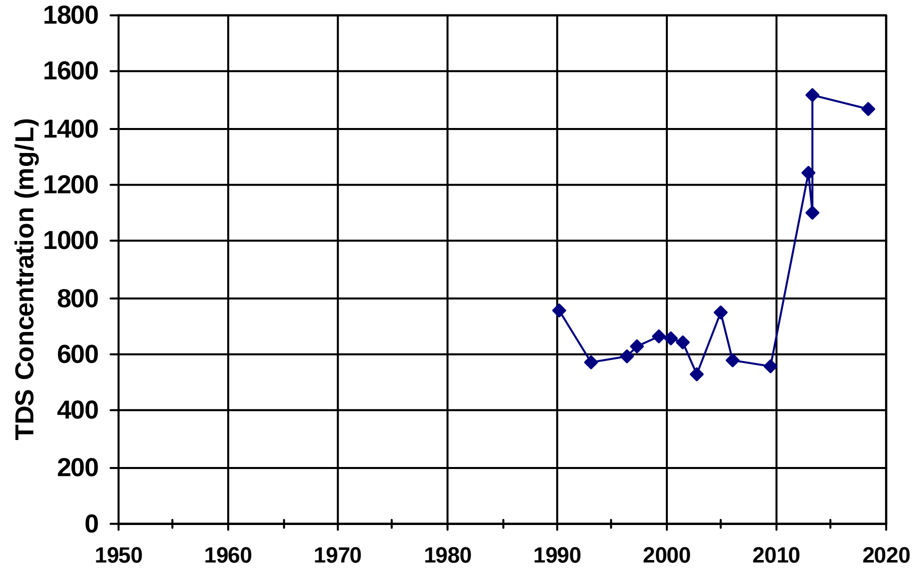



{R_WQ_TDSplots}

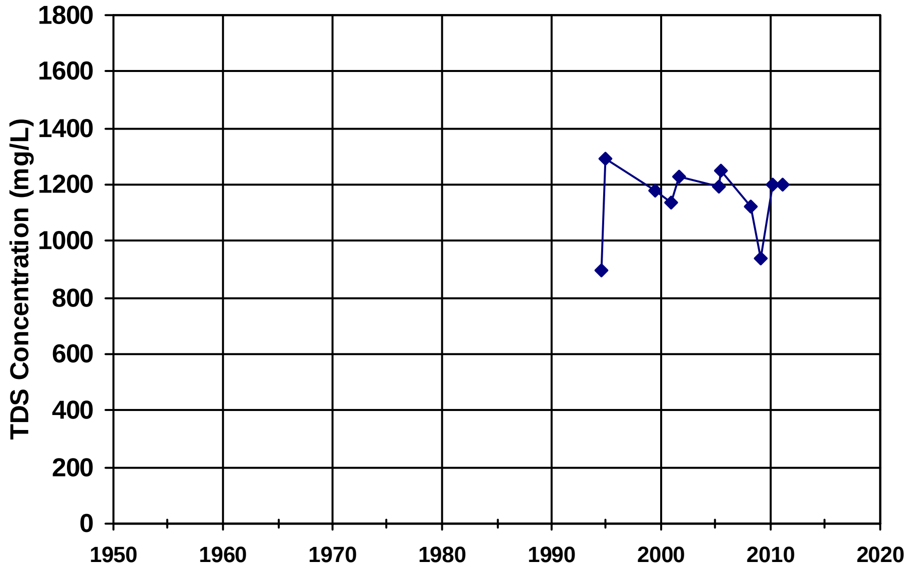
**WellID: TOWN OF DISCOVERY BAY-WELL 04A**
**Zone: Deep**
Well Depth: 357 Screened Int.: 307-347



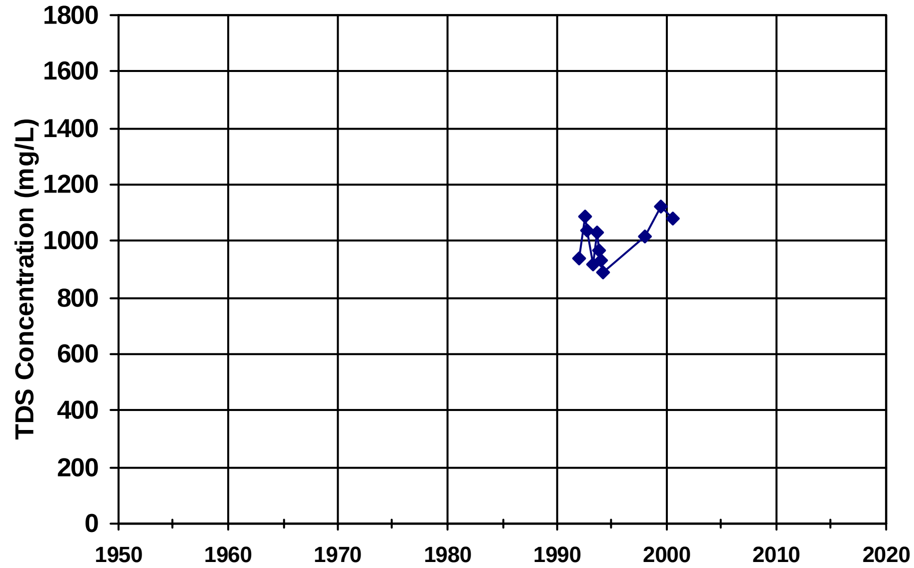

**WellID: TOWN OF DISCOVERY BAY-WELL 05A**
**Zone: Deep**
Well Depth: 357 Screened Int.: 251-281, 307-347




**WellID: CITY OF BRENTWOOD-Well 10A**
**Zone: Composite**
Well Depth: 210 Screened Int.: 52-72, 135-182

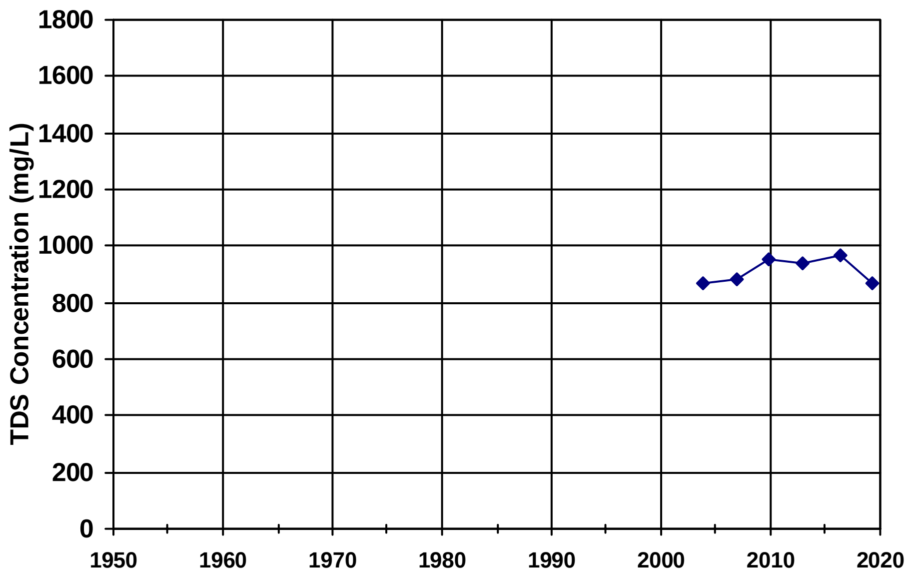



**WellID: DIABLO WATER DISTRICT-WELL 01 - STANDBY**
**Zone: Composite**
Well Depth: 170 Screened Int.: 100-170

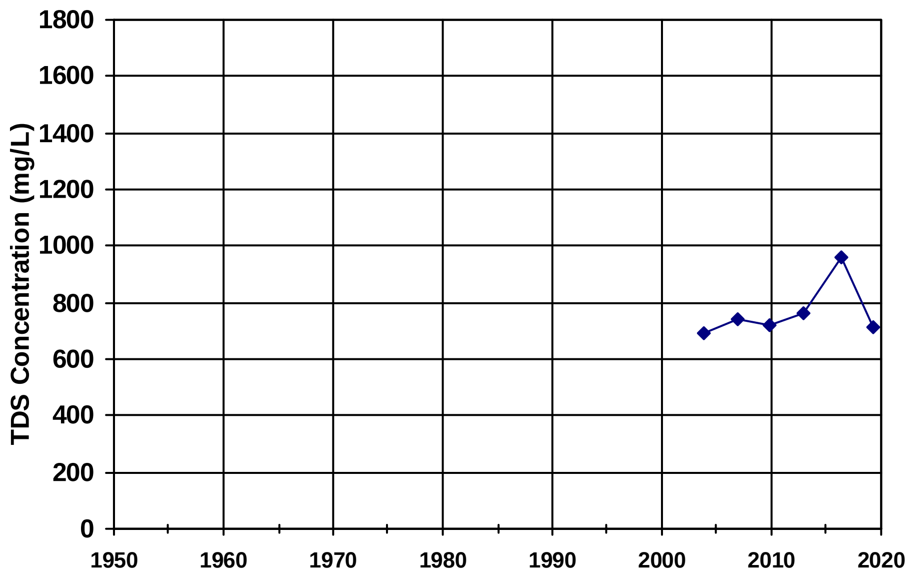



{R_WQ_TDSplots}

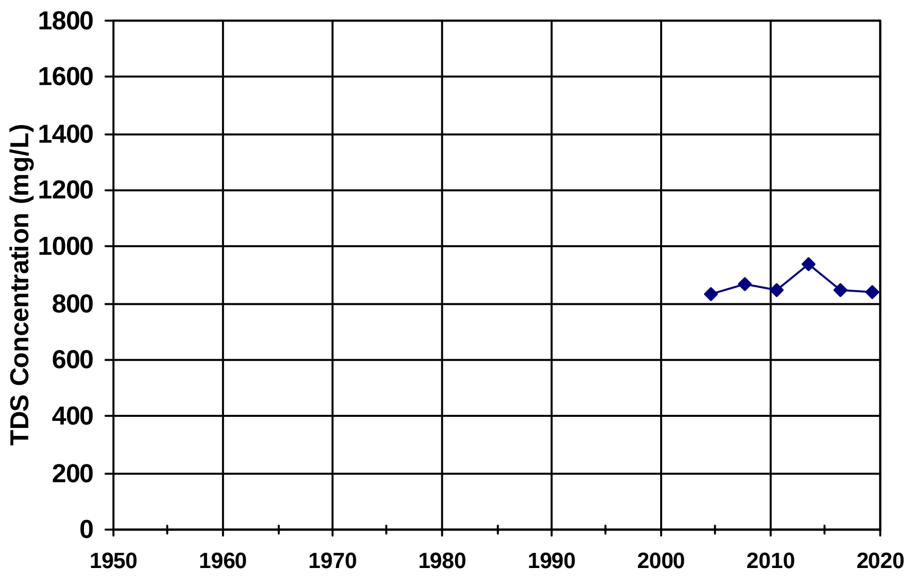
WellID: DELTA MUTUAL WATER COMPANY-East Well
Zone: Unknown
Well Depth: Screened Int.:



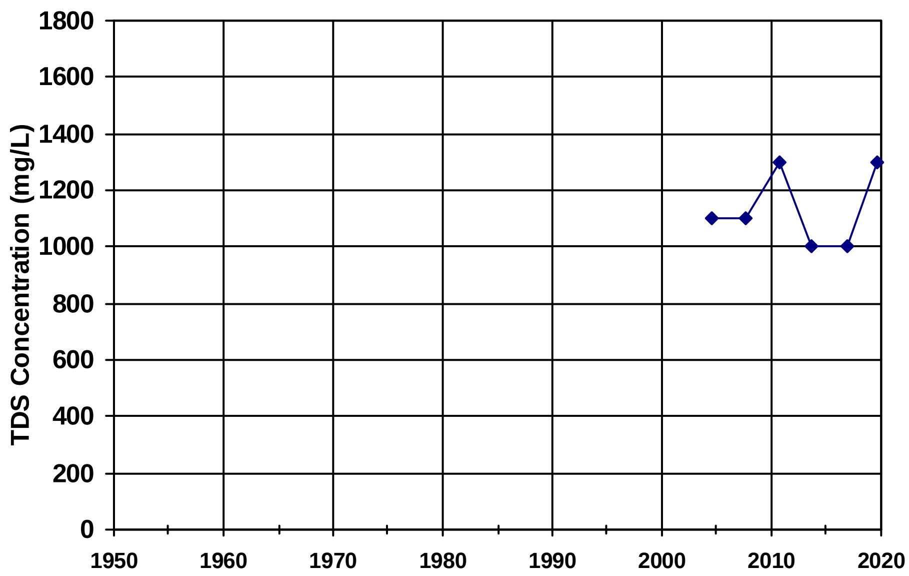

WellID: DELTA MUTUAL WATER COMPANY-West Well
Zone: Unknown
Well Depth: Screened Int.:




WellID: PLEASANTIMES MUTUAL WATER CO-WELL 2 - 4520 STONE
Zone: Unknown
Well Depth: Screened Int.:



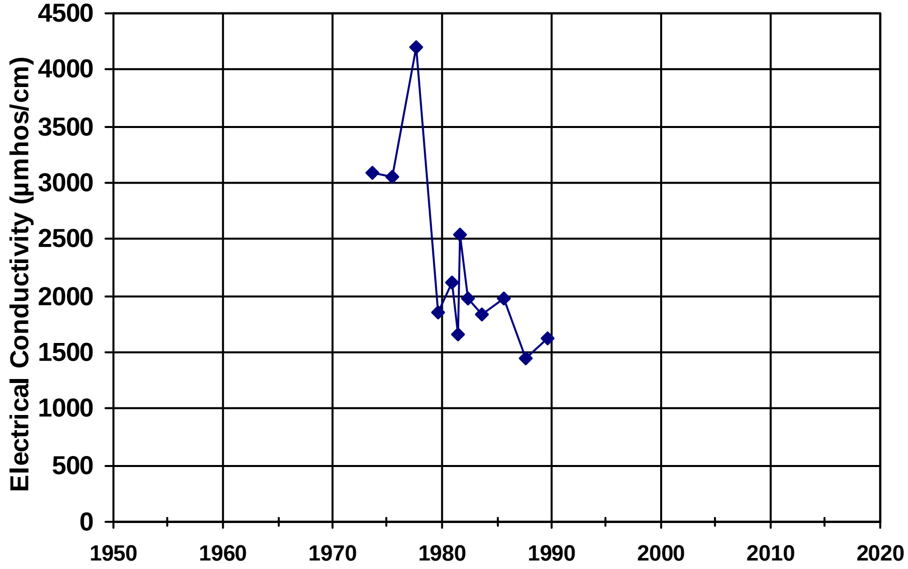

WellID: RIVERVIEW WATER ASSOCIATION-WELL 1 BEACON HARBOR
Zone: Unknown
Well Depth: Screened Int.:



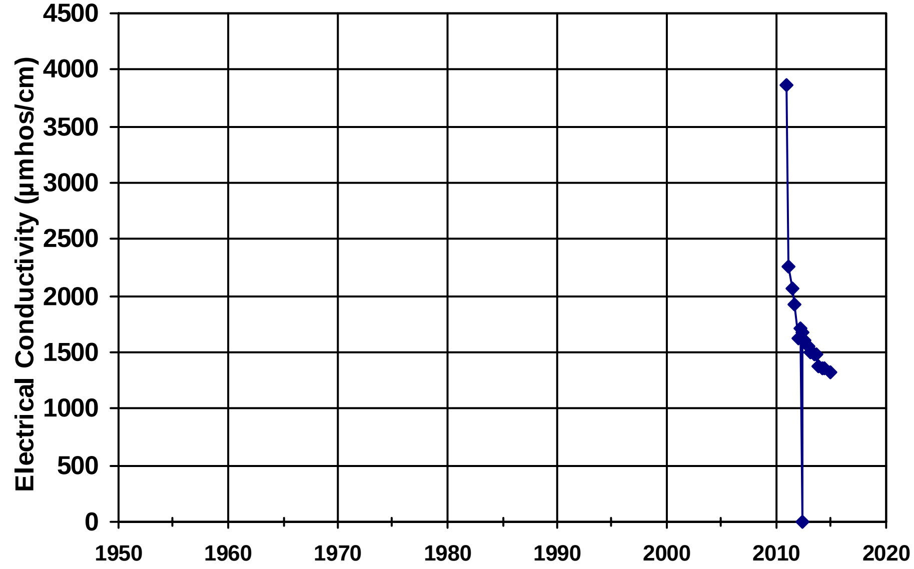

{R_WQ_TDSplots}

# Electrical Conductivity Graphs

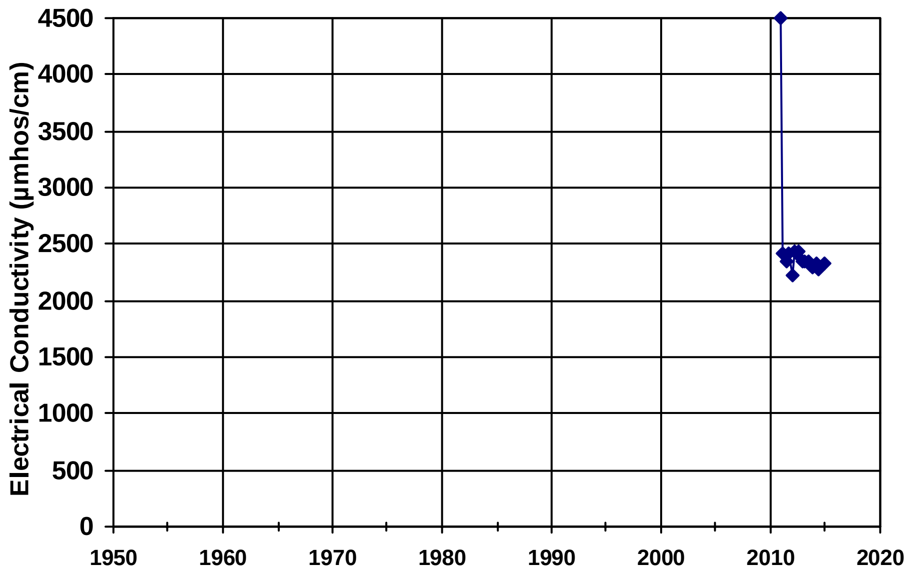
**WellID: 5 Binn**
**Zone: Shallow**
Well Depth: 45 Screened Int.:



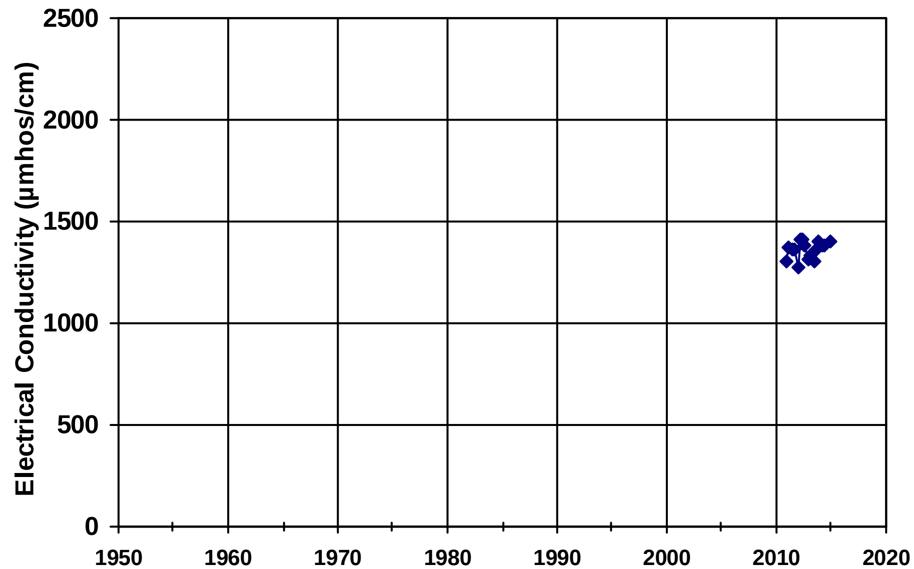

**WellID: BG-1**
**Zone: Shallow**
Well Depth: 55 Screened Int.: 40-55




**WellID: BG-2**
**Zone: Shallow**
Well Depth: 37.5 Screened Int.: 22.5-37.5

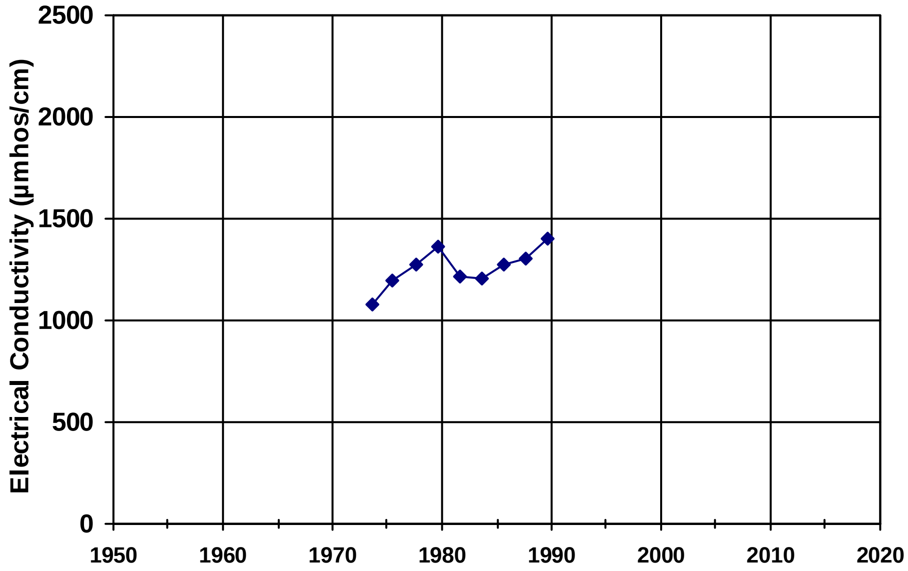



**WellID: BG-3**
**Zone: Shallow**
Well Depth: 35 Screened Int.: 20-35

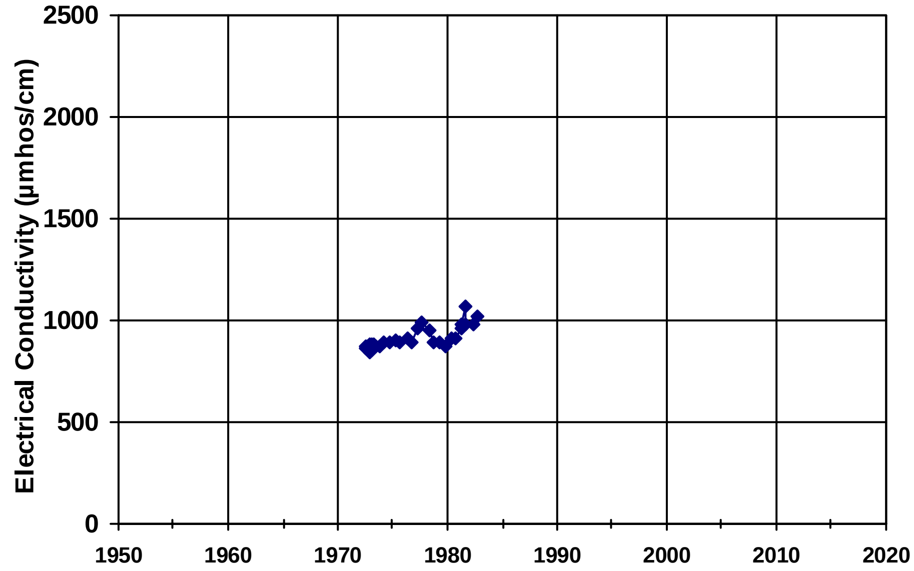



{R_WQ_TDSplots}

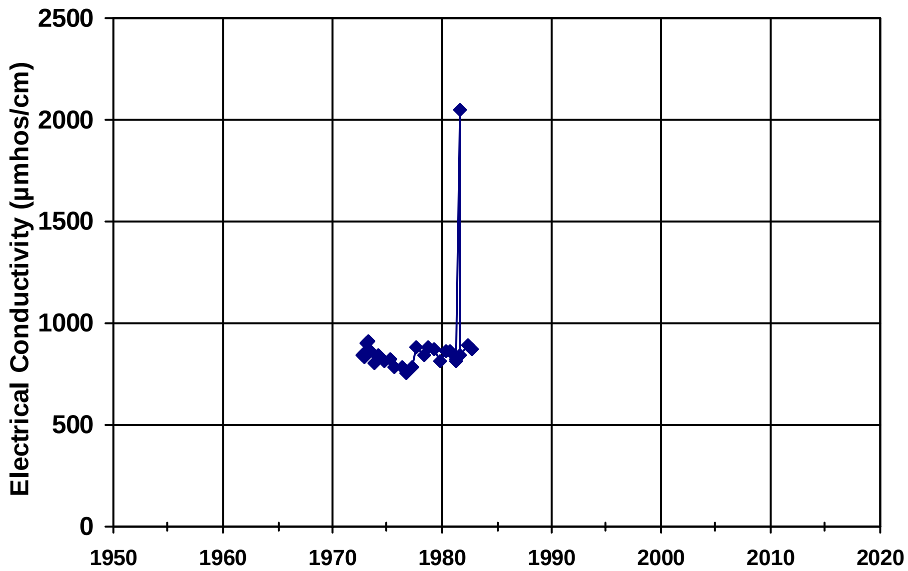
WellID: 01N03E17E001M
Zone: Shallow
Well Depth: 123 Screened Int.: 113-123



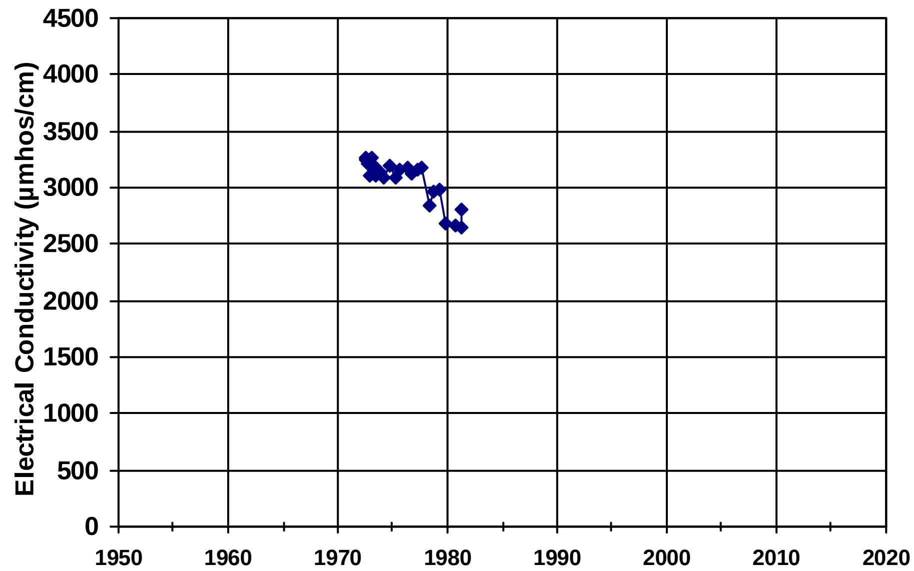

WellID: USGS-380012121461101
Zone: Shallow
Well Depth: 95 Screened Int.:




WellID: USGS-380016121454501
Zone: Shallow
Well Depth: 140 Screened Int.:

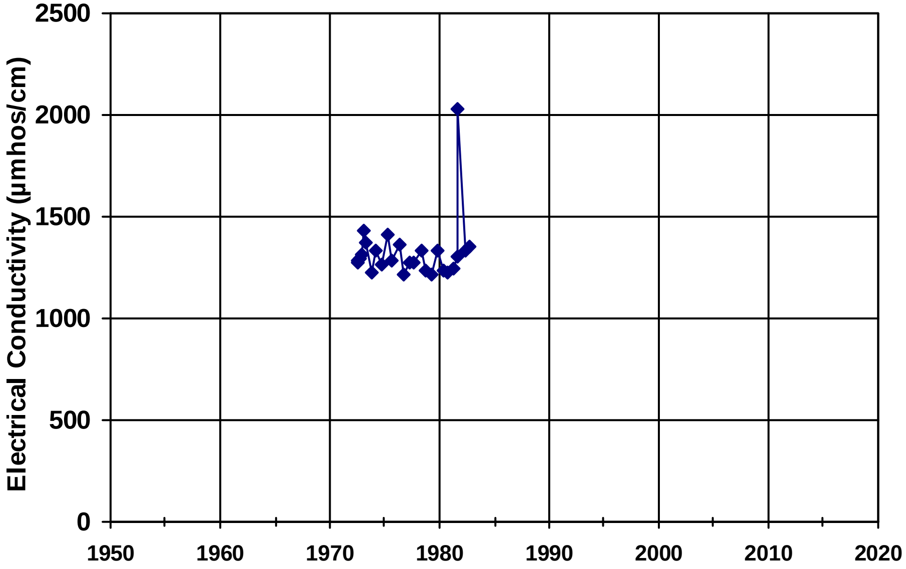



WellID: USGS-380017121443201
Zone: Shallow
Well Depth: 82 Screened Int.:

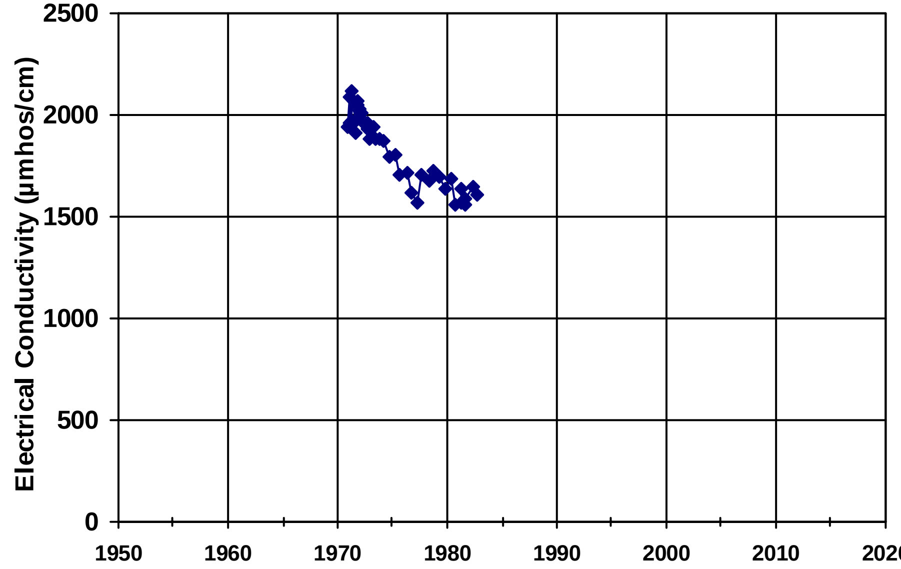



{R_WQ_TDSplots}

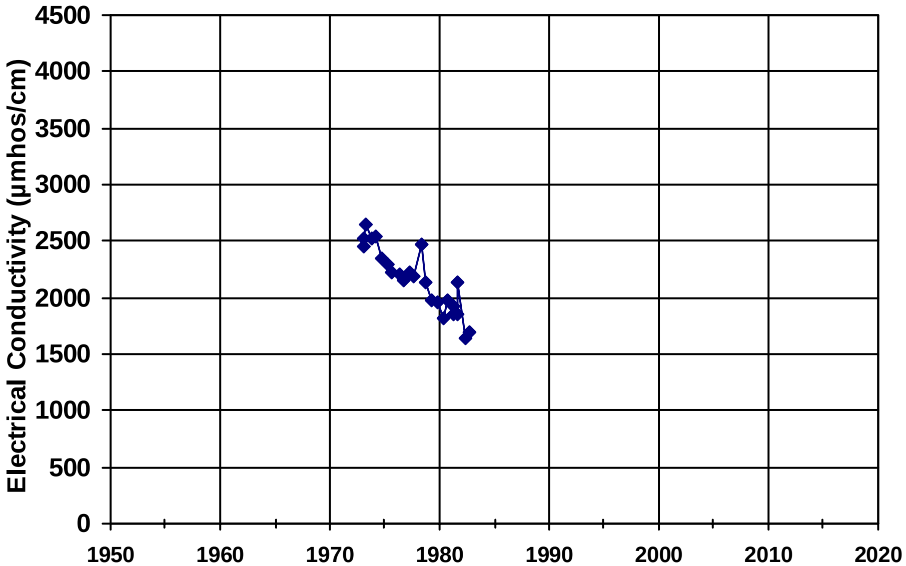
**WellID: USGS-380017121455901**
**Zone: Shallow**
Well Depth: 120 Screened Int.:



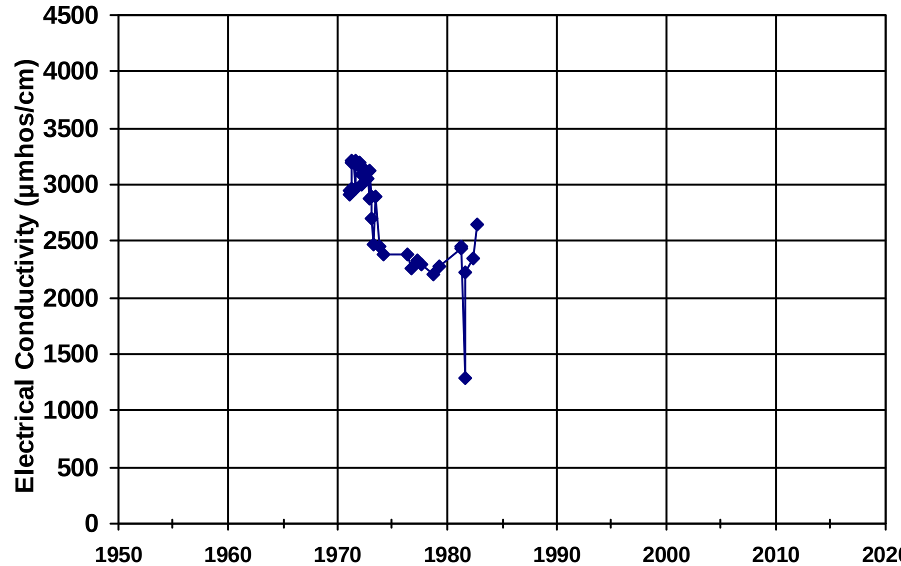

**WellID: USGS-380019121464601**
**Zone: Shallow**
Well Depth: 93 Screened Int.:




**WellID: USGS-380020121443901**
**Zone: Shallow**
Well Depth: 66 Screened Int.:




**WellID: USGS-380025121471101**
**Zone: Shallow**
Well Depth: 78 Screened Int.:

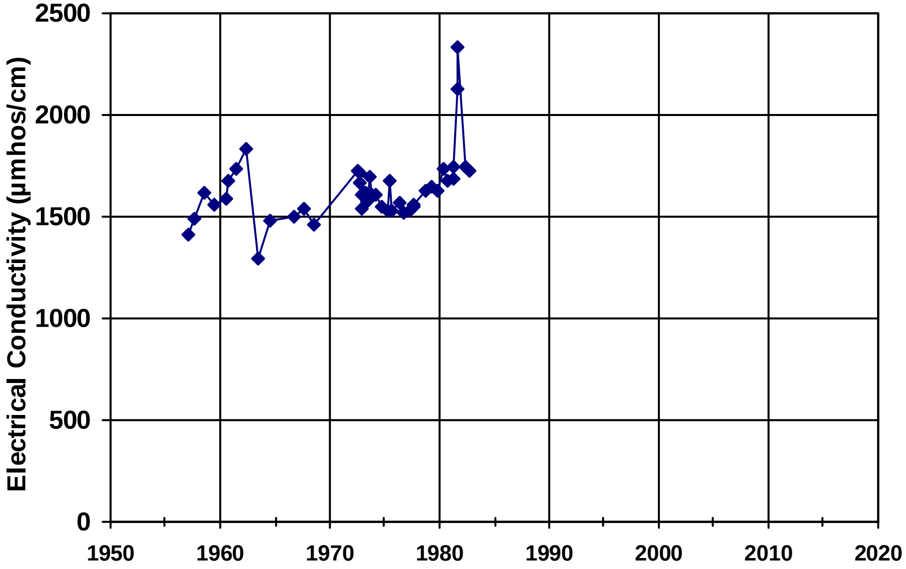



{R_WQ_TDSplots}

**WellID: USGS-380043121461201**

**Zone: Shallow**

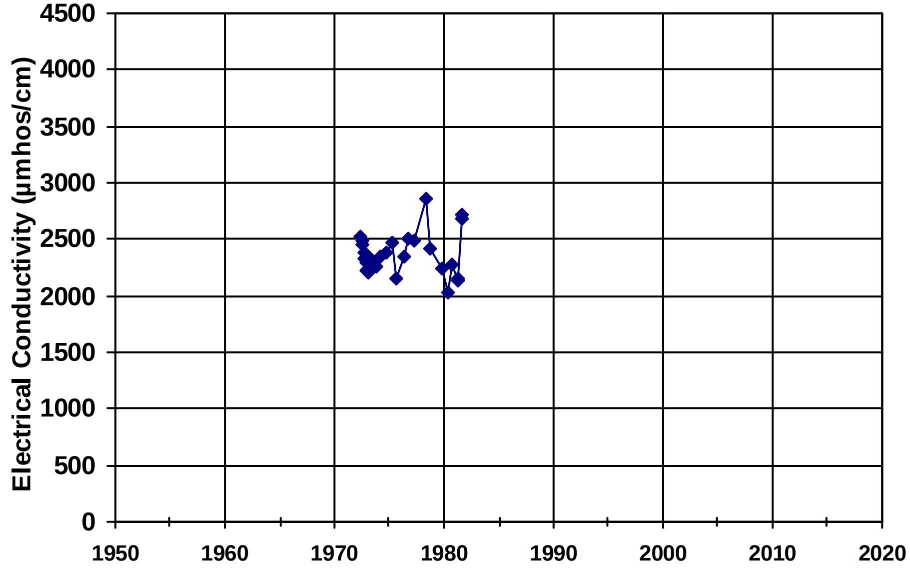
Well Depth: 67 Screened Int.:




**WellID: USGS-380048121470701**

**Zone: Shallow**

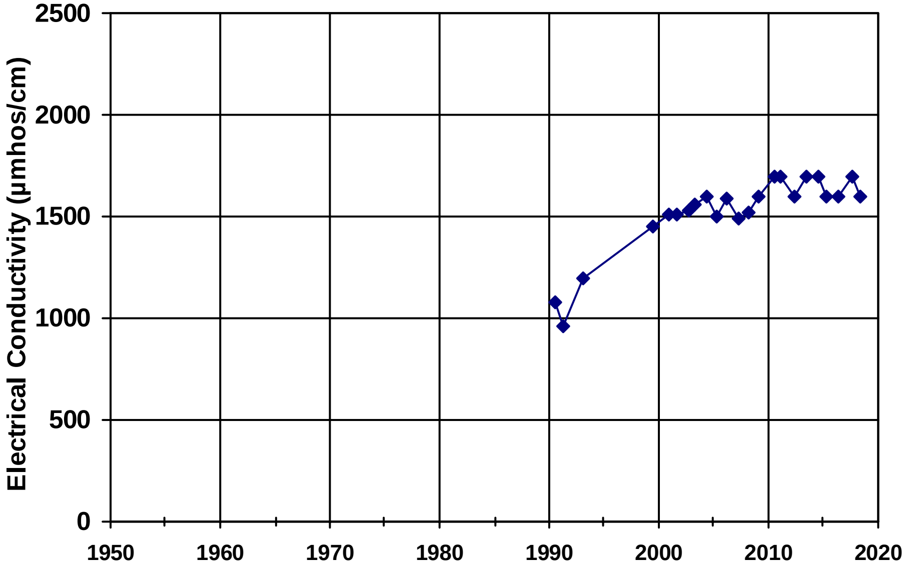
Well Depth: 165 Screened Int.:




**WellID: CITY OF BRENTWOOD-Well 06**

**Zone: Deep**

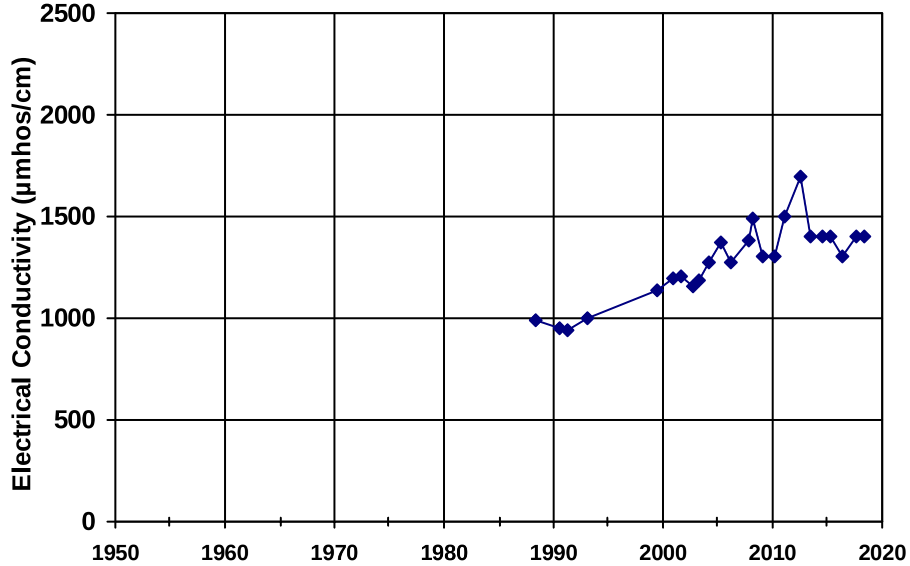
Well Depth: 305 Screened Int.: 250-300




**WellID: CITY OF BRENTWOOD-Well 07**

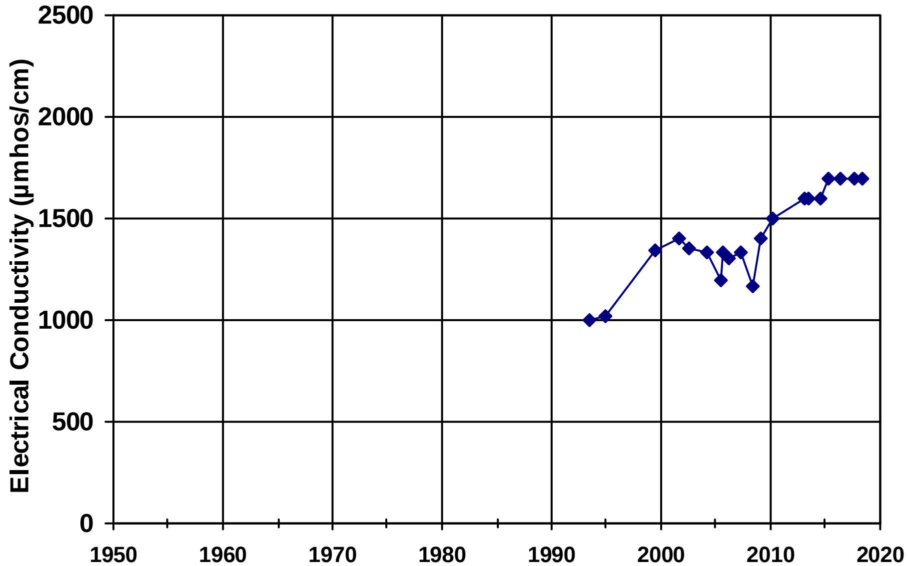
**Zone: Deep**

Well Depth: 300 Screened Int.: 265-295

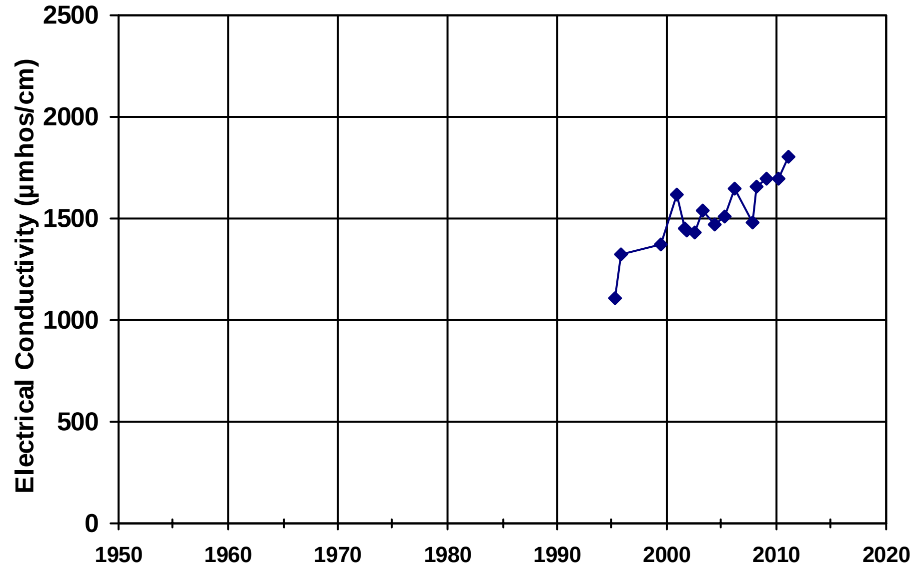



{R_WQ_TDSplots}

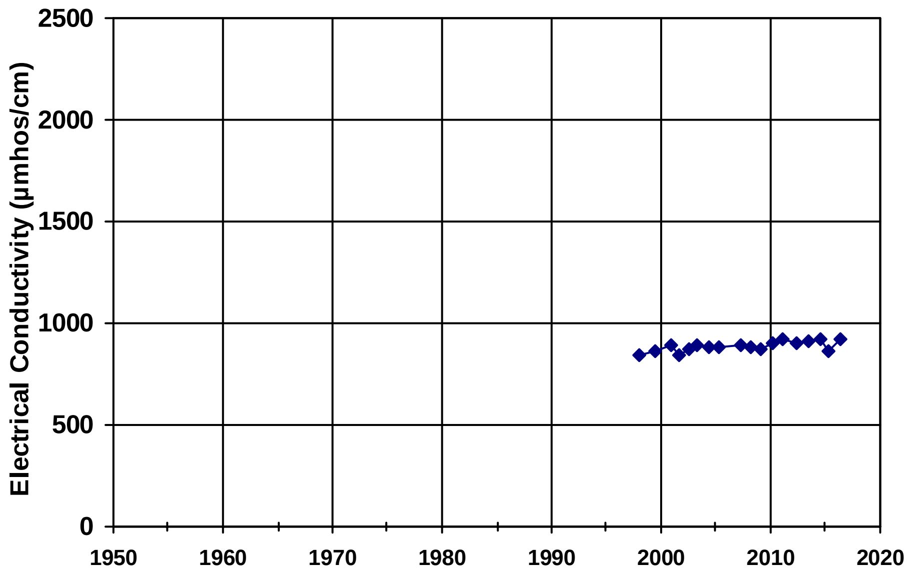
**WellID: CITY OF BRENTWOOD-Well 08**
**Zone: Deep**
Well Depth: 325 Screened Int.: 225-315



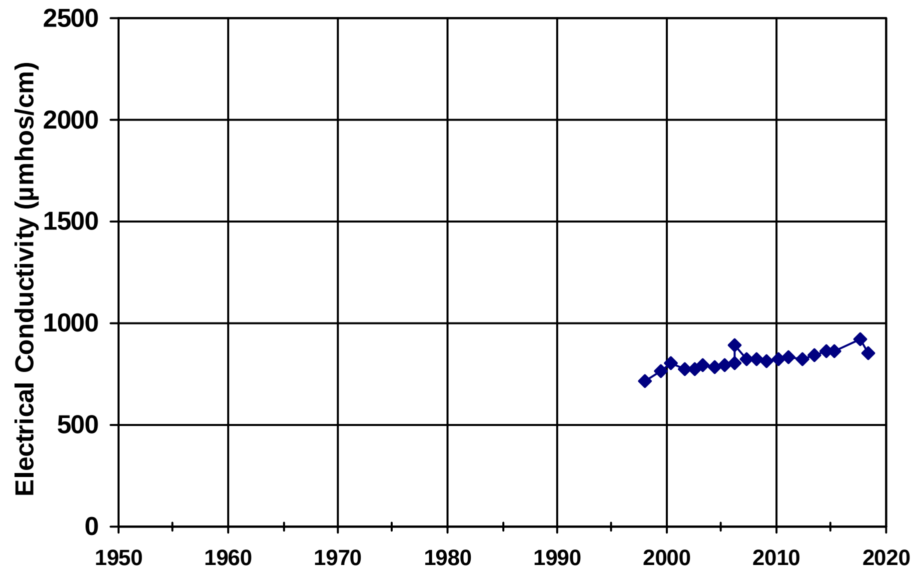

**WellID: CITY OF BRENTWOOD-Well 11**
**Zone: Deep**
Well Depth: Screened Int.: 255-365




**WellID: CITY OF BRENTWOOD-Well 12**
**Zone: Deep**
Well Depth: 610 Screened Int.: 350-380, 430-450

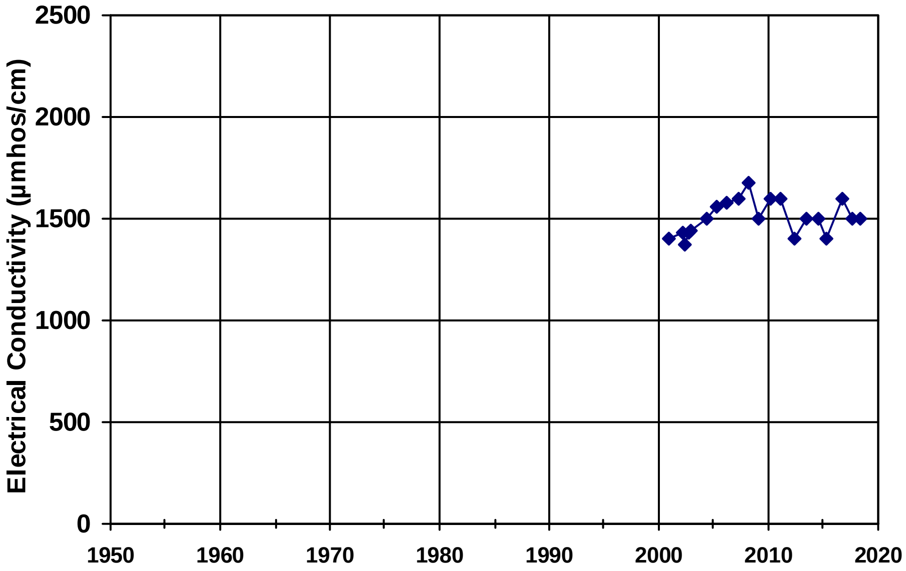



**WellID: CITY OF BRENTWOOD-Well 13**
**Zone: Deep**
Well Depth: 510 Screened Int.: 350-380, 430-480

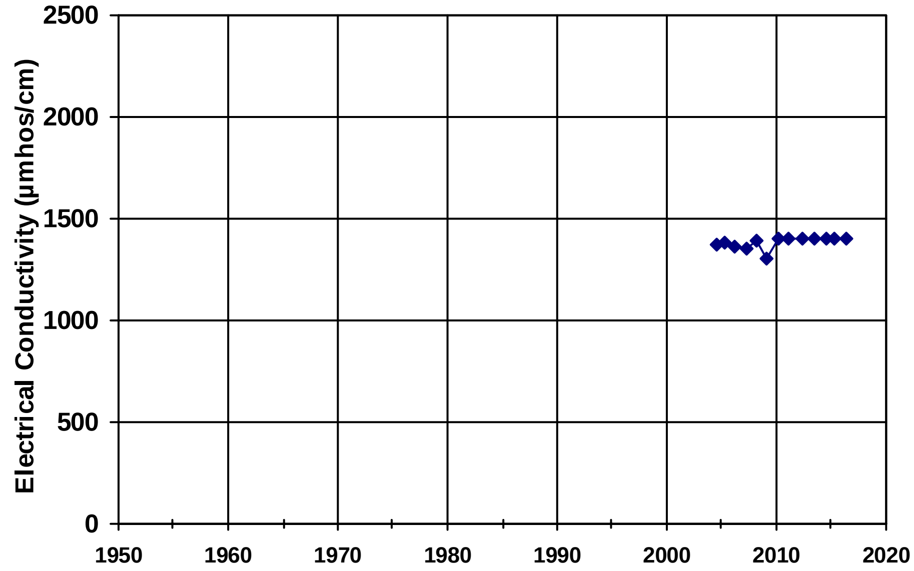



{R_WQ_TDSplots}

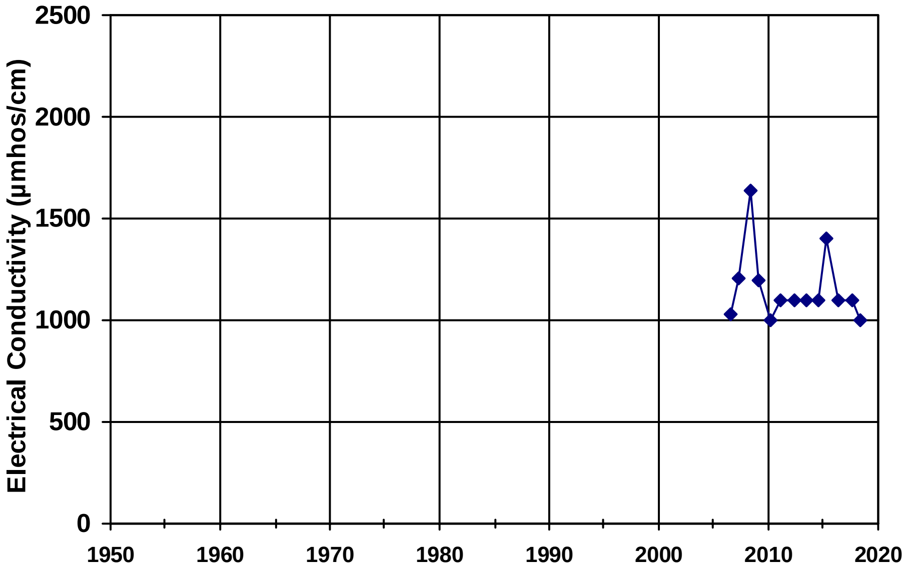
WellID: CITY OF BRENTWOOD-Well 14
Zone: Deep
Well Depth: 340 Screened Int.: 285-315



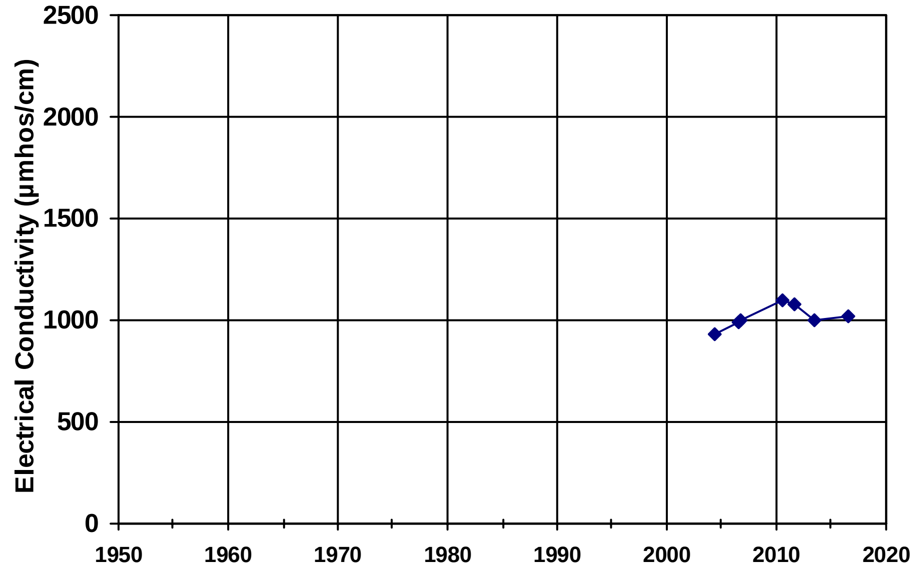

WellID: CITY OF BRENTWOOD-Well 09
Zone: Deep
Well Depth: 230 Screened Int.: 210-230




WellID: CITY OF BRENTWOOD-Well 15
Zone: Deep
Well Depth: 345 Screened Int.: 239-259,289-324

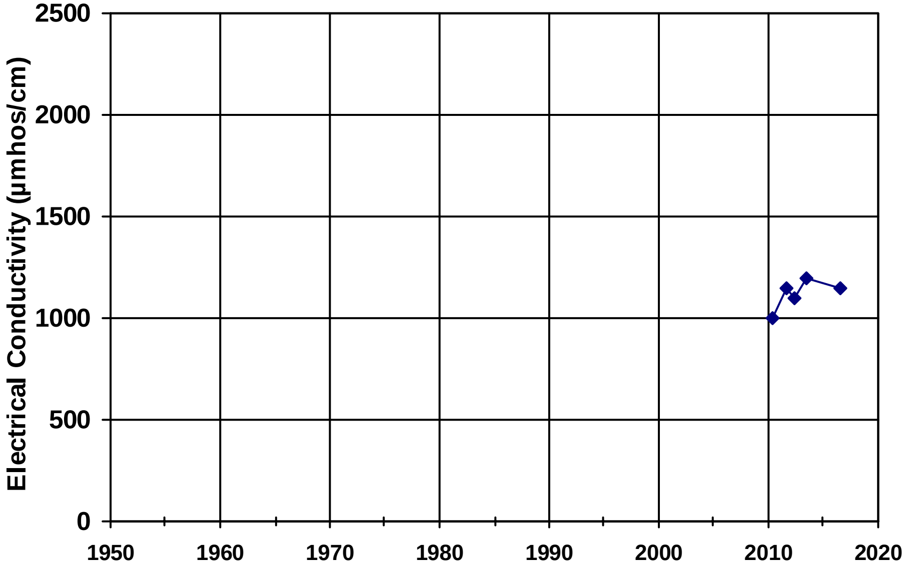



WellID: DIABLO WATER DISTRICT-Glen Park Well
Zone: Deep
Well Depth: 315 Screened Int.: 230-245, 260-300

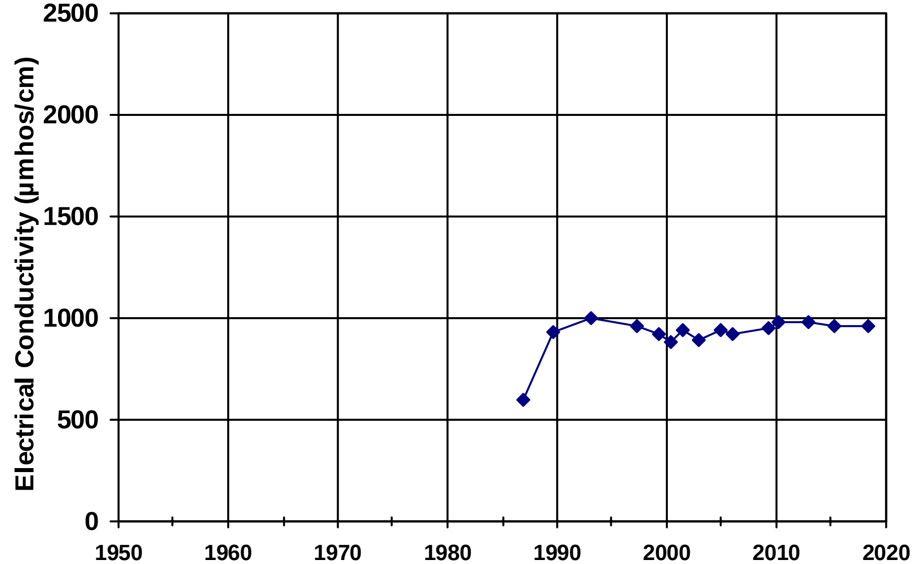



{R_WQ_TDSplots}

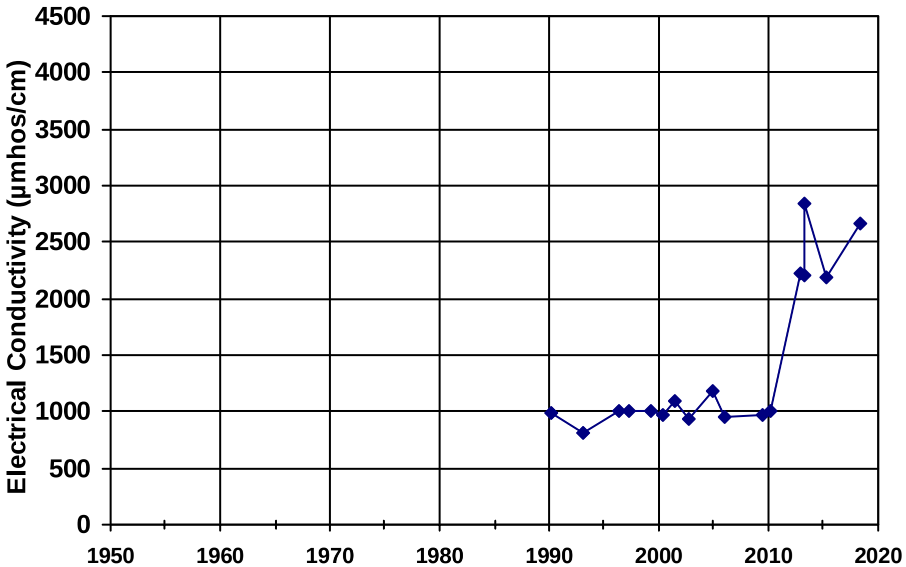
WellID: DIABLO WATER DISTRICT-Stonecreek PW
Zone: Deep
Well Depth: 305 Screened Int.: 220-295



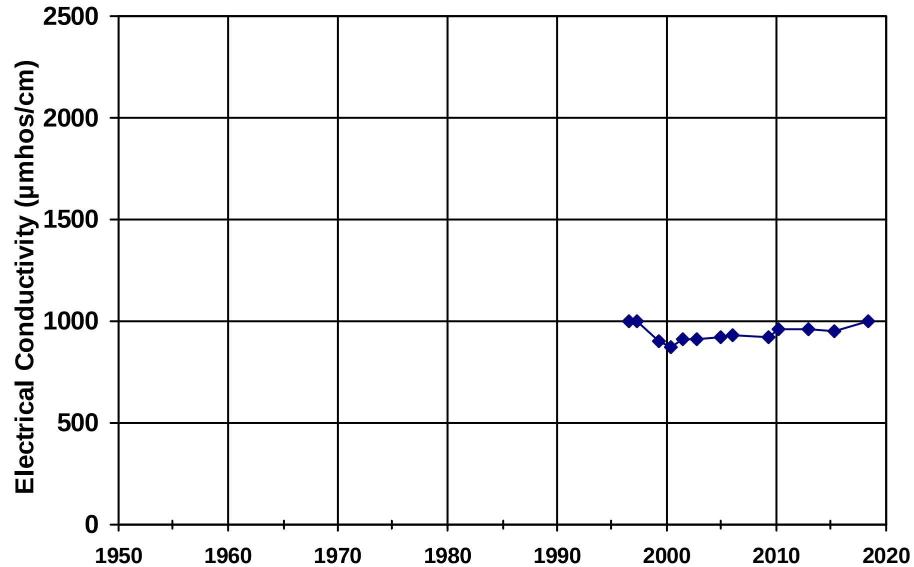

WellID: TOWN OF DISCOVERY BAY-WELL 02
Zone: Deep
Well Depth: 348 Screened Int.: 245-335




WellID: TOWN OF DISCOVERY BAY-WELL 05A
Zone: Deep
Well Depth: 357 Screened Int.: 251-281, 307-347

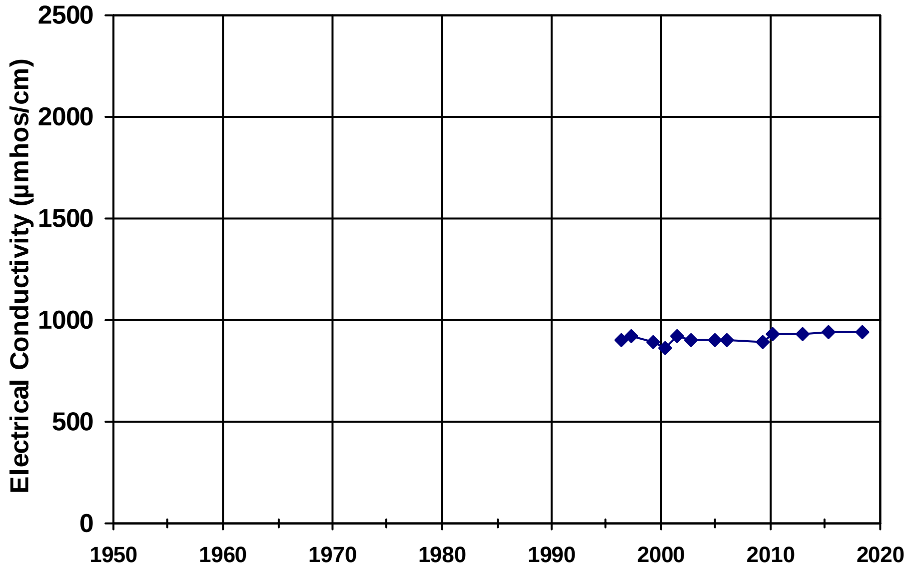



WellID: TOWN OF DISCOVERY BAY-WELL 04A
Zone: Deep
Well Depth: 357 Screened Int.: 307-347

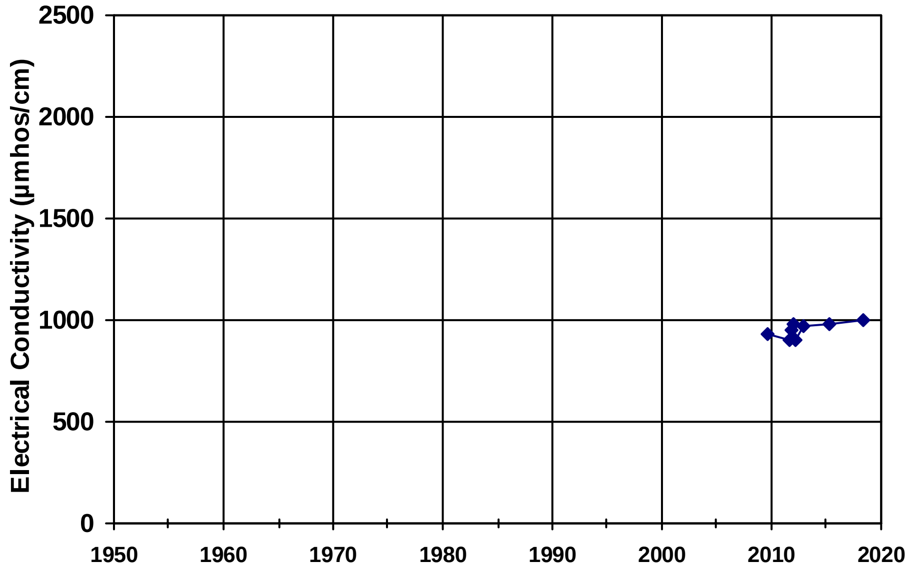



{R_WQ_TDSplots}

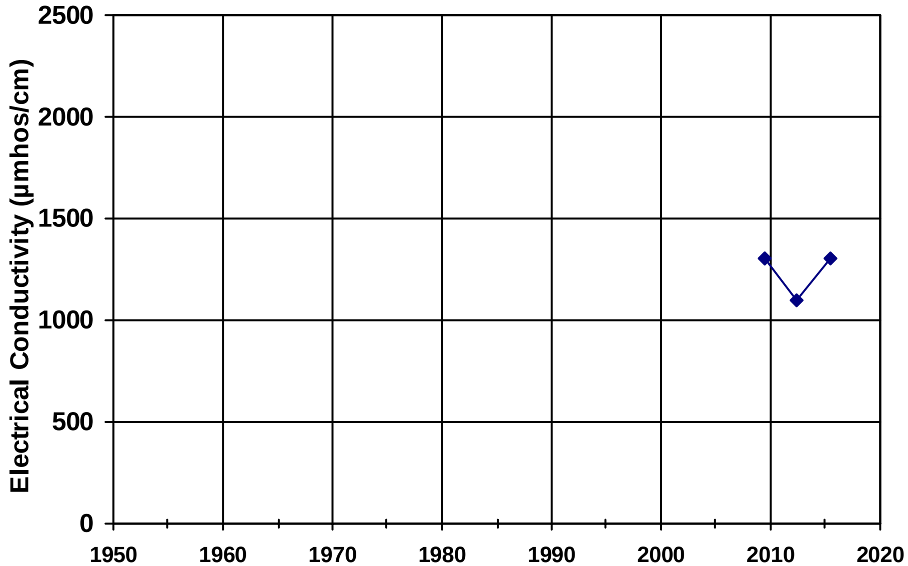
WellID: TOWN OF DISCOVERY BAY-WELL 01B
Zone: Deep
Well Depth: 350 Screened Int.: 271-289, 308-340



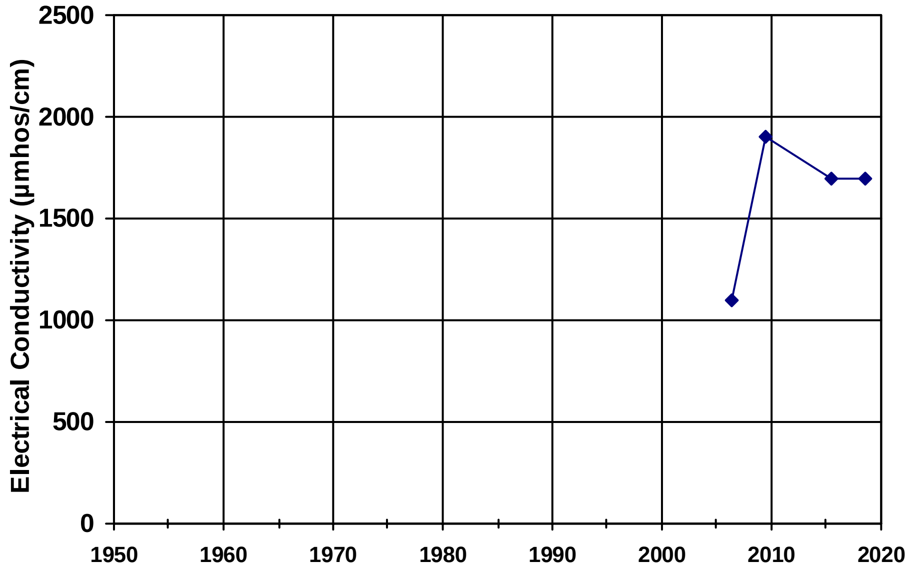

WellID: TOWN OF DISCOVERY BAY-WELL 06
Zone: Deep
Well Depth: 360 Screened Int.: 270-295, 305-350




WellID: WILLOW PARK MARINA-West Well
Zone: Deep
Well Depth: 340 Screened Int.: 250-310

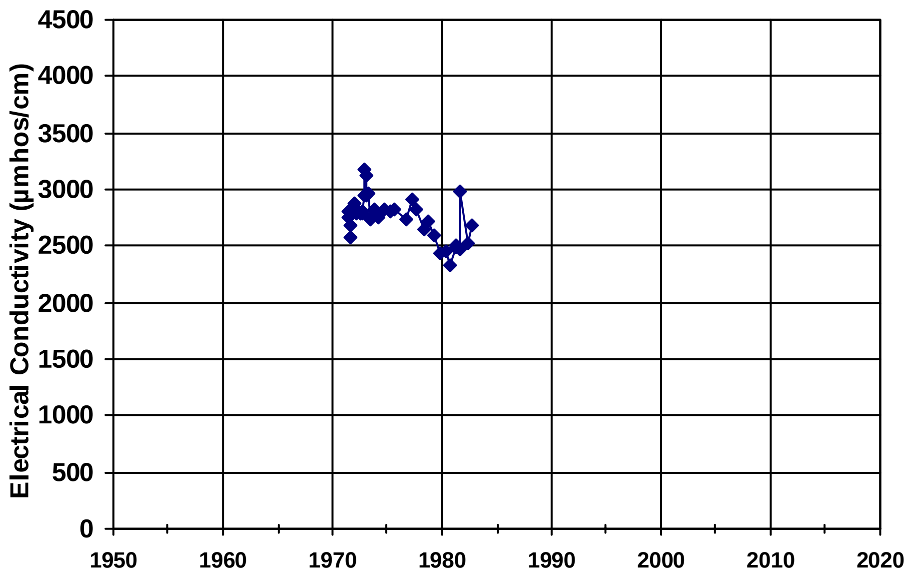



WellID: WILLOW MOBILE HOME PARK-Well Head
Zone: Deep
Well Depth: 410 Screened Int.: 292-332

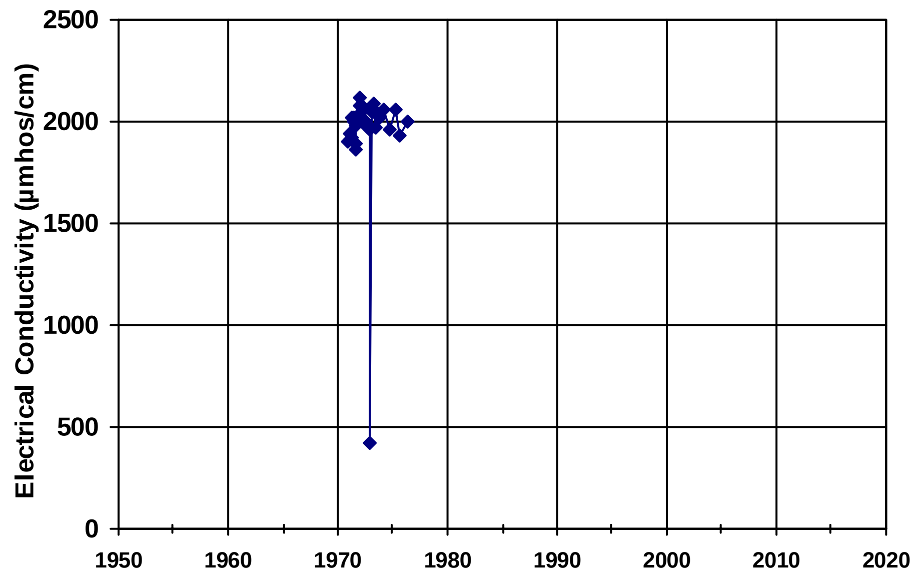



{R_WQ_TDSplots}

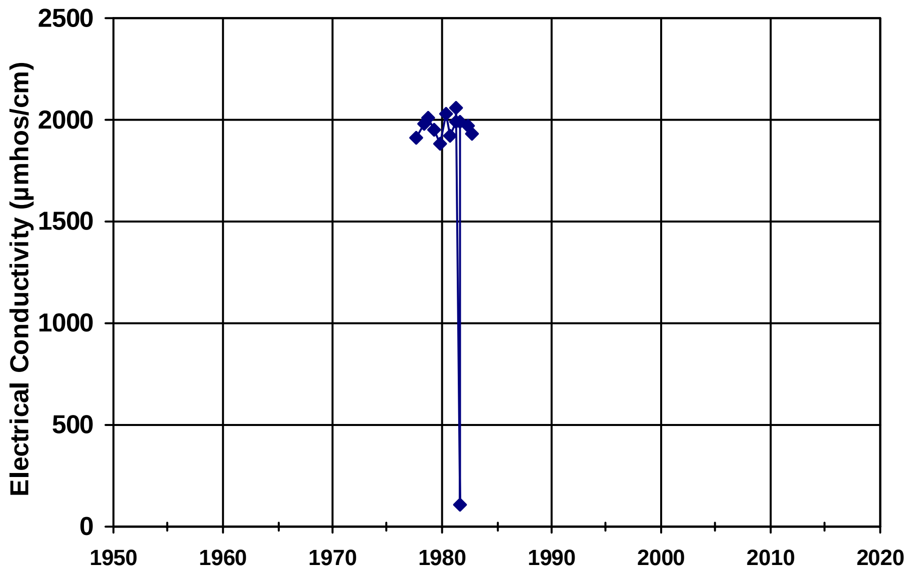
WellID: USGS-380019121473401
Zone: Deep
Well Depth: 190 Screened Int.:



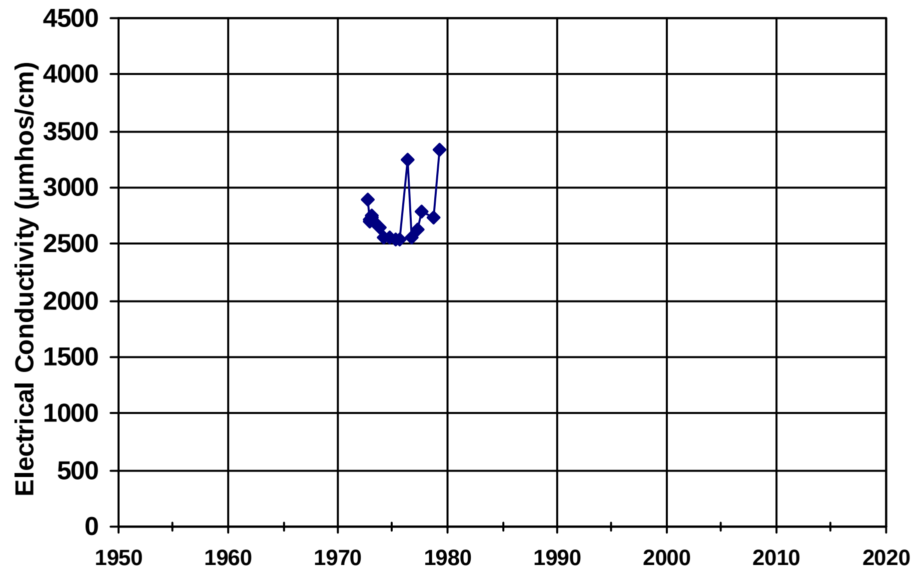

WellID: USGS-380024121490801
Zone: Deep
Well Depth: 124 Screened Int.:




WellID: USGS-380024121490803
Zone: Deep
Well Depth: 140 Screened Int.:




WellID: USGS-380048121460901
Zone: Deep
Well Depth: 500 Screened Int.:

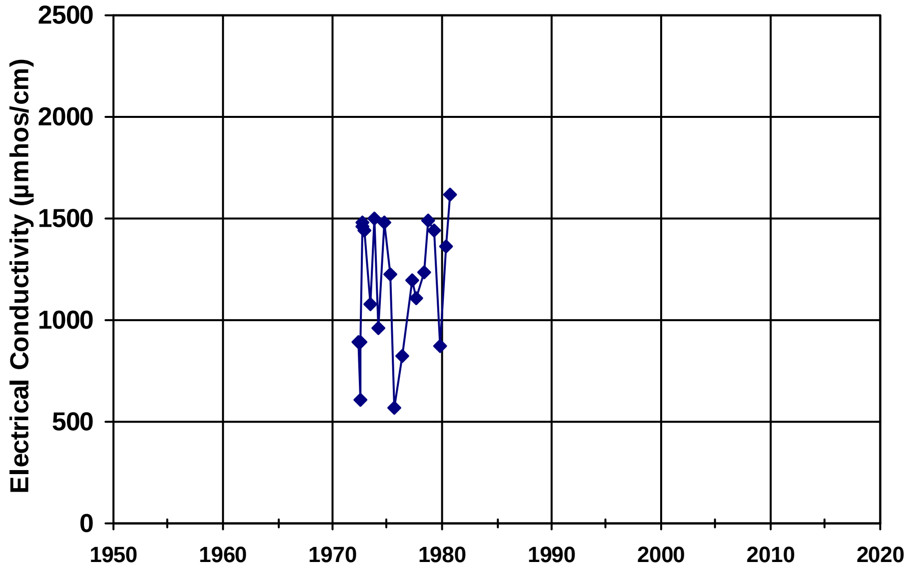



{R_WQ_TDSplots}

**WellID: USGS-380102121480801**

**Zone: Deep**

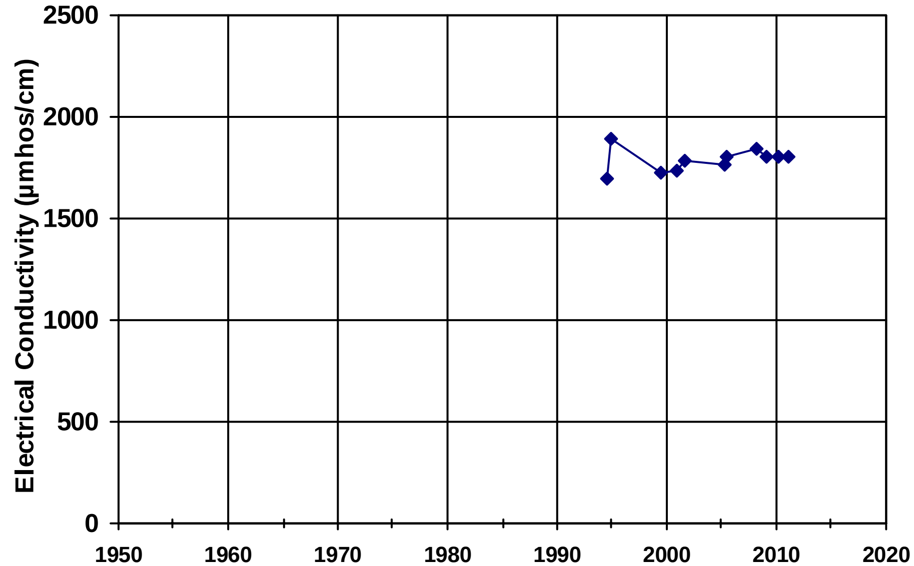
Well Depth: 258 Screened Int.:




**WellID: CITY OF BRENTWOOD-Well 10A**

**Zone: Composite**

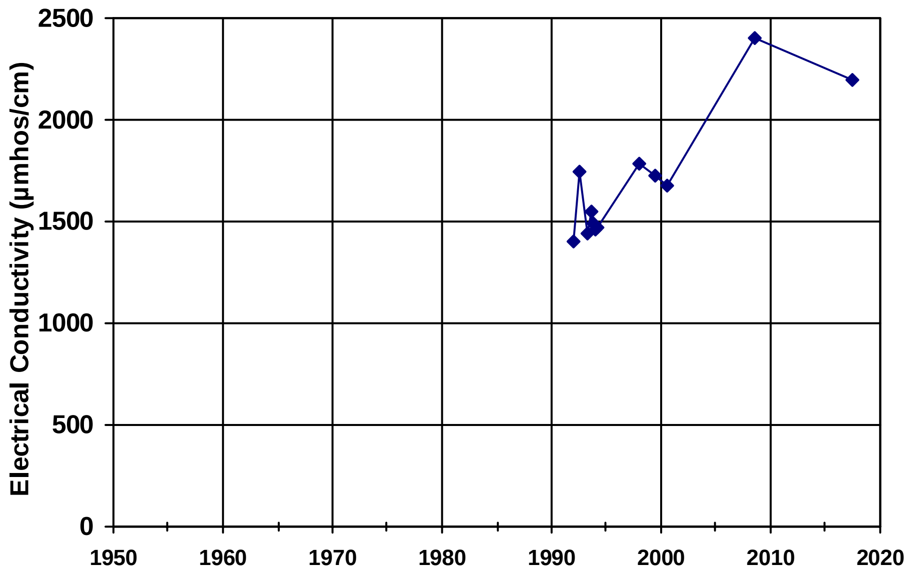
Well Depth: 210 Screened Int.: 52-72, 135-182




**WellID: DIABLO WATER DISTRICT-WELL 01 - STANDBY**

**Zone: Composite**

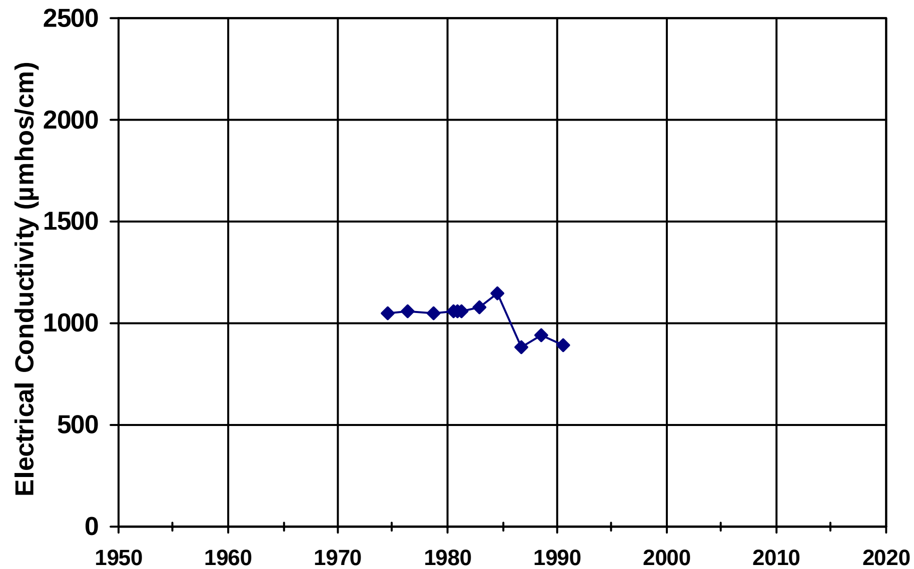
Well Depth: 170 Screened Int.: 100-170




**WellID: 6 Byer**

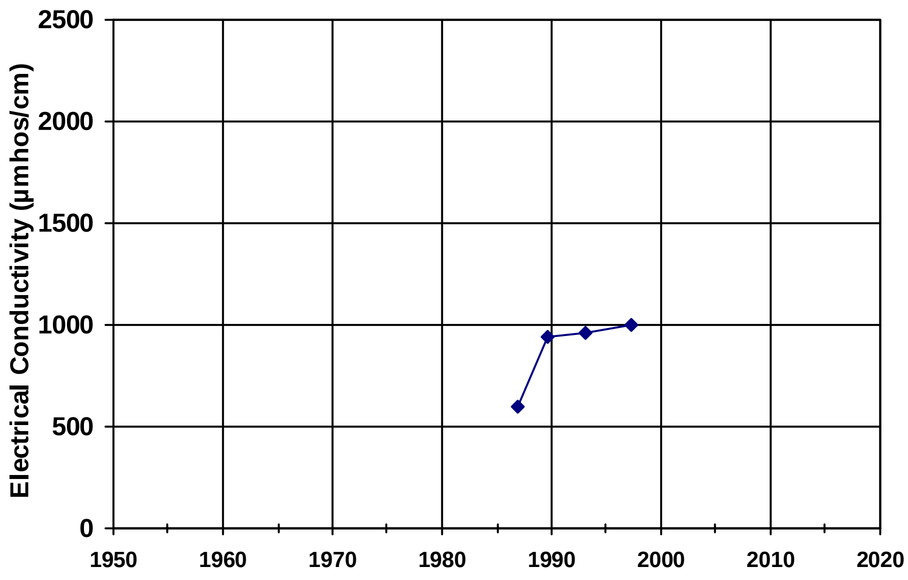
**Zone: Composite**

Well Depth: 185 Screened Int.:

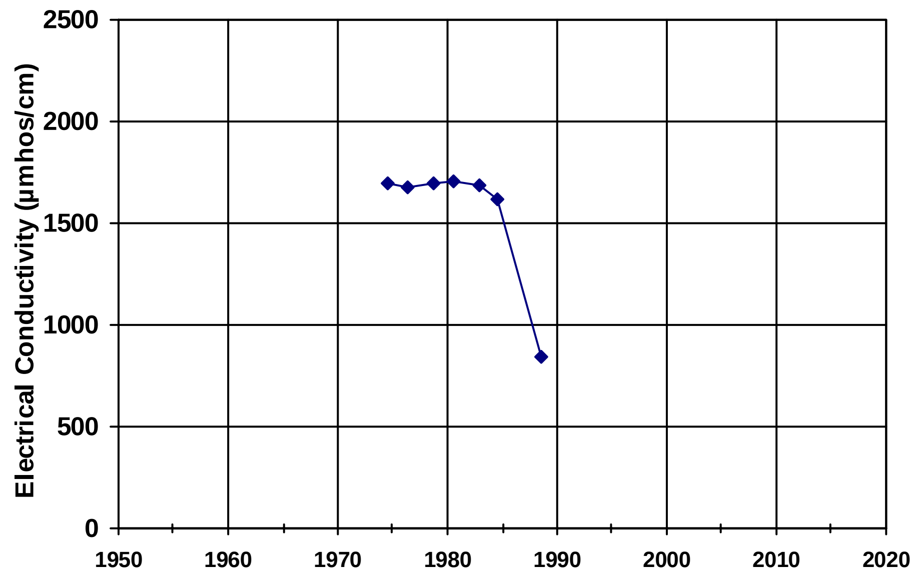



{R_WQ_TDSplots}

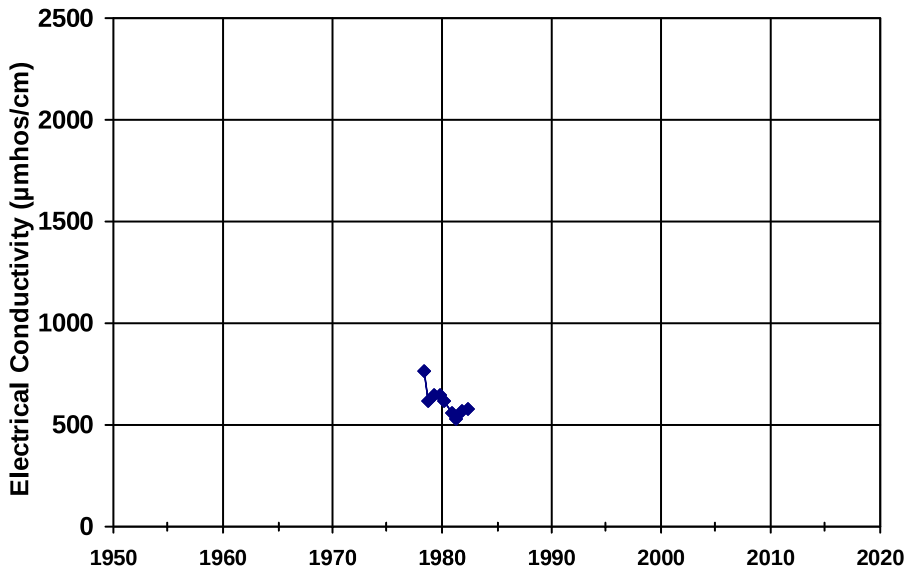
**WellID: TOWN OF DISCOVERY BAY-WELL 03 - INACTIVE**
**Zone: Unknown**
Well Depth: Screened Int.:



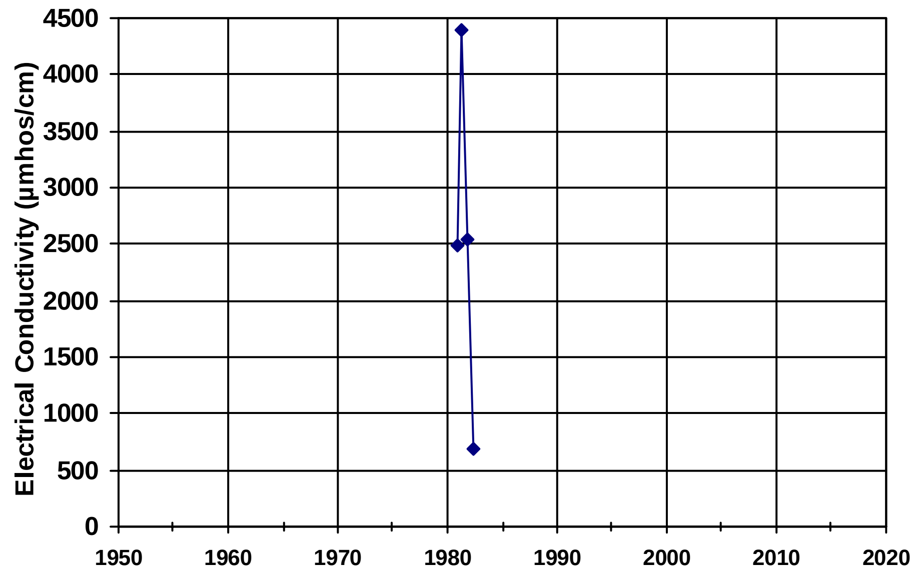

**WellID: 01N02E13H001M**
**Zone: Unknown**
Well Depth: Screened Int.:




**WellID: 01S04E09N002M**
**Zone: Unknown**
Well Depth: Screened Int.:

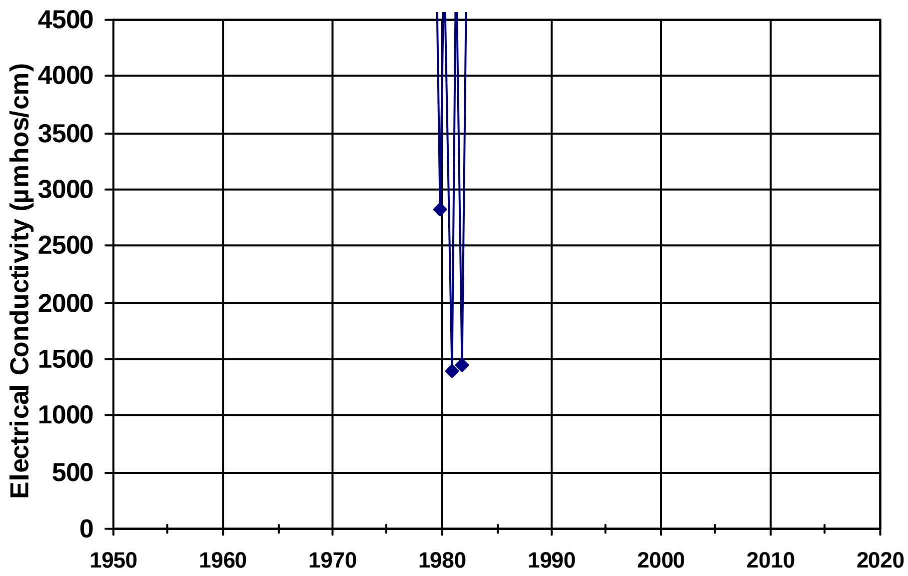



**WellID: 01S04E17A001M**
**Zone: Unknown**
Well Depth: Screened Int.:

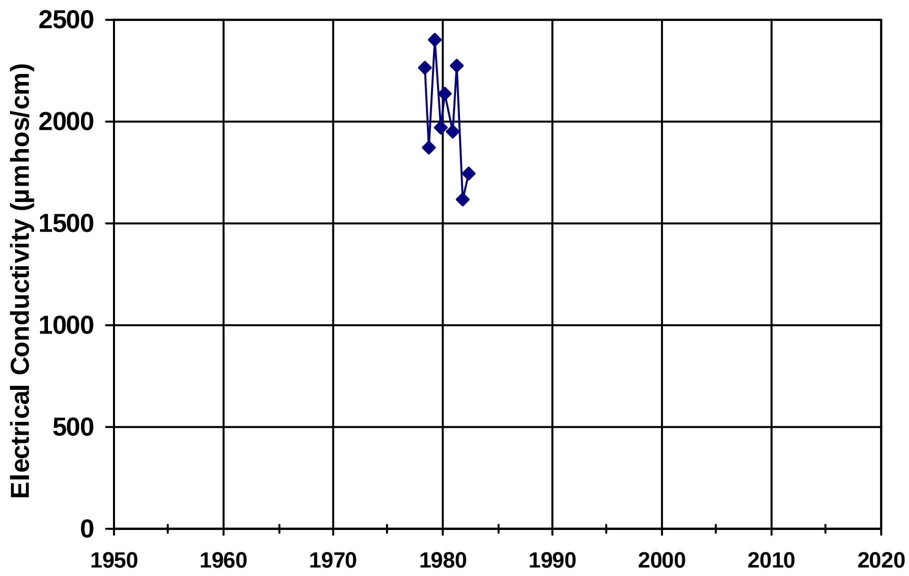



{R_WQ_TDSplots}

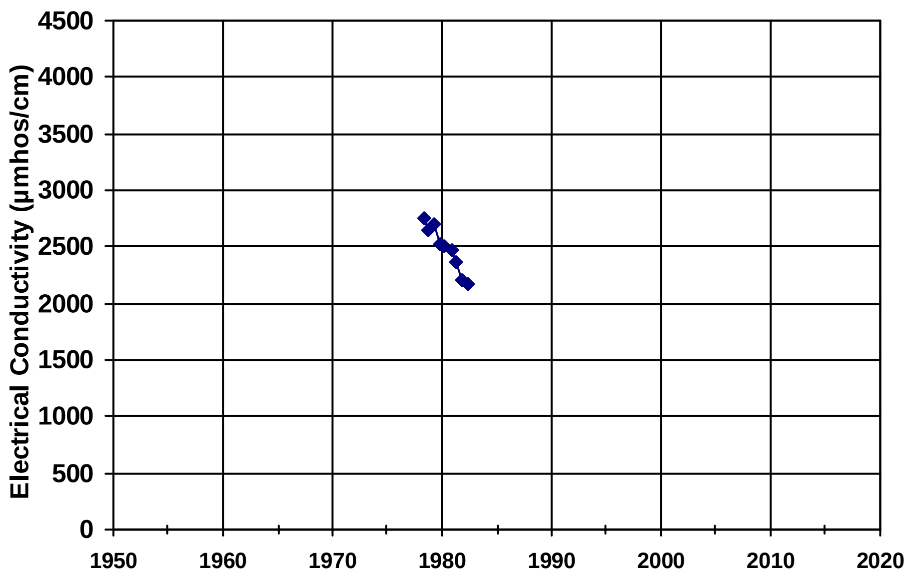
**WellID: 01S04E17A002M**
**Zone: Unknown**
Well Depth: Screened Int.:



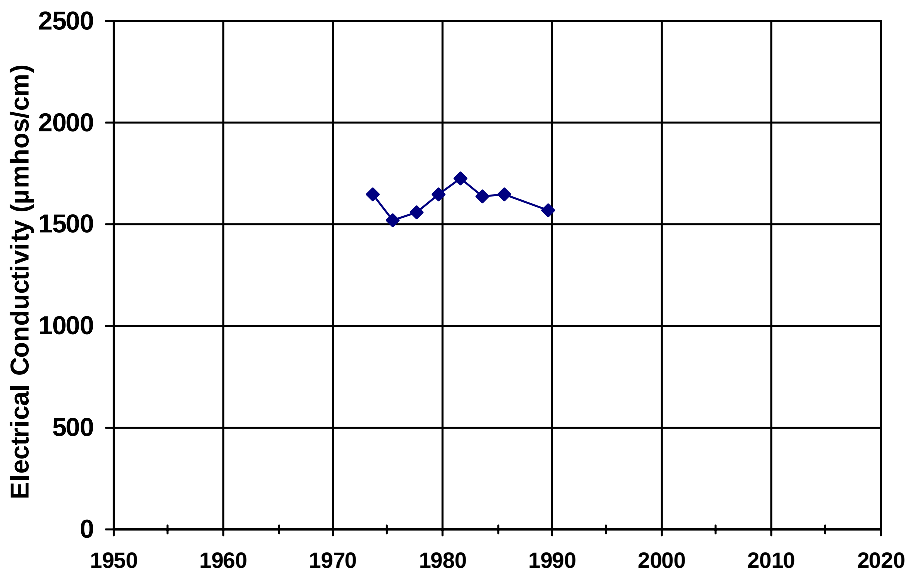

**WellID: 01S04E17C001M**
**Zone: Unknown**
Well Depth: Screened Int.:




**WellID: 01S04E20K001M**
**Zone: Unknown**
Well Depth: Screened Int.:

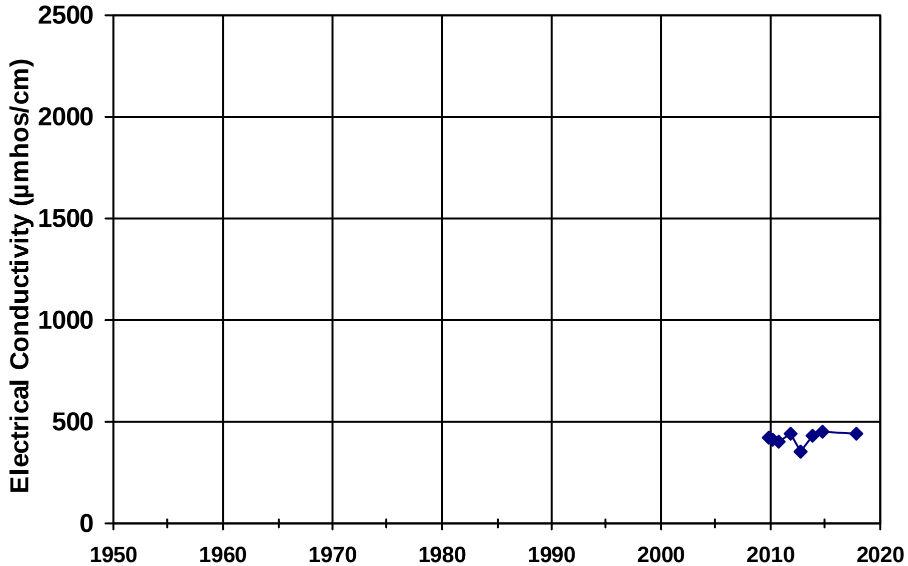



**WellID: 02N02E20A001M**
**Zone: Unknown**
Well Depth: Screened Int.:

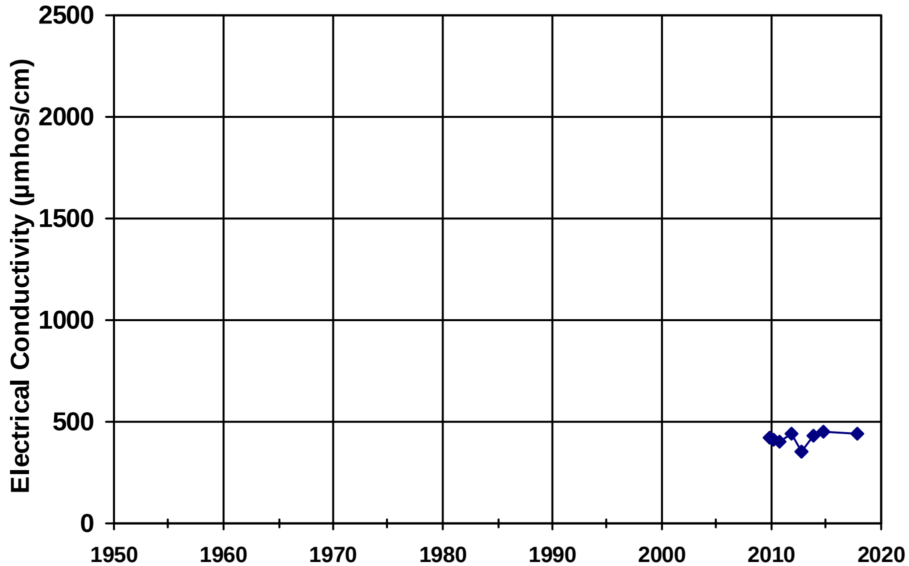



{R_WQ_TDSplots}

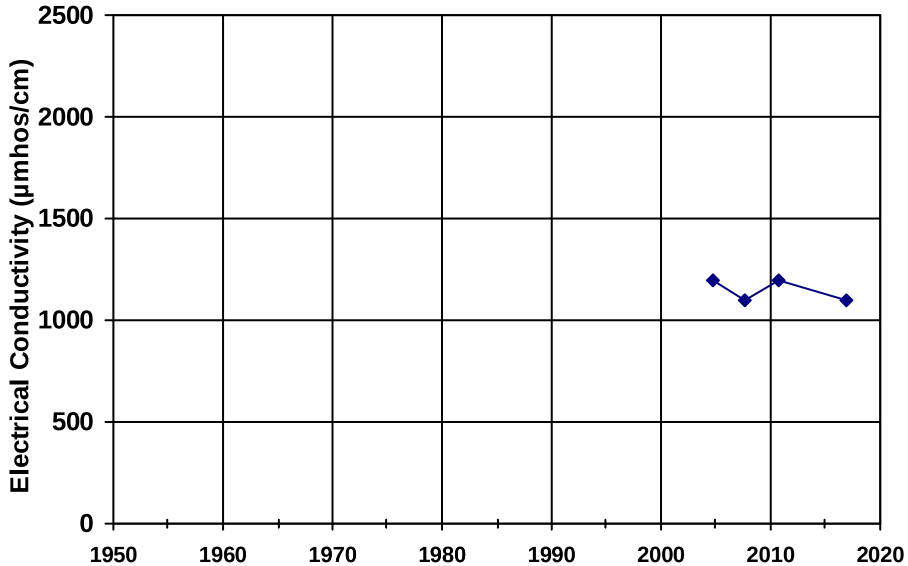
WellID: LOS VAQUEROS MARINA BLDG-SOURCE
Zone: Unknown
Well Depth: Screened Int.:



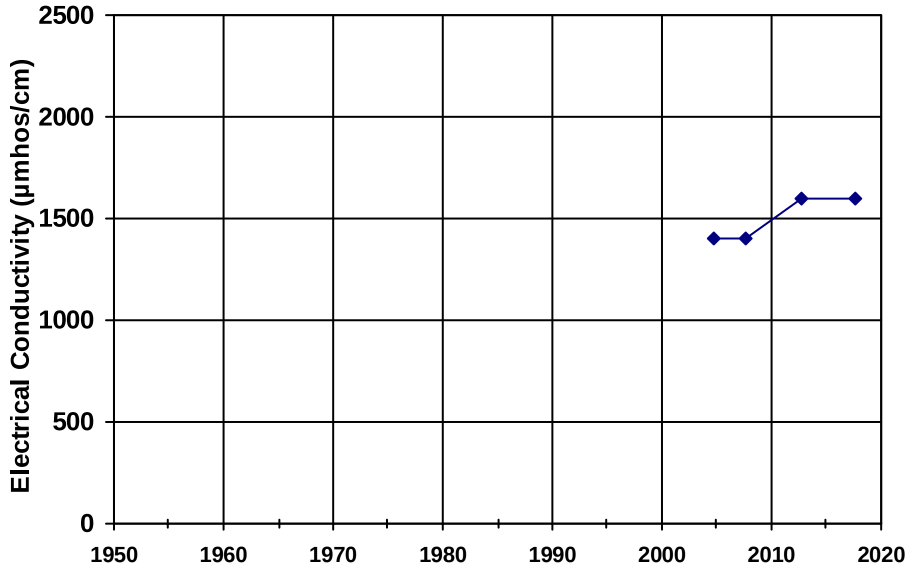

WellID: LOS VAQUEROS INTERPRETIVE CENTER-SOURCE
Zone: Unknown
Well Depth: Screened Int.:




WellID: FARRAR PARK PROPERTY OWNERS-Well Head
Zone: Unknown
Well Depth: Screened Int.:

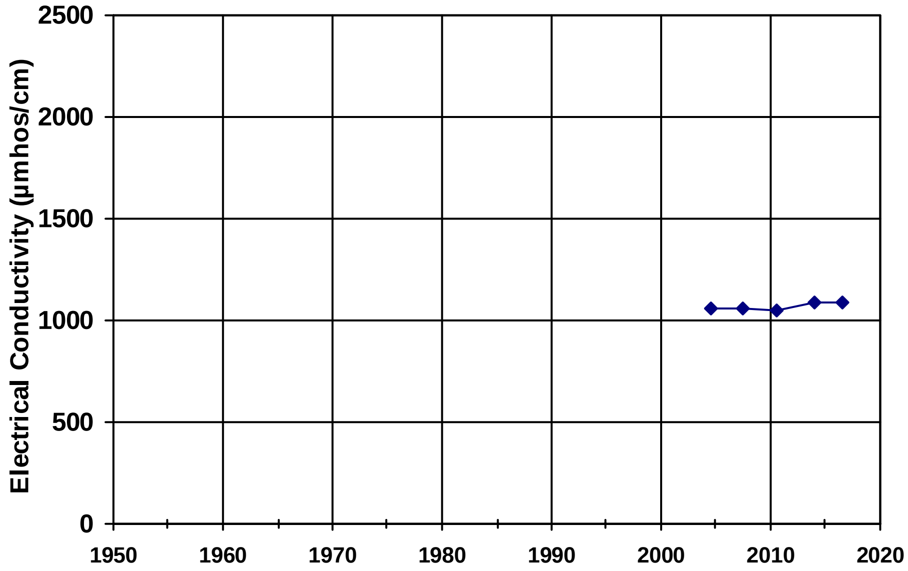



WellID: ANGLER S RANCH #3-WELL 02
Zone: Unknown
Well Depth: Screened Int.:

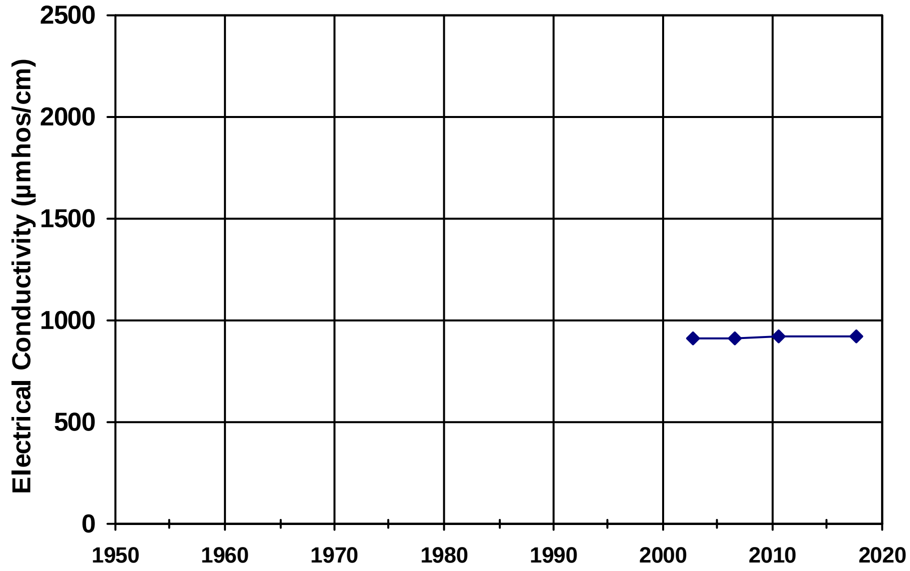



{R_WQ_TDSplots}

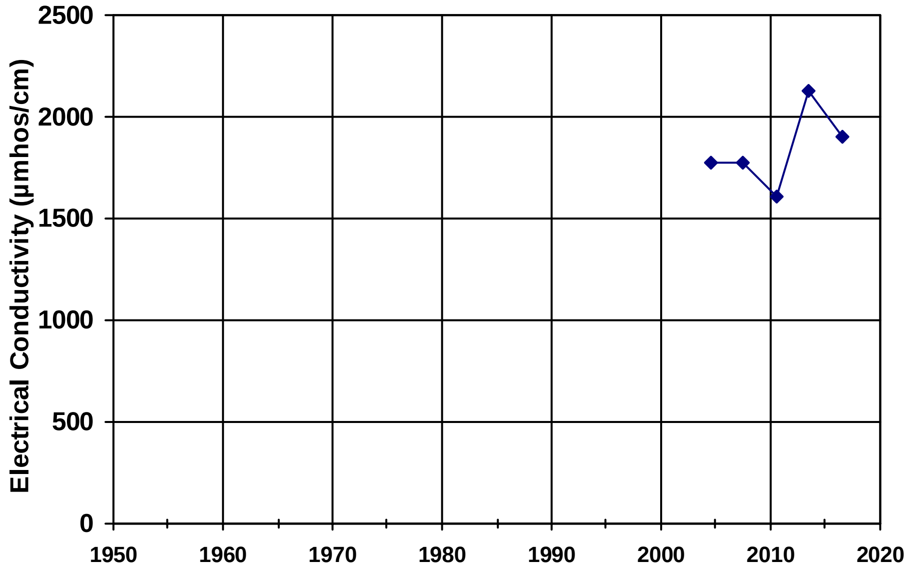
WellID: DUTCH SLOUGH WATER WORKS-Well Head
Zone: Unknown
Well Depth: Screened Int.:



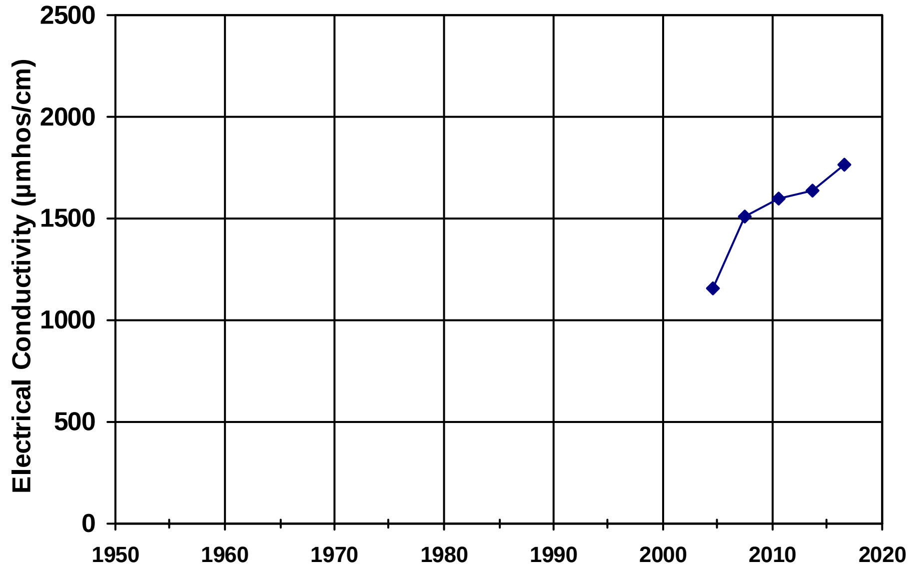

WellID: ORWOOD RESORT-WELL 2 - WEST WELL
Zone: Unknown
Well Depth: Screened Int.:




WellID: ANGLERS SUBDIVISION 4-WELL 1 - 1696 Taylor
Zone: Unknown
Well Depth: Screened Int.:

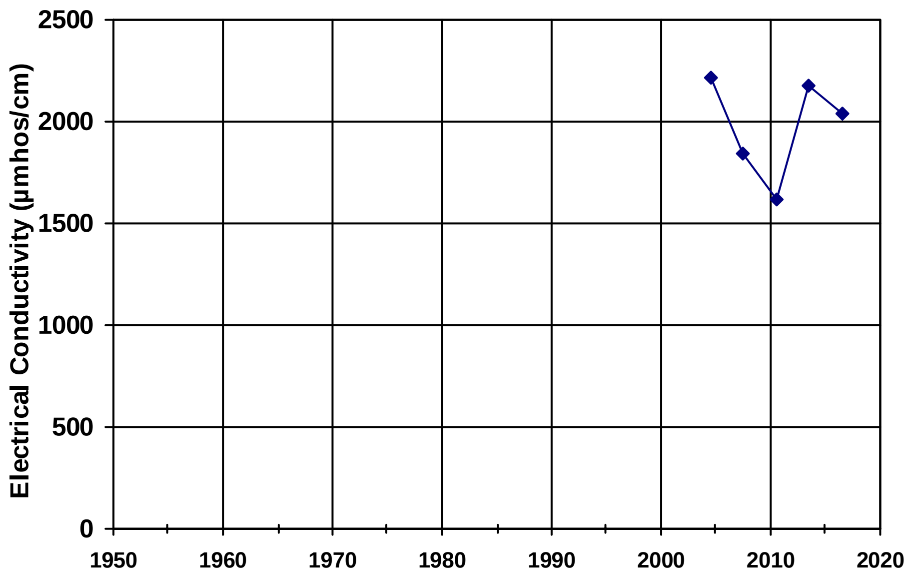



WellID: ANGLERS SUBDIVISION 4-WELL 2 - 1398 Taylor
Zone: Unknown
Well Depth: Screened Int.:

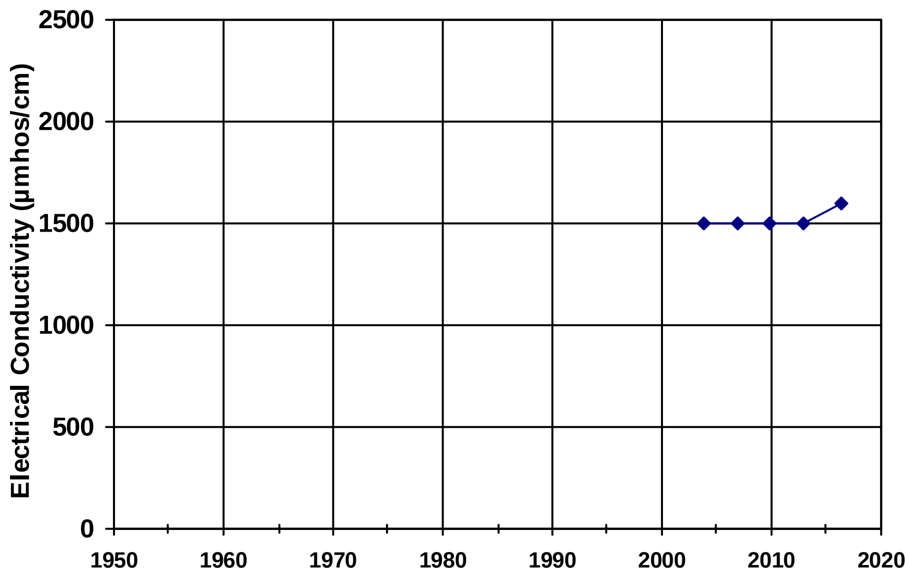



{R_WQ_TDSplots}

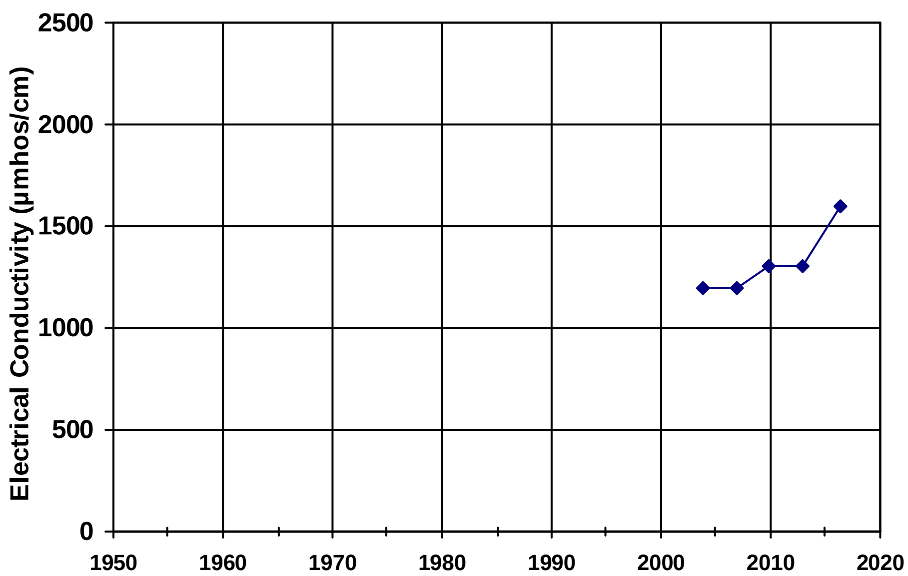
**WellID: ANGLERS SUBDIVISION 4-WELL 3 - 1698 Taylor**
**Zone: Unknown**
Well Depth: Screened Int.:



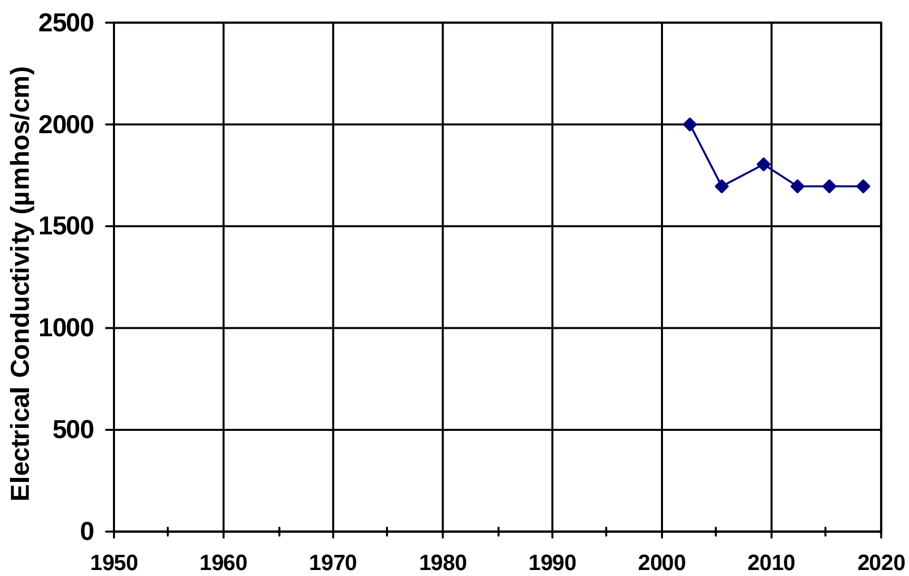

**WellID: DELTA MUTUAL WATER COMPANY-East Well**
**Zone: Unknown**
Well Depth: Screened Int.:




**WellID: DELTA MUTUAL WATER COMPANY-West Well**
**Zone: Unknown**
Well Depth: Screened Int.:

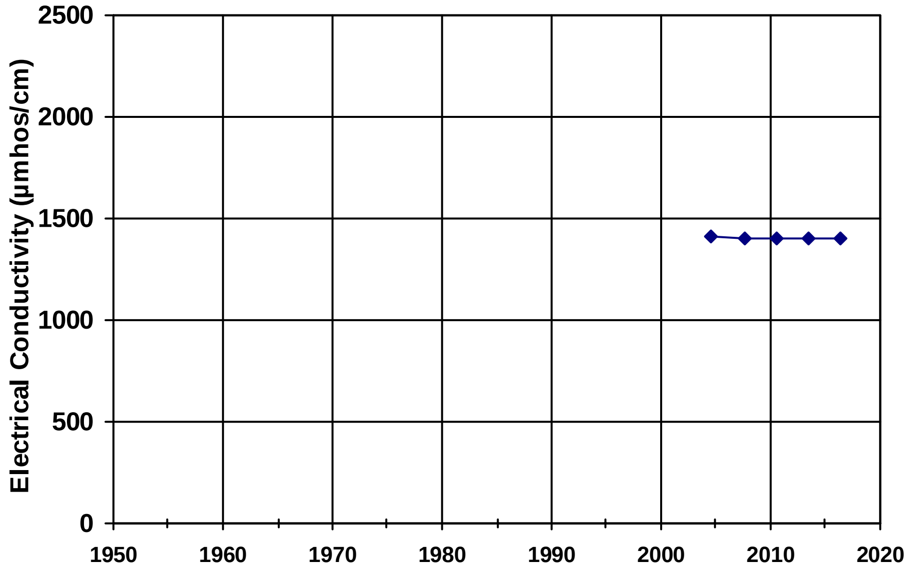



**WellID: SANTIAGO ISLAND VILLAGE-WELL 01**
**Zone: Unknown**
Well Depth: Screened Int.:

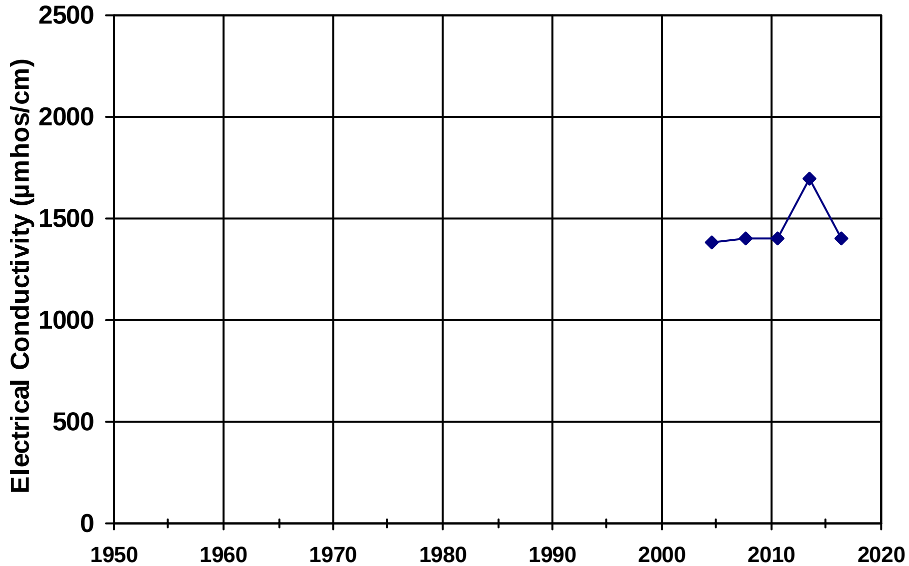



{R_WQ_TDSplots}

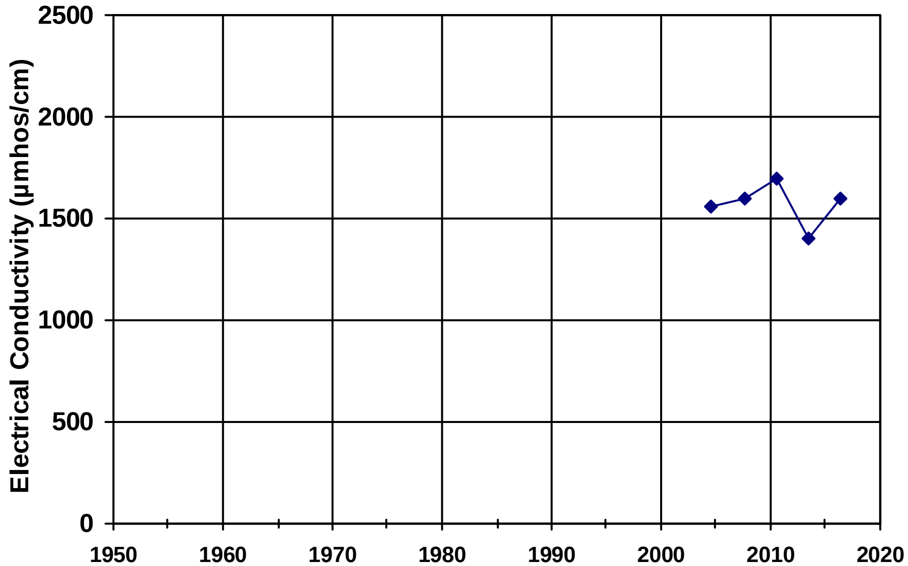
WellID: PLEASANTIMES MUTUAL WATER CO-Well 1 - 4282 STONE
Zone: Unknown
Well Depth: Screened Int.:



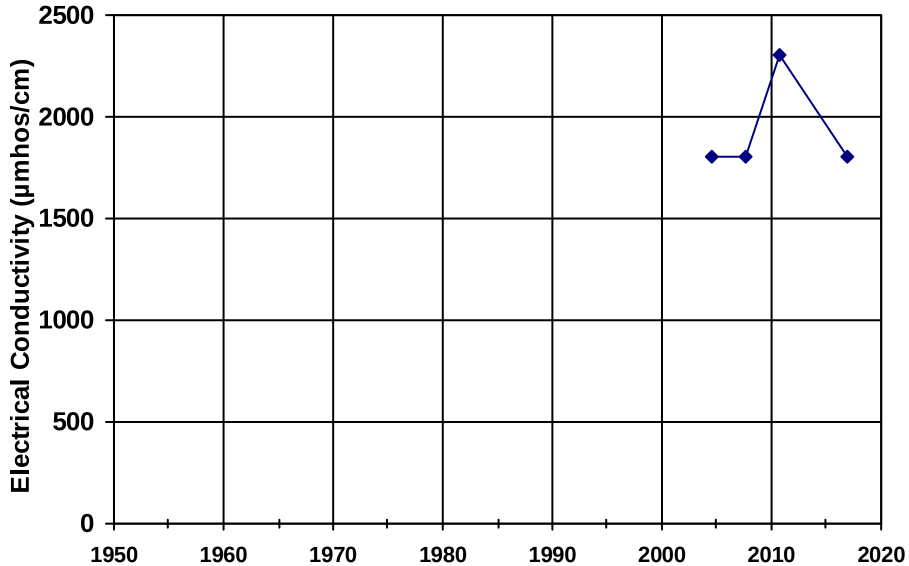

WellID: PLEASANTIMES MUTUAL WATER CO-WELL 2 - 4520 STONE
Zone: Unknown
Well Depth: Screened Int.:




WellID: PLEASANTIMES MUTUAL WATER CO-WELL 3 - 4441 WILLOW
Zone: Unknown
Well Depth: Screened Int.:




WellID: RIVERVIEW WATER ASSOCIATION-WELL 1 BEACON HARBOR
Zone: Unknown
Well Depth: Screened Int.:

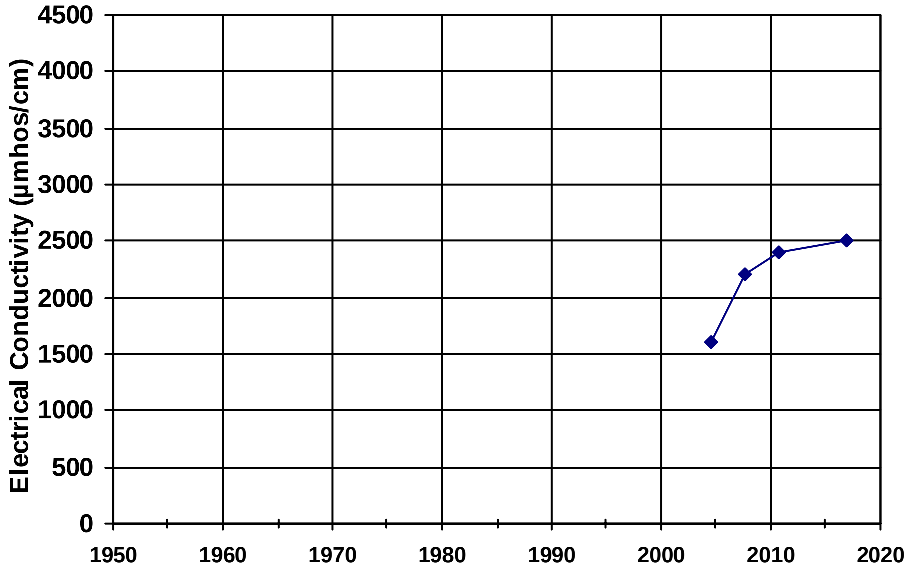



{R_WQ_TDSplots}

**WellID: RIVERVIEW WATER ASSOCIATION-WELL 2 END OF WILLOW RD**

**Zone: Unknown**

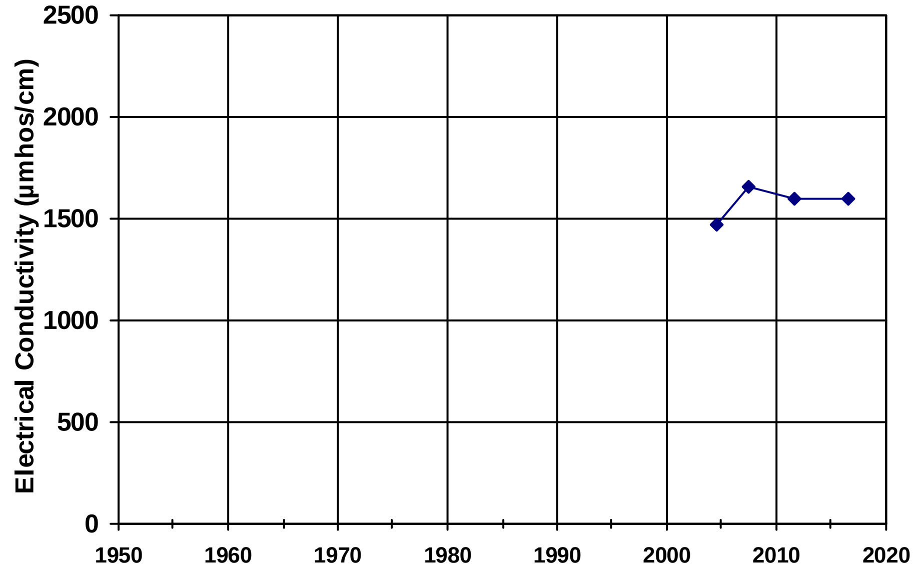
Well Depth: Screened Int.:




**WellID: BIG OAK MOBILE HOME PARK WATER-Well Head - West well**

**Zone: Unknown**

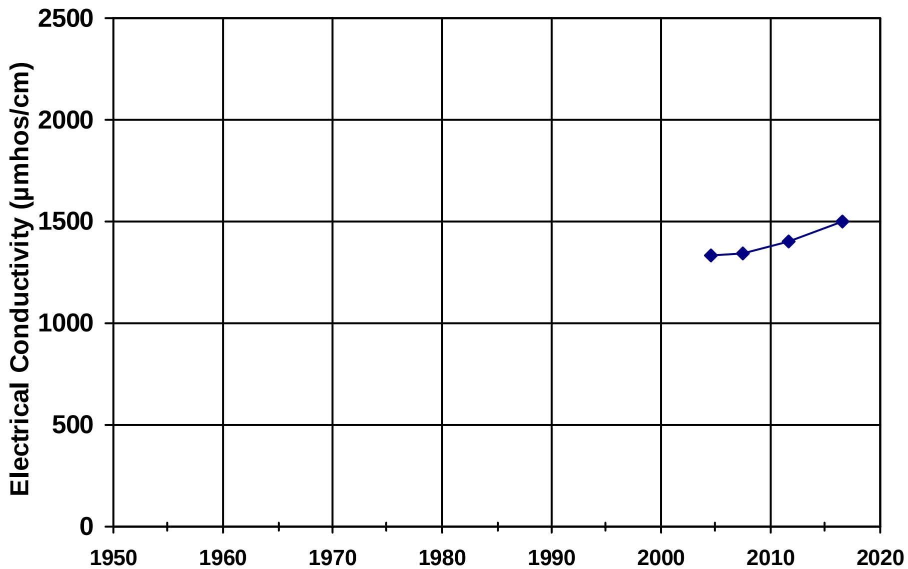
Well Depth: Screened Int.:




**WellID: BIG OAK MOBILE HOME PARK WATER-Wellhead- East well**

**Zone: Unknown**

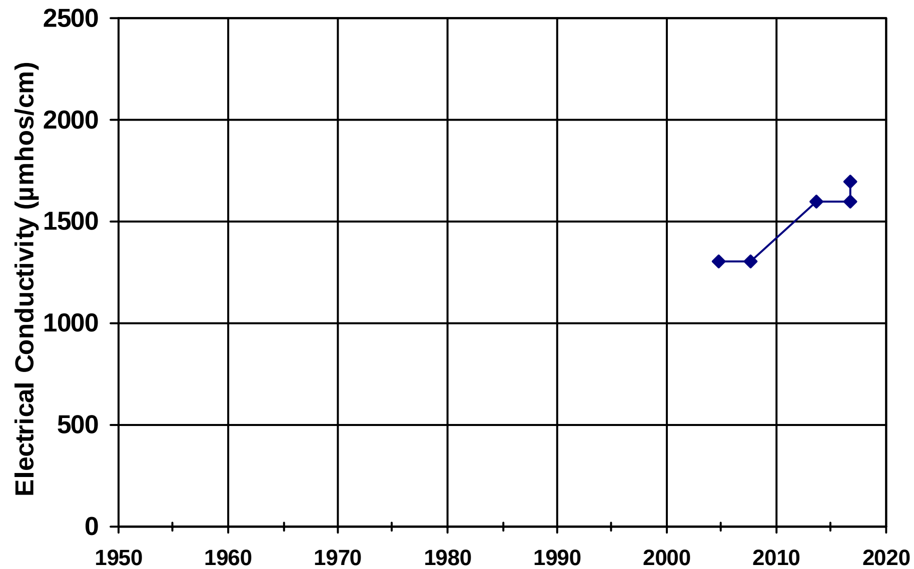
Well Depth: Screened Int.:




**WellID: SANDY POINT MOBILE HOME PARK-Well Head**

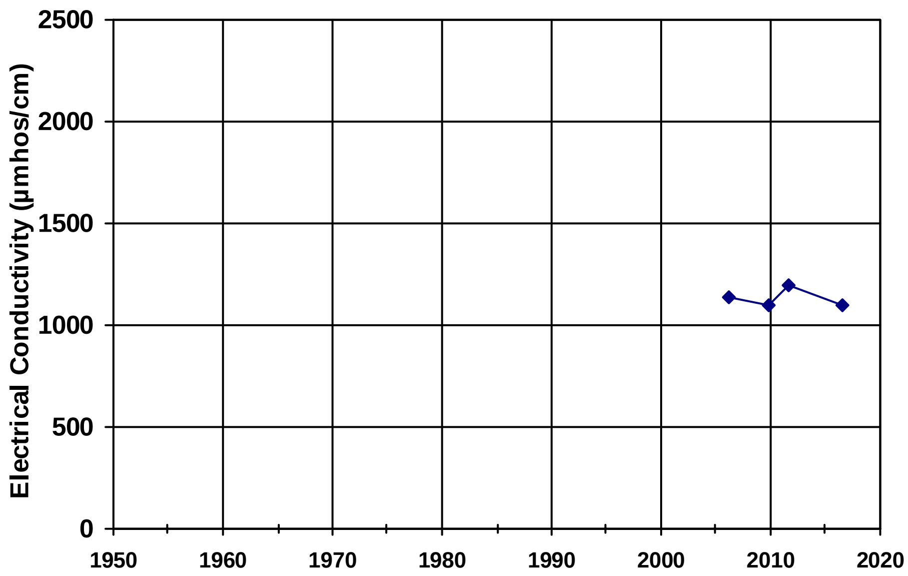
**Zone: Unknown**

Well Depth: Screened Int.:

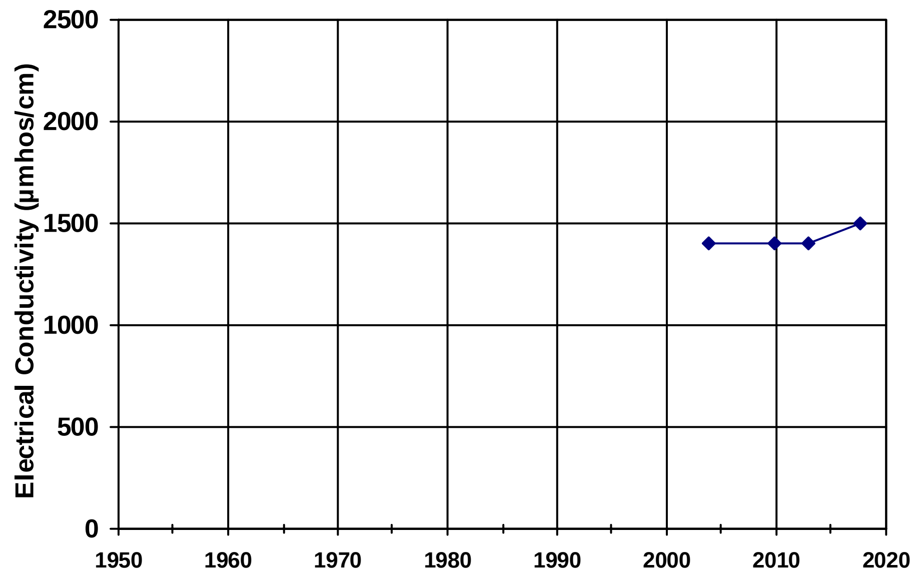



{R_WQ_TDSplots}

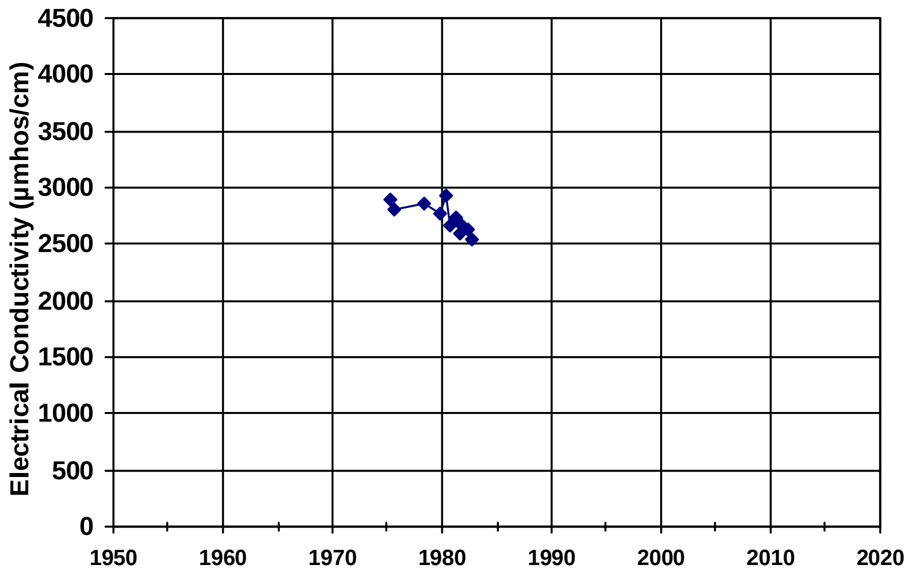
**WellID: CAMINO MOBILEHOME-WELL**
**Zone: Unknown**
Well Depth: Screened Int.:




**WellID: RUSSOS MOBILE PARK-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.:



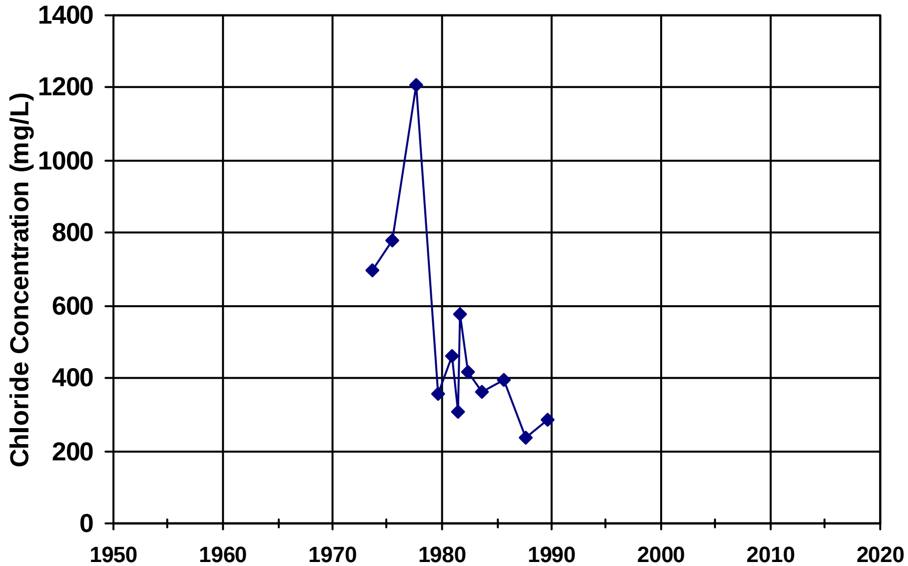

**WellID: USGS-380024121471501**
**Zone: Unknown**
Well Depth: Screened Int.:



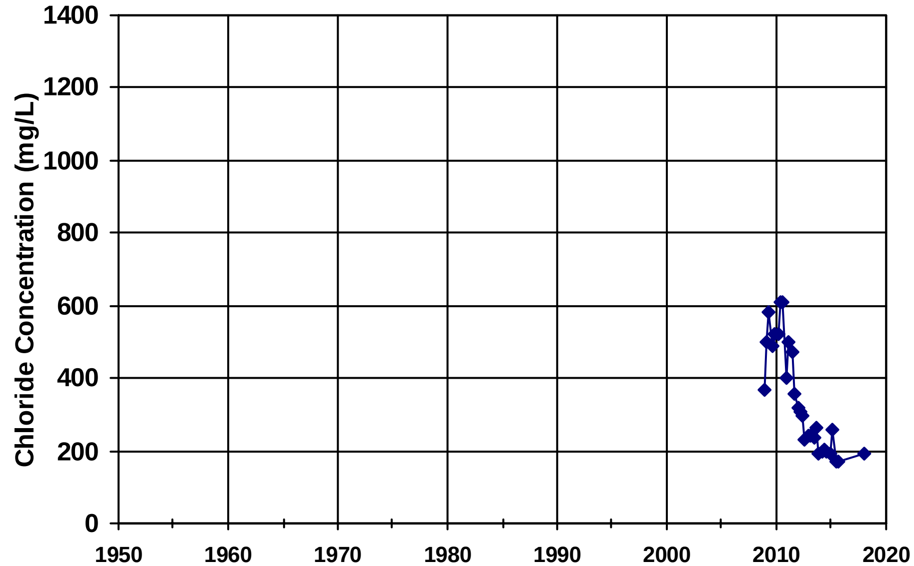

{R_WQ_TDSplots}

# Chloride Graphs

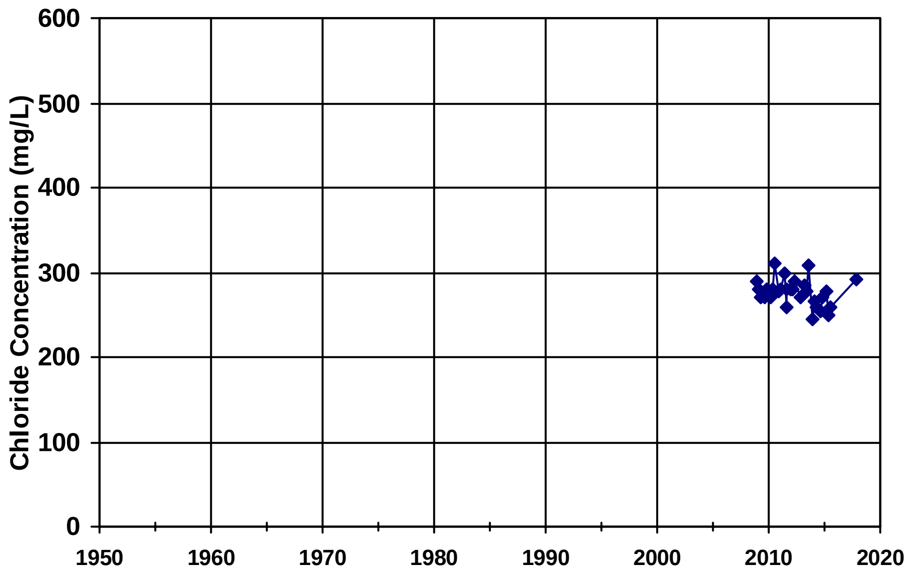
WellID: 5 Binn
Zone: Shallow
Well Depth: 45 Screened Int.



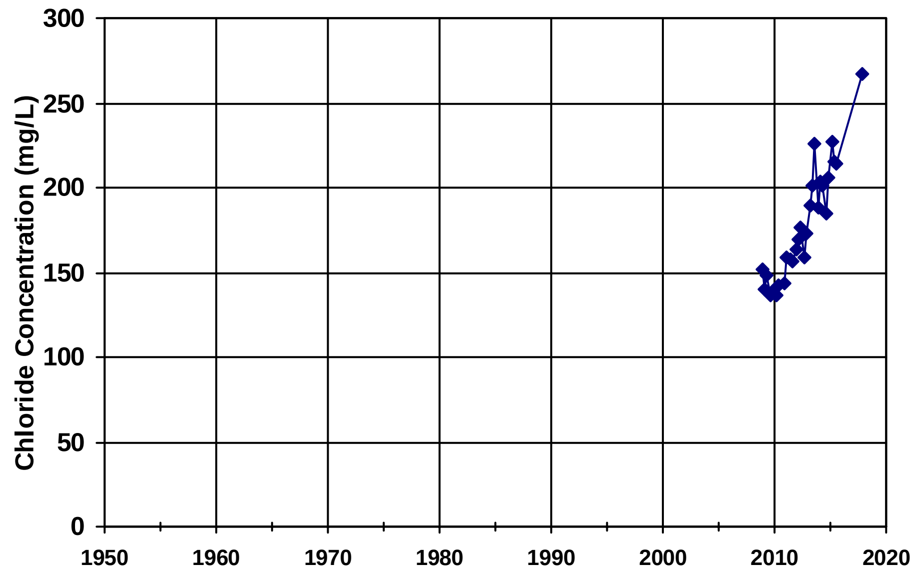

WellID: BG-1
Zone: Shallow
Well Depth: 55 Screened Int. 40-55




WellID: BG-2
Zone: Shallow
Well Depth: 37.5 Screened Int. 22.5-37.5

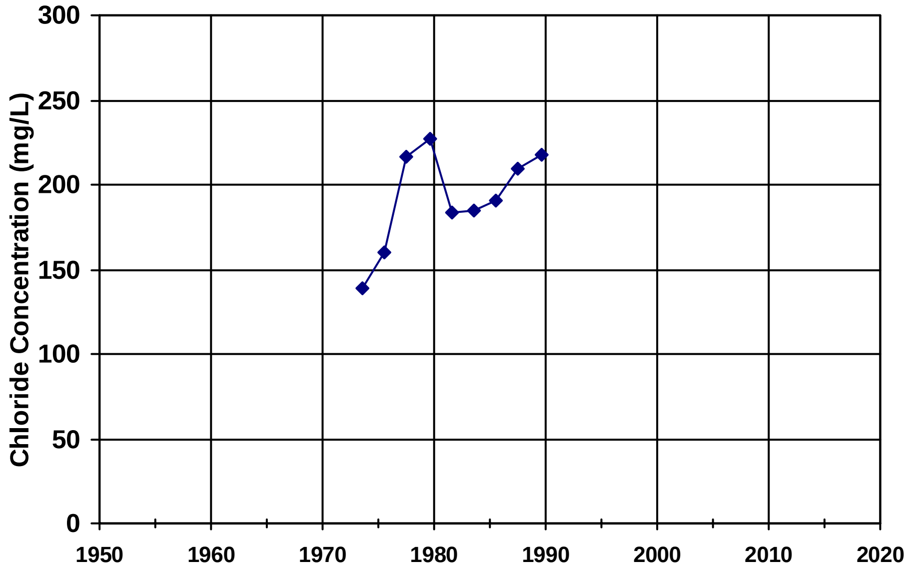



WellID: BG-3
Zone: Shallow
Well Depth: 35 Screened Int. 20-35

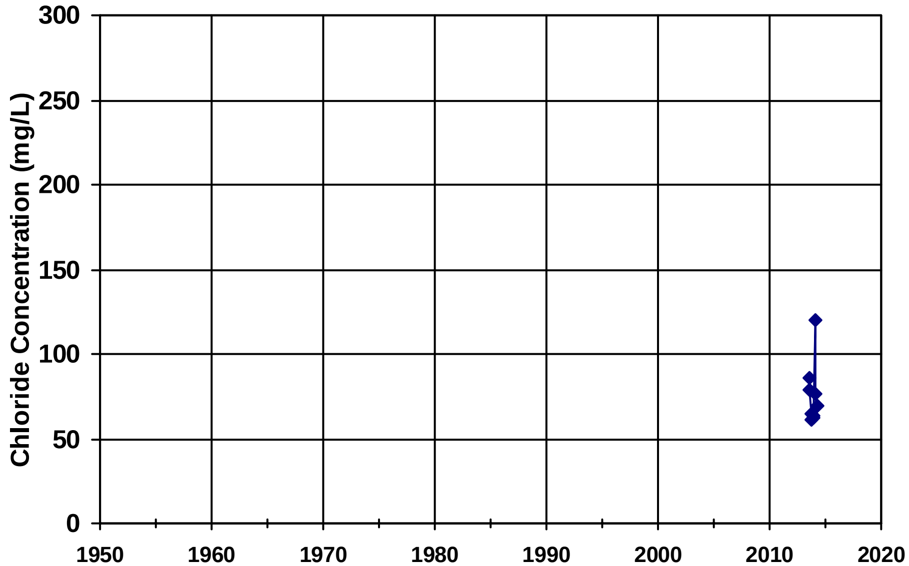



{R_WQ_CLplots}

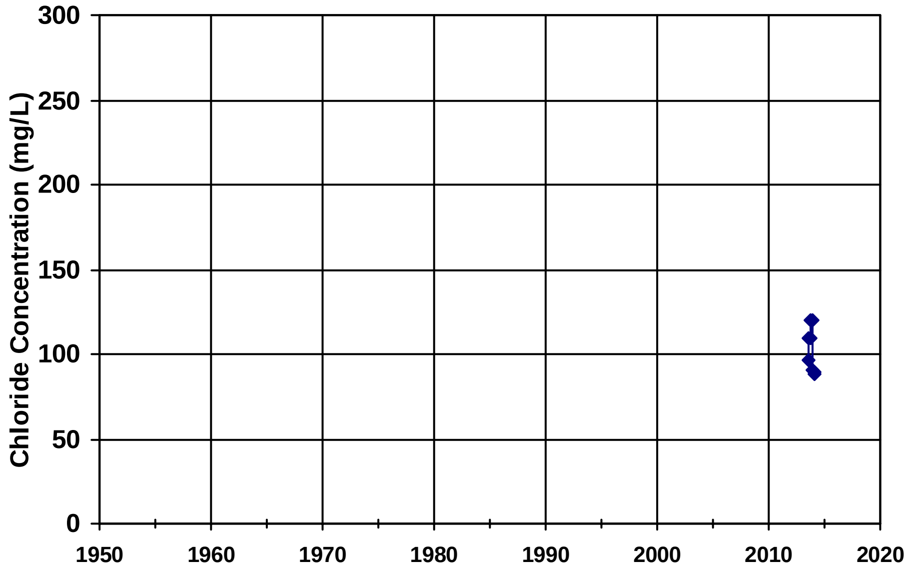
**WellID: 01N03E17E001M**
**Zone: Shallow**
Well Depth: 123 Screened Int. 113-123



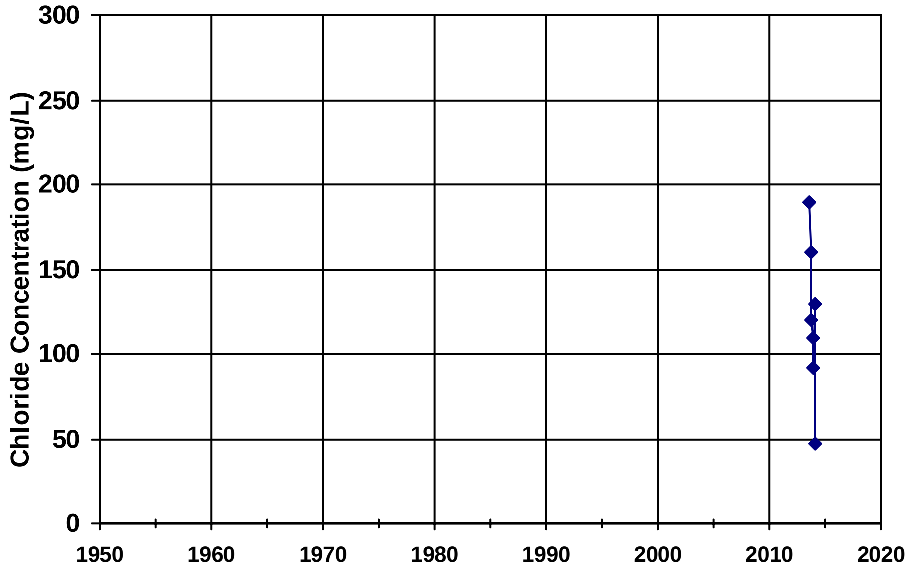

**WellID: SL186102968-7EW-4**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: SL186102968-7MW-1**
**Zone: Shallow**
Well Depth: Screened Int.

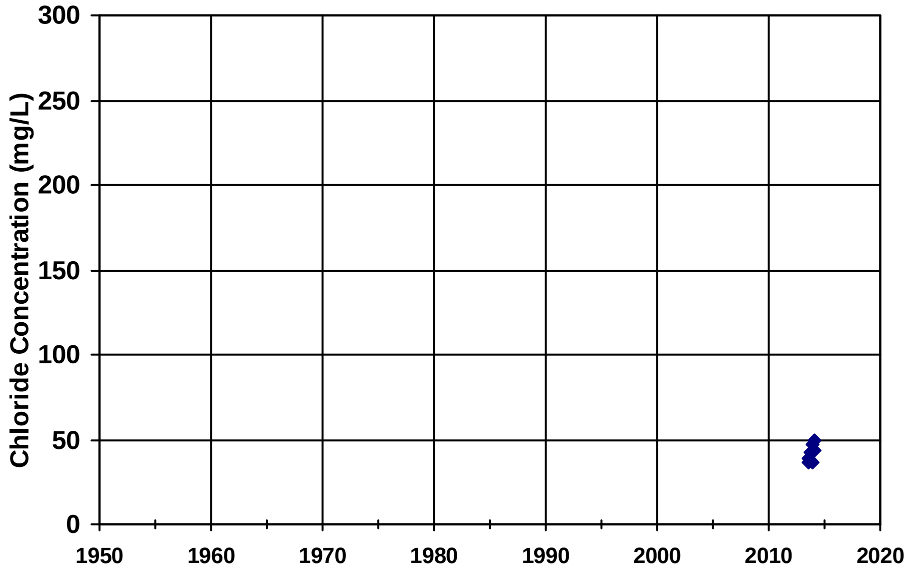



**WellID: SL186102968-7MW-11**
**Zone: Shallow**
Well Depth: Screened Int.

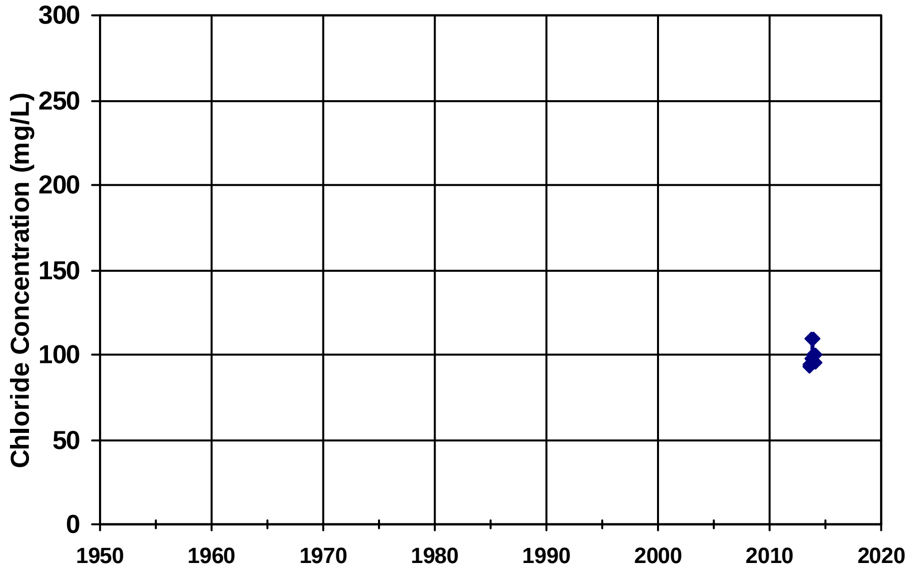



{R_WQ_CLplots}

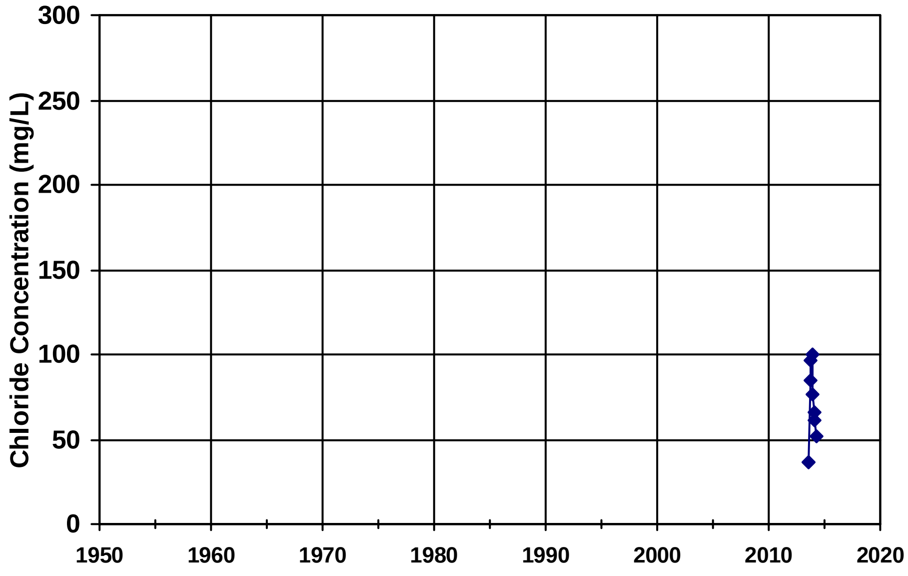
WellID: SL186102968-7MW-12
Zone: Shallow
Well Depth: Screened Int.



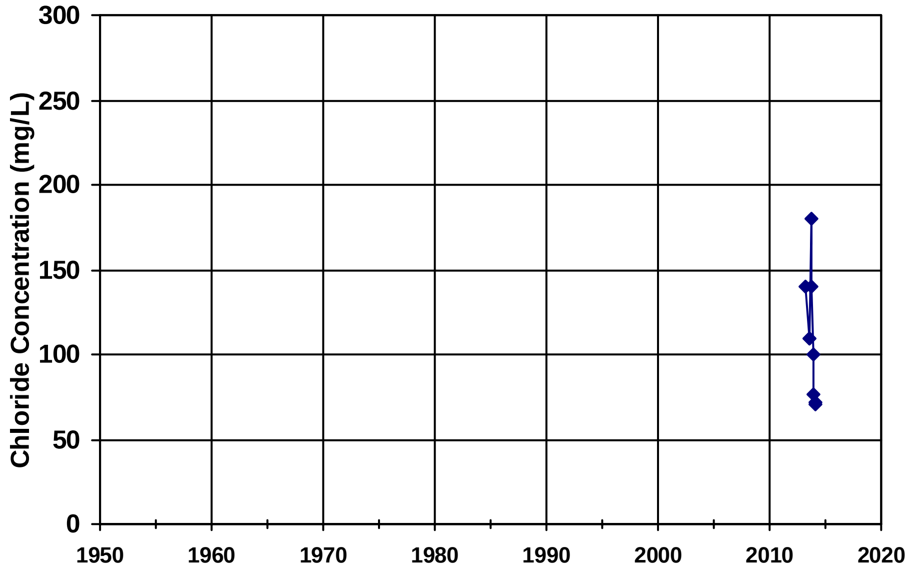

WellID: SL186102968-7MW-13
Zone: Shallow
Well Depth: Screened Int.




WellID: SL186102968-7MW-14
Zone: Shallow
Well Depth: Screened Int.

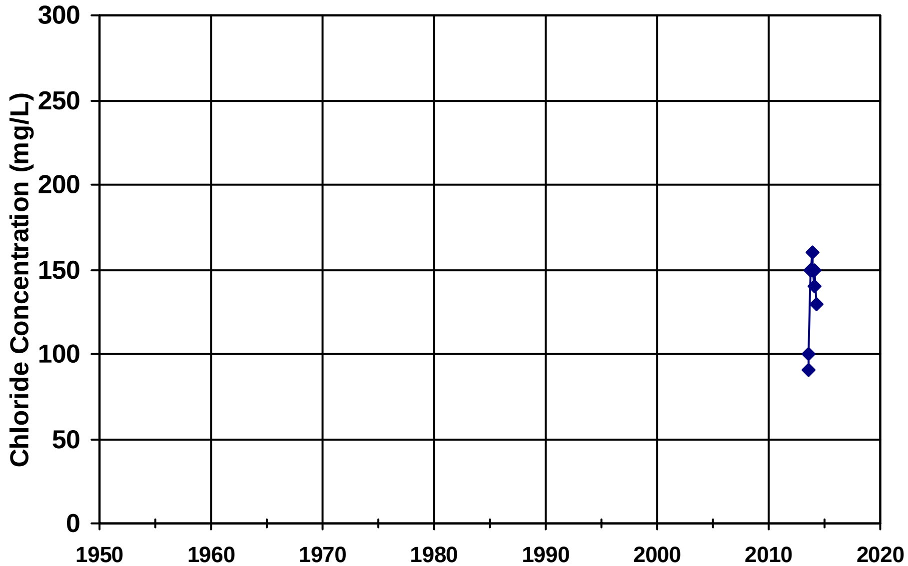



WellID: SL186102968-7MW-6
Zone: Shallow
Well Depth: Screened Int.

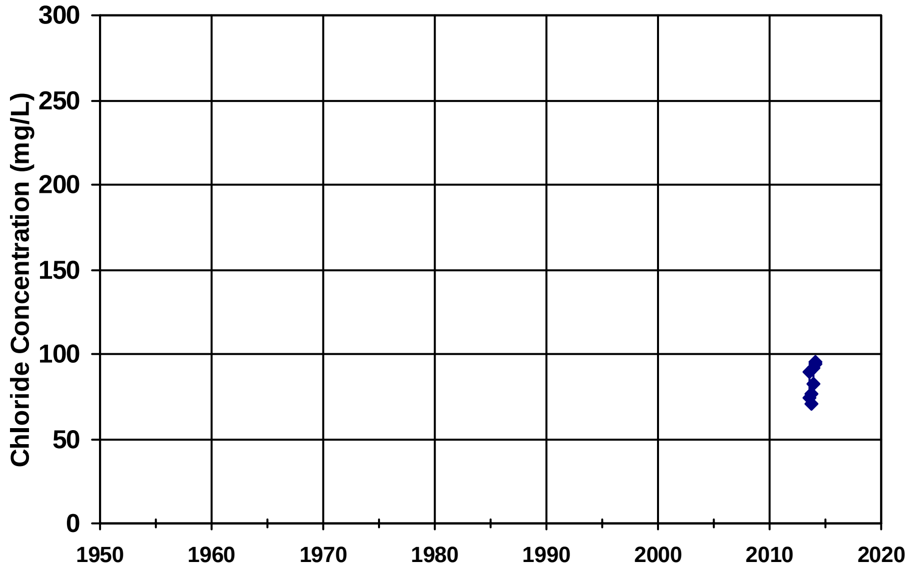



{R_WQ_CLplots}

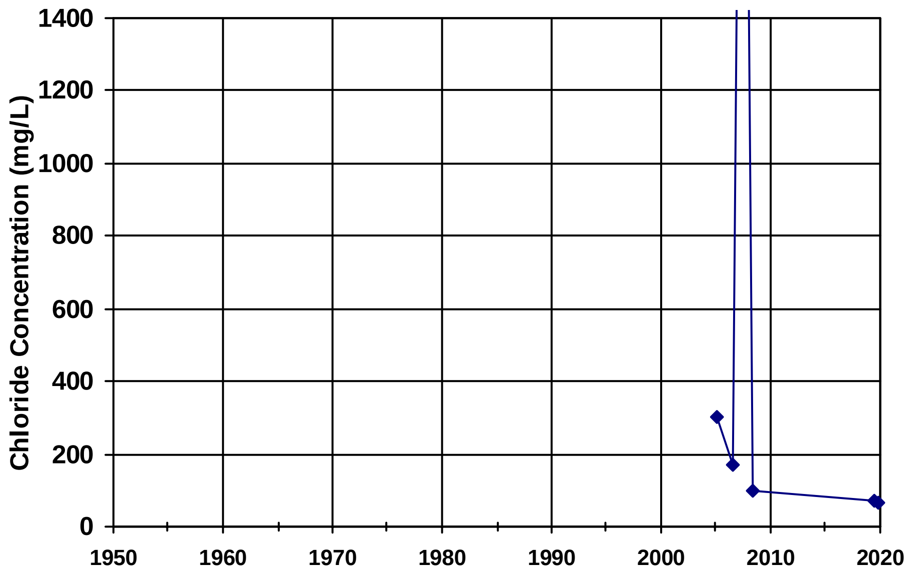
**WellID: SL186102968-7MW-8**
**Zone: Shallow**
Well Depth: Screened Int.



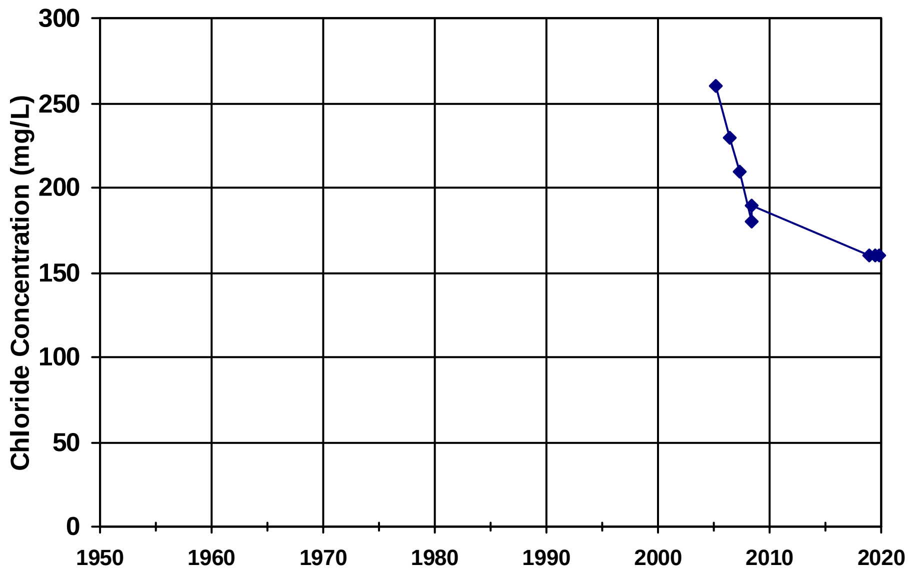

**WellID: SL186102968-7MW-9**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: SL205032990-W-04**
**Zone: Shallow**
Well Depth: Screened Int.

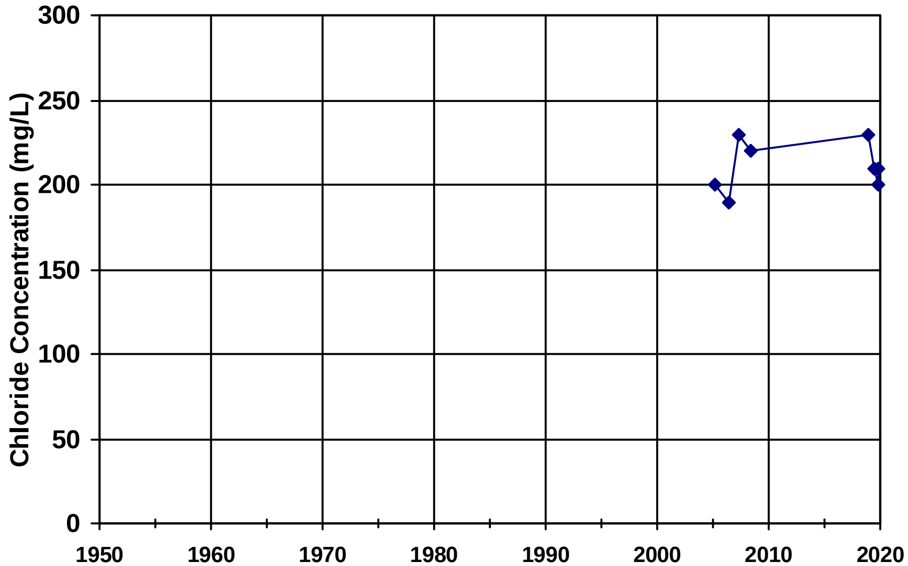



**WellID: SL205032990-W-05**
**Zone: Shallow**
Well Depth: Screened Int.

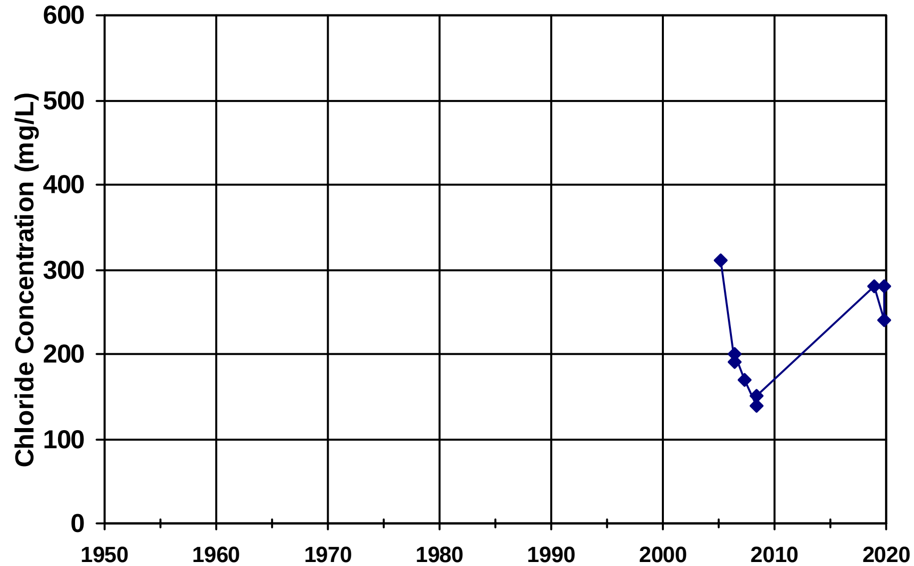



{R_WQ_CLplots}

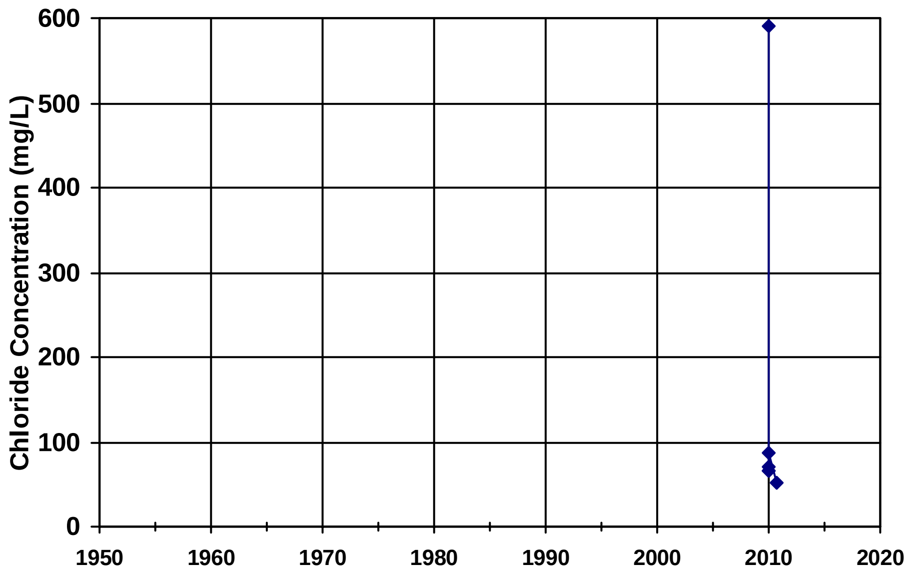
WellID: SL205032990-W-07
Zone: Shallow
Well Depth: Screened Int.



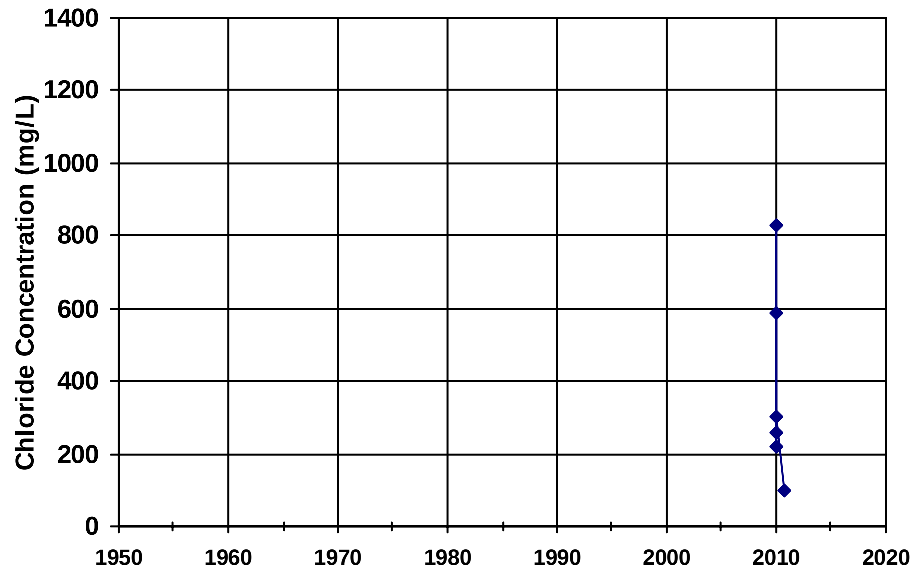

WellID: SL205032990-W-28
Zone: Shallow
Well Depth: Screened Int.




WellID: T10000000655-MW.05
Zone: Shallow
Well Depth: Screened Int.

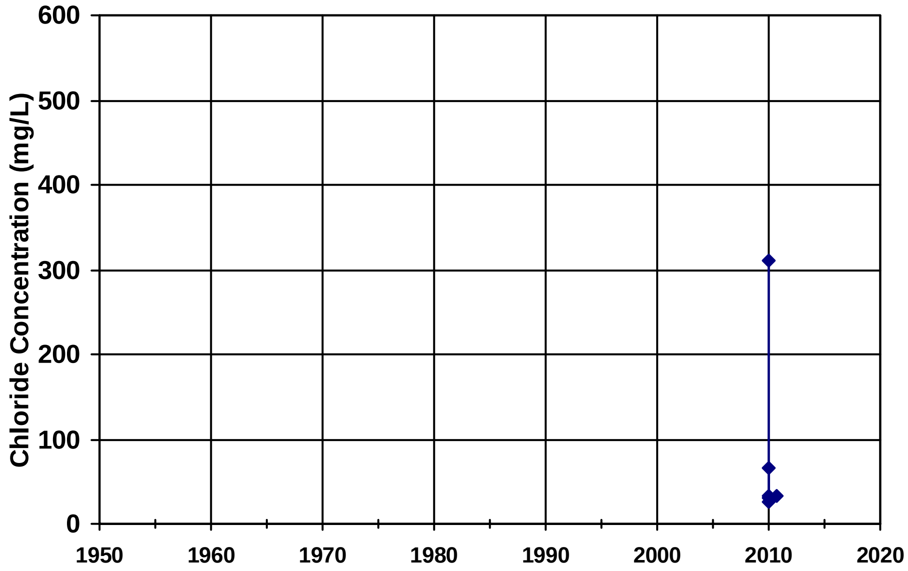



WellID: T10000000655-MW.06
Zone: Shallow
Well Depth: Screened Int.

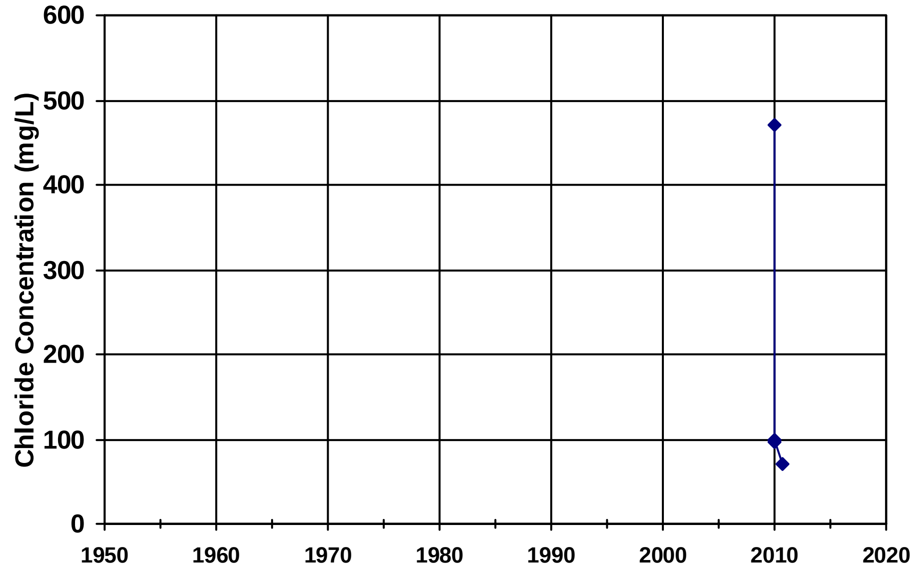



{R_WQ_CLplots}

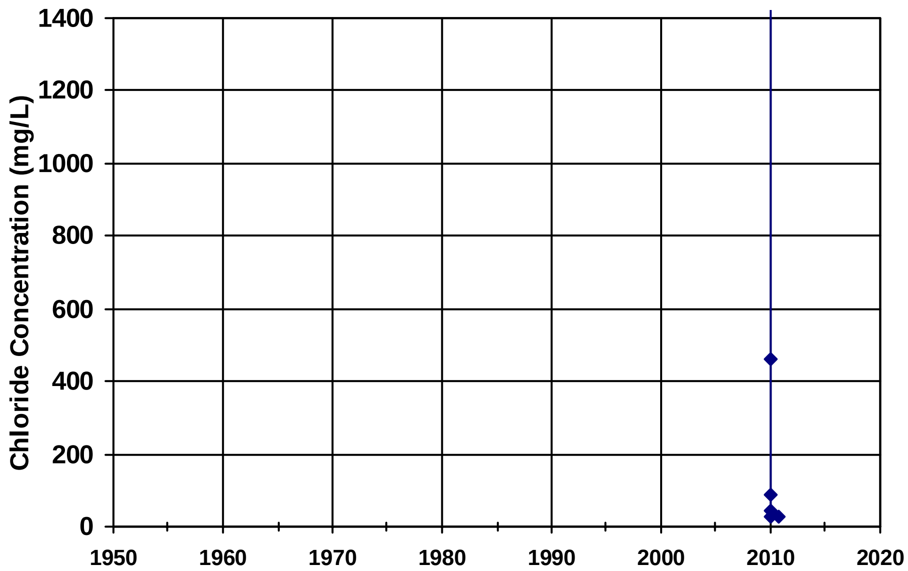
WellID: T10000000655-MW.07
Zone: Shallow
Well Depth: Screened Int.



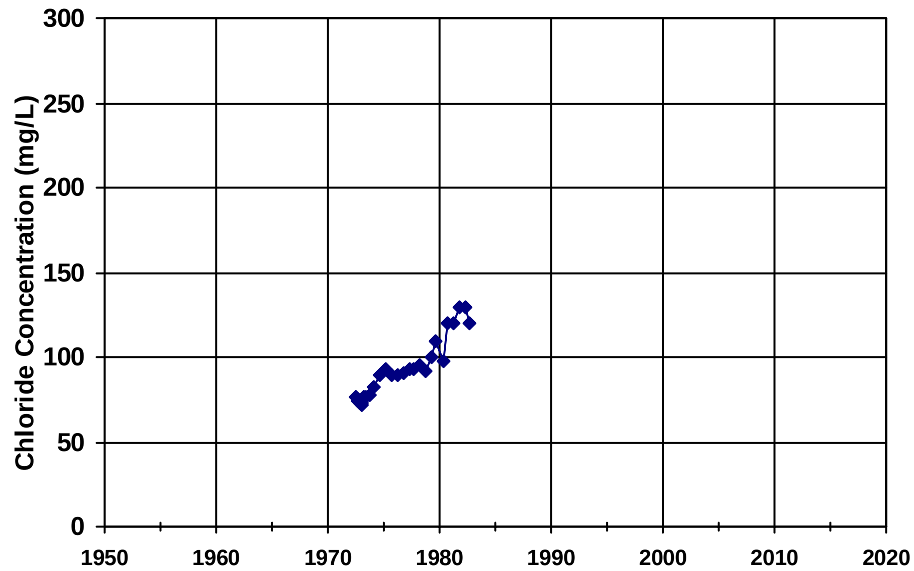

WellID: T10000000655-MW.08
Zone: Shallow
Well Depth: Screened Int.




WellID: T10000000655-MW.09
Zone: Shallow
Well Depth: Screened Int.




WellID: USGS-380012121461101
Zone: Shallow
Well Depth: 95 Screened Int.

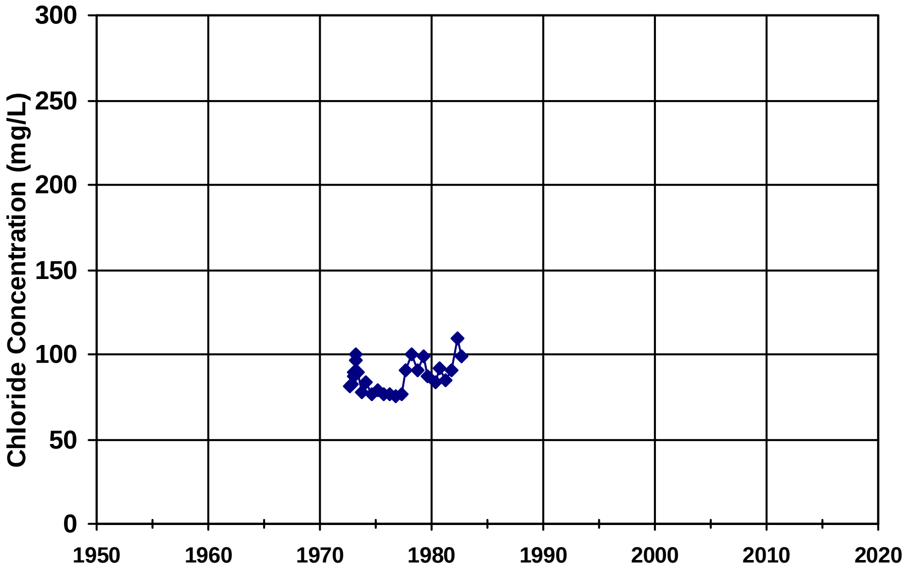



{R_WQ_CLplots}

**WellID: USGS-380016121454501**

**Zone: Shallow**

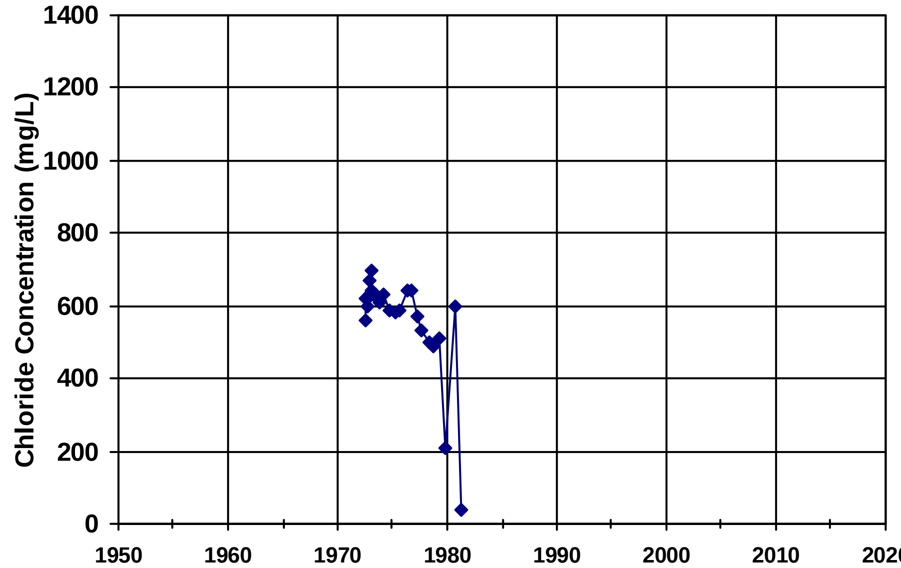
Well Depth: 140 Screened Int.




**WellID: USGS-380017121443201**

**Zone: Shallow**

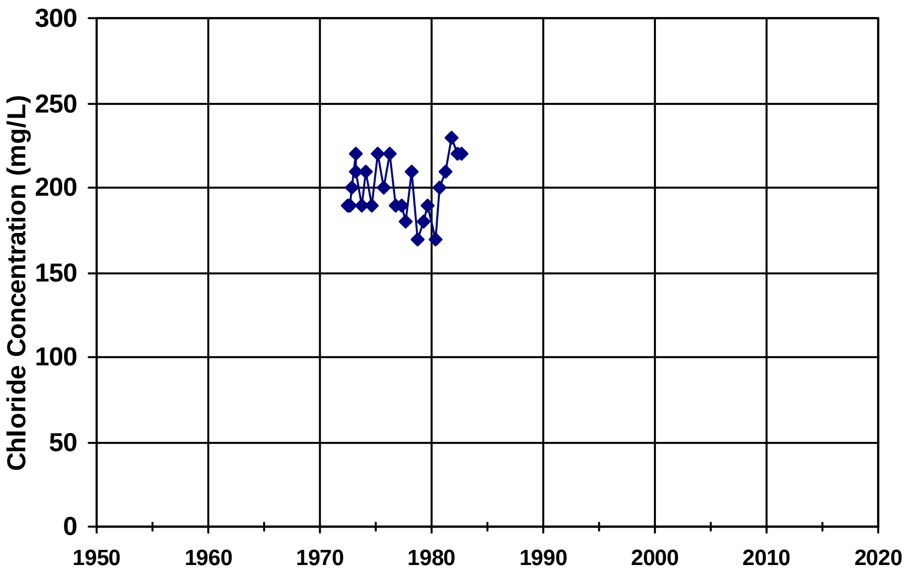
Well Depth: 82 Screened Int.




**WellID: USGS-380017121455901**

**Zone: Shallow**

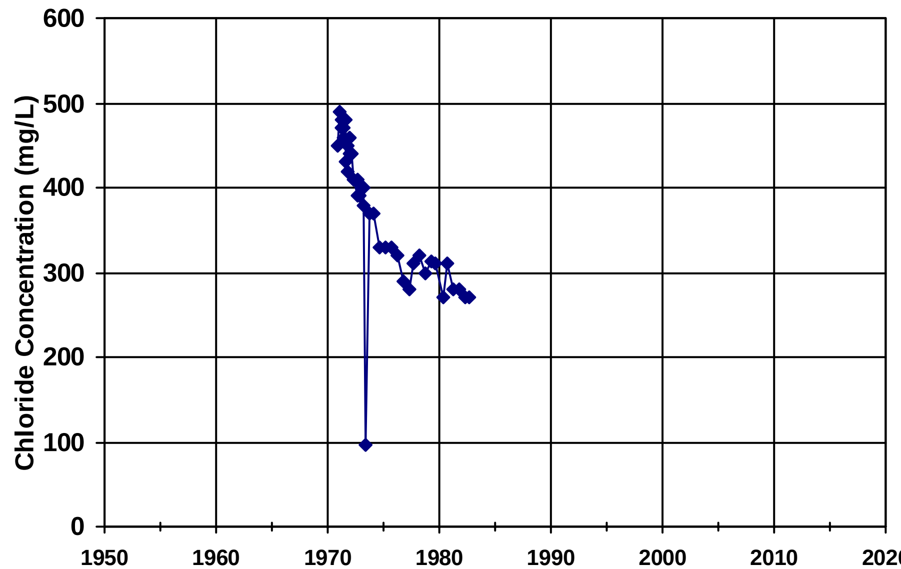
Well Depth: 120 Screened Int.




**WellID: USGS-380019121464601**

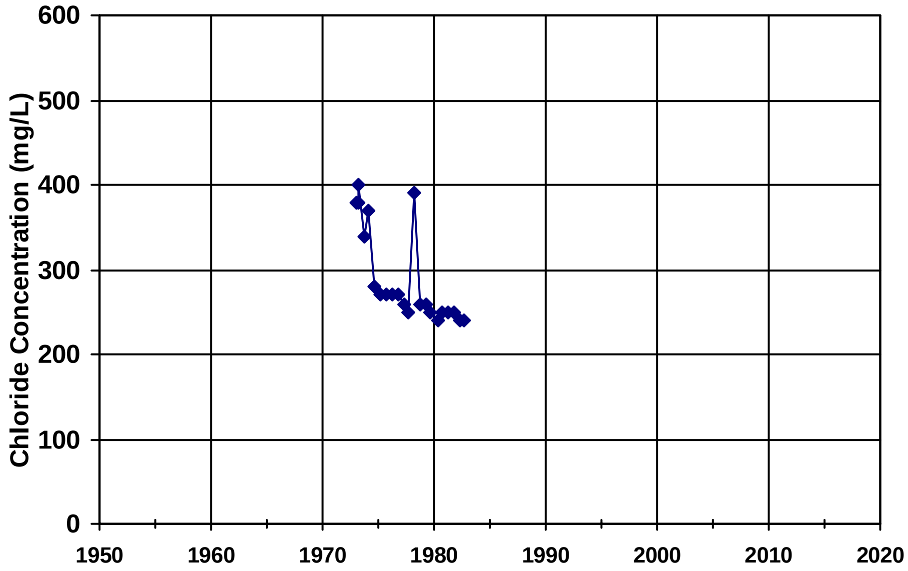
**Zone: Shallow**

Well Depth: 93 Screened Int.

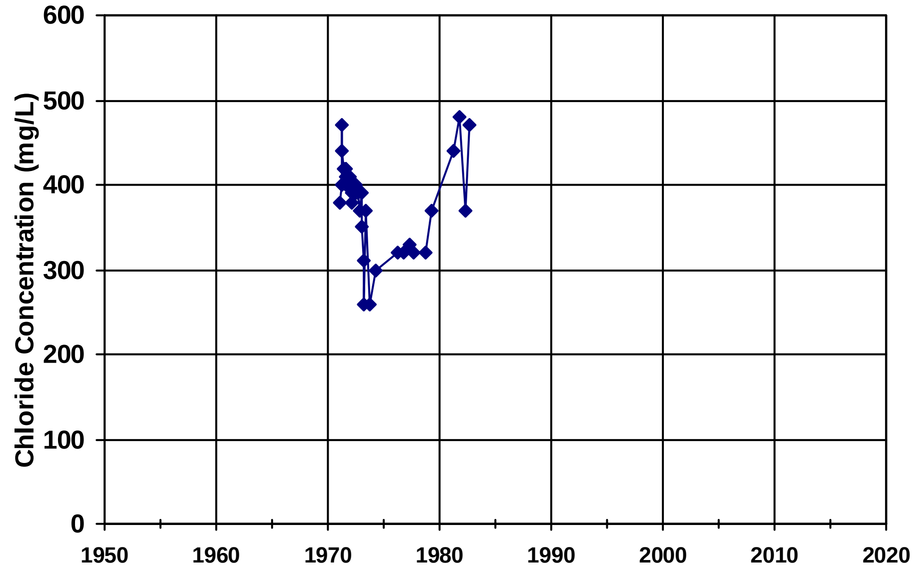



{R_WQ_CLplots}

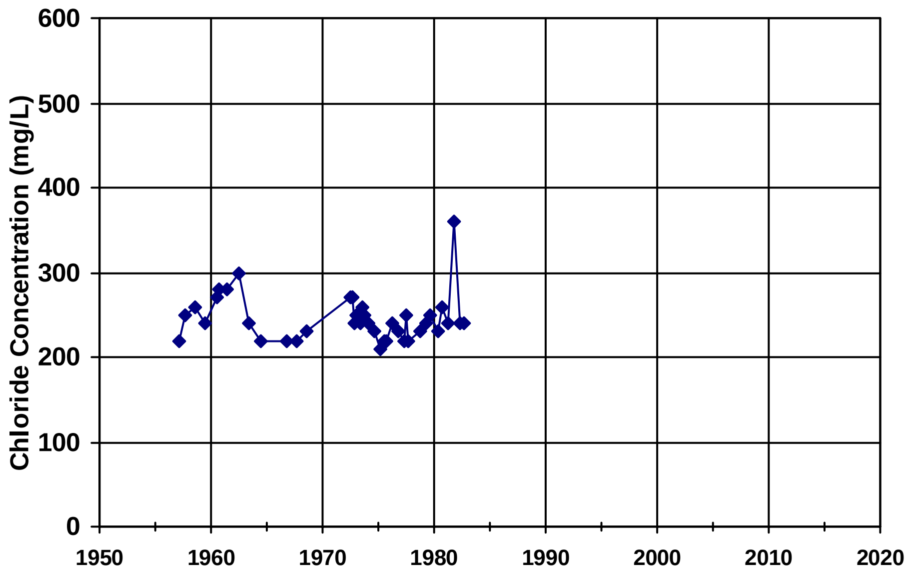
WellID: USGS-380020121443901
Zone: Shallow
Well Depth: 66 Screened Int.



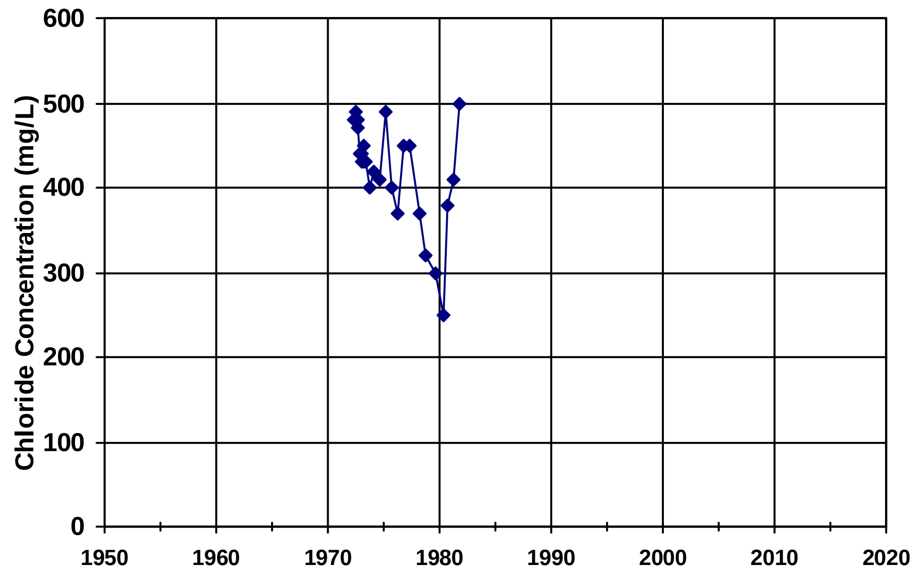

WellID: USGS-380025121471101
Zone: Shallow
Well Depth: 78 Screened Int.




WellID: USGS-380043121461201
Zone: Shallow
Well Depth: 67 Screened Int.




WellID: USGS-380048121470701
Zone: Shallow
Well Depth: 165 Screened Int.

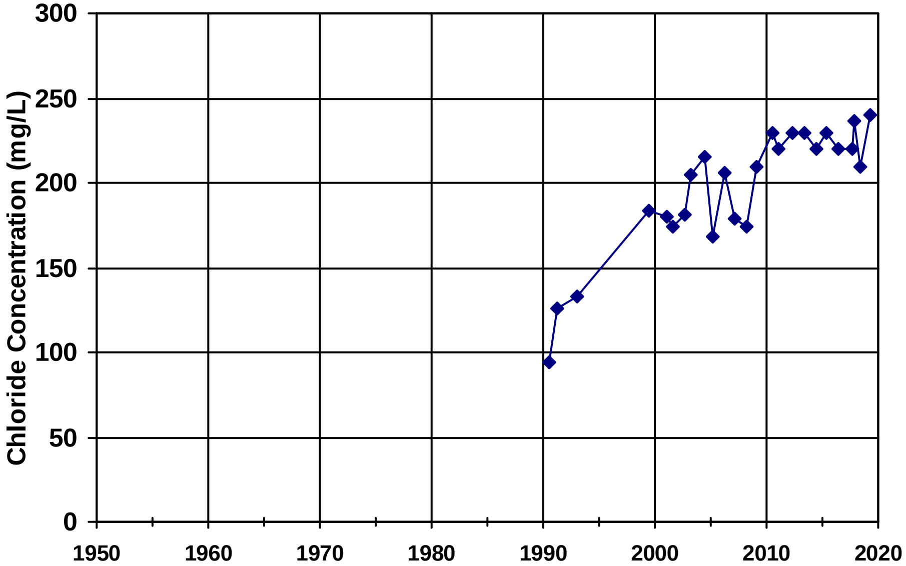



{R_WQ_CLplots}

**WellID: CITY OF BRENTWOOD-Well 06**

**Zone: Deep**

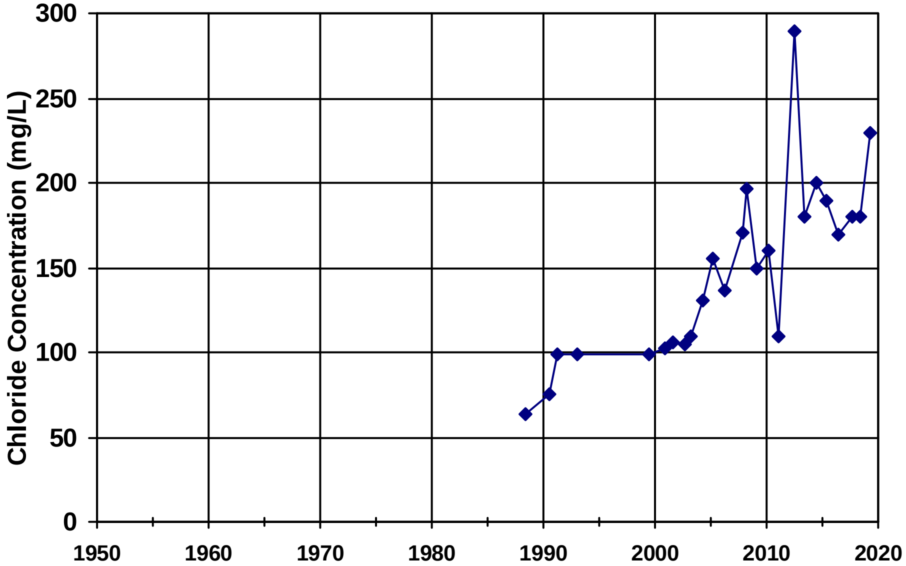
Well Depth: 305 Screened Int. 250-300




**WellID: CITY OF BRENTWOOD-Well 07**

**Zone: Deep**

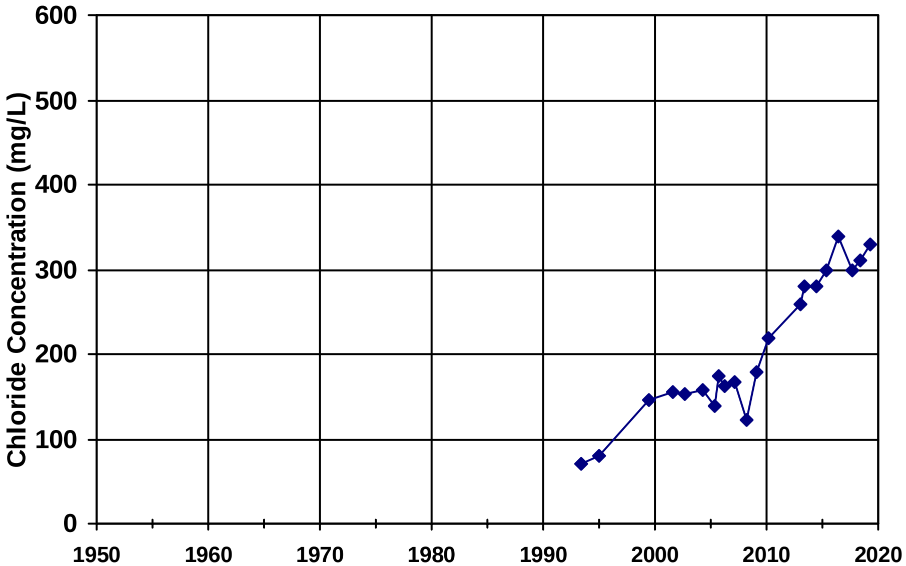
Well Depth: 300 Screened Int. 265-295




**WellID: CITY OF BRENTWOOD-Well 08**

**Zone: Deep**

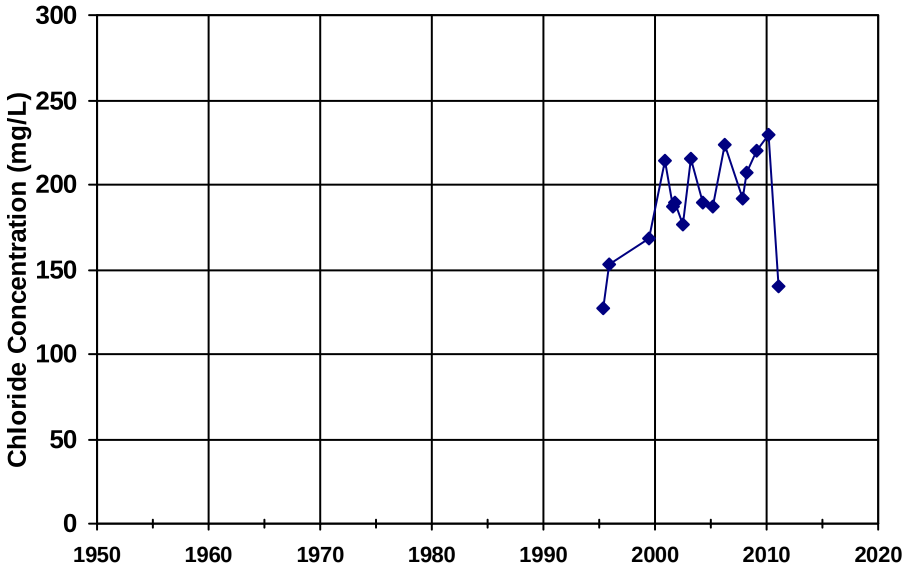
Well Depth: 325 Screened Int. 225-315




**WellID: CITY OF BRENTWOOD-Well 11**

**Zone: Deep**

Well Depth: Screened Int. 255-365

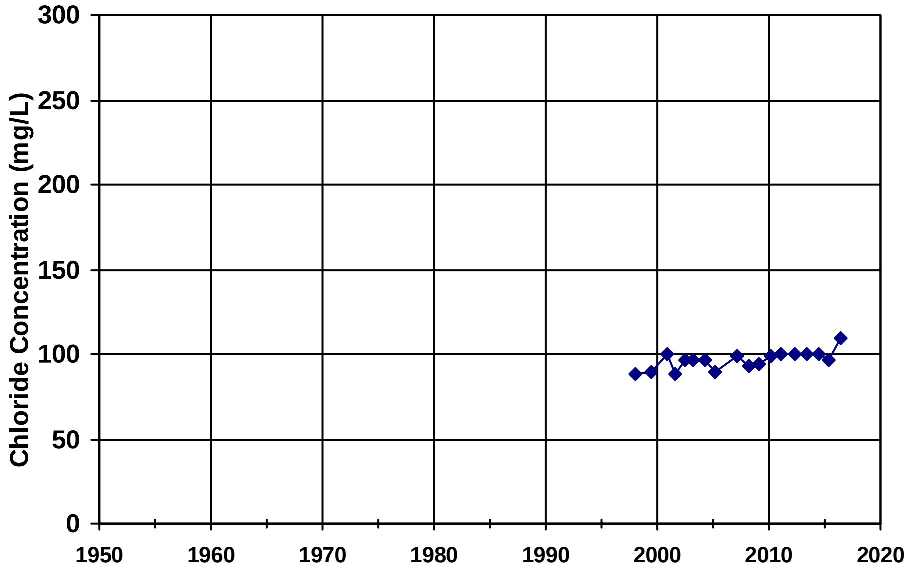



{R_WQ_CLplots}

**WellID: CITY OF BRENTWOOD-Well 12**

**Zone: Deep**

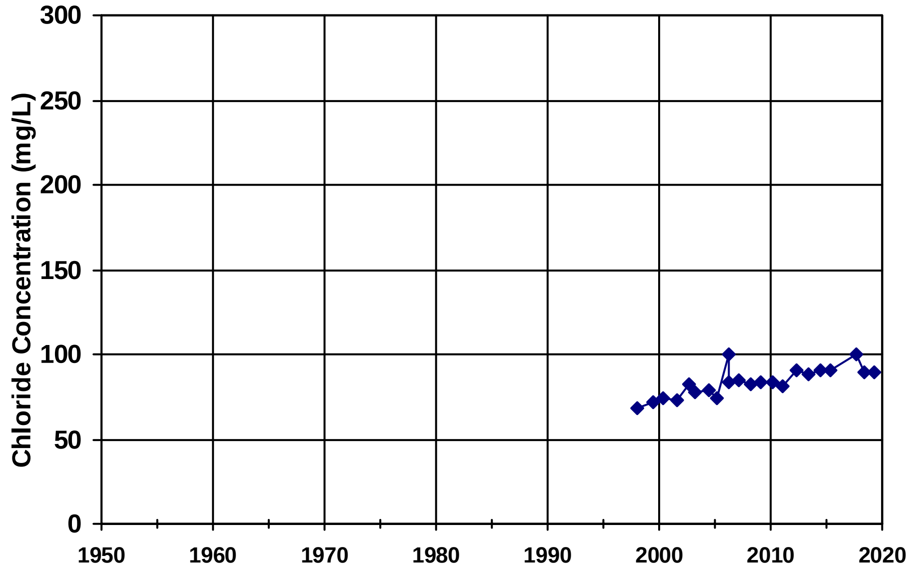
Well Depth: 610 Screened Int. 350-380, 430-450




**WellID: CITY OF BRENTWOOD-Well 13**

**Zone: Deep**

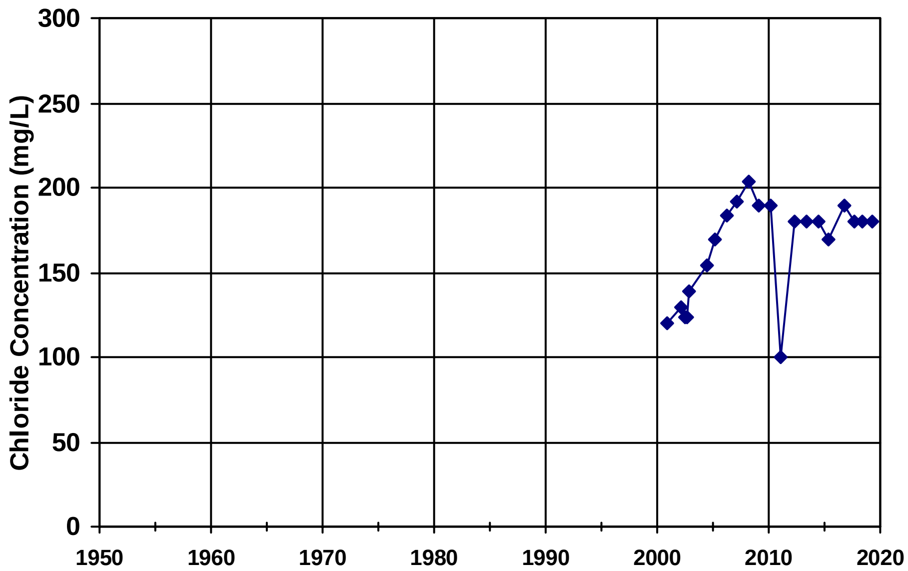
Well Depth: 510 Screened Int. 350-380, 430-480




**WellID: CITY OF BRENTWOOD-Well 14**

**Zone: Deep**

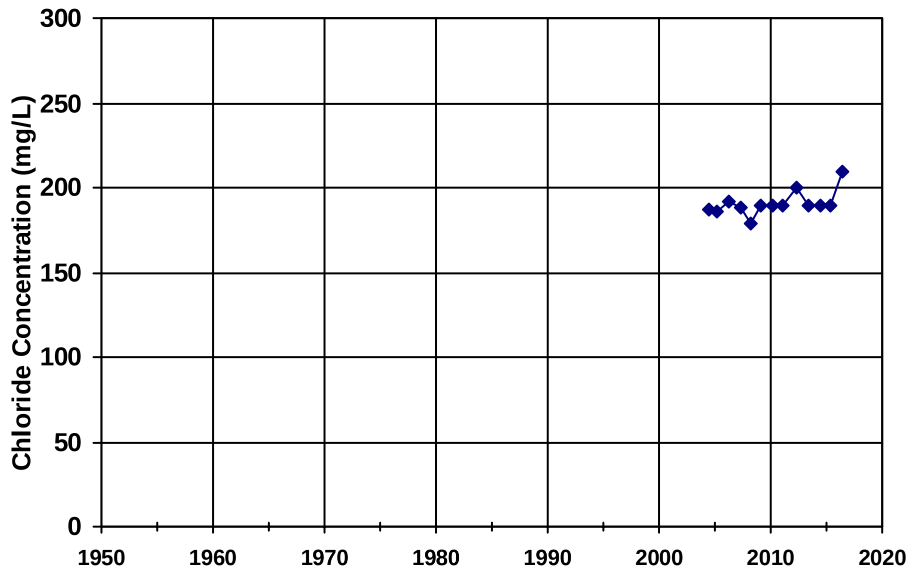
Well Depth: 340 Screened Int. 285-315




**WellID: CITY OF BRENTWOOD-Well 09**

**Zone: Deep**

Well Depth: 230 Screened Int. 210-230

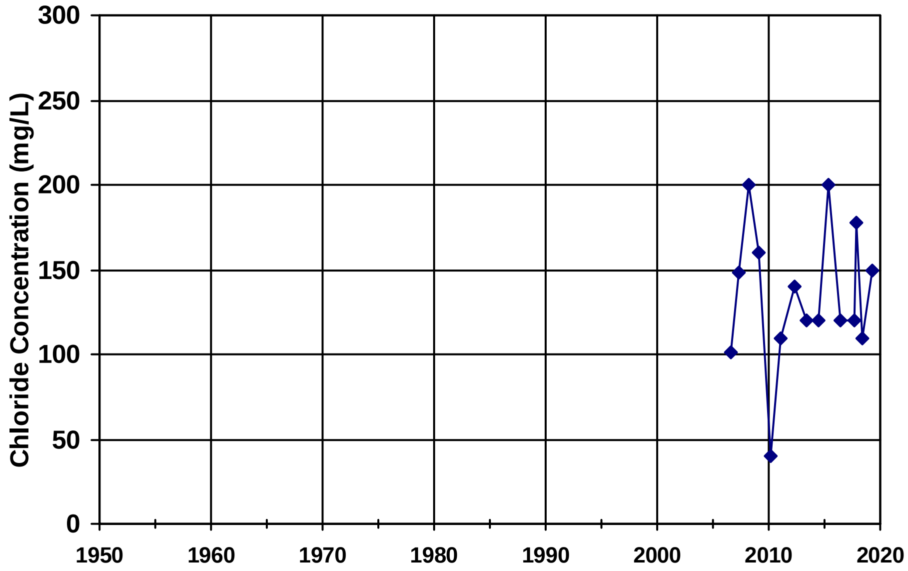



{R_WQ_CLplots}

**WellID: CITY OF BRENTWOOD-Well 15**

**Zone: Deep**

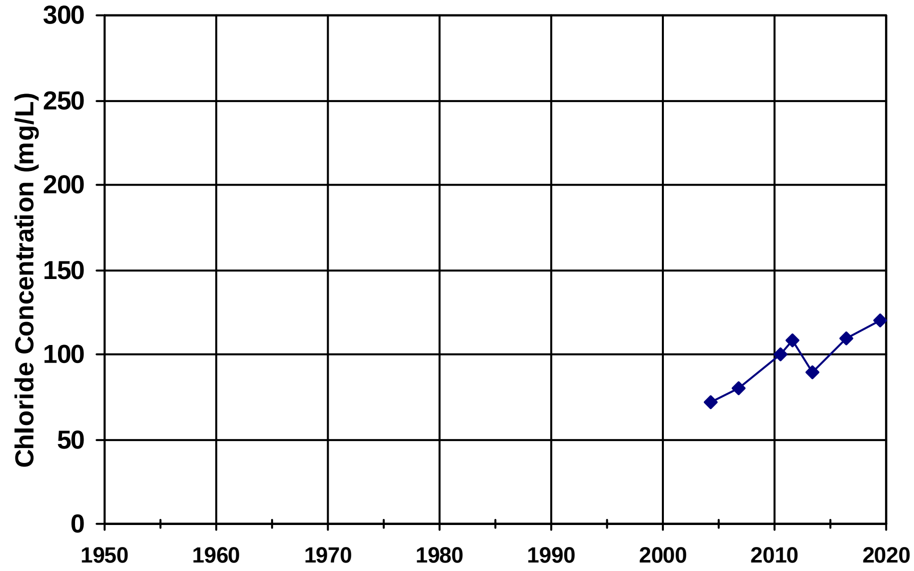
Well Depth: 345 Screened Int. 239-259,289-324




**WellID: DIABLO WATER DISTRICT-Glen Park Well**

**Zone: Deep**

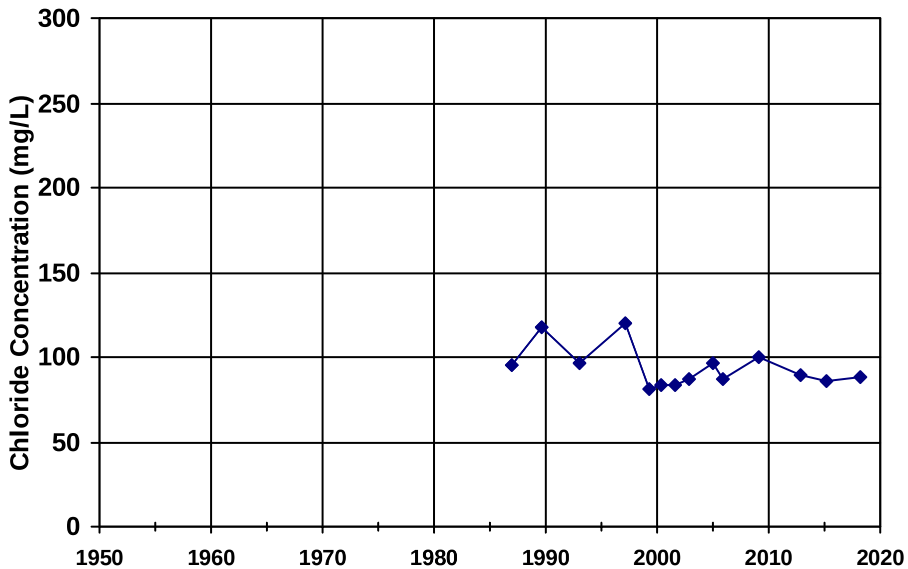
Well Depth: 315 Screened Int. 230-245, 260-300




**WellID: TOWN OF DISCOVERY BAY-WELL 02**

**Zone: Deep**

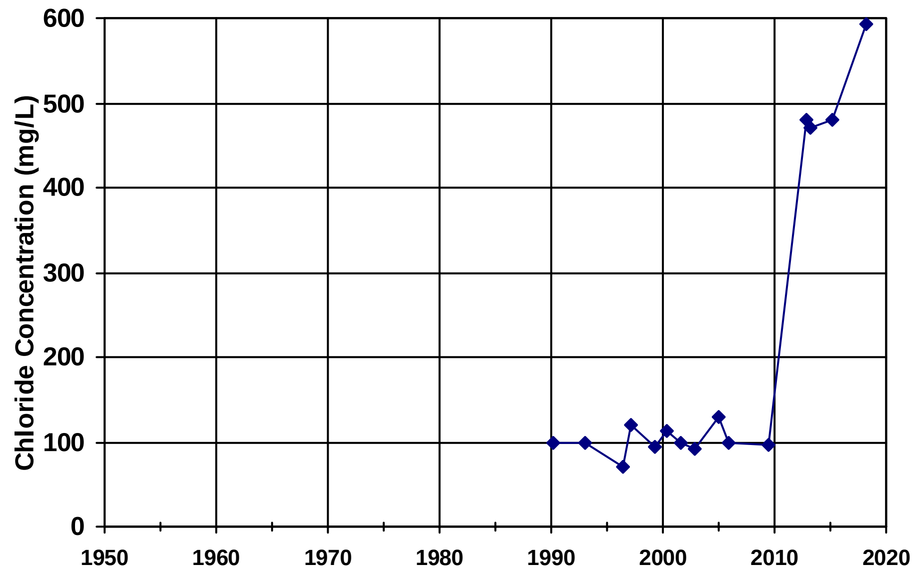
Well Depth: 348 Screened Int. 245-335




**WellID: TOWN OF DISCOVERY BAY-WELL 05A**

**Zone: Deep**

Well Depth: 357 Screened Int. 251-281, 307-347

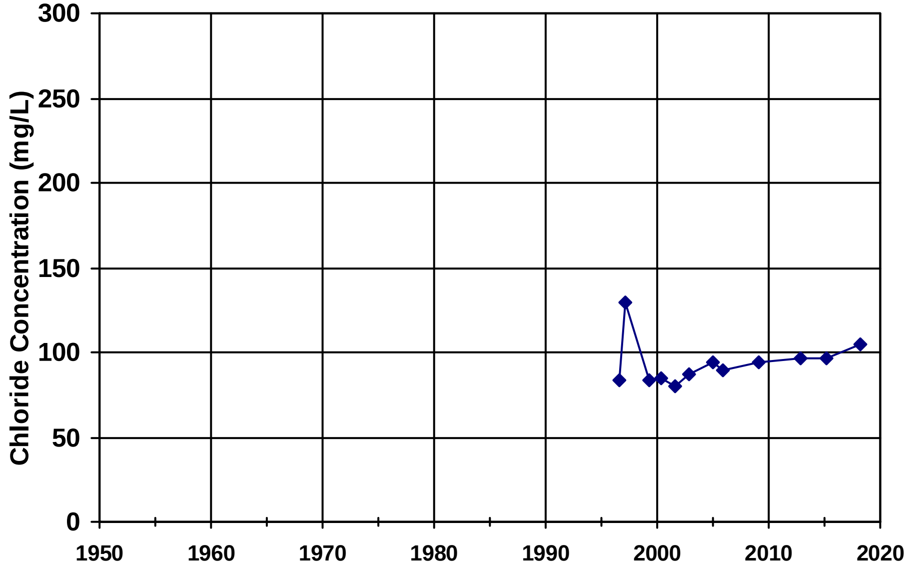



{R_WQ_CLplots}

**WellID: TOWN OF DISCOVERY BAY-WELL 04A**

**Zone: Deep**

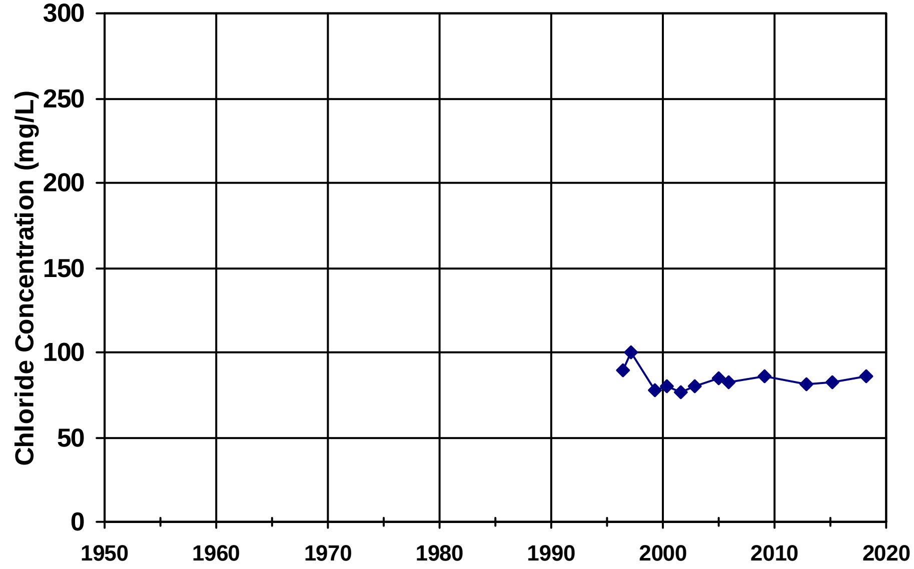
Well Depth: 357 Screened Int. 307-347




**WellID: TOWN OF DISCOVERY BAY-WELL 01B**

**Zone: Deep**

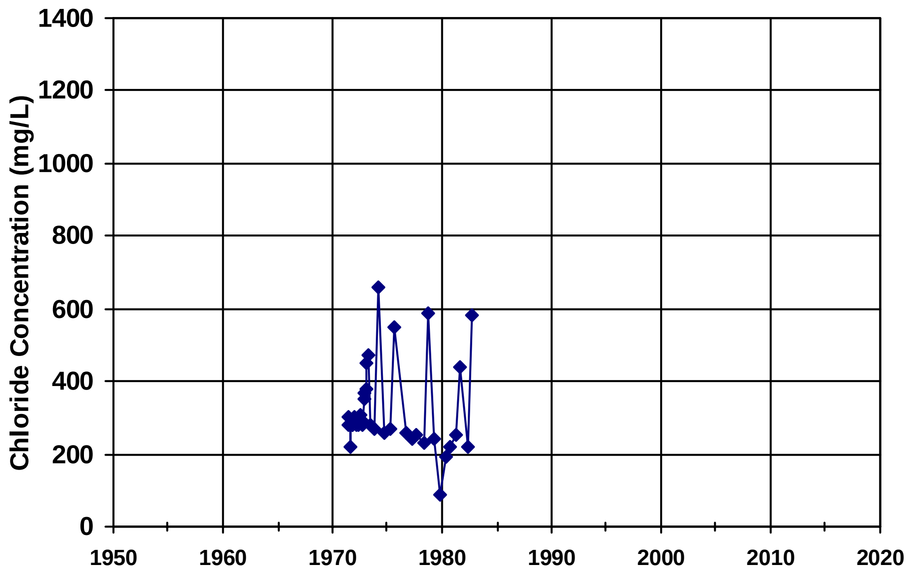
Well Depth: 350 Screened Int. 271-289, 308-340




**WellID: USGS-380019121473401**

**Zone: Deep**

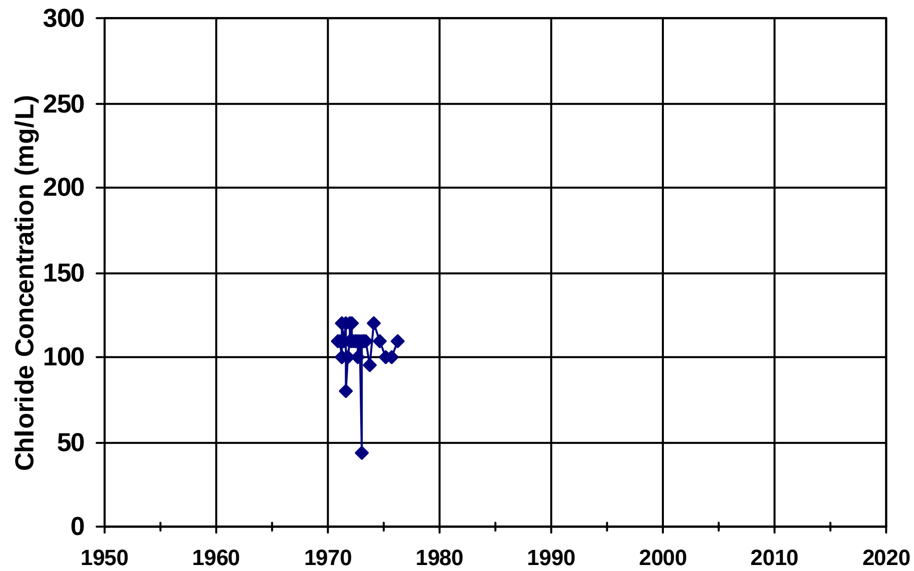
Well Depth: 190 Screened Int.




**WellID: USGS-380024121490801**

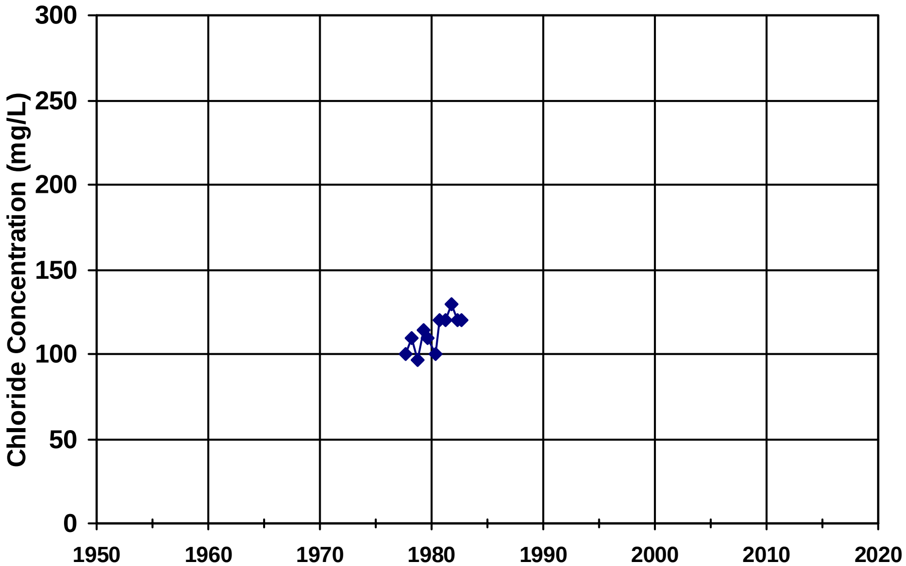
**Zone: Deep**

Well Depth: 124 Screened Int.

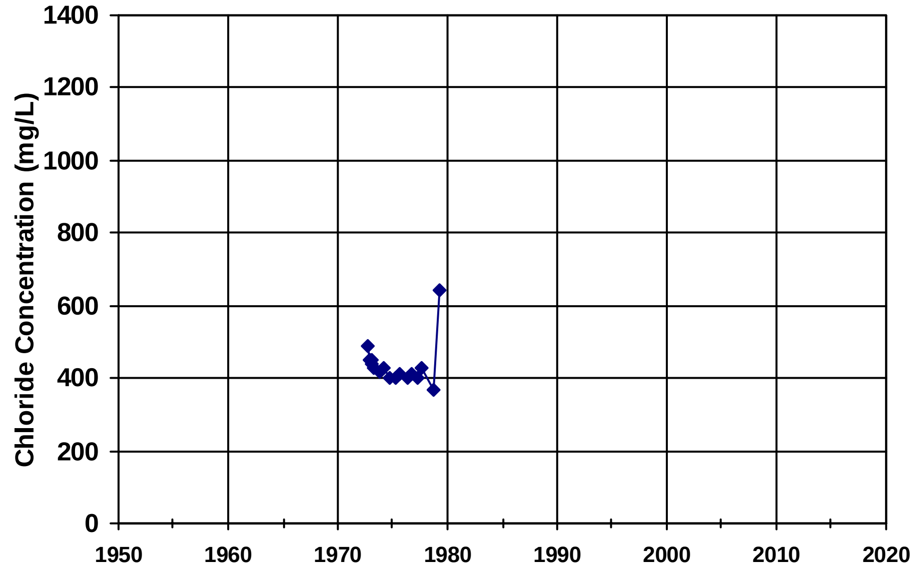



{R_WQ_CLplots}

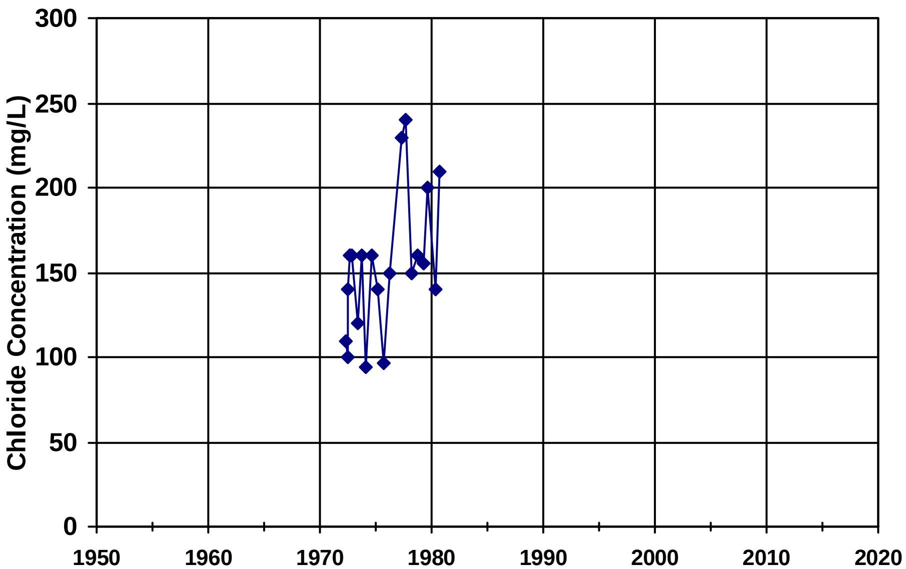
**WellID: USGS-380024121490803**
**Zone: Deep**
Well Depth: 140 Screened Int.



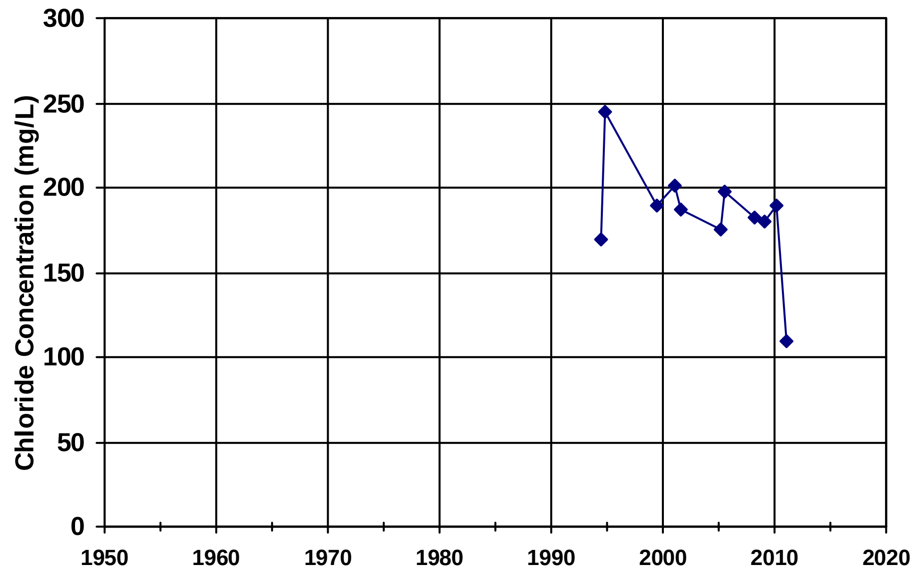

**WellID: USGS-380048121460901**
**Zone: Deep**
Well Depth: 500 Screened Int.




**WellID: USGS-380102121480801**
**Zone: Deep**
Well Depth: 258 Screened Int.




**WellID: CITY OF BRENTWOOD-Well 10A**
**Zone: Composite**
Well Depth: 210 Screened Int. 52-72, 135-182

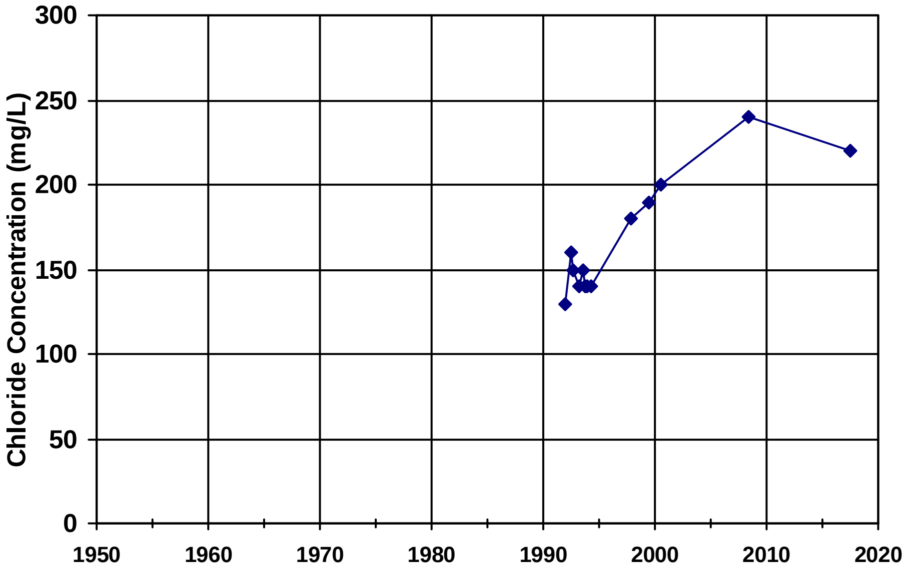



{R_WQ_CLplots}

**WellID: DIABLO WATER DISTRICT-WELL 01 - STANDBY**

**Zone: Composite**

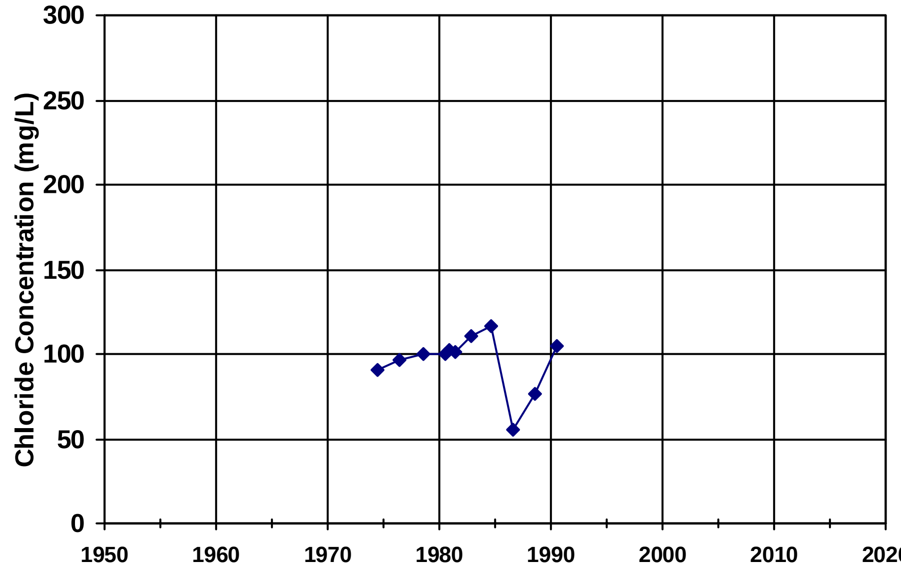
Well Depth: 170 Screened Int. 100-170




**WellID: 6 Byer**

**Zone: Composite**

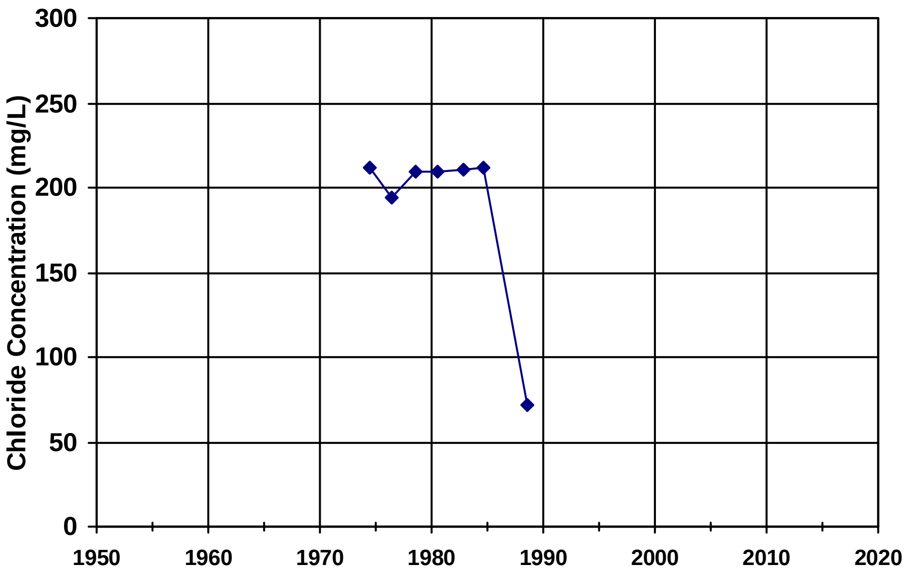
Well Depth: 185 Screened Int.




**WellID: 01N02E13H001M**

**Zone: Unknown**

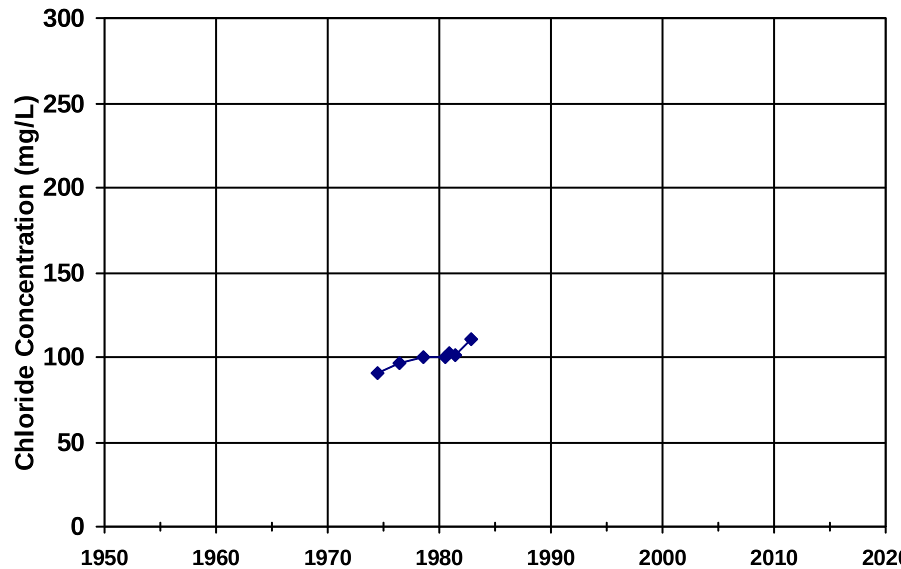
Well Depth: Screened Int.




**WellID: 01S03E03M001M**

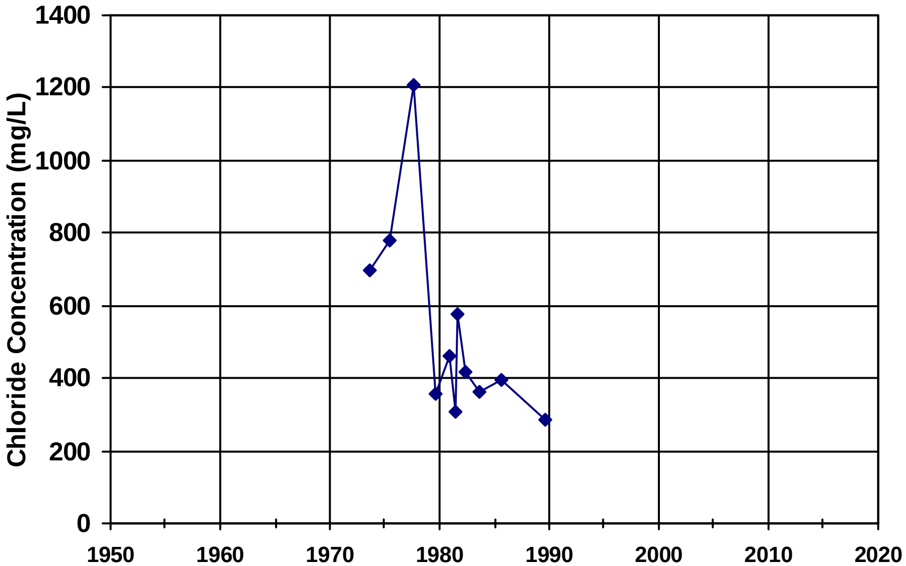
**Zone: Unknown**

Well Depth: Screened Int.

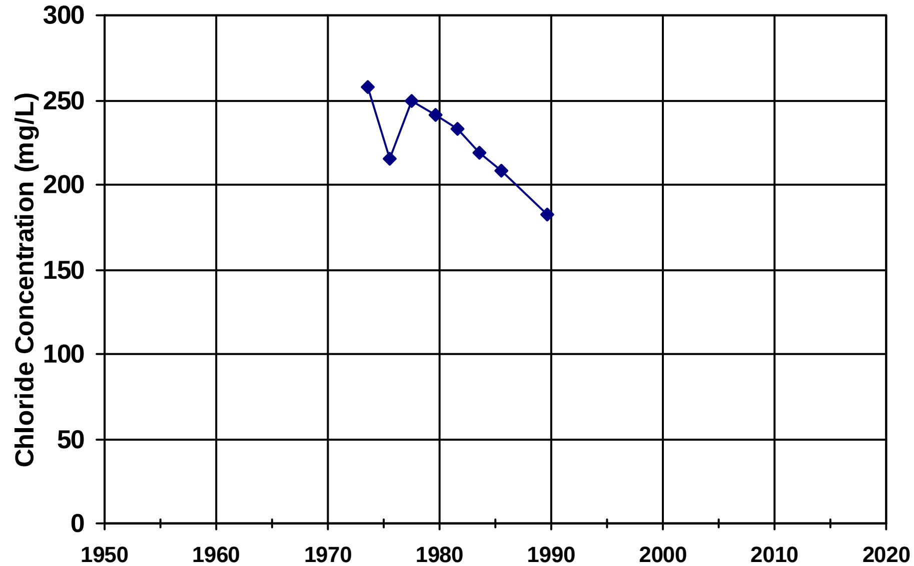



{R_WQ_CLplots}

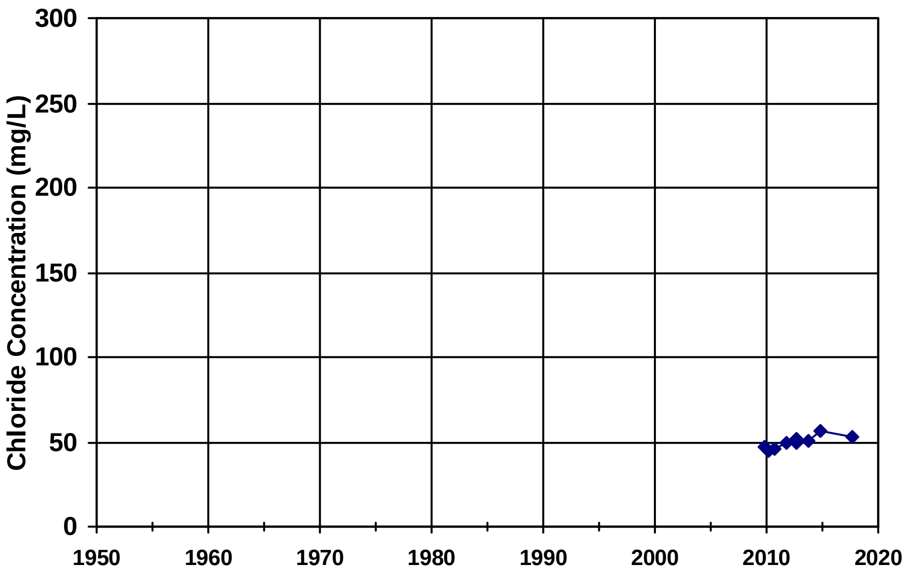
WellID: 01S03E15A001M
Zone: Unknown
Well Depth: Screened Int.



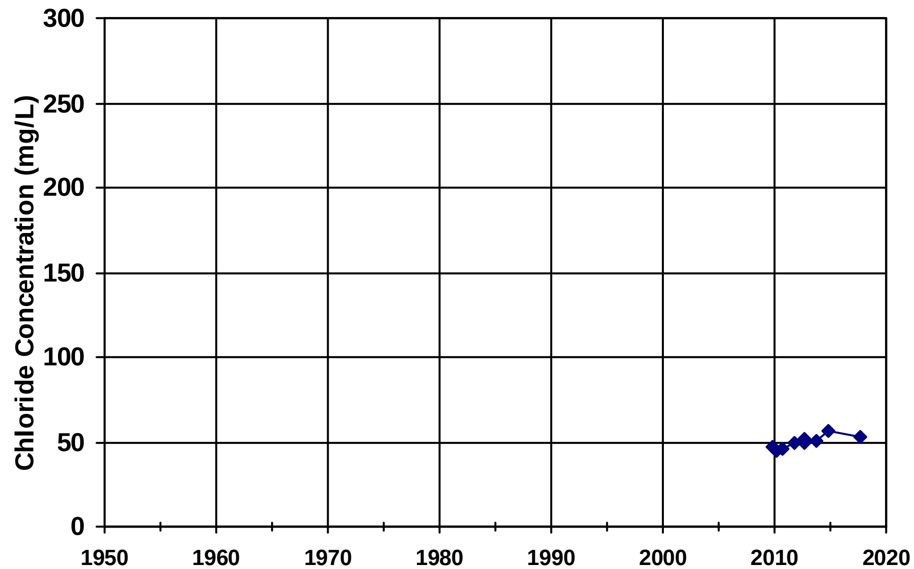

WellID: 02N02E20A001M
Zone: Unknown
Well Depth: Screened Int.




WellID: LOS VAQUEROS MARINA BLDG-SOURCE
Zone: Unknown
Well Depth: Screened Int.

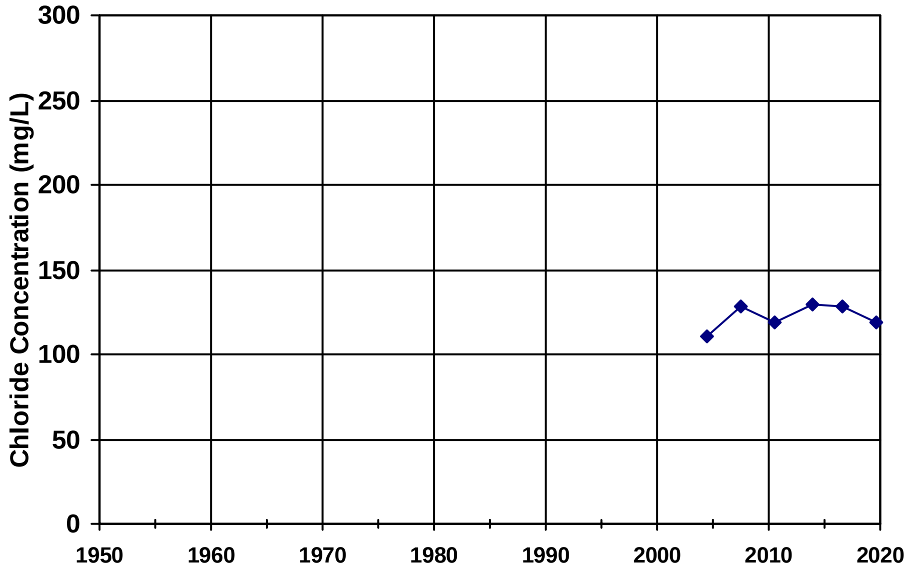



WellID: LOS VAQUEROS INTERPRETIVE CENTER-SOURCE
Zone: Unknown
Well Depth: Screened Int.

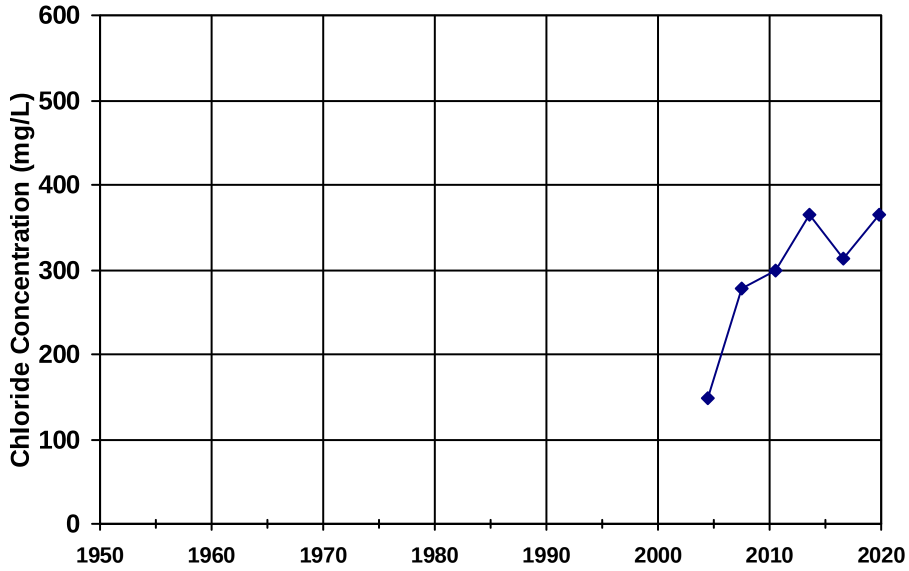



{R_WQ_CLplots}

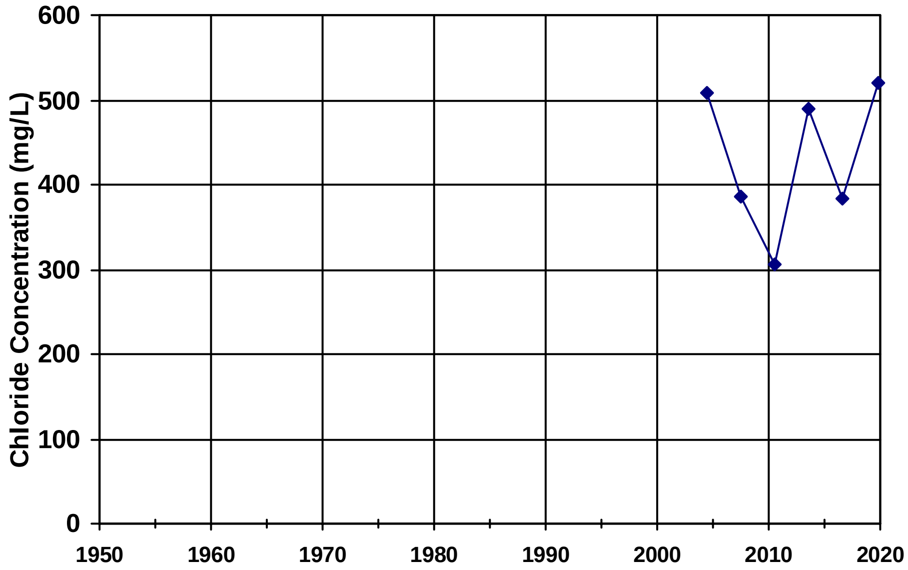
WellID: DUTCH SLOUGH WATER WORKS-Well Head
Zone: Unknown
Well Depth: Screened Int.



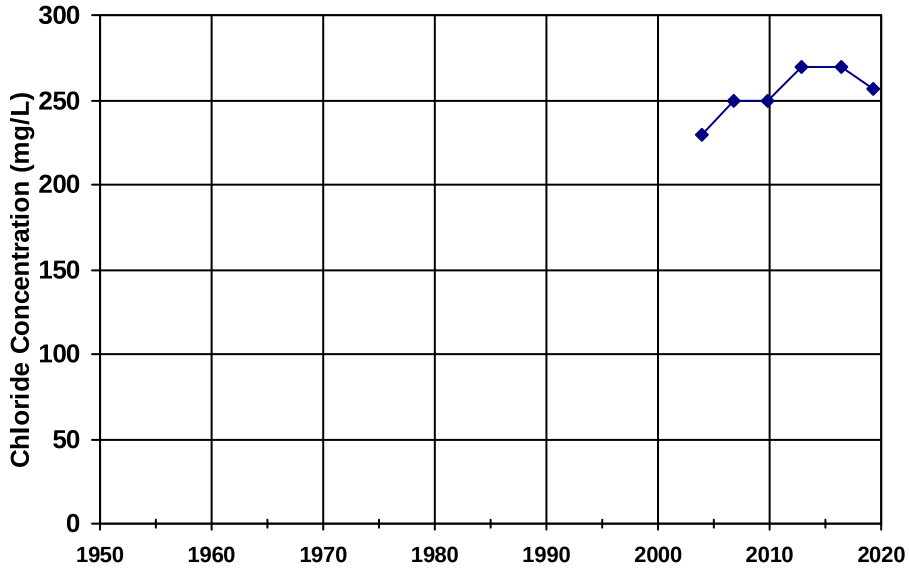

WellID: ANGLERS SUBDIVISION 4-WELL 2 - 1398 Taylor
Zone: Unknown
Well Depth: Screened Int.




WellID: ANGLERS SUBDIVISION 4-WELL 3 - 1698 Taylor
Zone: Unknown
Well Depth: Screened Int.

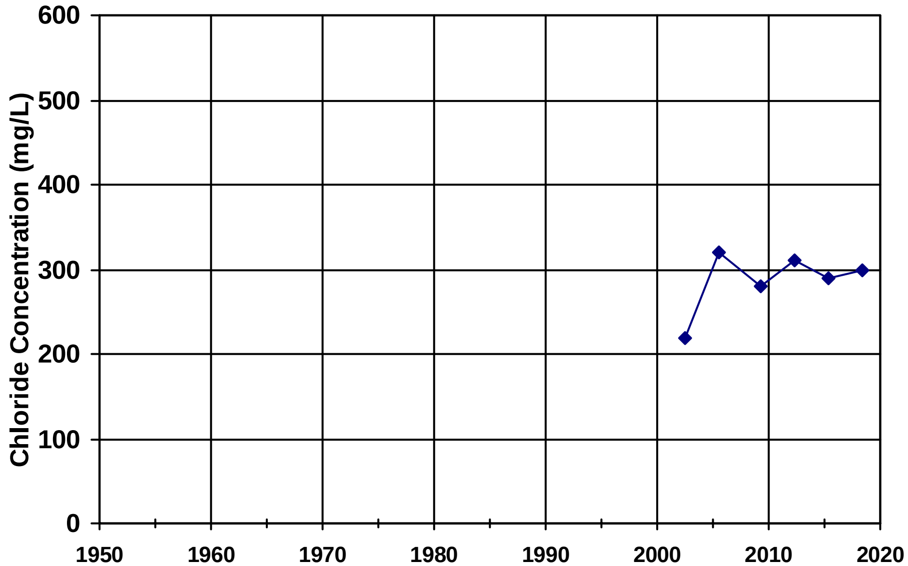



WellID: DELTA MUTUAL WATER COMPANY-East Well
Zone: Unknown
Well Depth: Screened Int.

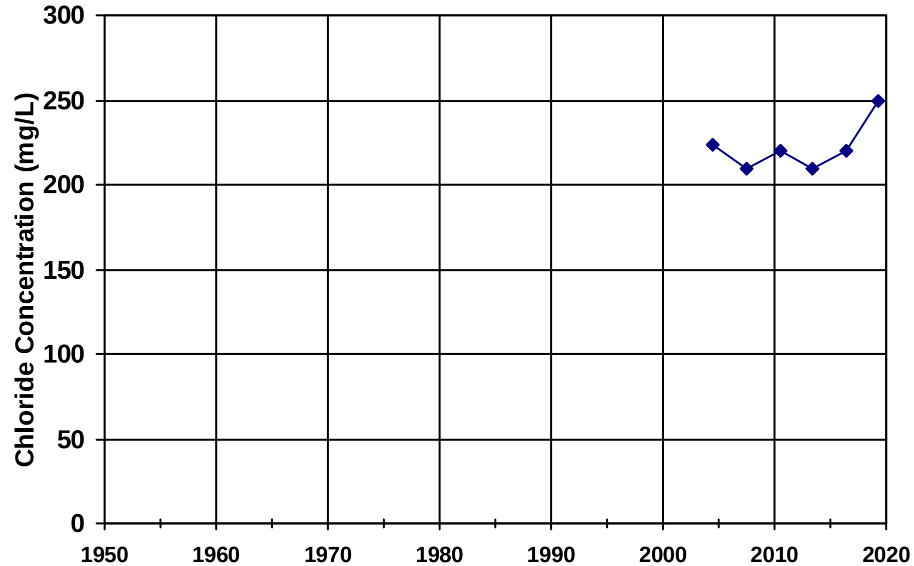



{R_WQ_CLplots}

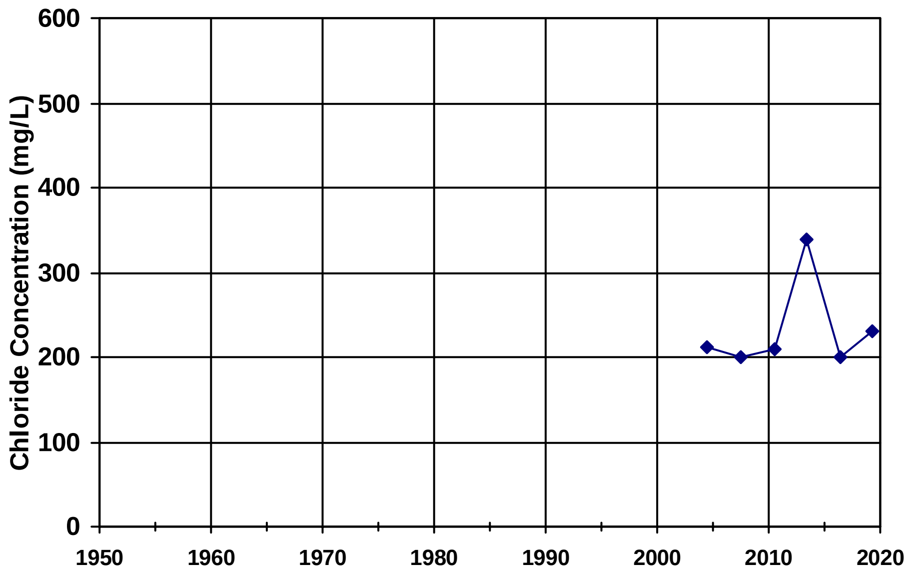
WellID: SANTIAGO ISLAND VILLAGE-WELL 01
Zone: Unknown
Well Depth: Screened Int.



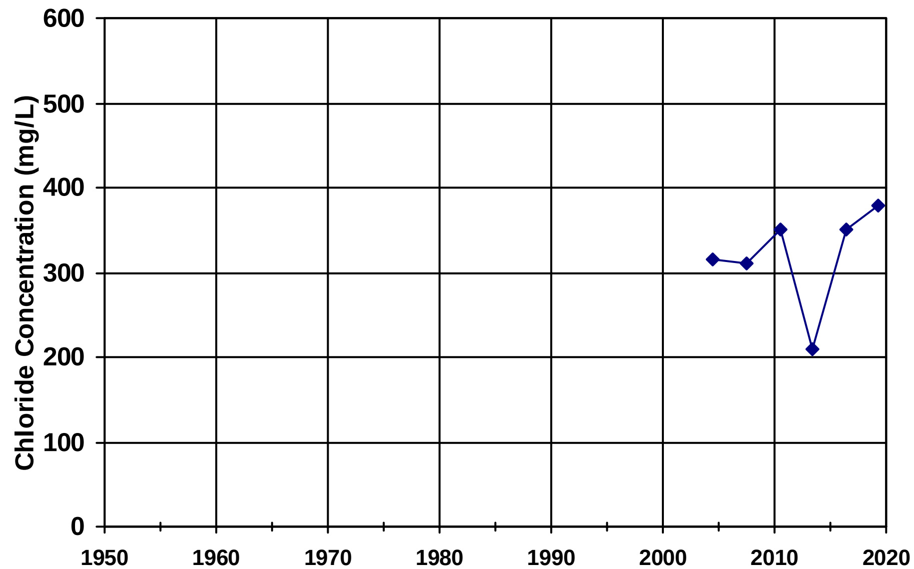

WellID: PLEASANTIMES MUTUAL WATER CO-Well 1 - 4282 STONE
Zone: Unknown
Well Depth: Screened Int.




WellID: PLEASANTIMES MUTUAL WATER CO-WELL 2 - 4520 STONE
Zone: Unknown
Well Depth: Screened Int.




WellID: PLEASANTIMES MUTUAL WATER CO-WELL 3 - 4441 WILLOW
Zone: Unknown
Well Depth: Screened Int.

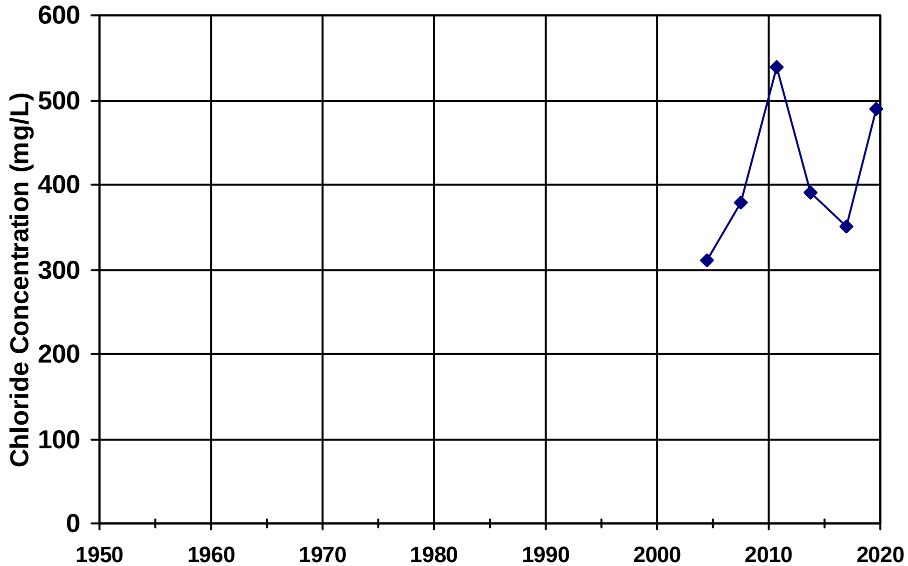



{R_WQ_CLplots}

**WellID: RIVERVIEW WATER ASSOCIATION-WELL 1 BEACON HARBOR**

**Zone: Unknown**

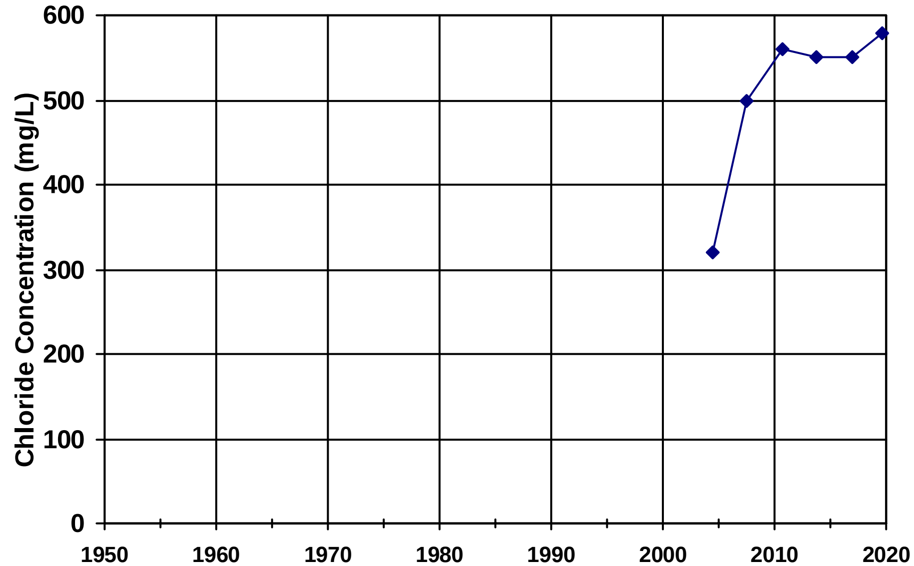
Well Depth: Screened Int.




**WellID: RIVERVIEW WATER ASSOCIATION-WELL 2 END OF WILLOW RD**

**Zone: Unknown**

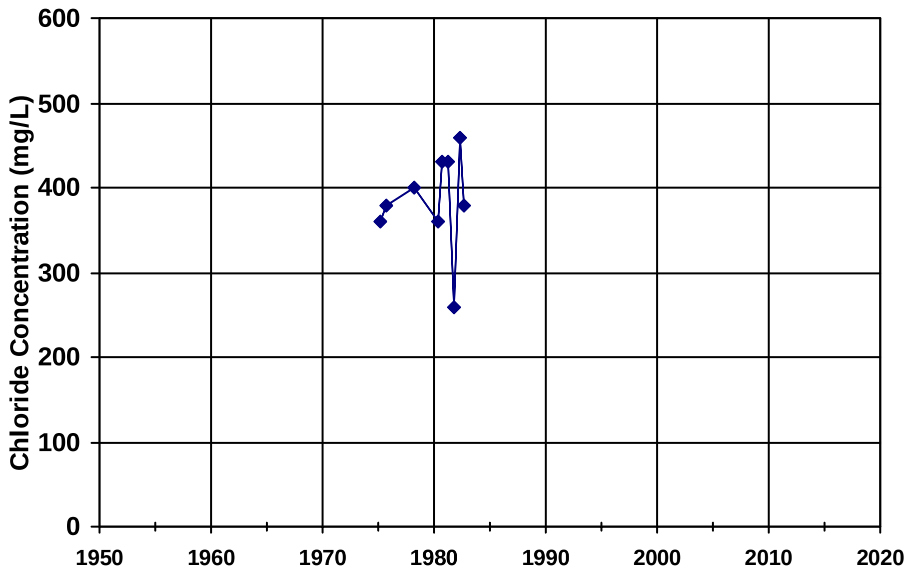
Well Depth: Screened Int.




**WellID: USGS-380024121471501**

**Zone: Unknown**

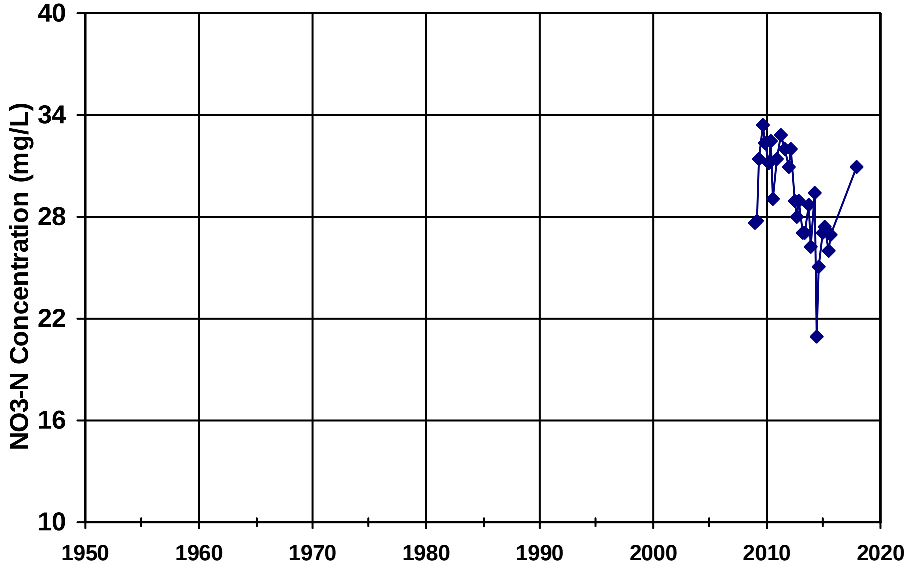
Well Depth: Screened Int.



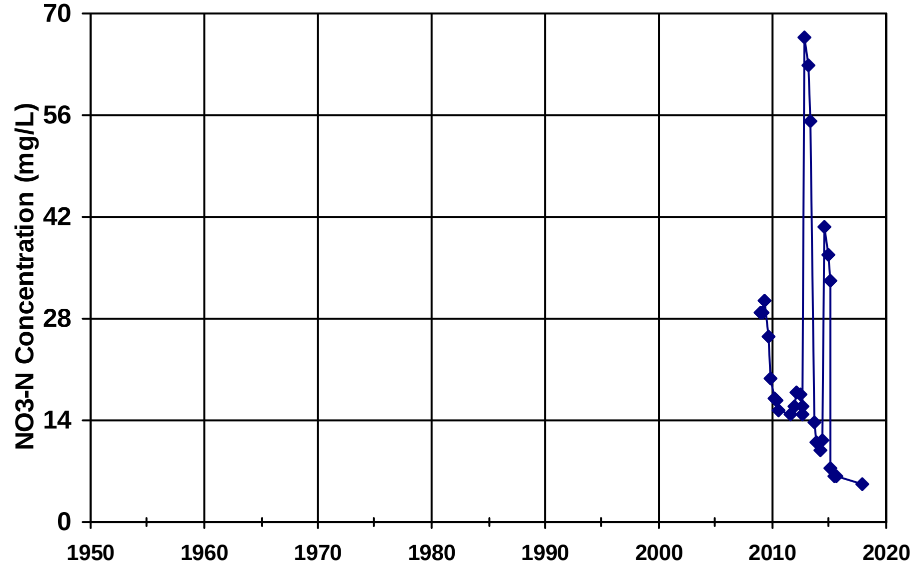

{R_WQ_CLplots}

# Nitrate-N Graphs

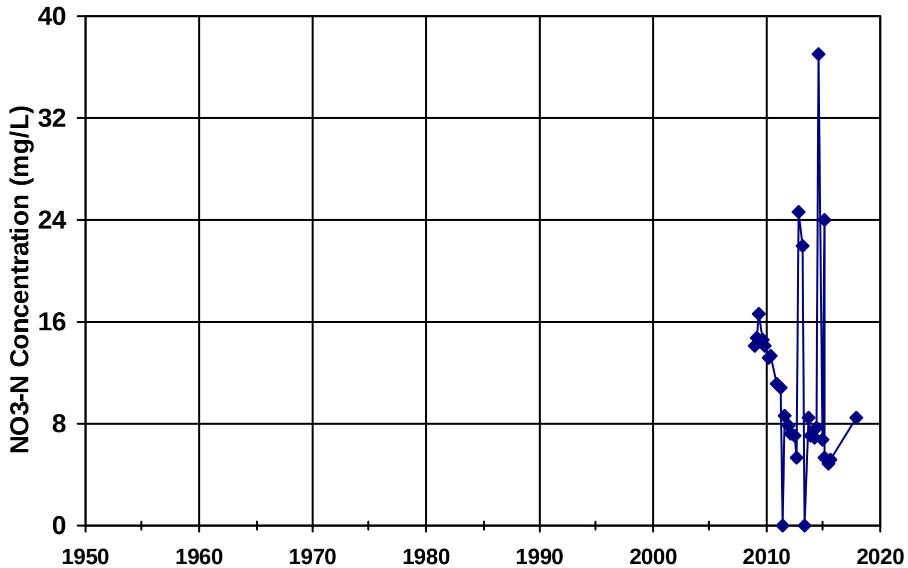
**WellID: BG-1**
**Zone: Shallow**
Well Depth: 55 Screened Int. 40-55



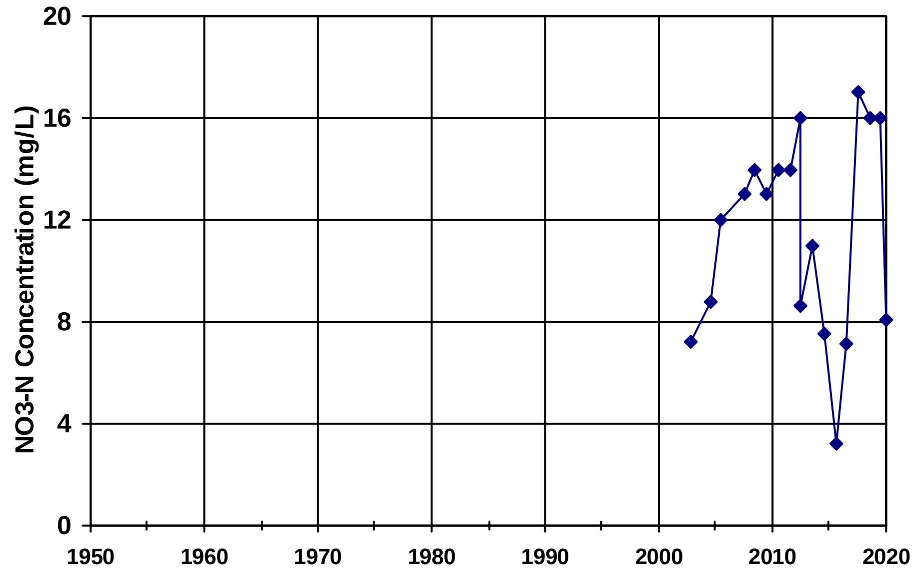

**WellID: BG-2**
**Zone: Shallow**
Well Depth: 37.5 Screened Int. 22.5-37.5




**WellID: BG-3**
**Zone: Shallow**
Well Depth: 35 Screened Int. 20-35

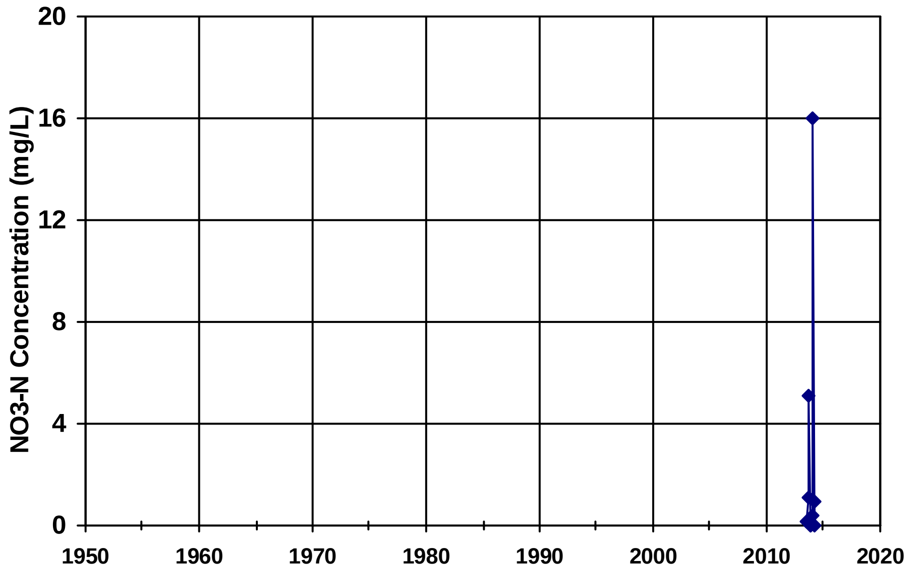



**WellID: BALDOCCHI WATER SYSTEM-Well Head**
**Zone: Shallow**
Well Depth: Screened Int. 100-110

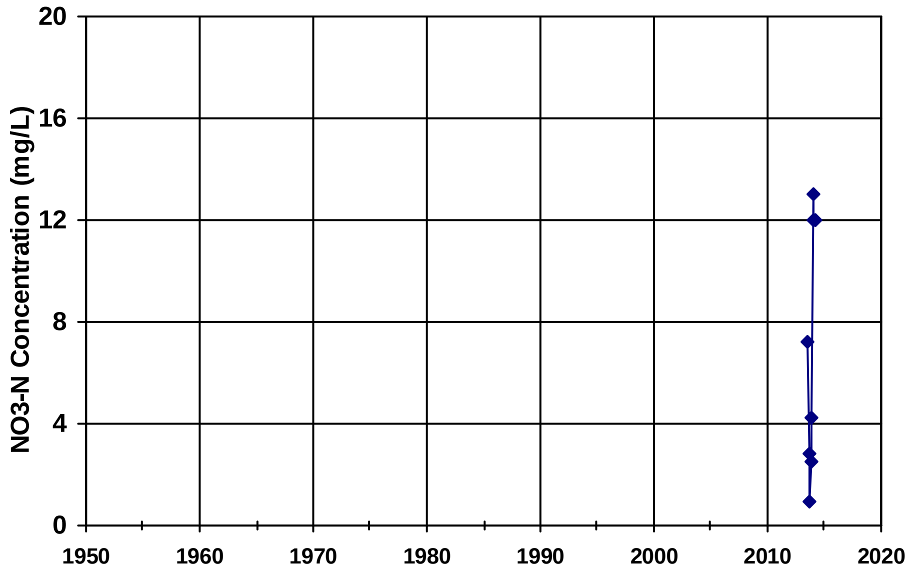



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

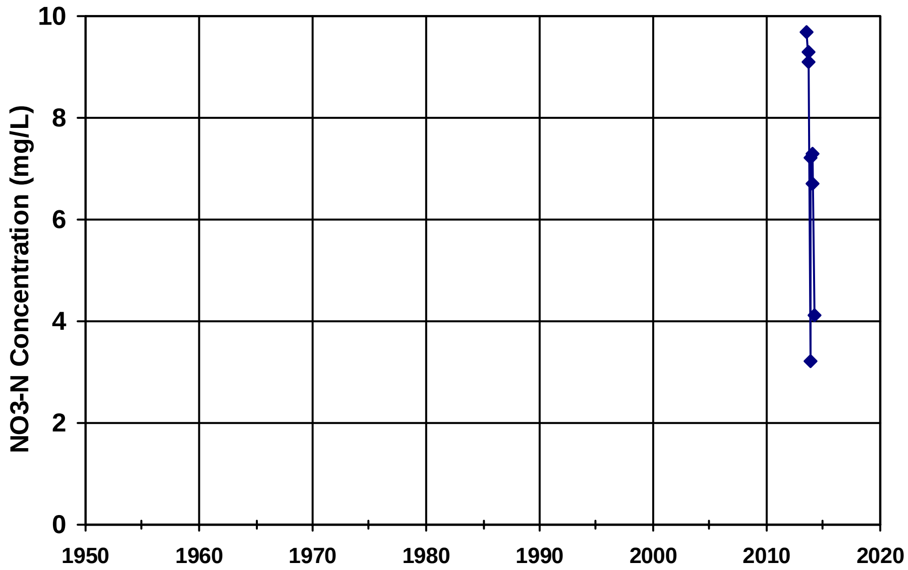
**WellID: SL186102968-7EW-4**
**Zone: Shallow**
Well Depth: Screened Int.



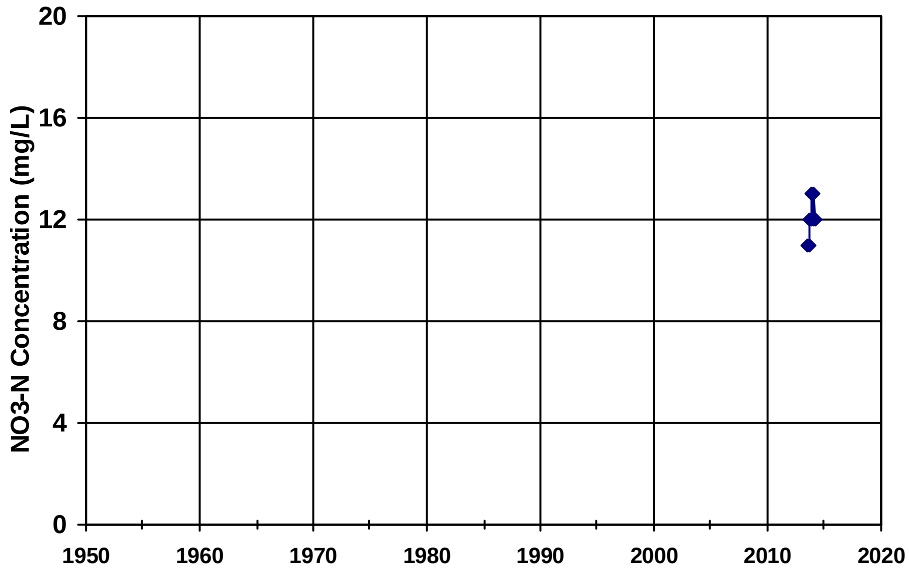

**WellID: SL186102968-7MW-1**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: SL186102968-7MW-11**
**Zone: Shallow**
Well Depth: Screened Int.

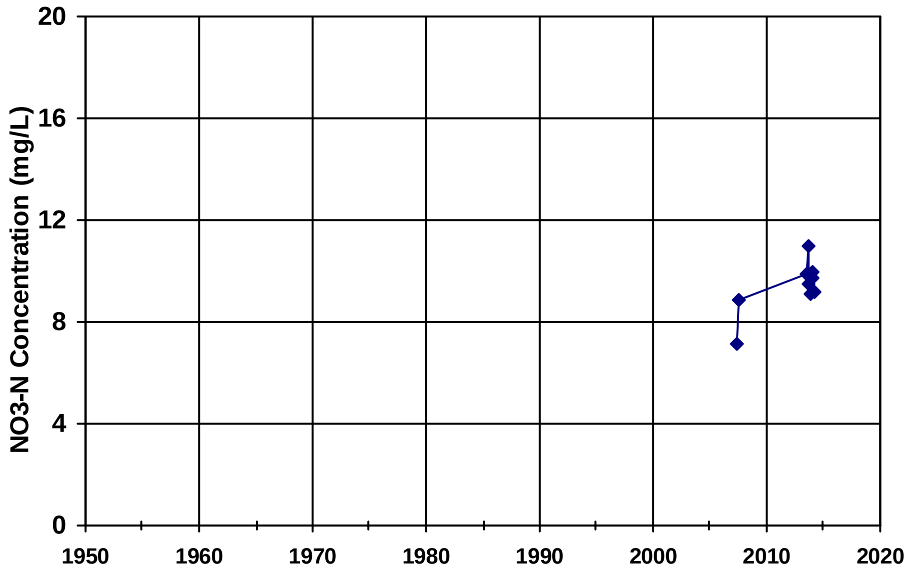



**WellID: SL186102968-7MW-12**
**Zone: Shallow**
Well Depth: Screened Int.

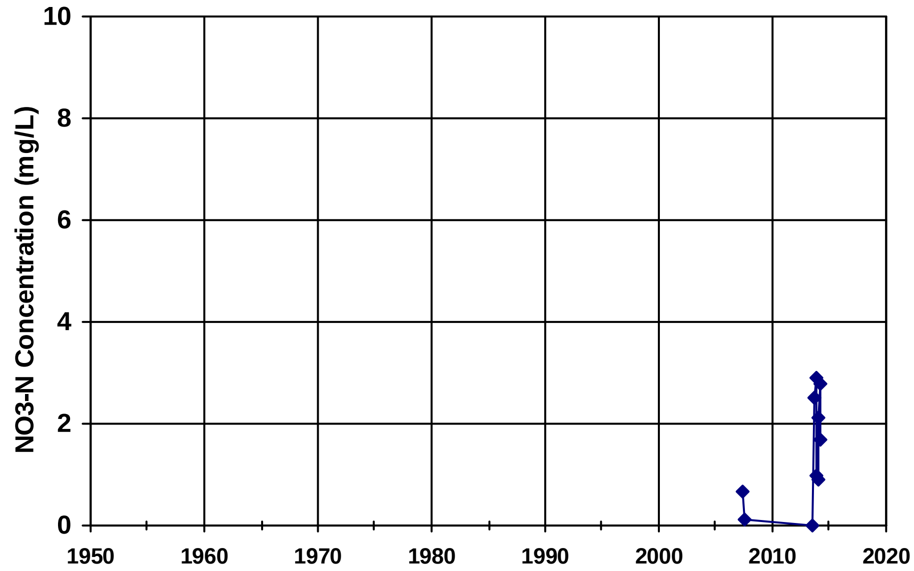



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

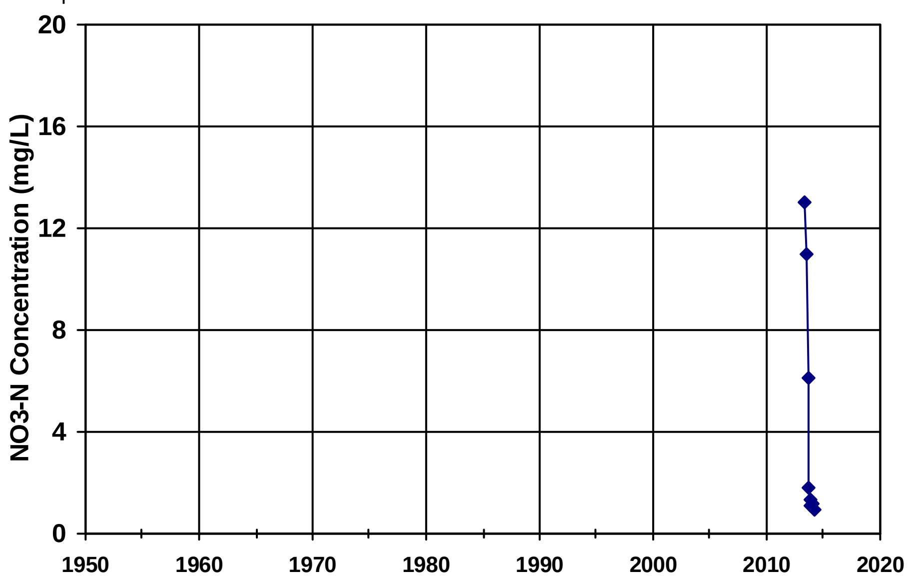
**WellID: SL186102968-7MW-13**
**Zone: Shallow**
Well Depth: Screened Int.



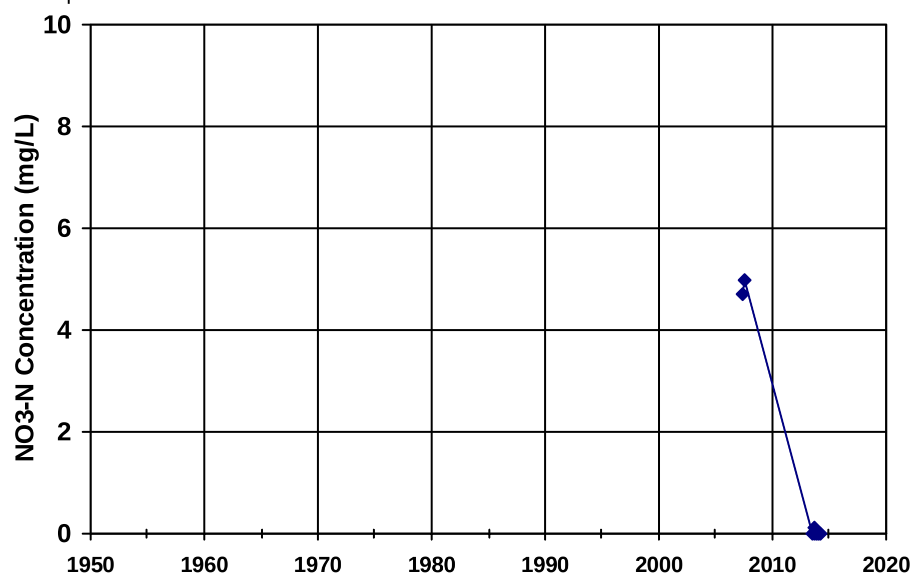

**WellID: SL186102968-7MW-14**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: SL186102968-7MW-6**
**Zone: Shallow**
Well Depth: Screened Int.

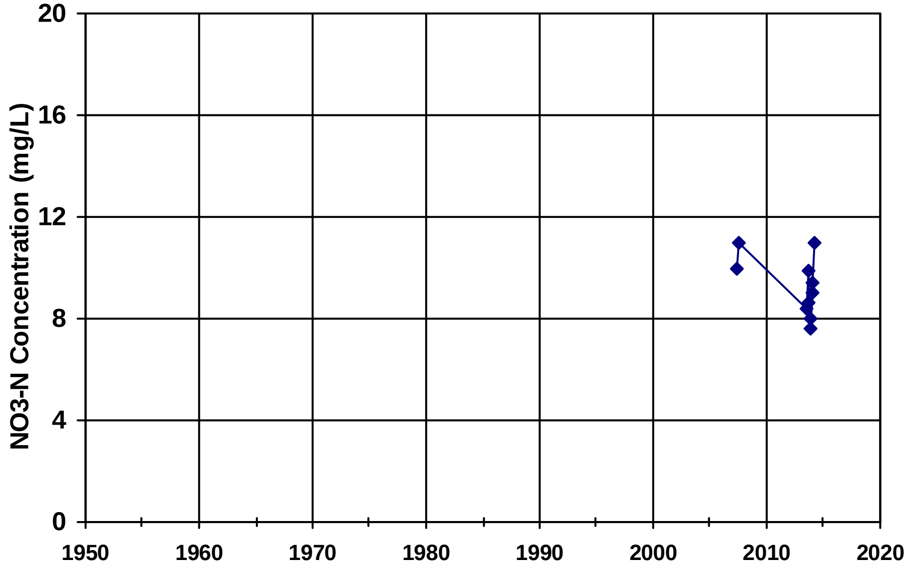



**WellID: SL186102968-7MW-8**
**Zone: Shallow**
Well Depth: Screened Int.

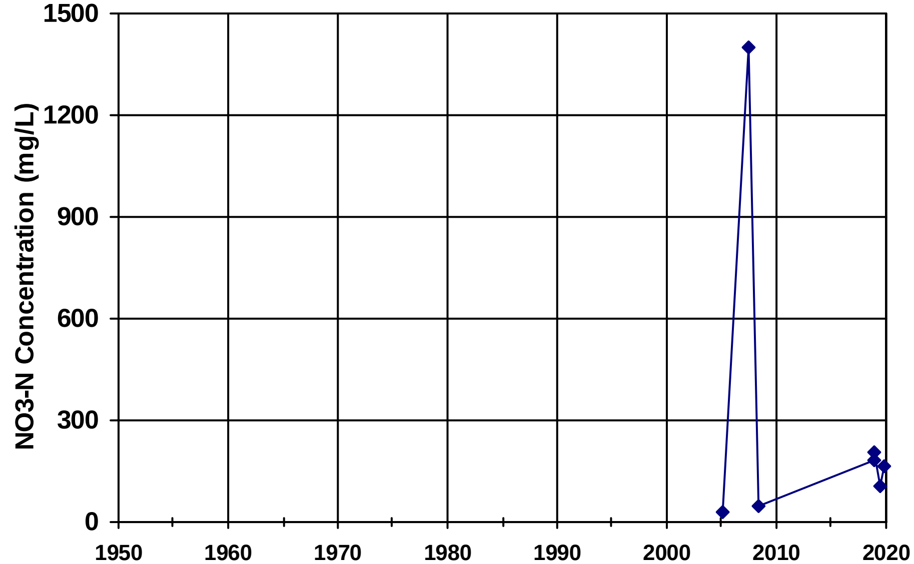



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

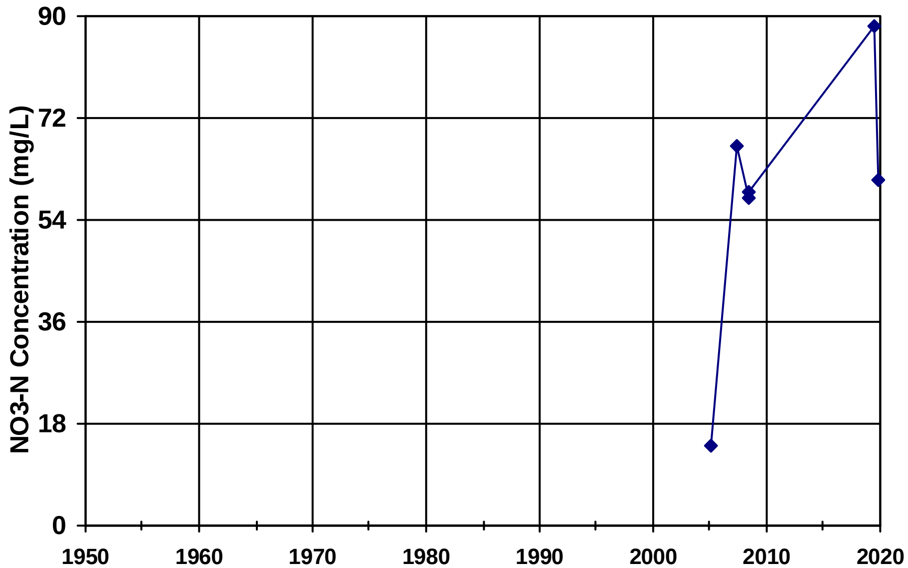
**WellID: SL186102968-7MW-9**
**Zone: Shallow**
Well Depth: Screened Int.



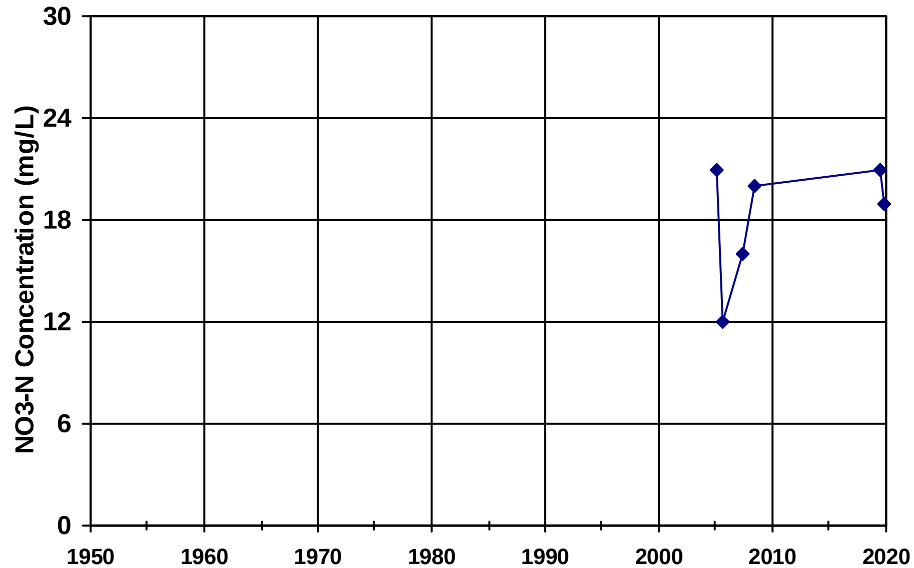

**WellID: SL205032990-W-04**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: SL205032990-W-05**
**Zone: Shallow**
Well Depth: Screened Int.

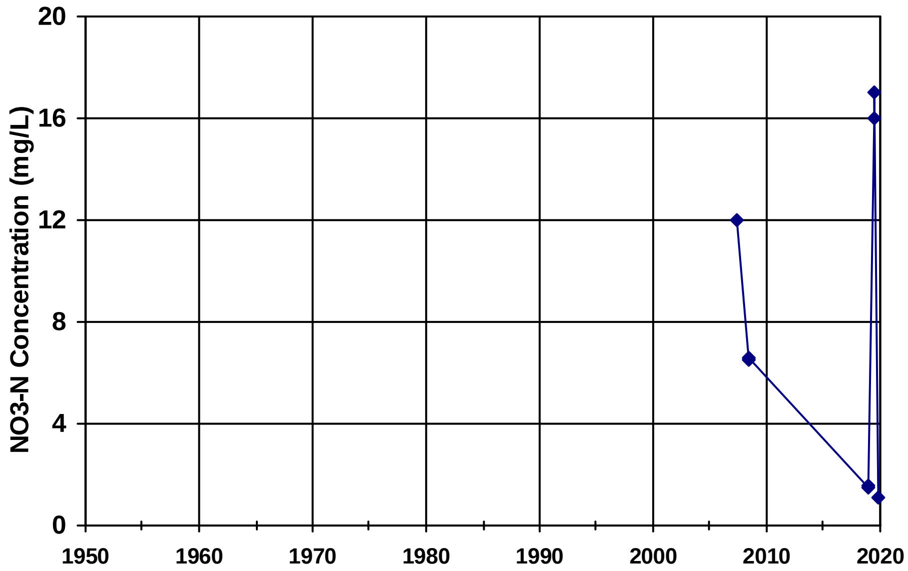



**WellID: SL205032990-W-07**
**Zone: Shallow**
Well Depth: Screened Int.

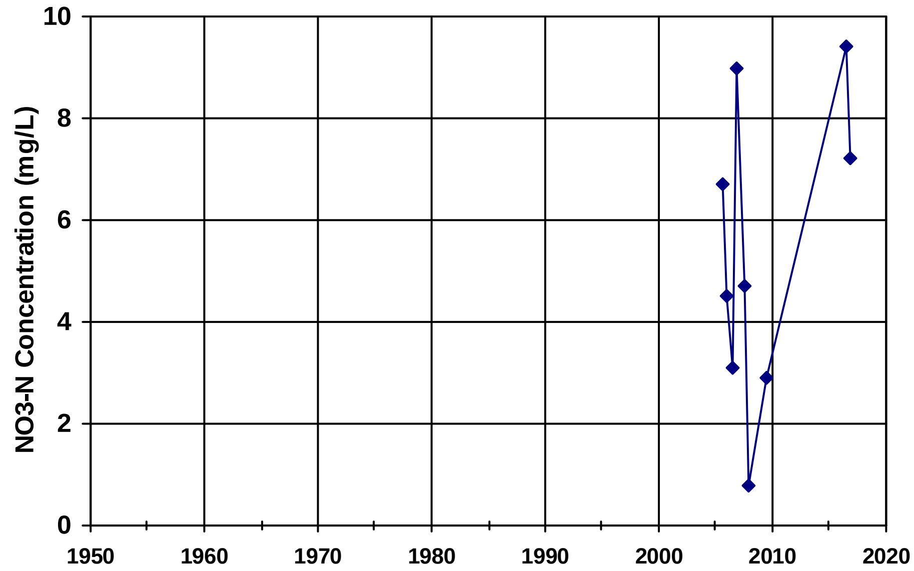



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

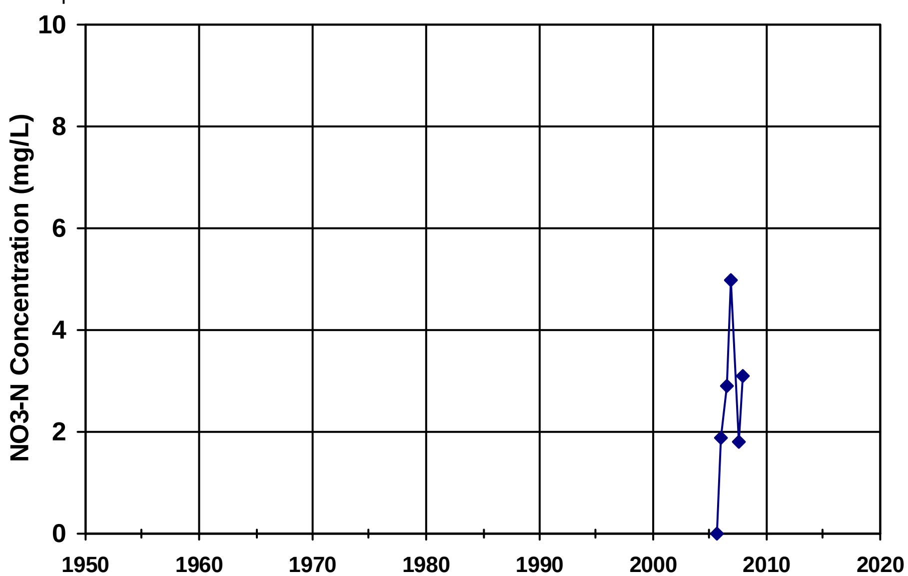
WellID: SL205032990-W-28
Zone: Shallow
Well Depth: Screened Int.



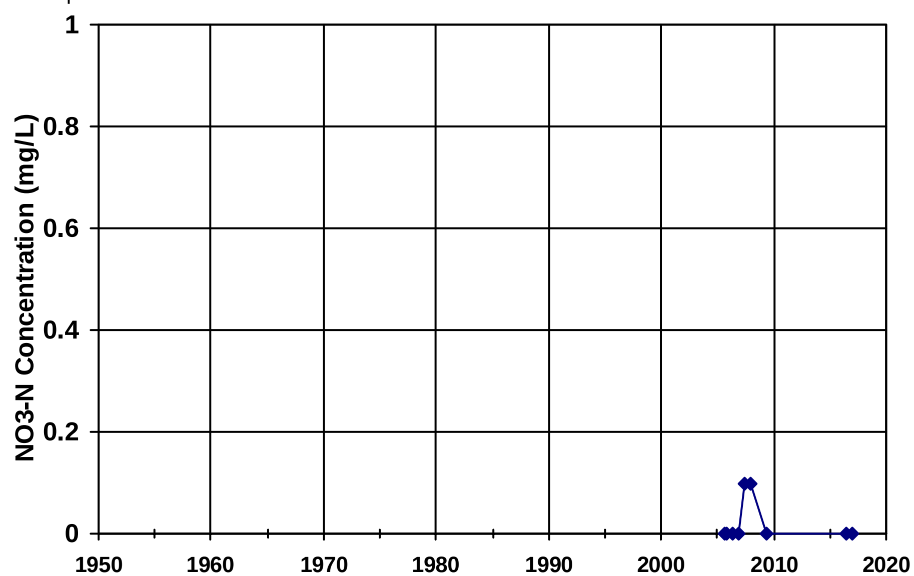

WellID: SL205092993-MW-14A
Zone: Shallow
Well Depth: Screened Int.




WellID: SL205092993-MW-18A
Zone: Shallow
Well Depth: Screened Int.

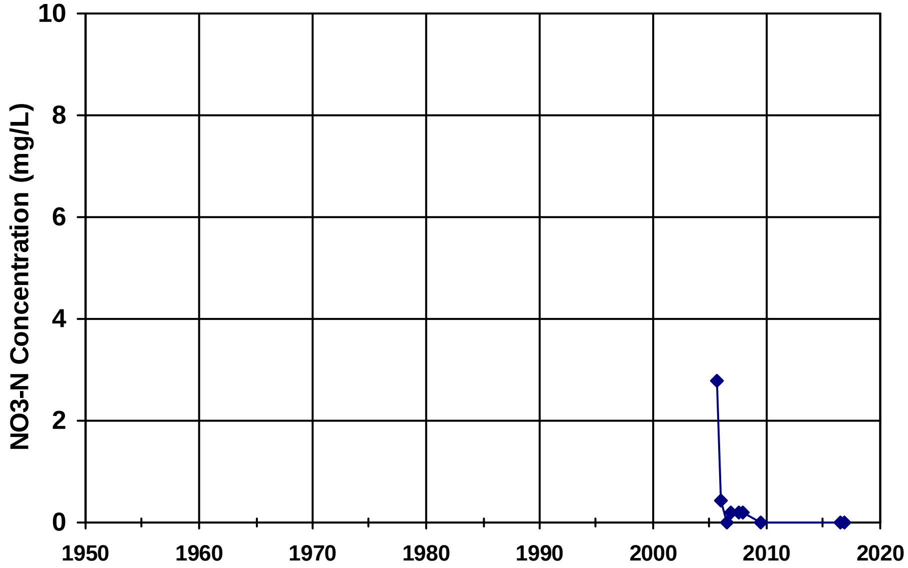



WellID: SL205092993-MW-5A
Zone: Shallow
Well Depth: Screened Int.

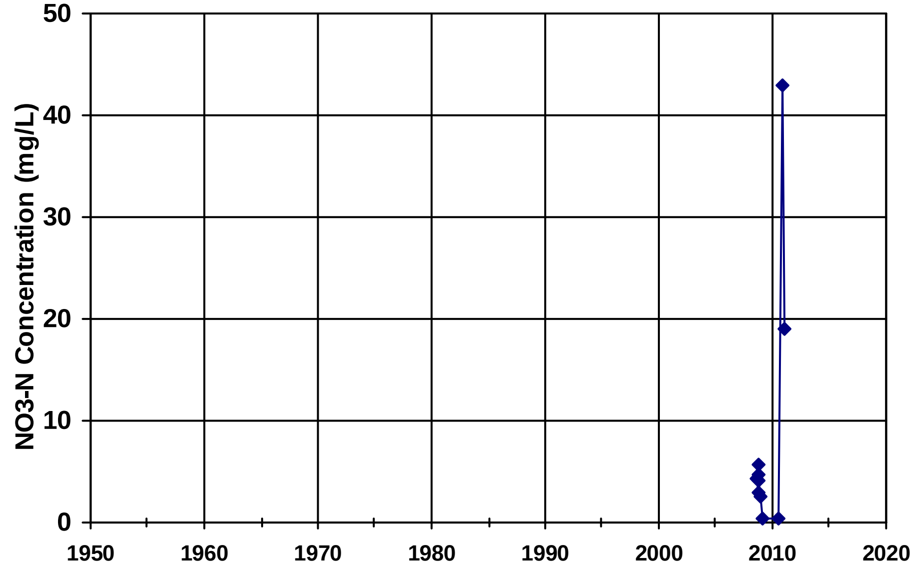



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

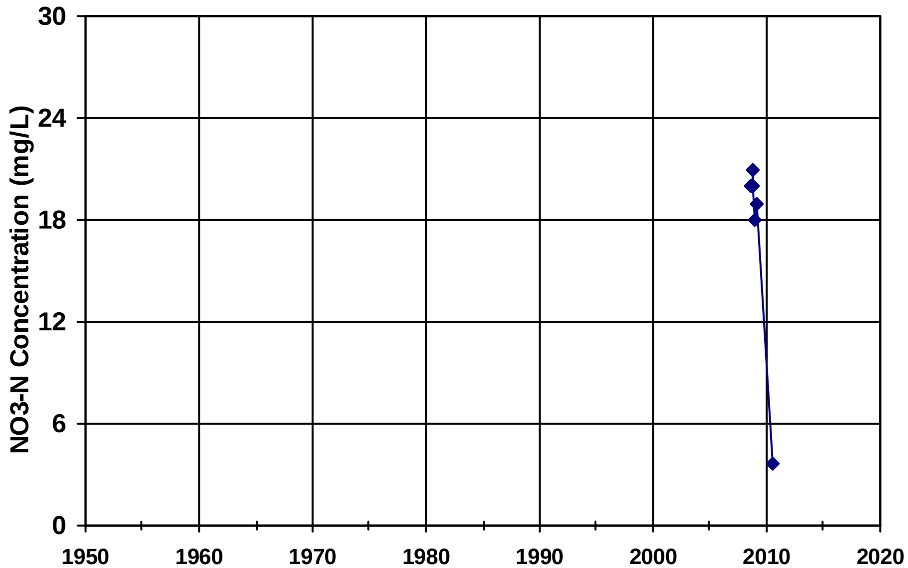
**WellID: SL205092993-MW-8A**
**Zone: Shallow**
Well Depth: Screened Int.



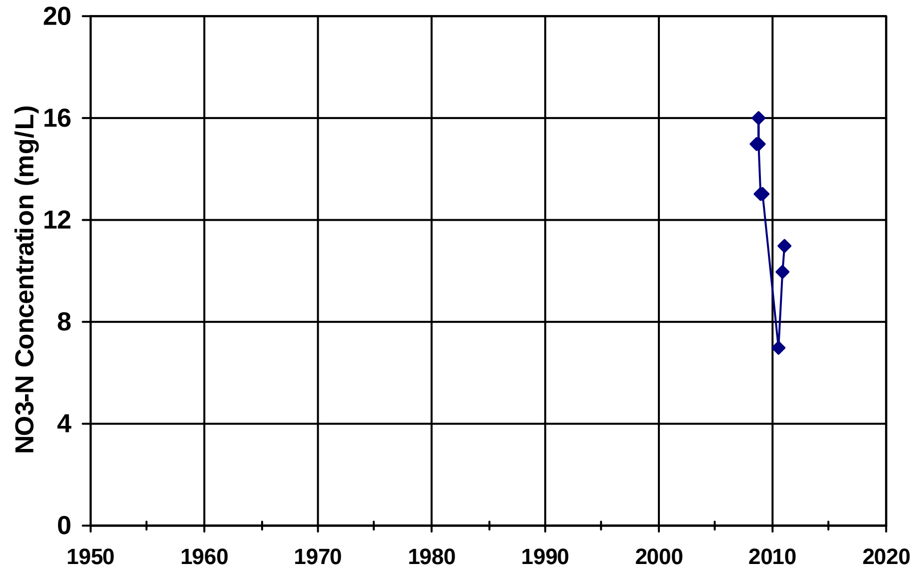

**WellID: T0601300766-MW5**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: T0601300766-MW8B**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: T0601300766-MW8C**
**Zone: Shallow**
Well Depth: Screened Int.

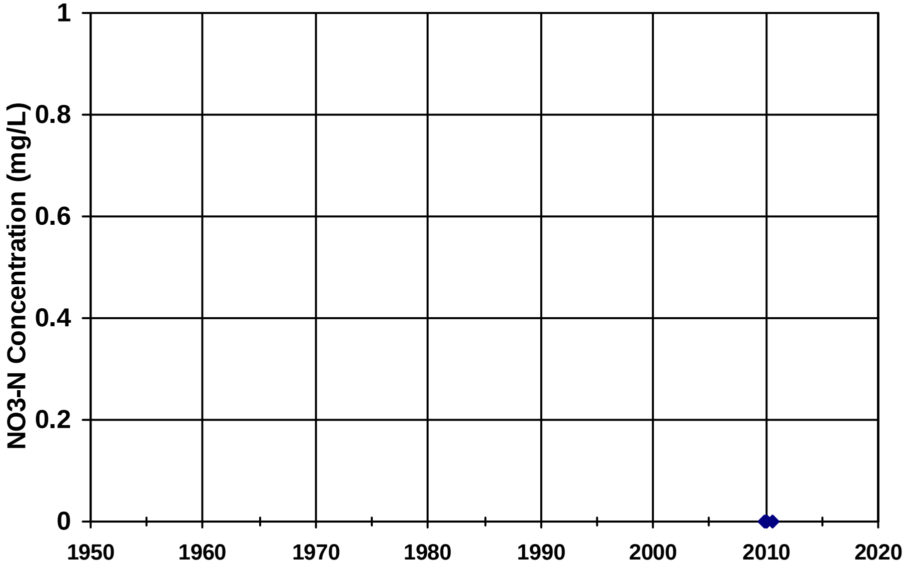



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

**WellID: T10000000655-MW.05**

**Zone: Shallow**

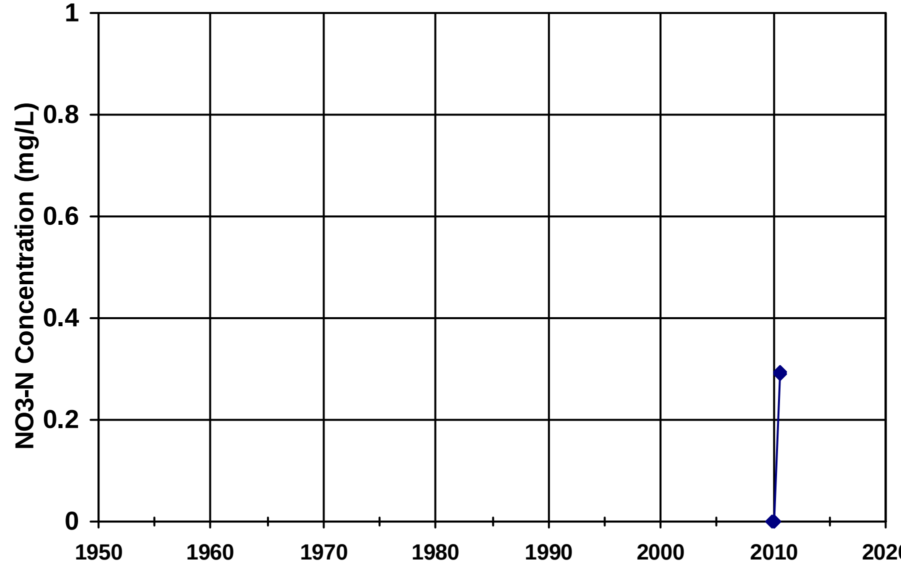
Well Depth: Screened Int.




**WellID: T10000000655-MW.06**

**Zone: Shallow**

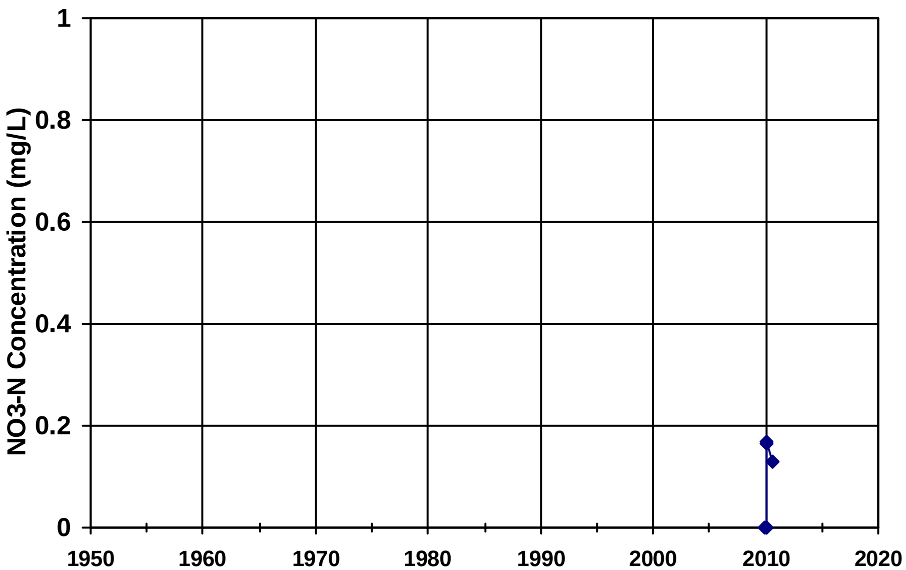
Well Depth: Screened Int.




**WellID: T10000000655-MW.07**

**Zone: Shallow**

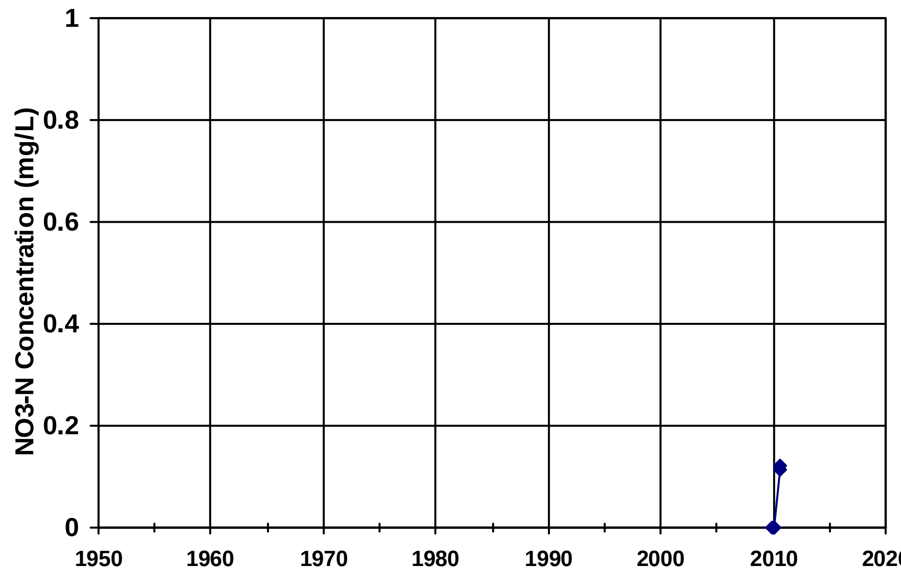
Well Depth: Screened Int.




**WellID: T10000000655-MW.08**

**Zone: Shallow**

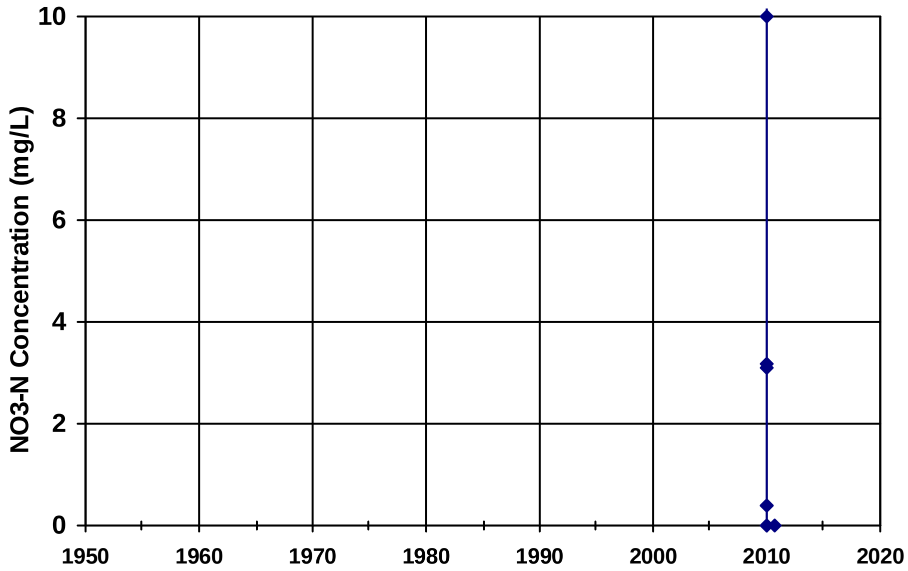
Well Depth: Screened Int.



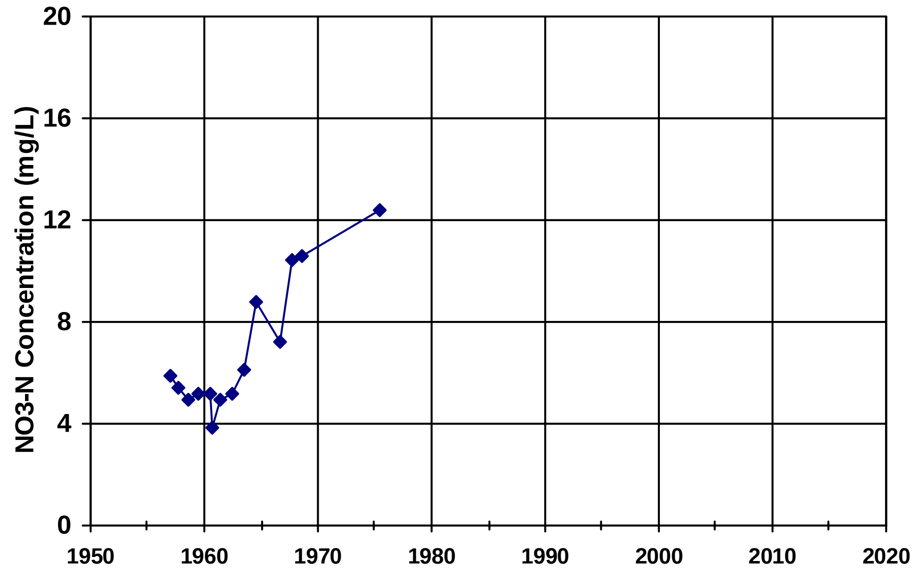

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

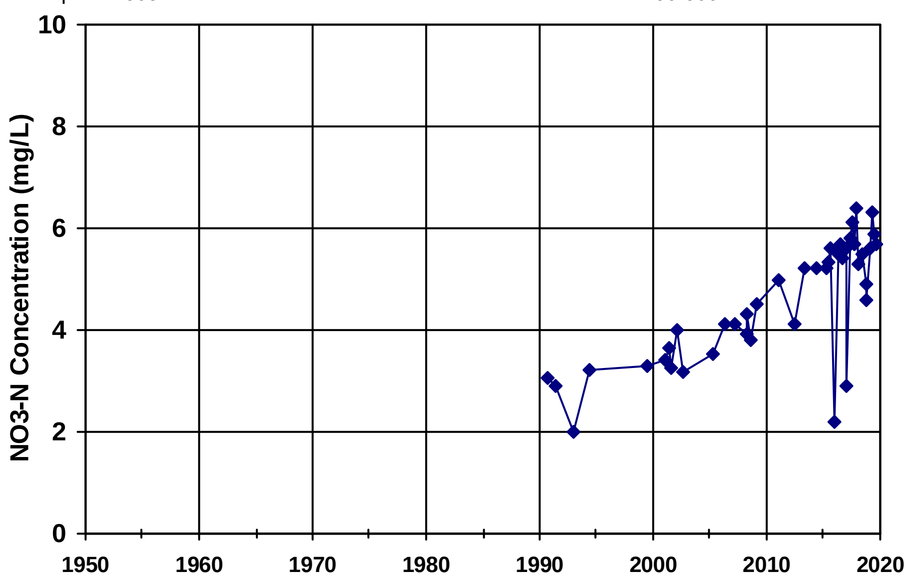
WellID: T10000000655-MW.09
Zone: Shallow
Well Depth: Screened Int.



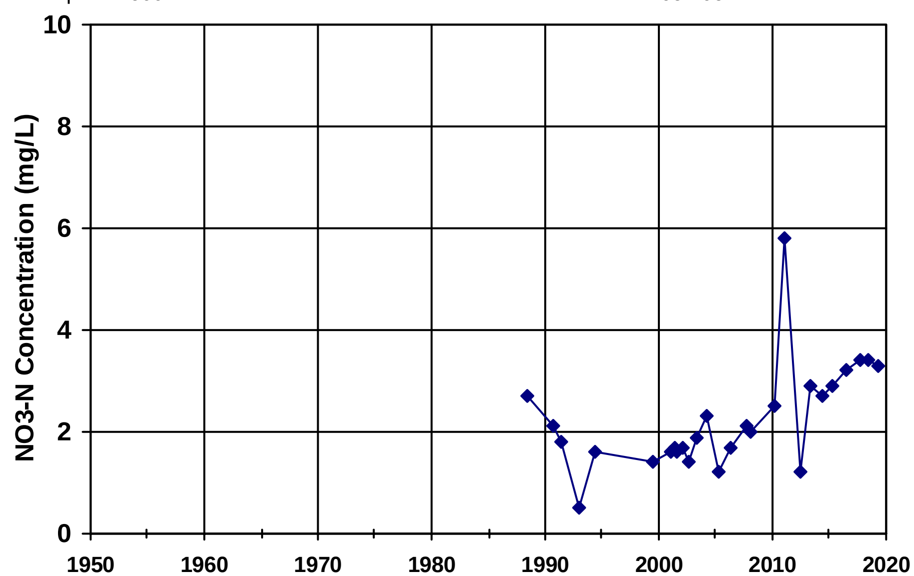

WellID: USGS-380043121461201
Zone: Shallow
Well Depth: 67 Screened Int.




WellID: CITY OF BRENTWOOD-Well 06
Zone: Deep
Well Depth: 305 Screened Int. 250-300

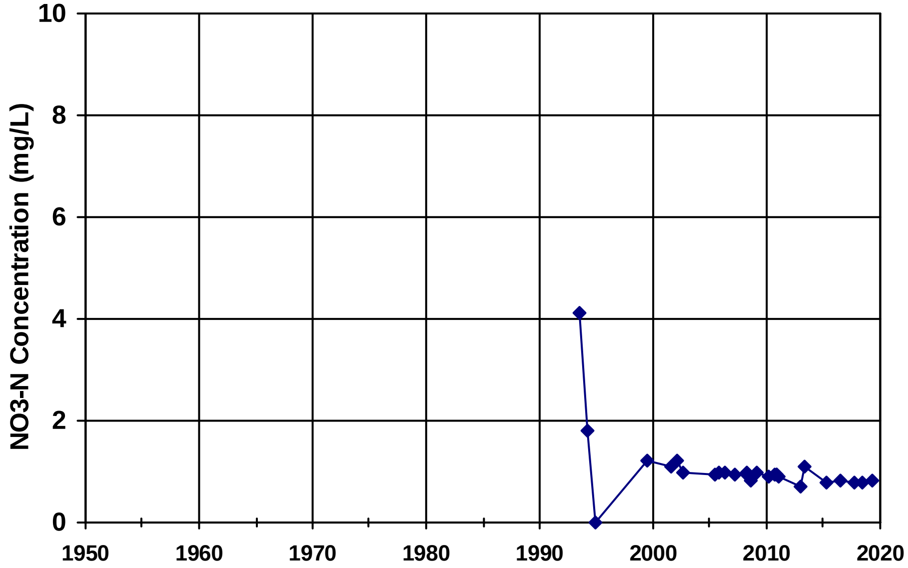



WellID: CITY OF BRENTWOOD-Well 07
Zone: Deep
Well Depth: 300 Screened Int. 265-295

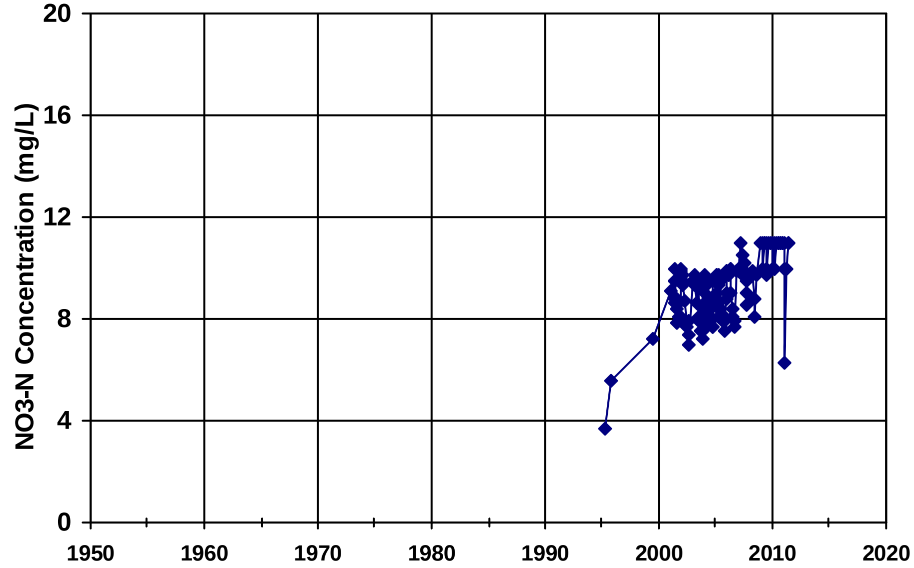



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

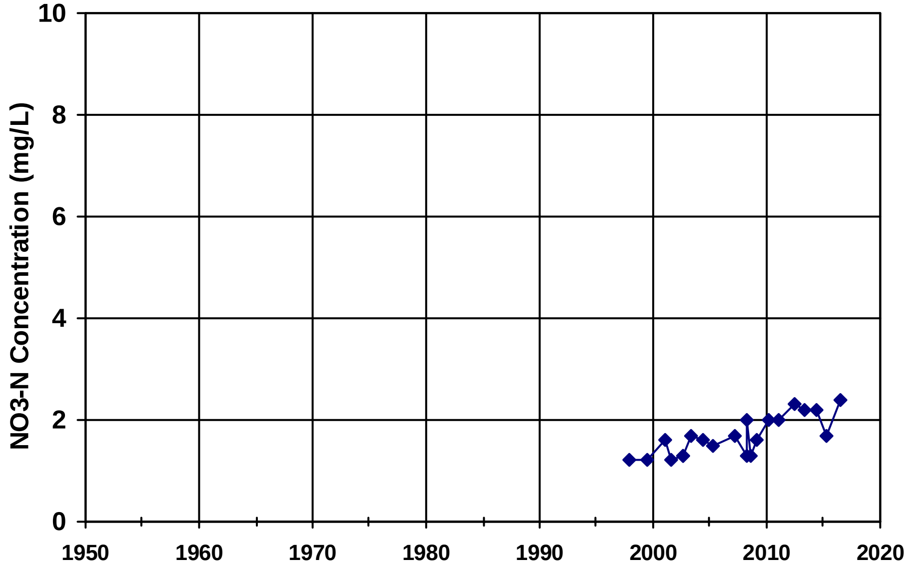
WellID: CITY OF BRENTWOOD-Well 08
Zone: Deep
Well Depth: 325 Screened Int. 225-315



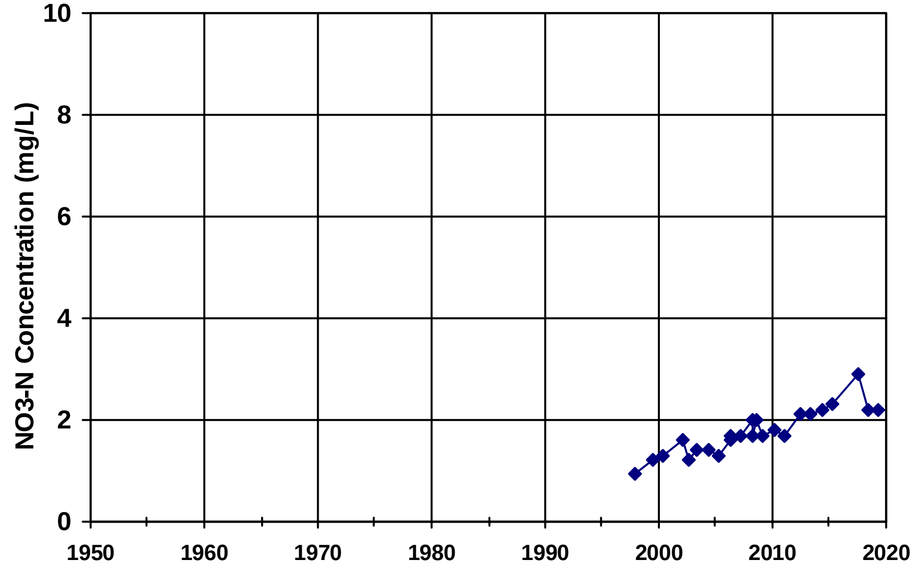

WellID: CITY OF BRENTWOOD-Well 11
Zone: Deep
Well Depth: Screened Int. 255-365




WellID: CITY OF BRENTWOOD-Well 12
Zone: Deep
Well Depth: 610 Screened Int. 350-380, 430-450

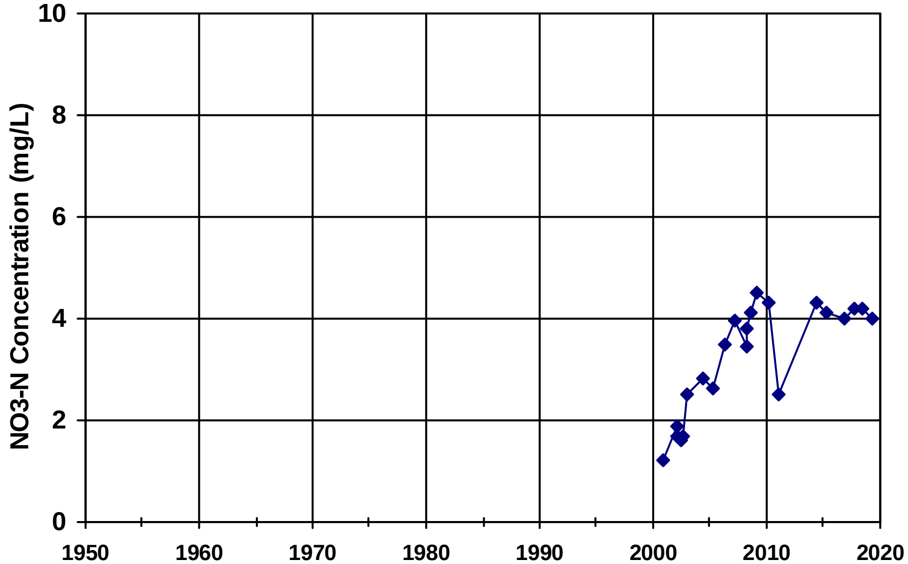



WellID: CITY OF BRENTWOOD-Well 13
Zone: Deep
Well Depth: 510 Screened Int. 350-380, 430-480

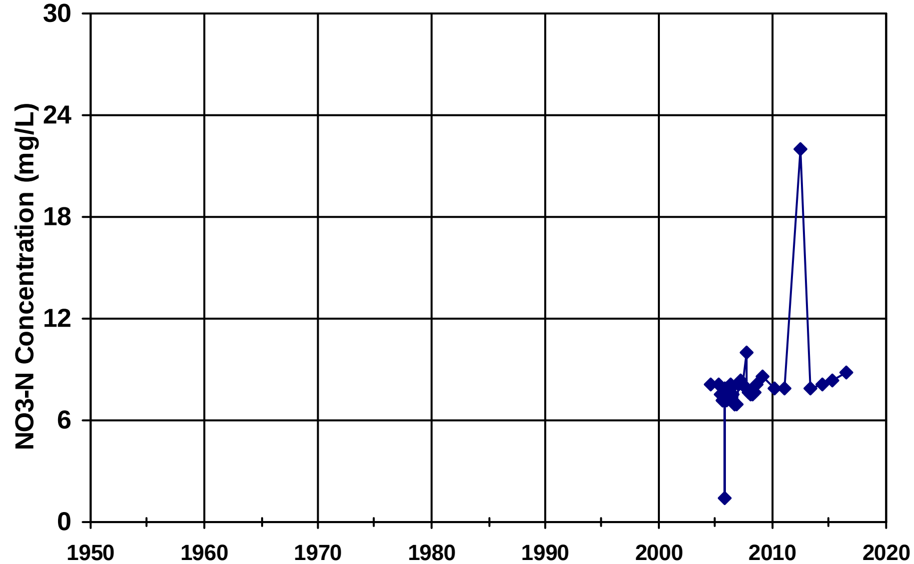



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

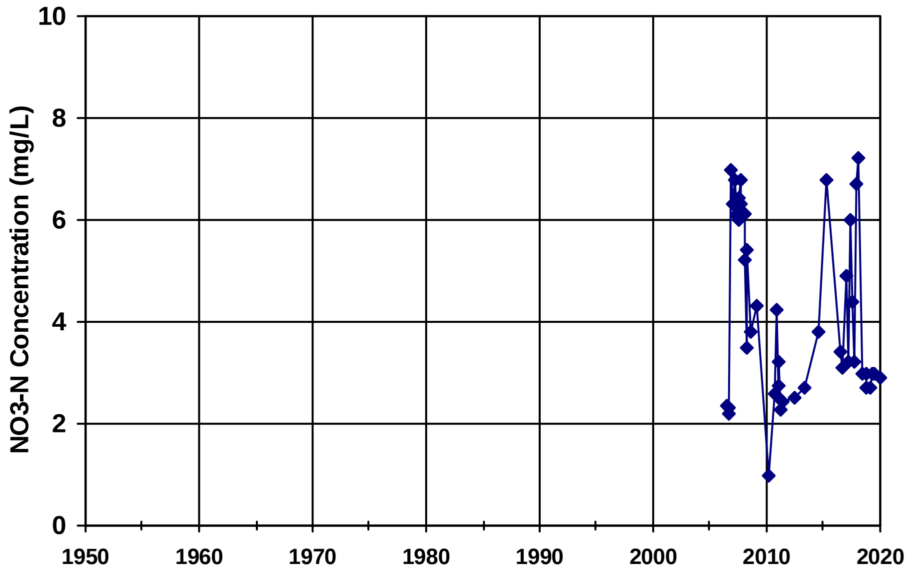
**WellID: CITY OF BRENTWOOD-Well 14**
**Zone: Deep**
Well Depth: 340 Screened Int. 285-315



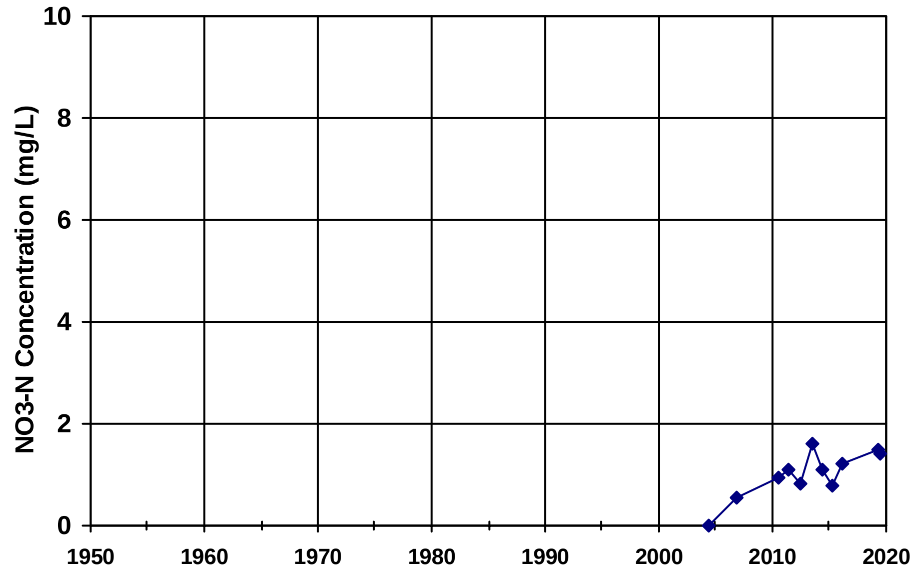

**WellID: CITY OF BRENTWOOD-Well 09**
**Zone: Deep**
Well Depth: 230 Screened Int. 210-230




**WellID: CITY OF BRENTWOOD-Well 15**
**Zone: Deep**
Well Depth: 345 Screened Int. 239-259,289-324

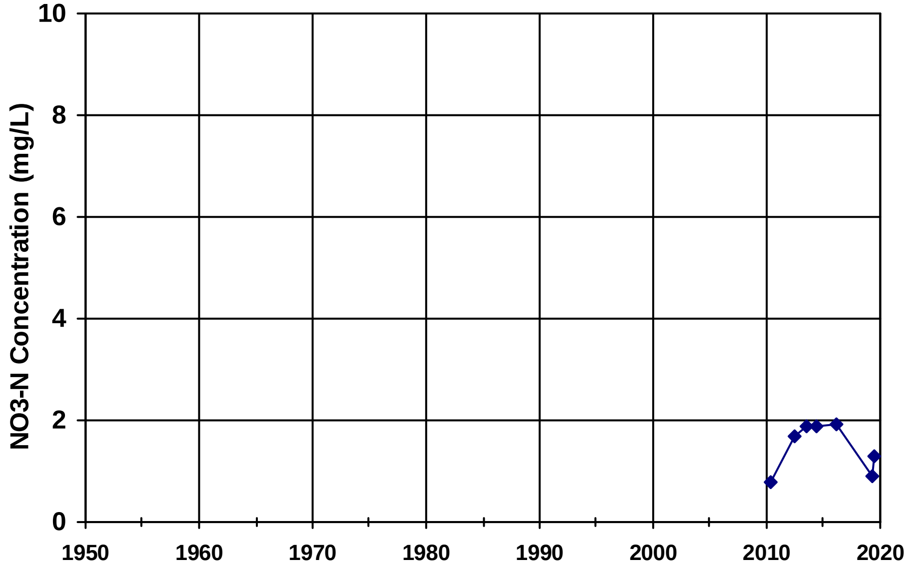



**WellID: DIABLO WATER DISTRICT-Glen Park Well**
**Zone: Deep**
Well Depth: 315 Screened Int. 230-245, 260-300

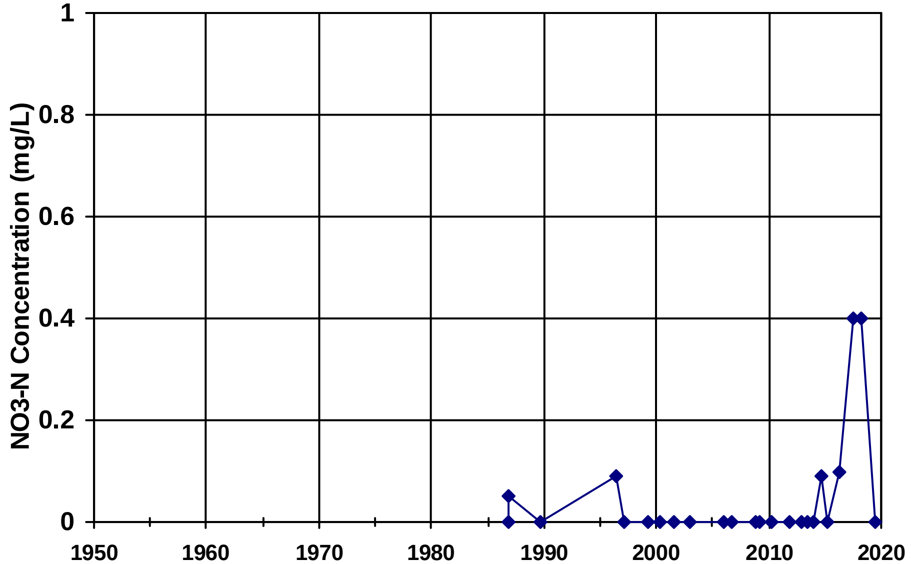



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

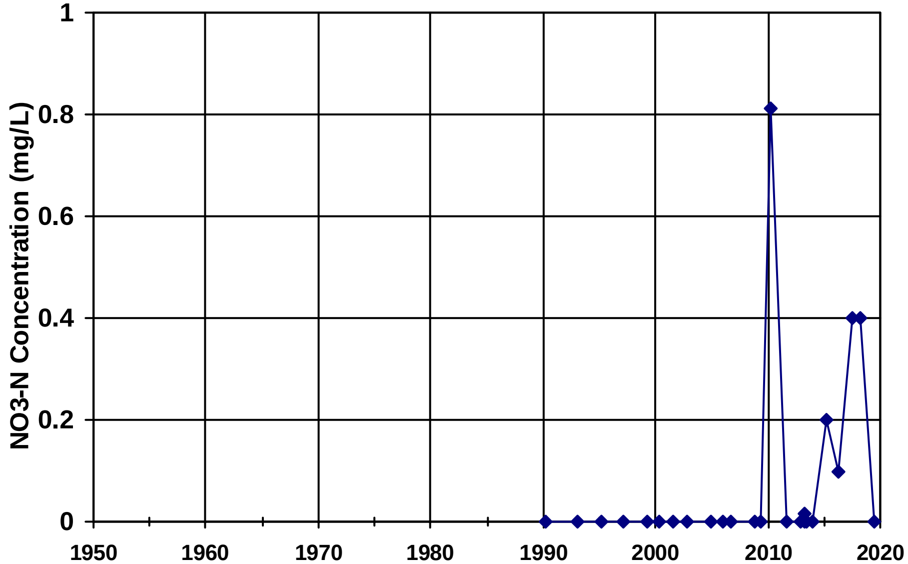
WellID: DIABLO WATER DISTRICT-Stonecreek PW
Zone: Deep
Well Depth: 305 Screened Int. 220-295



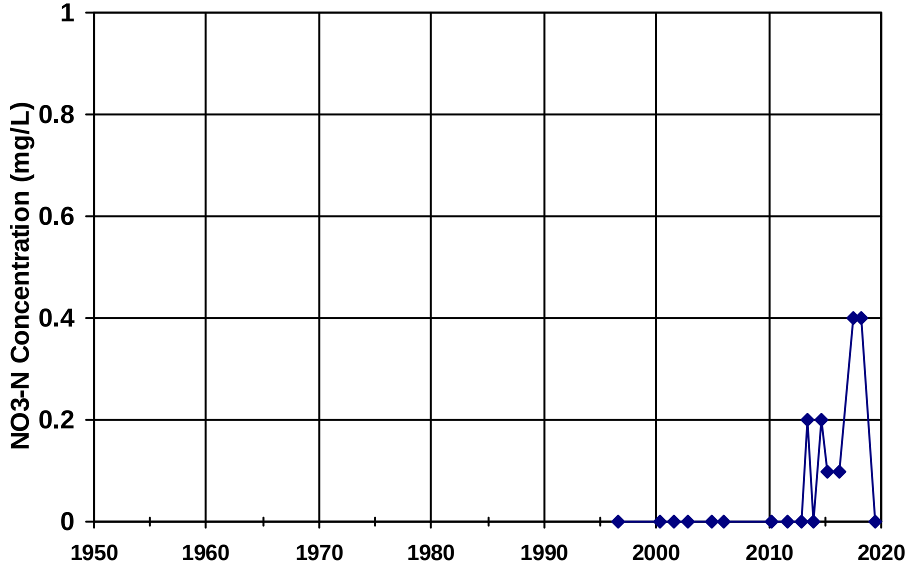

WellID: TOWN OF DISCOVERY BAY-WELL 02
Zone: Deep
Well Depth: 348 Screened Int. 245-335




WellID: TOWN OF DISCOVERY BAY-WELL 05A
Zone: Deep
Well Depth: 357 Screened Int. 251-281, 307-347




WellID: TOWN OF DISCOVERY BAY-WELL 04A
Zone: Deep
Well Depth: 357 Screened Int. 307-347

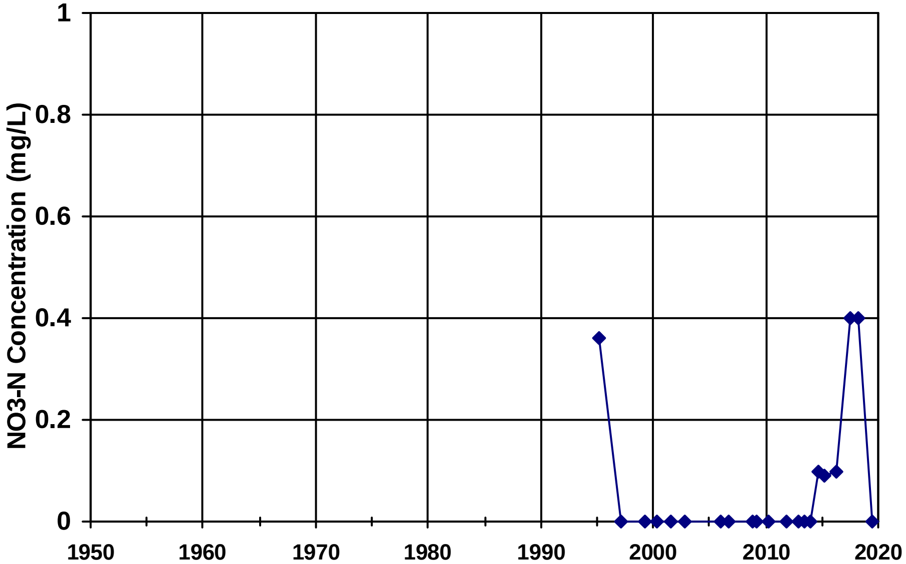



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

**WellID: TOWN OF DISCOVERY BAY-WELL 01B**

**Zone: Deep**

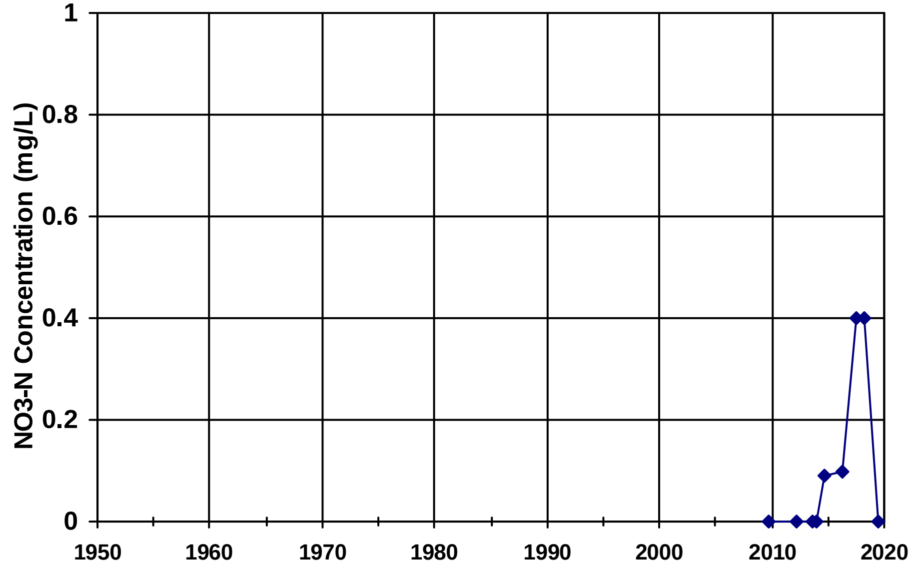
Well Depth: 350 Screened Int. 271-289, 308-340




**WellID: TOWN OF DISCOVERY BAY-WELL 06**

**Zone: Deep**

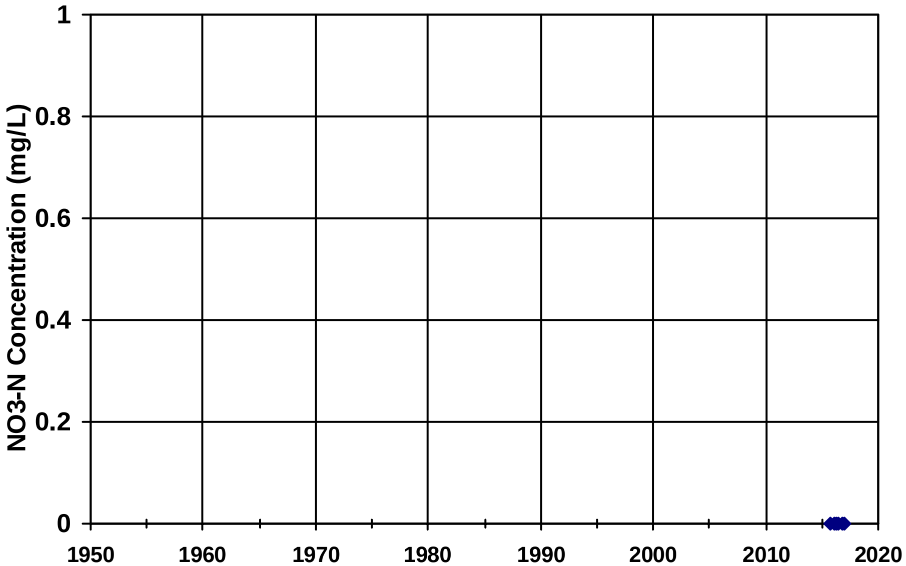
Well Depth: 360 Screened Int. 270-295, 305-350




**WellID: KNIGHTSEN ELEMENTARY SCHOOL-WELL 3**

**Zone: Deep**

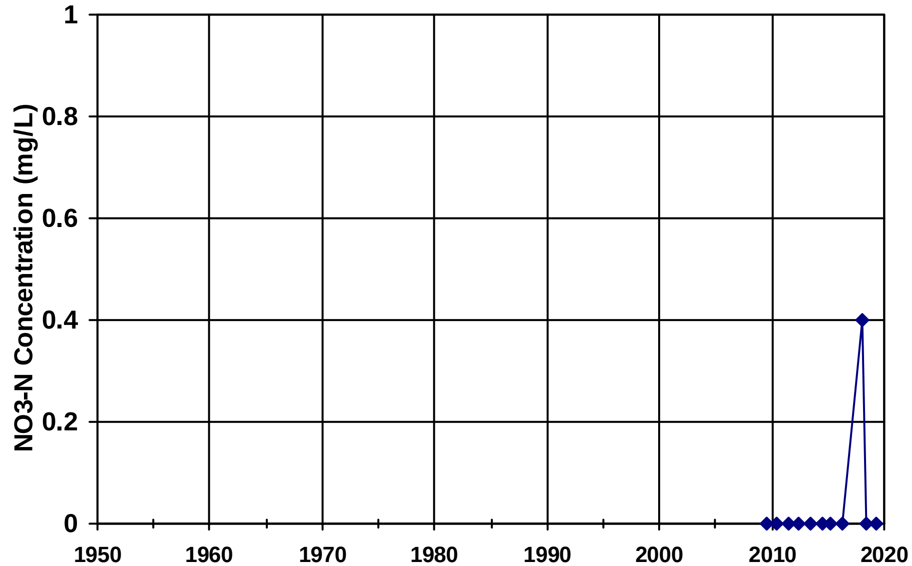
Well Depth: 415 Screened Int. 395-415




**WellID: WILLOW PARK MARINA-East Well**

**Zone: Deep**

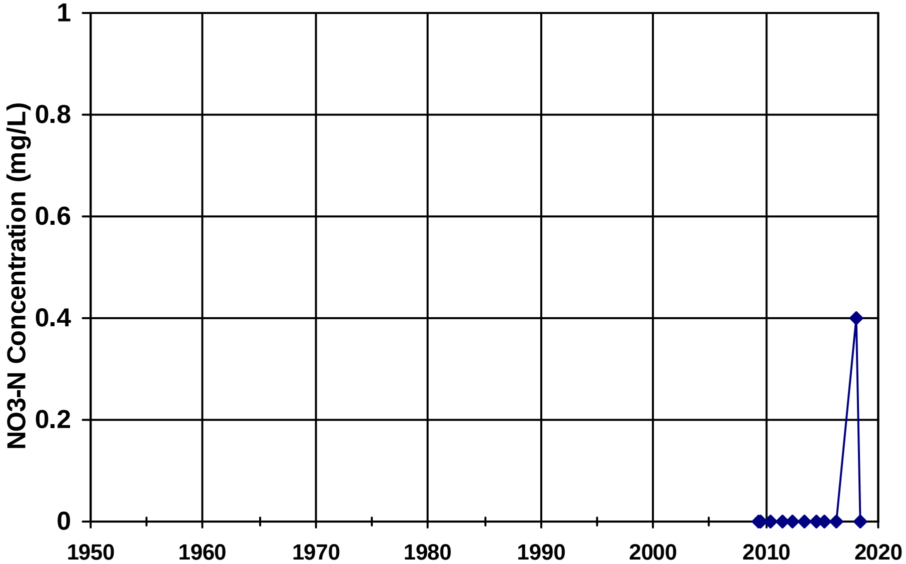
Well Depth: 400 Screened Int. 250-310



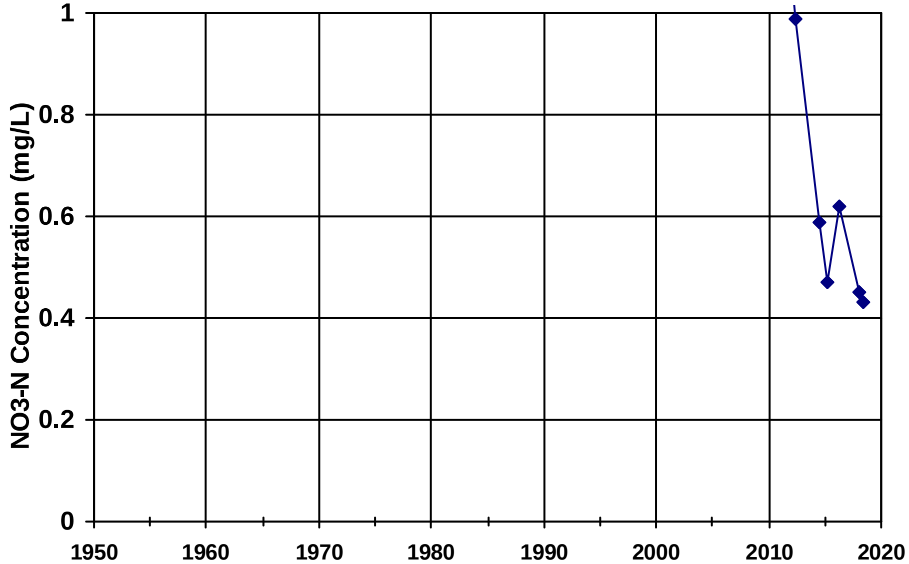

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

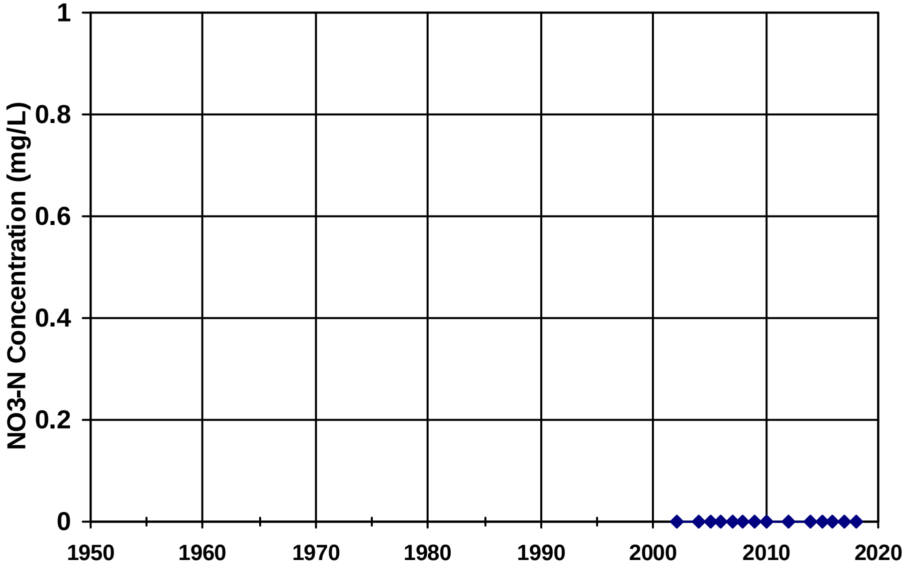
WellID: WILLOW PARK MARINA-West Well
Zone: Deep
Well Depth: 340 Screened Int. 250-310



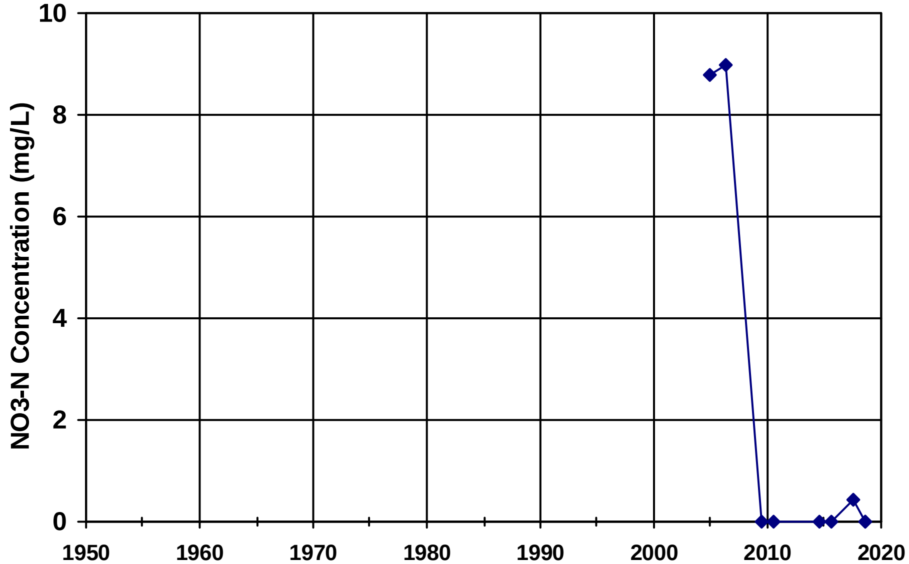

WellID: KNIGHTSEN COMMUNITY WATER SYSTEM-Well Head
Zone: Deep
Well Depth: 305 Screened Int. 235-255, 275-295




WellID: Bethel Island (Sugar Barge Marina-Well Head)
Zone: Deep
Well Depth: 333 Screened Int. 317-333




WellID: WILLOW MOBILE HOME PARK-Well Head
Zone: Deep
Well Depth: 410 Screened Int. 292-332

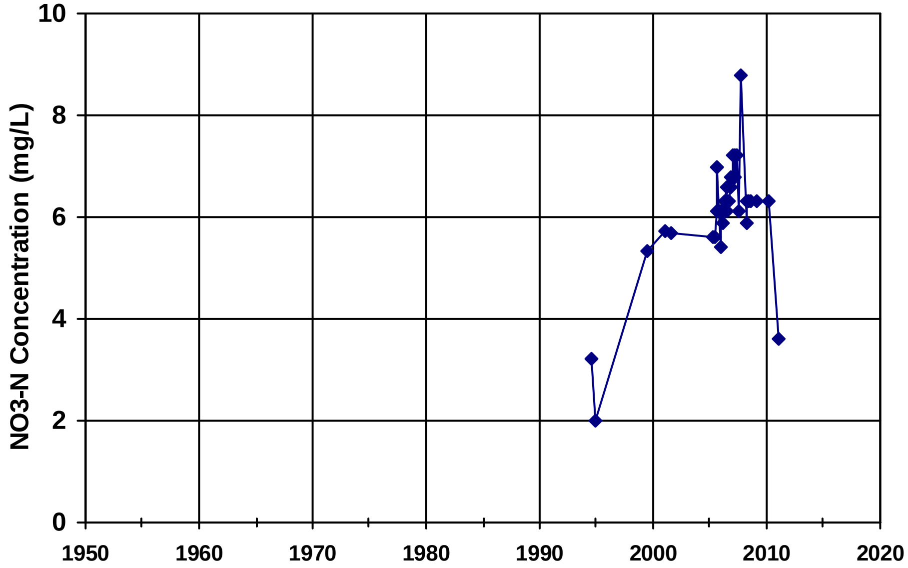



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

**WellID: CITY OF BRENTWOOD-Well 10A**

**Zone: Composite**

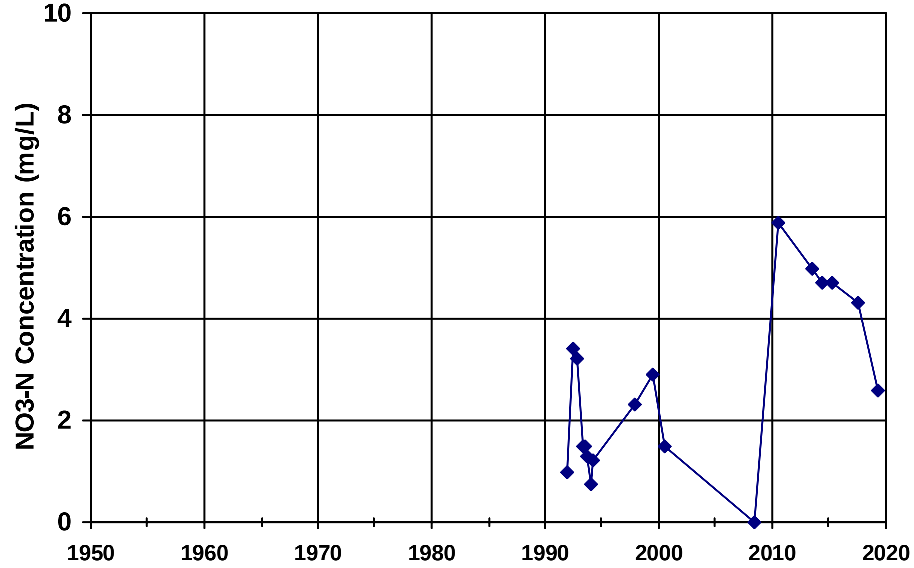
Well Depth: 210 Screened Int. 52-72, 135-182




**WellID: DIABLO WATER DISTRICT-WELL 01 - STANDBY**

**Zone: Composite**

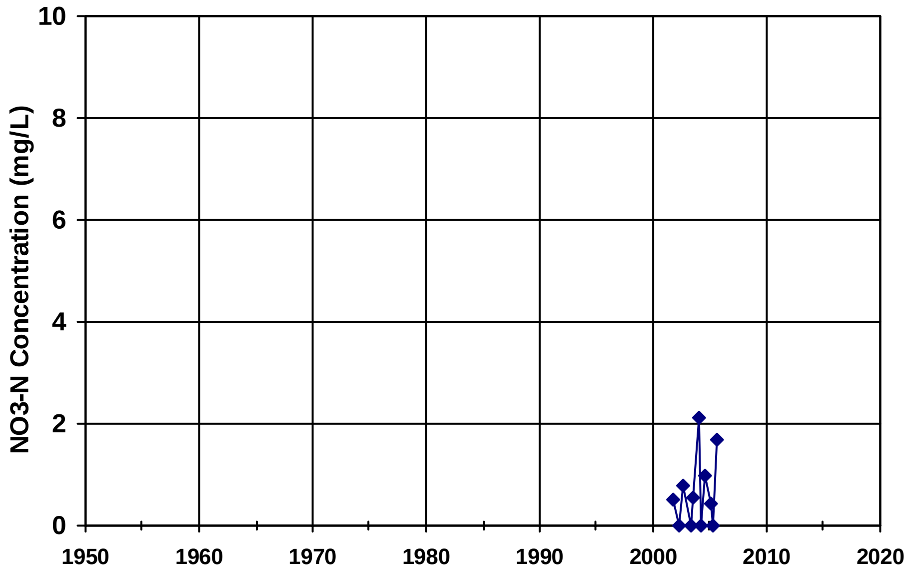
Well Depth: 170 Screened Int. 100-170




**WellID: KNIGHTSEN ELEMENTARY SCHOOL-NORTH WELL**

**Zone: Composite**

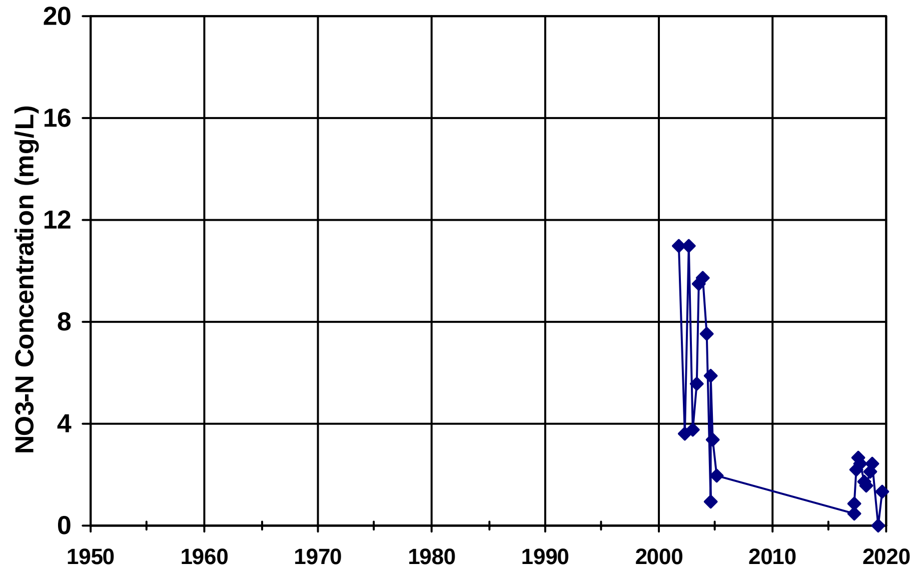
Well Depth: 230 Screened Int. 167-191, 210-230




**WellID: KNIGHTSEN ELEMENTARY SCHOOL-SOUTH WELL**

**Zone: Composite**

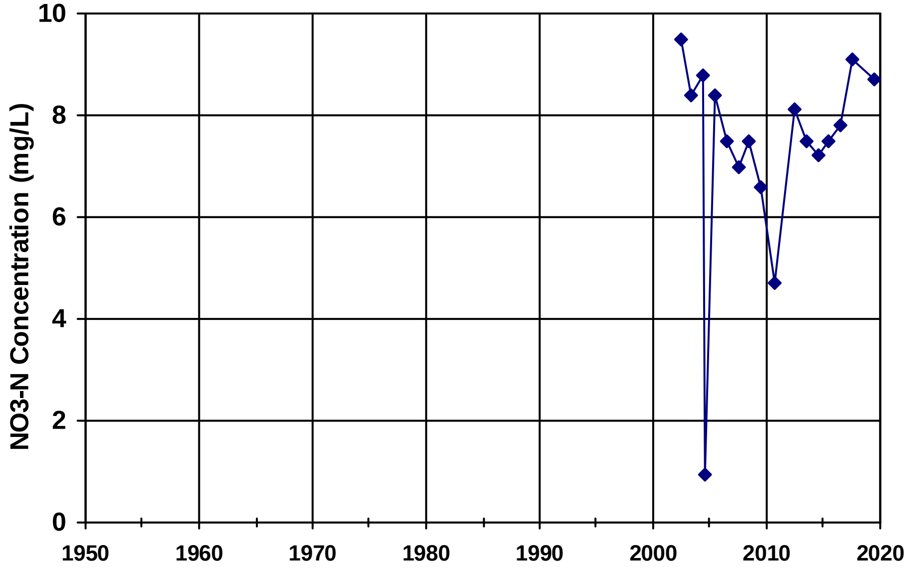
Well Depth: 230 Screened Int. 167-191, 210-230



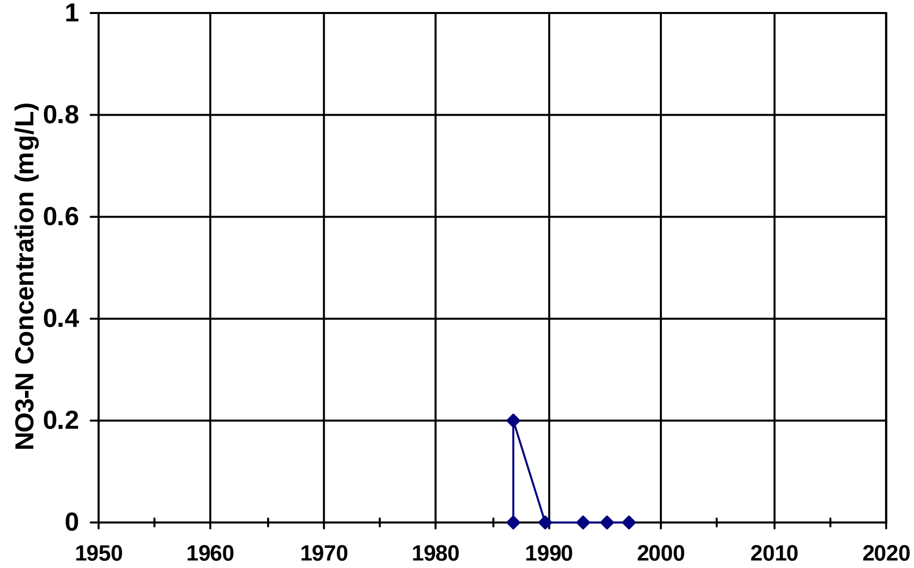

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

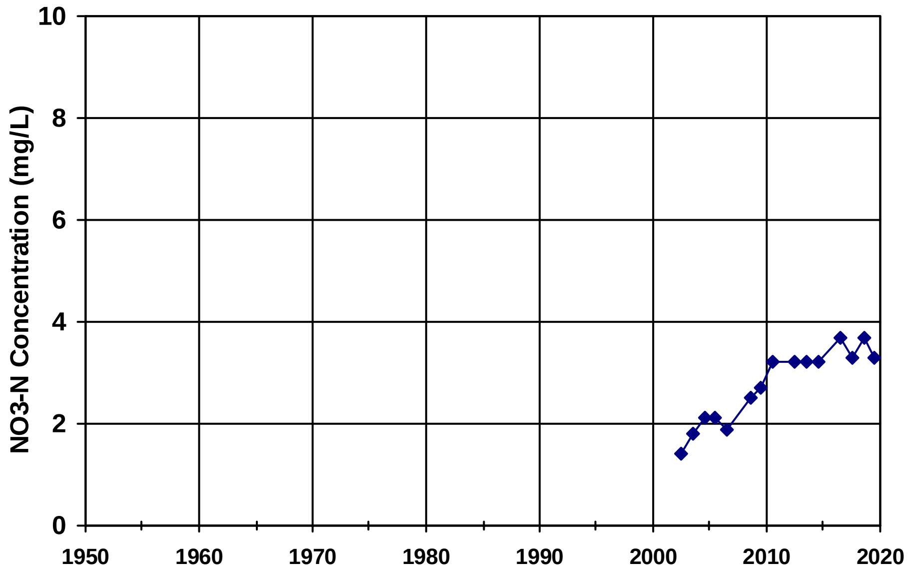
**WellID: BRENTWOOD MISSIONARY BAPTIST-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.



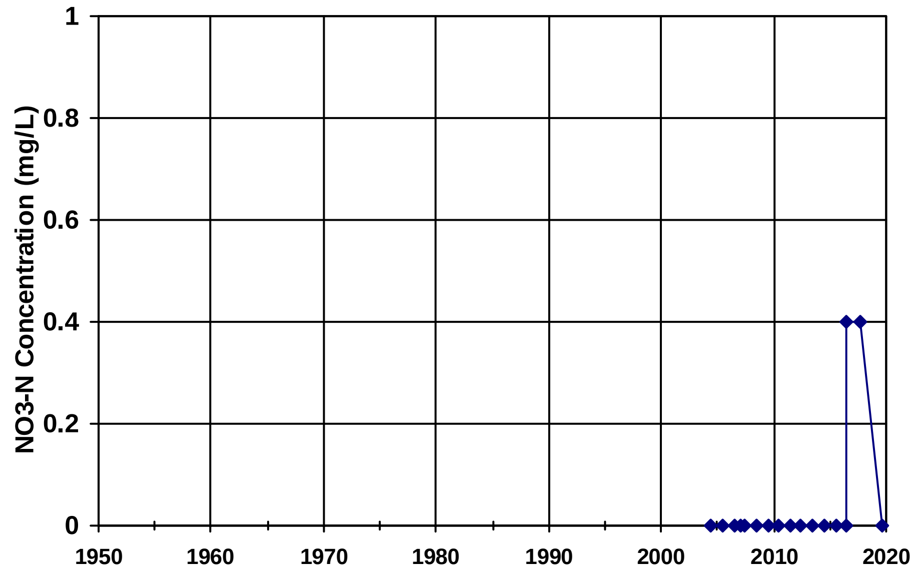

**WellID: TOWN OF DISCOVERY BAY-WELL 03 - INACTIVE**
**Zone: Unknown**
Well Depth: Screened Int.




**WellID: HOLY CROSS CEMETERY-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.




**WellID: OAKLEY MUTUAL WATER COMPANY-NORTH WELL - 4384 SANDMOUND**
**Zone: Unknown**
Well Depth: Screened Int.

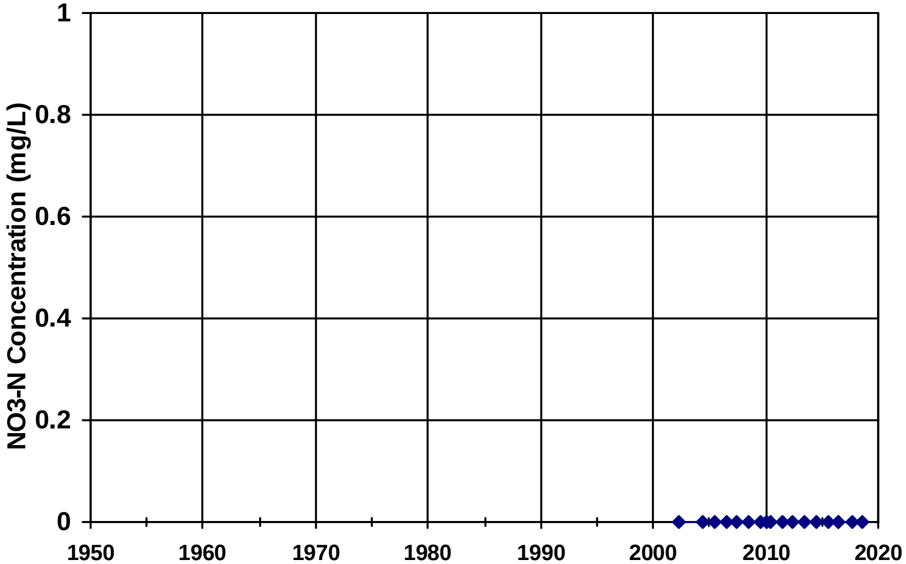



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

**WellID: OAKLEY MUTUAL WATER COMPANY-SOUTH WELL - 4508 SANDMOUND**

**Zone: Unknown**

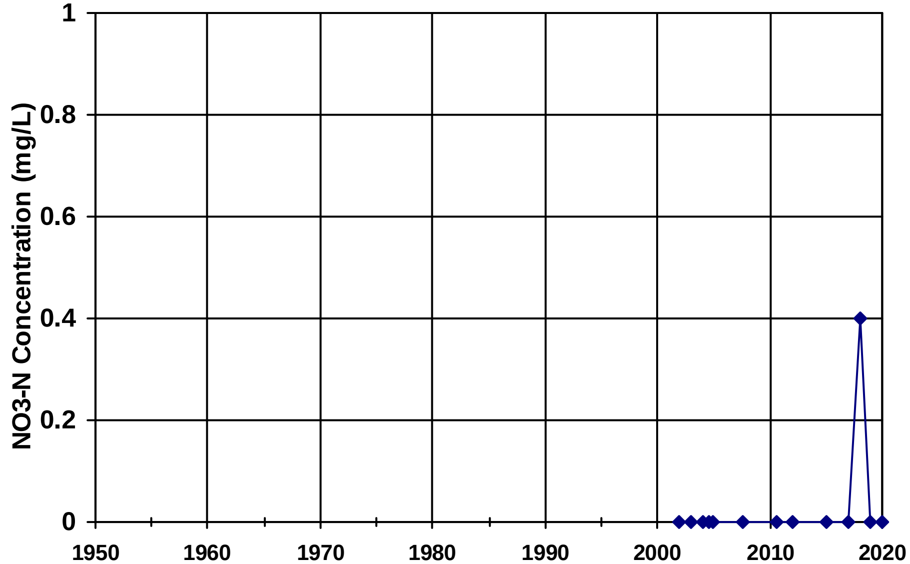
Well Depth: Screened Int.




**WellID: FARRAR PARK PROPERTY OWNERS-Well Head**

**Zone: Unknown**

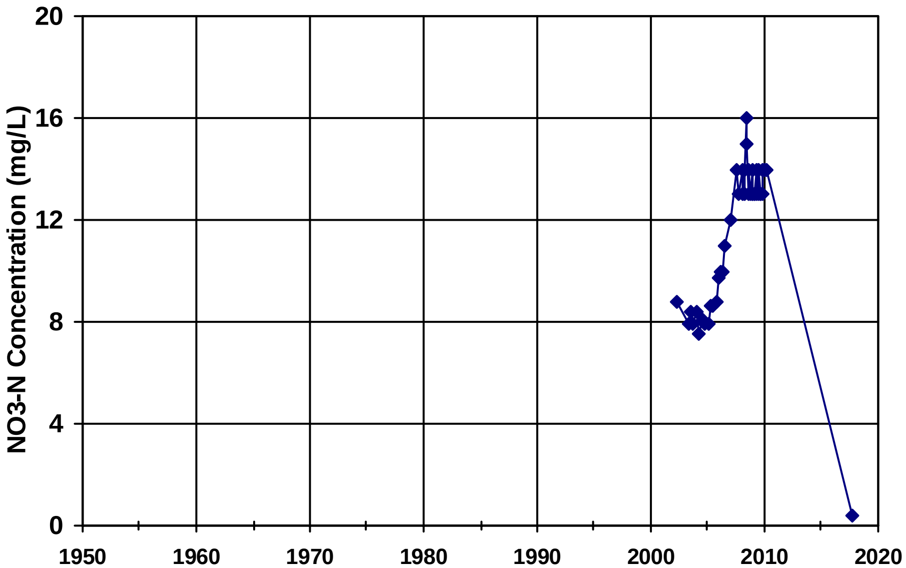
Well Depth: Screened Int.




**WellID: VILLA DE GUADALUPE-WELL**

**Zone: Unknown**

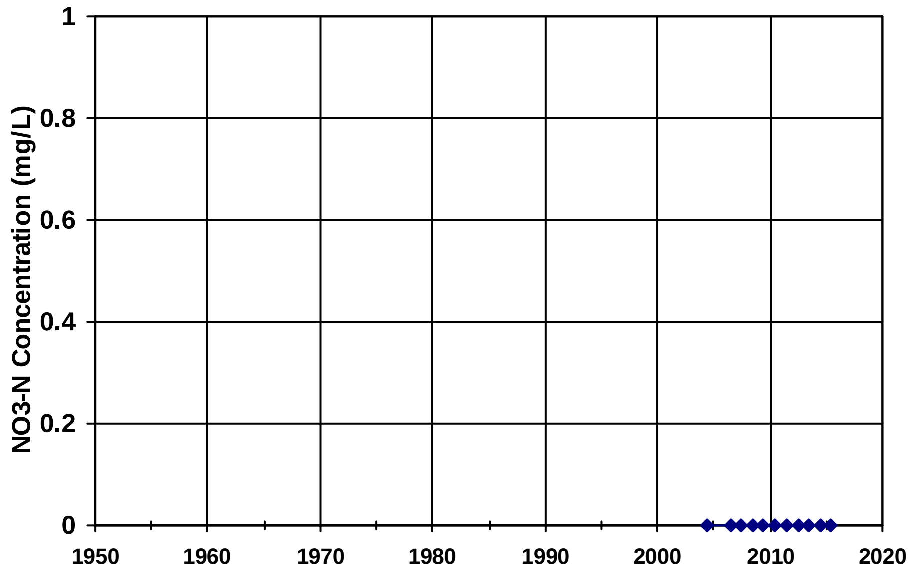
Well Depth: Screened Int.




**WellID: PARK MARINA-Well Head**

**Zone: Unknown**

Well Depth: Screened Int.



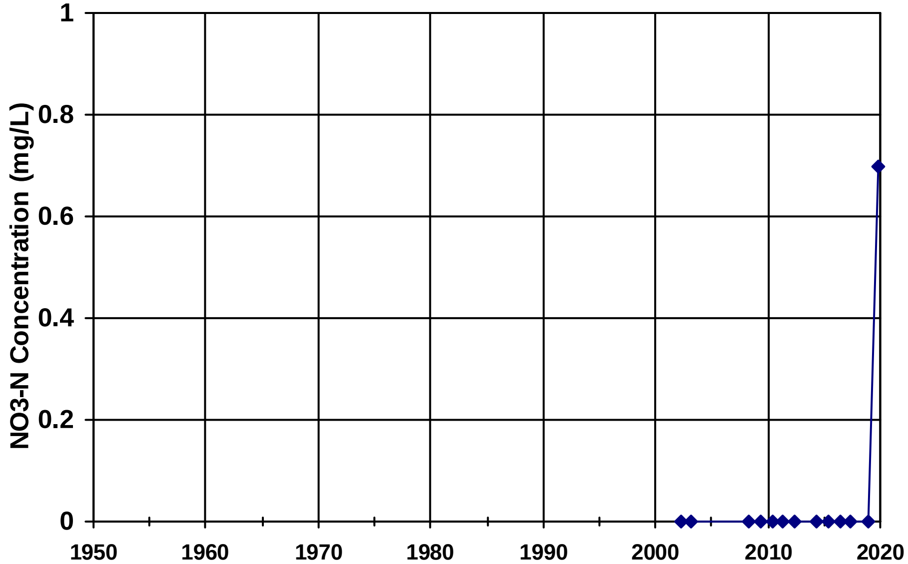

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

**WellID: NEW DOCS MARINA-Well Head**

**Zone: Unknown**

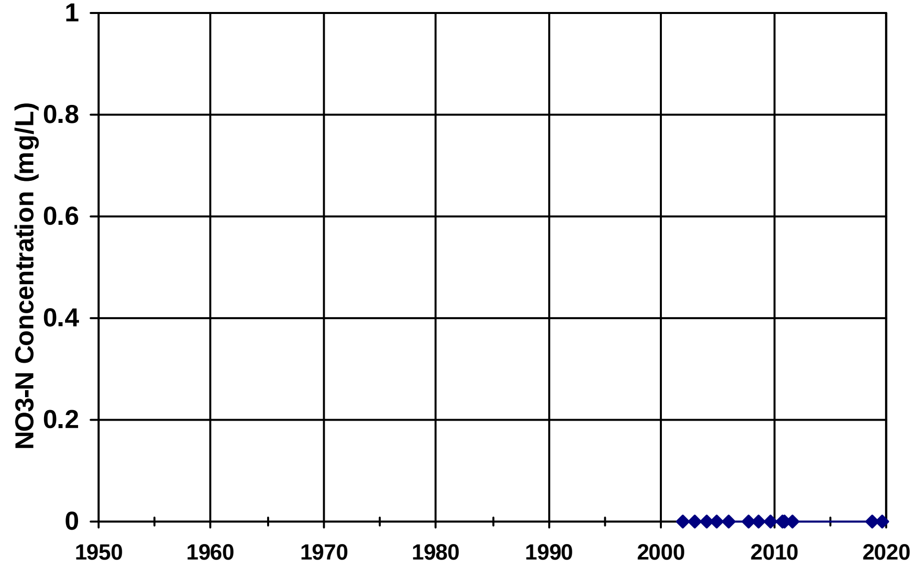
Well Depth: Screened Int.




**WellID: CRUISER HAVEN MARINA-Well Head**

**Zone: Unknown**

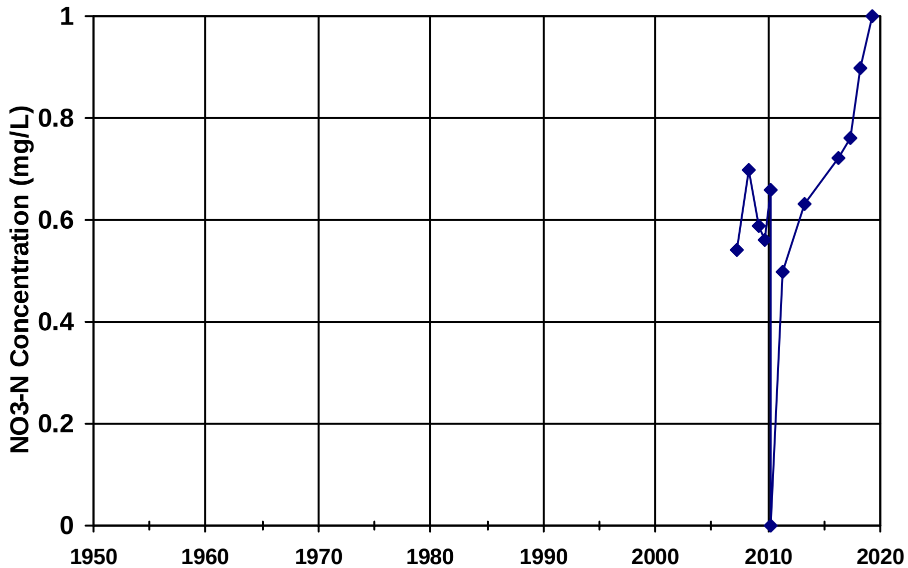
Well Depth: Screened Int.




**WellID: BYRON UNITED METHODIST-WELL HEAD**

**Zone: Unknown**

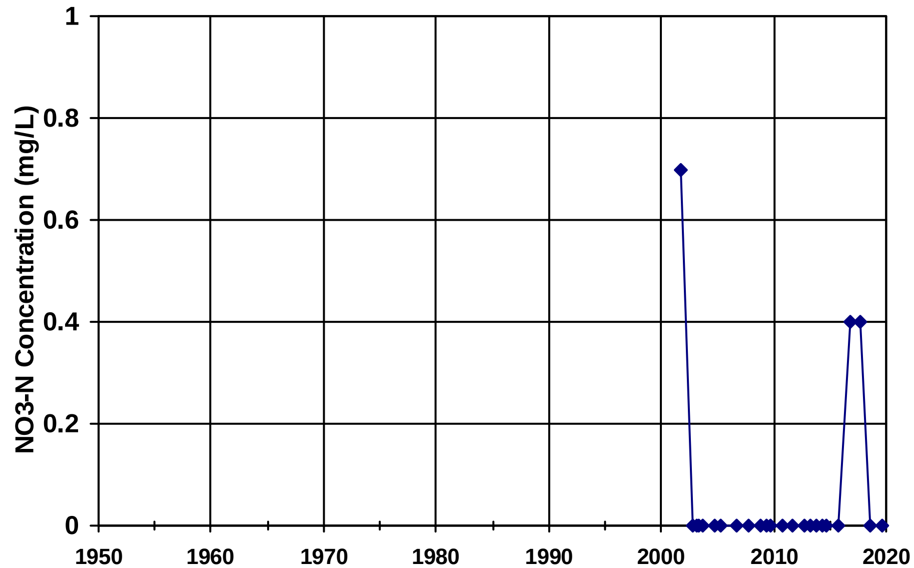
Well Depth: Screened Int.




**WellID: EXCELSIOR MIDDLE SCHOOL-Well Head**

**Zone: Unknown**

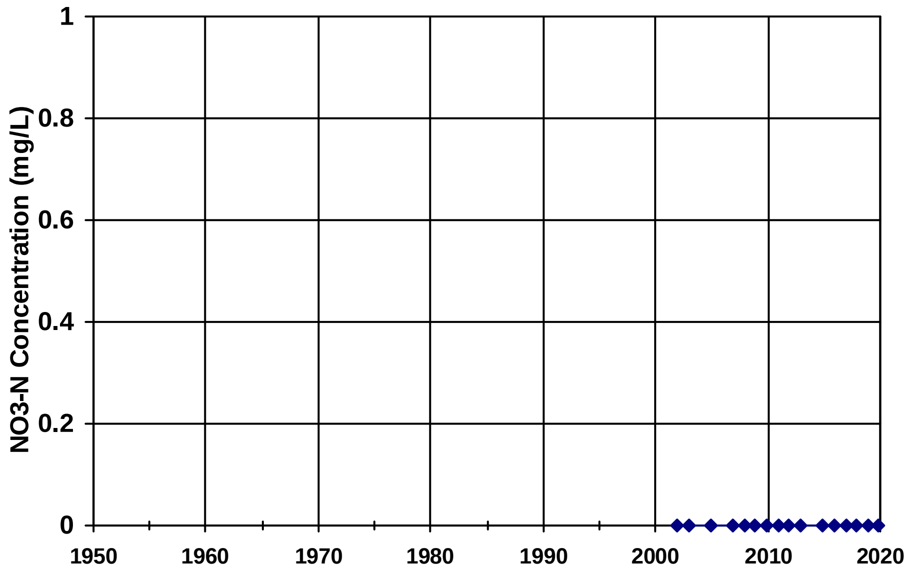
Well Depth: Screened Int.



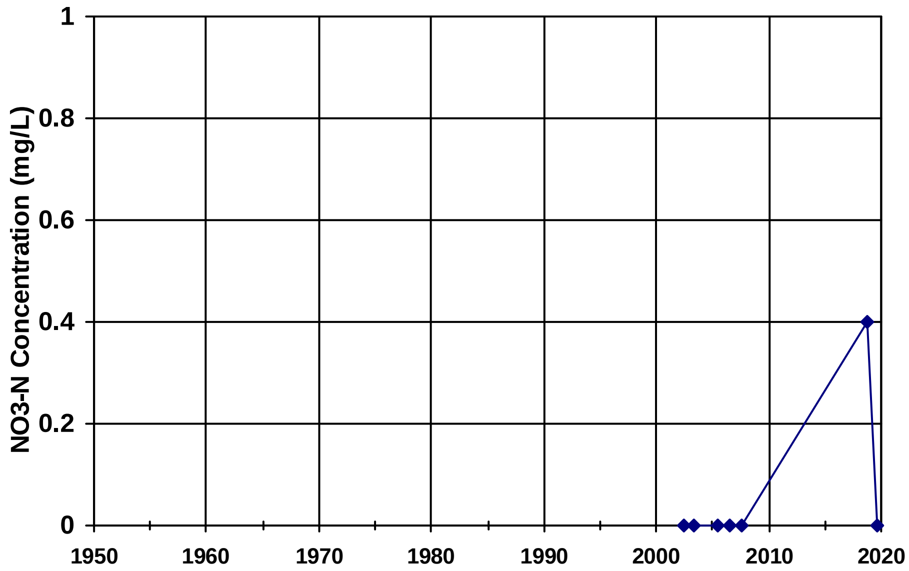

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

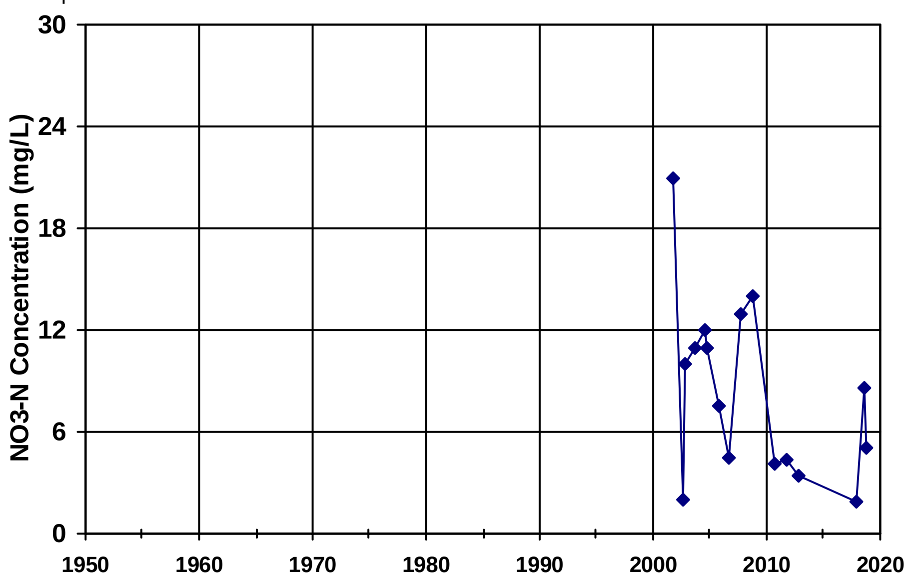
WellID: **MARINER COVE MARINA-Well Head**
Zone: **Unknown**
Well Depth: Screened Int.



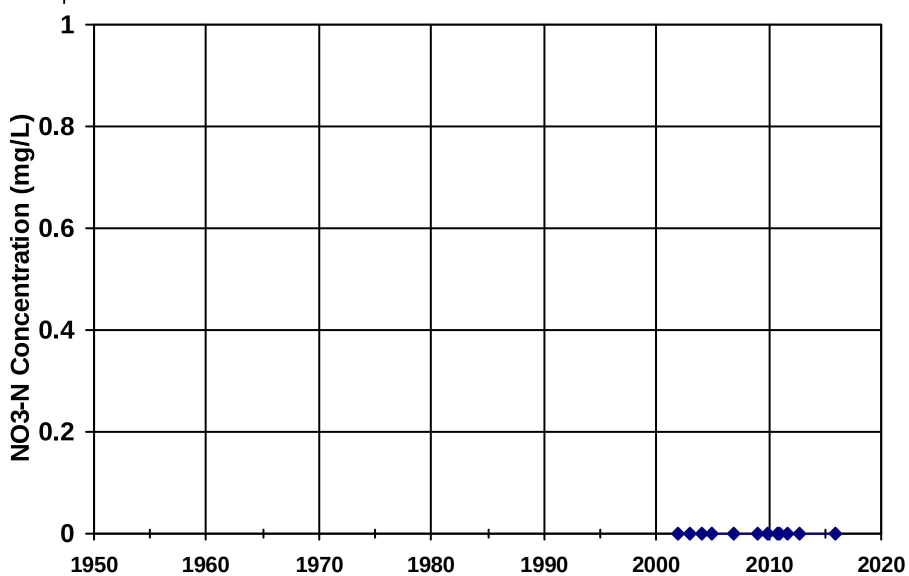

WellID: **GENOS DELI STATION-Well Head**
Zone: **Unknown**
Well Depth: Screened Int.




WellID: **BETHEL MISSIONARY BAPTIST-Well Head**
Zone: **Unknown**
Well Depth: Screened Int.

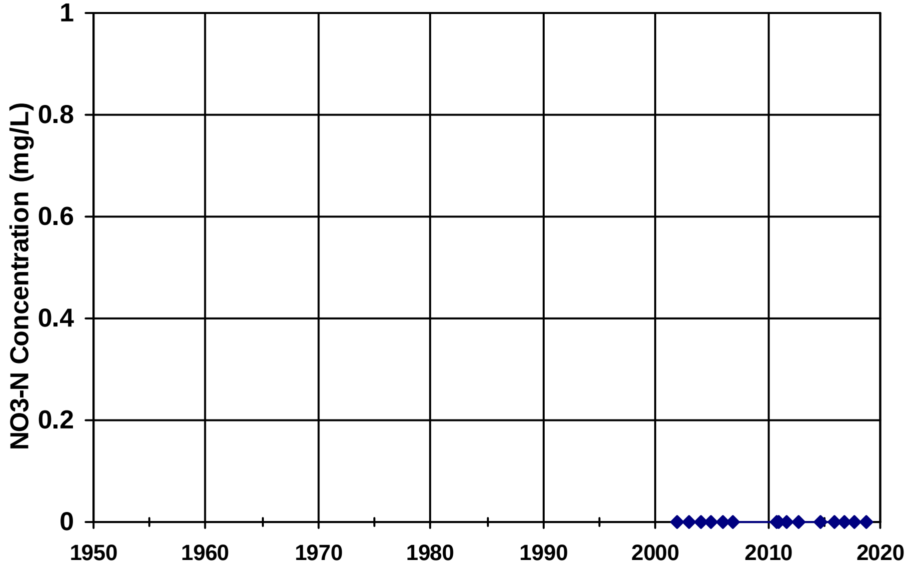



WellID: **HOLLAND RIVERSIDE MARINA-Well Head - West Well**
Zone: **Unknown**
Well Depth: Screened Int.

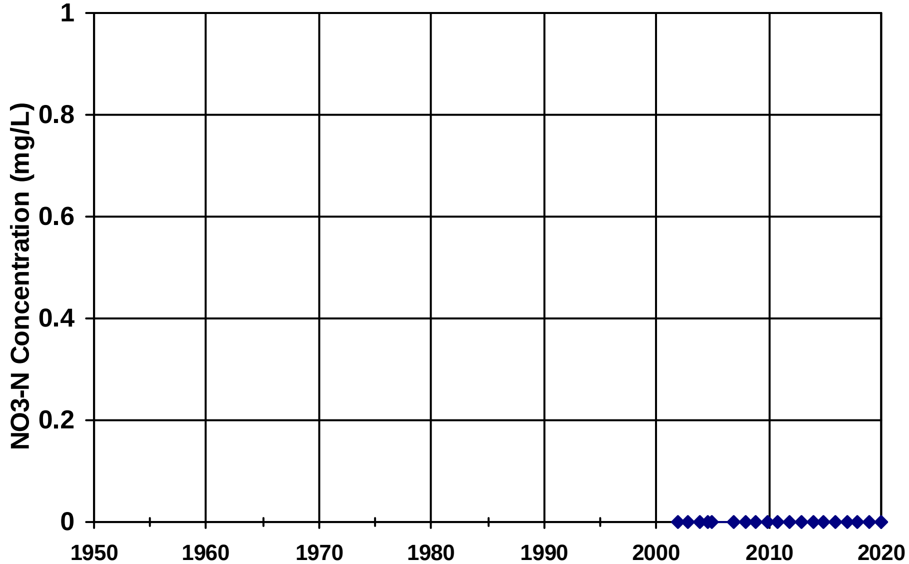



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

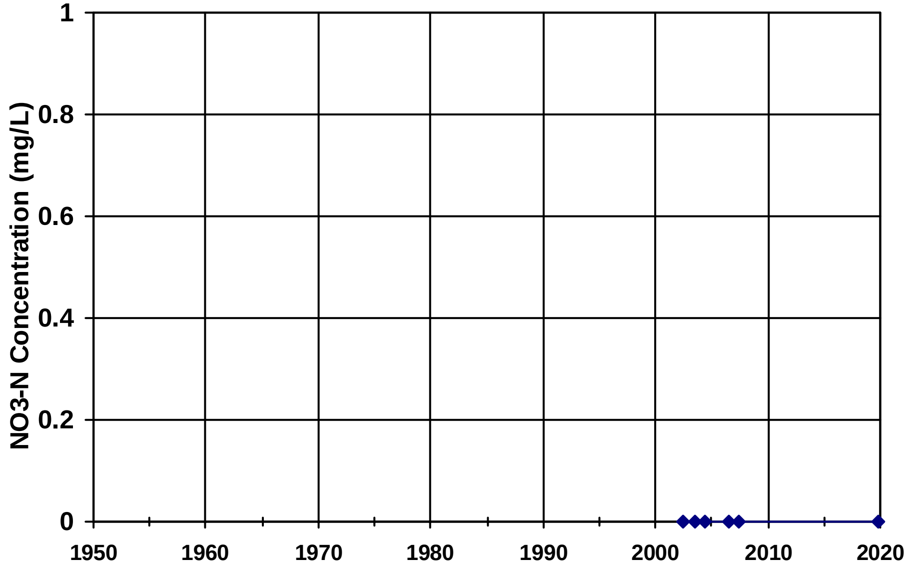
WellID: HOLLAND RIVERSIDE MARINA-well 2 - East Well
Zone: Unknown
Well Depth: Screened Int.



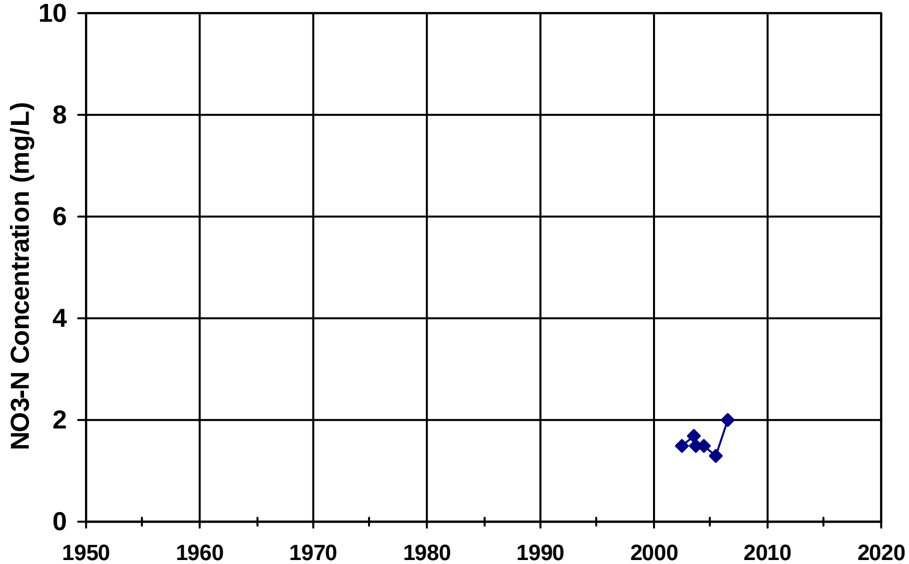

WellID: BETHEL BAPTIST CHURCH-Well Head
Zone: Unknown
Well Depth: Screened Int.




WellID: TONYS FAMILY RESTAURANT-WELL HEAD
Zone: Unknown
Well Depth: Screened Int.

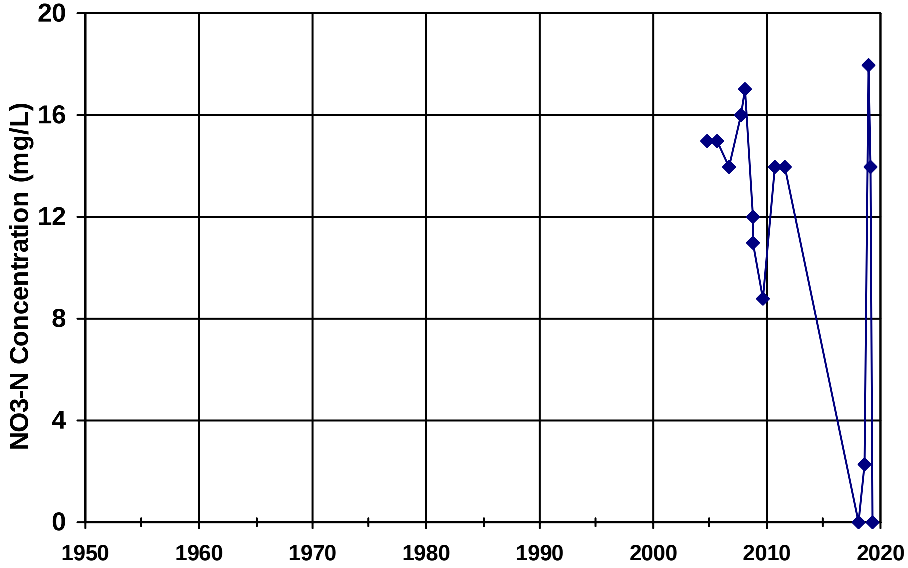



WellID: DELTA KIDS CENTER *CL 2/07-Well Head
Zone: Unknown
Well Depth: Screened Int.

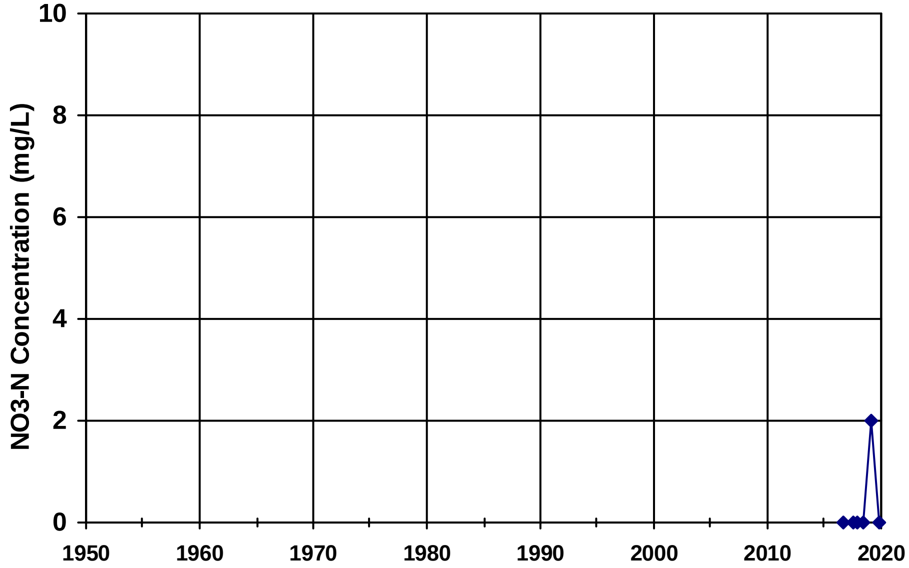



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

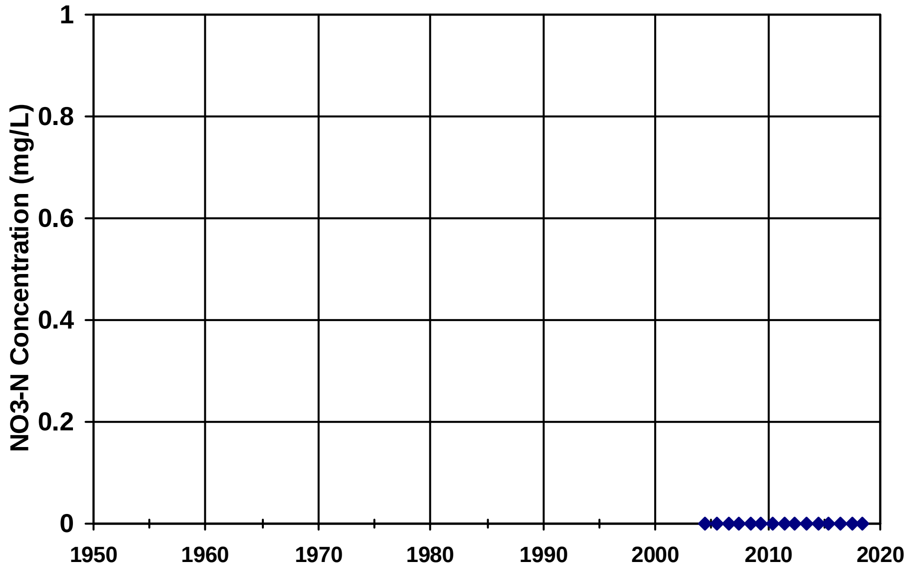
**WellID: BON GUSTOS-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.



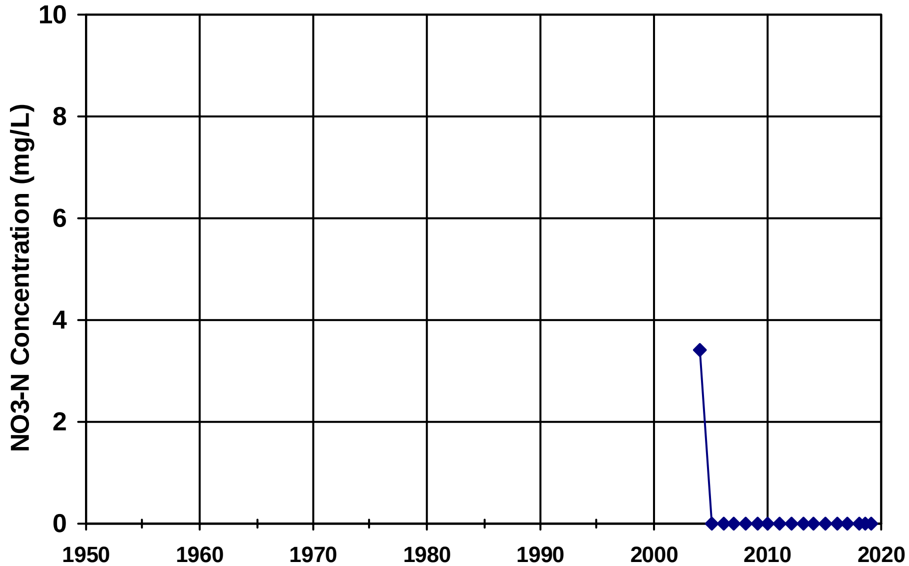

**WellID: BON GUSTOS-Bathroom Sink**
**Zone: Unknown**
Well Depth: Screened Int.




**WellID: BETHEL MARKET-WELLHEAD**
**Zone: Unknown**
Well Depth: Screened Int.

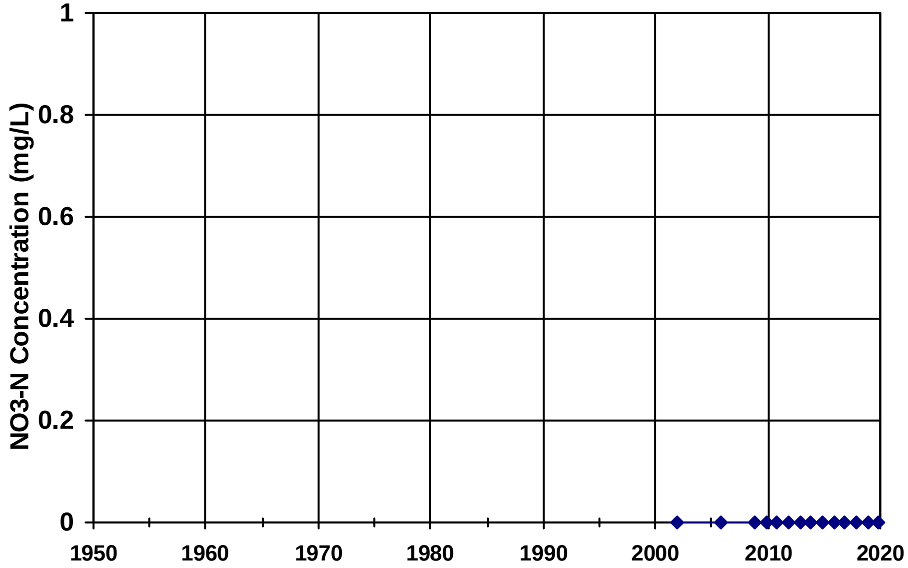



**WellID: TUGS-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.

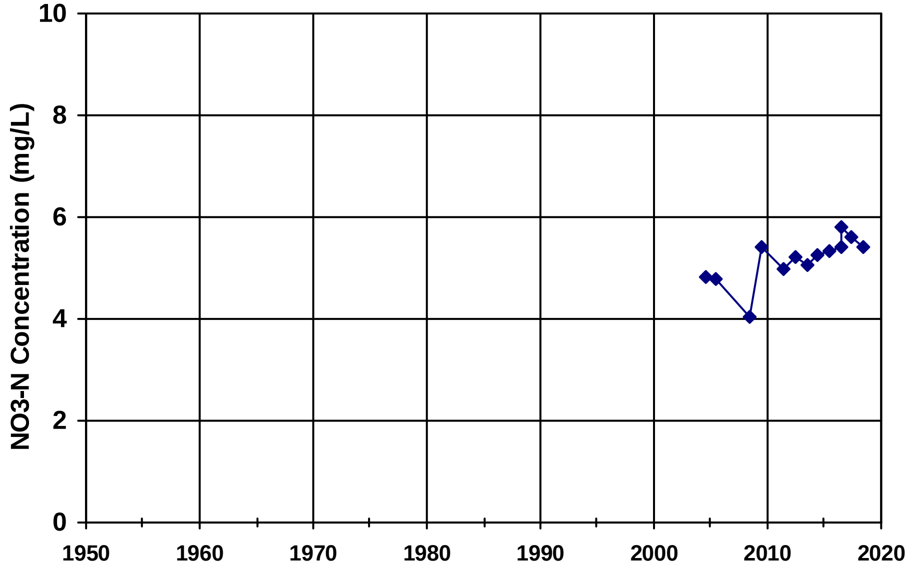



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

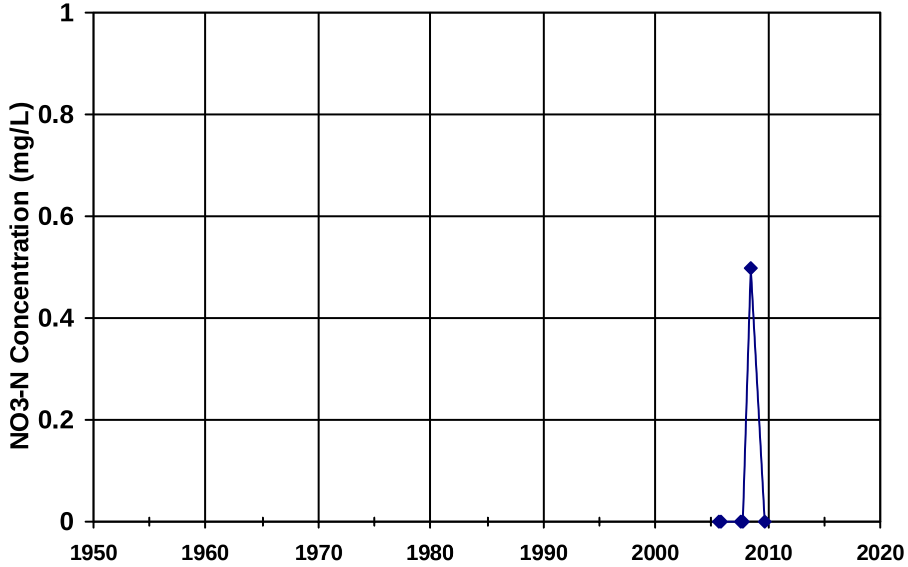
WellID: DELTA SPORTSMAN-Well Head
Zone: Unknown
Well Depth: Screened Int.



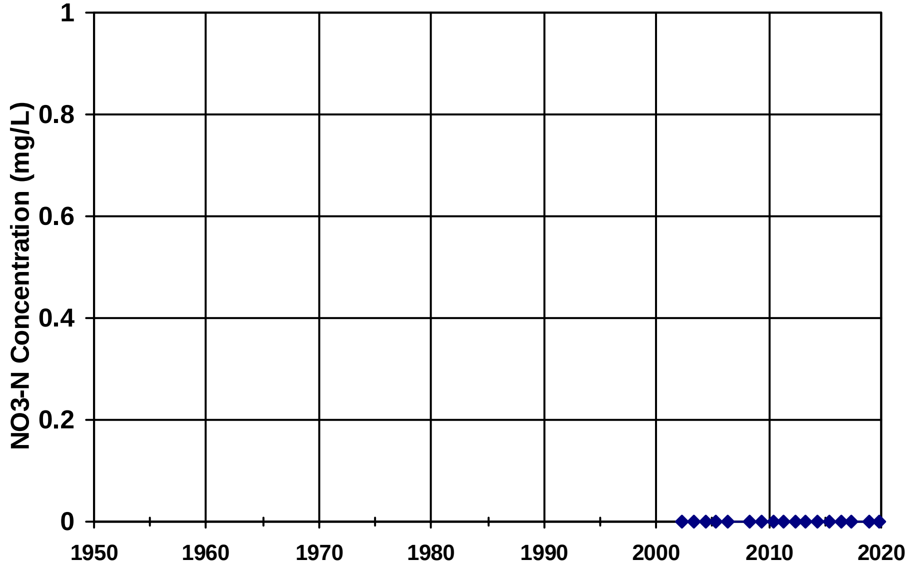

WellID: BAY STANDARDS-Well Head
Zone: Unknown
Well Depth: Screened Int.



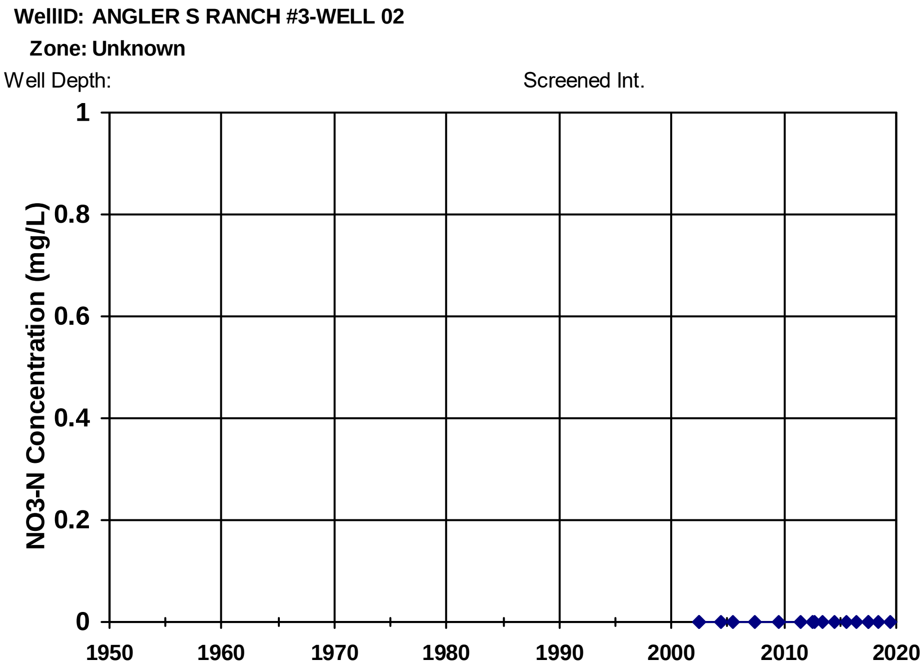

WellID: D ANNA YACHT CENTER-Well Head
Zone: Unknown
Well Depth: Screened Int.

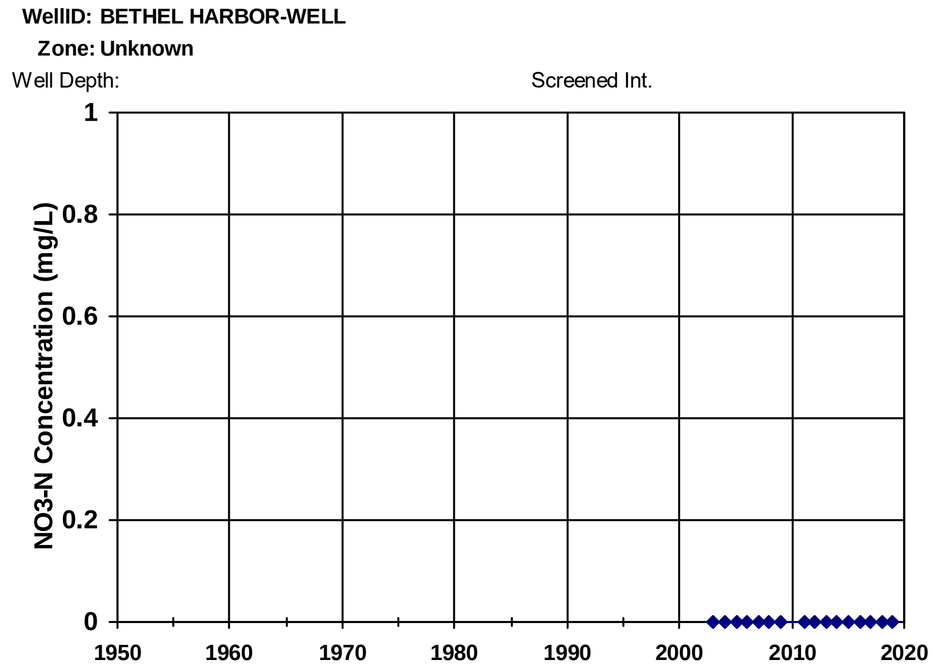


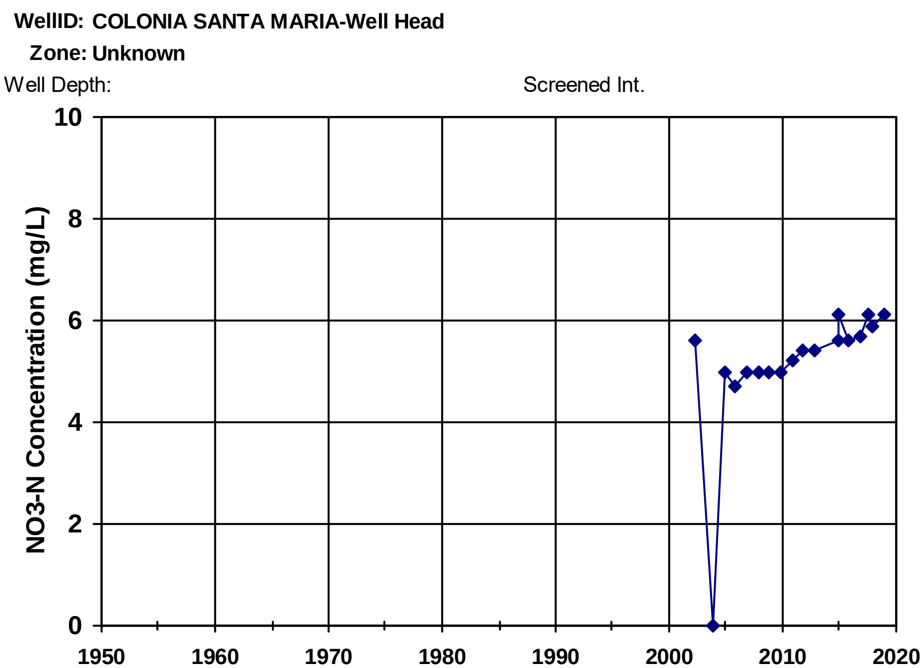

WellID: BYRON AIRPORT-Well Head
Zone: Unknown
Well Depth: Screened Int.

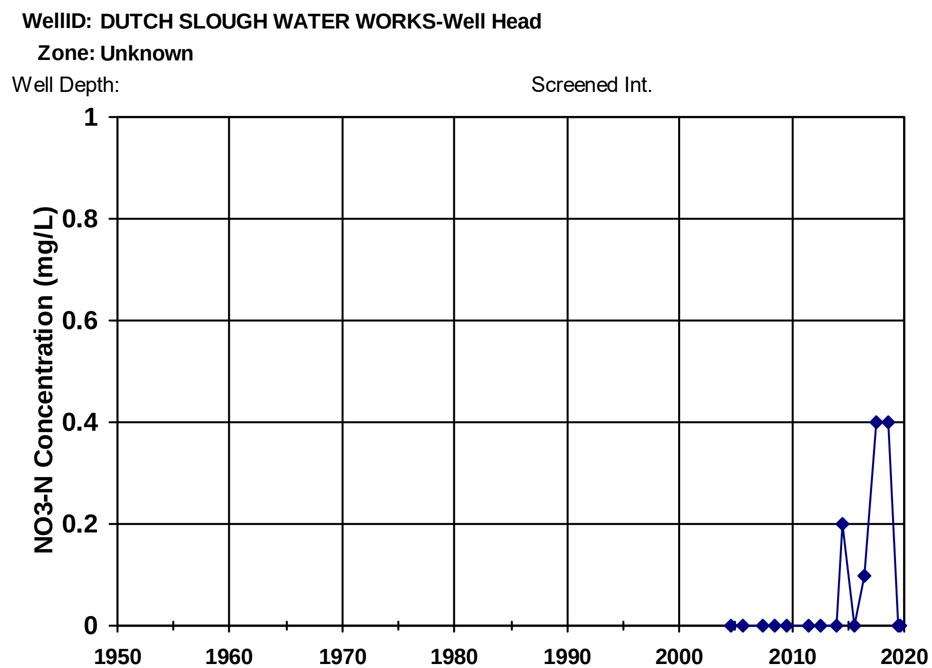



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}



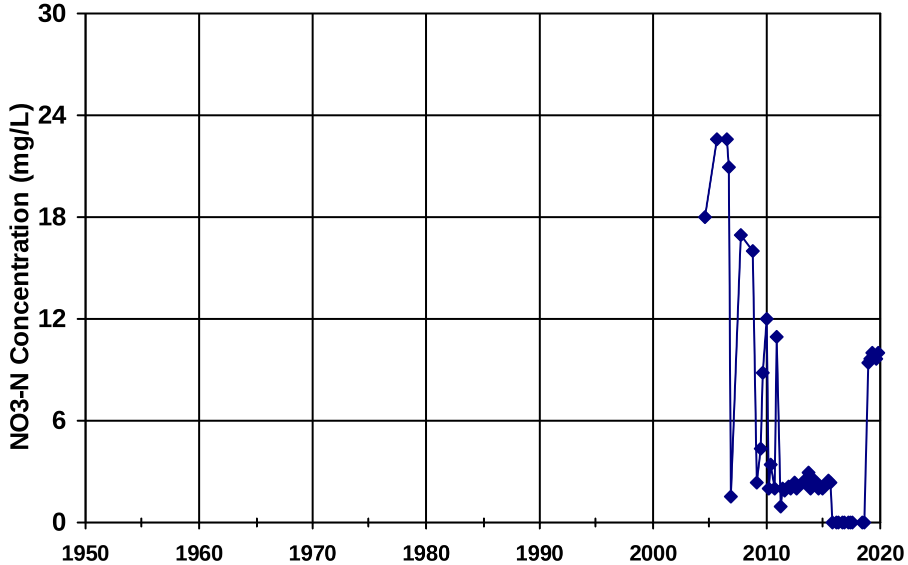



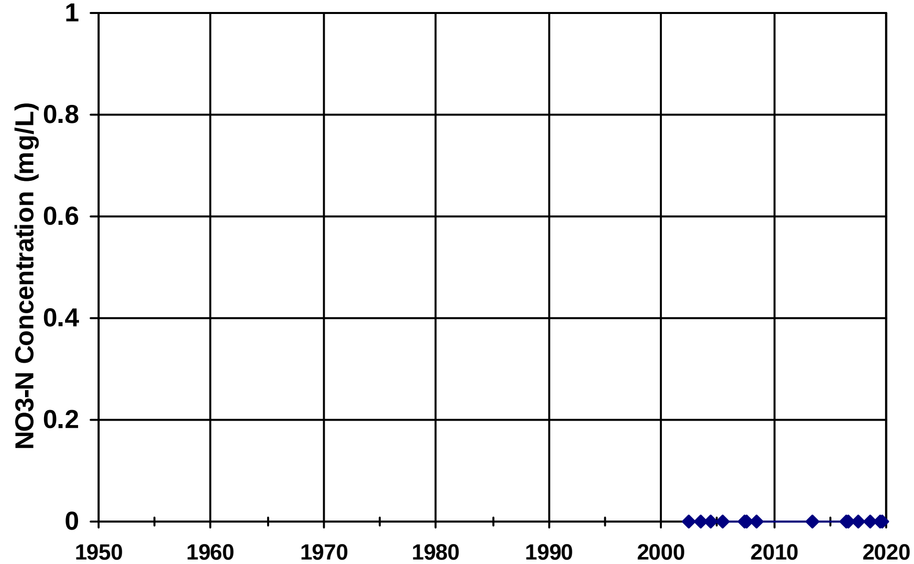

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

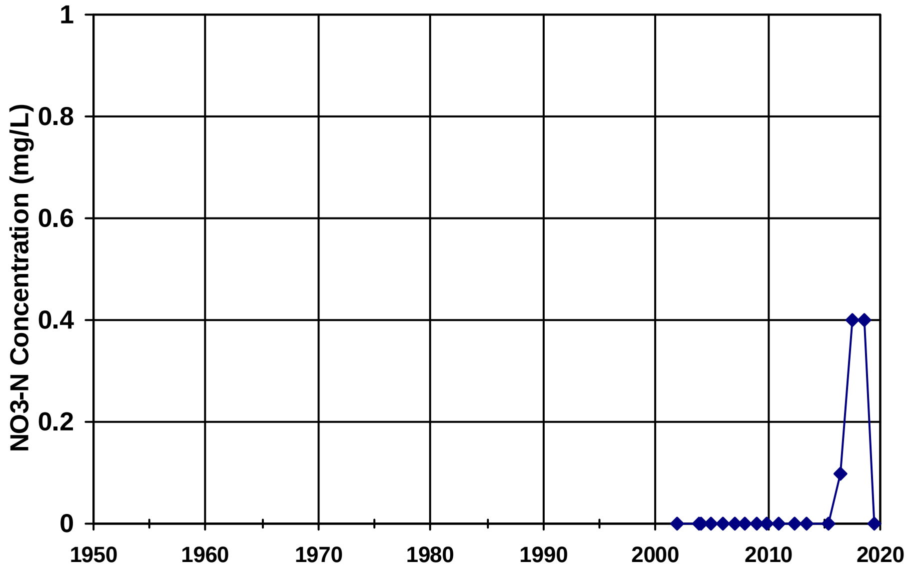
**WellID: BYRON CORNERS INC-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.



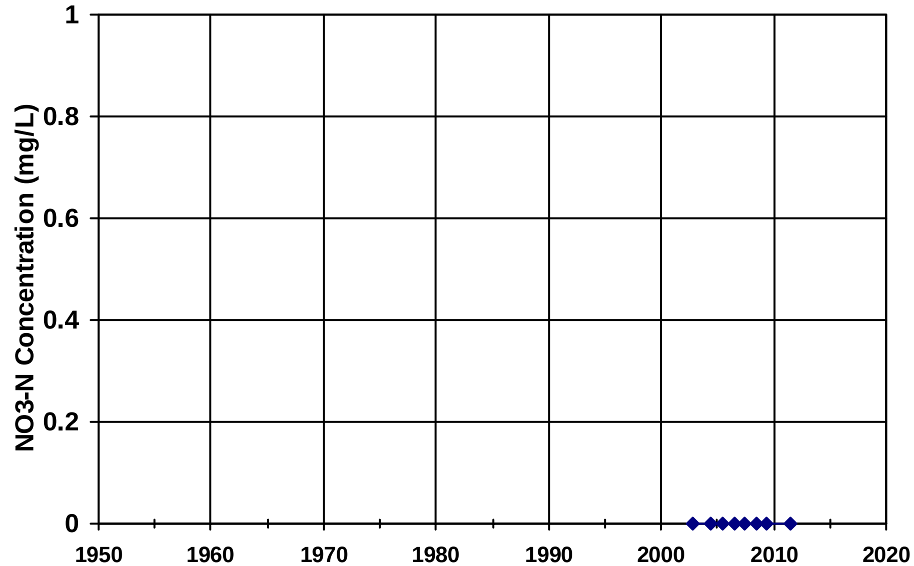

**WellID: FLAMINGO MOBILE MANOR-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.




**WellID: LINDQUIST LANDING MARINA-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.

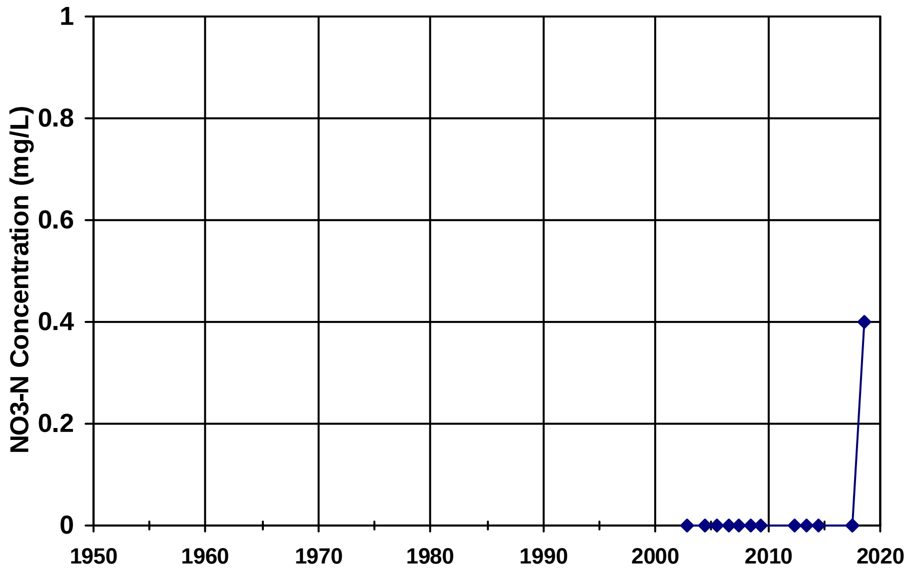



**WellID: ORWOOD RESORT-WELL 3 - PICNIC AREA**
**Zone: Unknown**
Well Depth: Screened Int.

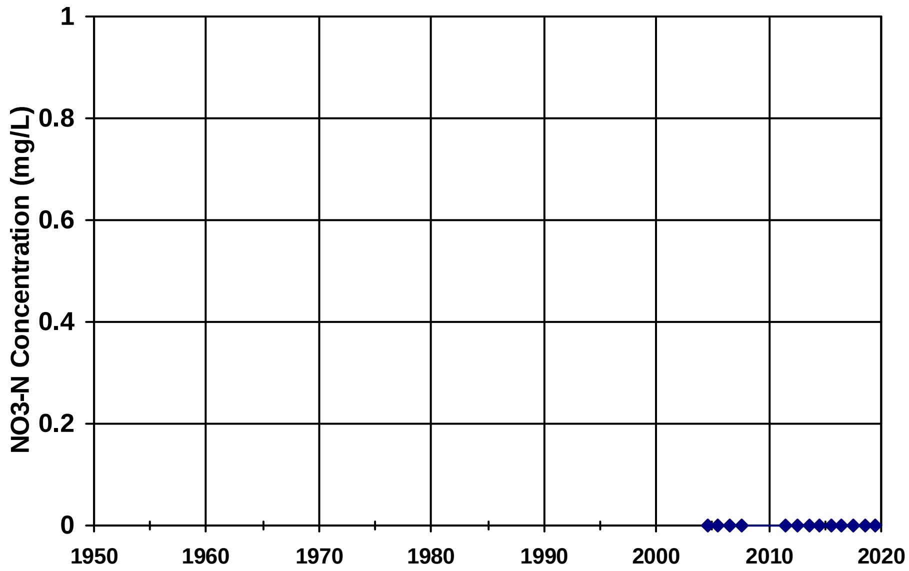



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

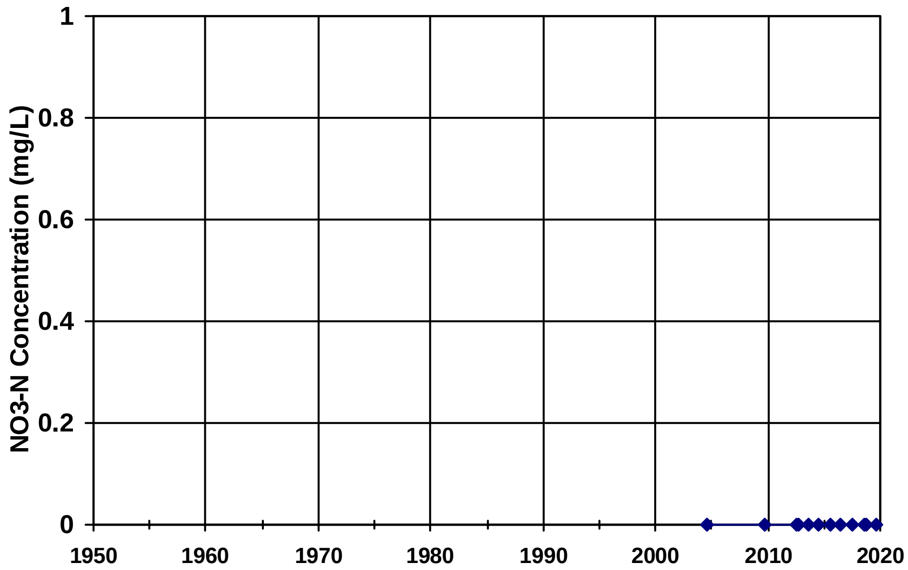
**WellID: ORWOOD RESORT-WELL 2 - WEST WELL**
**Zone: Unknown**
Well Depth: Screened Int.



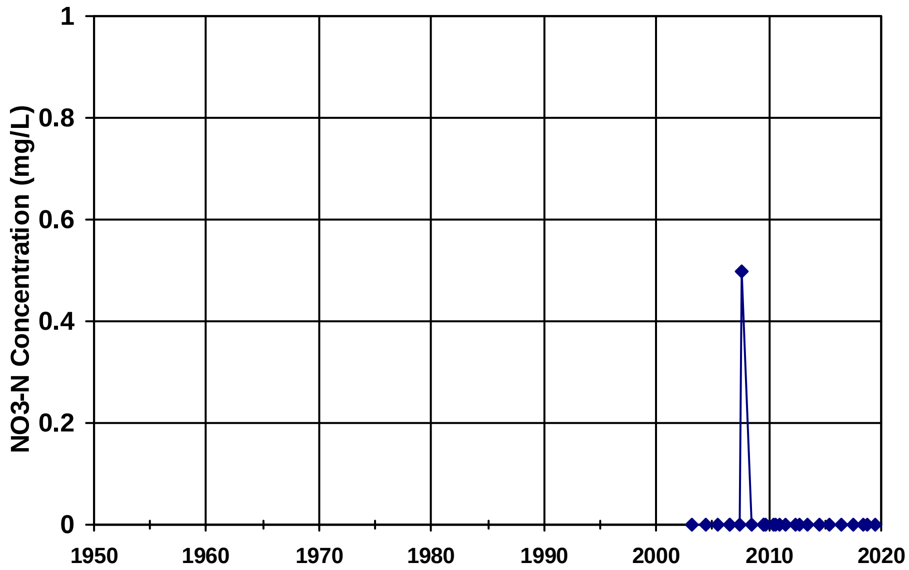

**WellID: SUNSET HARBOR-Well Head**
**Zone: Unknown**
Well Depth: Screened Int.



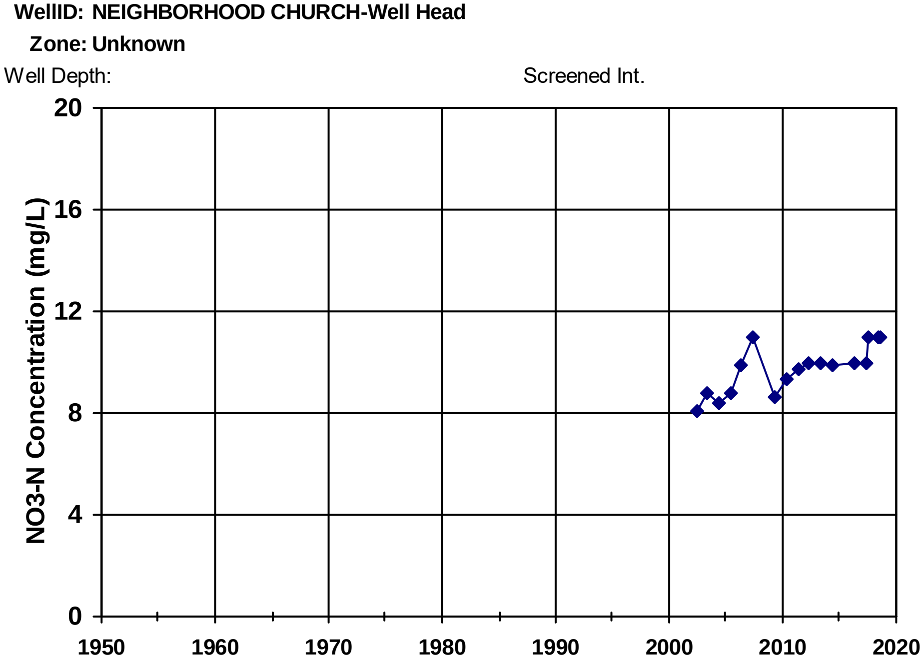

**WellID: SANDMOUND MUTUAL-3160 STONE ROAD WELL**
**Zone: Unknown**
Well Depth: Screened Int.

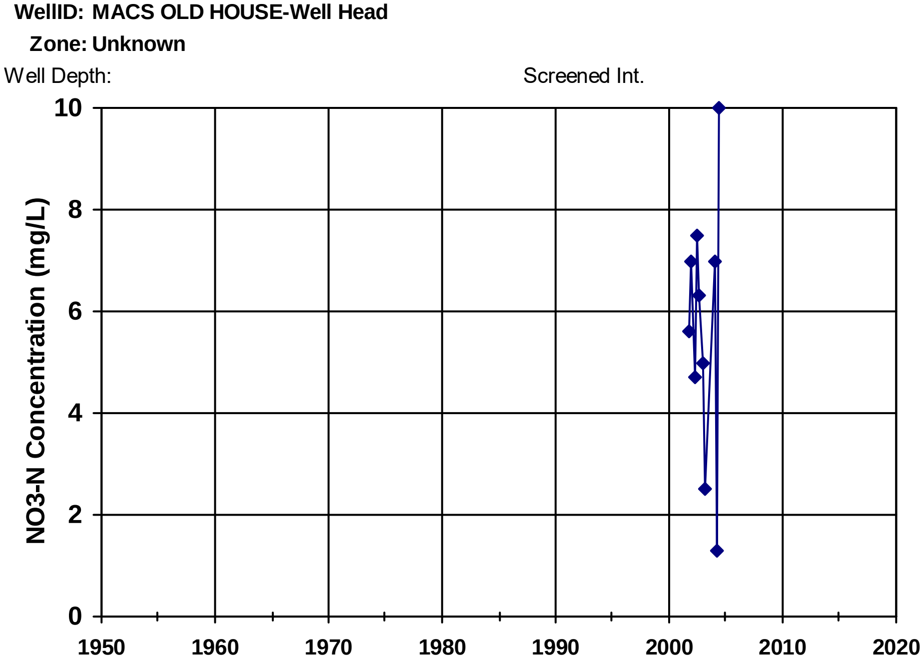


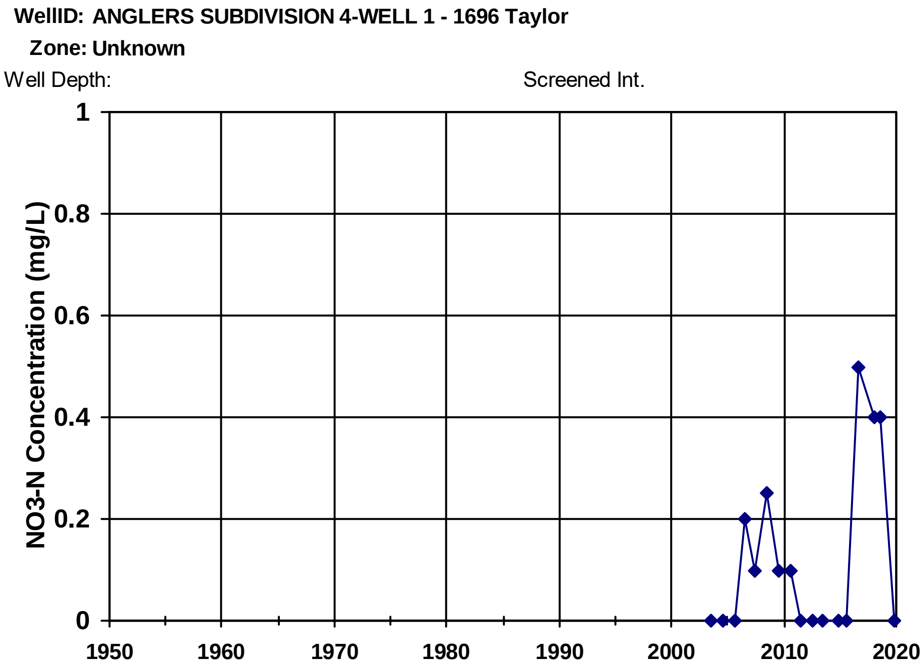

**WellID: SANDMOUND MUTUAL-3810 STONE ROAD WELL**
**Zone: Unknown**
Well Depth: Screened Int.

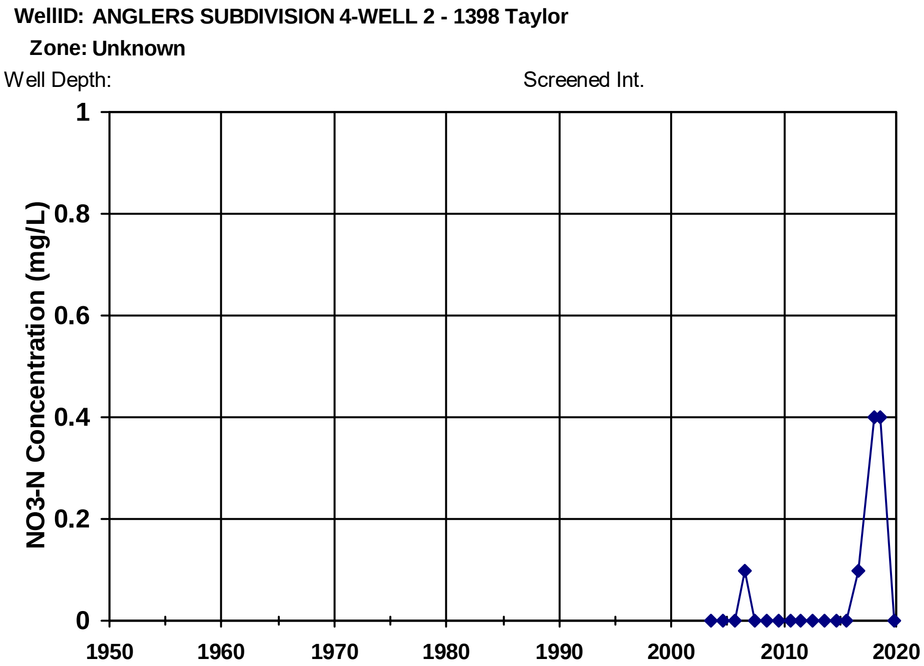



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}



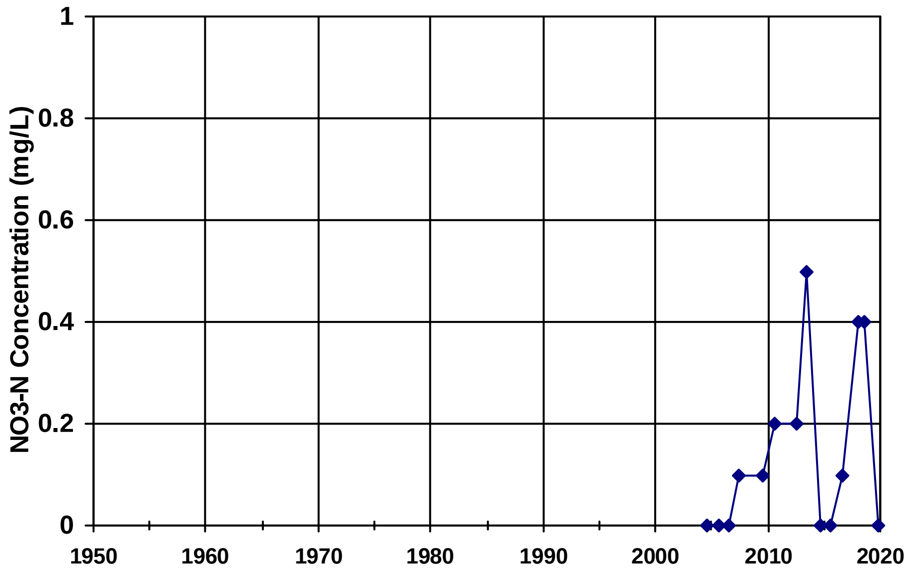



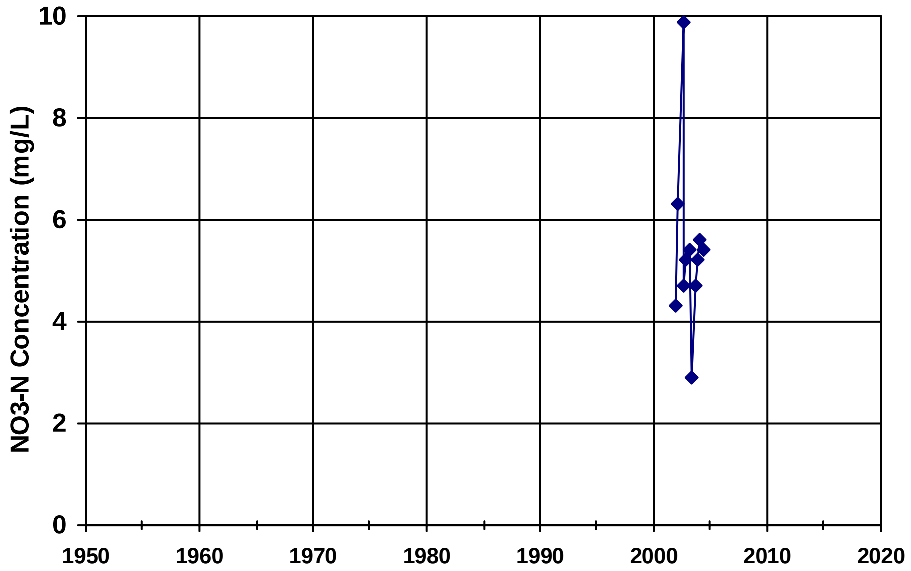

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

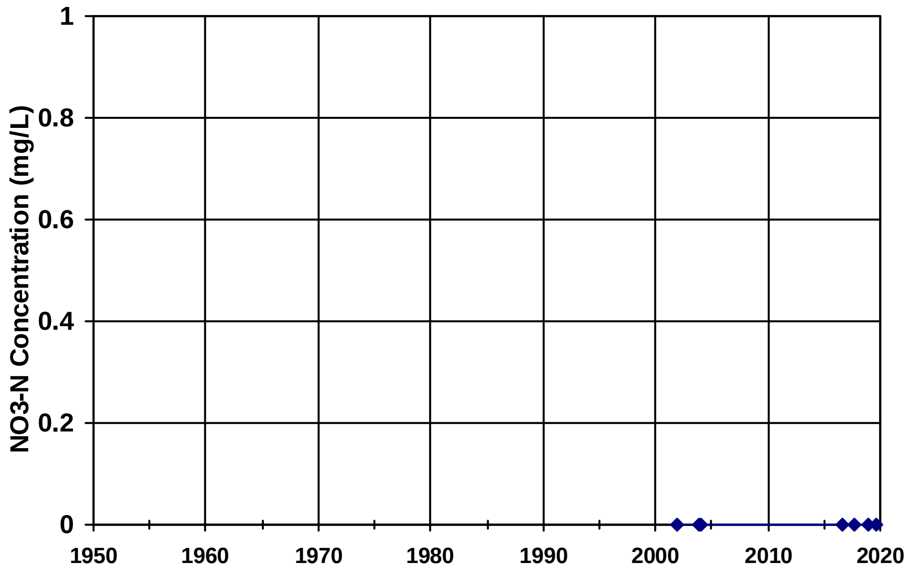
WellID: ANGLERS SUBDIVISION 4-WELL 3 - 1698 Taylor
Zone: Unknown
Well Depth: Screened Int.



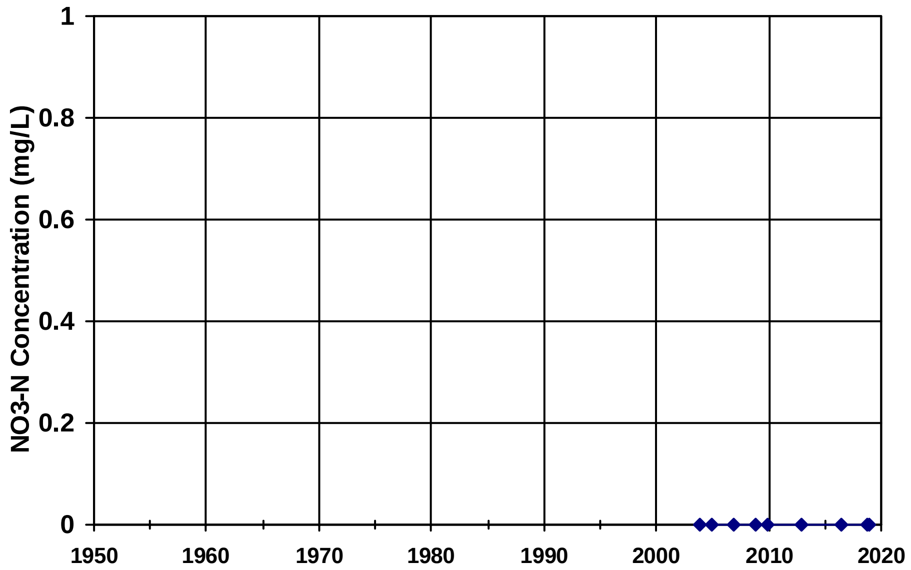

WellID: BRIDGEHEAD CAFE-Well Head
Zone: Unknown
Well Depth: Screened Int.




WellID: BETHEL ISLAND MUTUAL WATER CO-WELL 1
Zone: Unknown
Well Depth: Screened Int.

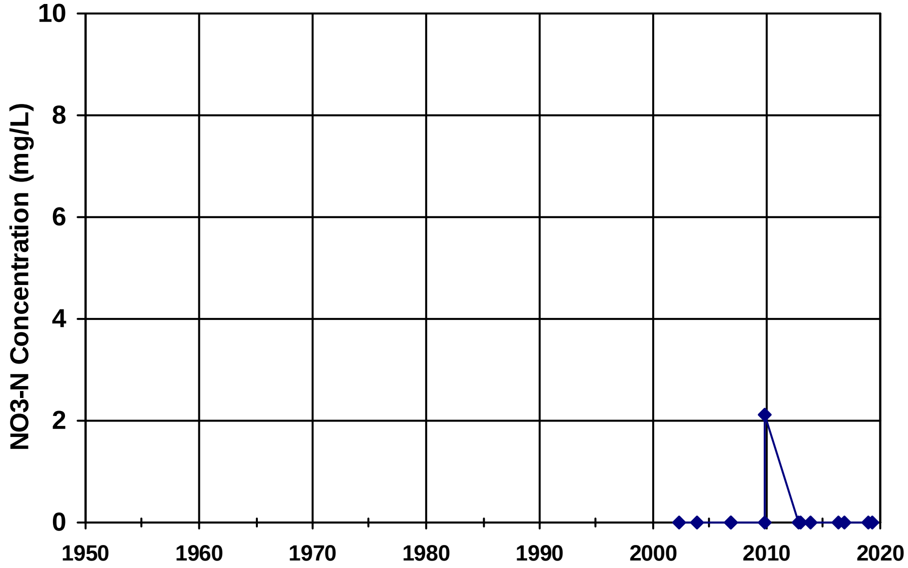



WellID: DELTA MUTUAL WATER COMPANY-East Well
Zone: Unknown
Well Depth: Screened Int.

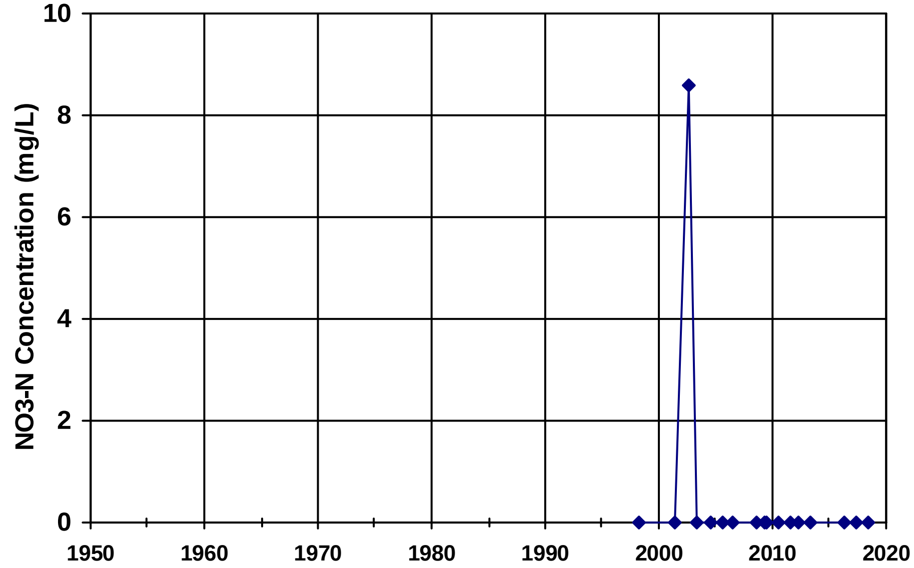



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

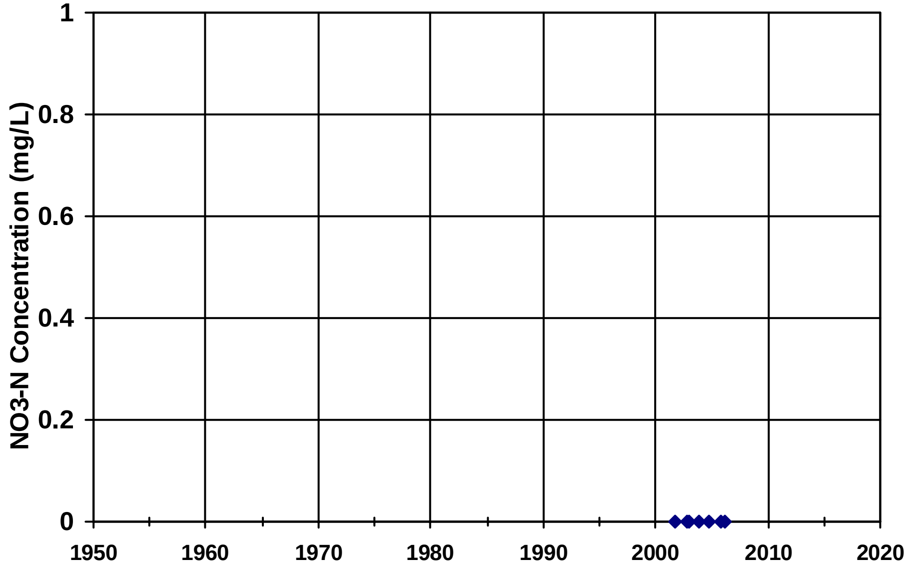
WellID: DELTA MUTUAL WATER COMPANY-West Well
Zone: Unknown
Well Depth: Screened Int.



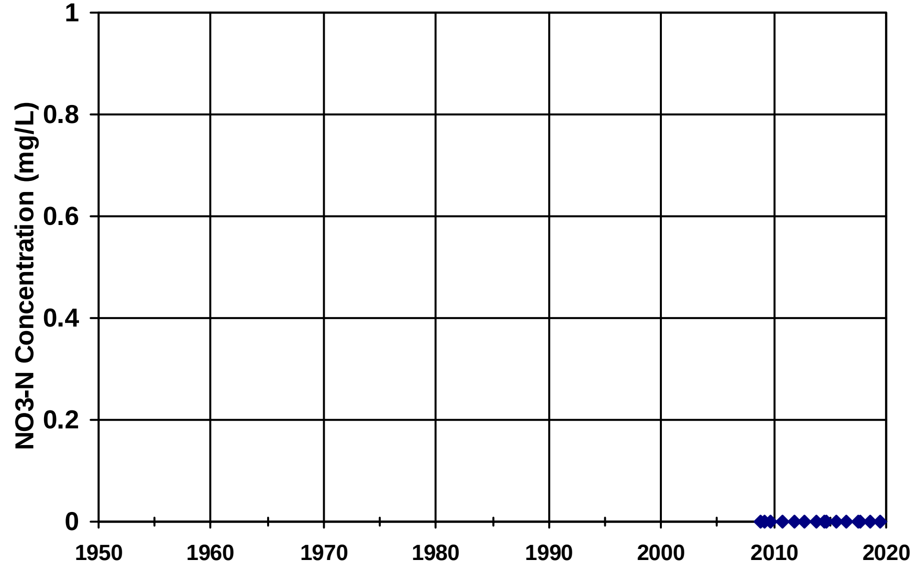

WellID: SANTIAGO ISLAND VILLAGE-WELL 01
Zone: Unknown
Well Depth: Screened Int.



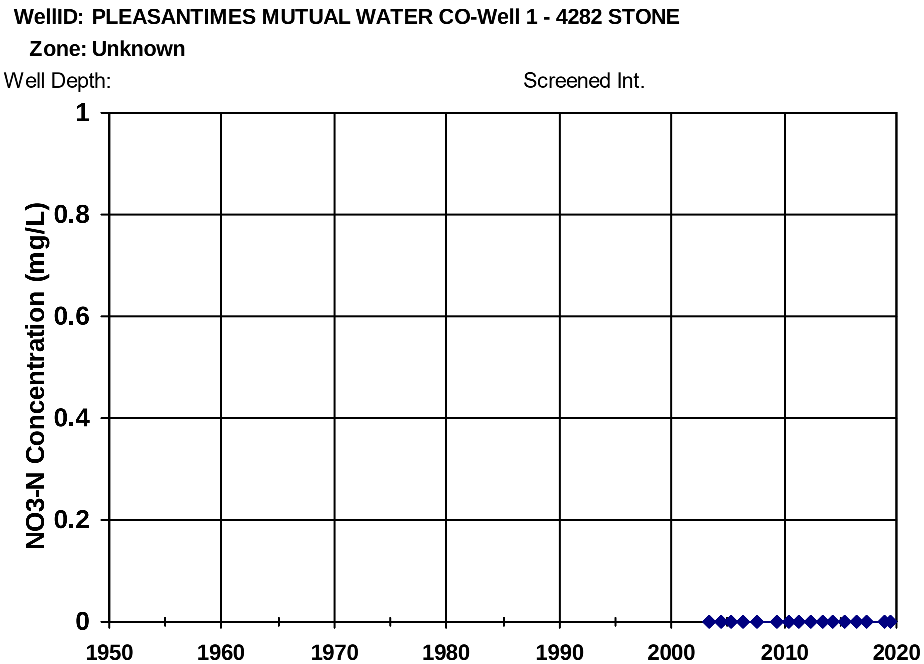

WellID: FRANKS MARINA-Well Head
Zone: Unknown
Well Depth: Screened Int.

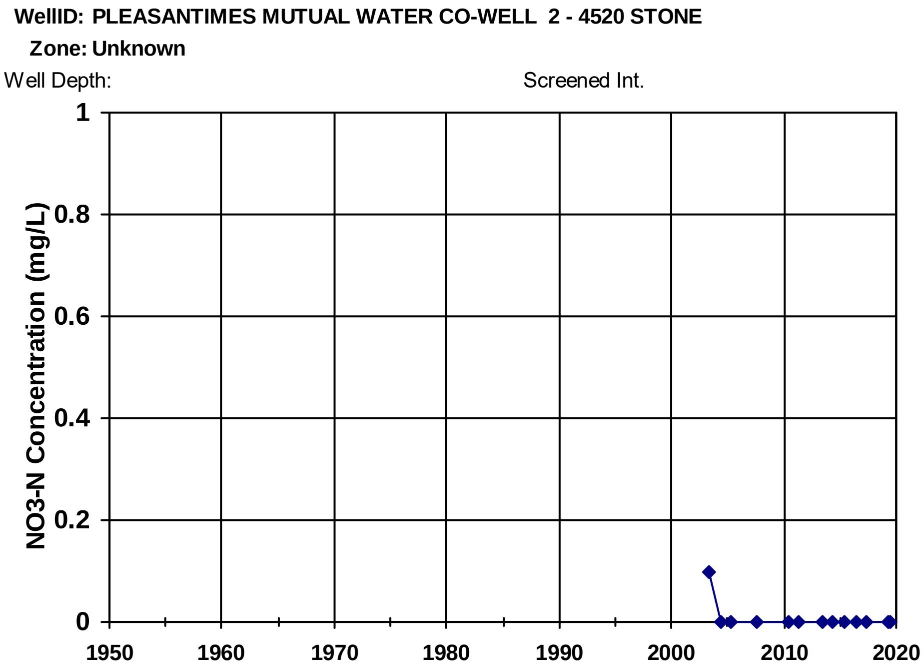


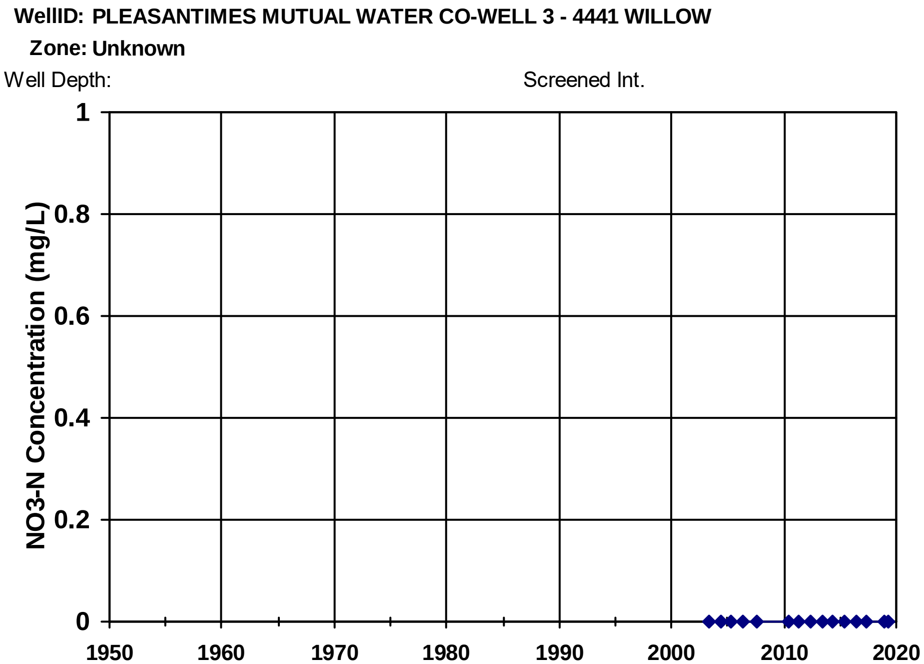

WellID: FRANKS MARINA-New Well
Zone: Unknown
Well Depth: Screened Int.

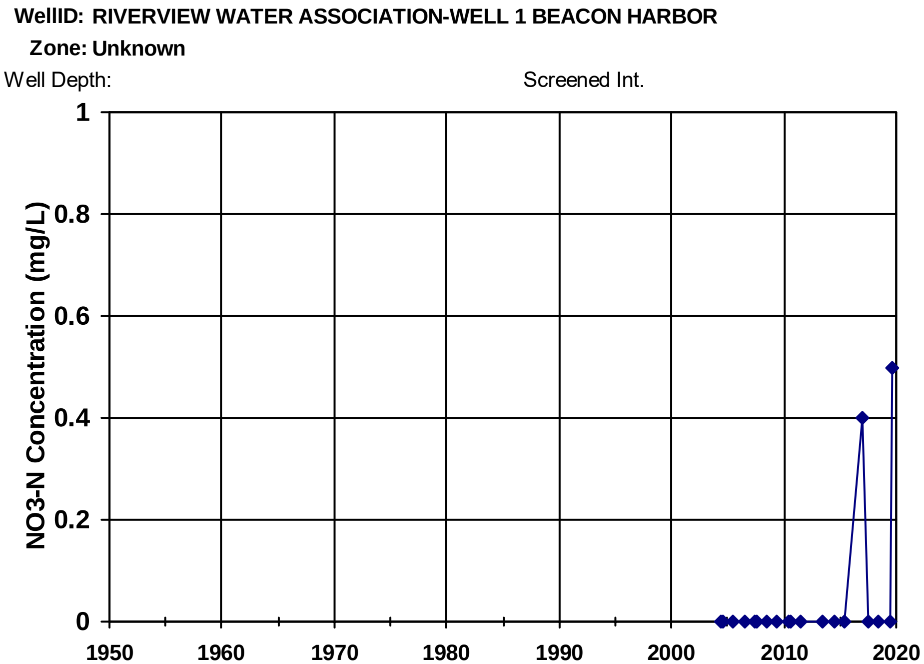



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}



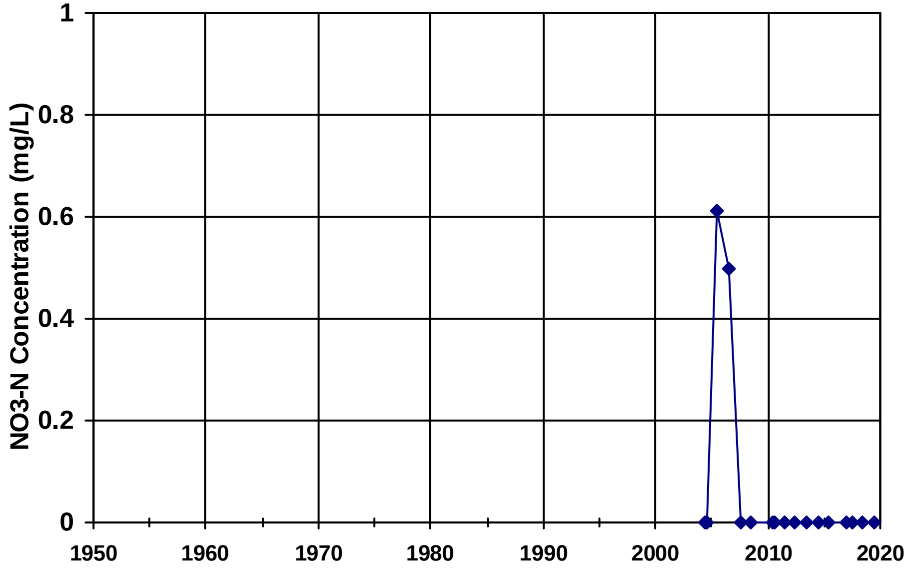



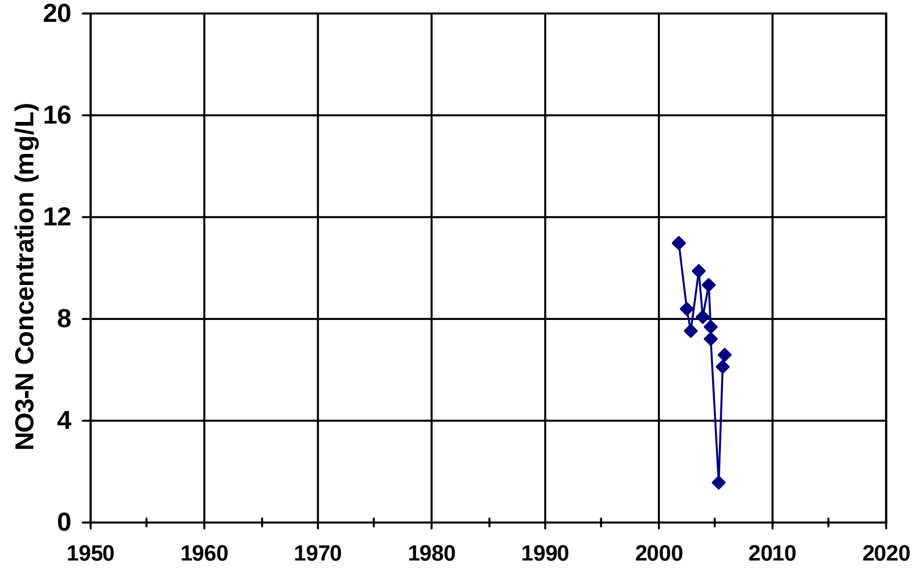

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

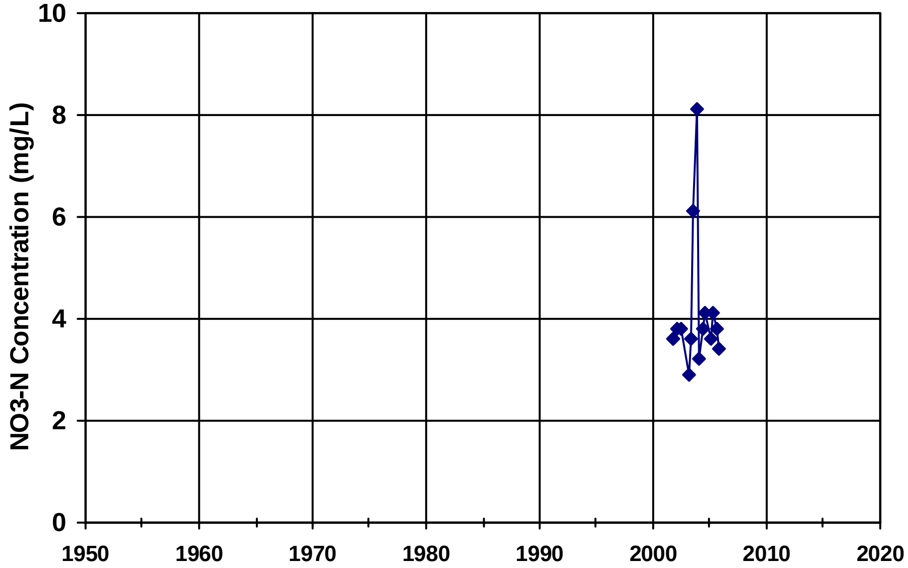
**WellID: RIVERVIEW WATER ASSOCIATION-WELL 2 END OF WILLOW RD**
**Zone: Unknown**
Well Depth: Screened Int.



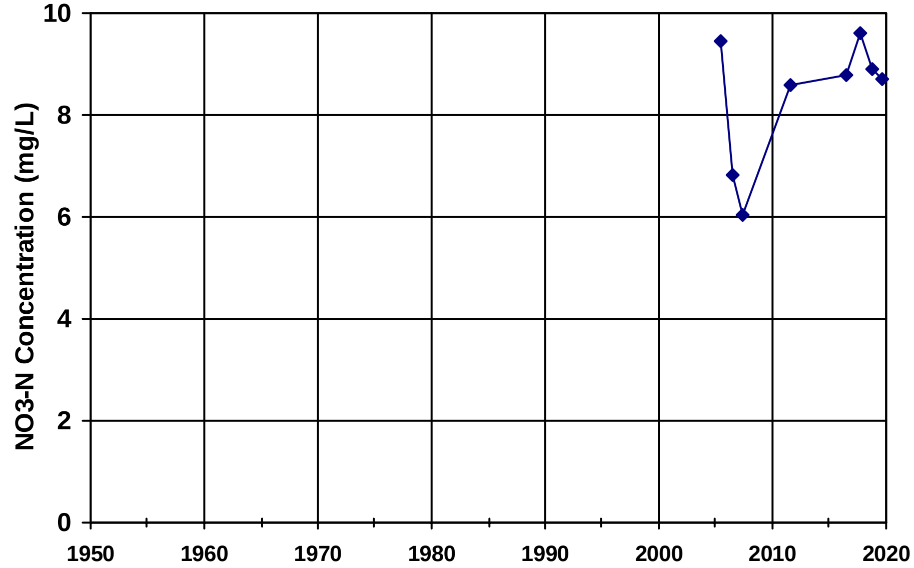

**WellID: DAVIS CAMP *CL 10/08-west well (north)**
**Zone: Unknown**
Well Depth: Screened Int.




**WellID: DAVIS CAMP *CL 10/08-east well (south)**
**Zone: Unknown**
Well Depth: Screened Int.




**WellID: BIG OAK MOBILE HOME PARK WATER-Well Head - West well**
**Zone: Unknown**
Well Depth: Screened Int.

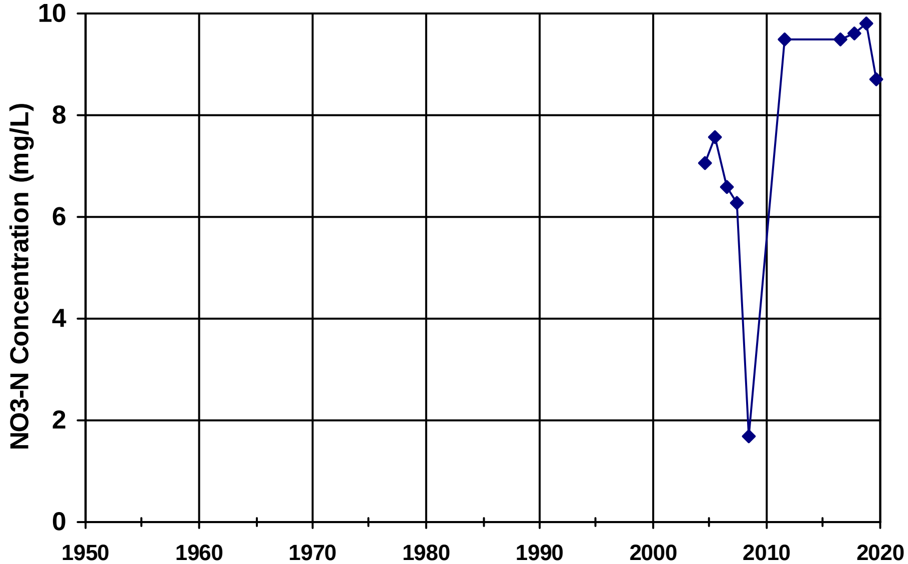



*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

**WellID: BIG OAK MOBILE HOME PARK WATER-Wellhead- East well**

**Zone: Unknown**

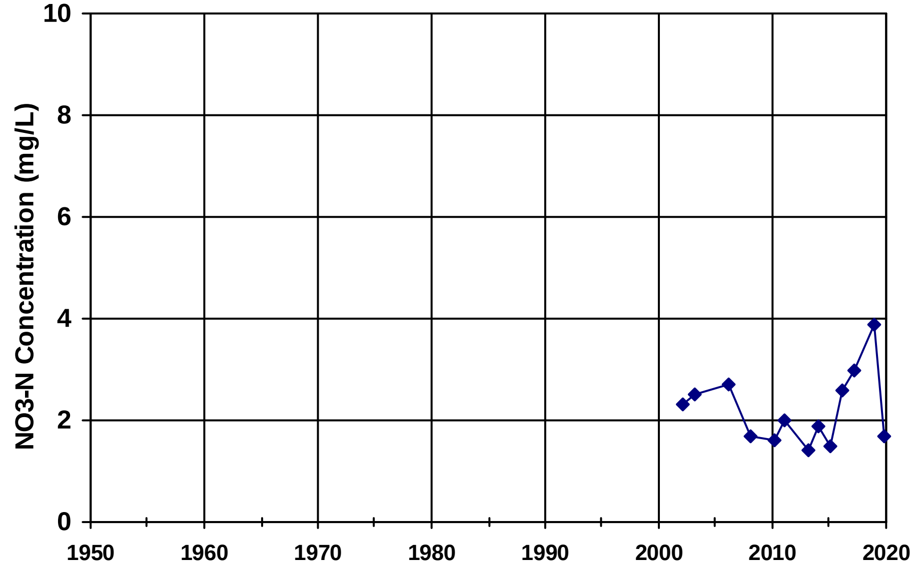
Well Depth: Screened Int.




**WellID: BYRON INN-Well Head**

**Zone: Unknown**

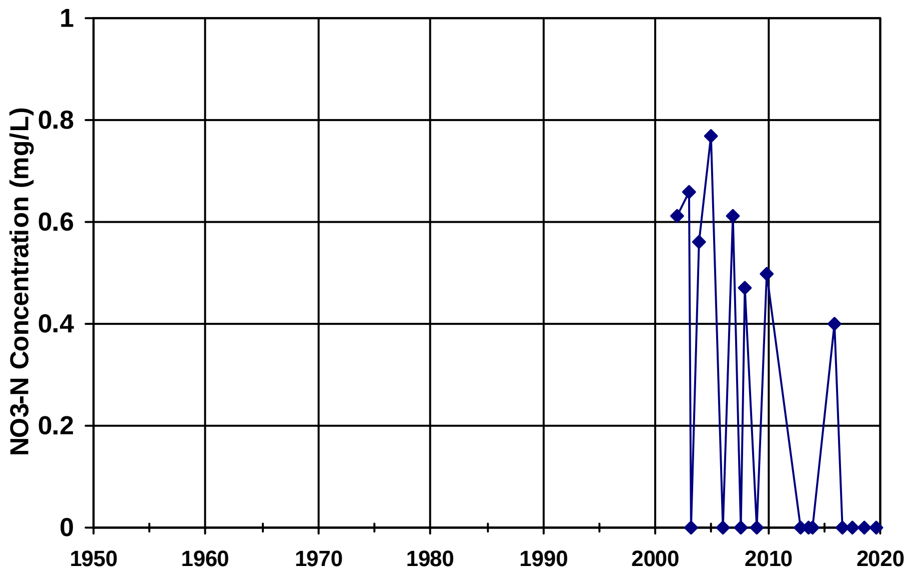
Well Depth: Screened Int.




**WellID: SANDY POINT MOBILE HOME PARK-Well Head**

**Zone: Unknown**

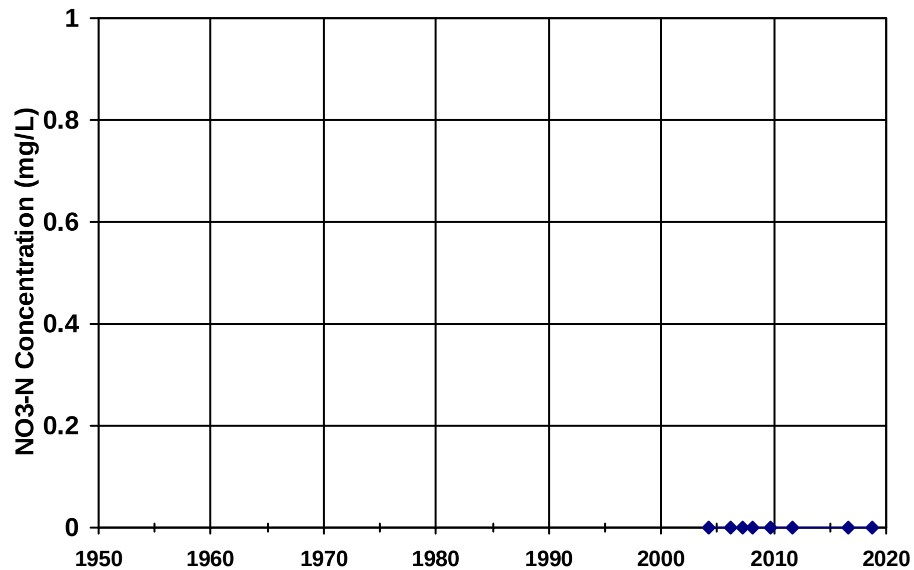
Well Depth: Screened Int.




**WellID: CAMINO MOBILEHOME-WELL**

**Zone: Unknown**

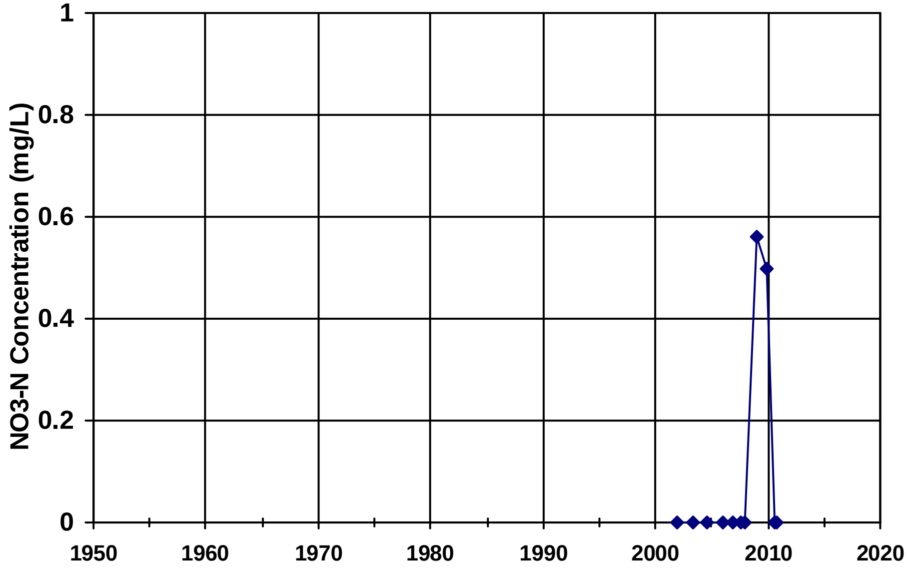
Well Depth: Screened Int.



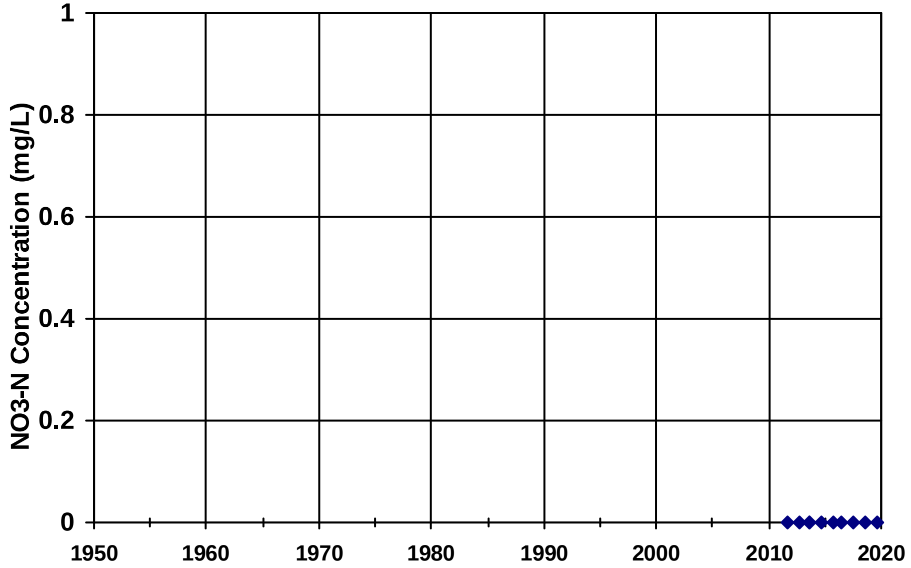

*Non-Detects are plotted as 0*

{R_WQ_NO3plots}

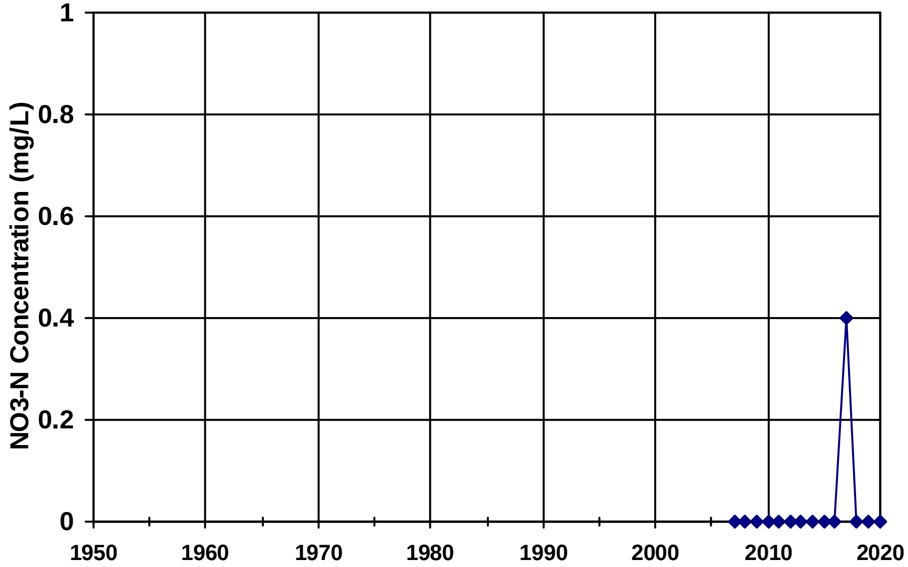
WellID: MARINA MOBILE MANOR-Well Head
Zone: Unknown
Well Depth: Screened Int.




WellID: MARINA MOBILE MANOR-NEW WELL
Zone: Unknown
Well Depth: Screened Int.



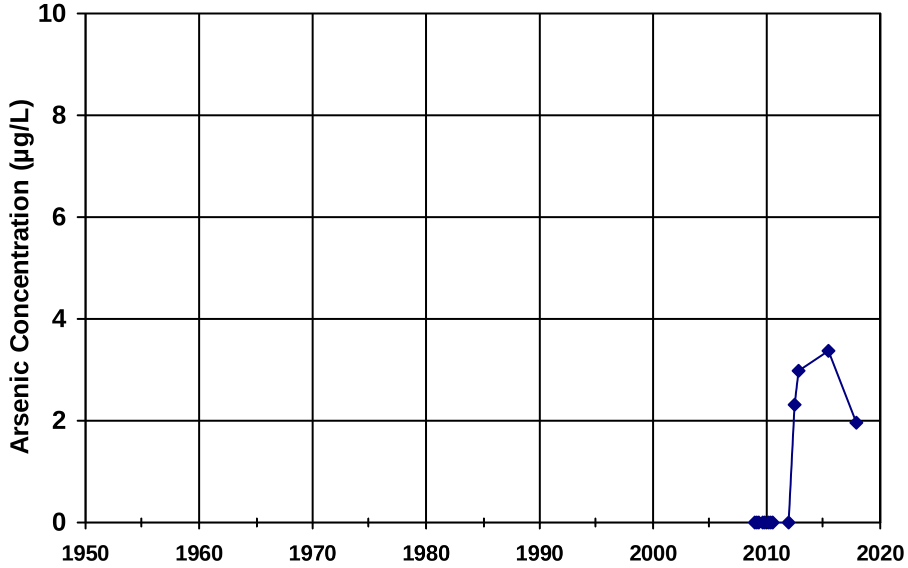

WellID: WILLOWEST MARINA WS-WELLHEAD
Zone: Unknown
Well Depth: Screened Int.



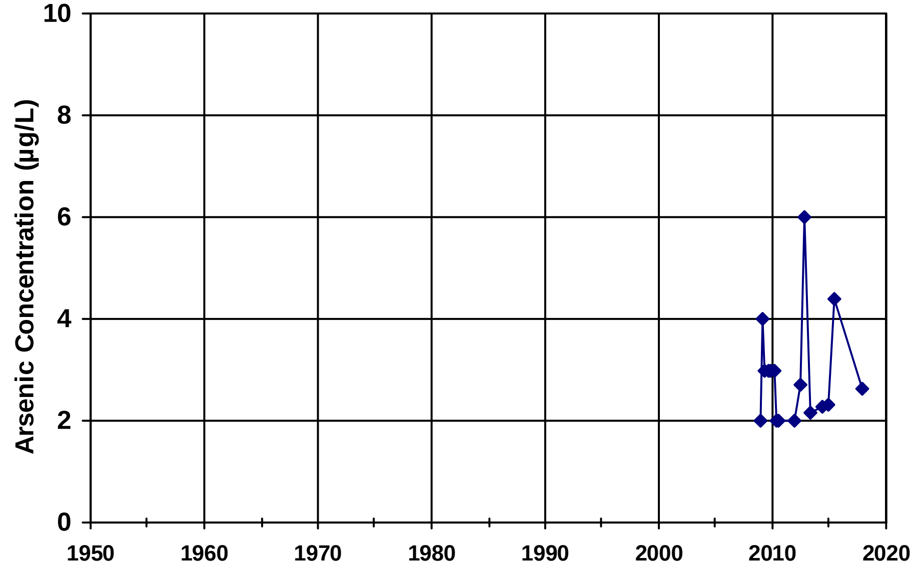

*Non-Detects are plotted as 0*
{R_WQ_NO3plots}

# Arsenic Graphs

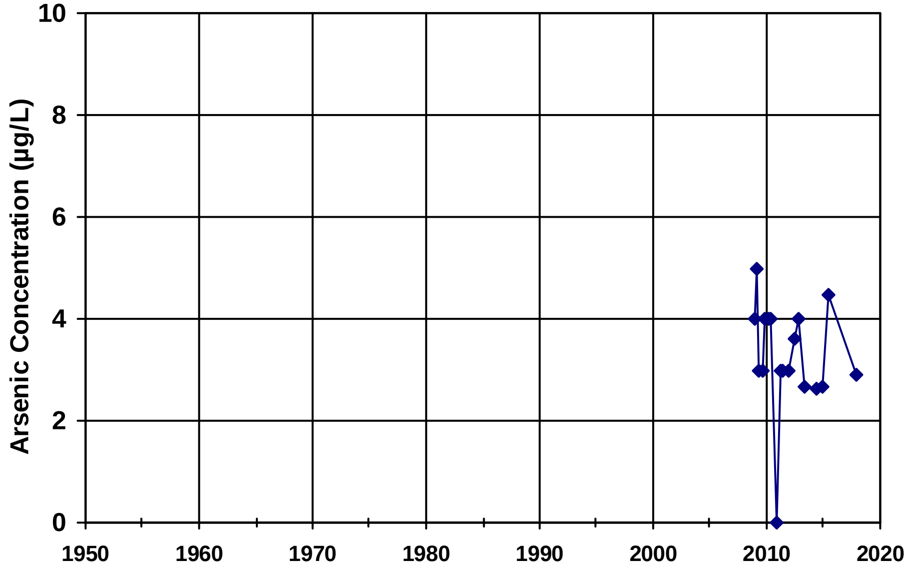
**WellID: BG-1**
**Zone: Shallow**
Well Depth: 55 Screened Int. 40-55



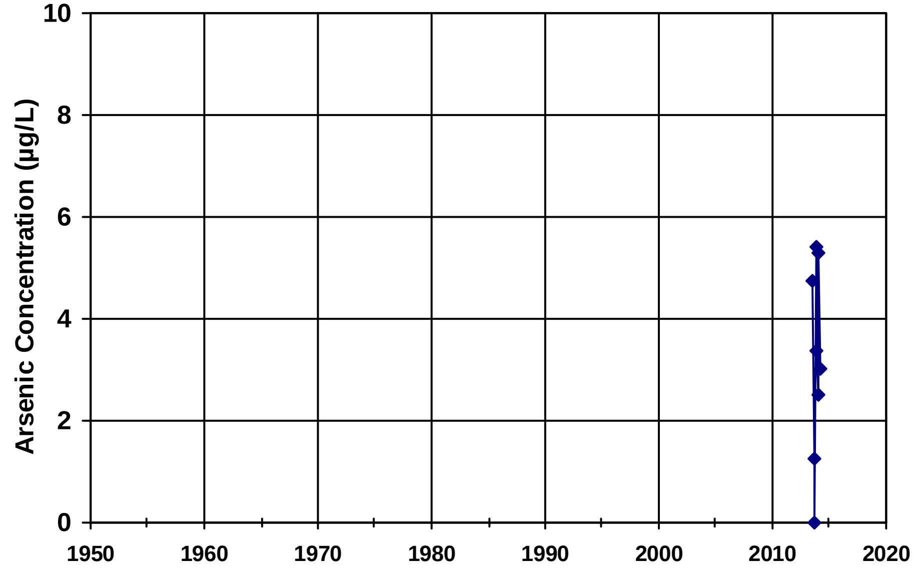

**WellID: BG-2**
**Zone: Shallow**
Well Depth: 37.5 Screened Int. 22.5-37.5




**WellID: BG-3**
**Zone: Shallow**
Well Depth: 35 Screened Int. 20-35

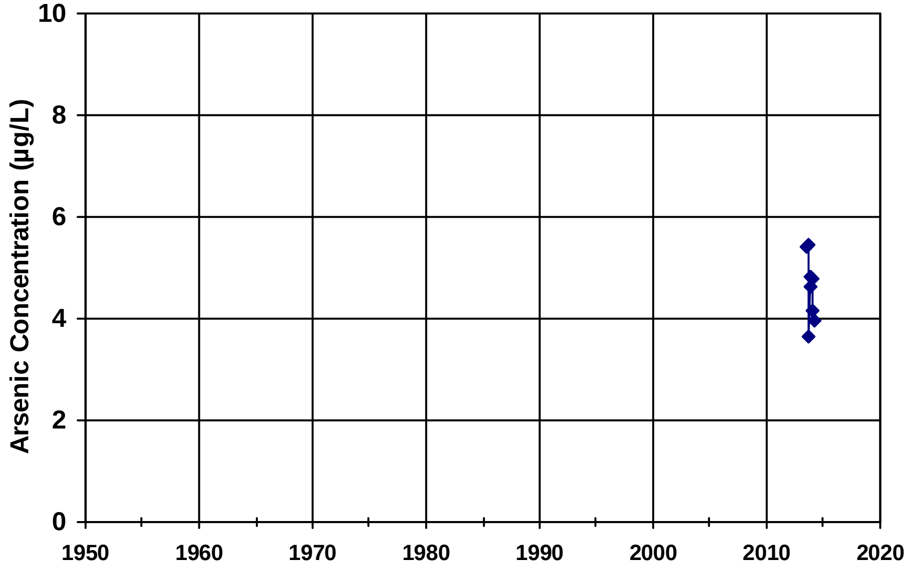



**WellID: SL186102968-7EW-4**
**Zone: Shallow**
Well Depth: Screened Int.

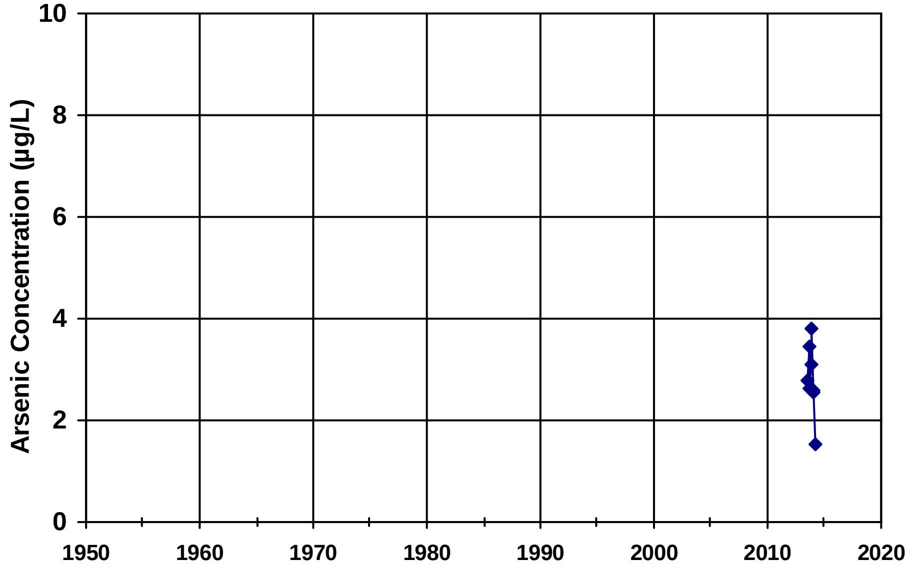



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

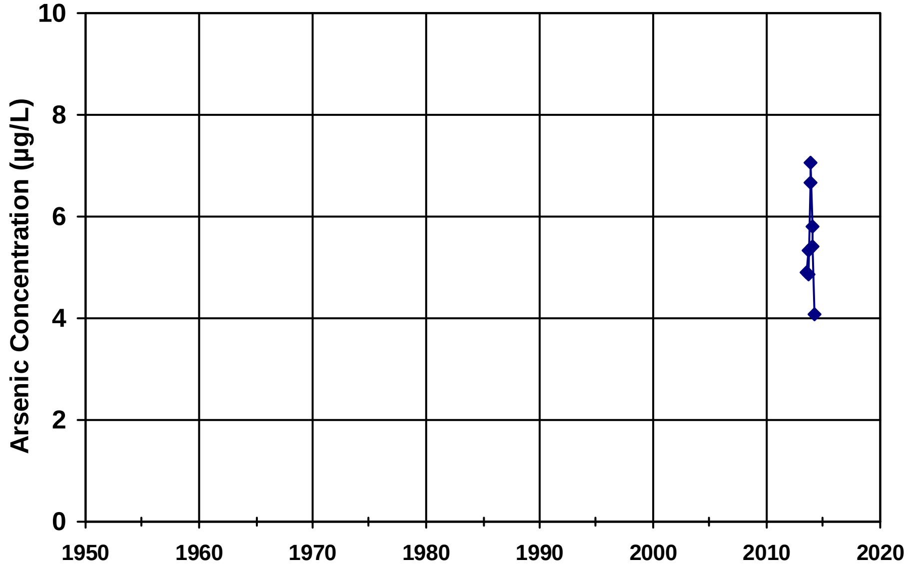
WellID: SL186102968-7MW-1
Zone: Shallow
Well Depth: Screened Int.



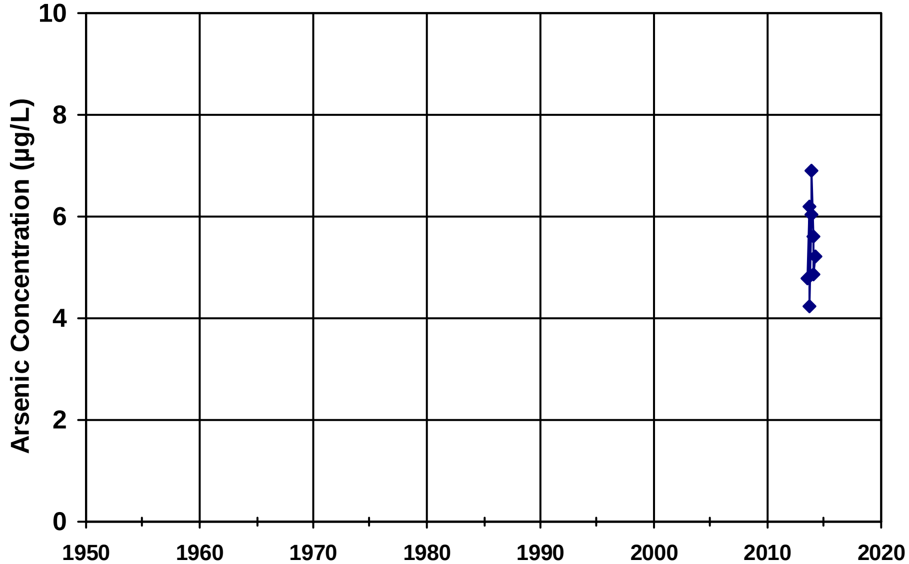

WellID: SL186102968-7MW-11
Zone: Shallow
Well Depth: Screened Int.




WellID: SL186102968-7MW-12
Zone: Shallow
Well Depth: Screened Int.

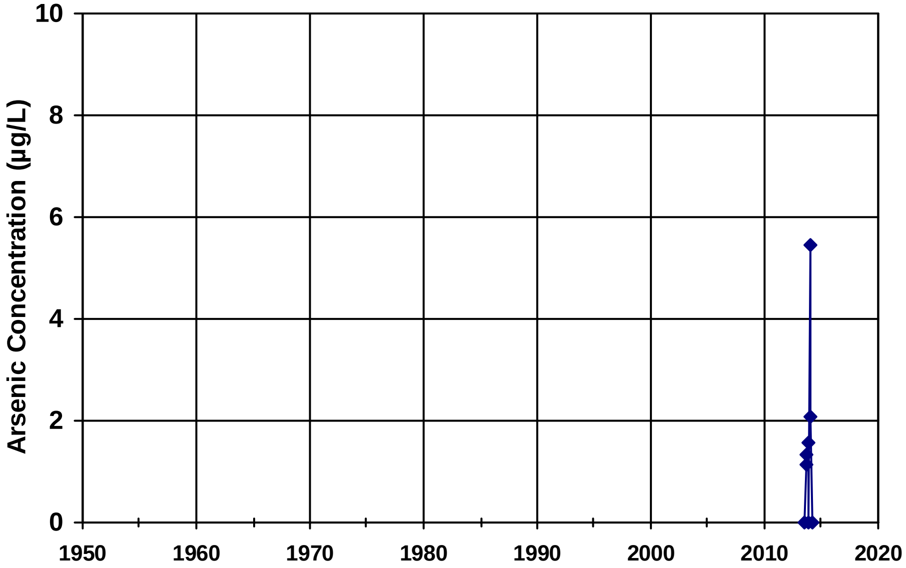



WellID: SL186102968-7MW-13
Zone: Shallow
Well Depth: Screened Int.

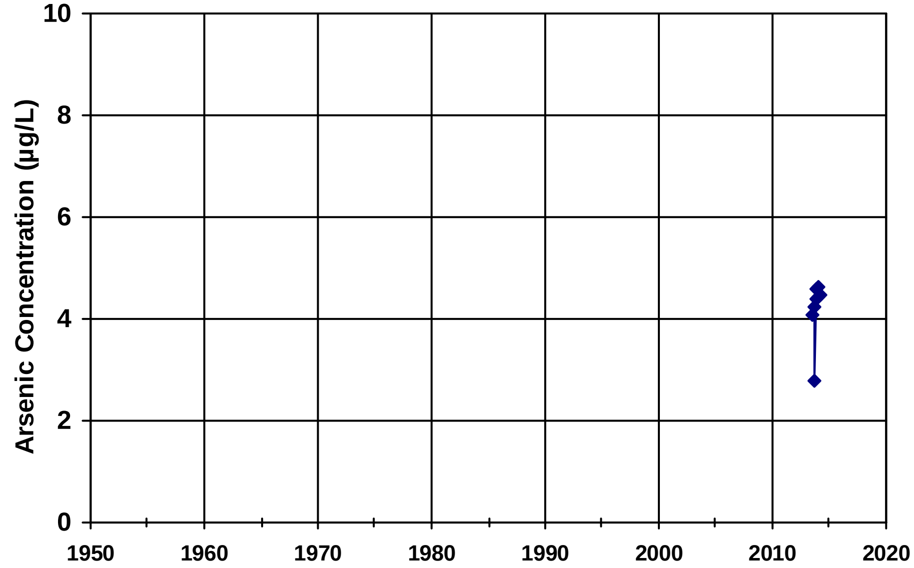



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

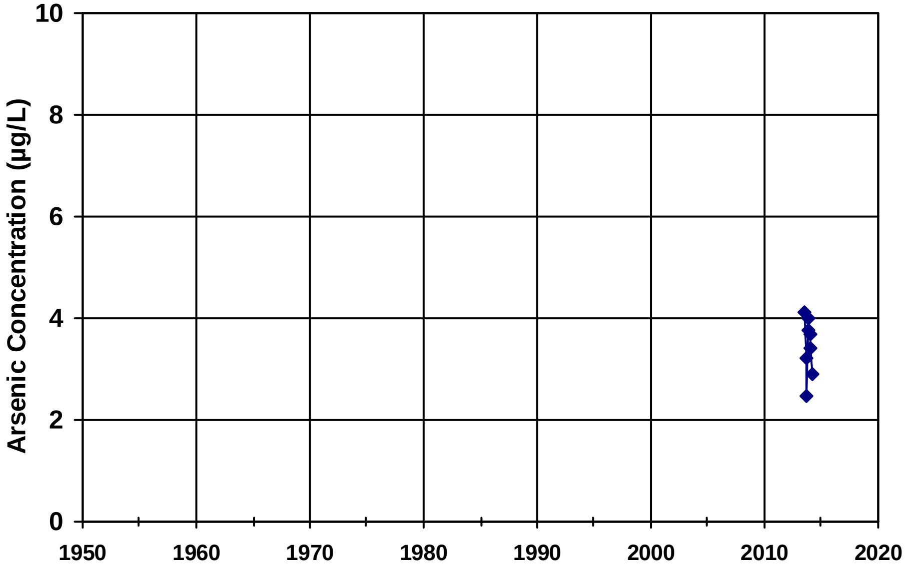
WellID: SL186102968-7MW-14
Zone: Shallow
Well Depth: Screened Int.



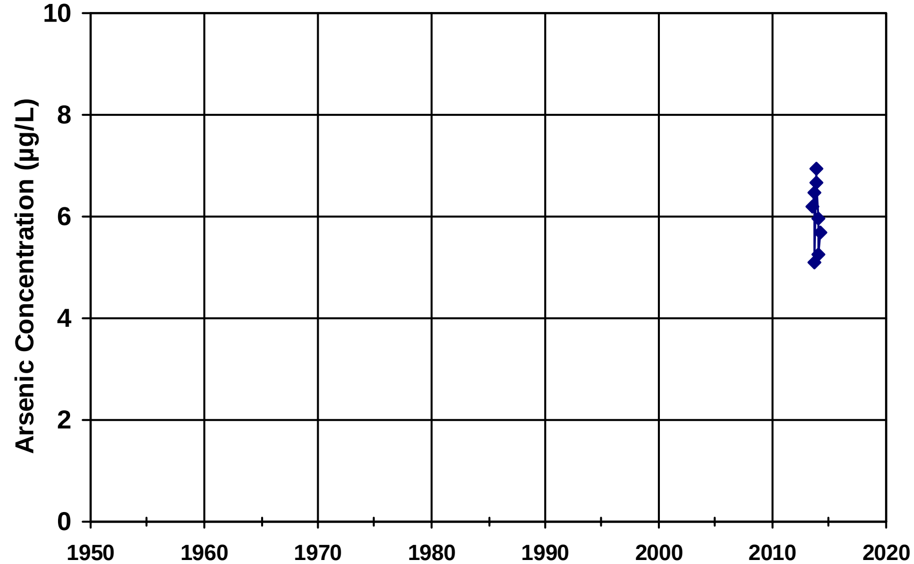

WellID: SL186102968-7MW-6
Zone: Shallow
Well Depth: Screened Int.




WellID: SL186102968-7MW-8
Zone: Shallow
Well Depth: Screened Int.

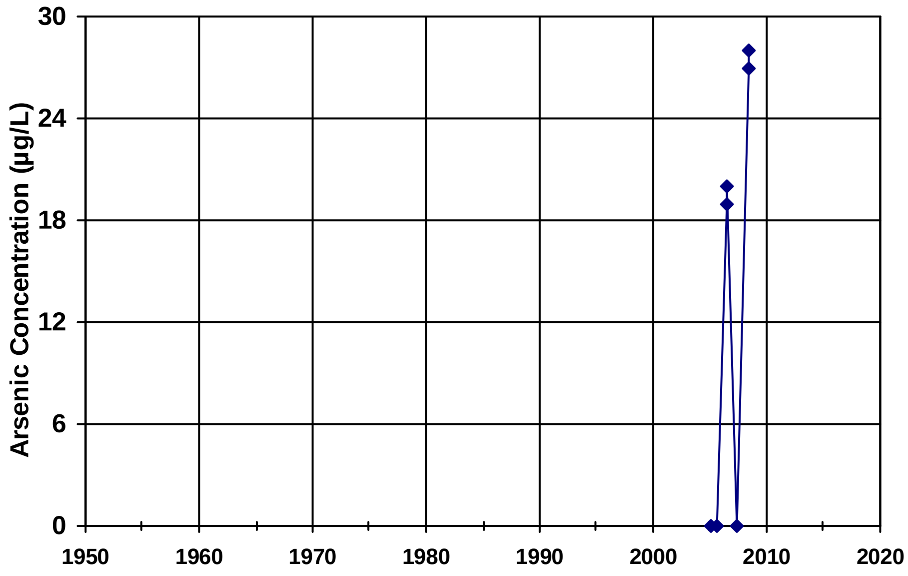



WellID: SL186102968-7MW-9
Zone: Shallow
Well Depth: Screened Int.

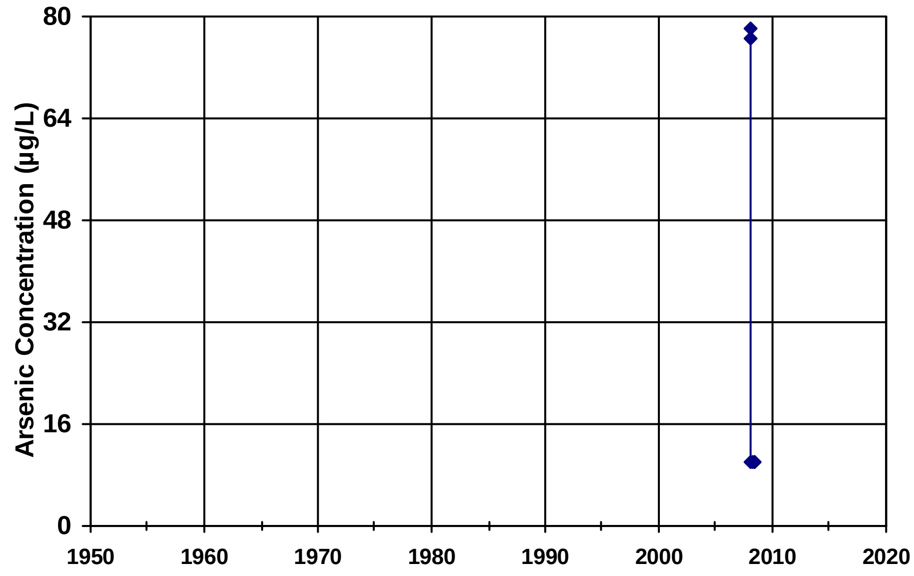



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

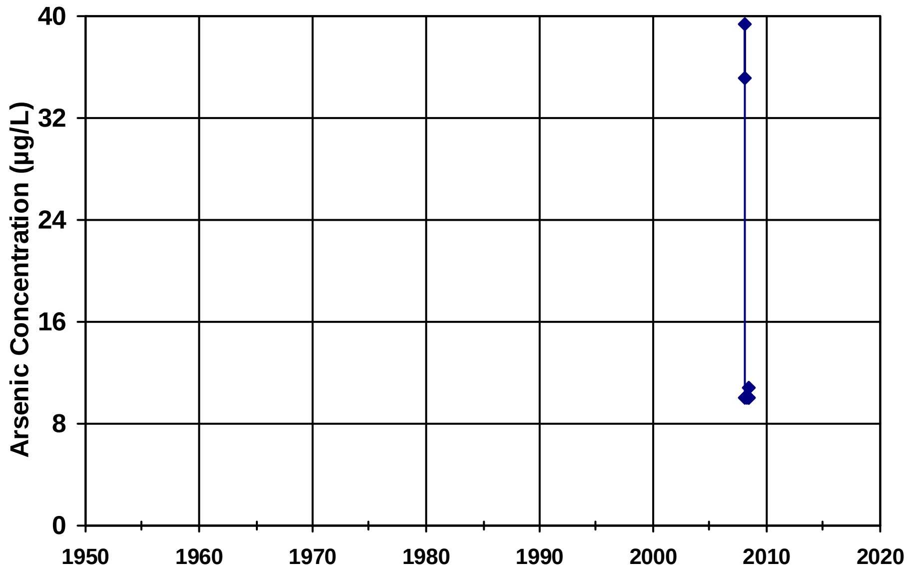
**WellID: SL205032990-W-05**
**Zone: Shallow**
Well Depth: Screened Int.



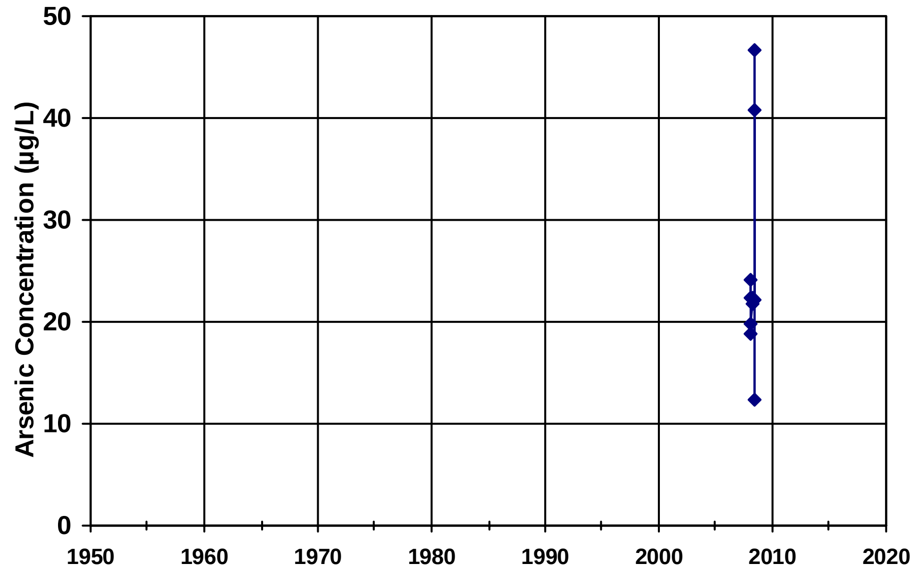

**WellID: T0601300807-IP-1**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: T0601300807-IP-2**
**Zone: Shallow**
Well Depth: Screened Int.

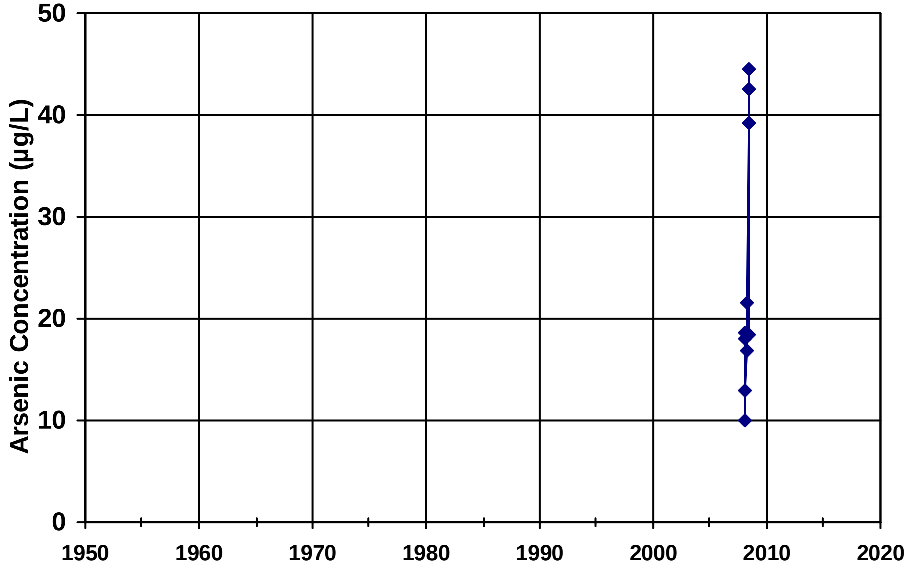



**WellID: T0601300807-OW-1**
**Zone: Shallow**
Well Depth: Screened Int.

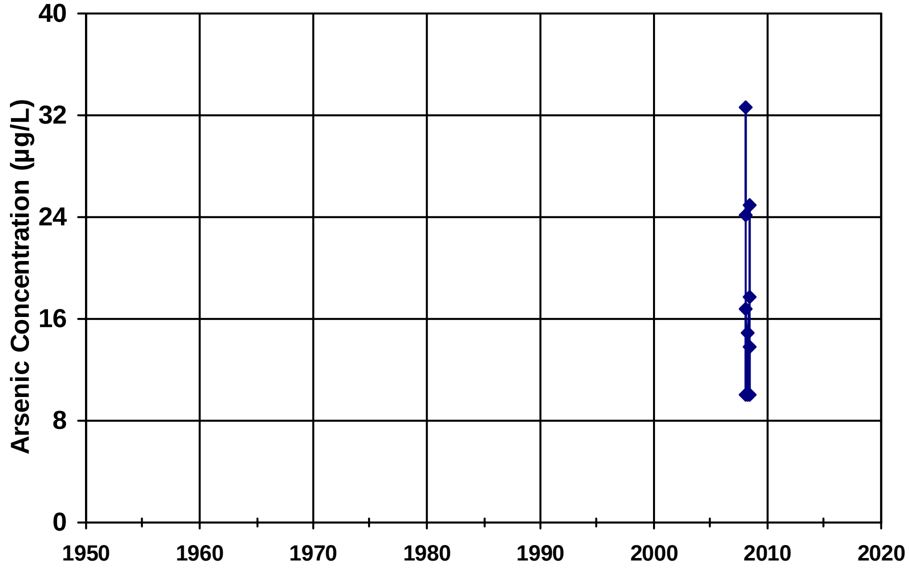



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

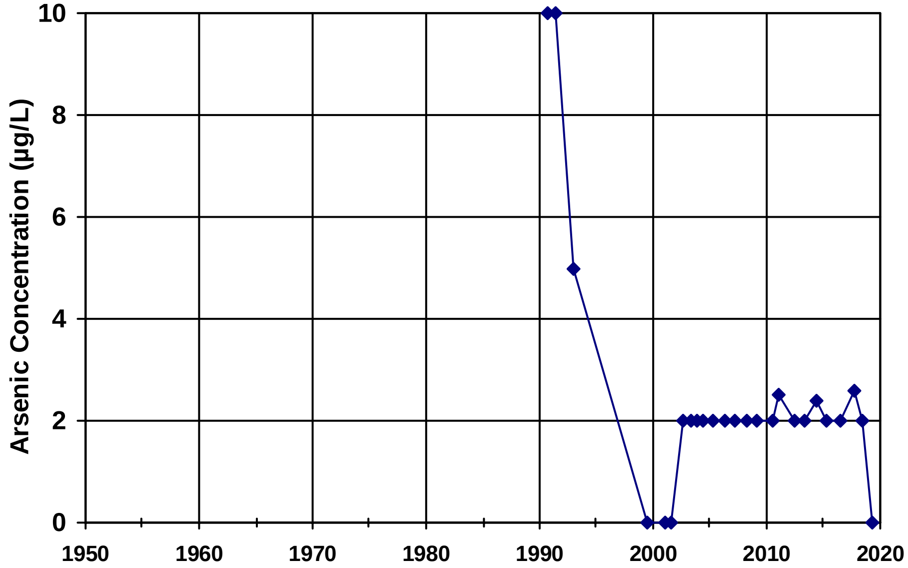
**WellID: T0601300807-OW-2**
**Zone: Shallow**
Well Depth: Screened Int.



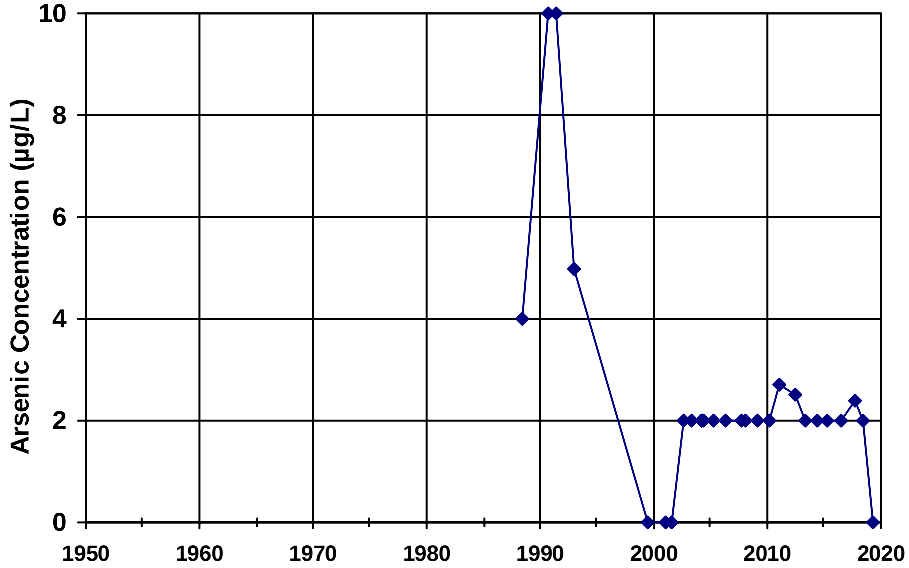

**WellID: T0601300807-S-11**
**Zone: Shallow**
Well Depth: Screened Int.




**WellID: CITY OF BRENTWOOD-Well 06**
**Zone: Deep**
Well Depth: 305 Screened Int. 250-300

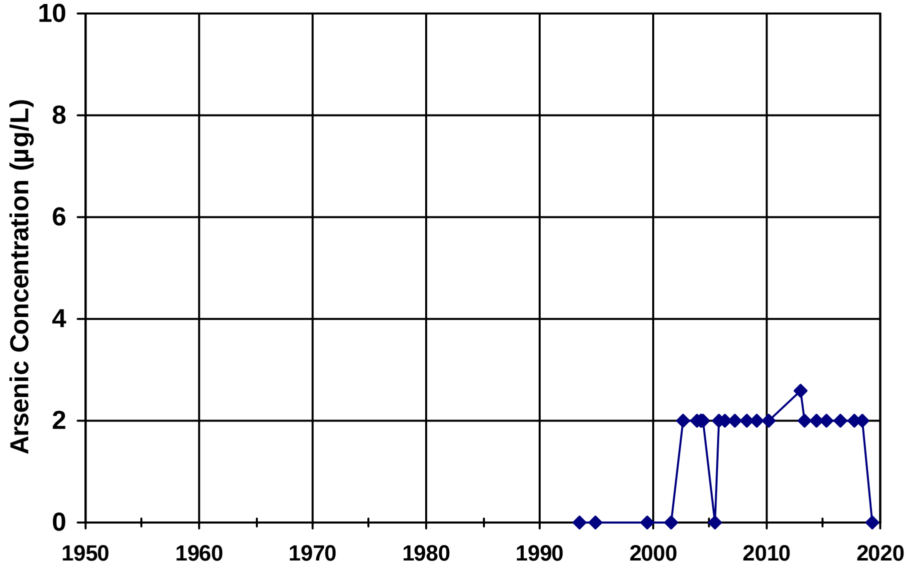



**WellID: CITY OF BRENTWOOD-Well 07**
**Zone: Deep**
Well Depth: 300 Screened Int. 265-295

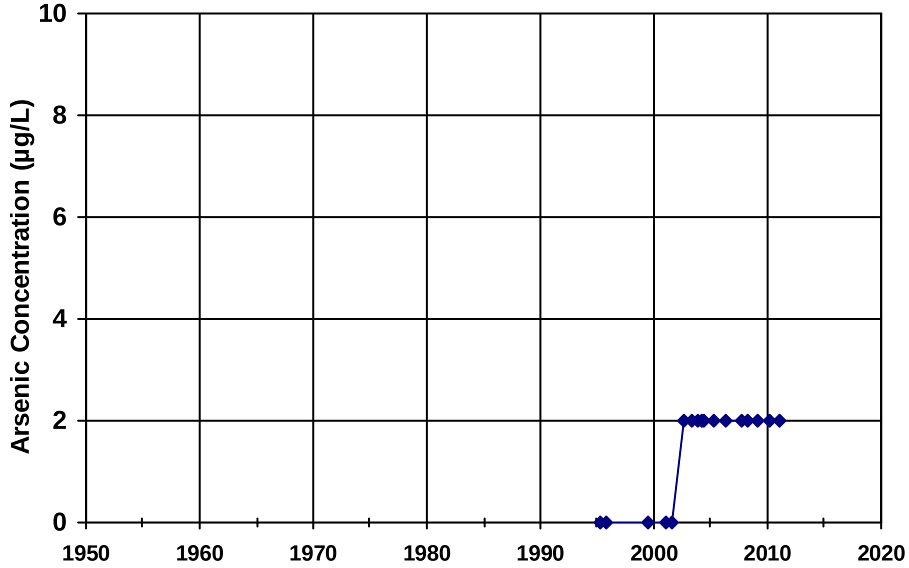



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

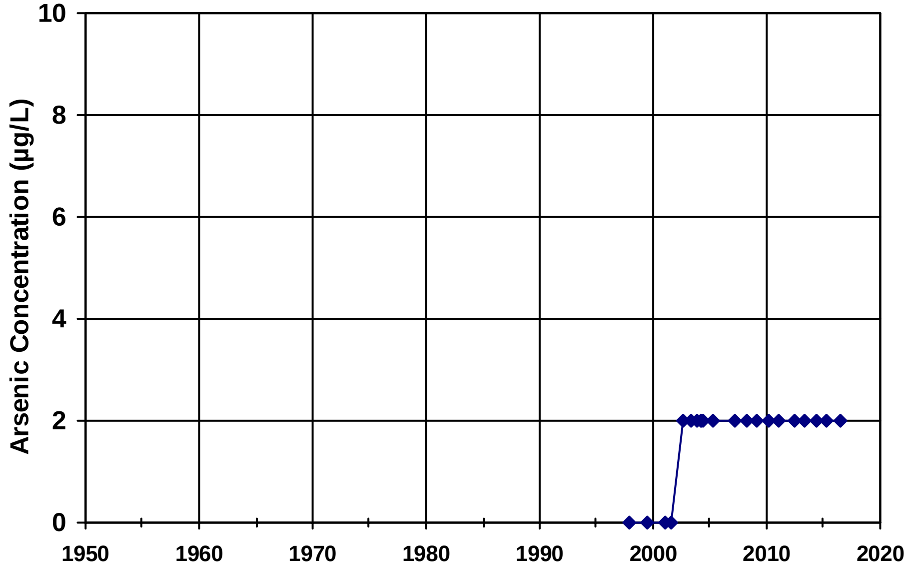
WellID: CITY OF BRENTWOOD-Well 08
Zone: Deep
Well Depth: 325 Screened Int. 225-315



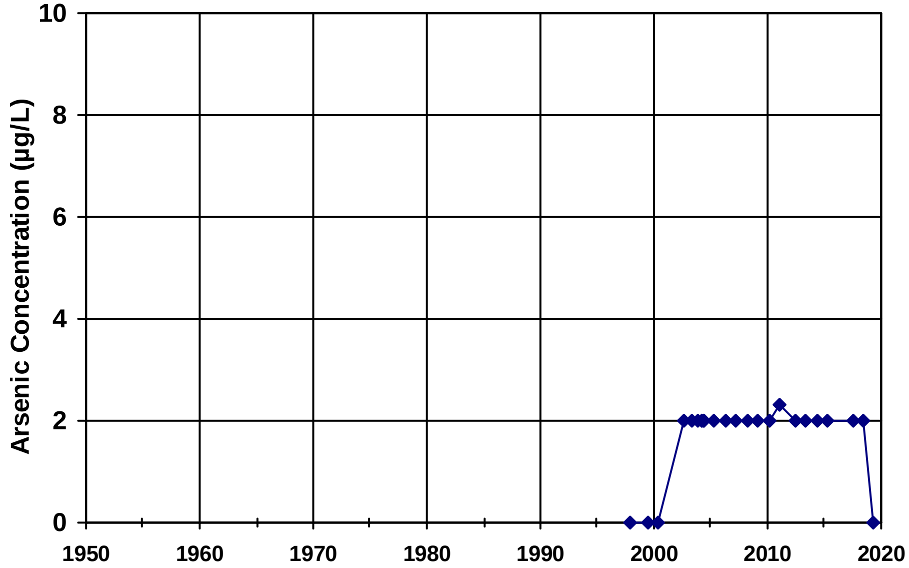

WellID: CITY OF BRENTWOOD-Well 11
Zone: Deep
Well Depth: Screened Int. 255-365




WellID: CITY OF BRENTWOOD-Well 12
Zone: Deep
Well Depth: 610 Screened Int. 350-380, 430-450

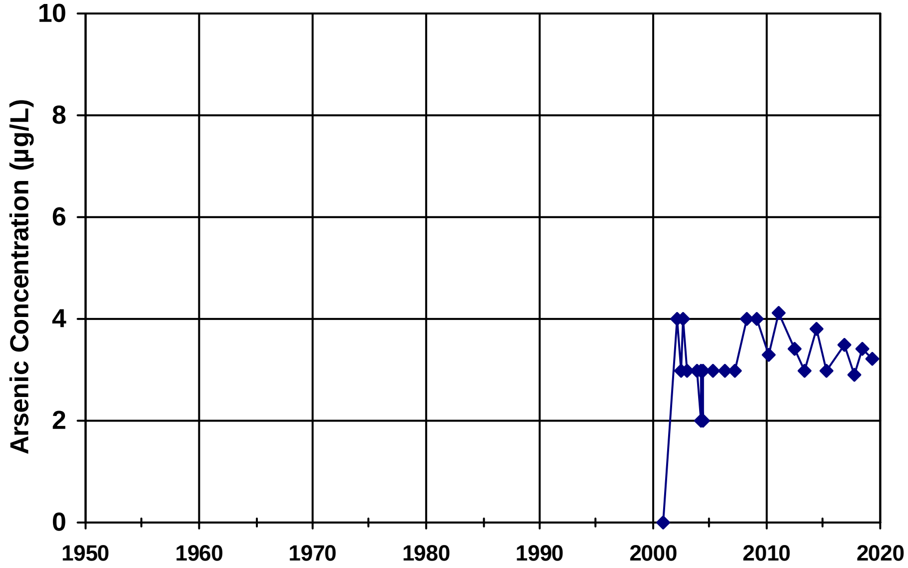



WellID: CITY OF BRENTWOOD-Well 13
Zone: Deep
Well Depth: 510 Screened Int. 350-380, 430-480

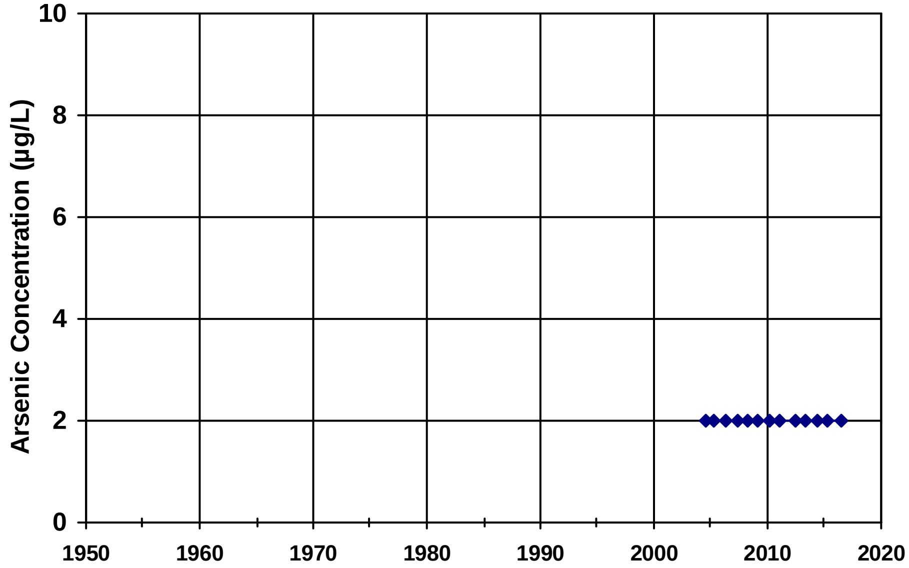



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

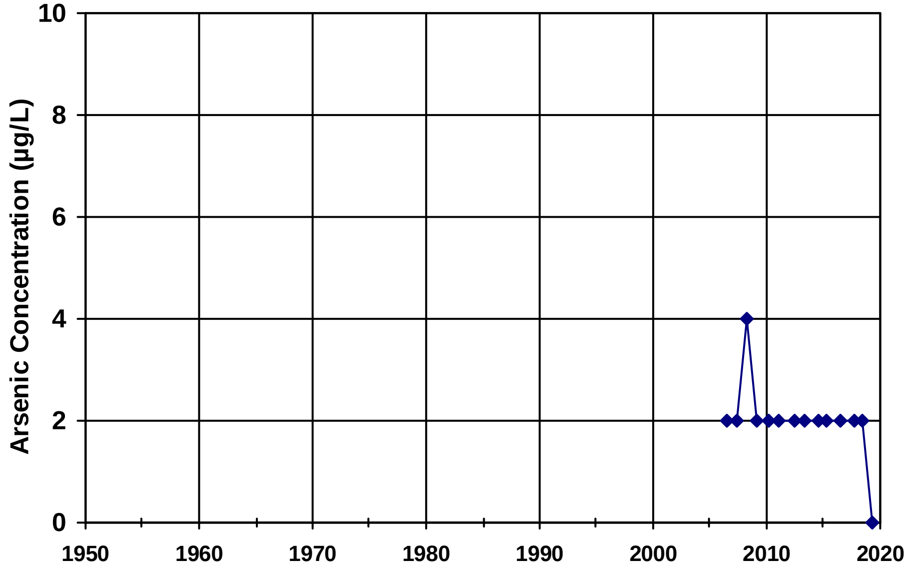
WellID: CITY OF BRENTWOOD-Well 14
Zone: Deep
Well Depth: 340 Screened Int. 285-315



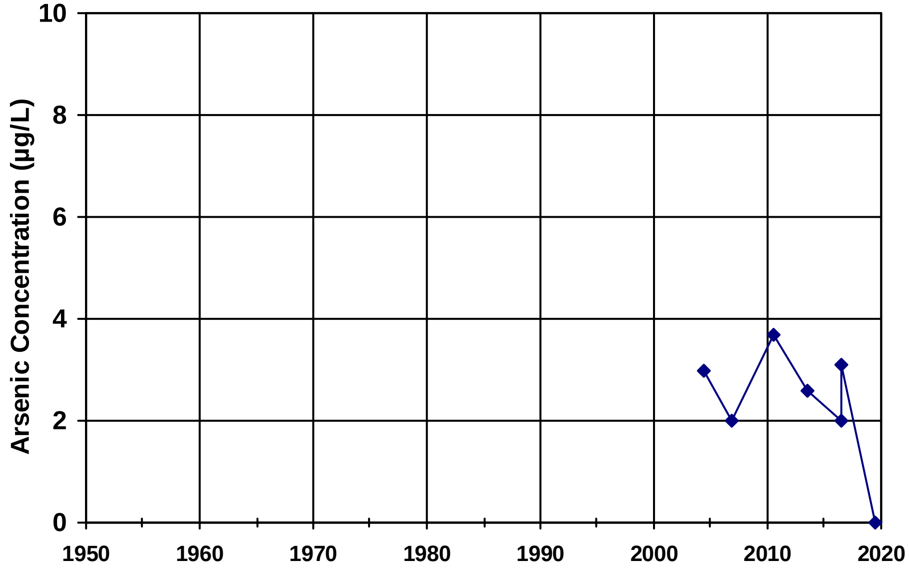

WellID: CITY OF BRENTWOOD-Well 09
Zone: Deep
Well Depth: 230 Screened Int. 210-230




WellID: CITY OF BRENTWOOD-Well 15
Zone: Deep
Well Depth: 345 Screened Int. 239-259,289-324

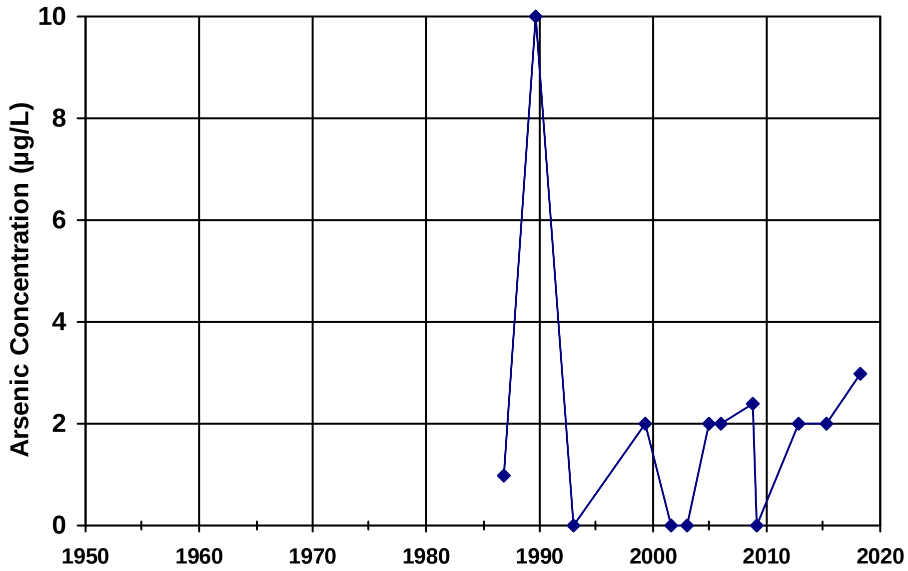



WellID: DIABLO WATER DISTRICT-Glen Park Well
Zone: Deep
Well Depth: 315 Screened Int. 230-245, 260-300

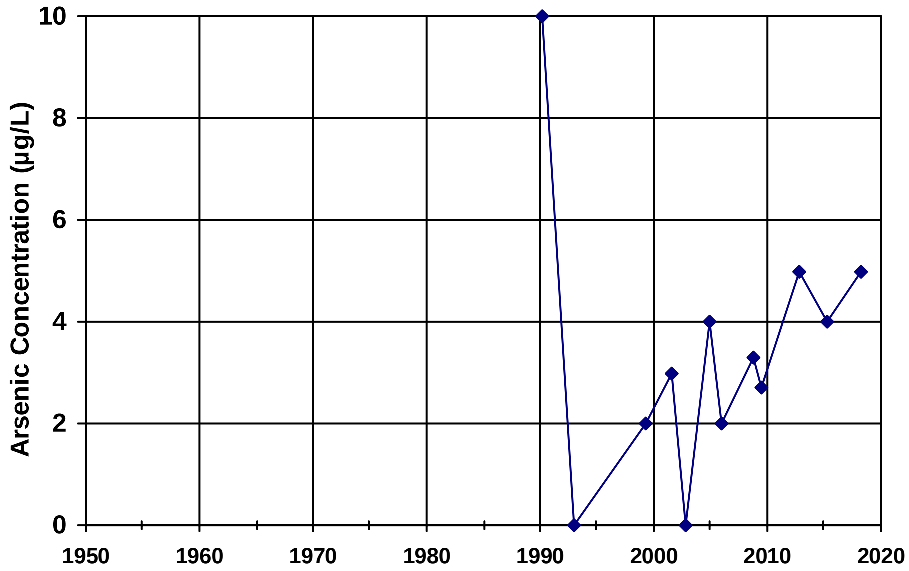



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

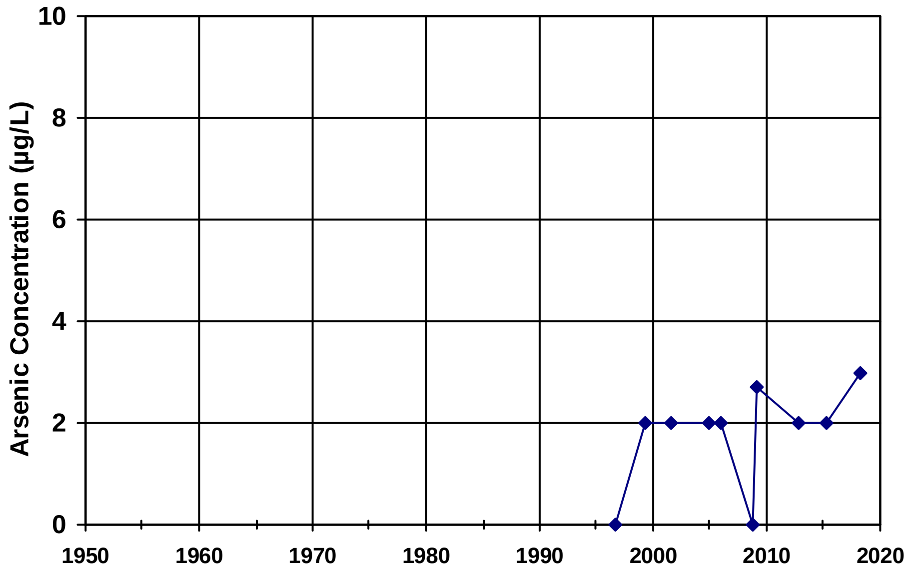
WellID: TOWN OF DISCOVERY BAY-WELL 02
Zone: Deep
Well Depth: 348 Screened Int. 245-335



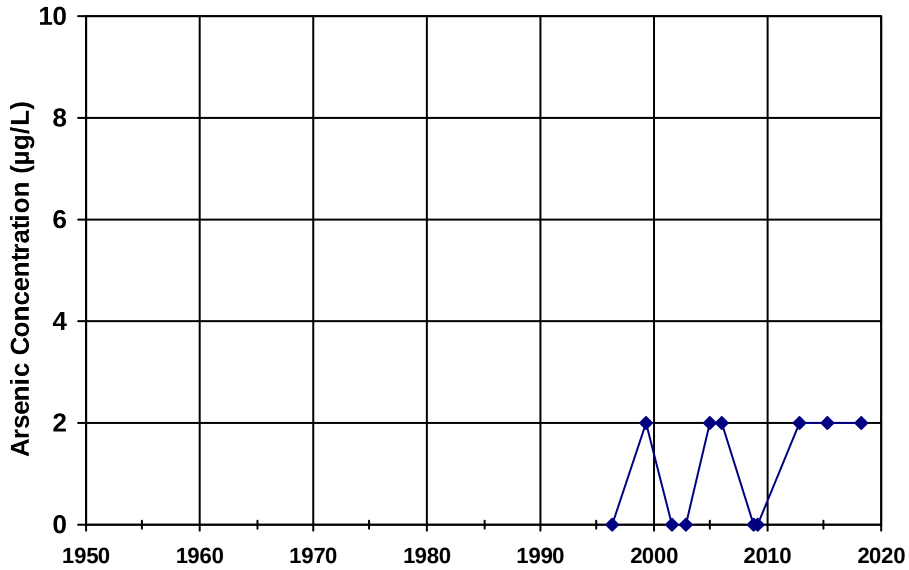

WellID: TOWN OF DISCOVERY BAY-WELL 05A
Zone: Deep
Well Depth: 357 Screened Int. 251-281, 307-347




WellID: TOWN OF DISCOVERY BAY-WELL 04A
Zone: Deep
Well Depth: 357 Screened Int. 307-347

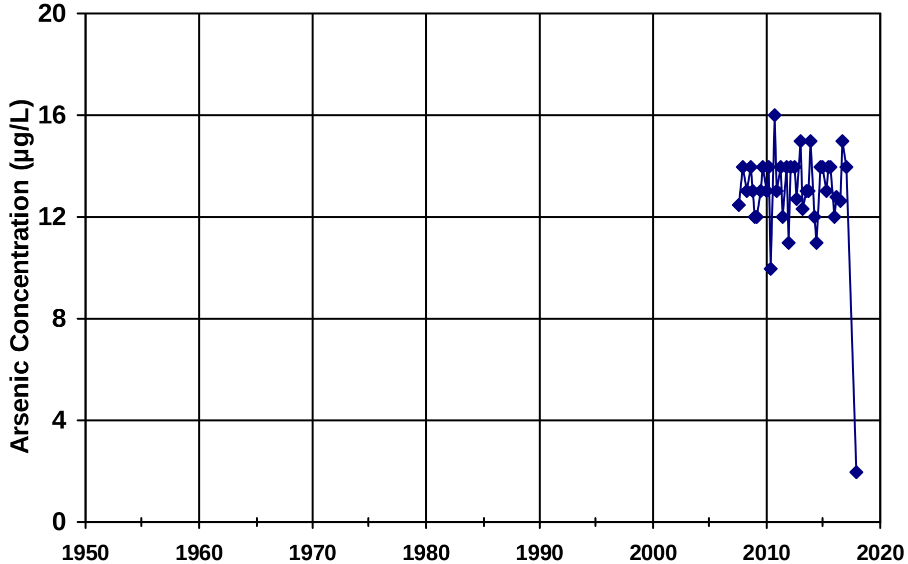



WellID: TOWN OF DISCOVERY BAY-WELL 01B
Zone: Deep
Well Depth: 350 Screened Int. 271-289, 308-340

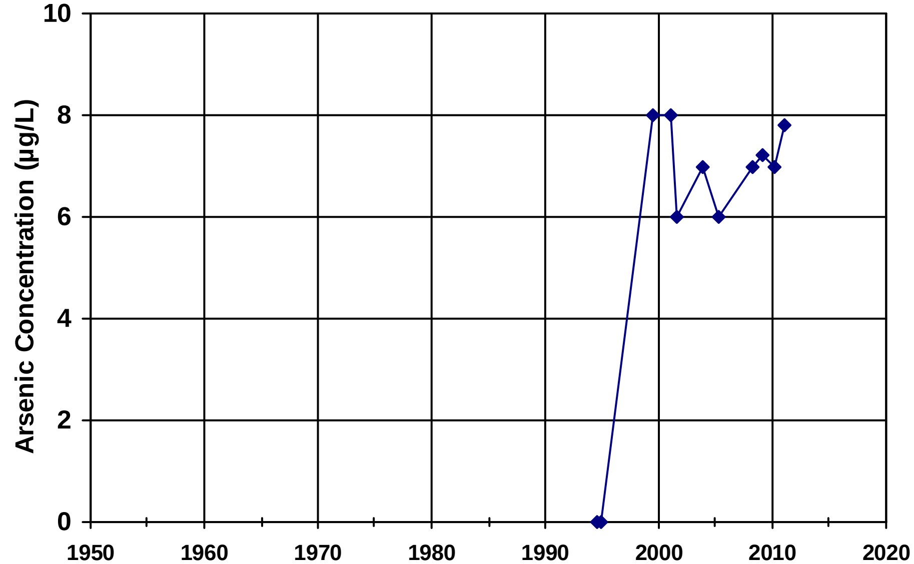



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

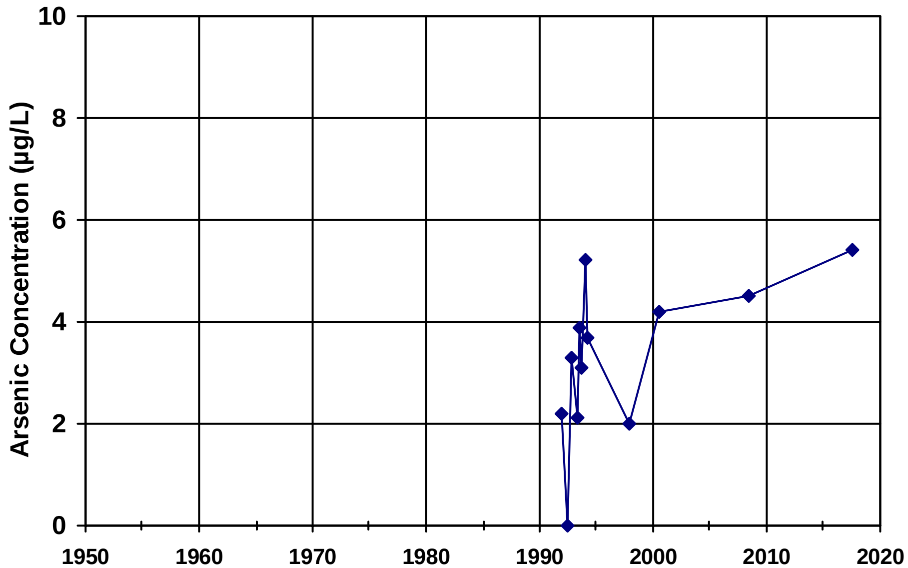
**WellID: KNIGHTSEN ELEMENTARY SCHOOL-WELL 3**
**Zone: Deep**
Well Depth: 415 Screened Int. 395-415



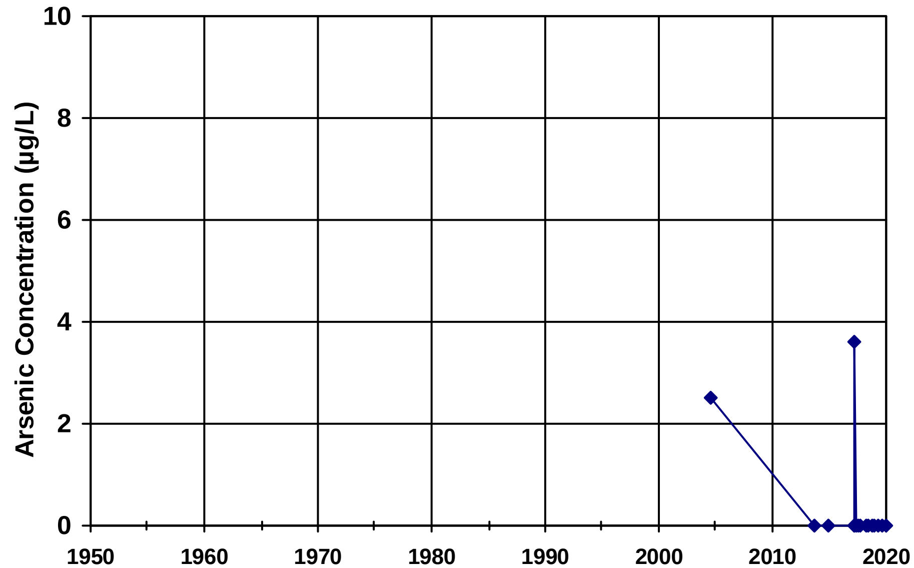

**WellID: CITY OF BRENTWOOD-Well 10A**
**Zone: Composite**
Well Depth: 210 Screened Int. 52-72, 135-182




**WellID: DIABLO WATER DISTRICT-WELL 01 - STANDBY**
**Zone: Composite**
Well Depth: 170 Screened Int. 100-170

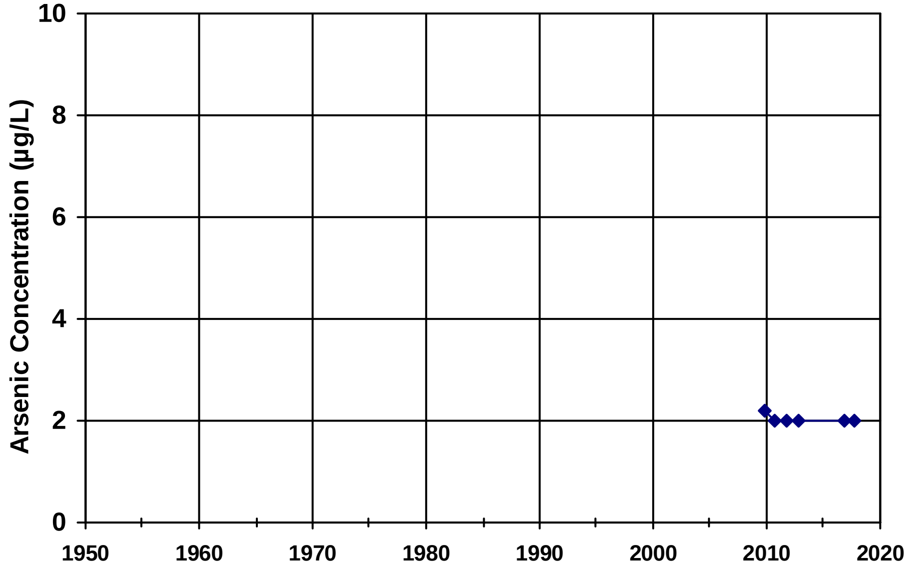



**WellID: KNIGHTSEN ELEMENTARY SCHOOL-SOUTH WELL**
**Zone: Composite**
Well Depth: 230 Screened Int. 167-191, 210-230

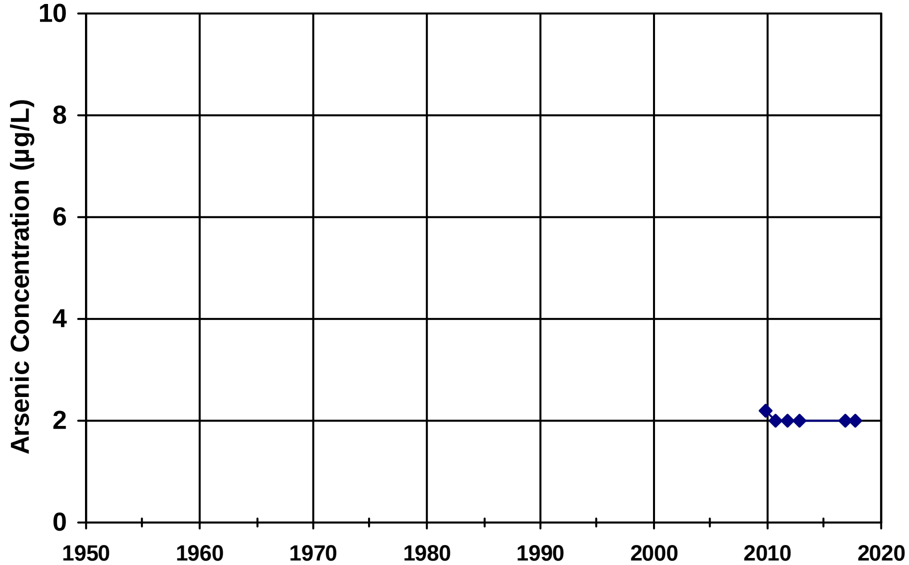



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

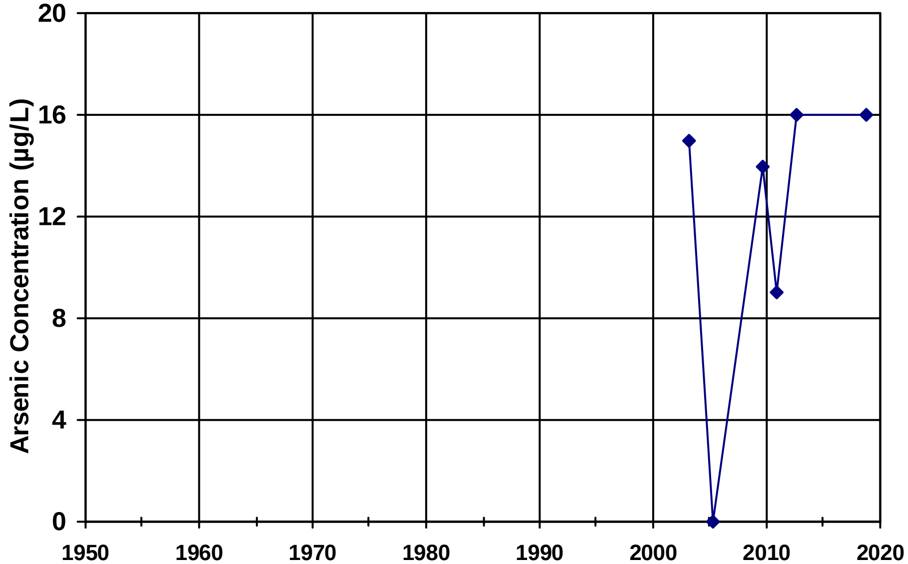
WellID: LOS VAQUEROS MARINA BLDG-SOURCE
Zone: Unknown
Well Depth: Screened Int.



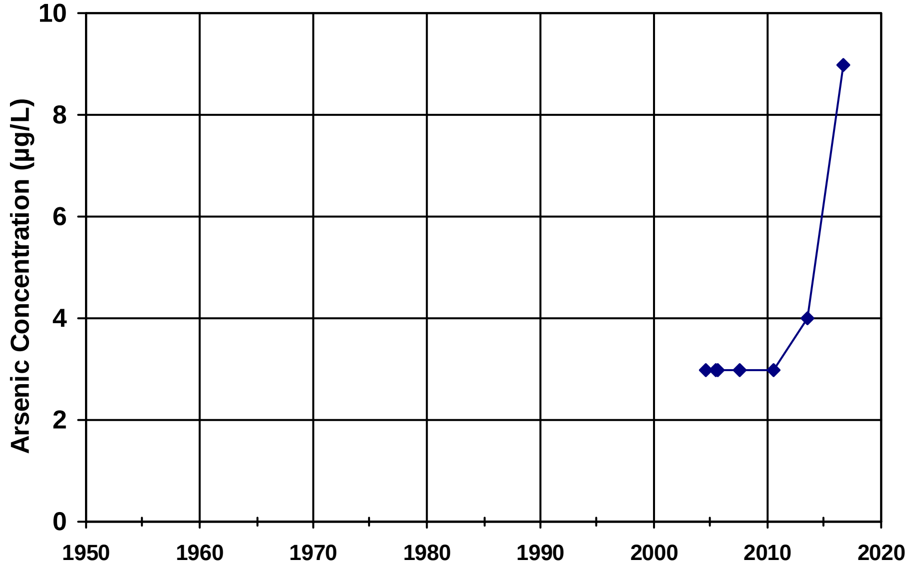

WellID: LOS VAQUEROS INTERPRETIVE CENTER-SOURCE
Zone: Unknown
Well Depth: Screened Int.




WellID: SANDMOUND MUTUAL-3810 STONE ROAD WELL
Zone: Unknown
Well Depth: Screened Int.




WellID: ANGLERS SUBDIVISION 4-WELL 1 - 1696 Taylor
Zone: Unknown
Well Depth: Screened Int.

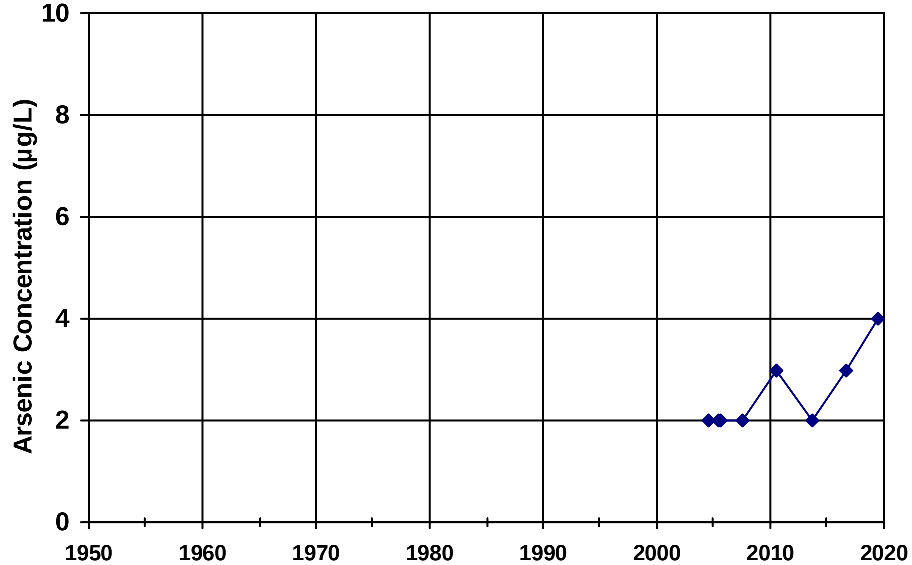



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

**WellID: ANGLERS SUBDIVISION 4-WELL 2 - 1398 Taylor**

**Zone: Unknown**

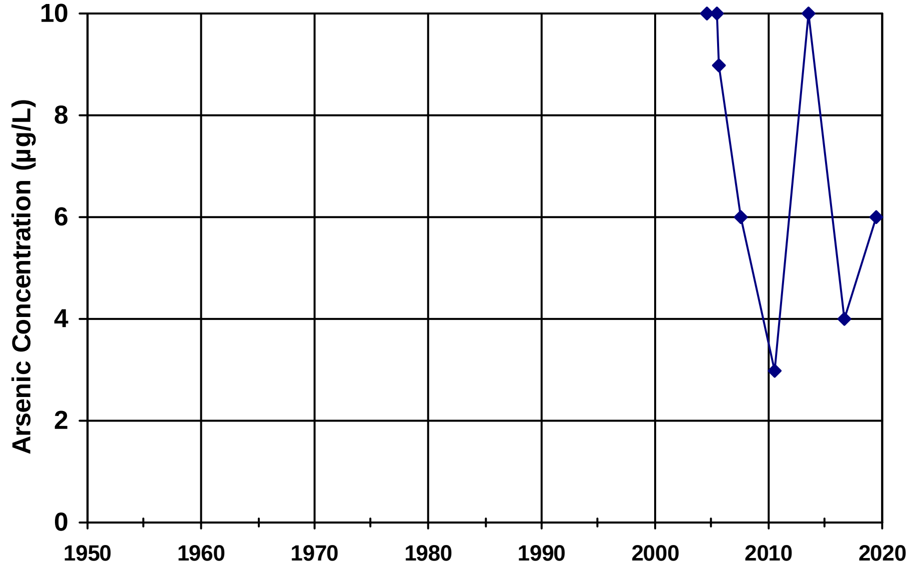
Well Depth: Screened Int.




**WellID: ANGLERS SUBDIVISION 4-WELL 3 - 1698 Taylor**

**Zone: Unknown**

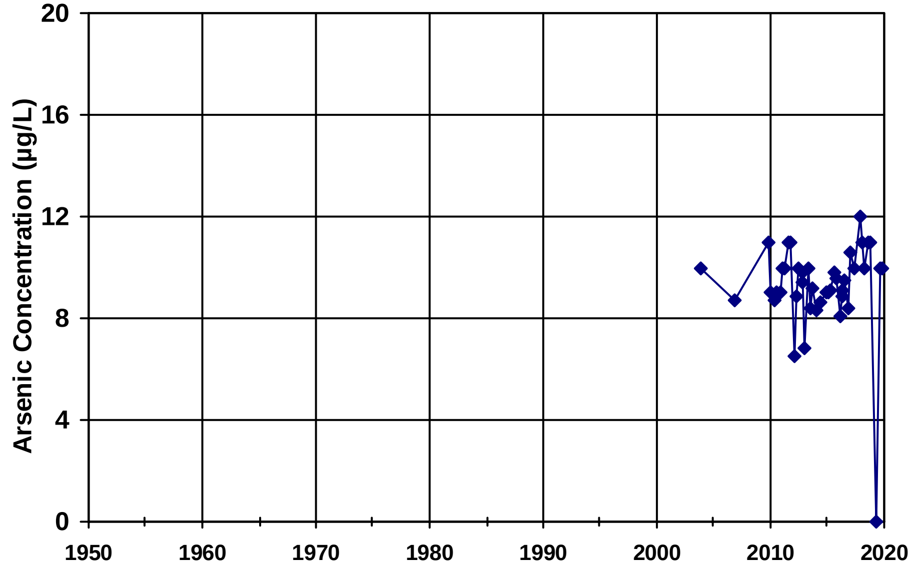
Well Depth: Screened Int.




**WellID: DELTA MUTUAL WATER COMPANY-East Well**

**Zone: Unknown**

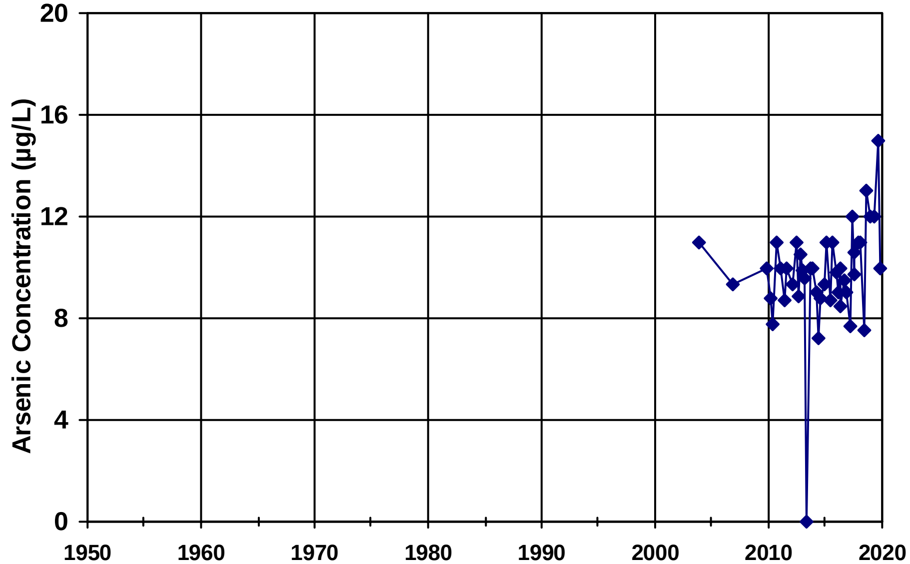
Well Depth: Screened Int.




**WellID: DELTA MUTUAL WATER COMPANY-West Well**

**Zone: Unknown**

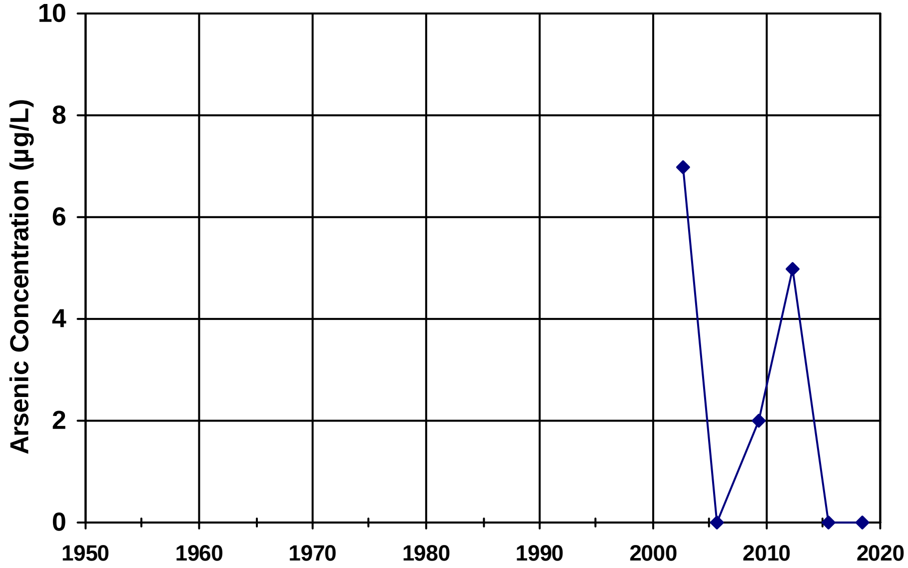
Well Depth: Screened Int.



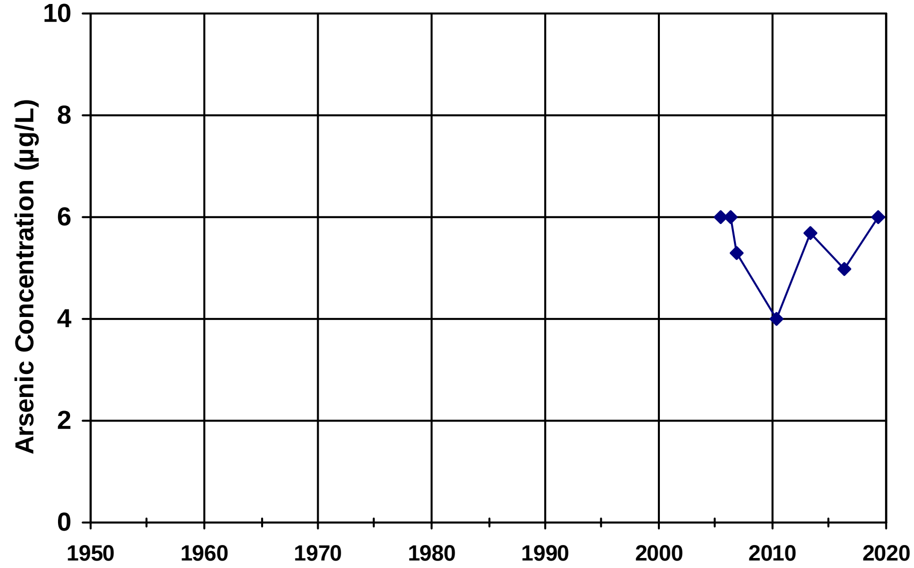

*Non-Detects are plotted as 0*

{R_WQ_ASplots}

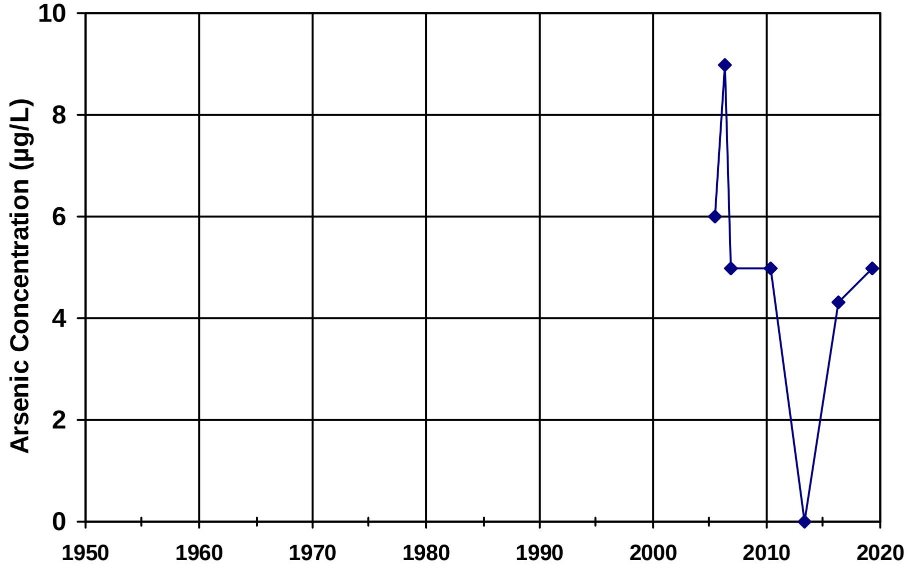
WellID: SANTIAGO ISLAND VILLAGE-WELL 01
Zone: Unknown
Well Depth: Screened Int.



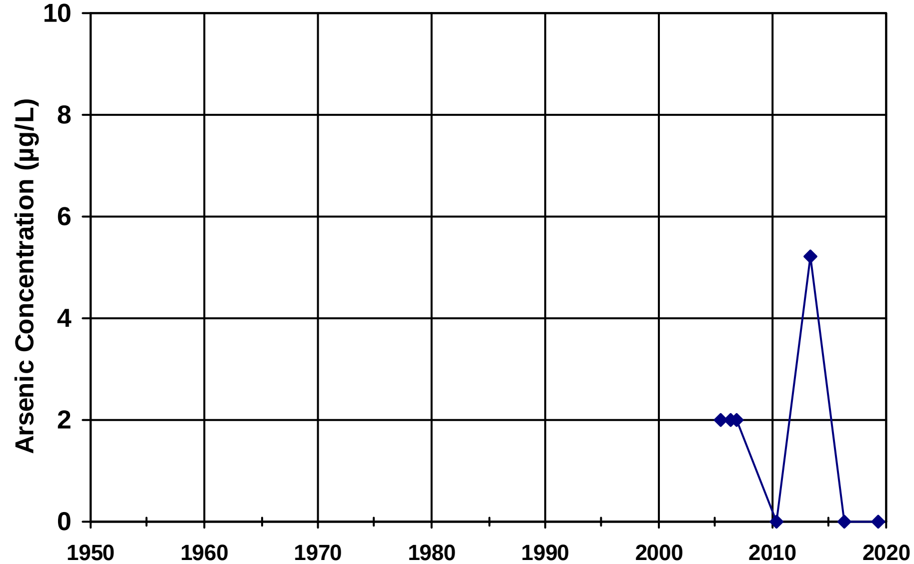

WellID: PLEASANTIMES MUTUAL WATER CO-Well 1 - 4282 STONE
Zone: Unknown
Well Depth: Screened Int.




WellID: PLEASANTIMES MUTUAL WATER CO-WELL 2 - 4520 STONE
Zone: Unknown
Well Depth: Screened Int.

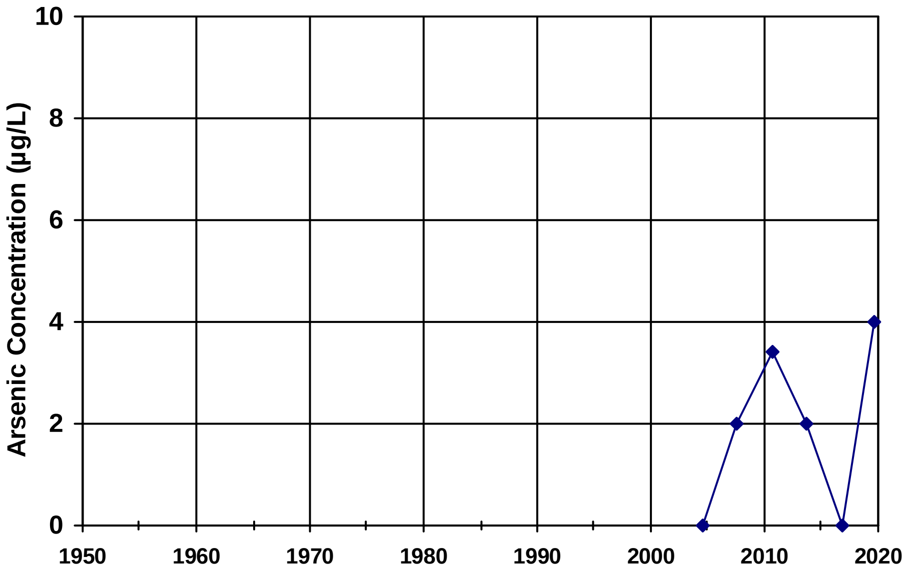



WellID: PLEASANTIMES MUTUAL WATER CO-WELL 3 - 4441 WILLOW
Zone: Unknown
Well Depth: Screened Int.

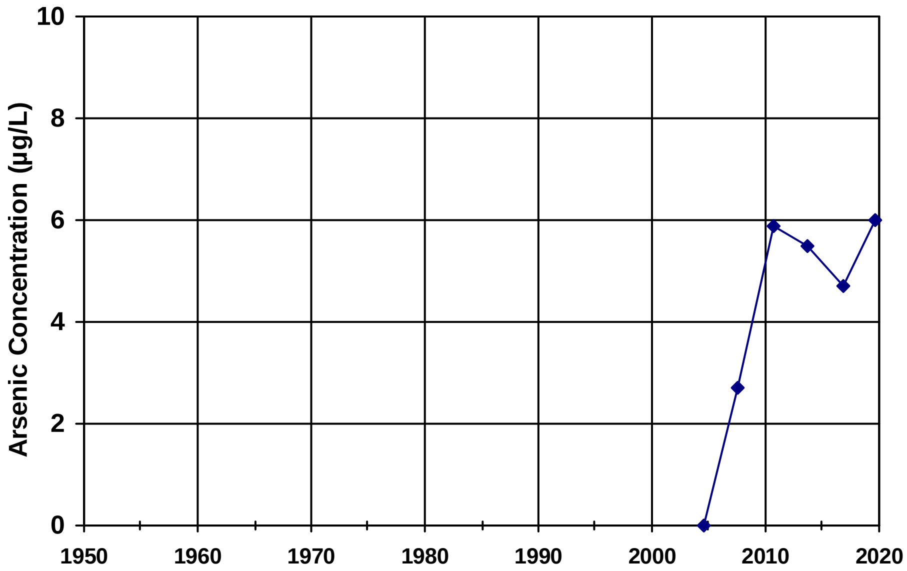



*Non-Detects are plotted as 0*
{R_WQ_ASplots}

WellID: RIVERVIEW WATER ASSOCIATION-WELL 1 BEACON HARBOR
Zone: Unknown
Well Depth: Screened Int.




WellID: RIVERVIEW WATER ASSOCIATION-WELL 2 END OF WILLOW RD
Zone: Unknown
Well Depth: Screened Int.




*Non-Detects are plotted as 0*
{R_WQ_ASplots}

# APPENDIX 3h

**Groundwater Contamination Sites**

**Contaminated Sites**
East Conta Costa Subbasin Groundwater Sustainability Plan
Contra Costa County, California

| Global ID | Business Name | Street Number | Street Name | City | Zip Code | Latitude | Longitude | Case Type | Status | Status Date | Potential Contaminents of Concern | Potential Media of Concern |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SL0601301206 | 1810 W. 10TH STREET | 1810 | W. 10TH STREET | Antioch | 94509 | 38.013084 | -121.829887 | Cleanup Program Site | Completed - Case Closed | 5/6/2009 | Arsenic, Lead | Soil |
| T0601300762 | A & A MARKET (FORMER) | 407 | MAIN ST | Oakley | 94561 | 38.0050065 | -121.7504086 | LUST Cleanup Site | Completed - Case Closed | 12/2/1997 | Gasoline | Soil |
| T0601341681 | A STREET EXTENSION | A | STREET EXTENSION | Antioch | 94531 | 38.015655 | -121.8078304 | LUST Cleanup Site | Completed - Case Closed | 11/5/2014 | Waste Oil / Motor / Hydraulic / Lubricating, Gasoline | Other Groundwater (uses other than drinking water) |
| T0601300769 | AL EAMES FORD | 1400 | 10TH ST W | Antioch | 94509 | 38.0116 | -121.82395 | LUST Cleanup Site | Completed - Case Closed | 5/27/2005 | Waste Oil / Motor / Hydraulic / Lubricating | Aquifer used for drinking water supply |
| SLT5SO033597 | ANCHOR GLASS | 1400 | WEST 4TH STREET | Antioch | | 38.015531 | -121.811412 | Land Disposal Site | Open | 1/1/1965 | | |
| L10001309503 | ANCHOR GLASS LANDFILL | 1400 | 4TH | Antioch | 94509 | 38.017154 | -121.825447 | Land Disposal Site | Open | 1/1/1965 | | |
| T10000000655 | Angelica Textile Service | 1409 | 4th Street W. | Antioch | 94509 | 38.01493011 | -121.82441 | LUST Cleanup Site | Completed - Case Closed | 9/19/2011 | | |
| SL185032890 | ANTIOCH DELTA COVE PROJECT / Antioch Diversified Development Associates | | WILBUR AVE | Antioch | 94509 | 38.01481176 | -121.803139 | Cleanup Program Site | Open - Inactive | 6/2/2009 | | |
| T0601300759 | ANTIOCH HIGH SCHOOL | 700 | 18TH ST W | Antioch | 94509 | 38.0050484 | -121.8153591 | LUST Cleanup Site | Completed - Case Closed | 8/27/1987 | Waste Oil / Motor / Hydraulic / Lubricating | Soil |
| T0601300794 | ANTIOCH PAVING COMPANY | 2540 | WILBUR AVE | Antioch | 94509 | 38.0116749 | -121.771962 | LUST Cleanup Site | Completed - Case Closed | 2/9/2000 | Other Solvent or Non-Petroleum Hydrocarbon | Soil |
| SLT5S0383079 | ANTIOCH YARD PROPERTY | | JAMES DONOLON BLVD. | Antioch | | 37.9805364 | -121.8234444 | Cleanup Program Site | Completed - Case Closed | 8/19/2011 | Diesel, Gasoline | Under Investigation |
| T0601376629 | B.C. STOCKING (FORMER) | 1700 | DISCOVERY BAY BLVD | Byron | 94514 | 37.90166667 | -121.6026367 | LUST Cleanup Site | Completed - Case Closed | 10/1/2010 | Gasoline, Diesel | Other Groundwater (uses other than drinking water) |
| T0601300802 | BEACON #3544 (FORMER) | 7920 | BRENTWOOD BLVD | Brentwood | 94513 | 37.941358 | -121.6960561 | LUST Cleanup Site | Completed - Case Closed | 1/26/2011 | Gasoline | Aquifer used for drinking water supply |
| T0601325015 | BEACON HILLCREST | 1801 | HILLCREST AVENUE | Antioch | 94509 | 38.00377326 | -121.7870175 | LUST Cleanup Site | Completed - Case Closed | 2/13/2018 | Gasoline | Aquifer used for drinking water supply |
| T0601300806 | BETHEL IS MUNI IMPROVEMENTS | 3085 | STONE RD | Bethel Island | 94511 | 38.0244212 | -121.6550644 | LUST Cleanup Site | Completed - Case Closed | 5/12/2010 | Gasoline | Soil |
| T0601378938 | BETHEL ISLAND GOLF COURSE | 3303 | GATEWAY ROAD | Bethel Island | 94511 | 38.02368333 | -121.6357667 | LUST Cleanup Site | Open - Site Assessment | 12/9/2013 | Gasoline | Other Groundwater (uses other than drinking water) |
| T0601300785 | BIG BREAK MARINA | 100 | BIG BREAK RD | Oakley | 94561 | 38.011439 | -121.733616 | LUST Cleanup Site | Completed - Case Closed | 11/13/1997 | Gasoline | Aquifer used for drinking water supply |
| L10006305872 | BIOSOLIDS RECLAMATION | | CAMINO DIABLO ROAD | Byron | 94514 | 37.867467 | -121.646613 | Land Disposal Site | Open | 1/1/1965 | | |
| L10001050819 | BLACK DIAMOND MINES REG PRESER | | SO. TERMINUS OF SOMERSVILLE | Antioch | 94509 | | | Land Disposal Site | Open - Verification Monitoring | 9/1/2009 | | |
| T0601300765 | BLUE GOOSE PROPERTIES | 380 | HWY 4 S | Brentwood | 94513 | 37.9286867 | -121.693474 | LUST Cleanup Site | Completed - Case Closed | 4/14/1997 | Gasoline | Soil |
| T0601389417 | BLUE STAR GAS | 1541 | CYPRESS ROAD, E | Oakley | 94561 | 37.99042 | -121.6672933 | LUST Cleanup Site | Completed - Case Closed | 8/30/2011 | Gasoline | Other Groundwater (uses other than drinking water) |
| T0601300743 | BP OIL | 3720 | LONE TREE WY | Antioch | 95509 | 37.983932 | -121.806301 | LUST Cleanup Site | Completed - Case Closed | 1/13/1997 | Gasoline | Aquifer used for drinking water supply |
| T0601300804 | BRENTWOOD CARDLOCK | 8285 | BRENTWOOD BLVD | Brentwood | 94513 | 37.93385759 | -121.6979599 | LUST Cleanup Site | Open - Site Assessment | 6/14/2016 | Gasoline | Aquifer used for drinking water supply |
| SL0601334843 | BRENTWOOD SHOPPING CENTER | 2200 | San Jose Avenue | Brentwood | 94513 | 37.946104 | -121.703137 | Cleanup Program Site | Completed - Case Closed | 6/19/2001 | | Under Investigation |
| T10000010078 | Brentwood Stenzel Lease | | San Jose Road | Brentwood | 94513 | 37.94031 | -121.72922 | Cleanup Program Site | Open - Inactive | 1/27/2017 | | |
| T0601300750 | BRENTWOOD SUB STATION | 29 | SPRUCE ST | Brentwood | 94513 | 37.937765 | -121.695245 | LUST Cleanup Site | Completed - Case Closed | 10/21/1997 | Gasoline | Aquifer used for drinking water supply |
| T0601300789 | BRIDGEHEAD INC | 5540 | BRIDGEHEAD RD | Oakley | 94561 | 38.005539 | -121.750306 | LUST Cleanup Site | Completed - Case Closed | 6/20/2003 | Gasoline | Aquifer used for drinking water supply |
| T0601300791 | BYRON BETHANY IRR. DISTRICT | 7995 | BRUNS RD | Byron | 94514 | 37.8393044 | -121.5992445 | LUST Cleanup Site | Completed - Case Closed | 9/13/1989 | Gasoline | Soil |
| T0601330032 | BYRON CORNER'S | 15031 | BYRON HIGHWAY | Byron | 94514 | 37.86677 | -121.63661 | LUST Cleanup Site | Completed - Case Closed | 10/9/2008 | Gasoline, Diesel | Soil |
| T0601300799 | BYRON GARAGE | 14711 | BYRON HWY | Byron | 95514 | 37.871616 | -121.641099 | LUST Cleanup Site | Completed - Case Closed | 4/24/1996 | Diesel | Soil |
| T0601300763 | CARL CROSS STATE FARM | 415 | G ST | Antioch | 94509 | 38.014978 | -121.813548 | LUST Cleanup Site | Completed - Case Closed | 12/2/1997 | Gasoline | Soil |
| T0601300778 | CHEVRON #9-1757 | 2100 | L ST | Antioch | 94509 | 38.00336 | -121.820733 | LUST Cleanup Site | Completed - Case Closed | 12/5/1994 | Gasoline | Aquifer used for drinking water supply |
| T0601300773 | CHEVRON #9-3801 | 5433 | NEROLY RD | Antioch | 94509 | 38.00459777 | -121.7511708 | LUST Cleanup Site | Completed - Case Closed | 5/29/2002 | Gasoline | Aquifer used for drinking water supply |
| T0601300782 | CHEVRON #9-4585 | 2413 | A ST | Antioch | 94509 | 38.0000886 | -121.8058588 | LUST Cleanup Site | Completed - Case Closed | 8/29/2017 | Gasoline | Aquifer used for drinking water supply |

| Global ID | Business Name | Street Number | Street Name | City | Zip Code | Latitude | Longitude | Case Type | Status | Status Date | Potential Contaminents of Concern | Potential Media of Concern |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T10000003117 | Chevron Marsh Creek Road-UPRR Crossing | | Marsh Creek Road | Brentwood | 94513 | 37.89636112 | -121.6642284 | Cleanup Program Site | Open - Site Assessment | 7/6/2011 | Total Petroleum Hydrocarbons (TPH) | Soil |
| T10000000197 | Chevron TAOC A Street | 2205 | A Street | Antioch | 94509 | 38.001146 | -121.804771 | Cleanup Program Site | Open - Site Assessment | 8/13/2008 | Crude Oil | Other Groundwater (uses other than drinking water), Soil |
| T10000000198 | Chevron TAOC New Love Pump Sta. | | Willow Ave | Antioch | 94509 | 37.99322032 | -121.7630625 | Cleanup Program Site | Completed - Case Closed | 11/16/2010 | Crude Oil | Soil, Soil Vapor, Surface water |
| SL0601319412 | CHEVRON TEXACO, BRUNS | | BYRON RD (MILEPOST 225.6) | Byron | | 37.8312 | -121.6057 | Cleanup Program Site | Completed - Case Closed | 11/19/2003 | Heating Oil / Fuel Oil | Other Groundwater (uses other than drinking water), Soil |
| SL0601380416 | CHEVRON, CENTRAL BLVD | | CENTRAL BOULEVARD | Brentwood | 94513 | 37.935668 | -121.701307 | Cleanup Program Site | Completed - Case Closed | 2/22/2012 | * Petroleum - Other | Aquifer used for drinking water supply, Soil, Soil Vapor, Under Investigation |
| SL0601370344 | CHEVRON, HICKSON KERLEY | 3951 | OAKLEY ROAD | Antioch | 94509 | 37.9968 | -121.7711 | Cleanup Program Site | Completed - Case Closed | 8/8/2012 | Heating Oil / Fuel Oil | Other Groundwater (uses other than drinking water), Soil |
| SL0601316394 | CHEVRON, HOLEY-BYRON ROAD | | HOLEY ROAD | Byron | 94514 | 37.831039 | -121.614936 | Cleanup Program Site | Completed - Case Closed | 9/13/2012 | Other Solvent or Non-Petroleum Hydrocarbon | Under Investigation |
| SL0601377128 | CHEVRON, MINNESOTA AVE | | CAMBRIAN PLACE | Brentwood | 94513 | 37.9513 | -121.7144 | Cleanup Program Site | Completed - Case Closed | 12/17/2009 | Gasoline | Other Groundwater (uses other than drinking water), Soil |
| SL0601311093 | CHEVRON, TAOC BYRON HOT SPRINGS | 5301 | BYRON HOT SPRINGS RD | Byron | 94514 | 37.8482 | -121.6223 | Cleanup Program Site | Completed - Case Closed | 6/18/2014 | Crude Oil | Other Groundwater (uses other than drinking water), Soil |
| SL0601351425 | CHEVRON, WALNUT BLVD | | WALNUT BOULEVARD | Brentwood | 94513 | 37.931234 | -121.696329 | Cleanup Program Site | Completed - Case Closed | 6/18/2015 | Other Solvent or Non-Petroleum Hydrocarbon, Crude Oil | Under Investigation |
| T0601389036 | CITY OF ANTIOCH CORP YARD | 1201 | WEST 4TH STREET | Antioch | 94531 | 38.0144 | -121.82228 | LUST Cleanup Site | Completed - Case Closed | 11/5/2014 | Gasoline | Aquifer used for drinking water supply |
| T0601300798 | CONTRA COSTA COUNTY FAIR | 1201 | 10TH ST W | Antioch | 95509 | 38.0113532 | -121.8210234 | LUST Cleanup Site | Completed - Case Closed | 8/12/1996 | Gasoline | Aquifer used for drinking water supply |
| SLT5S1103150 | Cooks Battery Reclamation Site | 139 | HILL AVENUE | Oakley | | 37.97429 | -121.688641 | Cleanup Program Site | Completed - Case Closed | 6/14/2006 | Lead | Under Investigation |
| T10000008764 | Custom Cleaners | 2575 | main street | Oakley | | 37.99771 | -121.73034 | Cleanup Program Site | Completed - Case Closed | 4/21/2016 | Tetrachloroethylene (PCE) | Soil Vapor |
| SL0601350932 | CYPRESS SQUARE SHOPPING CENTER | 2025 | MAIN STREET | Oakley | | 38.00353497 | -121.733923 | Cleanup Program Site | Completed - Case Closed | 8/30/2001 | Dichloroethane (DCA), Dichloroethene (DCE) | Other Groundwater (uses other than drinking water) |
| T0601300795 | DELTA DODGE | 1725 | 10TH ST W | Antioch | 94509 | 38.0111683 | -121.8247697 | LUST Cleanup Site | Completed - Case Closed | 7/19/2000 | Other Solvent or Non-Petroleum Hydrocarbon | Aquifer used for drinking water supply |
| T0601300746 | DIAMOND MECHANICAL CO. | 1705 | SOMERSVILLE RD | Antioch | 94509 | 38.0093313 | -121.8314626 | LUST Cleanup Site | Completed - Case Closed | 5/17/2000 | Gasoline | Soil |
| T0601300751 | DISCOUNT LIQUOR STORE | 39 | ROSSI AVE | Antioch | 94509 | 38.000013 | -121.807744 | LUST Cleanup Site | Completed - Case Closed | 2/20/2001 | Gasoline | Aquifer used for drinking water supply |
| T0601300811 | DISCOVERY BAY YACHT HARBOR | 5901 | MARINA RD | Discovery Bay | 94524 | 37.9046377 | -121.5902552 | LUST Cleanup Site | Completed - Case Closed | 12/4/2008 | Gasoline | Aquifer used for drinking water supply |
| SLT5S1283168 | DOW CHEMICAL CO.- MARSH CREEK DEHYDRATION STATION | | MARSH CREEK | Brentwood | | 37.94792973 | -121.69318 | Cleanup Program Site | Completed - Case Closed | 3/5/2009 | Benzene | Soil, Under Investigation |
| T0601300745 | DU PONT ANTIOCH WORKS | 6000 | BRIDGEHEAD RD | Antioch | 94509 | 38.0121453 | -121.7508293 | Cleanup Program Site | Open - Remediation | 5/1/2001 | Gasoline | Aquifer used for drinking water supply |
| SL0601340233 | DUPONT CHEMICAL CO., ANTIOCH WORKS (E.I. DUPONT) | 6000 | BRIDGEHEAD ROAD | Oakley | | 38.01225481 | -121.7505684 | Cleanup Program Site | Open - Remediation | 12/17/2004 | * Chlorinated Solvents - PCE, * Chlorinated Solvents - TCE, * Other Spill, * Semi-Volatile Organic Compounds, * Volatile Organic Compounds (VOC) | Other Groundwater (uses other than drinking water), Surface water |
| L10003120655 | EAST OF ANTIOCH LANDFILL | | SOUTH SIDE MARKLEY CREEK | Antioch | | | | Land Disposal Site | Open | 1/1/1965 | | |
| T0601300775 | EBMUD - BIXLER | 50 | BIXLER ST | Brentwood | 94513 | 37.93942542 | -121.6234159 | LUST Cleanup Site | Completed - Case Closed | 4/10/2018 | Gasoline | Aquifer used for drinking water supply |
| T0601300797 | EXXON #7-3982 | 2101 | SOMERSVILLE RD | Antioch | 94509 | 38.001685 | -121.839191 | LUST Cleanup Site | Completed - Case Closed | 8/12/1996 | Gasoline | Soil |
| T0601300808 | EXXON SS #7-5138 Case #1 | 2700 | HILLCREST AVE | Antioch | 94509 | 37.994418 | -121.785059 | LUST Cleanup Site | Completed - Case Closed | 2/8/2001 | Gasoline | Aquifer used for drinking water supply |
| T0601300783 | E-Z SERVE #100972 | 741 | 2ND ST | Brentwood | 94513 | 37.93389143 | -121.6946265 | LUST Cleanup Site | Open - Site Assessment | 4/19/2013 | Gasoline | Aquifer used for drinking water supply |
| T0601343310 | FIRST STOP GAS | 7935 | BRENTWOOD BLVD | Brentwood | 94513 | 37.9408115 | -121.6965066 | LUST Cleanup Site | Open - Remediation | 11/1/2010 | Gasoline, Diesel | Other Groundwater (uses other than drinking water) |

| Global ID | Business Name | Street Number | Street Name | City | Zip Code | Latitude | Longitude | Case Type | Status | Status Date | Potential Contaminents of Concern | Potential Media of Concern |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SL185922952 | FKP INC (FORMERLY HICKSON - KERLEY) | 3951 | OAKLEY RD | Antioch | | 37.99616268 | -121.7676544 | Cleanup Program Site | Open - Site Assessment | 5/1/2016 | * Fertilizers, * Metals/Heavy Metals, * Other Spill | Other Groundwater (uses other than drinking water) |
| T0601300753 | FOOD & LIQUOR #179 | 1502 | DISCOVERY BAY BLVD | Byron | 94514 | 37.9066246 | -121.6033624 | LUST Cleanup Site | Completed - Case Closed | 9/13/2000 | Gasoline | Aquifer used for drinking water supply |
| T0601300767 | FOOD & LIQUOR #86 | | HWY 4 & CYPRESS | Oakley | 94561 | 37.99041708 | -121.6965197 | LUST Cleanup Site | Completed - Case Closed | 8/14/1995 | Gasoline | Soil |
| T10000008457 | Former Delta Cleaners | 219 | Oak Street | Brentwood | 94513 | 37.93321 | -121.69436 | Cleanup Program Site | Open - Site Assessment | 2/8/2016 | Tetrachloroethylene (PCE) | Under Investigation |
| T0601300761 | FORMER DICK KANE MOTORS | 3100 | DELTA FAIR BLVD | Antioch | 94509 | 38.0013505 | -121.8380617 | LUST Cleanup Site | Completed - Case Closed | 6/11/1997 | Gasoline | Aquifer used for drinking water supply |
| T0601300756 | FORMER EXXON 7-3615 | 2610 | CONTRA LOMA BLVD | Antioch | 94509 | 37.9989086 | -121.8216102 | LUST Cleanup Site | Completed - Case Closed | 5/29/2012 | Gasoline | Aquifer used for drinking water supply |
| T0601300800 | FORMER SERVICE STATION | 1809 | A ST | Antioch | 95509 | 38.0044295 | -121.8058958 | LUST Cleanup Site | Open - Site Assessment | 7/27/2017 | Other Solvent or Non-Petroleum Hydrocarbon, Benzene, Ethylbenzene, Gasoline, MTBE / TBA / Other Fuel Oxygenates, Total Petroleum Hydrocarbons (TPH), Xylene | Well used for drinking water supply |
| T10000009947 | Former Somersville ARCO Service Station | 2698 | Somersville Road | Antioch | | 37.99903 | -121.84303 | Non-Case Information | Informational Item | 12/8/2016 | Benzene, Gasoline | |
| T0601372054 | FRIENDLY HARBORS, LLC | 7000 | HOLLAND TRACT ROAD | Brentwood | 94513 | 37.97360667 | -121.58215 | LUST Cleanup Site | Completed - Case Closed | 8/31/2009 | Gasoline, Diesel | Other Groundwater (uses other than drinking water) |
| SLT5S1443184 | Fulton Shipyard | 307 | FULTON SHIPYARD ROAD | Antioch | | 38.01675588 | -121.8022227 | Cleanup Program Site | Open - Site Assessment | 1/1/2013 | Lead, Other Metal, Other Petroleum, Total Petroleum Hydrocarbons (TPH) | Soil |
| T0601300809 | GAS FOR LESS | 924 | 10TH ST W | Antioch | 95509 | 38.01140736 | -121.8181786 | LUST Cleanup Site | Open - Site Assessment | 7/1/2015 | Gasoline | Aquifer used for drinking water supply |
| T0601300749 | GAYLORD (FORMER FIBERBOARD) | 1700 | 4TH ST | Antioch | 94509 | 38.0170839 | -121.827745 | LUST Cleanup Site | Completed - Case Closed | 8/12/1996 | Diesel | Aquifer used for drinking water supply |
| SL0601314468 | GAYLORD CONTAINER CORPORATION-East Mill | 2603 | WILBUR AVE | Antioch | | 38.014833 | -121.77047 | Cleanup Program Site | Open - Remediation | 10/19/2012 | * Perchlorate, * Volatile Organic Compounds (VOC) | Aquifer used for drinking water supply, Contaminated Surface / Structure, Other Groundwater (uses other than drinking water), Soil |
| SL0601350099 | GWF POWER PLANT - ANTIOCH | 1900 | WILBUR AVENUE | Antioch | | 38.011724 | -121.780983 | Cleanup Program Site | Completed - Case Closed | 6/27/2012 | Diesel | Other Groundwater (uses other than drinking water) |
| T0601300776 | HICKMOTT CANNERY (FORMER) | | 5TH & B ST | Antioch | 94509 | 38.015858 | -121.806506 | LUST Cleanup Site | Completed - Case Closed | 1/28/2016 | Gasoline | Aquifer used for drinking water supply |
| SL186423613 | HICKMOTT CANNERY (FORMER) | | 5th & B ST | Antioch | 94509 | 38.015858 | -121.805991 | Cleanup Program Site | Open - Inactive | 2/10/2016 | Arsenic, Other Metal | |
| SL186232981 | HICKSON-KERLEY PIPELINE RELEASE | 3951 | OAKLEY RD | Antioch | | 37.99677143 | -121.771152 | Cleanup Program Site | Completed - Case Closed | 3/20/2012 | | |
| T0601378105 | HILLCREST VALERO Case #2 | 2700 | HILLCREST AVE | Antioch | 94509 | 37.994418 | -121.785129 | LUST Cleanup Site | Completed - Case Closed | 5/5/2005 | Diesel | Soil |
| SL0601327206 | INLAND MARINE (FORMER) | 1600 | W. 10TH STREET, | Antioch | | 38.0124492 | -121.8263626 | Cleanup Program Site | Completed - Case Closed | 2/28/2012 | Waste Oil / Motor / Hydraulic / Lubricating | Soil |
| L10007411167 | JERSEY ISLAND ASH DISPOSAL | | DUTCH SLOUGH | Jersey | | | | Land Disposal Site | Open | 1/1/1965 | | |
| T0601300780 | KILPATRICK'S BAKERIES DEPOT | 1801 | SOMERSVILLE RD | Antioch | 94509 | 38.00919318 | -121.8314927 | LUST Cleanup Site | Completed - Case Closed | 2/18/2010 | Gasoline | Aquifer used for drinking water supply |
| T0601300801 | KLM TRANSPORTATION | 1831 | SOMERSVILLE RD | Antioch | 95509 | 38.0061938 | -121.8344618 | LUST Cleanup Site | Completed - Case Closed | 10/6/1998 | Diesel | Aquifer used for drinking water supply |
| SL205383009 | KMEP BALFOUR | 3150 | BALFOUR ROAD | Brentwood | 94513 | 37.9252618 | -121.7231225 | Cleanup Program Site | Completed - Case Closed | 7/19/2012 | Gasoline, * Petroleum - Automotive gasolines, * Petroleum - Diesel fuels | Aquifer used for drinking water supply |
| T10000002015 | KMEP Brentwood Booster | n/a | Balfour Rd and State Rte 4 | Brentwood | 94513 | 37.92564894 | -121.7337942 | Cleanup Program Site | Open - Remediation | 2/27/2017 | MTBE / TBA / Other Fuel Oxygenates, Total Petroleum Hydrocarbons (TPH) | Other Groundwater (uses other than drinking water), Soil |
| T10000003258 | KMEP Orwood Block Valve Release | | Orwood | Brentwood | 94513 | 37.93909965 | -121.5780866 | Cleanup Program Site | Completed - Case Closed | 3/2/2017 | Diesel, MTBE / TBA / Other Fuel Oxygenates, Gasoline | Aquifer used for drinking water supply, Soil, Surface water |

| Global ID | Business Name | Street Number | Street Name | City | Zip Code | Latitude | Longitude | Case Type | Status | Status Date | Potential Contaminents of Concern | Potential Media of Concern |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T0601300754 | LARRY CARTER MARINE | | BETHEL ISLAND RD | Bethel Island | 94511 | 38.0244212 | -121.6550644 | Cleanup Program Site | Completed - Case Closed | 11/9/2005 | Gasoline | Aquifer used for drinking water supply |
| T0601300777 | LAURITZEN YACHT HARBOR | | RTE 1 | Antioch | 94509 | 38.0074134 | -121.7717579 | LUST Cleanup Site | Completed - Case Closed | 12/2/1997 | Gasoline | Soil |
| T0601391419 | LAURITZEN YACHT HARBOR LLC | 115 | LAURITZEN LANE | Oakley | 94561 | 38.019304 | -121.749146 | LUST Cleanup Site | Completed - Case Closed | 6/2/2009 | Gasoline | Aquifer used for drinking water supply |
| T0601300744 | LIBERTY UNION HIGH SCHOOL | 850 | 2ND ST | Brentwood | 94513 | 37.93665002 | -121.6949558 | LUST Cleanup Site | Open - Remediation | 8/25/2004 | Gasoline | Aquifer used for drinking water supply |
| T0601300786 | LLOYD'S HOLIDAY HARBOR | | RTE 1 | Antioch | 94509 | 38.0074134 | -121.7717579 | LUST Cleanup Site | Completed - Case Closed | 12/2/1997 | Gasoline | Soil |
| SLT5S1813220 | Los Vaqueros Water Conveyance Pipeline Project | | STATION 238+97-240+17 SP UNDERCROSSING | Byron | | 37.88063187 | -121.6507018 | Non-Case Information | Informational Item | 10/27/2016 | | Under Investigation |
| SLT5S1843223 | Lyon Woodfield Project | | East from intersection of Brentwood Blvd and Nancy Street | Brentwood | | 37.94413936 | -121.6933409 | Cleanup Program Site | Completed - Case Closed | 7/17/2000 | | Soil |
| T0601393596 | MAGGIORE PROPERTY | 1200 | BALFOUR RD | Brentwood | 94513 | 37.925863 | -121.723886 | LUST Cleanup Site | Completed - Case Closed | 4/4/2003 | Gasoline | Aquifer used for drinking water supply |
| T0601341021 | MAZZEI AUTOMOBILE DEALERSHIP (FORMER) | 1530 | WEST 10TH STREET | Antioch | 94565 | 38.01194 | -121.82513 | LUST Cleanup Site | Completed - Case Closed | 1/9/2012 | Gasoline, Waste Oil / Motor / Hydraulic / Lubricating | Other Groundwater (uses other than drinking water) |
| T0601300810 | NEW BRIDGE MARINA | 6325 | BRIDGEHEAD RD | Antioch | 94509 | 38.0168421 | -121.7509044 | LUST Cleanup Site | Completed - Case Closed | 8/19/2009 | Gasoline | Aquifer used for drinking water supply |
| T0601300758 | OAKLEY BUILDERS SUPPLY | 800 | MAIN ST | Oakley | 94561 | 38.0052385 | -121.7444308 | LUST Cleanup Site | Completed - Case Closed | 12/2/1997 | Gasoline | Soil |
| T0601359797 | OLYMPIAN TEXACO STATION | 2310 | A STREET | Antioch | 94509 | 38.00021339 | -121.8061272 | LUST Cleanup Site | Open - Verification Monitoring | 6/13/2014 | Gasoline | Aquifer used for drinking water supply |
| SL185062892 | OXY USA, INC. FORMER WILLIAMSON TANK FARM | | DEER VALLEY ROAD | Brentwood | | 37.93308863 | -121.7007116 | Cleanup Program Site | Completed - Case Closed | 2/20/2003 | | Aquifer used for drinking water supply |
| SL0601327305 | PACIFIC GAS & ELECTRIC | 5400 | NERLOY | Oakley | | 38.004239 | -121.749912 | Cleanup Program Site | Completed - Case Closed | 3/23/2010 | * Volatile Organic Compounds (VOC) | Aquifer used for drinking water supply |
| T0601300747 | PANTELL'S MUSIC BOX | 407 | G ST | Antioch | 94509 | 38.0154171 | -121.8135982 | LUST Cleanup Site | Completed - Case Closed | 10/15/2013 | Gasoline | Aquifer used for drinking water supply |
| T0601300779 | PECKHAM PROPERTY | 3215 | 18TH ST E | Antioch | 94509 | 38.005953 | -121.760986 | LUST Cleanup Site | Completed - Case Closed | 1/27/1997 | Gasoline | Soil |
| T0601300781 | PERCY'S RADIATOR | 901 | A ST | Antioch | 94509 | 38.011985 | -121.8057 | LUST Cleanup Site | Completed - Case Closed | 2/13/2013 | Diesel | Aquifer used for drinking water supply |
| T0601391420 | PETROL EXPRESS | 1800 | 10TH ST W | Antioch | 94509 | 38.012637 | -121.82974 | LUST Cleanup Site | Completed - Case Closed | 11/21/2014 | Gasoline | Aquifer used for drinking water supply |
| T0601300752 | PG&E (FORMER CORP. YARD) | | BUCHANAN RD | Antioch | 94509 | 37.9956467 | -121.8065358 | LUST Cleanup Site | Completed - Case Closed | 4/28/2000 | Gasoline | Aquifer used for drinking water supply |
| SL0601394831 | PG&E ANTIOCH NATURAL GAS TERMINAL | 5900 | BRIDGEHEAD ROAD | Oakley | | 38.00961789 | -121.7499652 | Cleanup Program Site | Open - Eligible for Closure | 7/10/2018 | Benzene, Diesel, Ethylbenzene, Gasoline, Toluene, Total Petroleum Hydrocarbons (TPH), Xylene | Aquifer used for drinking water supply, Soil, Soil Vapor, Well used for drinking water supply |
| T0601300787 | PG&E ANTIOCH SERVICE CENTER | 2111 | HILLCREST AVE | Antioch | 94509 | 37.99949383 | -121.7865157 | LUST Cleanup Site | Completed - Case Closed | 11/4/1992 | Waste Oil / Motor / Hydraulic / Lubricating | Soil |
| SL205092993 | PG&E Antioch Service Yard Northern Parcel | | SOMERSVILLE AND BUCHANAN RD | Antioch | | 37.99766936 | -121.8435717 | Cleanup Program Site | Open - Remediation | 5/24/2017 | Trichloroethylene (TCE), Benzene, Diesel, Ethylbenzene, Gasoline, Naphthalene, Toluene, Total Petroleum Hydrocarbons (TPH), Xylene | Other Groundwater (uses other than drinking water) |
| T10000009571 | PG&E Antioch Service Yard Southern Parcel | | SOMERSVILLE AND BUCHANAN RD | Antioch | 94509 | 37.9967 | -121.84419 | Cleanup Program Site | Completed - Case Closed | 12/1/2016 | Benzene, Diesel, Ethylbenzene, Gasoline, Toluene, Total Petroleum Hydrocarbons (TPH), Xylene | Other Groundwater (uses other than drinking water) |
| SL186102968 | PG&E DUTCH SLOUGH DEHYDRATOR STATION | 1126 | Fetzer Lane | Oakley | 94561-6004 | 37.997942 | -121.709278 | Cleanup Program Site | Open - Site Assessment | 7/21/2017 | Benzene, Diesel, Ethylbenzene, Gasoline, Toluene, Total Petroleum Hydrocarbons (TPH), Waste Oil / Motor / Hydraulic / Lubricating, Xylene | Aquifer used for drinking water supply, Soil |

| Global ID | Business Name | Street Number | Street Name | City | Zip Code | Latitude | Longitude | Case Type | Status | Status Date | Potential Contaminents of Concern | Potential Media of Concern |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SL0601346154 | PG&E OAKLEY RD METERING STATION | | OAKLEY ROAD | Antioch | 94509 | 37.997698 | -121.759578 | Cleanup Program Site | Open - Remediation | 11/20/2013 | Other Petroleum | Aquifer used for drinking water supply |
| SL205032990 | Pioneer Americas (former KEMWATER & former IMPERIAL WEST) | 2151 | WILBUR AVE | Antioch | | 38.013806 | -121.778516 | Cleanup Program Site | Open - Remediation | 1/1/2002 | * * CHLORIDE, * * IRON, * * MAGNESIUM, * * MANGANESE, Nitrate | Other Groundwater (uses other than drinking water) |
| T0601359254 | PRIVATE RESIDENCE | | PRIVATE RESIDENCE | Brentwood | 94513 | 37.93461333 | -121.69216 | LUST Cleanup Site | Completed - Case Closed | 11/9/2009 | Diesel | Aquifer used for drinking water supply |
| T0601300788 | PROSPECTS | 820 | 2ND ST | Antioch | 94509 | 38.01702695 | -121.8173656 | LUST Cleanup Site | Completed - Case Closed | 9/27/2012 | Gasoline | Aquifer used for drinking water supply |
| T0601358660 | RAIN FOR RENT | 5301 | LIVE OAK AVENUE | Oakley | 94561 | 38.0018 | -121.74332 | LUST Cleanup Site | Completed - Case Closed | 4/8/2008 | Diesel, Waste Oil / Motor / Hydraulic / Lubricating | Other Groundwater (uses other than drinking water) |
| SL0601301938 | RAVENSWOOD (DELTA LAKES) | | POINT OF TIMBER RD | Brentwood | | 37.910976 | -121.632103 | Cleanup Program Site | Completed - Case Closed | 3/17/2017 | | |
| SL0601399070 | RESERVOIR 50 | | UNKNOWN | Antioch | | 37.99288211 | -121.8419838 | Cleanup Program Site | Completed - Case Closed | 6/24/2003 | | Under Investigation |
| T0601300784 | ROMI'S FOOD AND LIQUOR | 418 | 18TH ST E | Antioch | 94509 | 38.0047625 | -121.7978116 | LUST Cleanup Site | Completed - Case Closed | 7/27/2010 | Gasoline | Aquifer used for drinking water supply |
| T0601300793 | RUSTY PORT HOLE/BOYDS HARBOR | 3895 | WILLOW RD | Bethel Island | 94511 | 38.0365746 | -121.6258179 | LUST Cleanup Site | Completed - Case Closed | 12/3/1997 | Gasoline | Soil |
| T0601300755 | SAVER'S SS | 2323 | HWY 4 | Brentwood | 94513 | 37.9391544 | -121.6937351 | LUST Cleanup Site | Completed - Case Closed | 12/2/1997 | Gasoline | Soil |
| SL0601397127 | SCIORTINO WELL AREA | | BRENTWOOD BLVD | Brentwood | | 37.94803307 | -121.6908472 | Cleanup Program Site | Completed - Case Closed | 6/1/2009 | Gasoline, Diesel | Soil |
| T0601300760 | SCOTTO'S AUTO PAINTING | 1311 | 4TH ST | Antioch | 94509 | 38.015118 | -121.822693 | LUST Cleanup Site | Completed - Case Closed | 12/7/1987 | Diesel | Soil |
| T0601300774 | SHELL | 2838 | LONE TREE WY | Antioch | 94509 | 37.993946 | -121.808214 | LUST Cleanup Site | Completed - Case Closed | 2/9/1990 | Waste Oil / Motor / Hydraulic / Lubricating | Soil |
| T0601300403 | SHELL | 2010 | SOMERSVILLE RD | Antioch | 94531 | 38.002688 | -121.839233 | LUST Cleanup Site | Completed - Case Closed | 6/10/1997 | Gasoline | Other Groundwater (uses other than drinking water) |
| T0601306725 | SHELL SERVICE STATION CASE #2 | 2838 | LONE TREE | Antioch | 94509 | 37.99391333 | -121.8081533 | LUST Cleanup Site | Completed - Case Closed | 11/9/2010 | MTBE / TBA / Other Fuel Oxygenates | Other Groundwater (uses other than drinking water) |
| T0601300771 | SHELL SS CASE #1 | 1800 | A ST | Antioch | 94509 | 38.004695 | -121.806349 | LUST Cleanup Site | Completed - Case Closed | 1/8/1997 | Gasoline | Aquifer used for drinking water supply |
| T0601300807 | SHELL SS CASE #2 | 1800 | A ST | Antioch | 94509 | 38.0048494 | -121.8061518 | LUST Cleanup Site | Open - Assessment & Interim Remedial Action | 8/3/2017 | Gasoline | Aquifer used for drinking water supply |
| T0601300768 | SHELL SS (EX-TEXAXO/REGAL) | 2010 | Auto Center Drive | Antioch | 94509 | 38.00261155 | -121.8392458 | LUST Cleanup Site | Completed - Case Closed | 9/3/2014 | Gasoline | Aquifer used for drinking water supply |
| T0601300803 | SILVERA PROPERTY | 900 | A ST | Antioch | 94509 | 38.01124464 | -121.8062997 | LUST Cleanup Site | Open - Remediation | 6/8/2011 | Gasoline | Aquifer used for drinking water supply |
| SL186343607 | SR4 BYPASS AUTHORITY DAVIS PROPERTY | | STATE RT 4 BYPASS AUTHORITY | Brentwood | | 37.93308863 | -121.7007116 | Cleanup Program Site | Completed - Case Closed | 5/1/2002 | | Other Groundwater (uses other than drinking water) |
| SL186172975 | TERMO CO | | SOUTHWEST END OF SAN JOSE AVE | Brentwood | | 37.93308863 | -121.7007116 | Cleanup Program Site | Completed - Case Closed | 12/6/2000 | | Other Groundwater (uses other than drinking water) |
| T0601300748 | TERMO COMPANY | | SAN JOSE AVE | Brentwood | 94513 | 37.9340945 | -121.6999951 | LUST Cleanup Site | Completed - Case Closed | 10/31/1986 | Gasoline | Soil |
| SL185522920 | TEXACO WELDON & COMPILLI PROPERTY | | BYRON RD | Byron | | 37.84881851 | -121.6225547 | Cleanup Program Site | Completed - Case Closed | 6/18/2014 | | |
| T0601300770 | TOSCO - FACILITY #5963 | 2701 | CONTRA LOMA BLVD | Antioch | 94509 | 37.9979626 | -121.8219562 | LUST Cleanup Site | Completed - Case Closed | 1/9/2014 | Gasoline | Aquifer used for drinking water supply |
| T0601300790 | UNOCAL #2998 (FORMER) | 1029 | 10TH ST | Antioch | 94509 | 38.01099872 | -121.8194167 | LUST Cleanup Site | Completed - Case Closed | 11/8/2011 | Gasoline | Aquifer used for drinking water supply |
| T0601300772 | UNOCAL #3946 | 1601 | A ST | Antioch | 94509 | 38.0063554 | -121.8058529 | LUST Cleanup Site | Completed - Case Closed | 11/21/2014 | Gasoline | Aquifer used for drinking water supply |
| T0601300676 | USA GASOLINE CORPORATION | 1915 | Auto Center Drive | Antioch | 94531 | 38.006091 | -121.834142 | LUST Cleanup Site | Open - Remediation | 11/22/2011 | Gasoline | Other Groundwater (uses other than drinking water) |
| SL0601391758 | WALTER HANSEN TRUST | 1809 | A STREET | Antioch | | 38.004497 | -121.805555 | Cleanup Program Site | Open - Verification Monitoring | 7/9/2009 | * Chlorinated Hydrocarbons | Aquifer used for drinking water supply |
| T0601300766 | WILLIAM HARLOW | 206 | OAK ST | Brentwood | 94513 | 37.9329756 | -121.693715 | LUST Cleanup Site | Completed - Case Closed | 2/12/2016 | Gasoline | Aquifer used for drinking water supply |
| T0601300792 | WOODS YACHT HARBOR | 3307 | WELLS RD | Bethel Island | 94511 | 38.0077788 | -121.630247 | LUST Cleanup Site | Completed - Case Closed | 1/17/2002 | Gasoline | Aquifer used for drinking water supply |

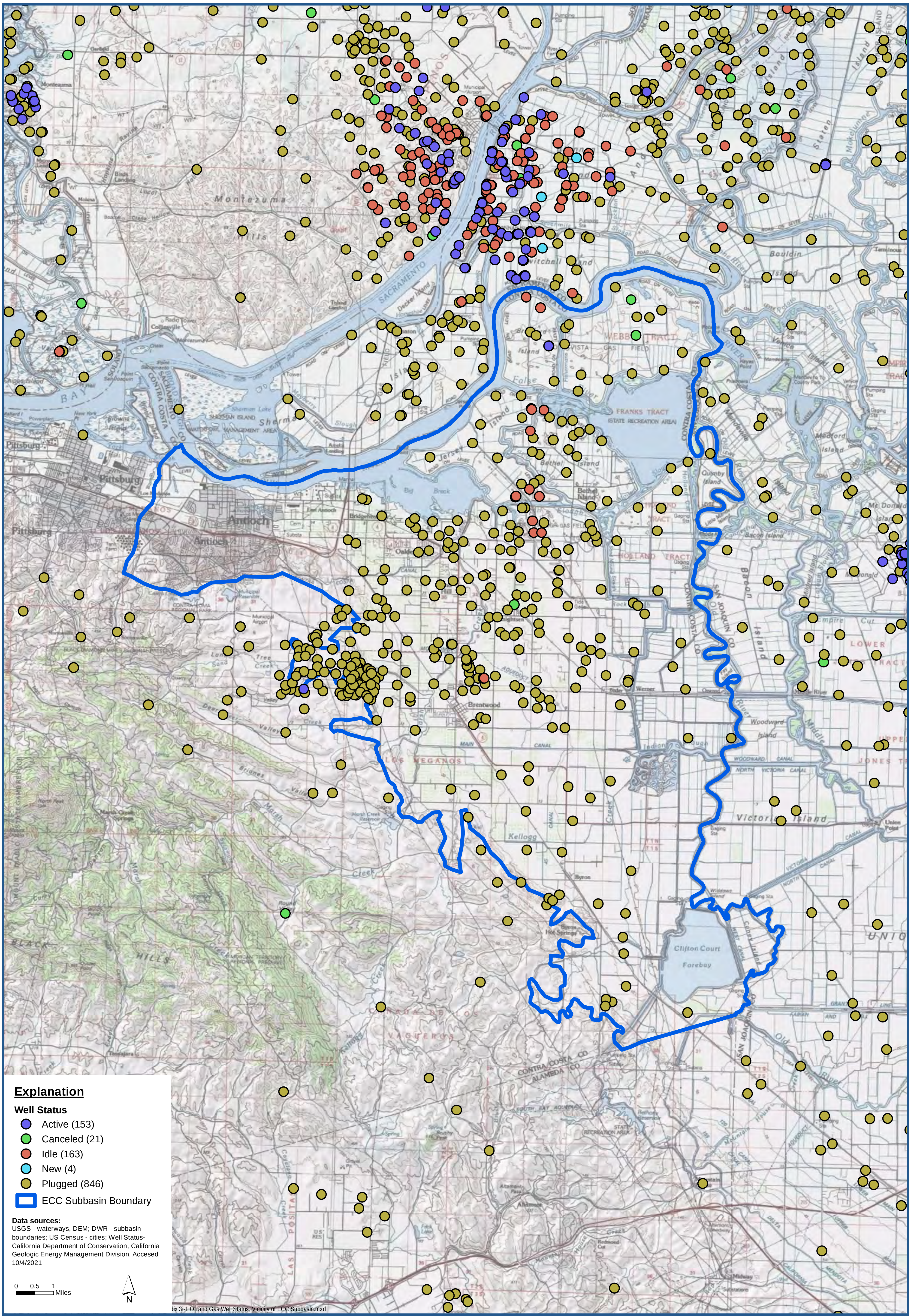
**Contaminated Sites**
East Conta Costa Subbasin Groundwater Sustainability Plan
Contra Costa County, California

| Global ID | Business Name | Street Number | Street Name | City | Zip Code | Latitude | Longitude | Case Type | Status | Status Date | Potential Contaminents of Concern | Potential Media of Concern |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T0601300764 | WOODY'S SERVICE | 1022 | 4TH ST W | Antioch | 94509 | 38.0155341 | -121.8186813 | LUST Cleanup Site | Completed - Case Closed | 8/19/2010 | Gasoline | Aquifer used for drinking water supply |

Note: Data dowloaded from Geotracker 10/8/2018

# APPENDIX 3i

**ECC Subbasin Oil and Gas Wells and Fields**

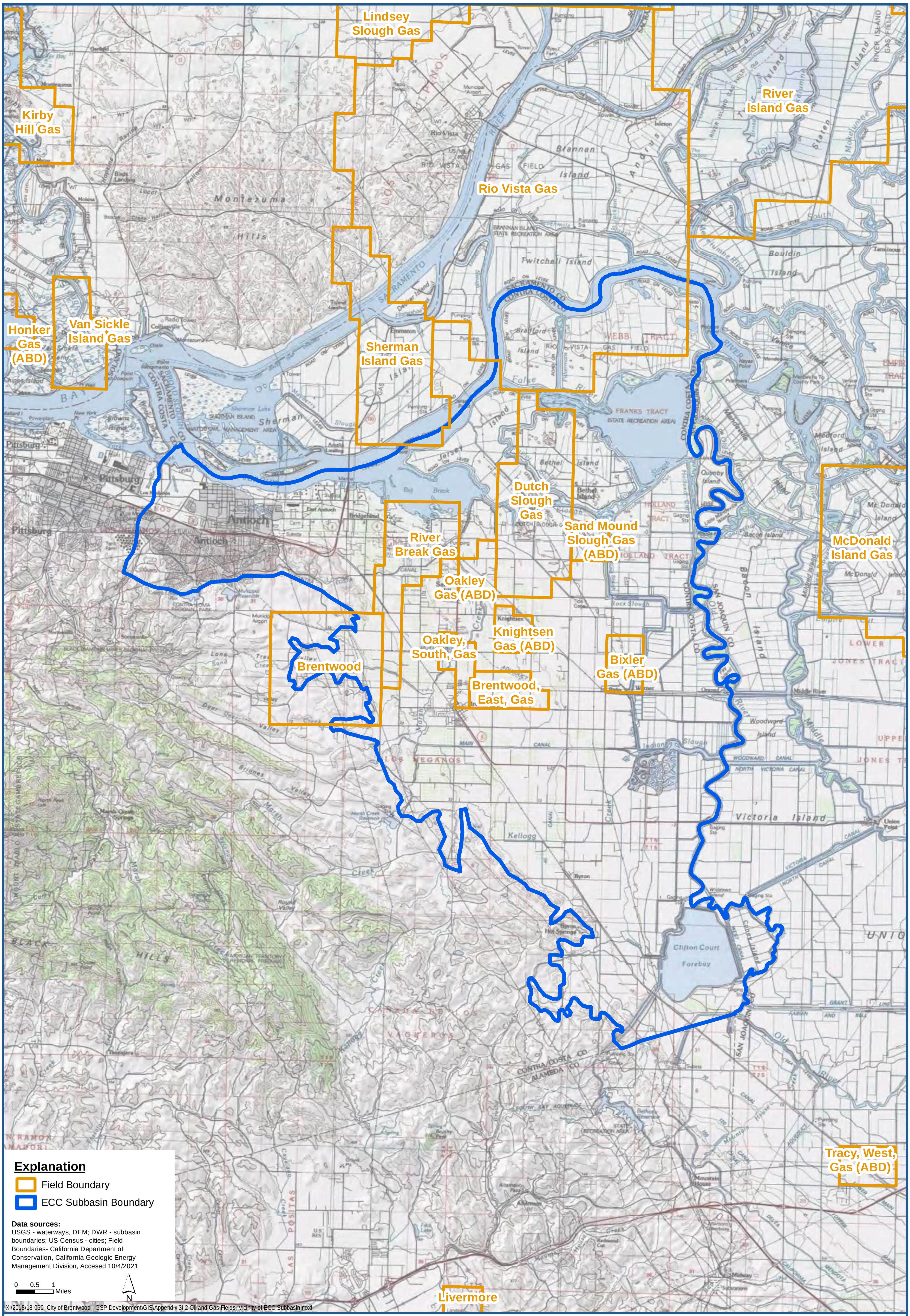



Luhdorff & Scalmanini
Consulting Engineers

**Oil and Gas Well Status, Vicinity of ECC Subbasin**

**Appendix 3i-1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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Consulting Engineers

**Oil and Gas Fields, Vicinity of ECC Subbasin**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 3i-2**

# APPENDIX 4a

**Individual Surface Water Diversions: Point of Delivery Totals by Tract/Model Subregion and by Calendar Year**

**Appendix 1 Reported Individual Surface Water Diversions: Point of Delivery Totals by Tract/Model Subregion and by Calendar Year (AF, source eWRIMS), East Contra Costa Subbasin**

| Subregion Name | Antioch | Big Break | Oakley | Jersey Island | Bradford Island | Webb Tract | Franks Tract | Bethel Island | Holland Tract and Quimby Island (769 ac) | Knightsen (Veale Tract (1362) & Bixler (584)) | Palm/ Orwood | Byron Tract (RD 800) (ac incl some TODB) | Clifton Court Forebay | Coney Island | South Clifton Court Forebay | Brent-wood | ECCID | Discovery Bay | BBID North | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year/Sub-region Number | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* | *17* | *18* | *19* | |
| 2008 | 0 | 0 | 0 | 0 | 0 | 14,700 | 0 | 0 | 10,500 | 1,850 | 3,088 | 59,709 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 89,861 |
| 2009 | 0 | 0 | 0 | 12,862 | 0 | 14,700 | 0 | 0 | 10,500 | 1,550 | 38,350 | 61,774 | 0 | 0 | 2,908 | 0 | 0 | 0 | 12 | 142,655 |
| 2010 | 0 | 22 | 0 | 12,862 | 0 | 14,700 | 0 | 0 | 13,715 | 10,166 | 56,542 | 61,555 | 0 | 3,252 | 2,908 | 0 | 0 | 1,912 | 15 | 177,649 |
| 2011 | 0 | 18 | 0 | 12,862 | 0 | 14,700 | 0 | 0 | 13,715 | 11,741 | 57,963 | 59,963 | 0 | 3,324 | 2,908 | 0 | 0 | 1,885 | 12 | 179,091 |
| 2012 | 0 | 30 | 32 | 12,862 | 1 | 14,700 | 0 | 0 | 14,221 | 9,173 | 54,734 | 62,145 | 0 | 3,660 | 2,905 | 0 | 0 | 1,969 | 12 | 176,444 |
| 2013 | 0 | 0 | 0 | 25,531 | 0 | 14,700 | 0 | 2,273 | 20,400 | 10,248 | 55,869 | 54,214 | 0 | 4,722 | 5,816 | 0 | 0 | 2,084 | 18 | 195,874 |
| 2014 | 0 | 0 | 0 | 11,559 | 0 | 0 | 0 | 4,258 | 11,811 | 7,920 | 41,225 | 52,630 | 0 | 4,769 | 4,405 | 0 | 0 | 1,785 | 18 | 140,380 |
| 2015 | 0 | 0 | 0 | 11,197 | 0 | 1,821 | 0 | 2,278 | 11,211 | 6,263 | 37,307 | 44,702 | 0 | 3,687 | 2,647 | 0 | 0 | 1,605 | 0 | 122,719 |
| 2016 | 0 | 0 | 0 | 10,366 | 3 | 15,043 | 0 | 6,136 | 21,492 | 5,894 | 57,027 | 31,869 | 0 | 4,065 | 2,174 | 0 | 0 | 1,440 | 18 | 155,526 |
| 2017 | 0 | 0 | 0 | 13,074 | 3 | 15,624 | 0 | 5,192 | 17,631 | 5,991 | 40,982 | 37,824 | 0 | 5,150 | 3,285 | 0 | 0 | 1,153 | 2 | 145,912 |
| 2018 | 0 | 0 | 0 | 13,381 | 3 | 1,812 | 0 | 3,823 | 15,720 | 7,037 | 41,034 | 25,954 | 0 | 2,283 | 1,780 | 0 | 0 | 1,357 | 2 | 114,184 |
| 2019 | 0 | 0 | 0 | 12,422 | 3 | 15,658 | 0 | 2,174 | 23,708 | 6,563 | 37,254 | 30,309 | 0 | 4,345 | 3,409 | 0 | 0 | 1,329 | 11 | 137,186 |

Note: There may be errors to these data due to a reporting units problem (gallons vs acre-feet) or duplicate reporting (Michael George, Delta Watermaster, Delta Protection Commission meeting September 17, 2020).

# APPENDIX 5a

**Model Documentation**

# East Contra Costa Subbasin

Groundwater Sustainability Plan (GSP)

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

***September 2021***

*Prepared by*

*Luhdorff & Scalmanini, Consulting Engineers*

# East Contra Costa Subbasin
# Groundwater Sustainability Plan

# East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report

**September 2021**

**Prepared For**

ECC Working Group

**Prepared By**

Luhdorff & Scalmanini,
Consulting Engineers

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| | |
|---|---|
| 3D | Three-Dimensional |
| AF | Acre-Feet |
| AN | Above Normal |
| BMP | Best Management Practice |
| BN | Below Normal |
| C | Critical |
| C2VSim | California Central Valley Groundwater-Surface Water Simulation Model |
| C2VSim-CG | California Central Valley Groundwater-Surface Water Simulation Model – Coarse Grid |
| C2VSim-FG Beta2 | California Central Valley Groundwater-Surface Water Simulation Model – Fine Grid |
| CDEC | California Data Exchange Center |
| CIMIS | California Irrigation Management Information System |
| CVHM | Central Valley Hydrologic Model |
| CVP | Central Valley Project |
| CWD | Chowchilla Water District |
| D | Dry |
| DWR | California Department of Water Resources |
| ECCSim | East Contra Costa Groundwater-Surface Water Simulation Model |
| ET | Evapotranspiration |
| $ET_a$ | Actual ET |
| $ET_c$ | Crop ET |
| $ET_o$ | Grass Reference ET |
| $ET_r$ | Alfalfa Reference ET |
| $ET_{ref}$ | Reference Crop Evapotranspiration |
| eWRIMS | SWRCB Electronic Water Rights Information Management System |
| ft/d | Feet Per Day |
| GDE | Groundwater Dependent Ecosystem |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| GWS | Groundwater System |
| HCM | Hydrogeologic Conceptual Model |
| IDC | Integrated Water Flow Model Demand Calculator |
| IWFM | Integrated Water Flow Model |
| Kh | Horizontal Hydraulic Conductivity |
| Kv | Vertical Hydraulic Conductivity |
| MA | Management Area |
| Model | Numerical Groundwater Flow Model |
| NOAA NCEI | National Oceanic and Atmospheric Administration National Centers for Environmental Information |
| NRCS | United States Department of Agriculture Natural Resources Conservation Service |
| PRISM | Parameter Elevation Regression on Independent Slopes Model |
| SGMA | Sustainable Groundwater Management Act of 2014 |

| | |
|---|---|
| SS | Specific Storage |
| SWRCB | State Water Resources Control Board |
| SWS | Surface Water System |
| Sy | Specific Yield |
| USACE | United States Army Corps of Engineers |
| USBR | United States Bureau of Reclamation |
| USGS | United States Geological Survey |
| W | Wet |
| WCR | Well Completion Report |

# 1 INTRODUCTION

This report documents the development and calibration of the East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim), a numerical groundwater flow model developed for the East Contra Costa Subbasin to support preparation of its Groundwater Sustainability Plan (GSP) along with other future potential groundwater management and planning needs. This report includes a summary of the model platform, data sources, model development and calibration, and calibration results.

## 1.1 Background

To support the preparation of the GSP for the East Contra Costa Subbasin, the Groundwater Sustainability Agencies (GSAs) in the Subbasin elected to pursue development of a numerical groundwater flow model to be able to satisfy GSP regulations requiring use of a numerical groundwater model, or equally effective approach, to evaluate projected water budget conditions and potential impacts to groundwater conditions and users from the implementation of the GSP. The development of ECCSim is intended to support groundwater resources management activities associated with GSP development and implementation. ECCSim utilizes data and the hydrogeologic conceptualization that are presented and described in the East Contra Costa Subbasin GSP to improve the understanding of hydrologic processes and their relationship to key sustainability metrics within the Subbasin. ECCSim provides a platform to evaluate potential outcomes and impacts from future management actions, projects, and adaptive management strategies through predictive modeling scenarios.

## 1.2 Objectives and Approach

Numerical groundwater models are structured tools developed to represent the physical basin setting and simulate groundwater flow processes by integrating a multitude of data (e.g., lithology, groundwater levels, surface water features, groundwater pumping, etc.) that compose the conceptualization of the natural geologic and hydrogeologic environment. ECCSim was developed in a manner consistent with the Modeling Best Management Practices (BMP) guidance document prepared by the California Department of Water Resources (DWR) (DWR, 2016). The objective of ECCSim is to simulate hydrologic processes and effectively estimate historical and projected future hydrologic conditions in the Subbasin related to groundwater dependent ecosystems (GDEs) and SGMA sustainability indicators relevant to the Subbasin including:

1. Lowering of Groundwater Levels
2. Reduction of Groundwater Storage
3. Depletion of Interconnected Surface Water
4. Water-Quality Degradation

The development of ECCSim involved starting with and evaluating the beta version (released 5/1/2018) of DWR's fine-grid version of the California Central Valley Groundwater-Surface Water Flow Model (C2VSim-FG Beta2) and eventually carving out a local model domain and conducting local refinements to the model structure (e.g., nodes, elements) and modifying or replacing inputs as needed to sufficiently and accurately simulate local conditions in the Subbasin within the model domain. C2VSim-FG Beta2 utilizes the most current version of the Integrated Water Flow Model (IWFM) code available at the time of the ECCSim development. IWFM and C2VSim-FG Beta2 were selected as the modeling platform due to the versatility in simulating crop-water demands in the predominantly agricultural setting of the subbasins, groundwater surface-water interaction, the existing hydrologic inputs existing in the model for the time period through the end of water year 2015, and the ability to customize the existing C2VSim-FG Beta2 model to be more representative of local conditions in the area of the East Contra Costa Subbasin. ECCSim was refined from C2VSim-FG Beta2 and calibrated to a diverse set of available historical data using industry standard techniques.

## 1.3 Report Organization

This report is organized into the following sections:

- Section 2: Model Code and Platform
- Section 3: Groundwater Flow Model Development
- Section 4: Groundwater Flow Model Results
- Section 5: Model Uncertainty and Limitations
- Section 6: Conclusions and Recommendations
- Section 7: References

# 2 MODEL CODE AND PLATFORM

The modeling code and platform utilized for ECCSim are described below. As required by GSP regulations, the selected model code is in the public domain. The decision to select the model codes for the ECCSim was based on providing the Subbasin with a modeling tool that can be used for GSP development with sufficient representation of local conditions, while utilizing to the extent possible, previous modeling tools available, including regional models. With this objective in mind, the model tools and platforms described below were determined to be most suitable for adaptation for use in GSP analyses.

## 2.1 Integrated Water Flow Model

IWFM is a quasi three-dimensional finite element modeling software that simulates groundwater, surface water, groundwater-surface water interaction, as well as other components of the hydrologic system (Dogrul et al., 2017). ECCSim is developed using the IWFM Version 2015 (IWFM-2015) code, which couples a three-dimensional finite element groundwater simulation process with one-dimensional land surface, river, lake, unsaturated zone and small-stream watershed processes (Brush et al., 2016). A key feature of IWFM-2015 is its capability to simulate the water demand as a function of different land use and crop types, and compare it to the historical or projected amount of water supply (Dogrul et al., 2017). IWFM uses a model layering structure in which model layers represent aquifer zones that are assigned aquifer properties relating to both horizontal and vertical groundwater movement (e.g., horizontal and vertical hydraulic conductivity) and storage characteristics (e.g., specific yield, specific storage) with the option to associate an aquitard to each layer, although represented aquitards are assigned a more limited set of properties relating primarily to their role in vertical flow (e.g., vertical hydraulic conductivity).

The IWFM-2015 source code and additional information and documentation relating to the IWFM-2015 code is available from DWR at the link below:

http://baydeltaoffice.water.ca.gov/modeling/hydrology/IWFM/IWFM-2015/v2015_0_630/index_v2015_0_630.cfm

### 2.1.1 IWFM Demand Calculator

IWFM includes a stand-alone Integrated Water Flow Model Demand Calculator (IDC) that calculates water demands. Agricultural water demands are calculated in IDC based on climate, land use, soil properties, and irrigation method whereas urban demands are calculated based on population and per-capita water use. ECCSim utilizes IDC to simulate root zone processes and water demands. The physically based IDC version 2015.0.0036 (DWR, 2015) is developed and maintained by DWR.

## 2.2 C2VSim-Fine Grid

The C2VSim-FG Beta2 model utilizes the IWFM-2015 code and represents a refinement of the previous C2VSim-Coarse Grid (C2VSim-CG) model. Refinements made in the development of C2VSim-FG Beta2 include a finer horizontal discretization, an updated aquifer layering scheme, updated precipitation data, and an extended simulation period through water year 2015 (DWR, 2018). C2VSim-CG had an average element size of approximately 15 square miles and the average element size for C2VSimFG Beta2 is about 0.6 square miles. The C2VSimFG Beta2 version available from DWR at the time of the initiation of modeling efforts to support GSP preparation for East Contra Costa, was not a calibrated model version. DWR published a calibrated version of the fine grid model on Tuesday December 8th 2020.

# 3 GROUNDWATER FLOW MODEL DEVELOPMENT

This section describes the spatial and temporal (time-series) structure of the model and the input data that was utilized for model development. The model development process utilized data and information that was available at the time of model development.

## 3.1 ECCSim – Historical Model

The ECCSim historical model simulates the period from October 1993 through September 2018 at a monthly time step, with a calibration period of October 1996 through September 2018. Annual model time periods are based on water years defined as October 1 through September 30. The historical calibration model period extends from water years 1997 through 2018. Water years 1994 through 1996 are not included as part of the historical calibration period, but are simulated to allow the model some time to adjust to the specified initial conditions and spin-up prior to the calibration period starting in October 1996.

### 3.1.1 Model Grid

Although ECCSim focuses on the East Contra Costa Subbasin, the model domain was extended outside the subbasin to incorporate a buffer zone including areas within the Tracy, Eastern San Joaquin, and Solano Subbasins and the Pittsburg Plain Basin. The extent of the buffer zone was determined based on the geometry of delta islands, surface water features, the anticipated impact of groundwater pumping, and jurisdictional boundaries. The ECCSim domain, shown in **Figure 3-1**, encompasses a total of 207,714 acres. All C2VSim-FG Beta2 model features (e.g., nodes, elements, streams, layers) within this domain were initially considered for adoption in the development of the ECCSim structure, but subsequent modifications and refinements made within ECCSim to these model components were made and are described in this report.

#### 3.1.1.1 Nodes and Elements

The ECCSim grid contains 1,097 nodes and 1,209 elements (**Figure 3-1**). The X-Y coordinates for node locations are presented in the UTM Zone 10N, NAD83 (meters) projected coordinate system. The number of nodes and elements within the ECCSim domain were altered from C2VSim-FG Beta2, the spacing and alignment of nodes and elements were constructed for ECCSim to more accurately align with the GSA boundaries, delta island geometry, and surface water features. **Figure 3-2** shows the difference between C2VSim-FG Beta 2 and modified nodes and elements in ECCSim. **Table 3-1** presents ECCSim grid characteristics.

**Table 3-1. ECCSim Grid Characteristics.**

| | |
|---|---|
| Nodes | 1,097 |
| Elements | 1,209 |
| *Average Element Size (acres)* | 172 |
| *Minimum Element Size (acres)* | 0.005 |
| *Maximum Element Size (acres)* | 1,252 |
| Subregions | 34 |
| Aquifer Layers | 4 |

### 3.1.1.2 Subregions

Model elements are grouped into subregions to assist in the summarization of model results and development of water budgets. ECCSim includes 34 subregions (listed in **Table 3-2**). The East Contra Costa Subbasin is divided into 19 water balance subregions. Subregions were delineated by subbasin, and also by GSA and area within the Subbasin. While subregions are used as the basis for summarizing model results, the model simulates hydrologic processes and conditions at the resolution of elements or nodes. **Figure 3-3** shows the delineation of subregions included within ECCSim.

**Table 3-2. Model Subregions within ECCSim.**

| Subregion | Subbasin/Basin | GSA | Area |
|---|---|---|---|
| **1** | East Contra Costa | City of Antioch GSA | Antioch |
| **2** | East Contra Costa | Diablo Water District GSA | Big Break |
| **3** | | | Oakley |
| **4** | East Contra Costa | County of Contra Costa GSA | Jersey Island |
| **5** | | | Bradford Island |
| **6** | | | Webb Tract |
| **7** | | | Franks Tract |
| **8** | | | Bethel Island |
| **9** | | | Holland Tract |
| **10** | | | Knightsen |
| **11** | | | Orwood |
| **12** | | | South Discovery Bay |
| **13** | | | Clifton Court Forebay |
| **14** | | | Coney Island |
| **15** | | | South Clifton Court Forebay |
| **16** | East Contra Costa | City of Brentwood GSA | Brentwood |
| **17** | East Contra Costa | East Contra Costa Irrigation District GSA | ECCID |
| **18** | East Contra Costa | Discovery Bay Community Services District GSA | Town of Discovery Bay |
| **19** | East Contra Costa | Byron-Bethany Irrigation District GSA – East Contra Costa | BBID North (Byron Division) |
| **20** | Tracy | Byron-Bethany Irrigation District GSA - Tracy | BBID South (Bethany Division) |
| **21** | | | BBID Mountain House Division |
| **22** | Tracy | County of San Joaquin GSA – Tracy | Hammer Island |
| **23** | | | Union Island |
| **24** | | | Victoria Island |
| **25** | | | Woodward Island |
| **26** | | | Bacon Island |
| **27** | | | Mandeville Island |
| **28** | Eastern San Joaquin | Central Delta Water Agency GSA | Venice Island |

| Subregion | Subbasin/Basin | GSA | Area |
|---|---|---|---|
| 29 | | | Bouldin Island |
| 30 | Solano | Reclamation District No. 317 GSA | Andrus Island |
| 31 | Solano | County of Sacramento GSA - Solano | Twitchell Island |
| 32 | | | Sherman Island |
| 33 | | | Kimball Island |
| 34 | Pittsburg Plain | Not Applicable | Pittsburg |

#### 3.1.1.3 Surface Water Bodies

ECCSim simulates surface water bodies including: Marsh Creek, Old River, Middle River, San Joaquin River, Big Break, Franks Tract, and Clifton Court Forebay. Surface water bodies simulated in C2VSimFG Beta2 only include the San Joaquin River, which was deemed insufficient for purposes of this GSP, so the ECCSim was developed to include these other afore-mentioned surface water bodies. The surface water bodies included in ECCSim are shown in **Figure 3-4**.

#### 3.1.1.4 Model Layers

The C2VSim-FG Beta2 model layering was adapted for ECCSim purposes to better represent the hydrogeological conceptual model (HCM) of the aquifer system through model layering. Within the ECCSim domain, C2VSim-FG Beta2 delineates three aquifer layers; ECCSim was refined to include four aquifer layers corresponding with key hydrogeologic features identified in the Hydrogeologic Conceptual Model (HCM) for the Subbasin. The aquifer system within ECCSim is broken down into the Shallow Aquifer (layers 1 and 2) and the Deep Aquifer (layers 3 and 4).

Using the HCM shallow and deep aquifer zones, the shallow zone is divided into two layers using CVHM's bottom of layer 1. CVHM's layer 2 is very similar to the HCM's delineation of the vertical boundary between the shallow and deep aquifer zones. Since according to the HCM, most of the wells in ECC are completed in the shallow zone, the deep aquifer zone is split into two model layers to account for deeper production and/or public supply wells that extend past the base of the shallow aquifer zone. Generally, layer thicknesses increase to the east. A summary of the model layering is stated below:

- Top of Layer 1: Land Surface
- Bottom of Layer 1: based on CVHM's bottom of layer 1, 50 feet below ground surface
- Bottom of Layer 2: based on our HCM Zone 1 and 2 Boundary
- Bottom of Layer 3: based on the bottom of the max depths of Production and Public Wells and to the east of the ECC Subbasin, consistent with C2VSimFG-Beta2 bottom of model layers 2 and 3
- Bottom of Layer 4: based on the base of freshwater from HCM, considering C2VSimFG and CVHM's base of model

Elevations and thicknesses of ECCSim aquifer and aquitard layers are shown in **Figures 3-5** through **3-13**.

### 3.1.2 Land Surface System

The IWFM Land Surface Process, which includes the IDC, calculates a water budget for four land use categories: 1) non-ponded agricultural crops, 2) ponded agricultural crops (i.e., rice), 3) native and riparian vegetation, and 4) urban areas. The Land Surface Process calculates water demand at the surface, allocates water to meet demands, and routes excess water through the root zone (Brush et al., 2016). The development of land surface system input files is explained in this section.

#### 3.1.2.1 Precipitation

Monthly precipitation time series data for water years 1922 through 2015 were extracted from C2VSim-FG Beta2. Precipitation rates were extracted for all elements and small watersheds included within the ECCSim model domain. Precipitation data within both C2VSim-FG Beta2 and ECCSim is based on Parameter Elevation Regression on Independent Slopes Model (PRISM) by the PRISM Climate Group at Oregon State University. Similar water year types and total annual precipitation for water years 2016-2018 were identified in previous years to bring the model's precipitation data up to date.

#### 3.1.2.2 Evapotranspiration

Monthly evapotranspiration (ET) time series data was extracted from C2VSim-FG Beta2 for water years 1922 through 2015. Evapotranspiration rates for each agricultural crop, urban outdoors, native vegetation, and bare soil was developed for each Subbasin in C2VSim-FG and for each small watershed. The same water years were repeated as used above for precipitation, based on water year types and annual precipitation, to fill in the ECCSim's missing years' data between water years 2016-2018. Adjustments to a subset of ET values were made in order to better match actual agricultural demand, as needed.

#### 3.1.2.3 Land Use

Land use work involves using land use surveys from 1995, 2014, and 2016 (DWR) to calculate the acreage of land use categories. To be consistent with C2VSim-FG land use parameters, a total of 24 land use groups were spatially joined to the ECCSim model elements. Most of the land use type categories are for irrigated agriculture (non-ponded crops including corn, pasture, grain, etc.), and the remaining categories cover ponded crops (like rice), native and riparian vegetation, and urban land use. To support water budget development for each land use group, the DWR Integrated Water Flow Model Demand Calculator (IDC) was employed using ECCSIM-updated land use and spatially joined ET and root zone input data from C2VSimFG. The IDC was used for the development of root zone and land and water use budget components on a monthly basis for use with the other flow components of IWFM.

### 3.1.3 Surface Water System

Due to the complexity of the surface water system in the ECCSim model domain, several approaches were employed to simulate the movement of surface water. The ECCSim model advances the representation of surface water bodies compared to C2VSim and C2VSimFG because the latter only simulated the San Joaquin River. ECCSim includes Marsh Creek, Old River, Middle River, San Joaquin River, Big Break, Franks Tract, Clifton Court Forebay, and the Delta into the simulated surface water system. **Figure 3-14** shows the simulated surface water features in the ECCSim model.

#### 3.1.3.1 Stream Package

The only surface water body that utilizes the stream package in IWFM is Marsh Creek. Marsh Creek is simulated with stream bed parameters estimated from elevation maps, soil properties, and stream characteristics. Rating curves for Marsh creek were developed using stage and gage data. Stream bed parameters, particularly stream bed conductivity and wetted perimeter, were further refined during the calibration process. Stream inflows for Marsh Creek were estimated based on stream gage data from USGS Station 11337600 (Marsh Creek at Brentwood, CA) and California Data Exchange Center's MDA Station (Marsh Creek at Dainty Ave).

#### 3.1.3.2 General Head Surface Water Features

Due to the nature of the engineering, controlled flows, and tidal influence of other surface water bodies in the model domain, the Middle River, San Joaquin River, Old River, Clifton Court Forebay, Franks Tract, and the Delta are simulated using general head boundaries. Similar to the simulation of the Delta in CVHM, general head boundaries were used along these surface water features. The elevations used for the general head inputs along these surface water features were based on stage data and interpolated stages between gaging stations. Stations used for analysis and estimation of the time-series stage (general head) values for nodes along rivers in ECCSim included: Venice Island, Three Mile Slough at San Joaquin River, San Joaquin River at Jersey Point (USGS), San Joaquin River at Antioch, Collinsville on Sacramento River, Middle River at Howard Road Bridge, Middle River at Tracy Blvd, Middle River Above Barrier, Middle River at Union Point, Jones Tract, Middle River at Bacon Island Rd, Old River at Quimbly Island Near Bethel Island, Old River at Coney Island, Old River at Clifton Court Intake, Old River at Delta Mendota Canal, Old River Near Tracy, and San Joaquin River at Prisoners Point Near Termino.

#### 3.1.3.3 Surface Water Diversions and Deliveries

Surface water diversions and deliveries are simulated in the model as diversions from a stream node with an assigned delivery destination (water balance subregion). Diversion amounts are based on data received from individual GSA entities, as well as the State Water Resources Control Board Electronic Water Rights Information Management System (eWRIMS) database.

Losses associated with surface water deliveries are defined as fractions of each surface water diversion within the model domain and remain constant throughout the simulation period. Recoverable losses occur as seepage of water from the delivery system prior to arrival at the delivery destination. Accordingly, the fraction of recoverable loss represents water that recharges from conveyance losses associated with surface water deliveries. Non-recoverable losses occur from evapotranspiration associated with surface water deliveries. The fraction of non-recoverable loss represents water that does not recharge. The remaining percentage of surface water diversions (after subtraction of recoverable and non-recoverable losses) is considered the delivery fraction. The recoverable loss and non-recoverable loss fractions used in the model were determined based on C2VSim-FG values for diversions in the East Contra Costa and Tracy Subbasins.

In ECCSim, surface water diversions are assigned to water balance subregions for water delivery. A total of 86 unique entities that have surface water points of diversion data from eWRIMS were compiled for monthly delivery amounts during the model simulation period. The surface water delivery points of diversion were grouped according to water balance subregion, and combined with GSA-reported purchased water, recycled water, and other surface water sources to provide the water supply for each water balance subregion (groundwater pumping provides the remainder of the water demand, both as reported by GSA entity and estimated for private pumpers). **Figure 3-15** shows the locations of historical surface water diversions.

### 3.1.4 Groundwater System

The IFWM Groundwater Flow Process balances subsurface inflows and outflows and manages groundwater storage within each element and layer (Brush et al., 2016). The development of groundwater system input files is explained in this section.

#### 3.1.4.1 Aquifer Parameters

Initial aquifer parameters were adopted from C2VSim-FG Beta2 and compared to both C2VSim-CG, CVHM values, and qualitatively to the HCM descriptions for appropriateness. Aquifer parameters in ECCSim are assigned to each node for each model layer, and were developed to represent subsurface hydrogeologic characteristics. Aquifer parameters were calibrated in groups based on depositional environment for regions that needed adjustment. Depositional environments included Alluvial Plain, Delta Islands, Fluvial Plain, and Marginal Delta Dune as described in the GSP Basin Settings section.

#### 3.1.4.2 Model Boundary Conditions

ECCSim utilizes a combination of no-flow boundaries and general head boundary conditions along the model domain's boundary. No-flow boundaries occur along the western border, and general head boundaries occur along the north, east, and southern model boundaries. General head boundary conductance was determined at each boundary node by layer. Conductance was calculated in each layer based on Kh, distance between boundary nodes, aquifer layer thickness, and the distance from the model boundary (set as 1,000-ft). Transient historical water level boundary conditions were developed using interpreted groundwater elevations from C2VSimFG Beta2. Groundwater elevations from C2VSimFG output over time were assigned to the appropriate corresponding ECCSim layer and node on the northern, eastern, and southern sides of the model domain. Similar water years were repeated as was done for the precipitation and ET records to bring the model forward.

#### 3.1.4.3 Groundwater Pumping

Pumping within ECCSim is simulated using a combination of individual wells and elemental pumping. Elemental pumping is calculated internally by the IDC to meet both agricultural and domestic/urban demands after available surface water deliveries have been accounted for. The vertical distribution of pumping by layer in ECCSim was modified based on review of well construction information in DWR's database of Well Completion Reports (WCR) for wells within the model domain. Agricultural and domestic/urban pumping were distributed vertically based on well construction information data in DWR's WCR database for respective well types. Individual municipal wells for which GSAs provided monthly pumping records for were simulated directly.

#### 3.1.4.4 Tile Drains

Tile drains were incorporated in ECCSim where historic drain maps or direct information from GSAs suggest their location. **Figure 3-16** shows the area of drains simulated within the model domain. Information from GSAs supported an estimated depth of either 5 or 8 feet below land surface as the depth of the drains.

### 3.1.5 Small Watersheds

A total of 22 small watersheds were included in ECCSim from C2VSim-FG Beta2 (**Figure 3-17**). **Table 3-3** summarizes the contributions of small watersheds to modeled streams. Minor modifications were made to C2VSim-FG Beta2 small watersheds to properly route water to the water balance subregions in ECCSim by making minor edits to the contributing acreage of small watersheds to better align with model elements along the western boundary.

**Table 3-3. Summary of Small Watersheds.**

| Water Balance Subregion Fed by Small Watersheds | Count of Contributing Watersheds | Total Contributing Watershed Acreage |
|---|---|---|
| **34** | 5 | 6,732 |
| **1** | 5 | 6,631 |
| **16** | 3 | 12,994 |
| **17** | 1 | 17,599 |
| **19** | 4 | 15,782 |
| **20** | 3 | 16,336 |
| **21** | 1 | 2,791 |
| **TOTAL** | **22** | **78,865** |

### 3.1.6 Initial Conditions

Initial conditions for ECCSim were generated from simulated output from C2VSimCG and the C2VSim-FGC2VSim-FG Beta2 regional models for October 1993 in conjunction with mapped groundwater conditions based on observed groundwater levels and contour interpretation. ECCSim initial Conditions for the unsaturated zone and small watersheds were defined from simulated C2VSim-FGC2VSim-FG Beta2 conditions. Initial water level conditions used in the historical ECCSim runs are shown in **Figures 3-18** through **3-21**.

## 3.2 Model Calibration

ECCSim was calibrated through a process of trial and error. The calibration procedure focused on adjusting key model parameter values to improve the fit of simulated data to observed data. The key model parameters included in calibration were aquifer properties and conductance terms associated with surface water features. Aquifer parameters adjusted during calibration included Kh, Kv, Ss, and Sy, which were adjusted from original C2VSimFG aquifer parameters based on depositional environment. Conductance terms associated with streambed properties and simulated surface water features using general head conditions were adjusted during the calibration period to help match shallow groundwater levels in certain areas. Drain elevations were also adjusted in some areas where there was uncertainty about the actual drain elevations and the shallow groundwater levels were not matching observed groundwater levels well. Model results were compared to observed groundwater levels. Observations used to constrain aquifer parameter values included over 3,000 groundwater level observations from 32 wells (**Figure 3-22**).

## 3.3 ECCSim – Projected Model

ECCSim was used to simulate projected future scenarios including under expected changes in urban growth (land use), and anticipated climate change and sea level rise (hydrology). The projected simulation period runs from WY 2019 through 2068 beginning on October 1, 2018 and ending September 30, 2068, at a monthly time step. The development of the projected future scenarios in ECCSim is described in this section.

### 3.3.1 Projected Hydrology

Future hydrology model inputs were projected into the future based on adjustments provided by DWR's Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development document[1]. DWR provides climate change adjustment values for climate data, streamflow data, and sea-level rise information. These adjustments are applied to historical hydrology to achieve a future hydrologic period of 50 years that are representative of hydrology potentially occurring in the future. DWR summarizes the various model outputs and respective timelines, which is repeated in **Table 3-4**. The most recent fifty-year period of common simulation periods is 1954-2003. Therefore, this historic period was selected to perform the adjustments for developing the future scenario hydrology inputs.

**Table 3-4. Model Data Outputs and Related Simulation Periods.**

| Model | Output Data | Simulation Period |
|---|---|---|
| **VIC** | Precipitation, Reference ET, Unimpaired flows | 1915-2011 |
| **CalSim II** | Reservoir outflows, river flows, diversions, deliveries | 1921-2003 |
| **Common Simulation Period for Models at 2030 and at 2070** | | 1921-2003 (82 years of projected hydrology) |

In terms of sea-level rise, DWR's Guidance Document mentions that sea-level rise estimates by the National Research Council (NRC) provide two values of expected sea-level rise as median predicted values for the years 2030 and 2070. These two values are 15 and 45 centimeters, respectively, which translates to about 0.5 to 1.4 feet of sea-level rise. In order to be conservative, the ECCSim's future scenario will apply these values to the general head values associated with the Delta according to the incremental changes estimated between the simulated future time frame of 2019 to 2068 as specified in **Table 3-5**.

[1] https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final_ay_19.pdf (accessed 12/10/2020)

**Table 3-5. Incremental Projected Sea Level Rise Amounts (2019-2068).**

| Projected Water Year | Projected Sea-Level Rise Incremental Adjustment (ft) | Projected Water Year | Projected Sea-Level Rise Incremental Adjustment (ft) | Projected Water Year | Projected Sea-Level Rise Incremental Adjustment (ft) |
|---|---|---|---|---|---|
| 2019 | 0 | 2036 | 0.65 | 2053 | 1.075 |
| 2020 | 0.0455 | 2037 | 0.675 | 2054 | 1.1 |
| 2021 | 0.091 | 2038 | 0.7 | 2055 | 1.125 |
| 2022 | 0.136 | 2039 | 0.725 | 2056 | 1.15 |
| 2023 | 0.182 | 2040 | 0.75 | 2057 | 1.175 |
| 2024 | 0.227 | 2041 | 0.775 | 2058 | 1.2 |
| 2025 | 0.273 | 2042 | 0.8 | 2059 | 1.225 |
| 2026 | 0.318 | 2043 | 0.825 | 2060 | 1.25 |
| 2027 | 0.364 | 2044 | 0.85 | 2061 | 1.275 |
| 2028 | 0.409 | 2045 | 0.875 | 2062 | 1.3 |
| 2029 | 0.455 | 2046 | 0.9 | 2063 | 1.325 |
| **2030** | **0.5** | 2047 | 0.925 | 2064 | 1.35 |
| 2031 | 0.525 | 2048 | 0.95 | 2065 | 1.375 |
| 2032 | 0.55 | 2049 | 0.975 | 2066 | 1.4 |
| 2033 | 0.575 | 2050 | 1 | 2067 | 1.425 |
| 2034 | 0.6 | 2051 | 1.025 | 2068 | 1.45 |
| 2035 | 0.625 | 2052 | 1.05 | | |

### 3.3.2 Projected Land Use Changes

Urban growth is the main change expected to occur in terms of land use for the future fifty-year time period. Urban growth is expected to change in the Contra Costa County area within the model domain. The projected change in urban acres is provided in **Table 3-6**.

**Table 3-6. Projected Change in Urban Areas**

| Area | 2016 Urban Area | Projected 2026 Urban Area |
|---|---|---|
| ECC Subbasin | 22,596 | 41,630 |
| Entire Model Domain | 30,712 | 52,593 |

### 3.3.3 Projected Future Scenarios

Five projected future scenarios were simulated to compare possible outcomes. These scenarios include: 1) a Projected Land Use Change scenario; 2) a Projected Land Use Change with Increased Pumping (Sustainable Yield Run); 3) a Projected Land Use Change with Climate Change scenario(s); 4) a Projected Land Use Change with Sea Level Change scenario; and 5) a Projected Land Use Change with Climate Change and Sea Level Change scenario. The projected scenarios with climate change incorporate the 2030 mean climate change scenario adjustment for precipitation, ET, stream inflows, and surface water diversion volumes. Future wet and dry climate change scenarios were also evaluated. The projected scenario with sea-level change uses a ramping up of sea level rise from 0.5 feet in 2030 to 1.5 feet in 2070. All other model inputs are held constant across projected future scenarios.

The Projected Land Use Change scenario was chosen as the baseline future projected scenario. The Projected Land Use with Climate Change(s), Projected Land Use Change with Sea Level Rise, and Projected Land Use Change with Climate Change and Sea Level Rise model runs were chosen as sensitivity analysis scenarios. The Projected Land Use Change with Increased Pumping scenario is an attempt to determine the sustainable yield for the East Contra Costa Subbasin, to determine what the sustainable yield of the subbasin might be. **Table 3-7** summarizes the differences between each projected future scenario.

**Table 3-7. Summary of Projected Future Scenarios.**

| Scenario Conditions | Projected Land Use Change | Projected Land Use Change with Increased Pumping (Sustainable Yield Run) | Projected Land Use Change with Climate Change | Projected Land Use Change with Sea Level Rise | Projected Land Use Change with Climate Change and Sea Level Rise |
|---|---|---|---|---|---|
| **Change in Land Use (Urban Growth)** | x | x | x | x | x |
| **Climate Change Adjustment** | | | x | | x |
| **Sea Level Rise** | | | | x | x |
| **Increased Groundwater Pumping (reducing Surface Water Deliveries)** | | x | | | |

### 3.3.4 Land Surface System

The development of land surface system datasets for projected future scenarios is described below.

#### 3.3.4.1 Precipitation

The precipitation amount in each future year was assumed to be equal to the amount in the historical period from 1954-2003. For scenarios with climate change adjustments, the historical precipitation amount was adjusted by using the DWR 2070 median tendency, 2070 wet, and 2070 dry climate change scenario monthly multipliers. Additional information about the development of projected precipitation rates is included in **Table 3-8**.

**Table 3-8. Development of Projected Future Land Surface Process Components.**

| Water Budget Component | Without Climate Change Adjustments (2019-2068) | With Climate Change Adjustments (2019-2068) |
|---|---|---|
| **Precipitation** | 1954-2003 repeat historical data | 1954-2003 historical data adjusted by DWR 2030 central tendency, 2070 wet, and 2070 dry monthly change factors |
| **Evapotranspiration** | 1954-2003 repeat historical data, assuming land use adjusted for projected urban area growth from 2019-2068 | 1954-2003 historical data adjusted by DWR 2030 central tendency, 2070 wet, and 2070 dry monthly change factors, assuming land use adjusted for projected urban area growth from 2019-2068 |

#### 3.3.4.2 Evapotranspiration

Evapotranspiration rates were also projected into the future based on historical data from 1954-2003 and projected changes in land use (described in Section 3.3.3.3). Additional information about the development of projected ET rates is included in **Table 3-8**.

#### 3.3.4.3 Land Use

***Projected Land Use Change Scenarios***
Except in areas with urban growth, projected land use acreage in future scenarios was based on 2016 land use from DWR Land Use surveys. In areas with urban growth, agricultural acreage decreases over time with urban expansion in the vicinity of existing urban areas. **Table 3-6** describes the changes in urban areas for the subbasin and the model domain.

### 3.3.5 Surface Water System

The development of surface water system datasets for projected future scenarios is described below.

#### 3.3.5.1 Surface Water Features

Stream inflow volumes and other surface water feature inputs were projected into the future based on historical data from the base period as it corresponds to the projected water year based on water year type. For scenarios with climate change, a climate change adjustment was incorporated into the projections. Additional information about the development of projected stream inflows is included in **Table 3-9**.

**Table 3-9. Development of Projected Future Surface Water System Components.**

| Water Budget Component | Without Climate Change Adjustments (2019-2068) | With Climate Change Adjustments (2019-2068) | With Sea Level Rise Adjustments (2019-2068) |
|---|---|---|---|
| Surface Water Inflow - Unimpaired Streams (Marsh Creek) | 1954-2003 repeat historical data | 1954-2003 historical data adjusted by DWR 2030 central tendency monthly change factors; 2070 wet and 2070 dry monthly change factors were also incorporated | 1954-2003 repeat historical data |
| Surface Water Delta Features | 1954-2003 repeat historical data | 1954-2003 repeat historical data | Incremental increase in delta heads based on 2030 and 2070 sea level rises (15 and 45 cm) |
| Surface Water General Head Boundaries (Middle River, Old River, San Joaquin River) | 1954-2003 repeat historical data | 1954-2003 historical data adjusted by DWR 2030 monthly change factors; 2070 wet and 2070 dry monthly change factors were also incorporated | 1954-2003 repeat historical data |
| Surface Water General Head Boundaries (Franks Tract & Clifton Court Forebay) | 1954-2003 repeat historical data | 1954-2003 repeat historical data | 1954-2003 repeat historical data |
| Drains* | Repeat historical data | Repeat historical data | Repeat historical data |
| Diversions* | 1954-2003 repeat historical data | 1954-2003 historical data adjusted by DWR 2030 monthly change factors; 2070 wet and 2070 dry monthly change factors were also incorporated | 1954-2003 repeat historical data |

*Drains and diversions adjust according to urban growth – drains are removed if urban area extends into drain areas, and diversion amounts increase for urban municipal demand and decrease for removal of agricultural lands as a result of urban growth.

### 3.3.6 Groundwater System

The development of groundwater system datasets for projected future scenarios is described below.

#### 3.3.6.1 Boundary Conditions

Model boundary general head boundary conditions were developed for use in evaluating potential future conditions in the projected future scenarios. This was completed by matching water year types from the base period of 1997-2018 to the fifty-year period of 1954-2003.

#### 3.3.6.2 Groundwater Pumping

The pumping specifications used for the historical simulation period were retained for the duration of all projected simulations (2019-2068), with the exceptions of the following areas:

- Urban areas that rely of groundwater increase municipal pumping according to population growth
- Removal of agricultural areas that rely on groundwater due to urban growth results in a decrease in agricultural pumping

#### 3.3.6.3 Sustainable Yield Run

The future scenario in which ECCSim is used to estimate the sustainable yield attempts to stress the subbasin at levels not previously experienced. Surface water deliveries were reduced by specified percentages. This allows the model to ramp up the amount of groundwater pumping and it is possible to observe the changes in: groundwater storage, groundwater levels, surface water depletion, and subbasin interflow over a fifty-year time frame.

### 3.3.7 Initial Conditions

Initial conditions for projected future simulation in ECCSim were generated from the historical simulation in ECCSim. Initial Conditions for the unsaturated zone, root zone, small watersheds, and groundwater levels were defined as the final conditions of the historical simulation in ECCSim. Generally speaking, the future scenarios are a continuation of the historic simulation period.

# 4 GROUNDWATER FLOW MODEL RESULTS

Calibrated parameter values for the historical model simulation as well as water budgets for both the historical and projected future scenarios in ECCSim are presented in this section. Model calibration involves the adjustment of model parameters to achieve a model that simulates the observed hydrologic system as best possible. Model parameters adjusted during calibration include aquifer parameters, and surface water and drain elevations. The final parameters for the calibrated model are presented in this section. Previous discussion of the calibration process and values was also presented in Sections 3.1 and 3.2.

## 4.1 Aquifer Parameters

Initial aquifer parameter values assigned to each model element were based on C2VSimFG beta2 reported values. These values were further refined and adjusted during the calibration process. Final calibrated values are presented in **Table 4-1**.

### 4.1.1 Hydraulic Conductivity

The calibrated horizontal hydraulic conductivity (Kh) values range from 0.04 feet per day (ft/d) to 850 ft/d (**Table 4-1**). The final Kh values in the calibrated model area shown by model layer in **Figures 4-1 through 4-4**. Calibrated vertical hydraulic conductivity (Kv) values range from 0.0002 ft/d to 52.25 ft/d (**Table 4-1**). The Kv values in the calibrated model are shown by model layer in **Figures 4-5 through 4-8**.

### 4.1.2 Storage Coefficients

Final specific yield (Sy) values used in the calibrated model range from 0.06 to 0.09 (**Table 4-1**). Final Sy values in the calibrated model by layer are shown in **Figures 4-9 through 4-12**. Specific storage (Ss) values used in the calibrated model range from 2.25 x $10^{-7}$ $ft^{-1}$ to 6.00 x $10^{-5}$ $ft^{-1}$ (**Table 4-1**). Final calibrated Ss values by model layer are shown in **Figures 4-13 through 4-16**. The calibrated Ss term incorporates elastic storage, inelastic storage, and the compressibility of water. The C2VSim-FG Beta2 model available for use in development of the ECCSim model and at the time of this model report, does not currently include the capability to simulate land subsidence. With the inclusion of a subsidence component in future versions of IWFM, which will account for the inelastic storage component, the Ss term can be refined in future versions of ECCSim to include only elastic storage.

**Table 4-1. Summary of Calibrated Aquifer Parameter Values.**

| | | Aquifer Parameters | | | |
|---|---|---|---|---|---|
| | | Horizontal Conductivity (Kh) | Specific Storage (Ss) | Specific Yield (Sy) | Vertical Conductivity (Kv) |
| **Units** | | **ft/d** | **$ft^{-1}$** | **-** | **ft/d** |
| **Layer 1** | **Min** | 1.00 | 1.29E-05 | 0.07 | 0.05 |
| | **Max** | 327.38 | 6.43E-05 | 0.11 | 15.00 |
| | **Average** | 35.33 | 1.88E-05 | 0.08 | 2.43 |
| | **Median** | 25.00 | 1.50E-05 | 0.08 | 2.00 |
| **Layer 2** | **Min** | 0.04 | 4.50E-06 | 0.07 | 0.00 |
| | **Max** | 327.38 | 6.43E-05 | 0.11 | 2.80 |
| | **Average** | 31.77 | 1.38E-05 | 0.08 | 0.46 |
| | **Median** | 25.00 | 7.50E-06 | 0.08 | 0.39 |
| **Layer 3** | **Min** | 0.10 | 4.50E-07 | 0.06 | 0.01 |
| | **Max** | 650.00 | 6.43E-05 | 0.11 | 7.00 |
| | **Average** | 56.61 | 9.64E-06 | 0.08 | 0.62 |
| | **Median** | 25.00 | 6.75E-06 | 0.07 | 0.37 |
| **Layer 4** | **Min** | 5.75 | 2.25E-07 | 0.01 | 0.14 |
| | **Max** | 850.00 | 7.11E-05 | 0.11 | 52.25 |
| | **Average** | 100.17 | 9.77E-06 | 0.08 | 2.50 |
| | **Median** | 14.10 | 4.73E-06 | 0.07 | 0.19 |

### 4.1.3 Groundwater Levels

Out of 133 wells with observed groundwater levels in the model domain, a subset of 33 wells was selected for model calibration. Wells were selected to provide a broad representation of the model domain based on the spatial distribution, availability of associated well construction information, depth zone of well completion (e.g., layer 1, 2, 3, or 4), and period of record of available water level data. Simulated and observed groundwater elevations were compared over the 1997 through 2018 calibration period. Well hydrographs of simulated and observed groundwater elevations used for model calibration are included in **Appendix A**.

To quantify model fit between the simulated and observed groundwater levels, residual (simulated minus observed) groundwater levels were calculated for each well. To summarize calibration results, a single model layer was selected to compare to observed water levels. In some cases, a well is constructed across multiple model layers, or no construction details were available to determine where the well was screened. In these cases, a single model layer was chosen for each well based on a qualitative review of the hydrograph.

A histogram of residual groundwater elevations for all observations is shown in **Figure 4-17**. Residual groundwater levels range from -40 feet to 70 feet, with 72 percent of simulated groundwater elevations within 10 feet of observed and almost 84 percent of simulated groundwater elevations within 20 feet of observed. A review of average residual groundwater elevations by well (**Figure 4-18**) shows that 14 wells, or 42 percent of total, have an average residual groundwater elevation within 10 feet of observed, while 27 wells, or 82 percent of total, have an average residual groundwater elevation within 20 feet of observed. Average residual groundwater elevations by well range from -34 feet to 34 feet.

The relation between observed and simulated groundwater elevations is shown by layer in **Figure 4-19**. Points plotting above 1-to-1 correlation line represent observations where ECCSim is simulating higher than observed groundwater elevations, while points plotting below the 1-to-1 correlation line represent observations where ECCSim is simulating lower than observed groundwater elevations. In general, points are plotting close to the 1-to-1 correlation line, indicating a good model fit.

The relationship between residual and observed groundwater elevations is shown by layer in **Figure 4-20**. This figure shows that the model generally predicts water levels close to observed in the Upper Aquifer, as the majority of points plot near the origin. The model tends to predict higher than observed levels at lower observed groundwater elevations, while the model tends to predict lower than observed levels at higher observed groundwater elevations. The greatest residuals occur in wells in layers 3 and 4.

The spatial distribution of residual errors in the simulated levels are presented by well in **Figure 4-21**. The East Contra Costa Subbasin is generally well calibrated.

### 4.1.4 Groundwater Pumping

Over the historical model period, most of the pumping occurs in the two middle layers (Layers 2 and 3) within the East Contra Costa Subbasin. Approximately 92 percent of pumping occurs in Layers 2 and 3. The proportion and distribution of pumping is maintained for the projected future climate scenarios.

The sustainable yield future scenario ramps up the groundwater pumping to determine a higher level of pumping that the ECC Subbasin can sustain without resulting in negative effects including storage depletion, surface water depletion, or reversal of subsurface lateral flow with neighboring subbasins.

**Table 4-2. Summary of Historical and Projected Groundwater Pumping in ECCSim.**

| East Contra Costa Subbasin (area 107,596 ac) | | | |
|---|---|---|---|
| **Model Scenario** | **Model Layer** | **Pumping Amount or Proportion** | **Units** |
| **Historical Period (1997-2018)** | Layer 1 | 319 | AF/yr |
| | Layer 2 | 11,699 | AF/yr |
| | Layer 3 | 30,835 | AF/yr |
| | Layer 4 | 3,602 | AF/yr |
| | Total Avg Pumping | 46,455 | AF/yr |
| | Total ECC Subbasin Avg Pumping | 0.4 | AF/ac/yr |
| | Layer 1 | 0.7 | % |
| | Layer 2 | 25.2 | % |
| | Layer 3 | 66.4 | % |
| | Layer 4 | 7.8 | % |
| **Future Land Use Period (2019-2068)** | Layer 1 | 205 | AF/yr |
| | Layer 2 | 4,122 | AF/yr |
| | Layer 3 | 20,757 | AF/yr |
| | Layer 4 | 3,883 | AF/yr |
| | Total Avg Pumping | 28,966 | AF/yr |
| | Total ECC Subbasin Avg Pumping | 0.3 | AF/ac/yr |
| | Layer 1 | 0.7 | % |
| | Layer 2 | 14.2 | % |
| | Layer 3 | 71.7 | % |
| | Layer 4 | 13.4 | % |
| **Future Sustainable Yield[2] Period (2019-2068)** | Layer 1 | 616 | AF/yr |
| | Layer 2 | 7,631 | AF/yr |
| | Layer 3 | 59,478 | AF/yr |
| | Layer 4 | 4,267 | AF/yr |
| | Total Avg Pumping | 71,992 | AF/yr |
| | Subbasin Avg Pumping | 0.7 | AF/ac/yr |
| | Layer 1 | 0.9 | % |
| | Layer 2 | 10.6 | % |
| | Layer 3 | 82.6 | % |
| | Layer 4 | 5.9 | % |

[2] The Sustainable Yield run was developed using a reduction of surface water deliveries by 50%, thereby increasing groundwater pumping without deleterious effects.

## 4.2 Water Budget

Groundwater budgets were generated for the East Contra Costa Subbasin for each of the model simulations. Water budget results are presented in the following sections.

### 4.2.1 Historical Period, 1997-2018

The water budget during the historical calibration period simulation was calculated for the 1997-2018 water years from October 1, 1997 through September 30, 2018.

Change in groundwater storage shows overall stability over the 21-year historical calibration period. Groundwater leaves the subbasin through drains in amounts that average about 74,800 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 17,800 AF per year. Deep percolation accounts for an average recharge of about 90,000 AF per year. Groundwater pumping accounts for an average discharge of about 46,500 AF per year. Net subsurface outflow accounts for an average of about 8,500 AF per year. There is some uncertainty in subsurface outflow estimates because these calculations depend on a variety of factors inside and outside the subbasin.

Detailed historical water budget results for East Contra Costa Subbasin are presented in **Appendix B**, and groundwater elevation hydrographs at select wells are included in **Appendix A**.

### 4.2.2 Projected Scenarios, 2019-2068

The water budget during the future projected fifty-year period simulation was calculated for the 2019-2068 water years from October 1, 2018 through September 30, 2068.

***Projected Land Use Change***

Change in groundwater storage shows aquifer storage replenishment as a result of the projected land use change resulting in more urban land in the subbasin. Groundwater leaves the subbasin through drains in amounts that average about 71,200 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 20,300 AF per year. Deep percolation accounts for an average recharge of about 85,000 AF per year. Groundwater pumping accounts for an average discharge of about 46,100 AF per year. Net subsurface outflow accounts for an average of about 7,000 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

***Projected Land Use Change with Climate Change***

Change in groundwater storage shows aquifer storage replenishment as a result of the projected land use change resulting in more urban land in the subbasin. Groundwater leaves the subbasin through drains in amounts that average about 84,000 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 13,900 AF per year. Deep percolation accounts for an average recharge of about 97,000 AF per year. Groundwater pumping accounts for an average discharge of about 34,000 AF per year. Net subsurface outflow accounts for an average of about 11,400 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

***Projected Land Use Change with Sea Level Rise***

Change in groundwater storage shows aquifer storage replenishment as a result of the projected land use change resulting in more urban land in the subbasin. Groundwater leaves the subbasin through drains in amounts that average about 86,500 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 13,300 AF per year. Deep percolation accounts for an average recharge of about 95,700 AF per year. Groundwater pumping accounts for an average discharge of about 29,000 AF per year. Net subsurface outflow accounts for an average of about 13,000 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

***Projected Land Use Change with Climate Change and Sea Level Rise***
Change in groundwater storage shows aquifer storage replenishment as a result of the projected land use change resulting in more urban land in the subbasin. Groundwater leaves the subbasin through drains in amounts that average about 81,100 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 14,600 AF per year. Deep percolation accounts for an average recharge of about 97,100 AF per year. Groundwater pumping accounts for an average discharge of about 34,000 AF per year. Net subsurface outflow accounts for an average of about 11,400 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

***Projected Land Use Change with Wet Climate Change***
Change in groundwater storage shows aquifer storage replenishment as a result of the projected land use change resulting in more urban land in the subbasin. Groundwater leaves the subbasin through drains in amounts that average about 103,000 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 6,900 AF per year. Deep percolation accounts for an average recharge of about 129,500 AF per year. Groundwater pumping accounts for an average discharge of about 32,600 AF per year. Net subsurface outflow accounts for an average of about 14,800 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

***Projected Land Use Change with Dry Climate Change***
Change in groundwater storage shows aquifer storage replenishment as a result of the projected land use change resulting in more urban land in the subbasin. Groundwater leaves the subbasin through drains in amounts that average about 75,800 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 16,100 AF per year. Deep percolation accounts for an average recharge of about 88,300 AF per year. Groundwater pumping accounts for an average discharge of about 36,100 AF per year. Net subsurface outflow accounts for an average of about 10,000 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

### 4.2.3 Sustainable Yield Projected Period, 2019-2068

The water budget during the sustainable yield projected period simulation was calculated for the 2019-2068 water years from October 1, 2018 through September 30, 2068.

***Projected Land Use Change with Increased Pumping***
Change in groundwater storage shows some aquifer storage replenishment despite increasing the groundwater pumping. Groundwater leaves the subbasin through drains in amounts that average about 56,900 AFY during the base period. Surface water/groundwater interaction accounts for an average recharge of about 19,200 AF per year. Deep percolation accounts for an average recharge of about 96,000 AF per year. Groundwater pumping accounts for an average discharge of about 72,000 AF per year. Net subsurface outflow accounts for an average of about 3,700 AF per year.

Detailed projected water budget results for East Contra Costa Subbasin are presented in **Appendix B**.

## 5 MODEL UNCERTAINTY AND LIMITATIONS

Any groundwater flow model is a simplification of the natural environment, and therefore has recognized limitations. For this reason, uncertainty exists in the ability of any numerical model to completely represent groundwater flow. Some of the uncertainty is associated with limitations in available data.

Considerable effort was made to reduce model uncertainty by improving the calibration of aquifer parameters to better match observed groundwater conditions.

The finding and conclusions of this study are focused on a Subbasin scale and use of the model for site-specific analysis should be conducted with an understanding that representation of local site-specific conditions may be approximate and should be verified with local site-specific investigations. The flow model was developed in a manner consistent with the level of care and skill normally exercised by professionals practicing under similar conditions in the area. There is no warranty, expressed or implied, that this modeling study has considered or addresses all hydrogeological, hydrological, environmental, geotechnical or other characteristics and properties associated with the subject model domain and the simulated system.

# 6 CONCLUSIONS AND RECOMMENDATIONS

Based on the calibration of ECCSim to historical conditions for the calibration period from water year 1997 to 2018 and accompanying assessment of model sensitivity, the ECCSim groundwater flow model is suitable for use as a tool to support management of water resources within the East Contra Costa Subbasin.

## 6.1 Conclusions

ECCSim provides a useful tool for evaluating a wide variety of future scenarios and inform the decision-making process to maintain sustainable groundwater management in the East Contra Costa Subbasin. A numerical model can be a convenient and cost-efficient tool for providing insights into groundwater responses to various perturbations including natural variability and change, and also changes associated with management decisions or other humanmade conditions. However, as with any other modeling tool, information obtained from a numerical model also has a level of uncertainty, especially for long-term predictions or forecasts. The level of uncertainty associated with model simulations are likely to increase the more the scenarios extend beyond the range of historical conditions and processes over which the model was calibrated, such as for long-term predictive scenarios or predictive scenarios with extreme alterations to the hydrologic conditions.

## 6.2 Recommendations

Future and ongoing updates to ECCSim will be valuable for improving the model performance and verifying the accuracy of the model predictions.  Using data from the ongoing monitoring efforts and forthcoming GSP monitoring, ECCSim should be updated periodically, including through extending of the model period and associated inputs. Although the frequency of conducting model updates may depend on a variety of factors, including evaluation of the model performance in predicting future conditions, such an update could initially be considered every five years. This frequency of model update should be adequate and cost effective to test and improve ECCSim periodically with new site-specific and monitoring information. Groundwater elevations, groundwater pumping, rainfall, and stream discharge should be collected on an ongoing basis, to the extent possible, at intervals of at least monthly for pumpage, rainfall, and streamflow, and less frequently (semi-annually at least) for groundwater levels. The new groundwater data should be compared with the respective model simulation results so that the flow model can be verified into the future. If the differences between the measured groundwater data and ECCSim's predicted results are significant, adjustment and modification may be applied to the model input parameters.

ECCSim has been calibrated and verified. It adheres closely to site-specific observed data so that model input parameters are reasonable and appropriate especially within the East Contra Costa Subbasin. Additional model revisions may be conducted in areas outside the East Contra Costa Subbasin as that data is obtained from adjacent GSAs.

Further refinement to ECCSim should be made by addressing key data gaps. The calibrated C2VSimFG model should be evaluated to incorporate any relevant aspects of the model into ECCSim, as appropriate and necessary. In particular, a calibrated land subsidence simulation package should be considered for incorporation into ECCSim. This capability is anticipated with the release of the calibrated C2VSimFG model. Updates to aquifer parameters can be made through incorporation of lithologic information or aquifer testing information developed from new monitoring well construction efforts in the future. Through upcoming GSP-related monitoring, additional groundwater level data can be used to refine boundary condition water levels and improve model calibration. Additional improvements to model calibration can be made by the potential linking of additional well construction information to wells with appropriate monitoring periods of record, and refinements to the simulation of surface water distribution systems. Further refinements to ECCSim can be made by extending the historical base period and ongoing updating of model calibration in preparation for 5-year GSP status/update report.

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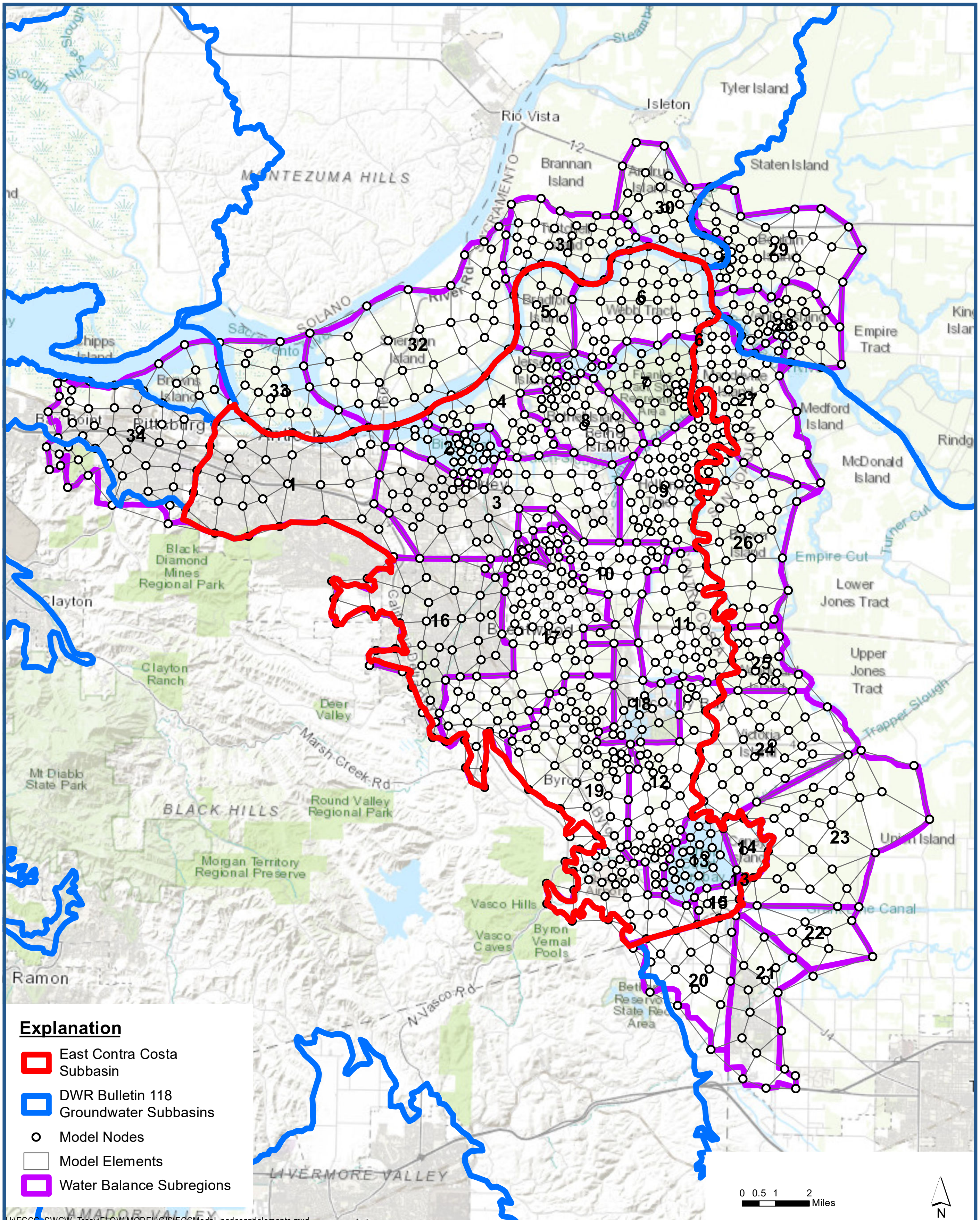
# FIGURES

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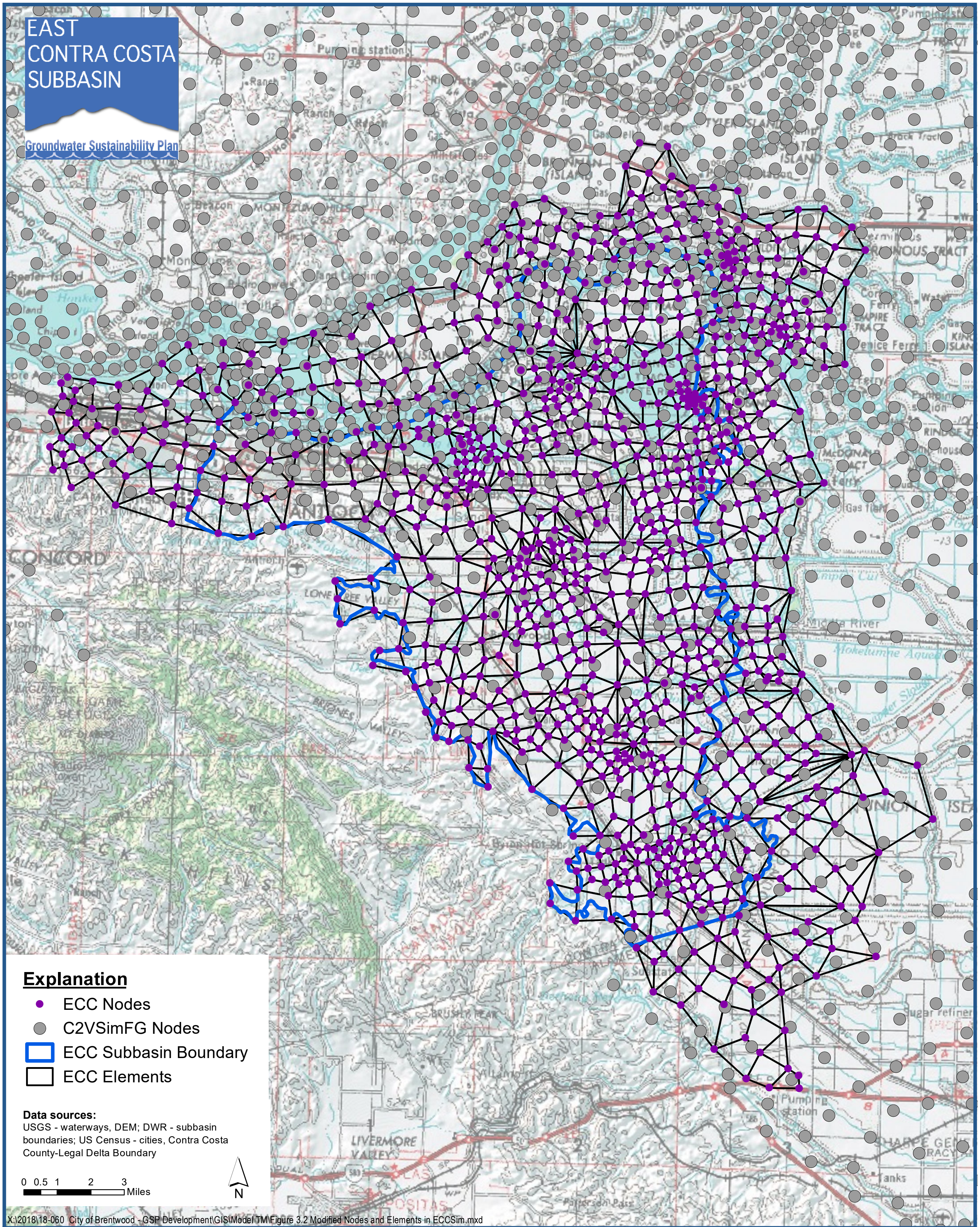
**Model Grid and Node Refinement**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim)*

**Figure 3-1**

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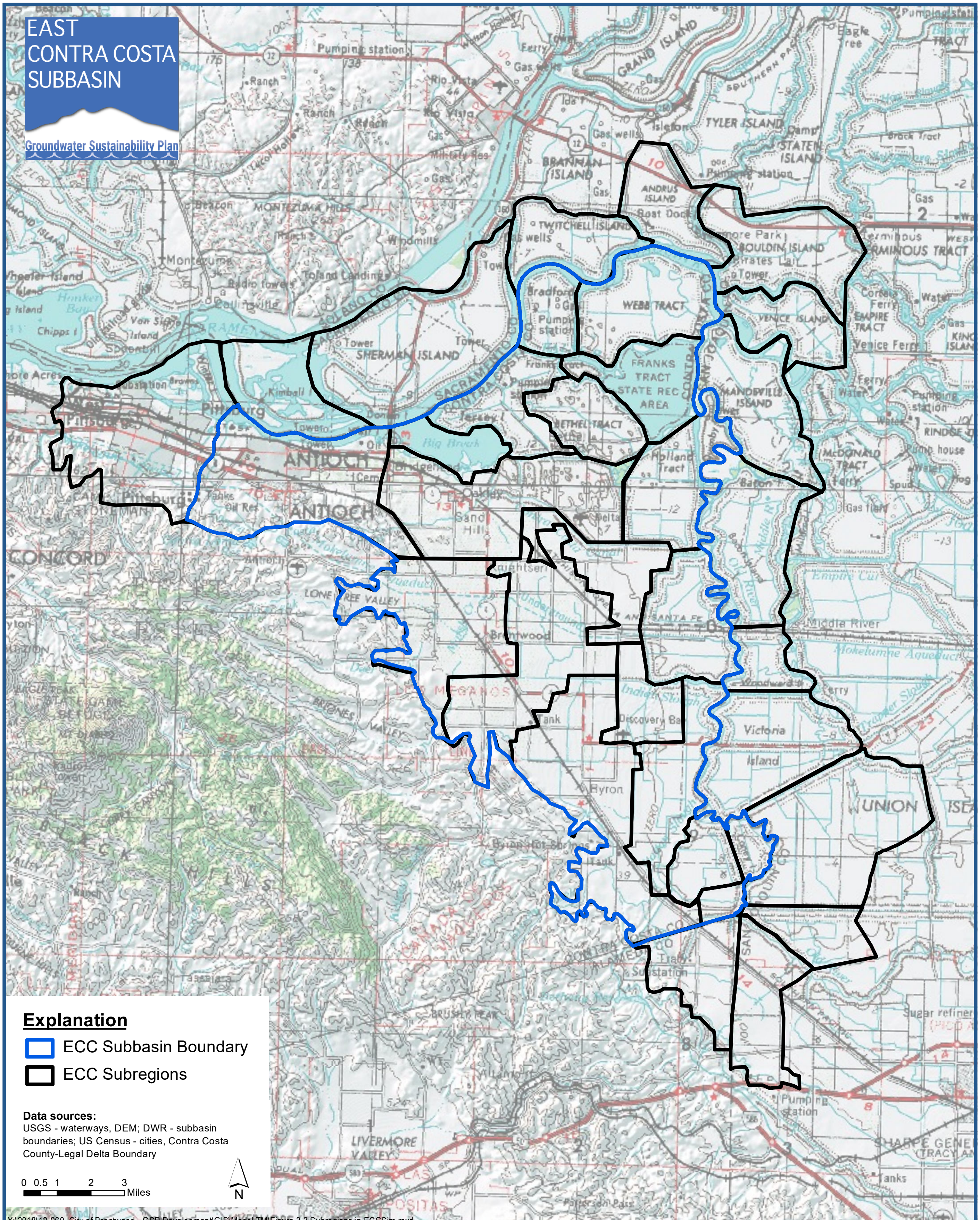
**Modified Nodes and Elements in ECCSim**

**Figure 3-2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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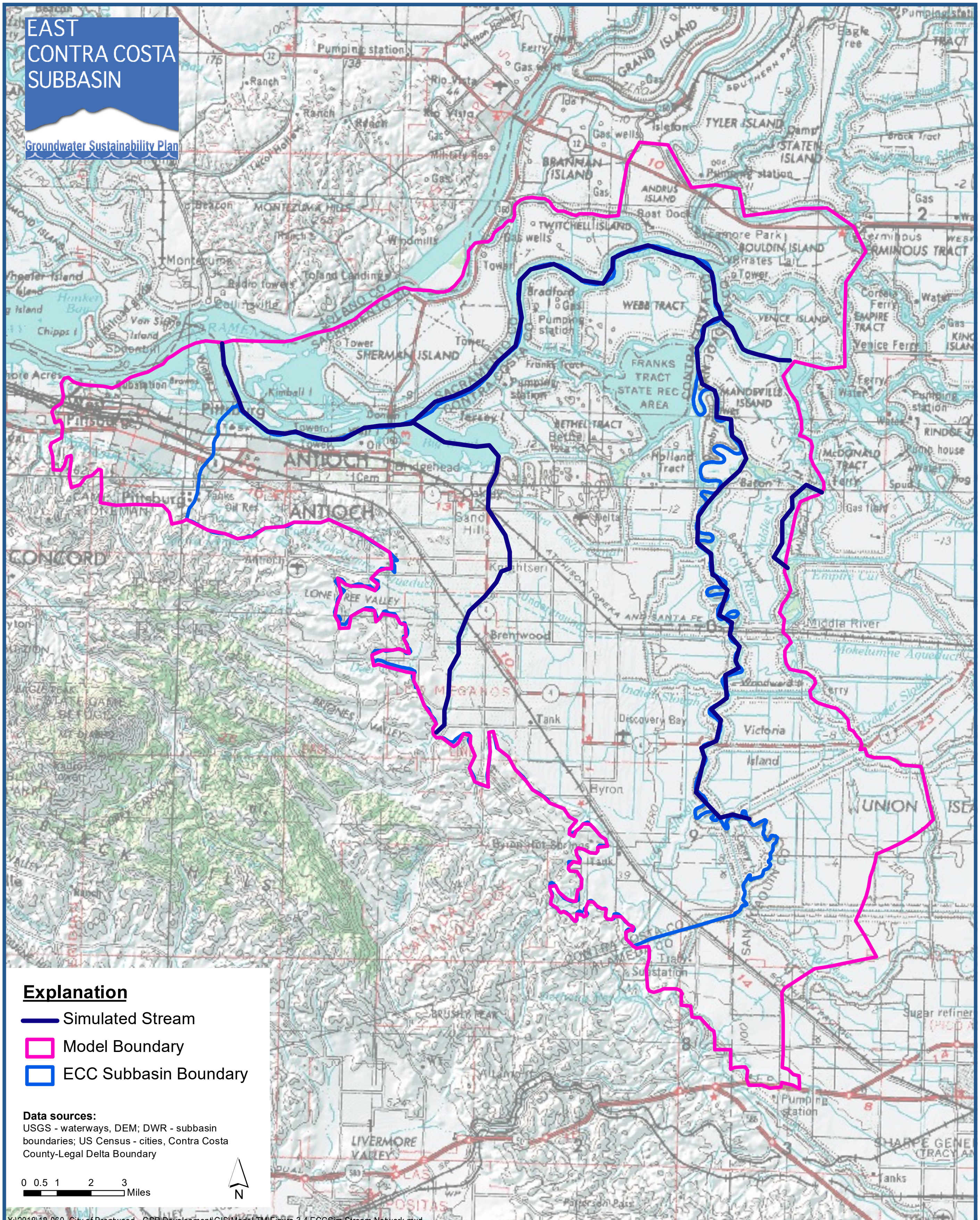
**Subregions in ECCSim**

**Figure 3-3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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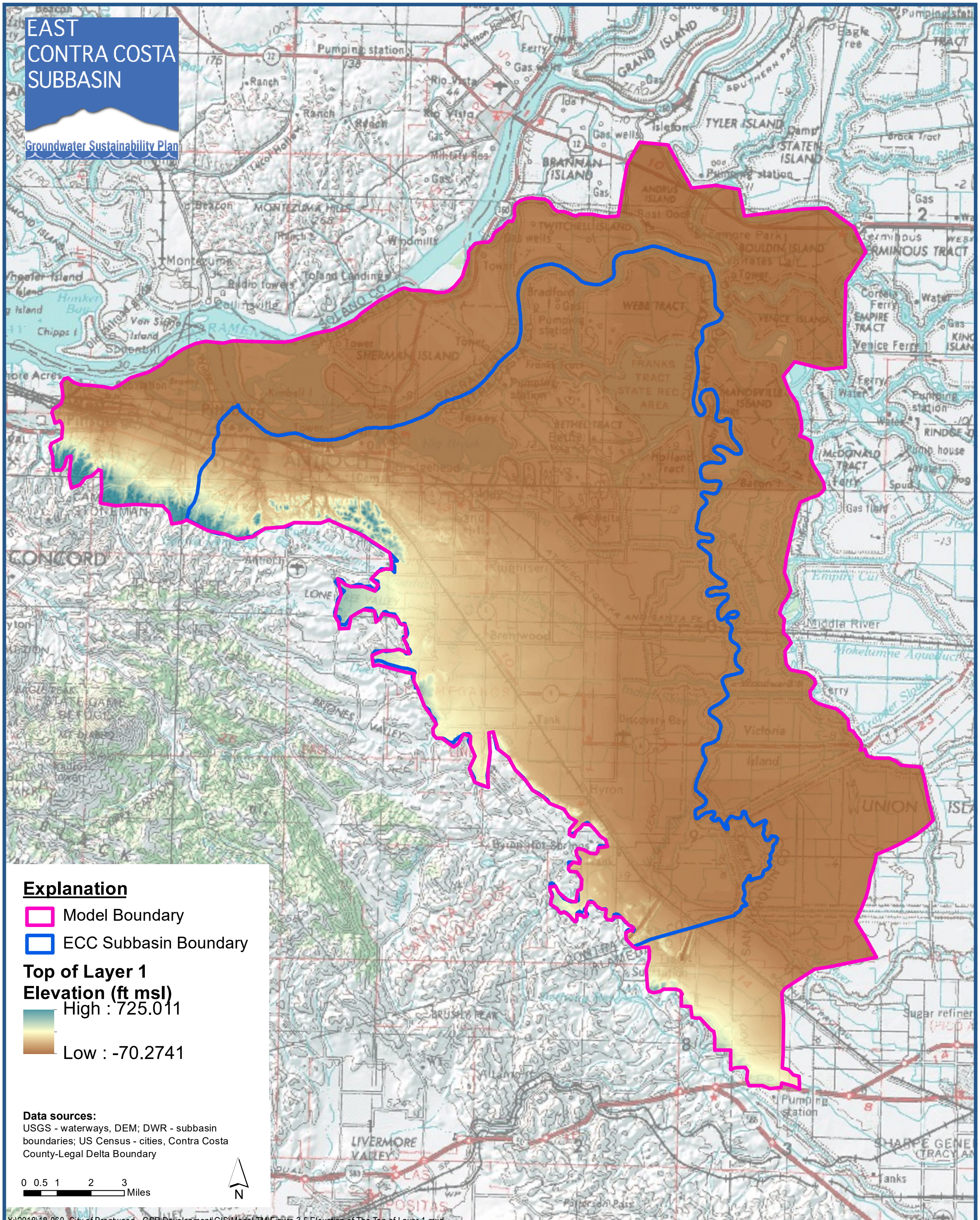
**ECCSim Stream Network**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-4**

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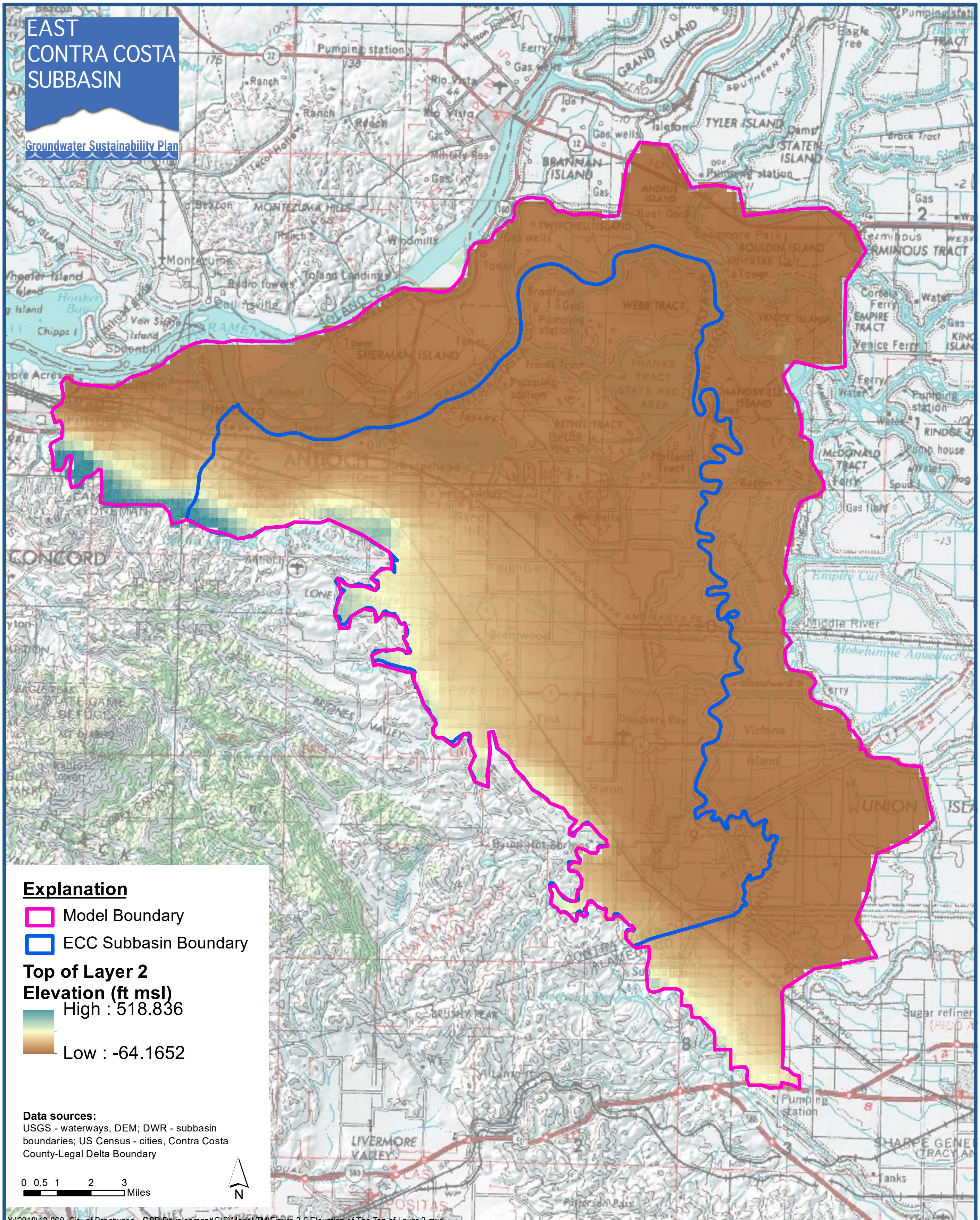
**Elevation of The Top of Layer 1**

**Figure 3-5**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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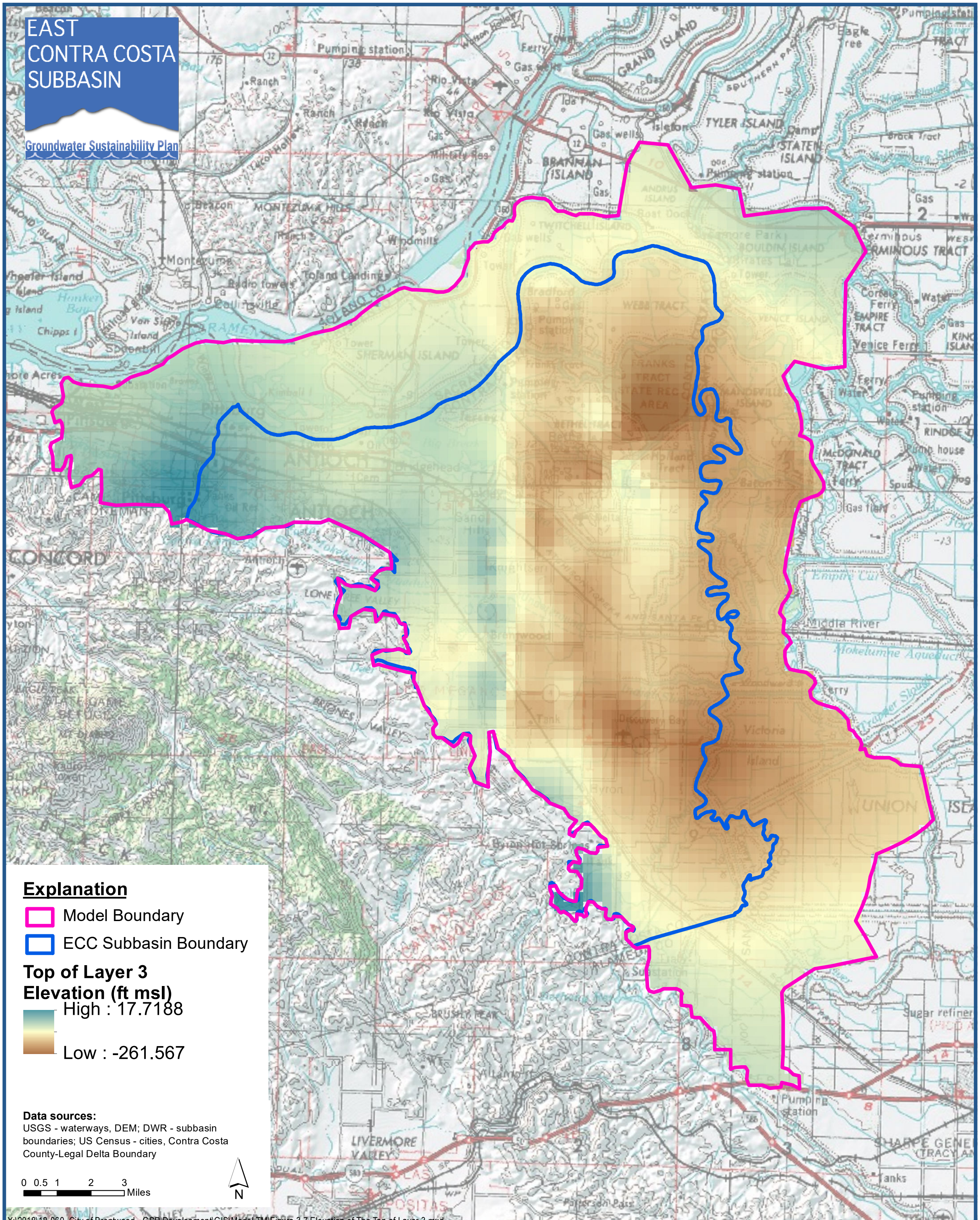
**Elevation of The Top of Layer 2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-6**

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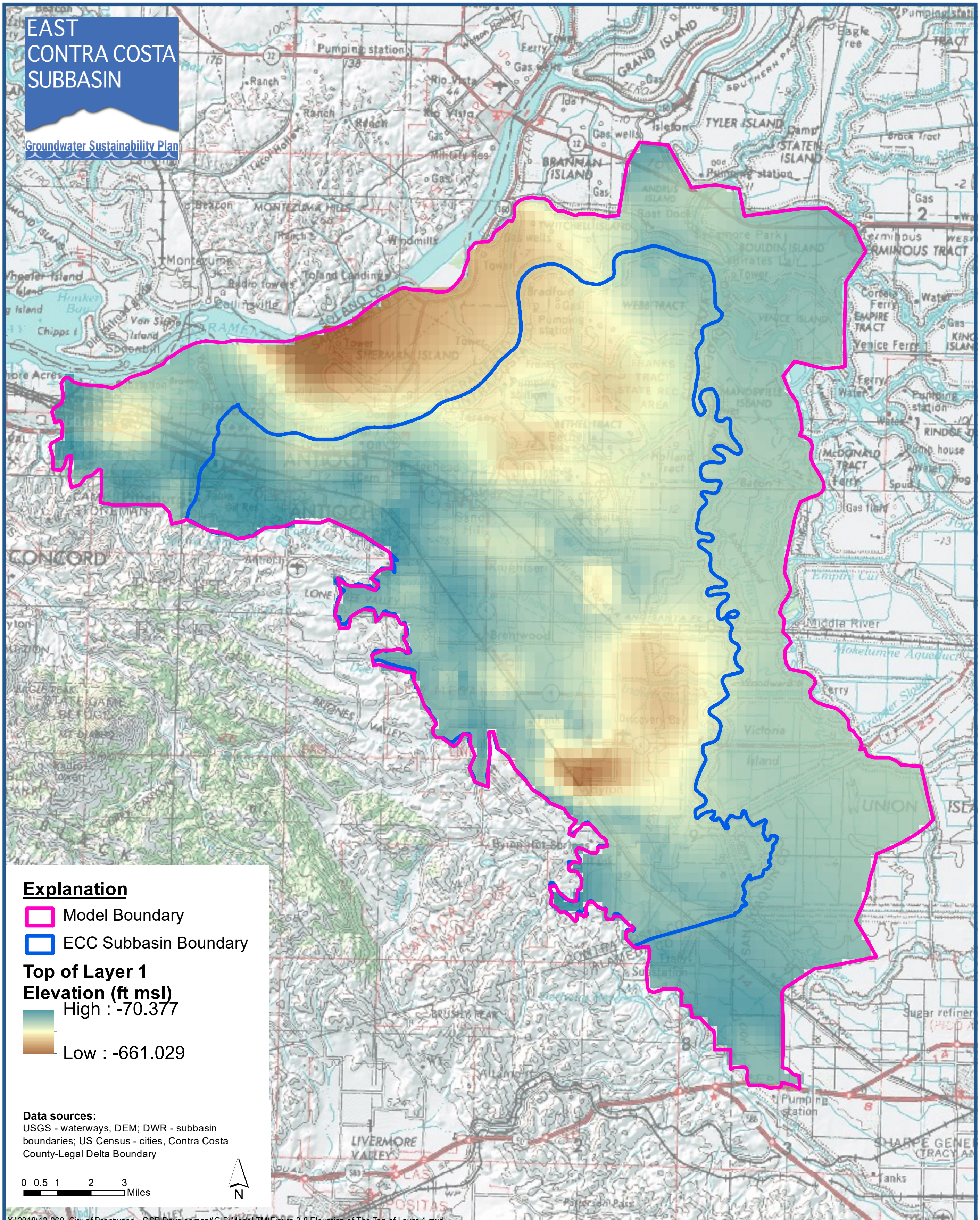
**Elevation of The Top of Layer 3**

**Figure 3-7**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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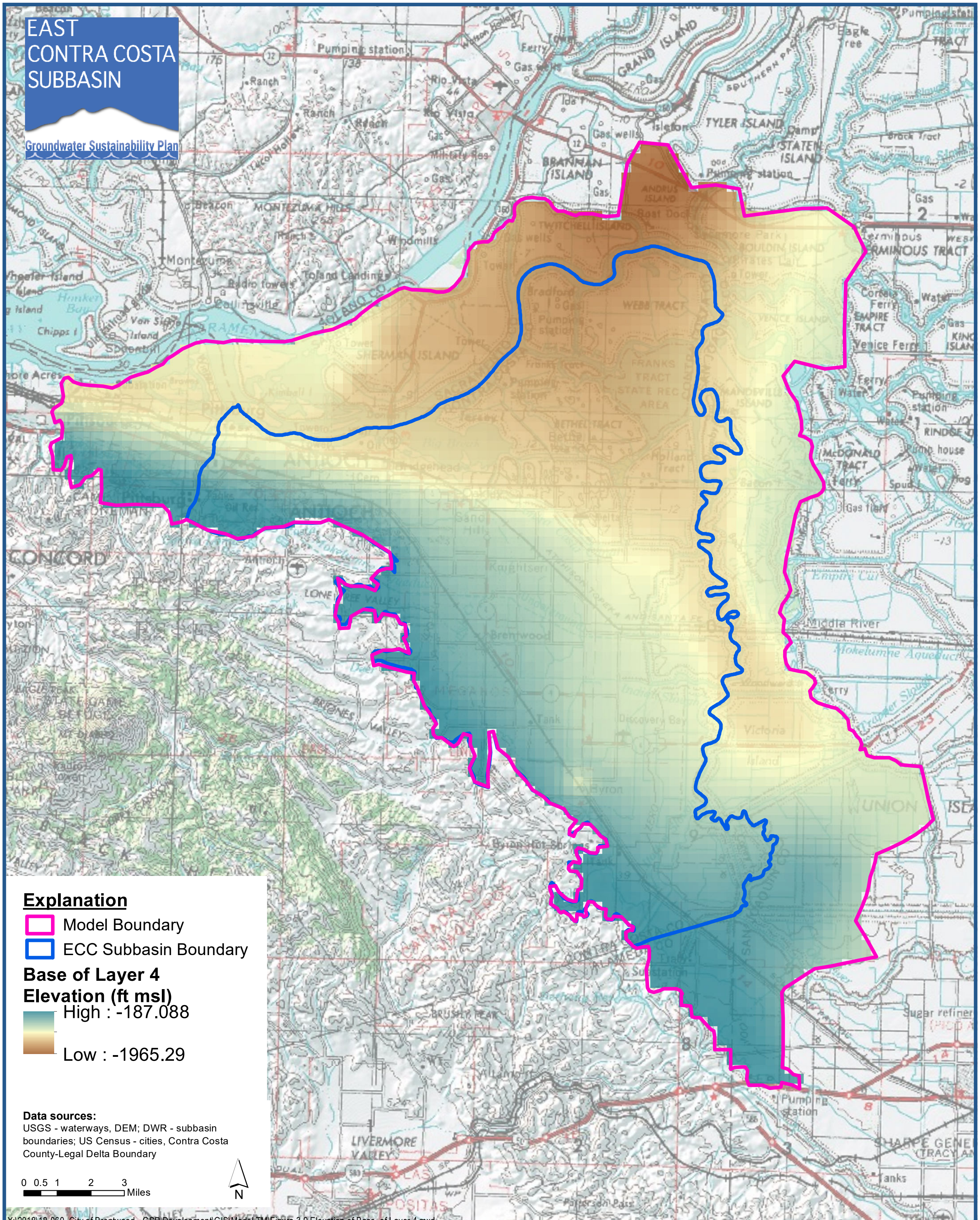
**Elevation of The Top of Layer 4**

**Figure 3-8**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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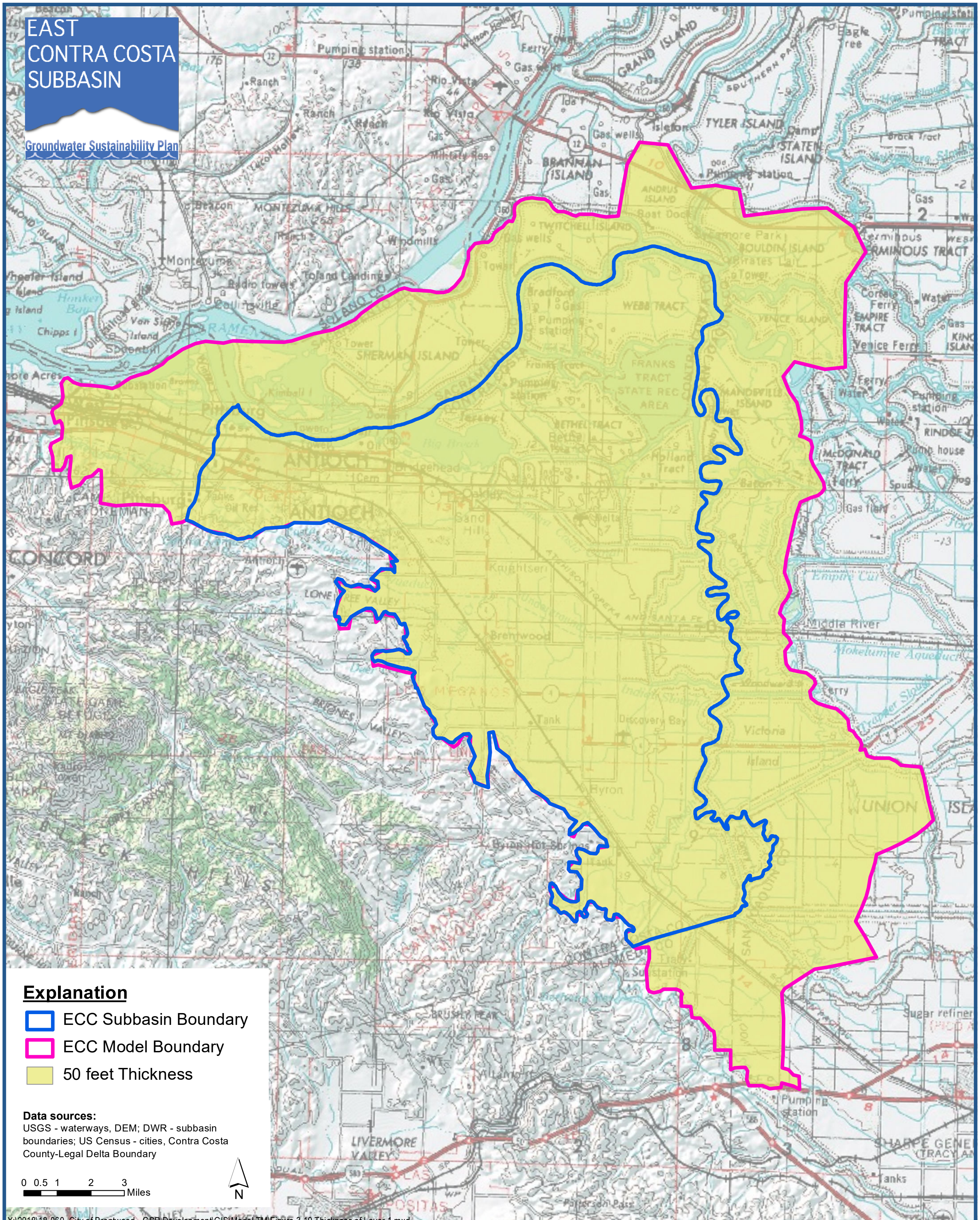
**Elevation of The Bottom of Layer 4**

**Figure 3-9**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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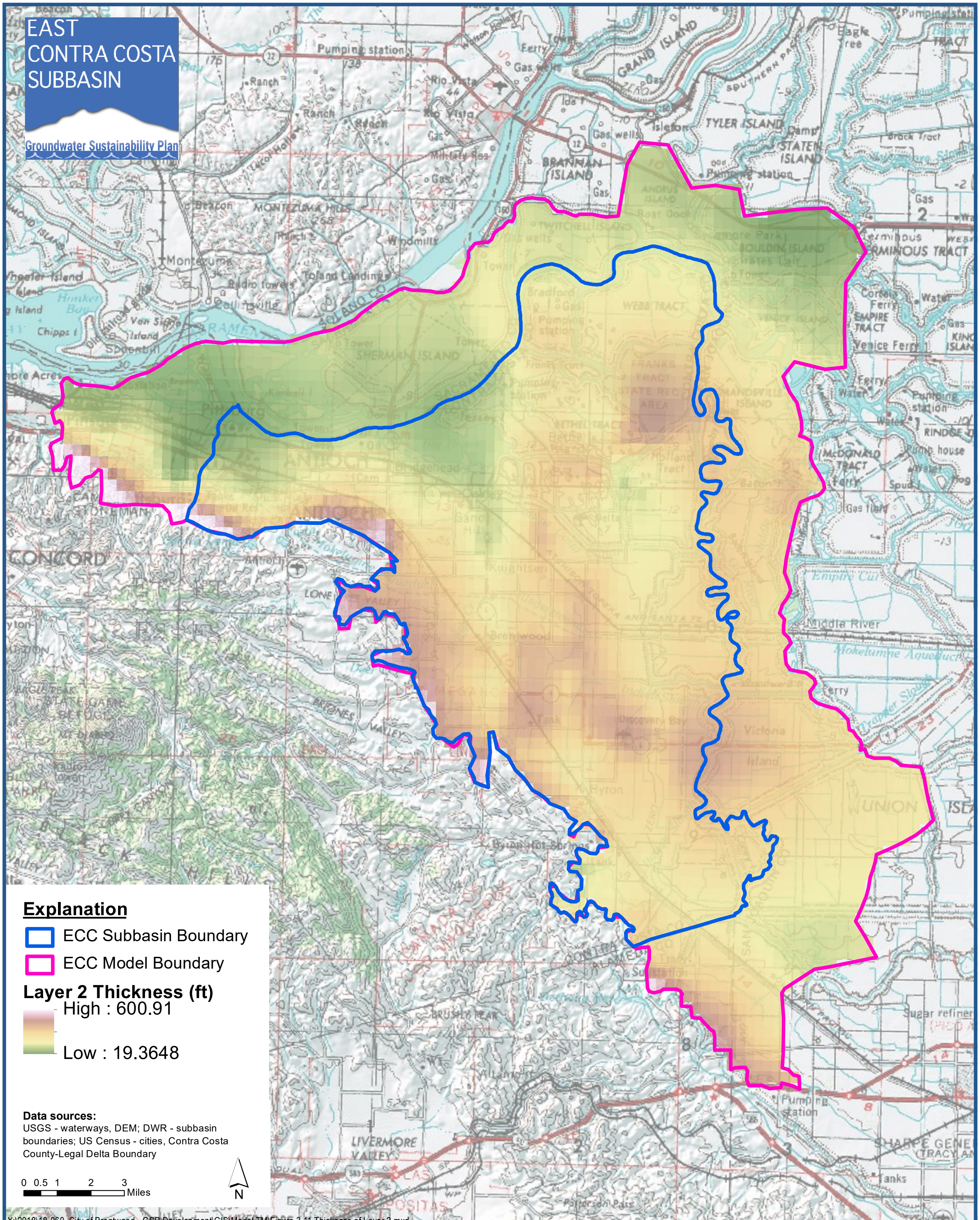
**Thickness of Layer 1**

**Figure 3-10**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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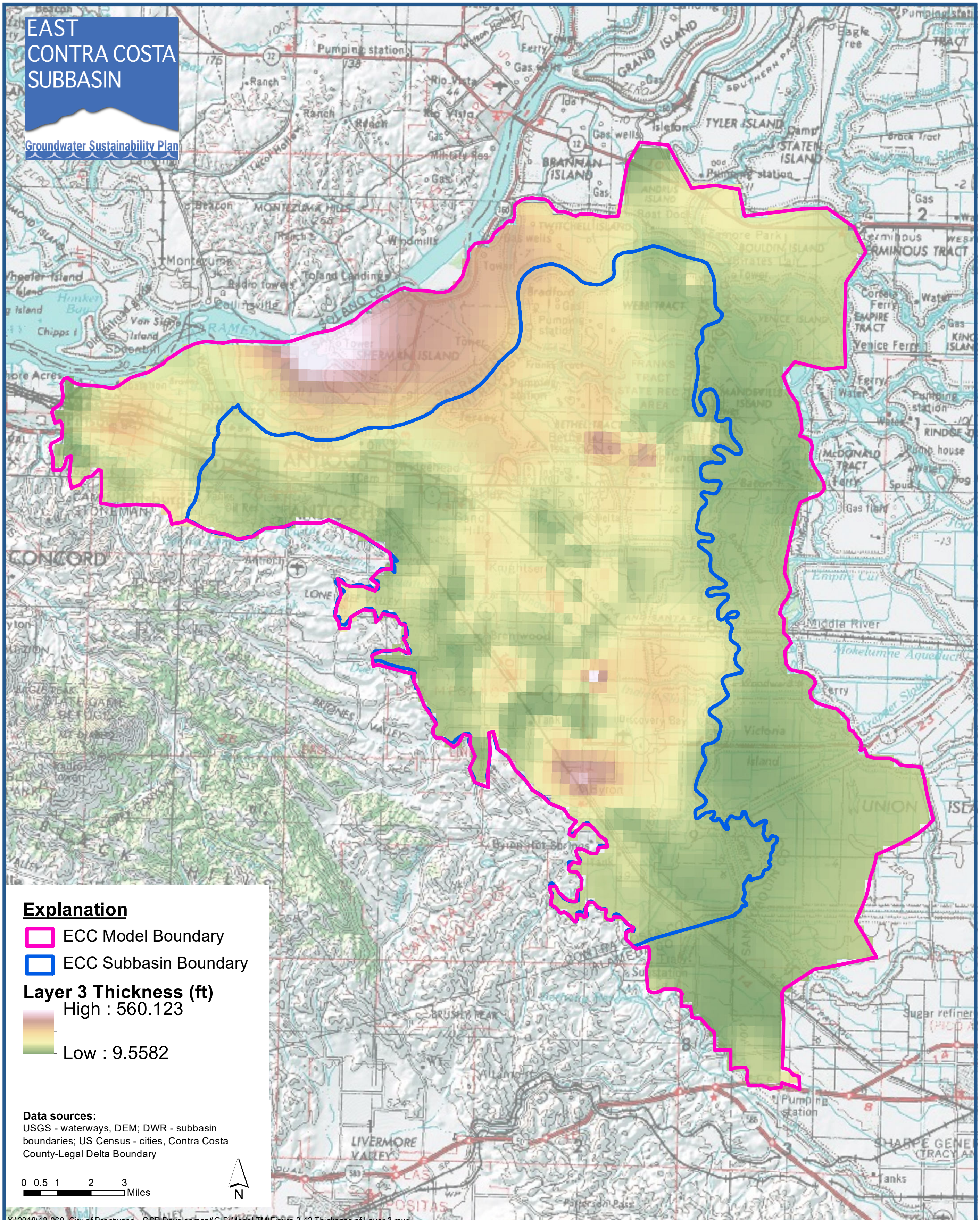
**Thickness of Layer 2**

**Figure 3-11**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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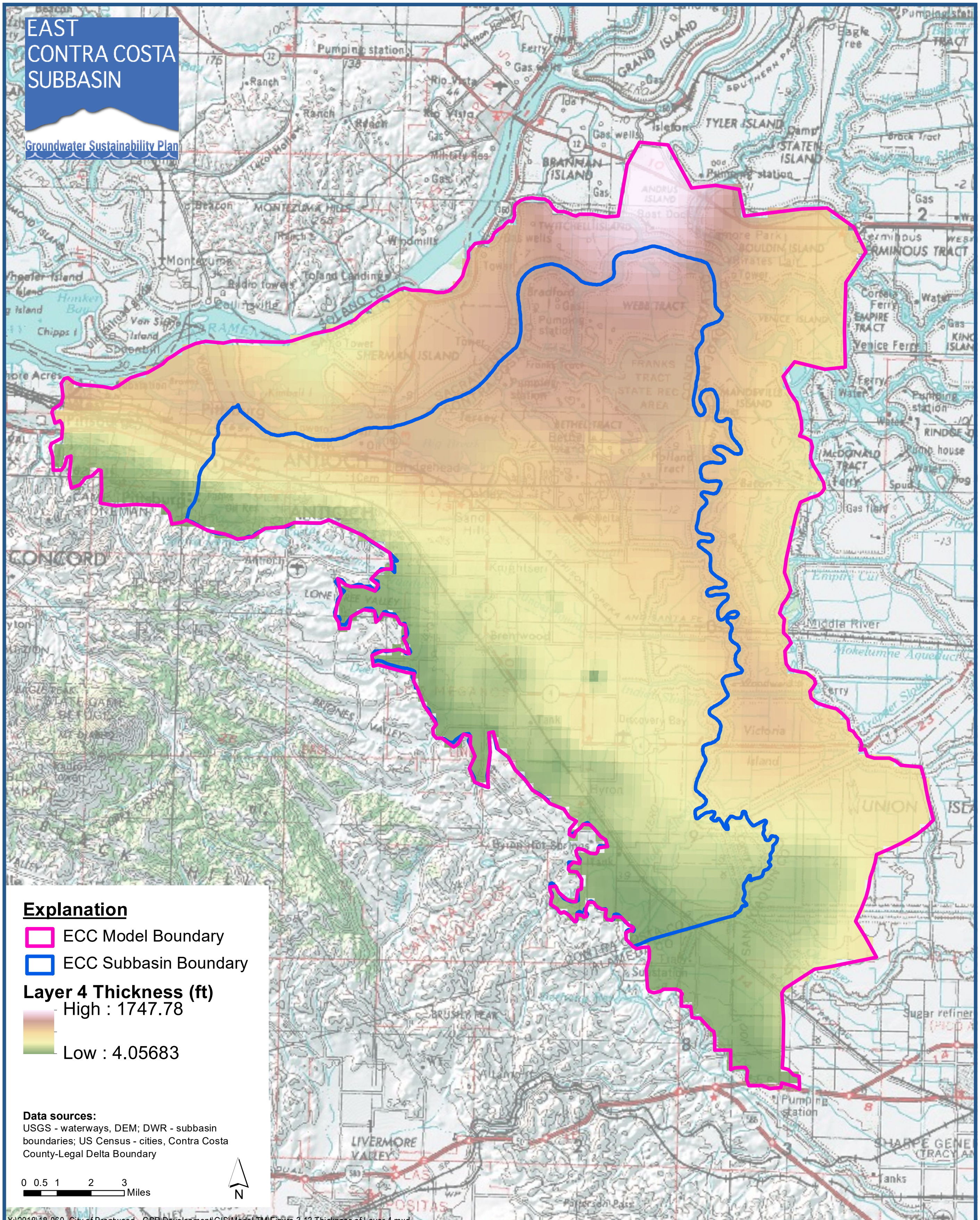
**Thickness of Layer 3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-12**

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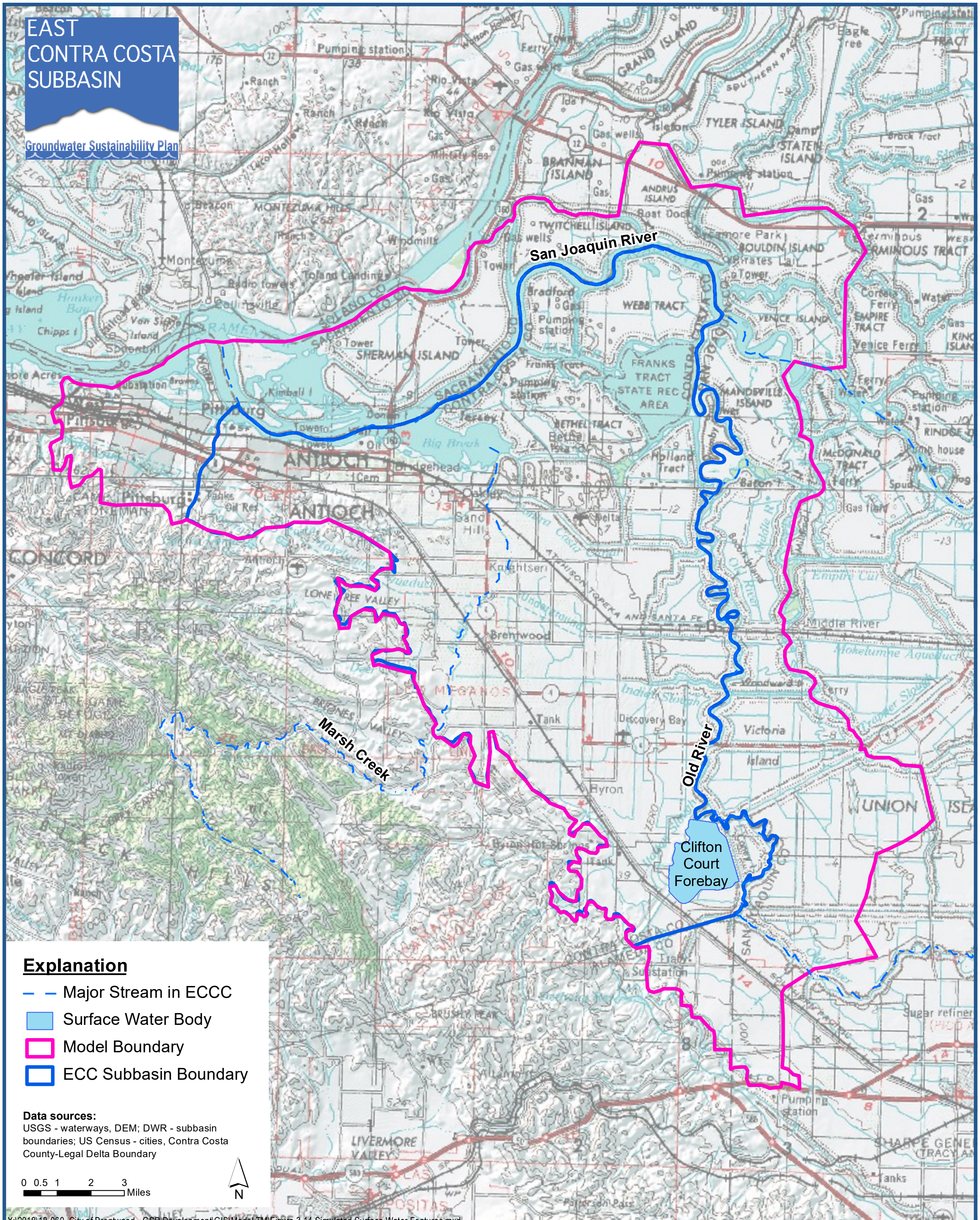
**Thickness of Layer 4**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-13**

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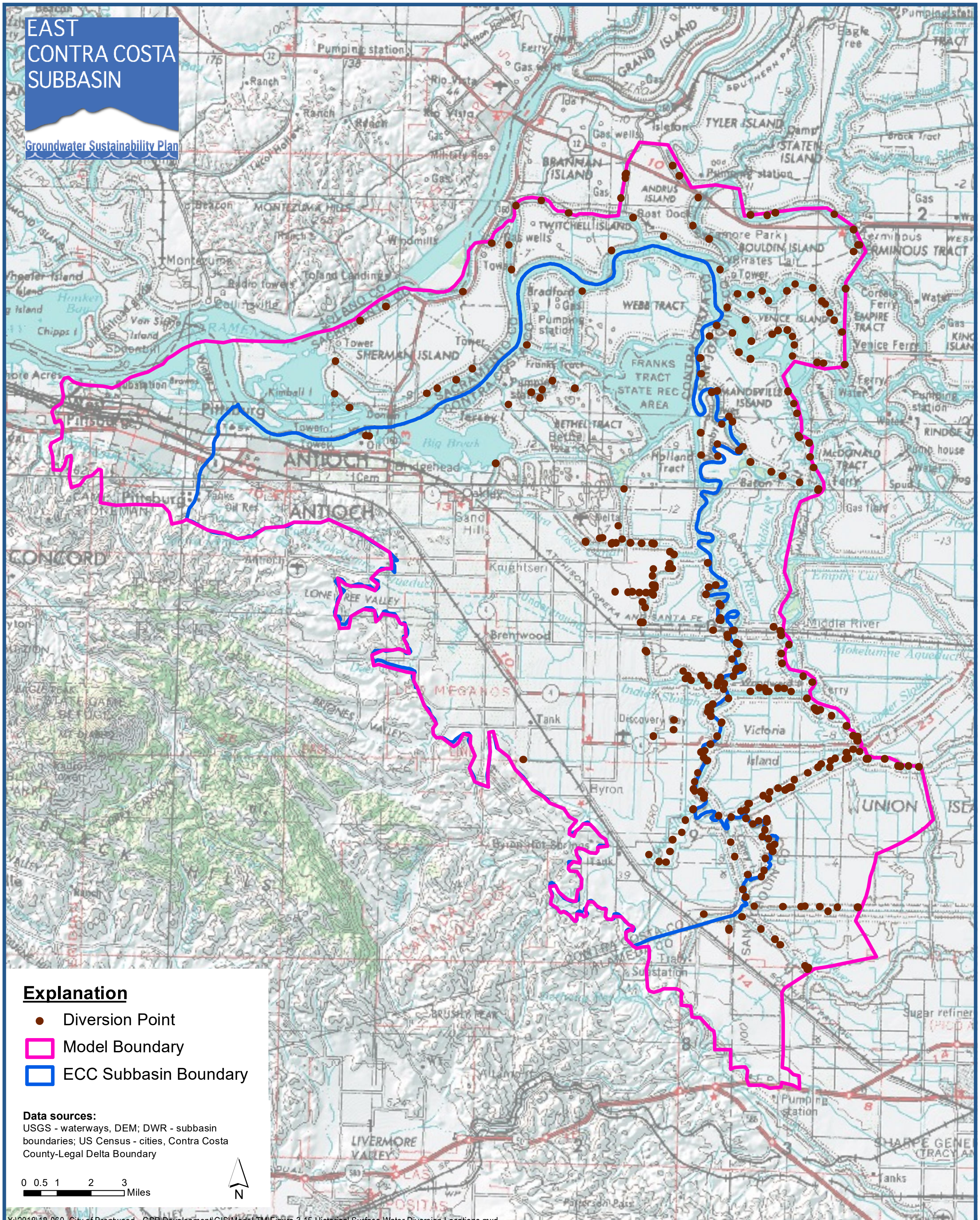
**Simulated Surface Water Features**

**Figure 3-14**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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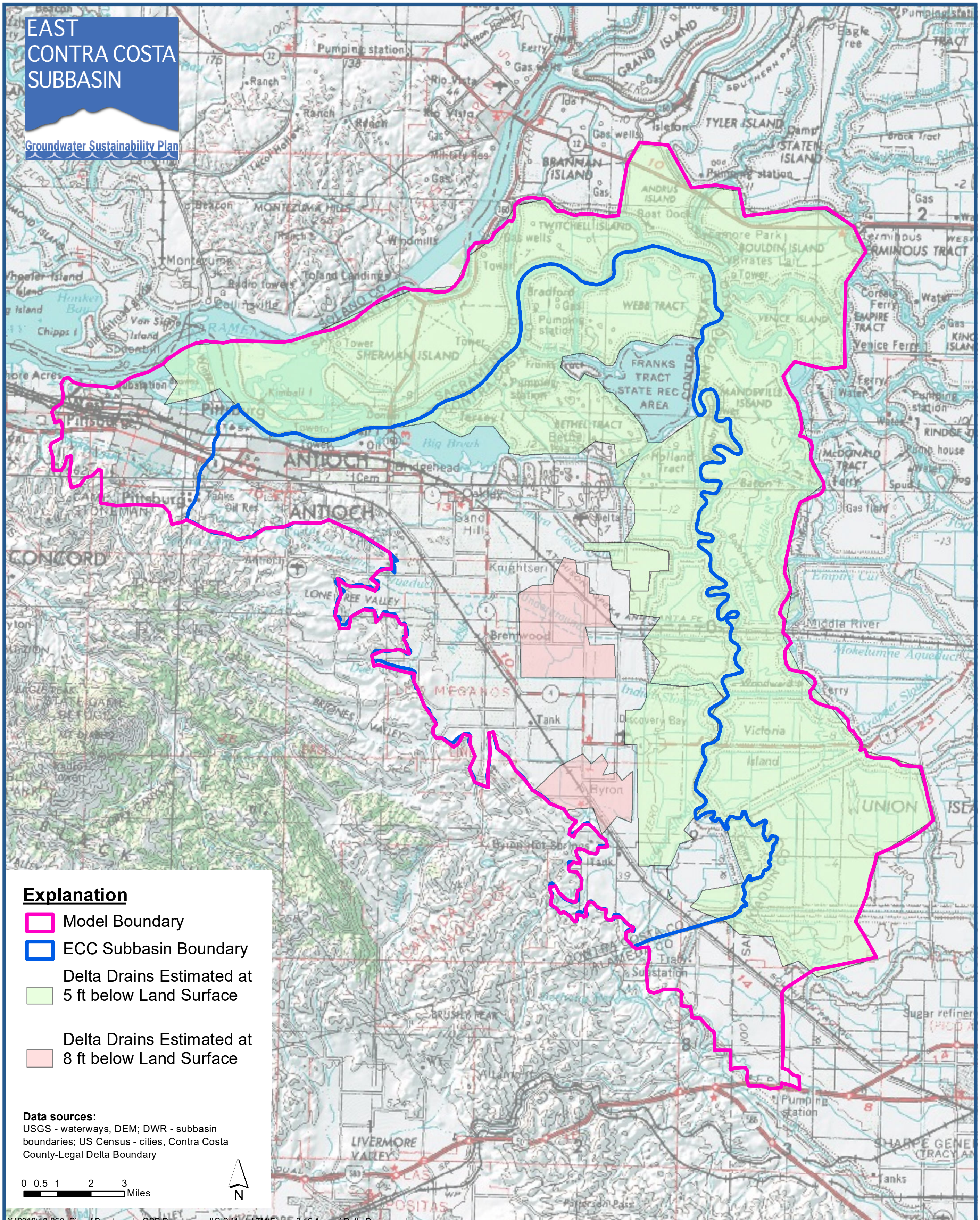
**Historical Surface Water Diversion Locations**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-15**

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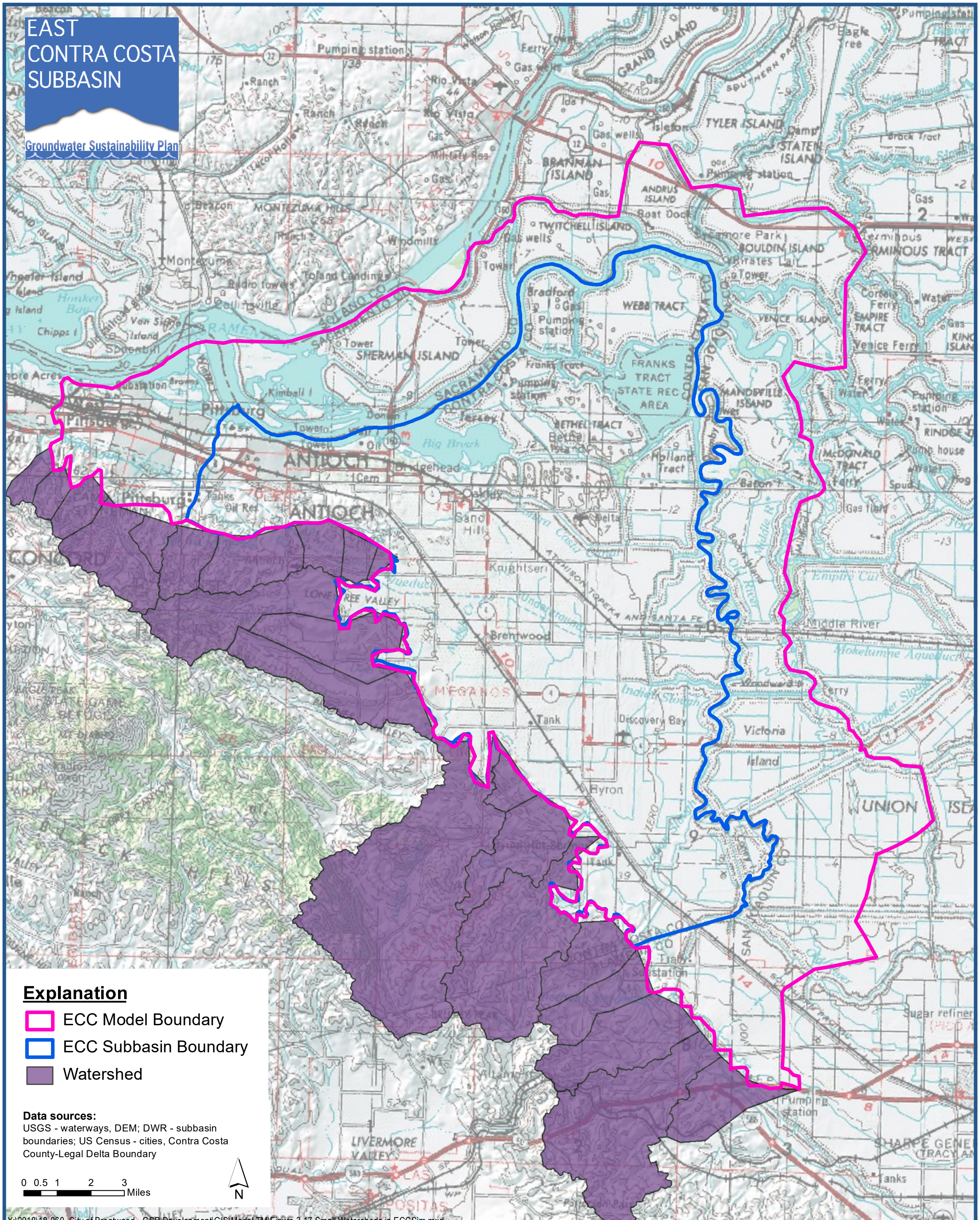
**Area of Delta Drains**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-16**

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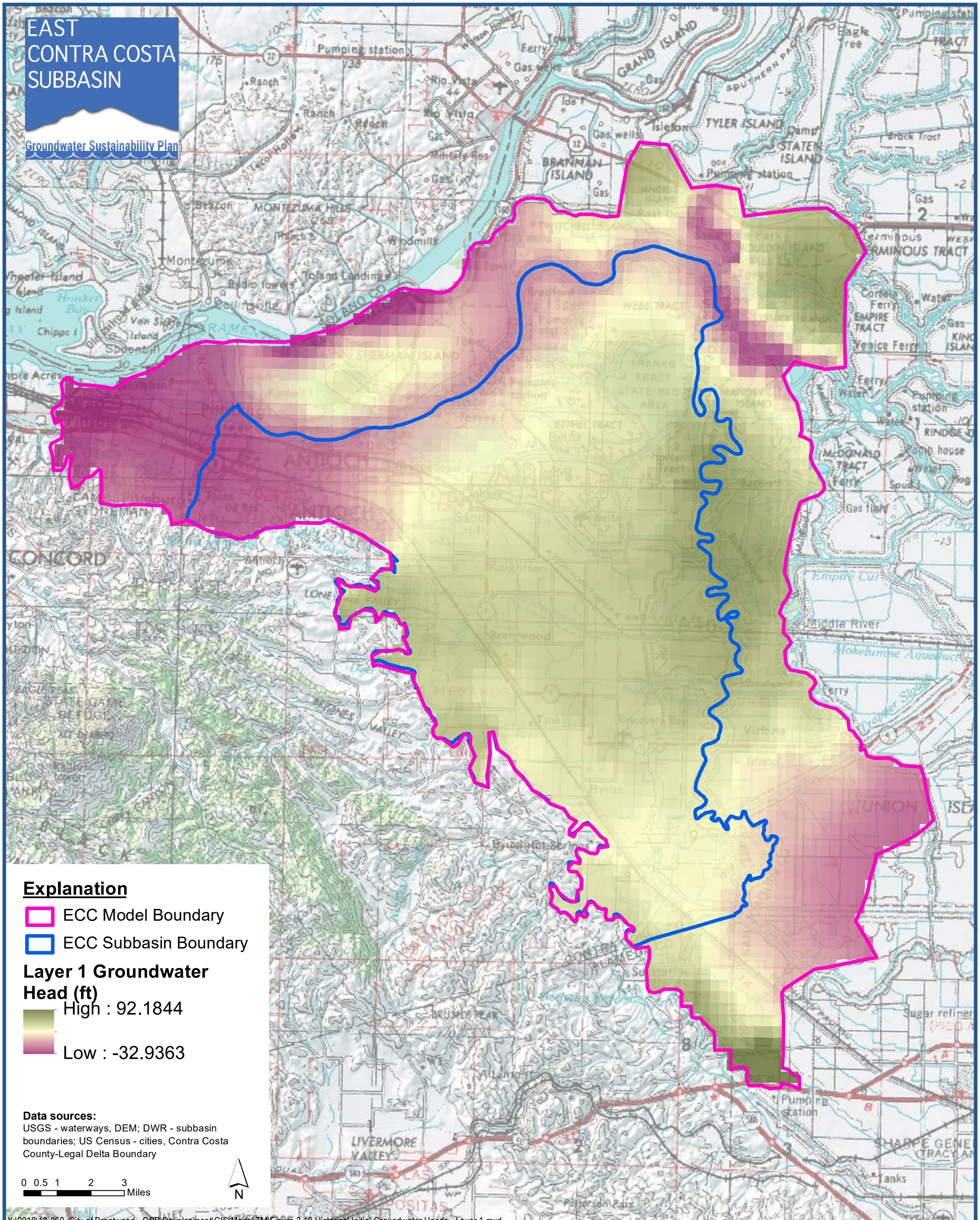
**Small Watersheds in ECCSim**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-17**

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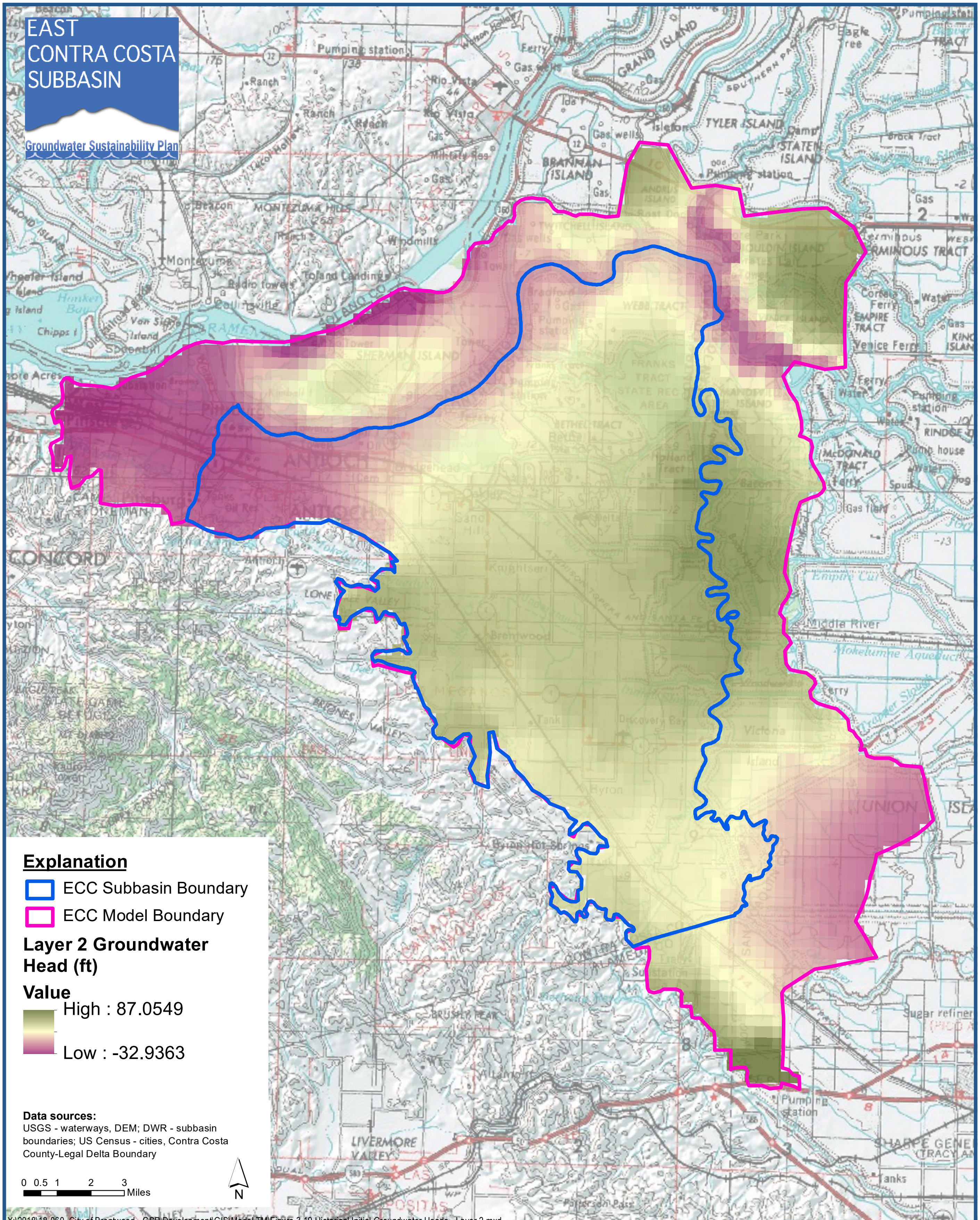
**Historical Initial Groundwater Heads - Layer 1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-18**

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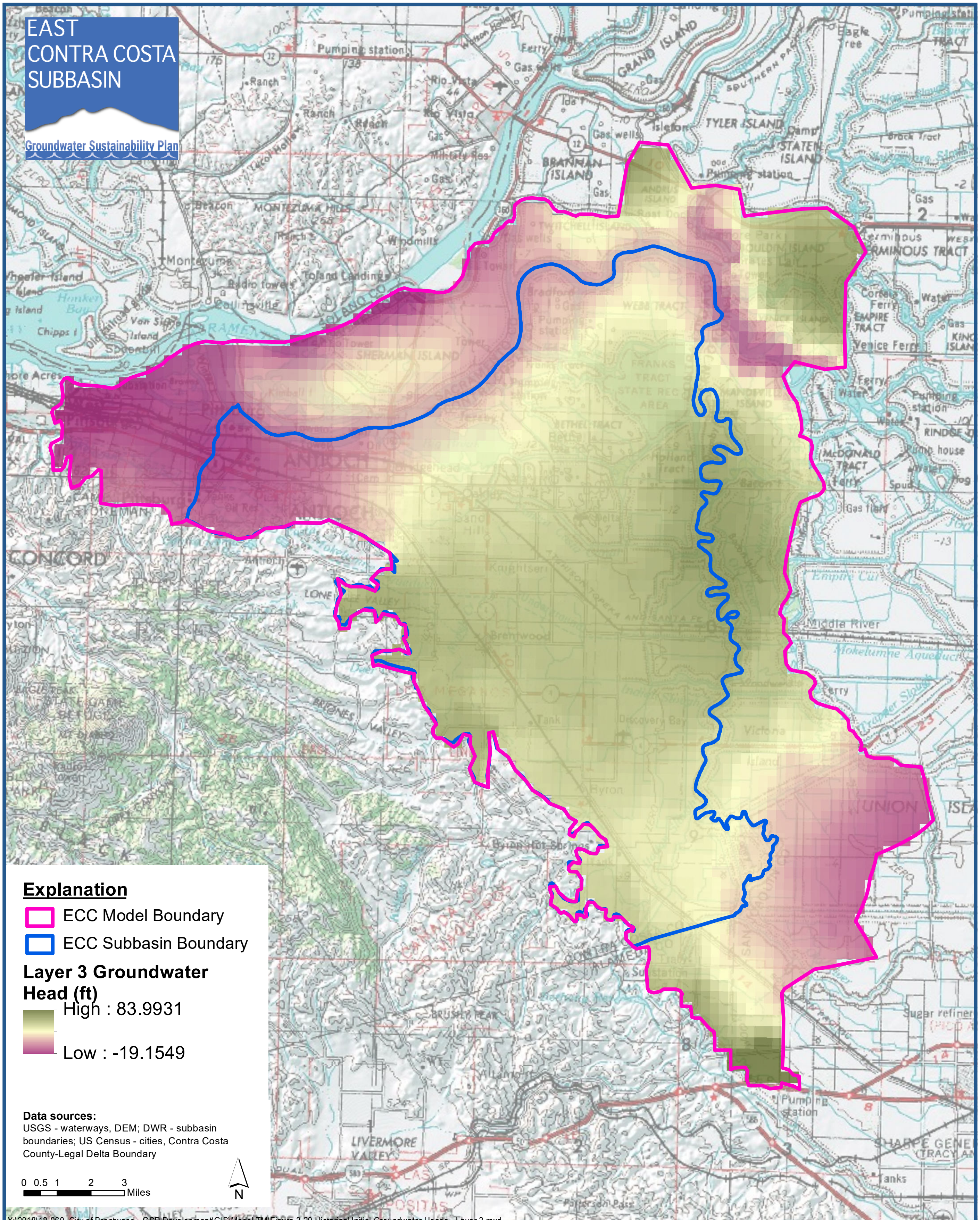
**Historical Initial Groundwater Heads - Layer 2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-19**

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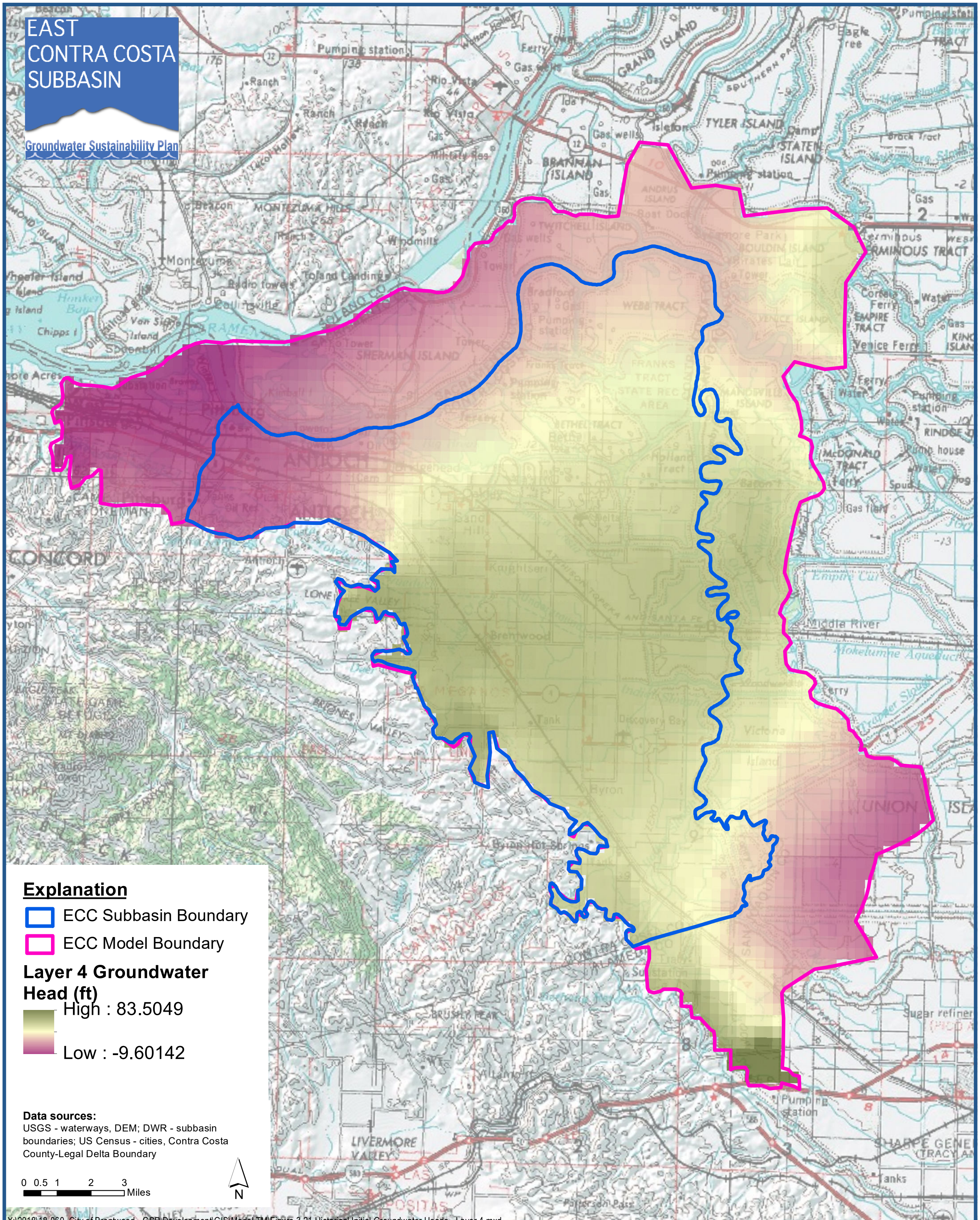
**Historical Initial Groundwater Heads - Layer 3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-20**




X:\2018\18-060 City of Brentwood - GSP Development\GIS\Model TM\Figure 3.21 Historical Initial Groundwater Heads - Layer 4.mxd

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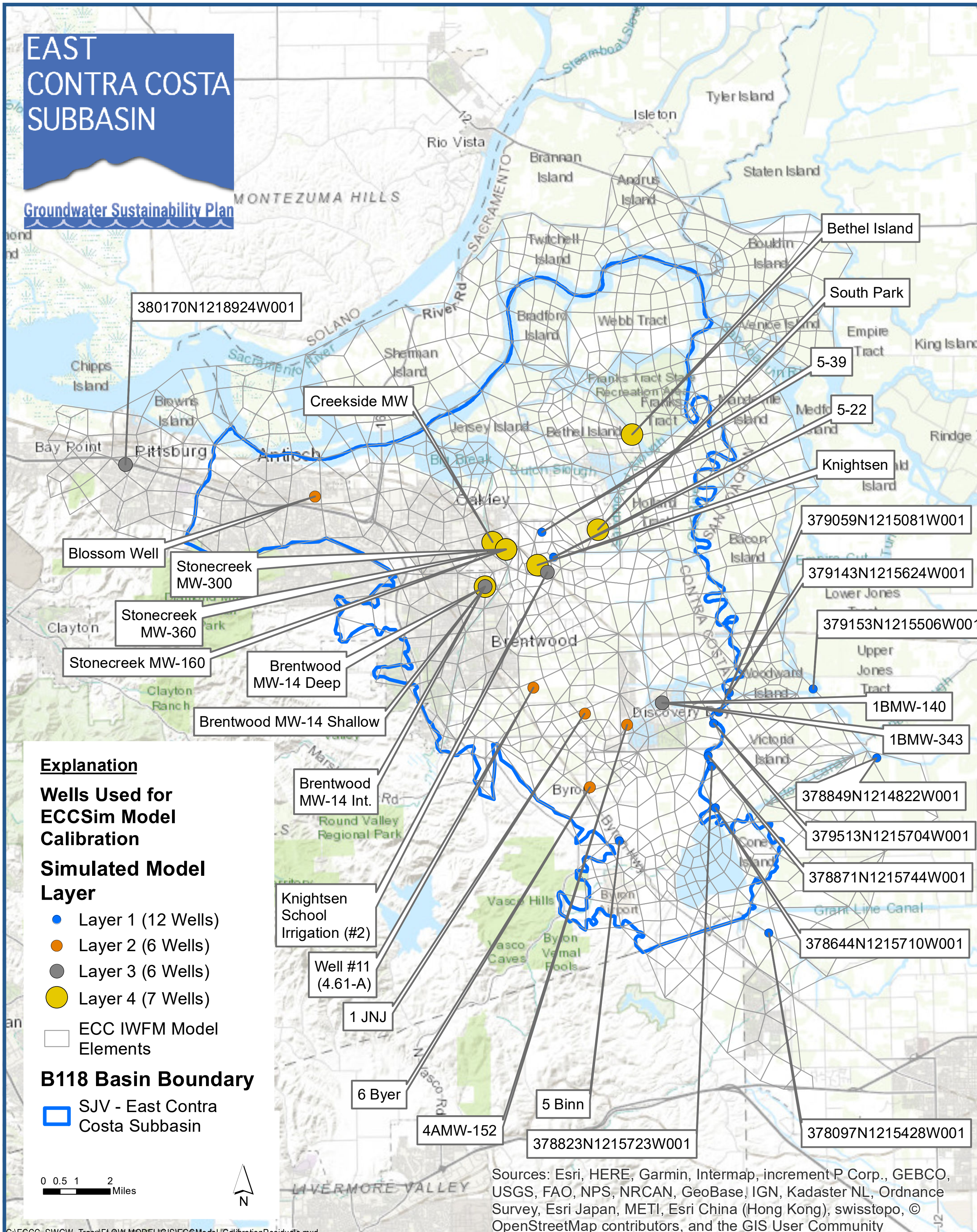
**Historical Initial Groundwater Heads - Layer 4**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-21**

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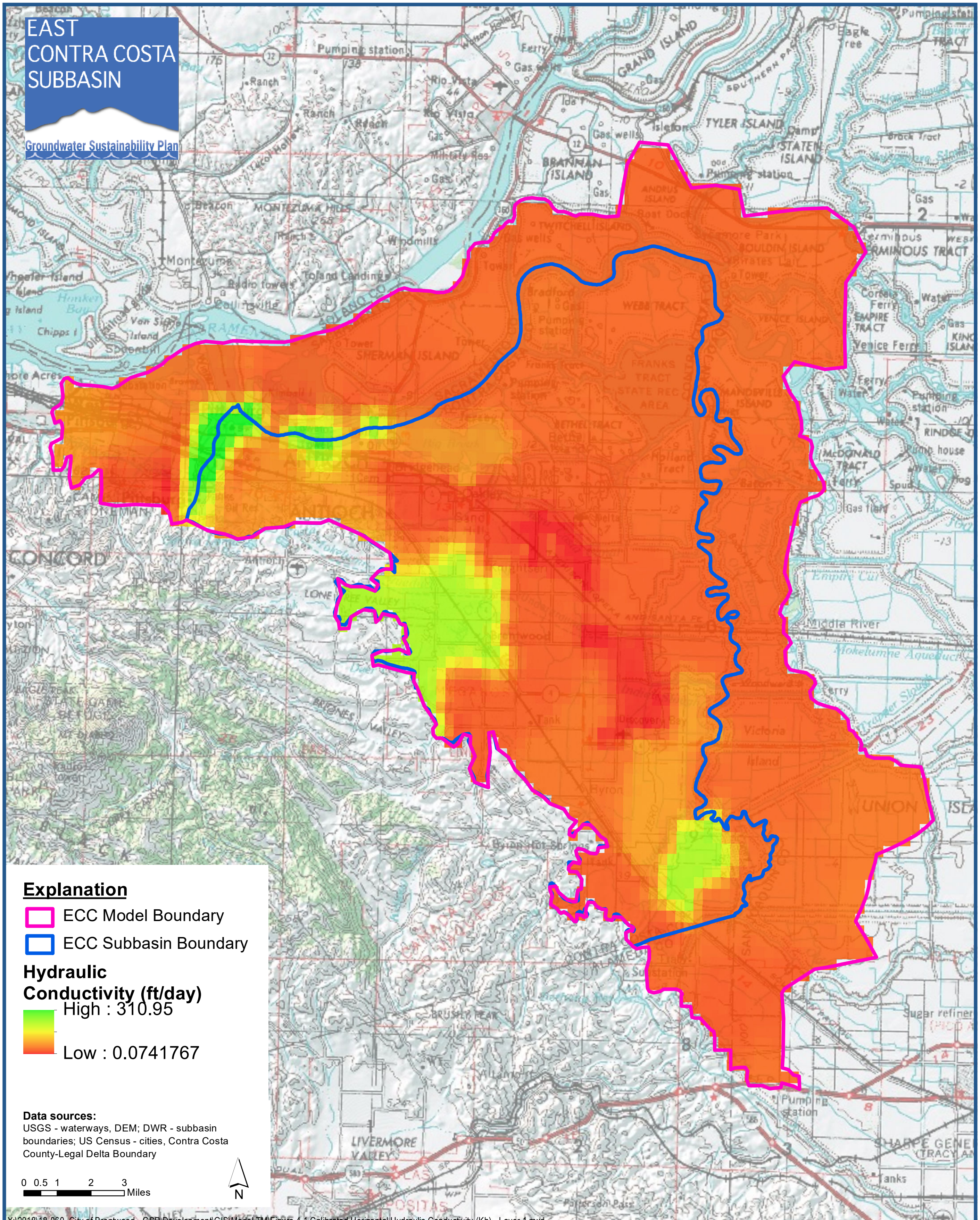
**Map of Groundwater Level Calibration Wells**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 3-22**

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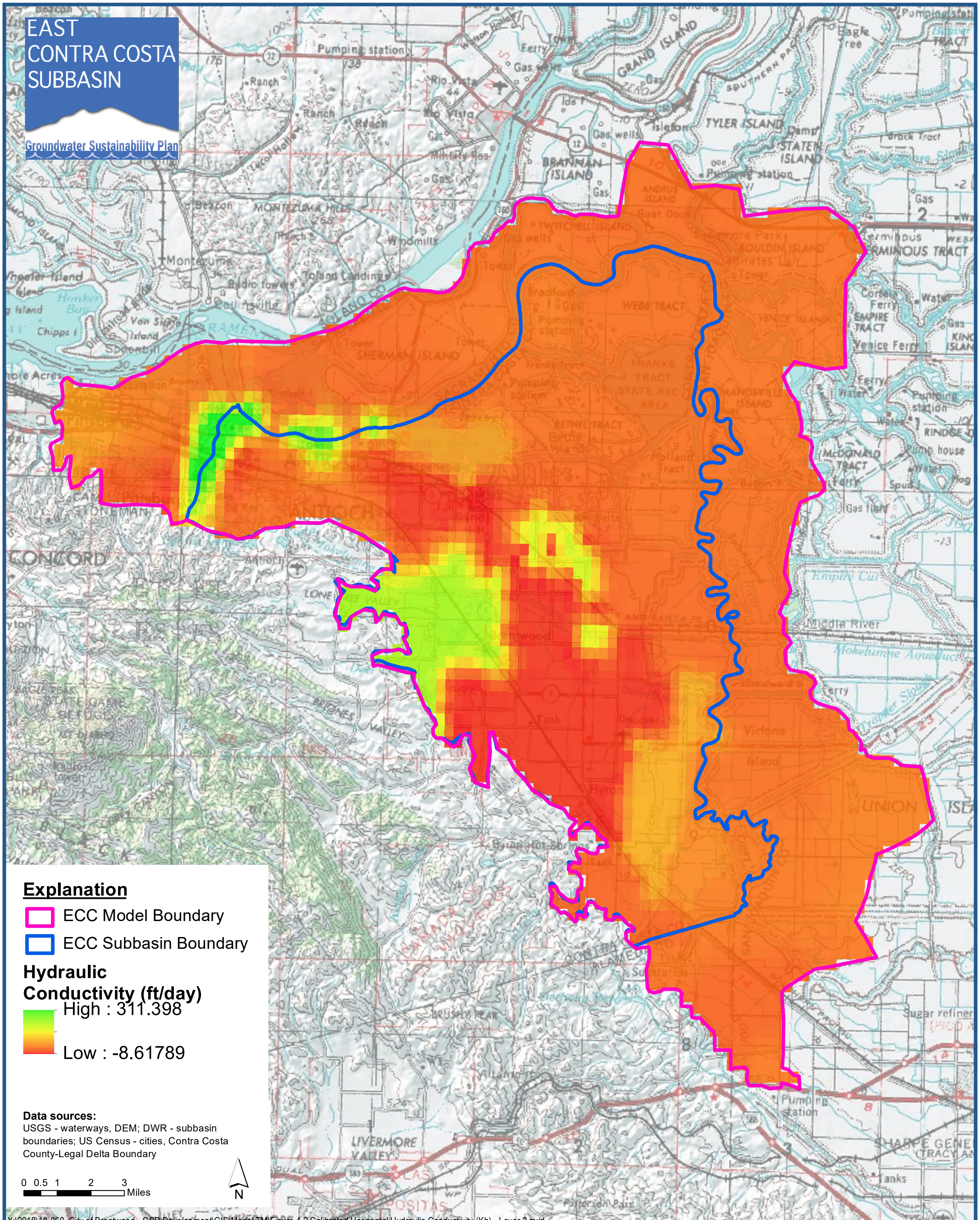
**Calibrated Horizontal Hydraulic Conductivity (Kh) - Layer 1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-1**

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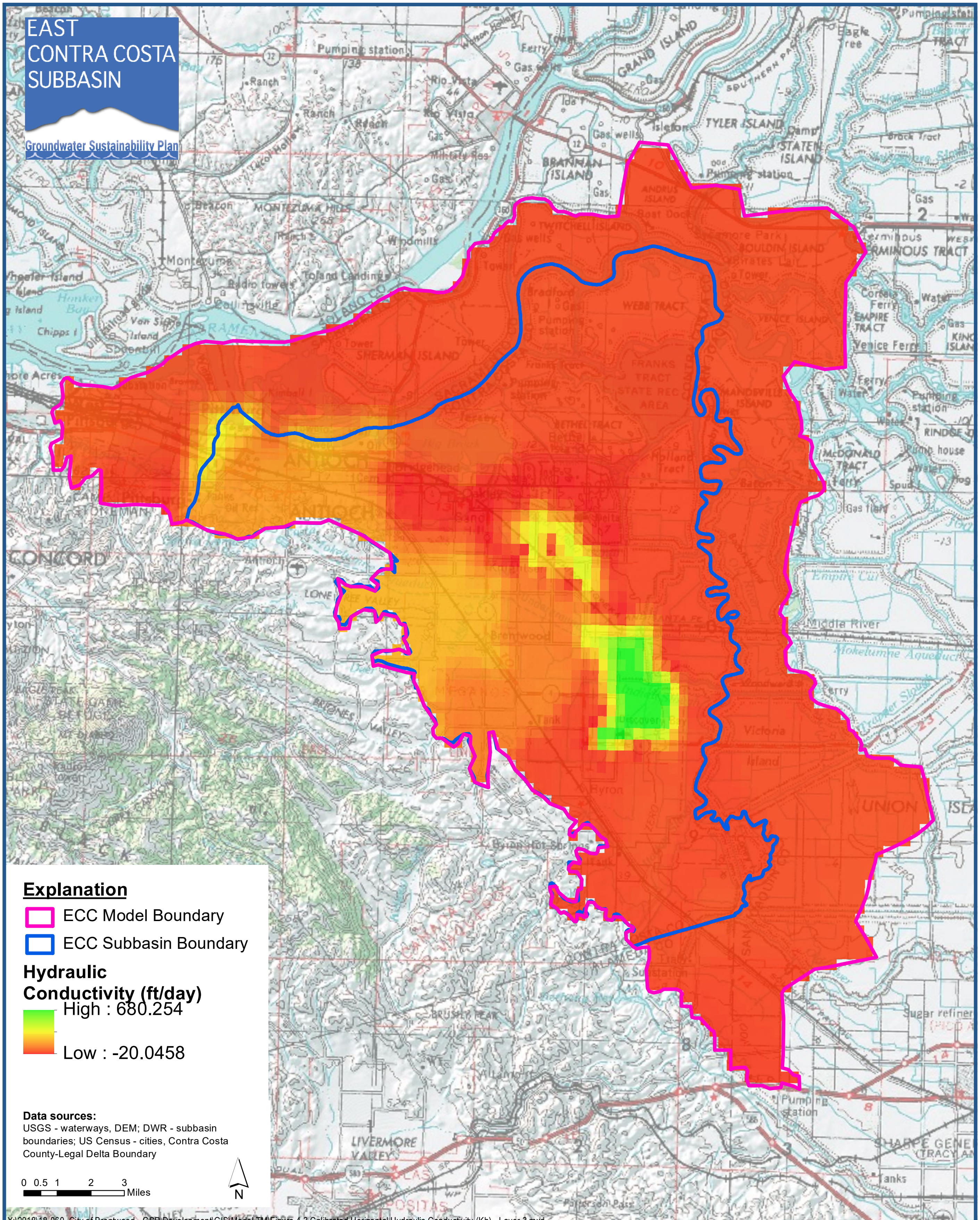
**Calibrated Horizontal Hydraulic Conductivity (Kh) - Layer 2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-2**

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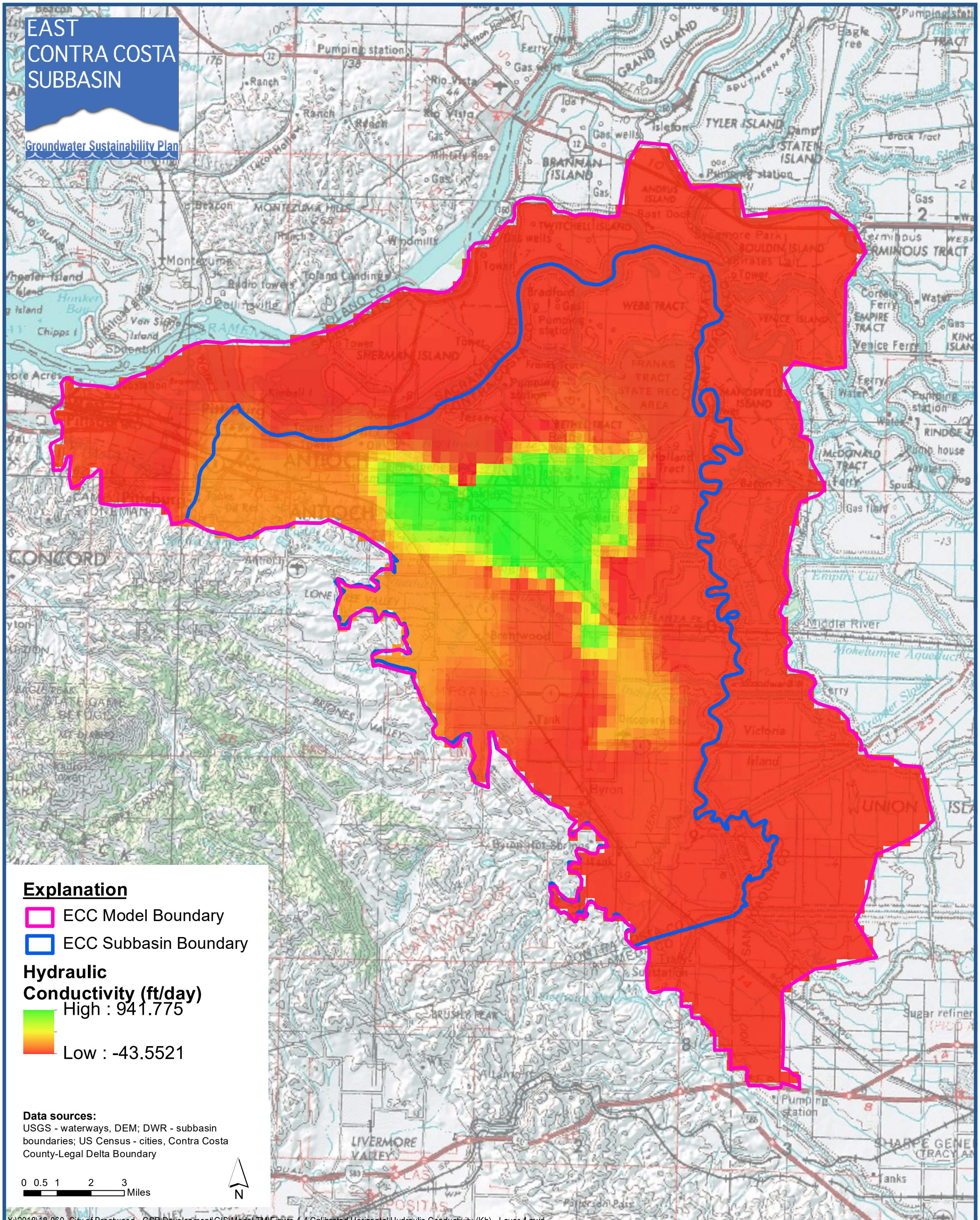
**Calibrated Horizontal Hydraulic Conductivity (Kh) - Layer 3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-3**

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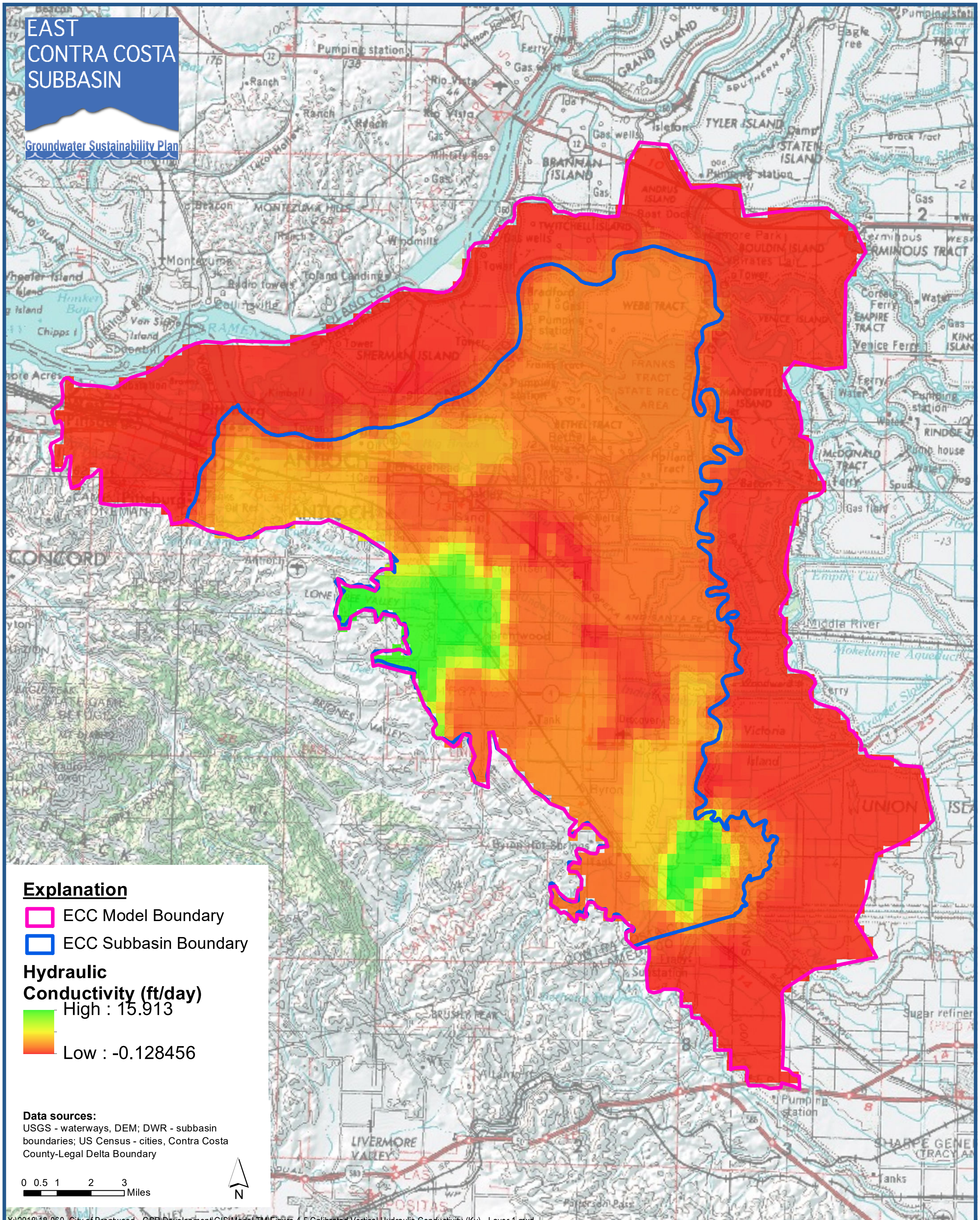
**Calibrated Horizontal Hydraulic Conductivity (Kh) - Layer 4**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-4**

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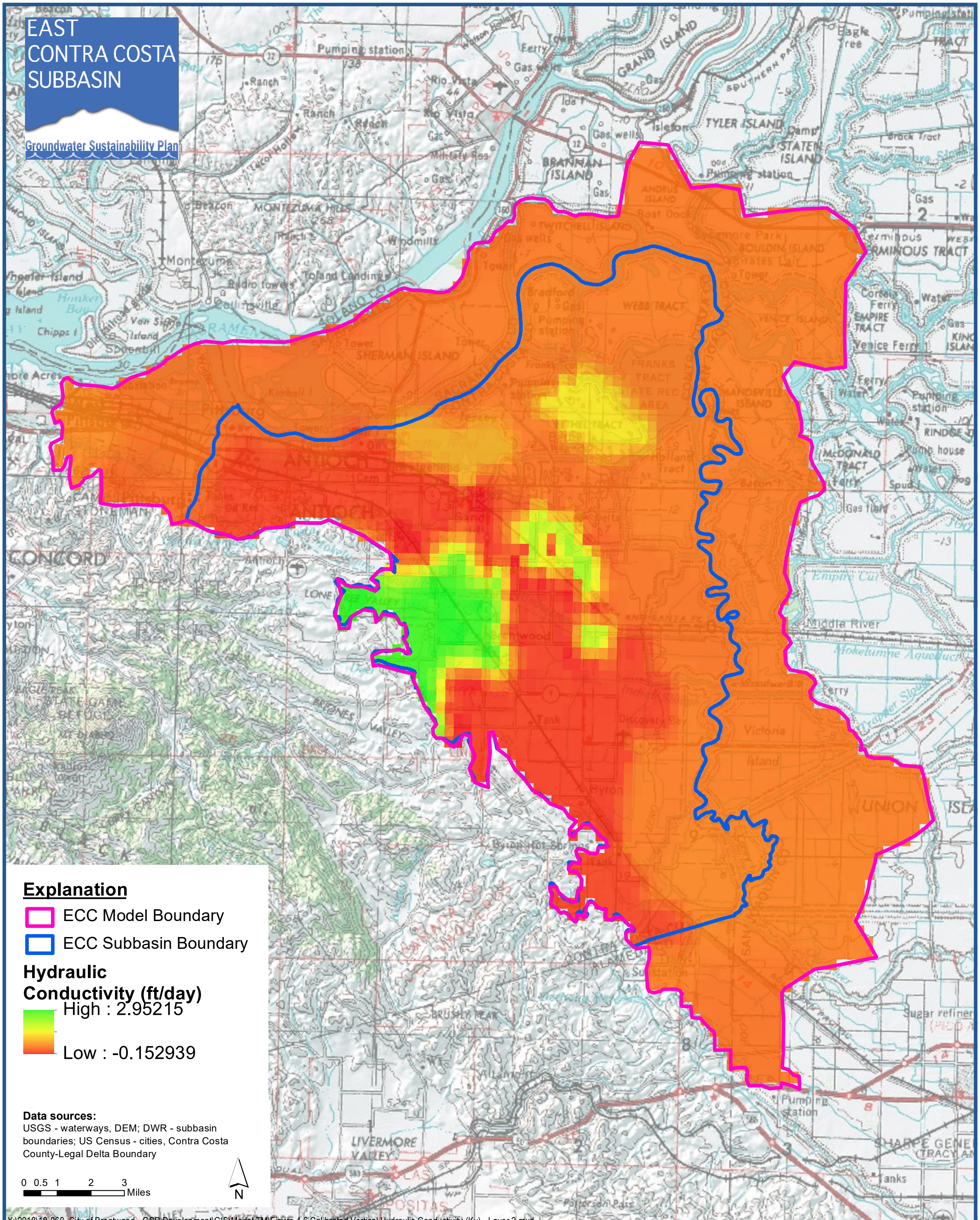
**Calibrated Vertical Hydraulic Conductivity (Kv) - Layer 1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-5**

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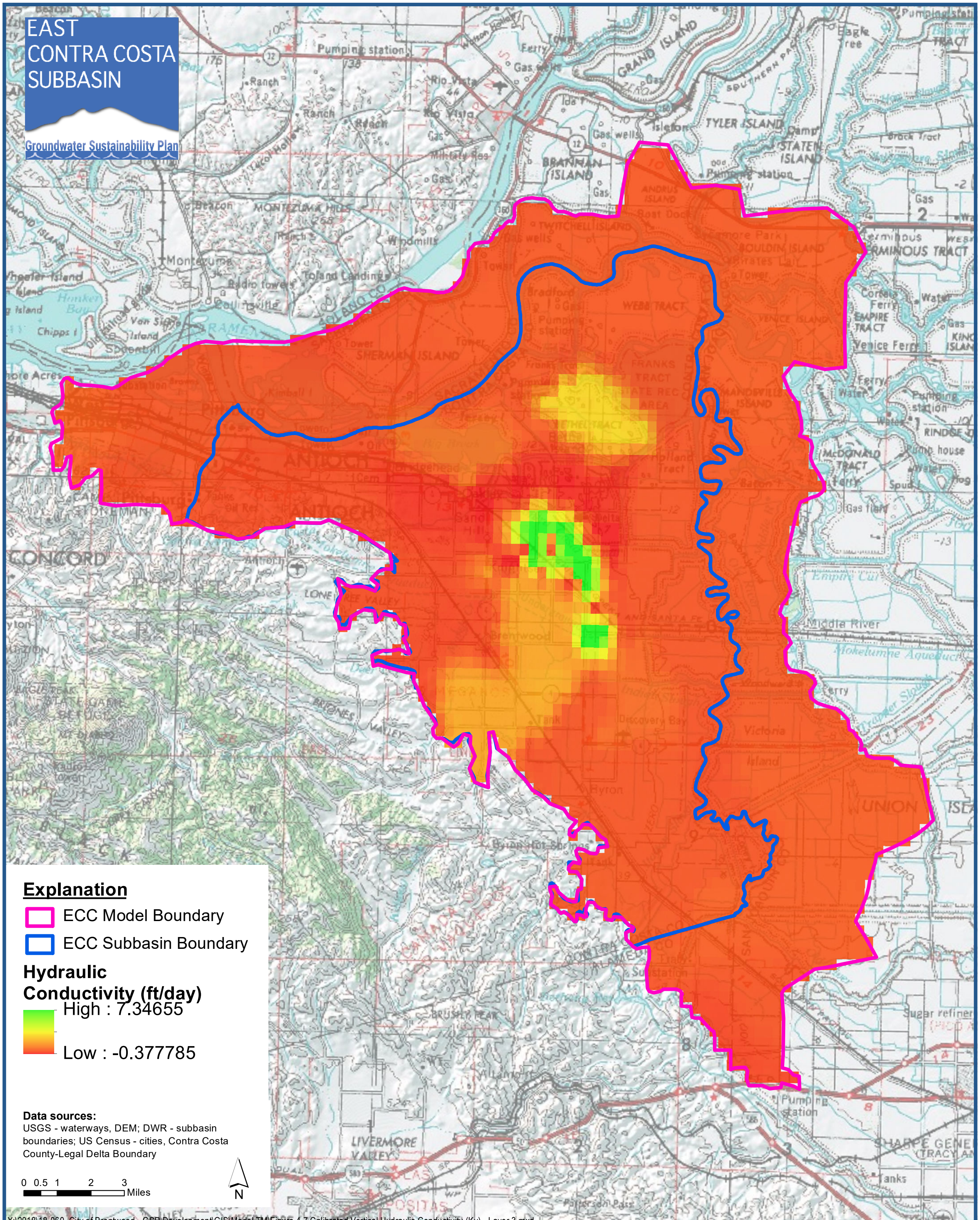
**Calibrated Vertical Hydraulic Conductivity (Kv) - Layer 2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-6**




X:\2018\18-060 City of Brentwood - GSP Development\GIS\Model TM\Figure 4.7 Calibrated Vertical Hydraulic Conductivity (Kv) - Layer 3.mxd

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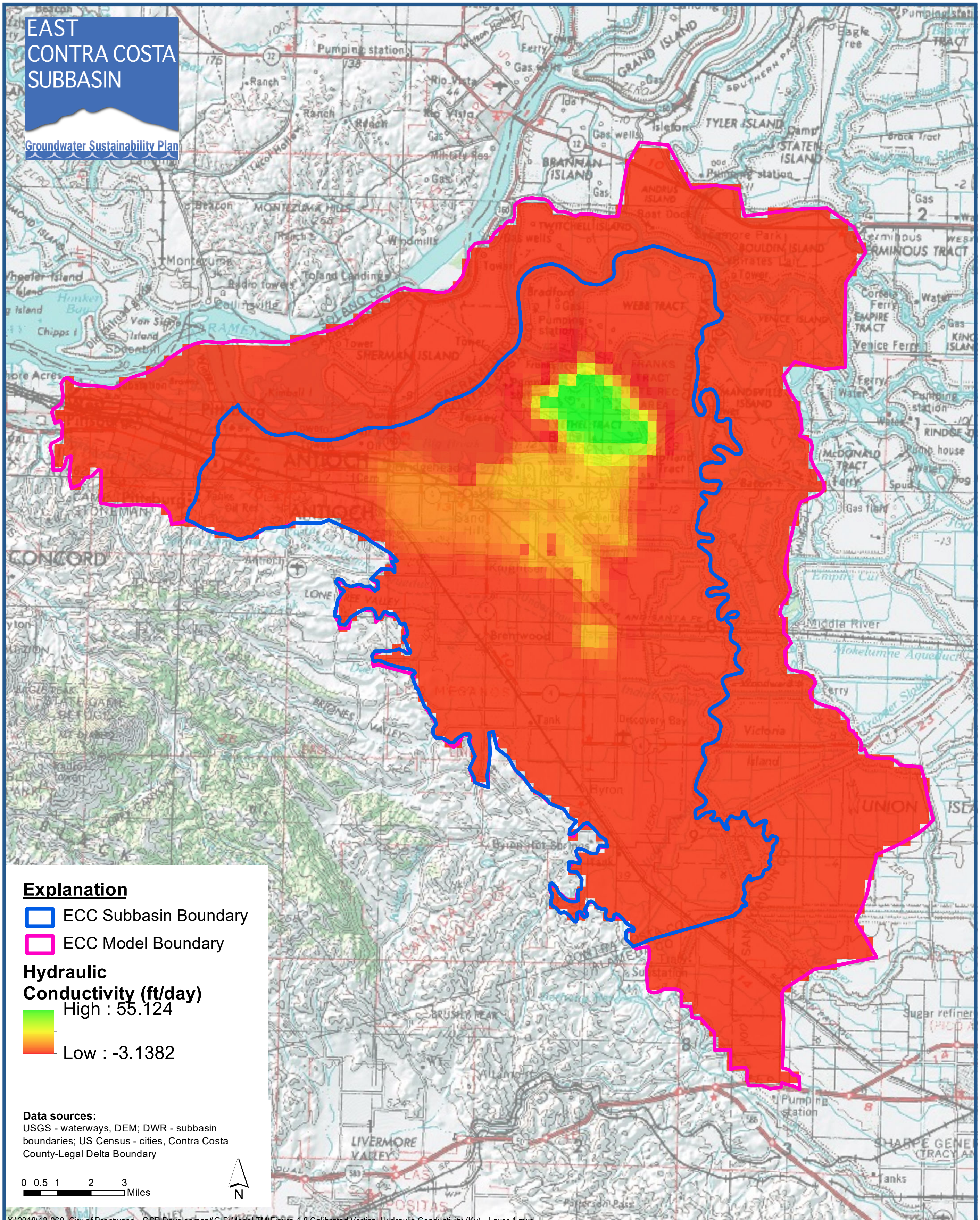
**Calibrated Vertical Hydraulic Conductivity (Kv) - Layer 3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-7**

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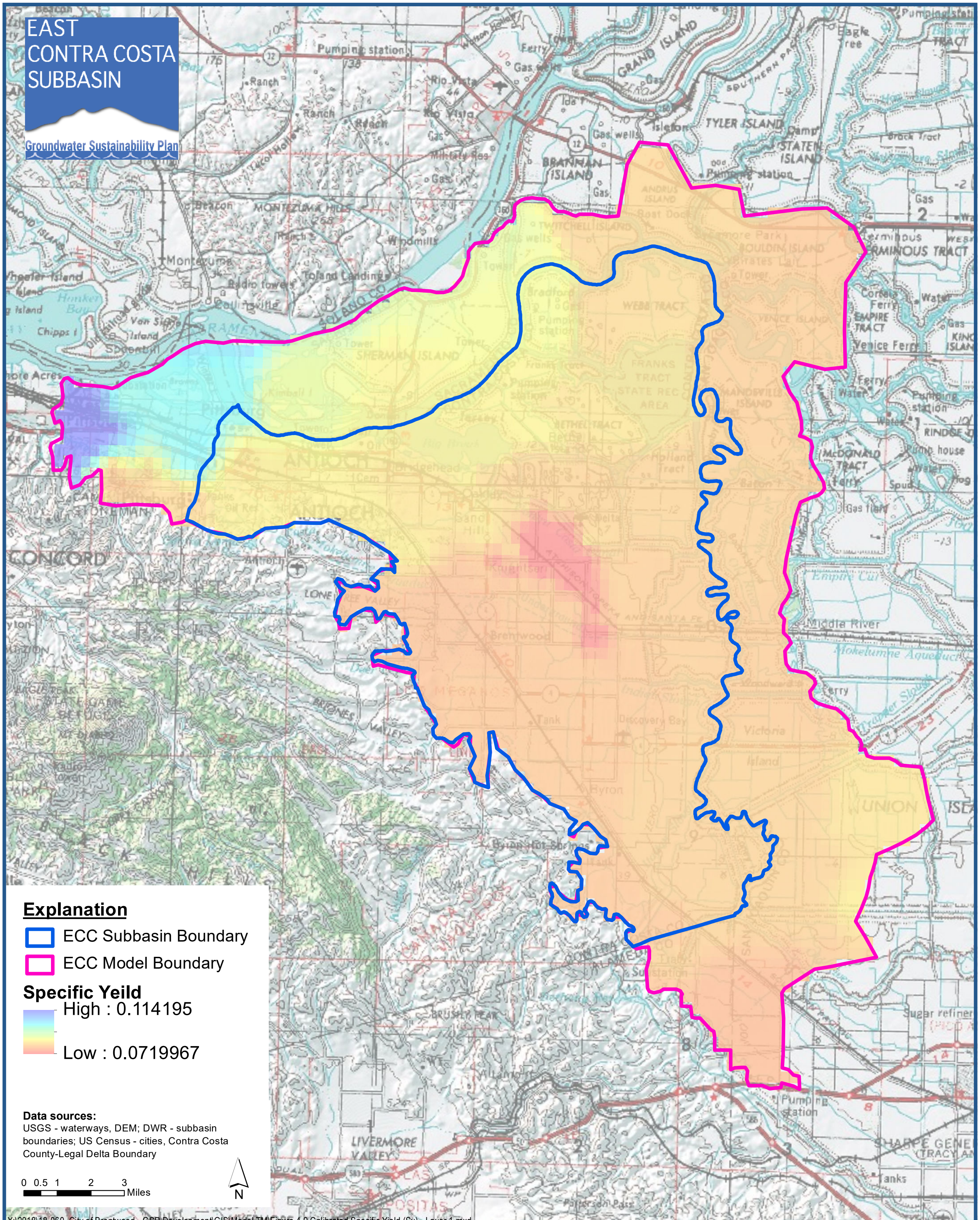
**Calibrated Vertical Hydraulic Conductivity (Kv) - Layer 4**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-8**

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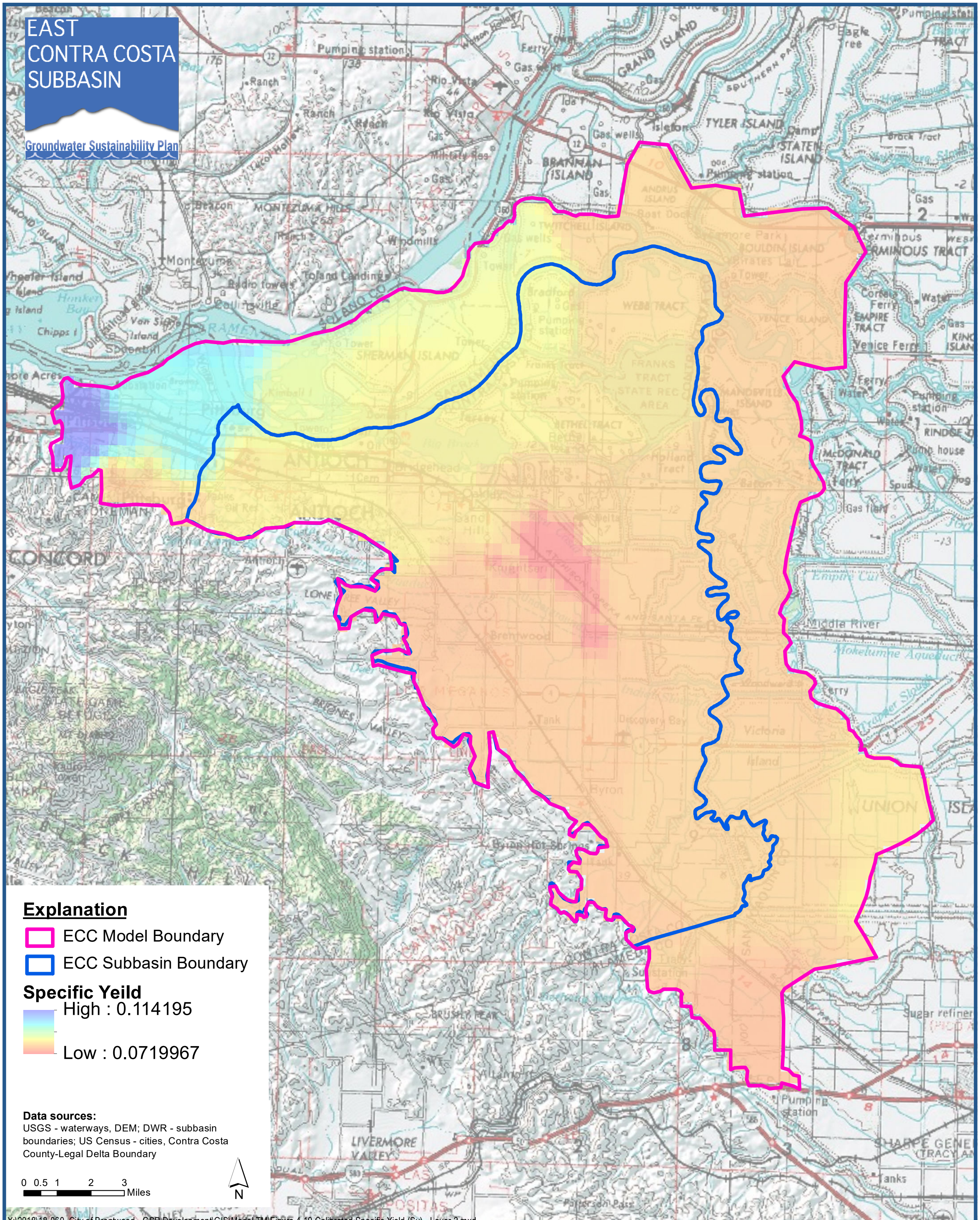
**Calibrated Specific Yield (Sy) - Layer 1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-9**

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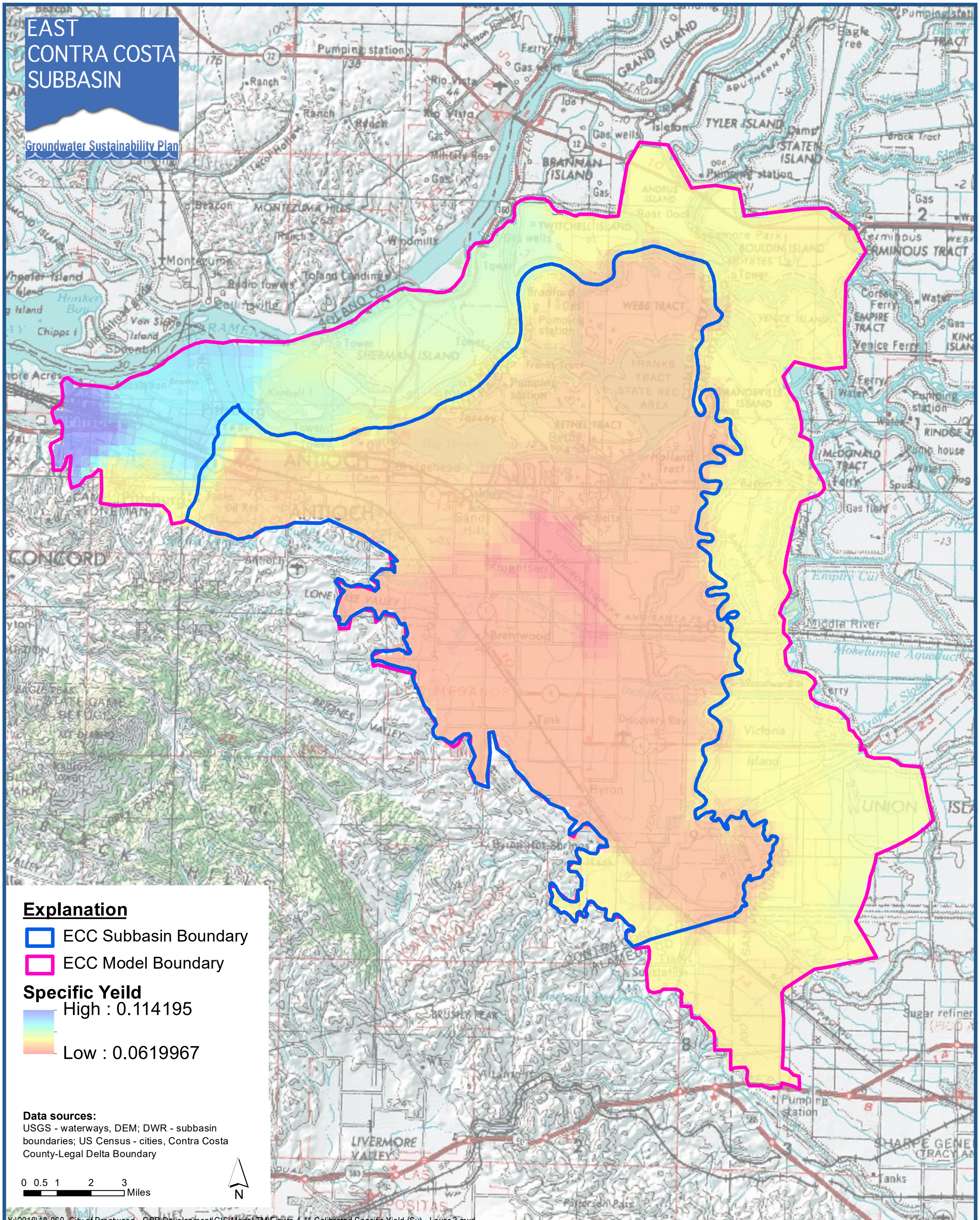
**Calibrated Specific Yield (Sy) - Layer 2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-10**

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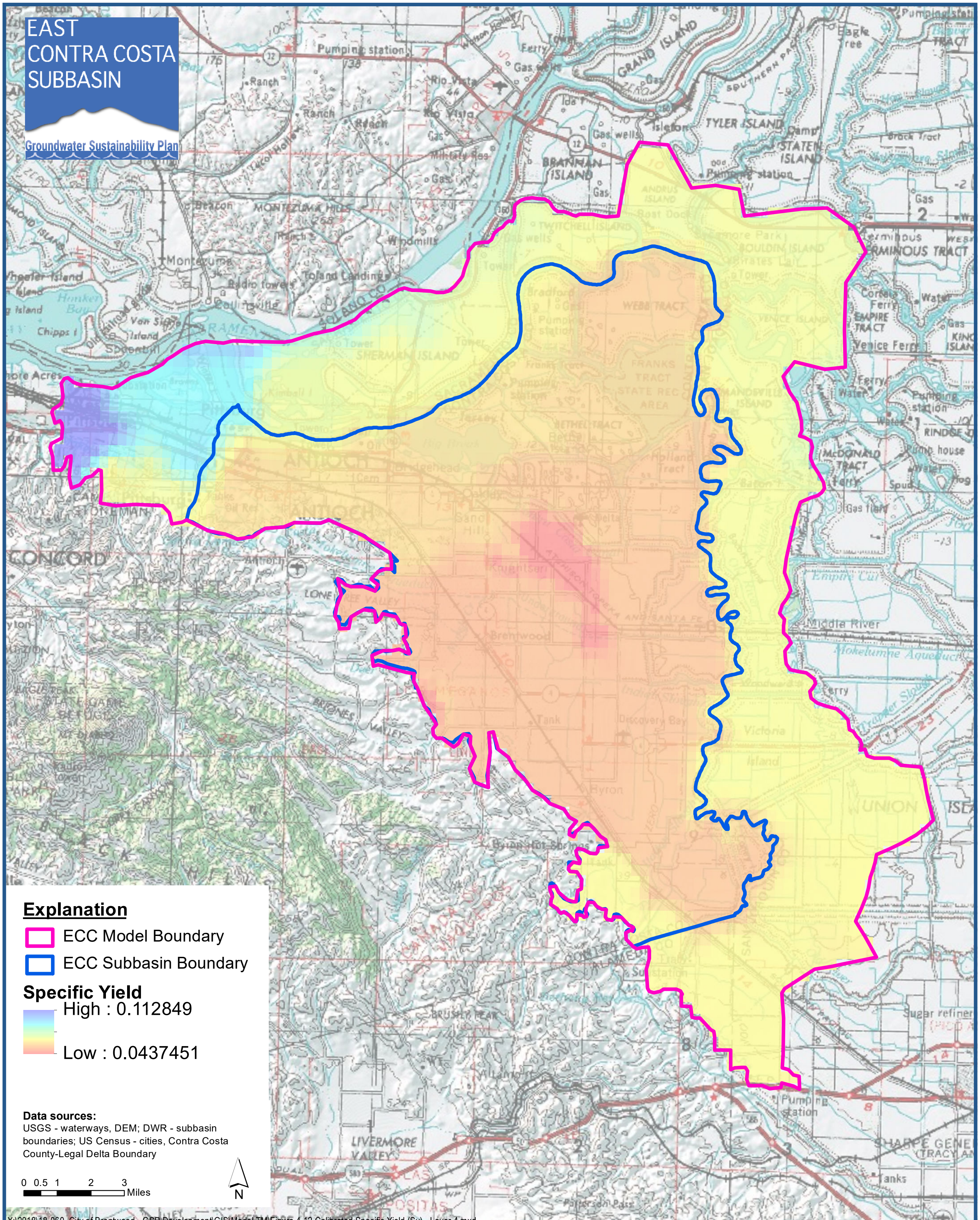
**Calibrated Specific Yield (Sy) - Layer 3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-11**

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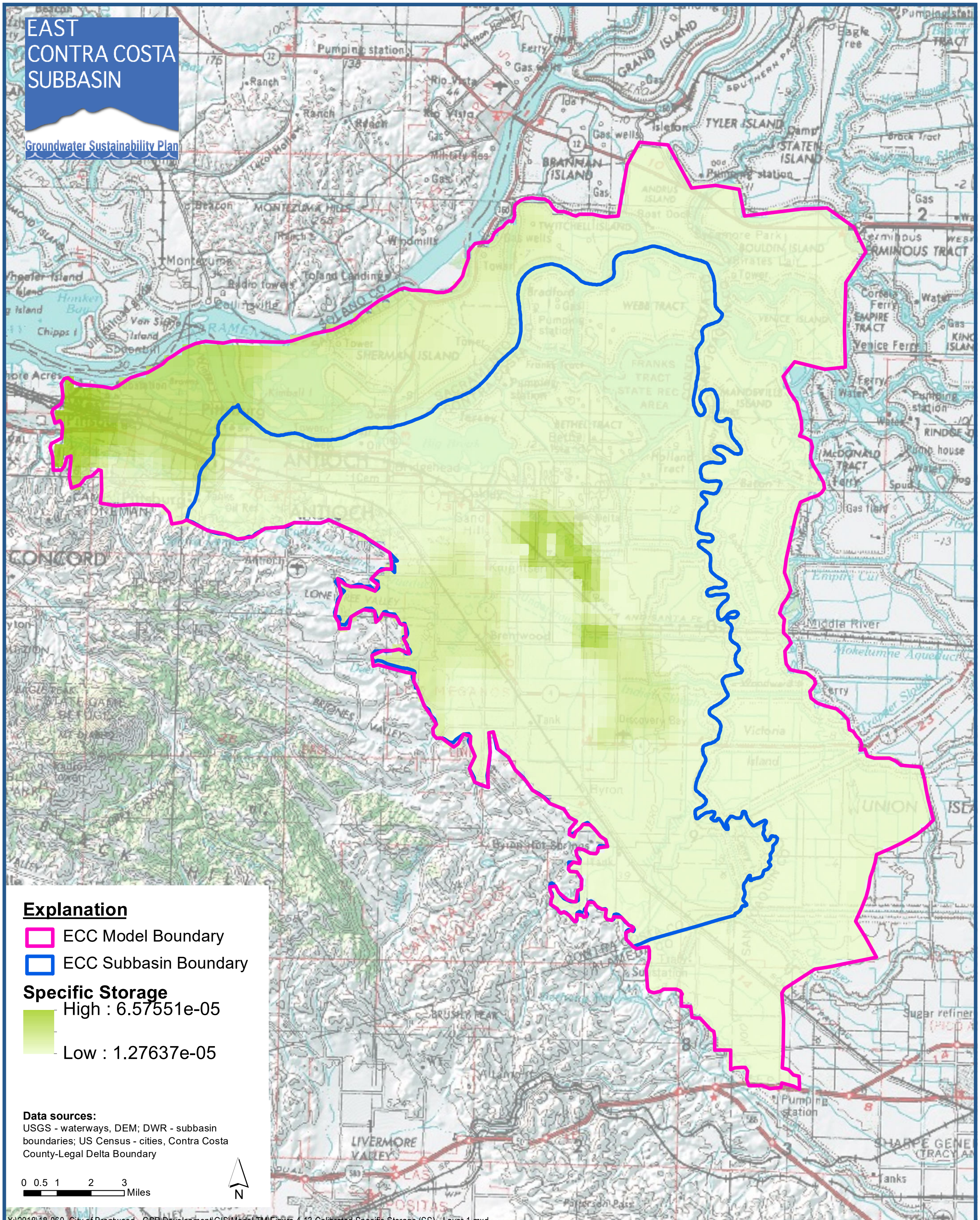
**Calibrated Specific Yield (Sy) - Layer 4**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-12**

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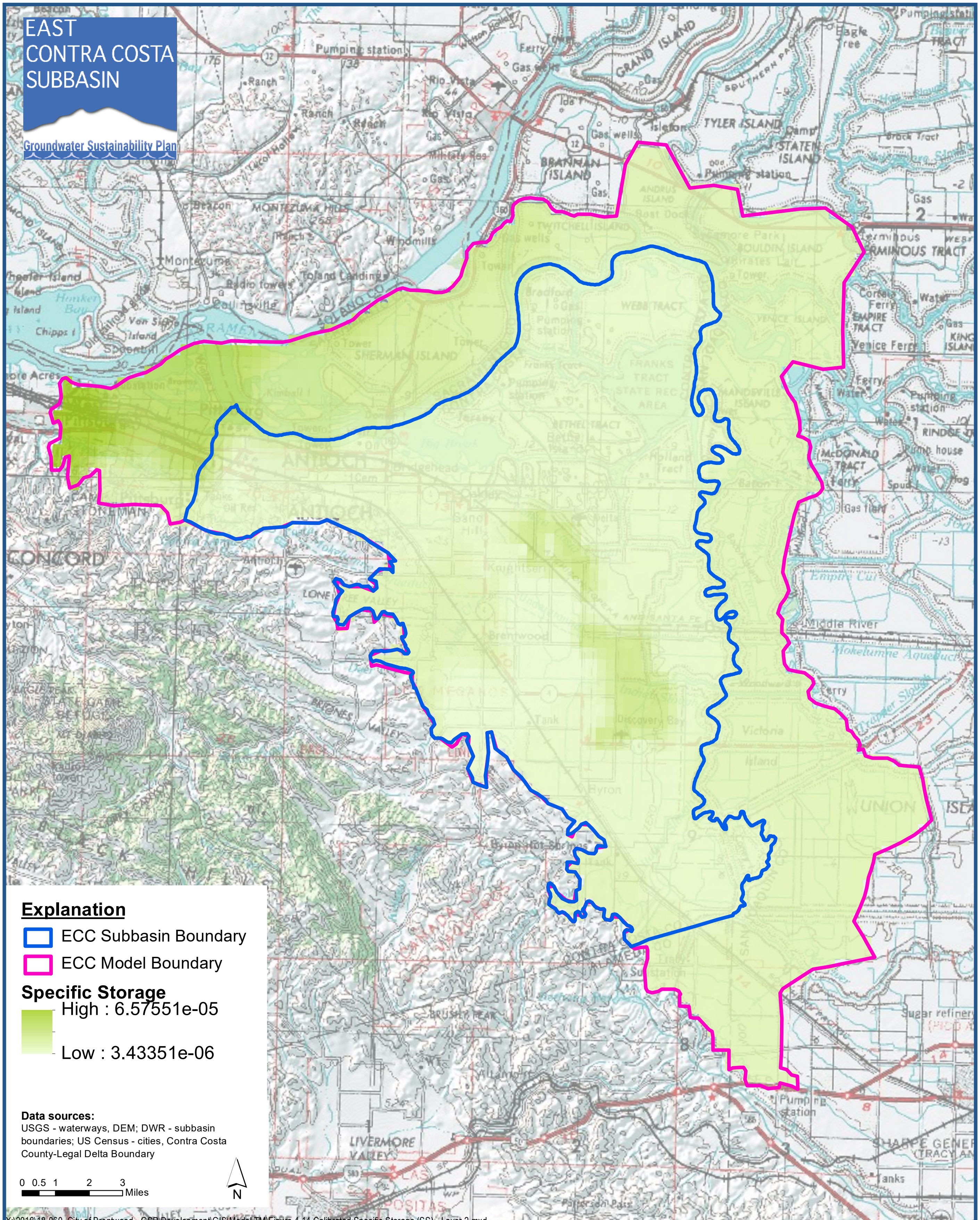
**Calibrated Specific Storage (SS) - Layer 1**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-13**

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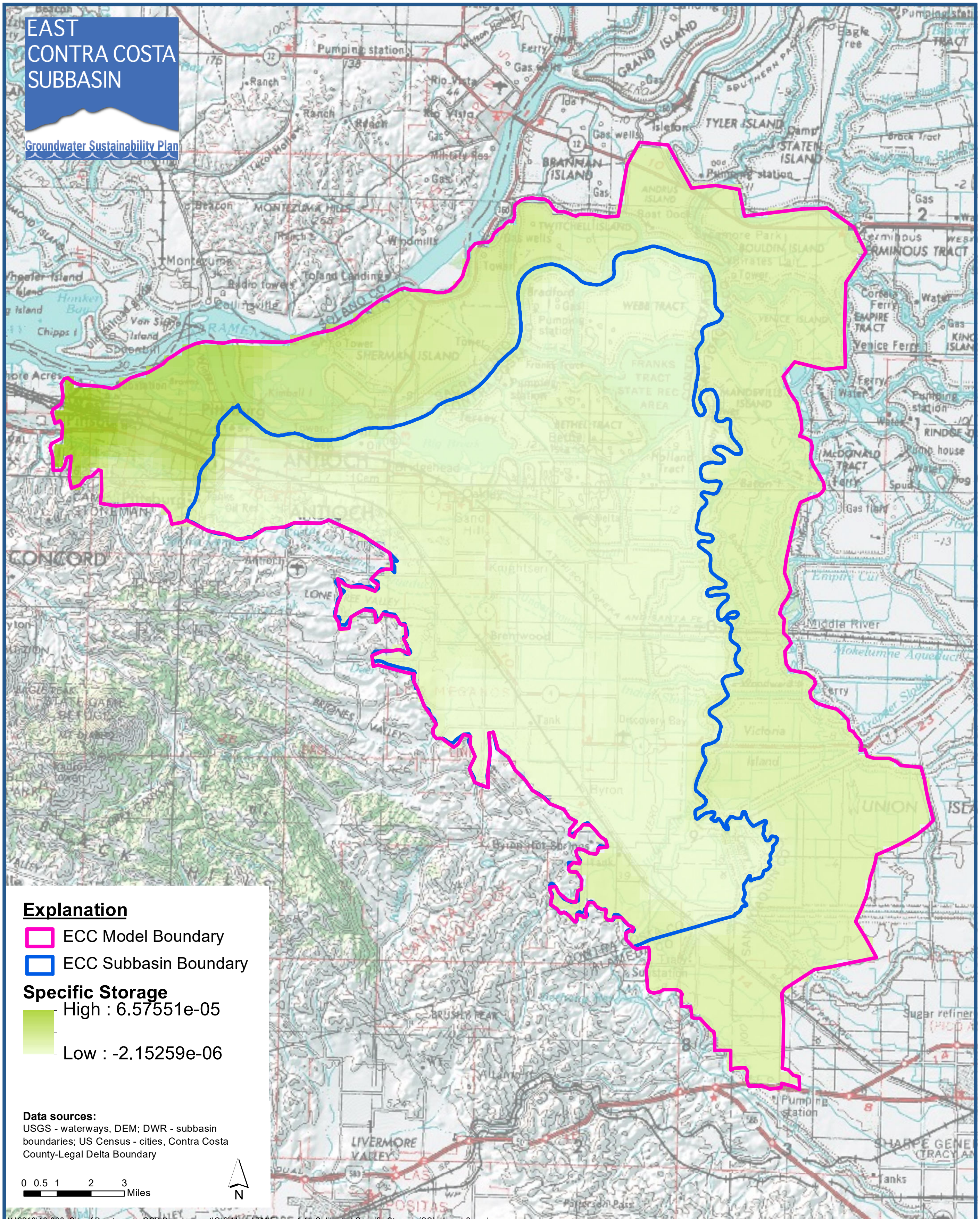
**Calibrated Specific Storage (SS) - Layer 2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-14**

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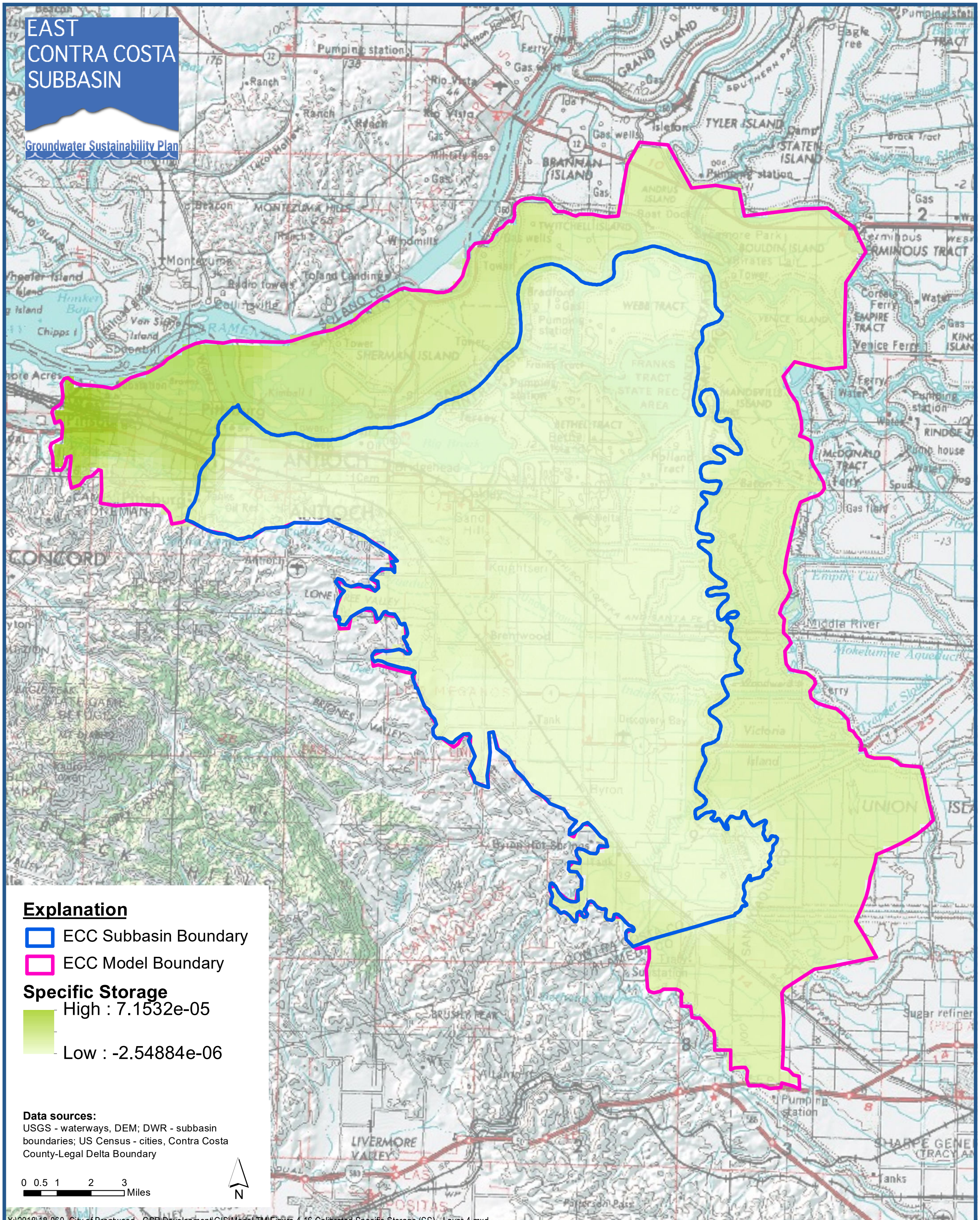
**Calibrated Specific Storage (SS) - Layer 3**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Figure 4-15**

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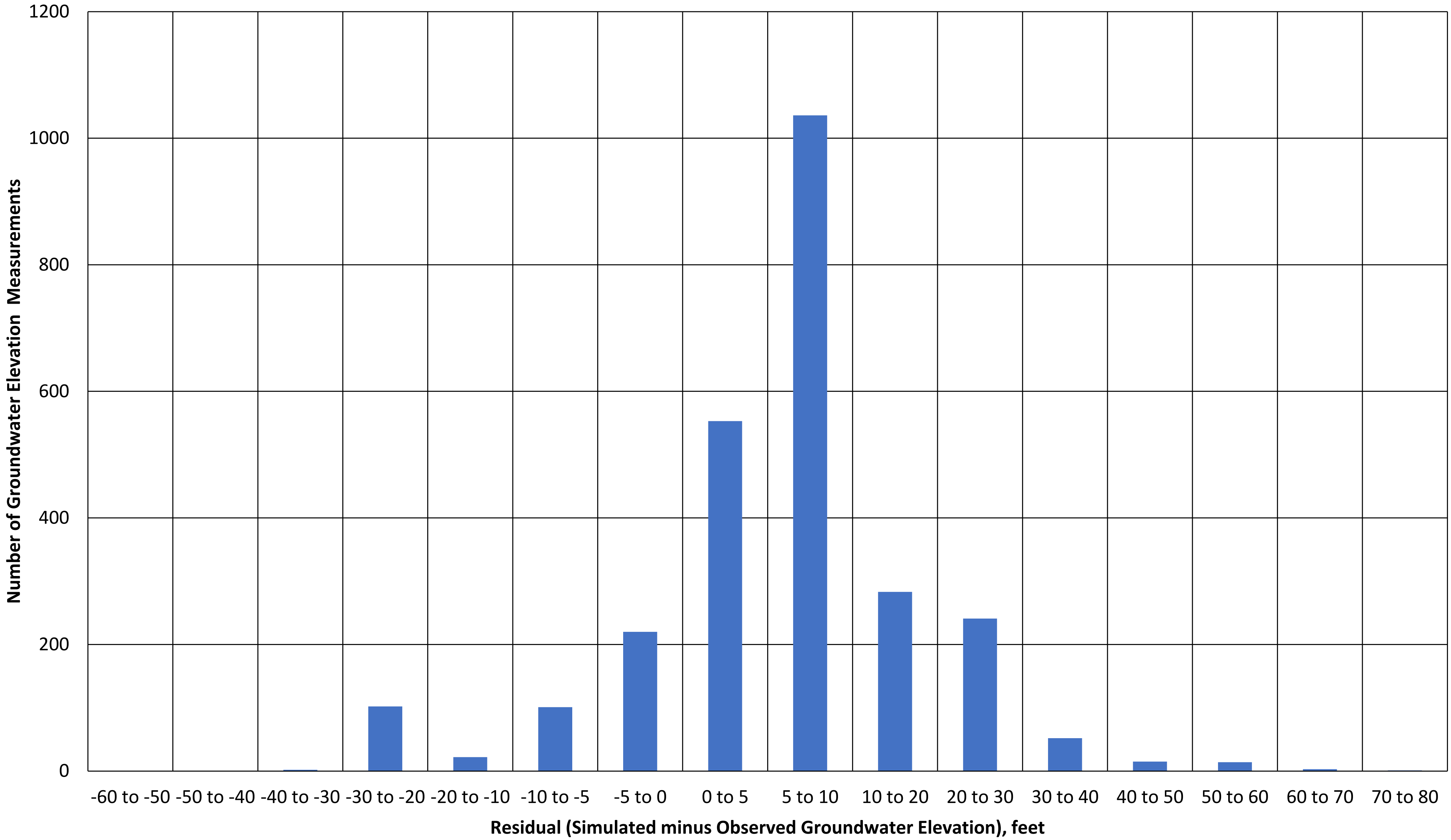
**Calibrated Specific Storage (SS) - Layer 4**

**Figure 4-16**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

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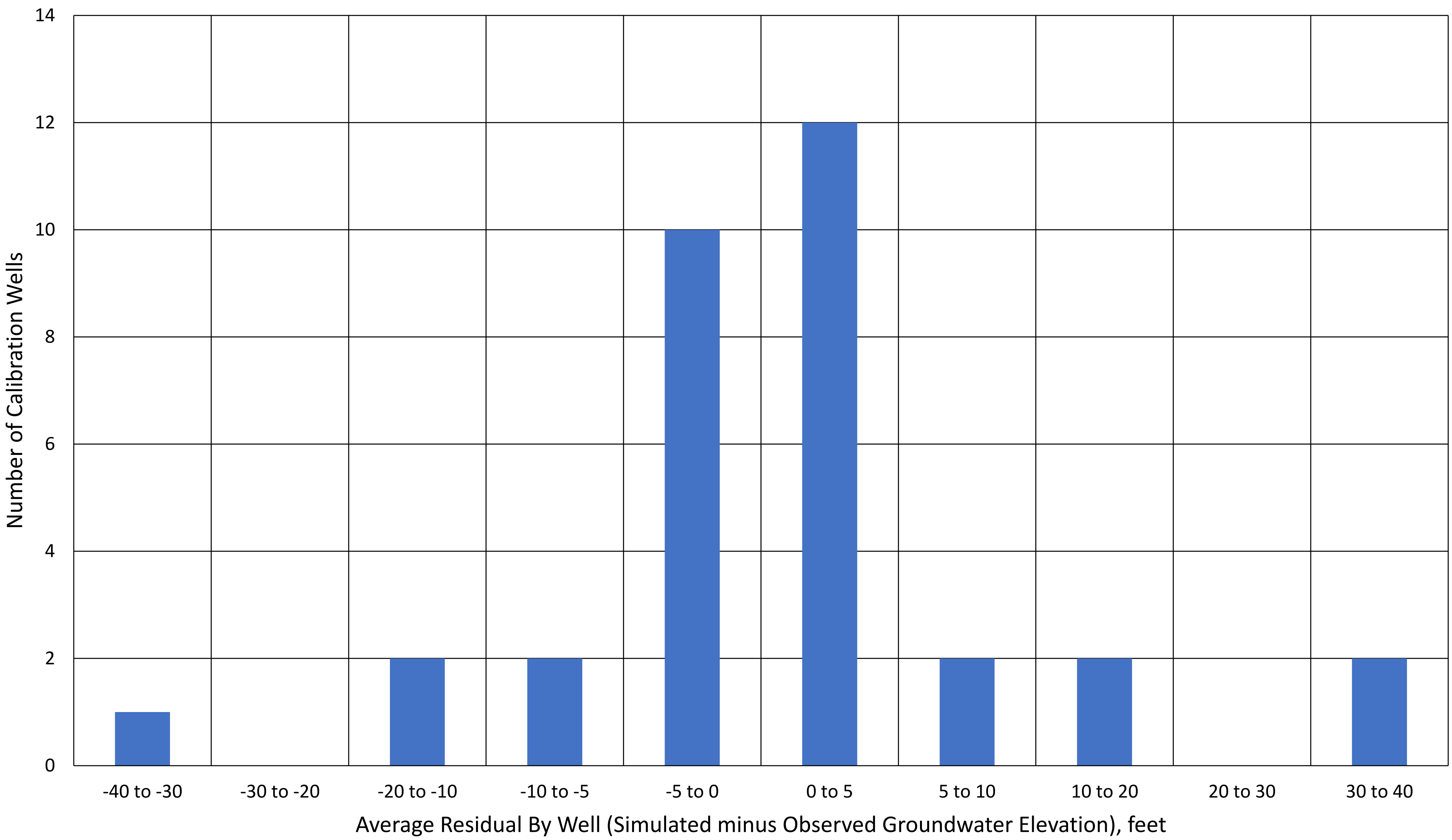
**Histogram of Residual (Simulated minus Observed) Groundwater Elevations for All Observations**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 4-17**

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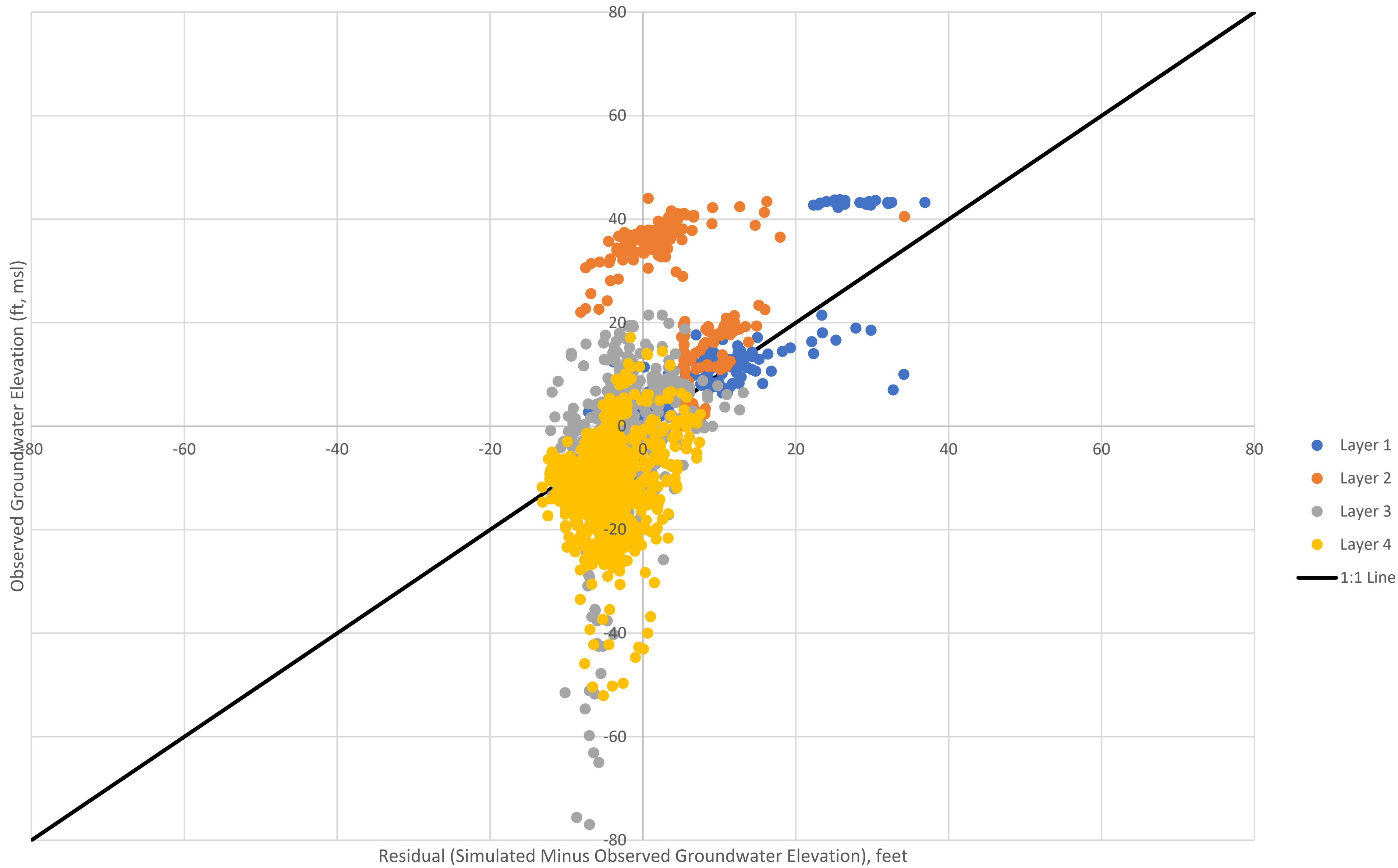
**Histogram of Average Residual (Simulated minus Observed) Groundwater Elevation by Well**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 4-18**

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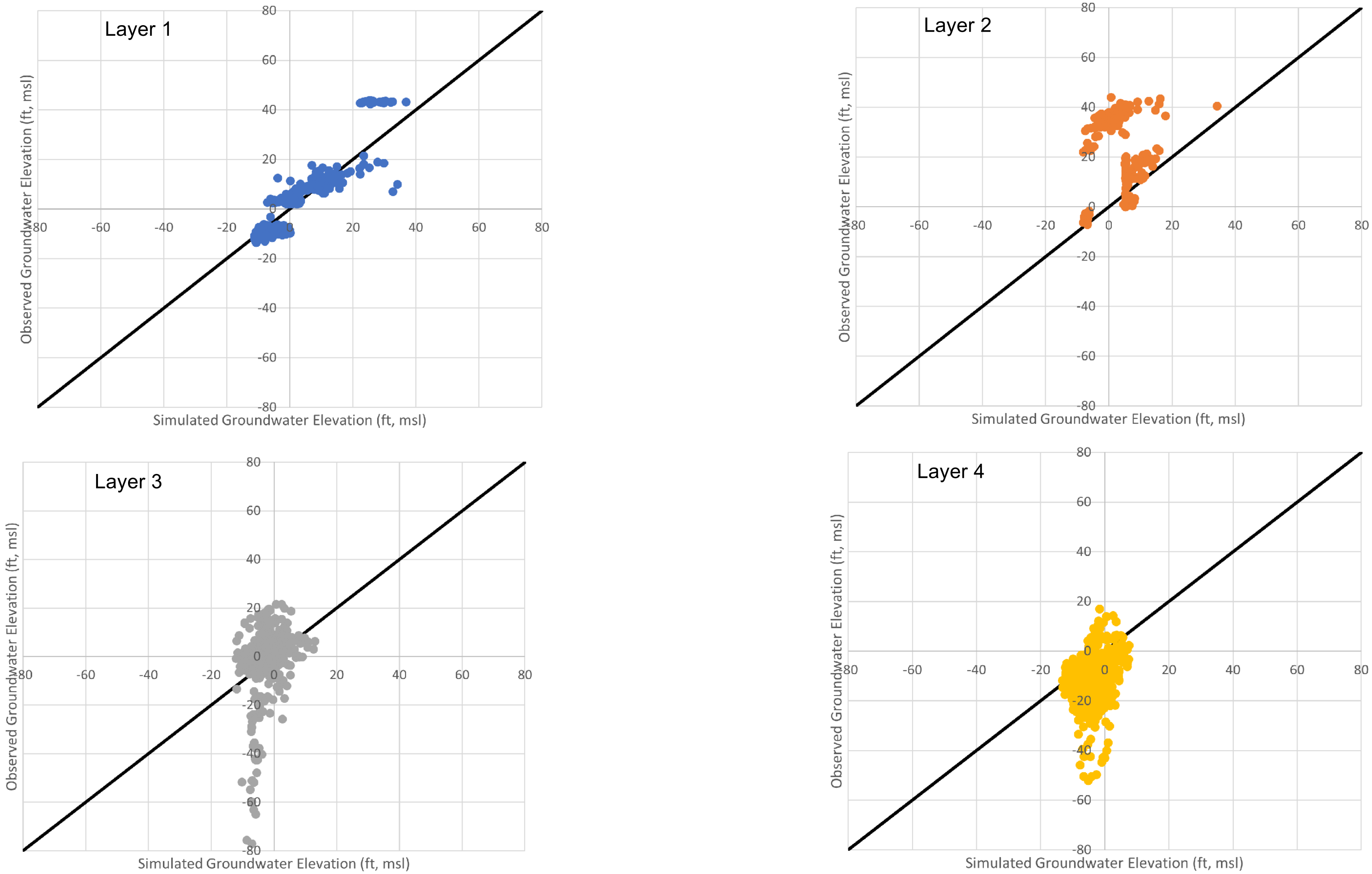
**Simulated vs. Observed Groundwater Elevations, By Layer**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 4-19**




X:\2018\18-060 City of Brentwood - GSP Development\GIS\Model TM\Figure 4.20 Simulated vs. Observed Groundwater Elevations.mxd

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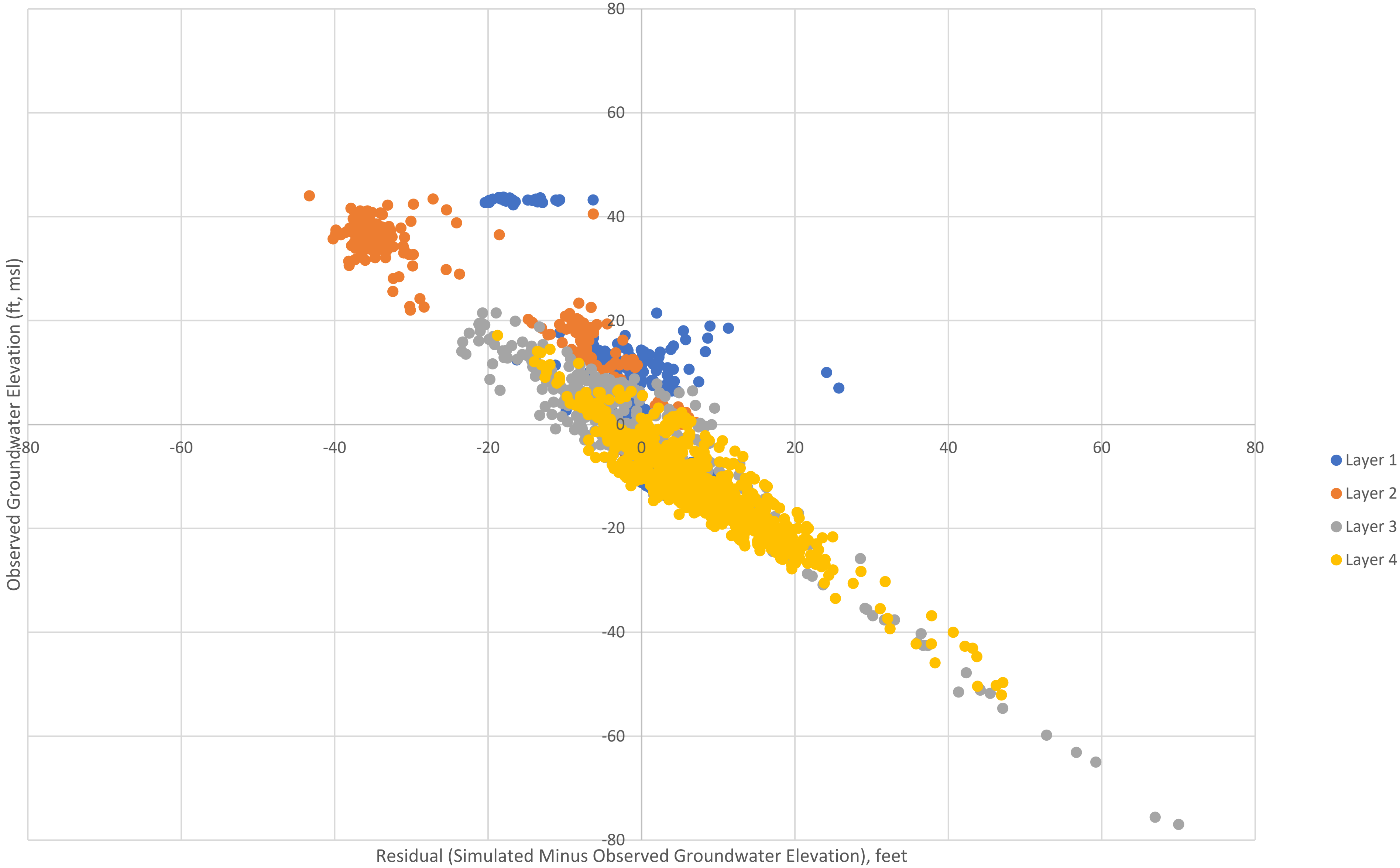
**Simulated vs. Observed Groundwater Elevations By Layer**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 4-20**

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**Residual (Simulated minus Observed) vs. Observed Groundwater Elevations, By Layer**

*East Contra Costa Groundwater-Surface Water Simulation Model (ECCSim) Report*

**Figure 4-21**

# APPENDIX 6a

**Monitoring Protocols**

# 1 MONITORING PROTOCOLS

## 1.1 Protocols for Measuring Groundwater Levels

- 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 shall be measured to the nearest 0.1 foot relative to the Reference Point.
- For measuring wells that are under pressure, allow a period of time for the groundwater levels to stabilize. In these cases, multiple measurements shall be collected to ensure the well reached equilibrium such that no significant changes in water level are observed. Every effort shall be made to ensure that a representative stable depth to groundwater is recorded. If a well does not stabilize, the quality of the value shall be appropriately qualified as a questionable measurement.
- The groundwater elevation will be calculated using the following equation.

GWE = RPE − DTW

Where:

GWE = Groundwater Elevation in NAVD88 datum

RPE = Reference Point Elevation in NAVD88 datum

DTW = Depth to Water from the reference point

- The measurements of depth to water shall be consistent in units of feet, to an accuracy of tenths of feet or hundredths of feet.
- The well caps or plugs shall be secured following depth to water measurement.
- Groundwater level measurements are to be made on a semi-annual basis during periods of seasonal highs and lows.

### 1.1.1 Protocols for Recording Groundwater Level Measurements

- The field personnel shall record the well identifier, date, time (24-hour format), RPE, height of the reference point above or below ground surface, DTW, GWE, and provide comments regarding any factors that may influence the depth to water readings such as weather, nearby irrigation, pumping, flooding, potential for tidal influence, or well condition. If there is a questionable measurement or the measurement cannot be obtained, it shall be noted. Standardized field forms shall be used for all data collection.
- All data shall be entered into the GSP data management system (DMS) as soon as possible. Care shall be taken to avoid data entry errors and the entries shall be checked by a second person.
- Semi-annual groundwater level data collected from the wells in the CASGEM network will be submitted to DWR by March 31 (spring data) and October 31 (fall data) by the database manager.

### 1.1.2 Protocols for Installing Pressure Transducers and Downloading Data

- The field personnel 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 transducer. It is recommended that transducers record measured groundwater levels to conserve data storage capacity; groundwater elevations can be calculated at a later time after downloading.
- The field personnel 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 will be used to ensure that the data being collected is meeting the Data Quality Objectives (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 shall be included in the evaluation.
- The field personnel 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 to verify that the cable has not slipped.
- The transducer data shall periodically be checked against manually measured groundwater levels to monitor electronic drift or cable movement. This shall happen during routine site visits, at least annually to maintain data integrity.
- The data shall be downloaded as necessary to ensure no data is lost. Downloaded data shall be entered into the GSP DMS following the quality assurance/quality control (QA/QC) program established for the GSP. Data collected with non-vented data logger cables shall be corrected for atmospheric barometric pressure changes, as appropriate. After the field personnel is confident that the transducer data have been safely downloaded and stored, the data shall be deleted from the data logger to ensure that adequate data logger memory remains for new data.

### 1.1.3 Protocols for Groundwater Storage Measurements

Groundwater storage shall be determined from groundwater elevation measurements. Groundwater elevation contours shall be created annually and compared to the groundwater contours generated in the previous year. The change in groundwater elevation at each monitoring site will also be analyzed on annual basis to understand where the greatest decline in storage is occurring spatially. For the comparison of annual groundwater conditions, the highest groundwater elevations recorded in the spring of each year will be used.

Where groundwater levels indicate a change in storage, storage change in the unconfined to semi-confined Shallow Zone will be calculated as follows:

$\Delta Qs = (\Delta H) \times (Sy) \times (A)$

Where:

$\Delta Qs$ = Change in Shallow Zone Storage

$\Delta H$ = change in groundwater elevation (or hydraulic head)

Sy = specific yield of the unconfined aquifer

A = surface area of the aquifer

Groundwater storage change in the semi-confined to confined Deep Zone shall be calculated with the equation below:

$\Delta Qd = (\Delta H) \times (Ss \times B) \times (A)$

Where:

$\Delta Qd$ = Change in deep Zone Storage

$\Delta H$ = change in groundwater elevation (or hydraulic head)

Ss = specific storage of the confined aquifer

B = aquifer thickness

A = surface area of the aquifer

## 1.2 Protocols for Groundwater Quality Measurements including Seawater Intrusion

Water quality monitoring of production wells that are part of municipal and other public water systems are incorporated into the groundwater quality monitoring network. Data from these sources include initial monitoring and ongoing compliance monitoring. The data is comprised of regulated primary and secondary drinking water constituents from which a baseline of water quality conditions in the Deep Aquifer water supply source is derived. Selected key constituents identified as having the potential to influence sustainable management in the ECC Subbasin are discussed, along with baseline maps and tables, under Basin Setting **Section 3.5.5**. The key constituents are total dissolved solids (TDS), nitrate, chloride, arsenic, boron, and mercury. While there may be localized constituents of concern, including point-source contamination sites, within GSAs, the key constituents are intended to satisfy monitoring for the water quality degradation sustainability indicator. Annual monitoring of groundwater quality in new and existing dedicated monitoring wells will include sampling and laboratory analysis of the key constituents on an annual basis while recognizing that monitoring in the public supply sources may be less frequent. At the 5-year periodic evaluation (see **Section 6.10**), the monitoring frequency and the list of key constituents will be assessed with respect to sustainable management. At that time, for example, monitoring frequency in the dedicated wells might be adjusted to coincide with drinking water compliance monitoring frequency.

During sampling events, field parameters shall be measured and recorded. The field parameters shall include electrical conductivity at 25 °C (EC) in µS/cm, pH, temperature (in °C), and dissolved oxygen (DO) in mg/L.

The GSP monitoring program will utilize the following protocols for collecting groundwater quality samples:

- Prior to sampling, the analytical laboratory will be contacted to schedule laboratory time, obtain appropriate sample containers, and clarify any sample holding times or sample preservation requirements.
- Verify well identification at the monitoring site (the well identifier may appear on the well housing or the well casing).
- In the case of wells with dedicated pumps, samples shall be collected at or near the wellhead following purging.
- Prior to sampling, the sampling port and sampling equipment shall be cleaned to remove any contaminants. The equipment shall be decontaminated between each sampling locations or wells to avoid cross-contamination.
- The groundwater elevation in the well shall be measured following appropriate protocols described above in the groundwater level measuring protocols.
- For any well not equipped with low-flow or passive sampling equipment, an adequate volume of water shall be purged from the well to ensure that the groundwater sample is representative of ambient groundwater and not stagnant water in the well casing. Purging three well casing volumes is generally considered adequate. Professional judgment will be employed to determine the proper configuration of the sampling equipment with respect to well construction such that a representative ambient groundwater sample is collected. If pumping causes a well to be evacuated (go dry), document the condition and allow well to recover to at least 90% of original water level prior to sampling.
- Field parameters of pH, electrical conductivity and temperature shall be collected during purging and prior to the collection of each sample. Field parameters monitored during the purging of the well shall stabilize prior to sampling. Measurements of pH shall only be taken in the field; laboratory pH analyses are typically unachievable due to short hold times. Other parameters, such as Oxidation-Reduction Potential (ORP), Dissolved Oxygen (DO) (in situ measurements preferable), or turbidity, may also be useful for assessing purge conditions. All field instruments shall be calibrated daily and evaluated for drift throughout the day.
- Sample containers shall be labeled prior to sample collection. The sample label must include sample ID (often well ID), sample date and time, sample personnel, sample location, preservative used, and analytes and analytical method.

- Samples shall be collected under laminar flow conditions. This may require reducing pumping rates prior to sample collection.
- All samples requiring preservation must be preserved as soon as practically possible, ideally at the time of sample collection. Ensure that samples are appropriately filtered as recommended for the specific analyte. Entrained solids can be dissolved by preservative leading to inconsistent results of dissolve analytes. Specifically, samples to be analyzed for metals shall be field filtered prior to preservation; do not collect an unfiltered sample in a preserved container.
- Samples should be chilled and maintained at 4 °C to prevent degradation of the sample. The laboratory's Quality Assurance Management Plan shall be followed.
- Samples must be shipped under chain of custody documentation to the appropriate laboratory promptly to avoid violating holding time restrictions.
- Groundwater quality samples shall be collected annually in new wells per **Table 6-8**.
- All data shall be entered into the GSP DMS as soon as possible. Data entries should be checked by a second person for quality assurance.

## 1.3 Protocols for Groundwater Pumping Measurements

Measurements of groundwater pumping are conducted in all public supply wells but pumping at privately-owned domestic and irrigation wells are not monitored. The following protocols shall be followed when recording groundwater pumping totals:

- Groundwater pumping amounts shall be reported in units of acre-feet on monthly basis.
- Amounts are to be determined by a totalizer/flowmeter or calculated using electric consumption records.
- Groundwater pumping totals shall be sourced from the well owner.
- Meters shall be periodically checked for accuracy utilizing manufacturers recommendations. If necessary, meters shall be periodically calibrated according to manufacturer specifications.
- All data shall be entered into the GSP DMS annually.

## 1.4 Protocols for Subsidence Measurements

Subsidence in the ECC Subbasin will be evaluated using the available data from UNAVCO PBO stations. The GSAs will not be responsible for collecting subsidence data. Available subsidence data from the four selected UNAVCO PBO stations (P256, P230, P248 and P257) will be downloaded annually and entered into the GSP DMS for inclusion in an Annual Report.

## 1.5 Protocols for Interconnected Surface Water Measurements

Shallow groundwater levels associated with Interconnected surface water measurements will be made by collecting groundwater elevation measurements from adjacent (or nested) Shallow and Deep Zone wells. Protocols for groundwater level measuring and groundwater level recording shall be followed when measuring and recording groundwater levels.

Vertical hydraulic gradient associated with the groundwater-surface water system will be calculated as follows:

$\Delta h = (h1 - h2) / (m1 - m2)$

Where:

$\Delta h$ = vertical gradient

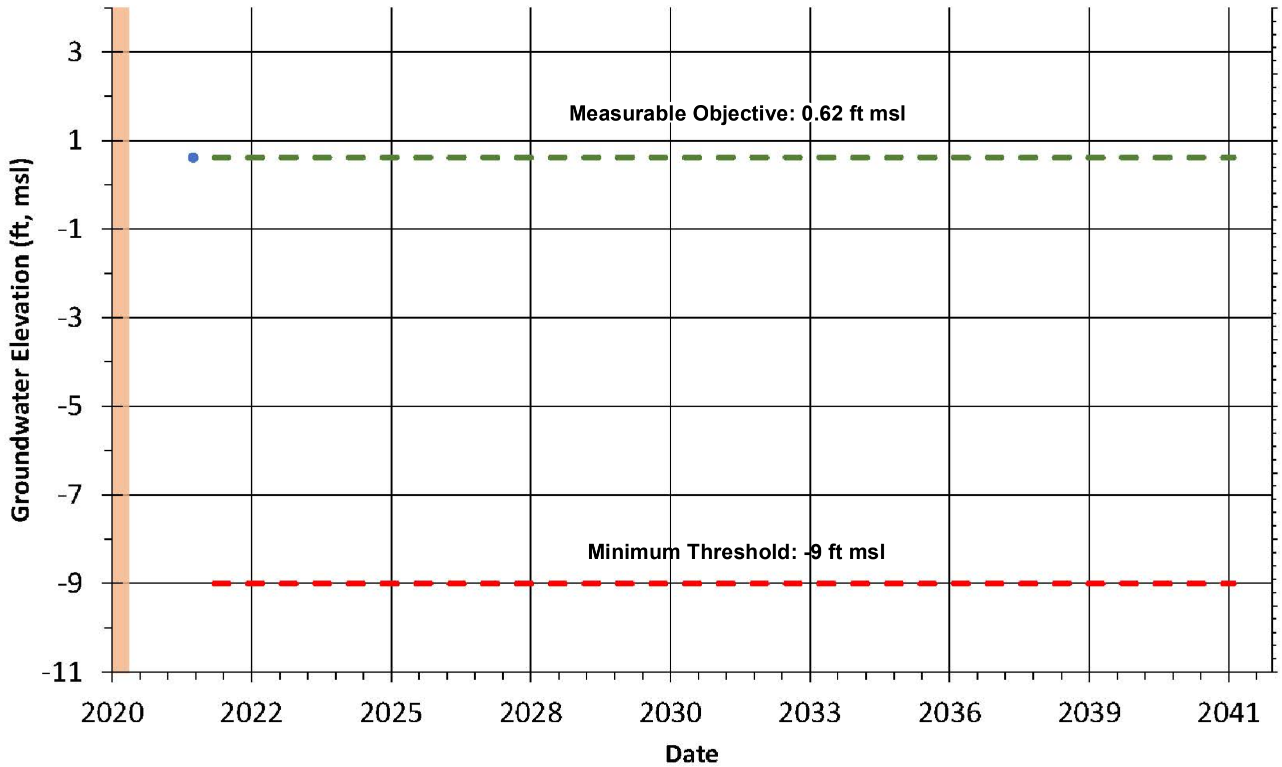
h1 and h2 = groundwater elevation in deep and shallow wells, respectively

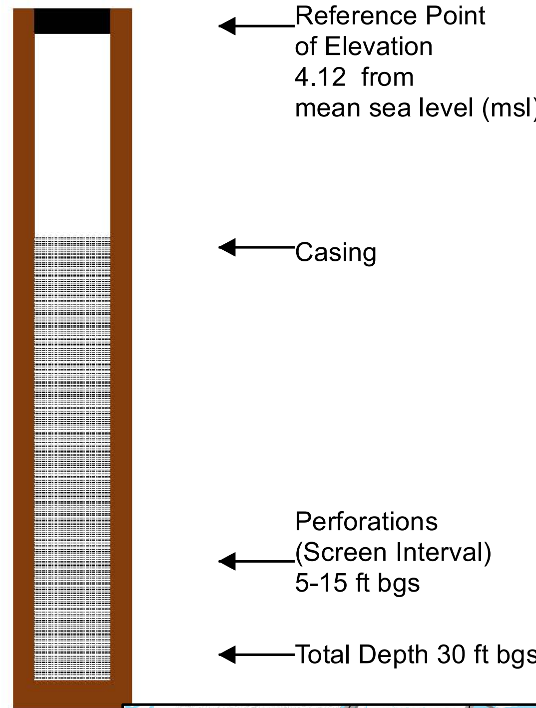
m1 and m2 = mid-point elevations of the screens in deep and shallow wells, respectively

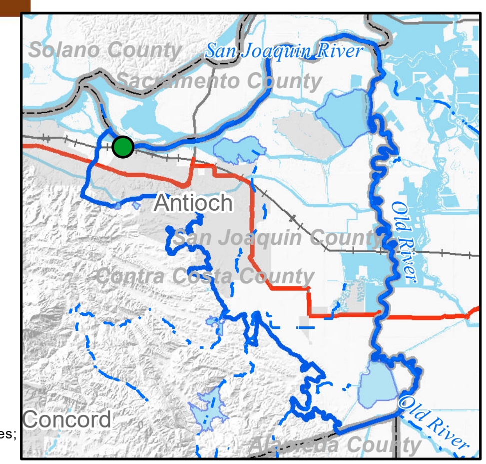
Surface flow data of interconnected surface waters shall be downloaded by the database manager from public databases for annual reporting. Groundwater elevations, calculated vertical gradients, surface water flow rates (daily or monthly mean flow in cubic feet per second) and stage of surface water (elevation relative to NAVD88) shall be entered into the GSP DMS on an annual basis.

# APPENDIX 7a

**Representative Monitoring Sites Minimum Threshold, Measurable Objectives for Chronic Lowering of Groundwater Levels**




**Explanation**

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

**Water Year Hydrologic Classification**[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

Note that the MT and MO may be revised as additional data becomes available.

**Data sources:**
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

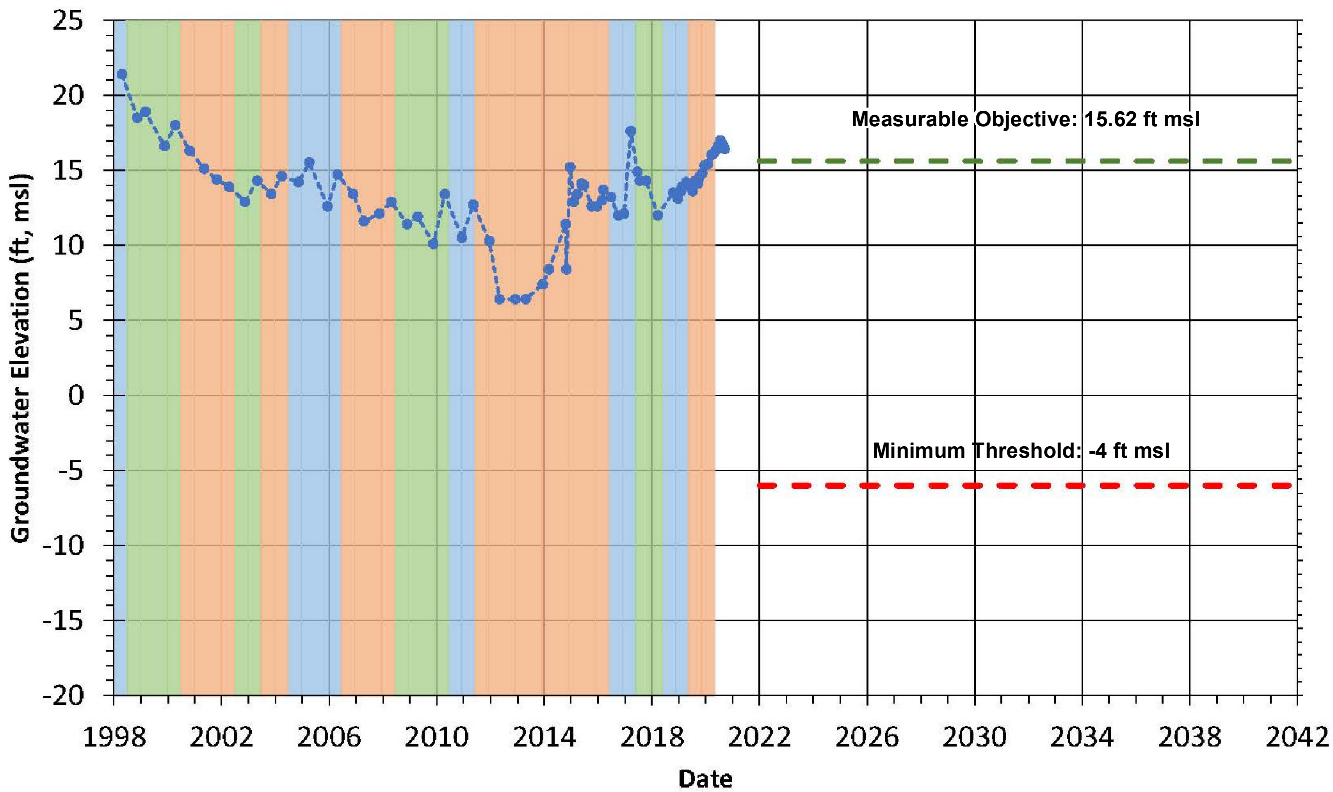
X:\2018\18-060 City of Brentwood - GSP Development\GIS\Appendix 7a-1 MO MT Graphic Antioch MW-15.mxd

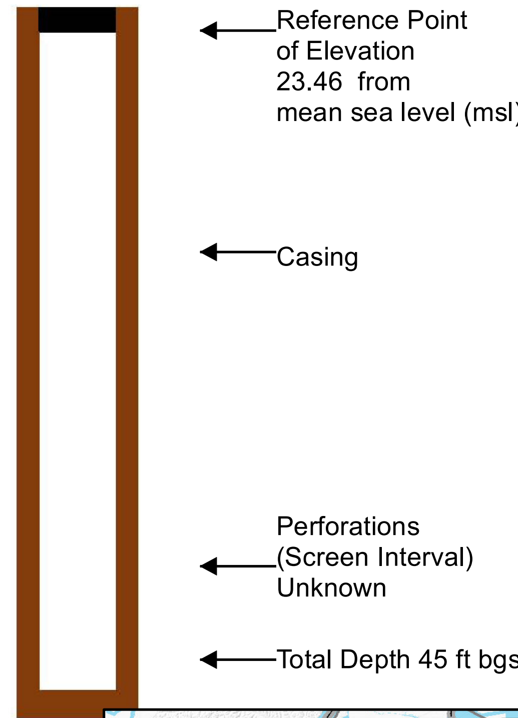
Luhdorff & Scalmanini Consulting Engineers

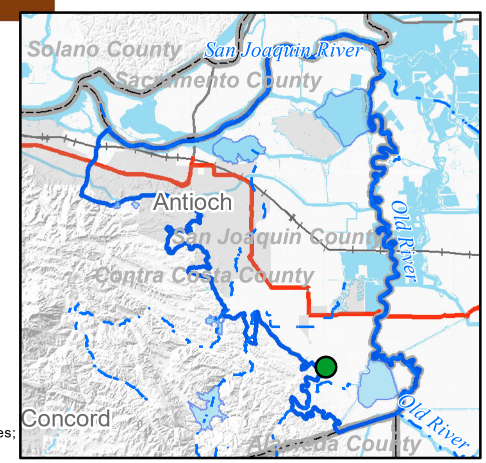
**Measurable Objectives and Minimum Thresholds- Antioch MW-15**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-1**




**Explanation**

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

**Water Year Hydrologic Classification**[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

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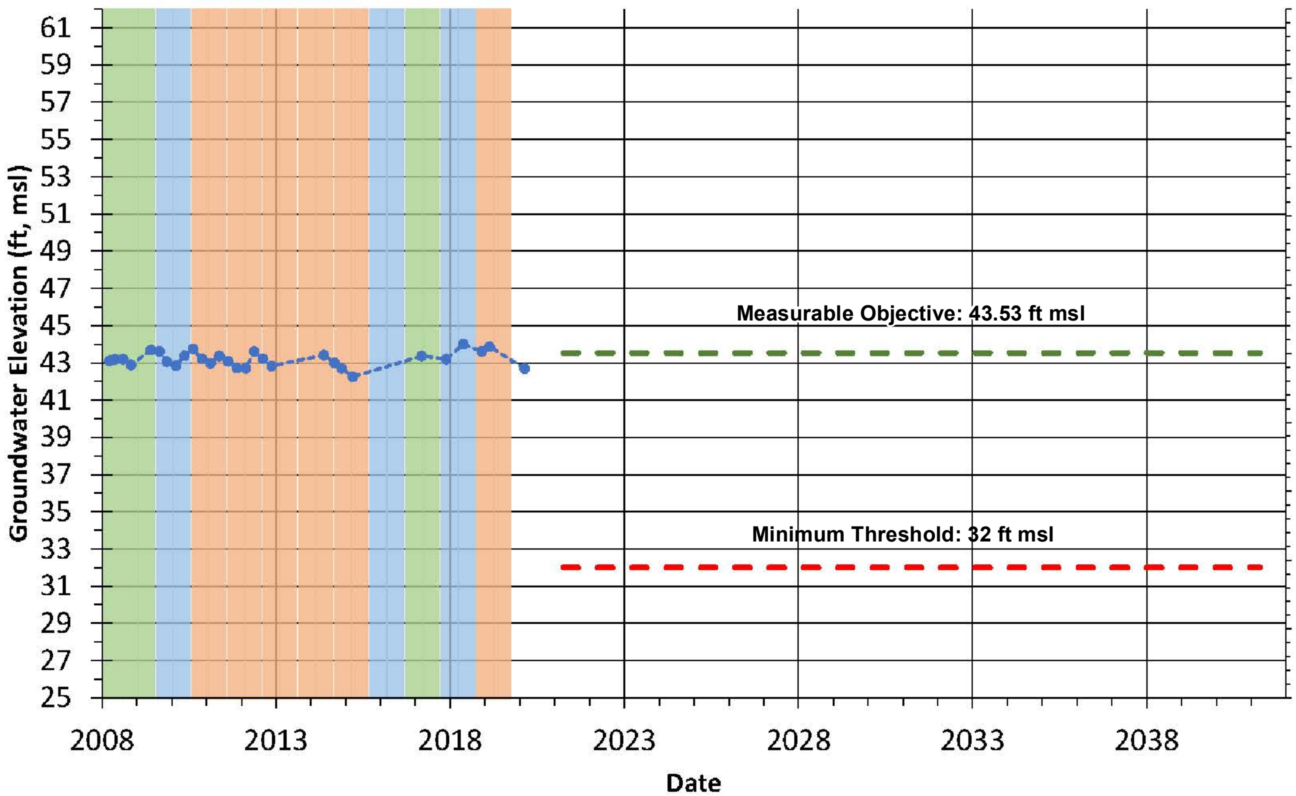
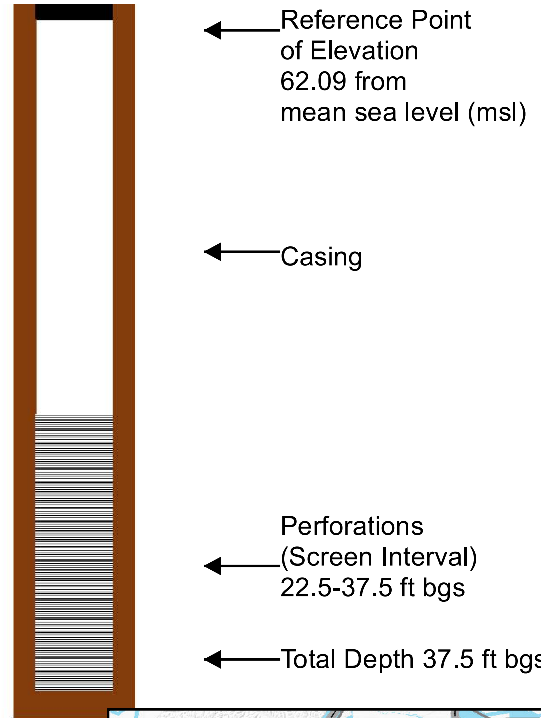
Luhdorff & Scalmanini
Consulting Engineers

**Measurable Objectives and Minimum Thresholds- 5 Binn**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-2**



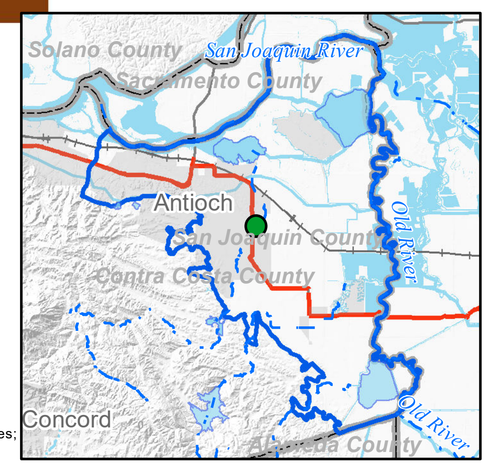

## Explanation

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

## Water Year Hydrologic Classification[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities




1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

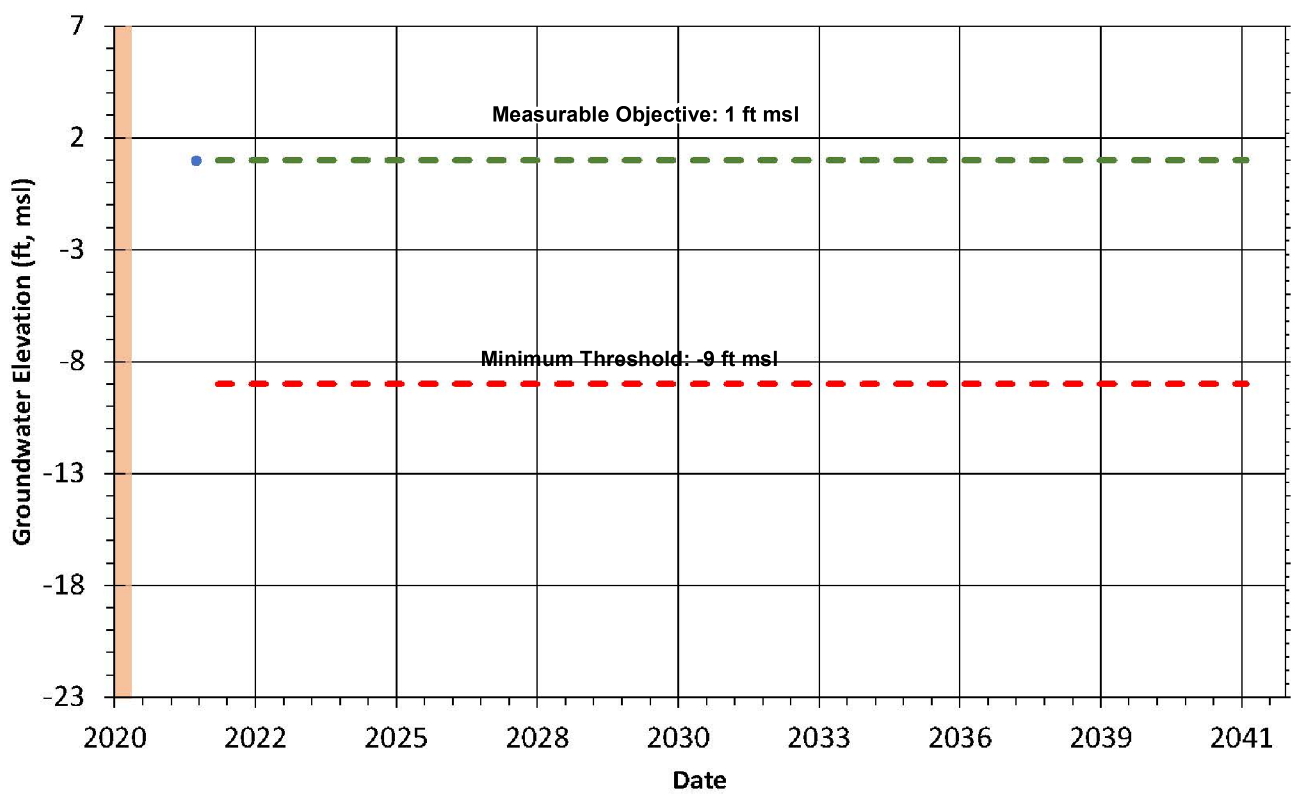
X:\2018\18-060 City of Brentwood - GSP Development\GIS\Appendix 7a-3 MO MT Graphic BG-2.mxd

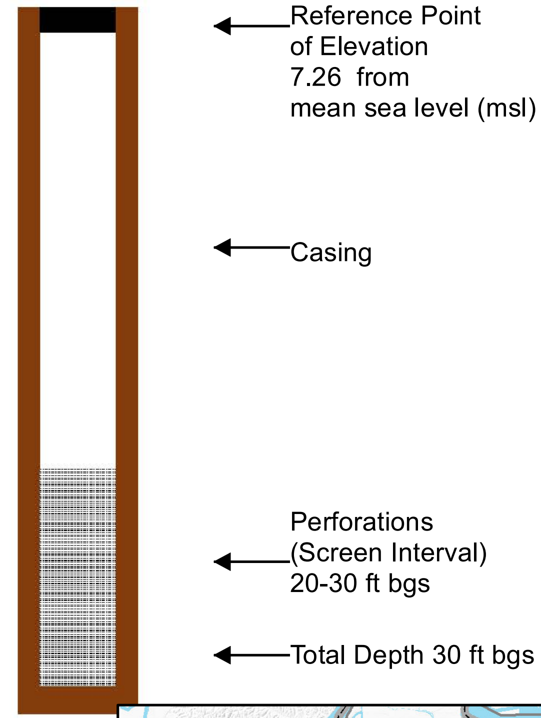
Luhdorff & Scalmanini
Consulting Engineers

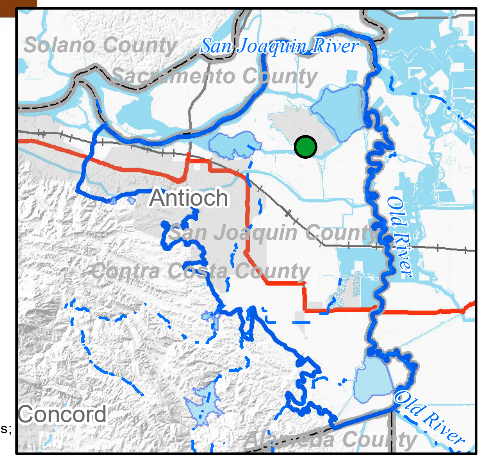
**Measurable Objectives and Minimum Thresholds- BG-2**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-3**




## Explanation

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

## Water Year Hydrologic Classification[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

Note that the MT and MO may be revised as additional data becomes available.

**Data sources:**
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

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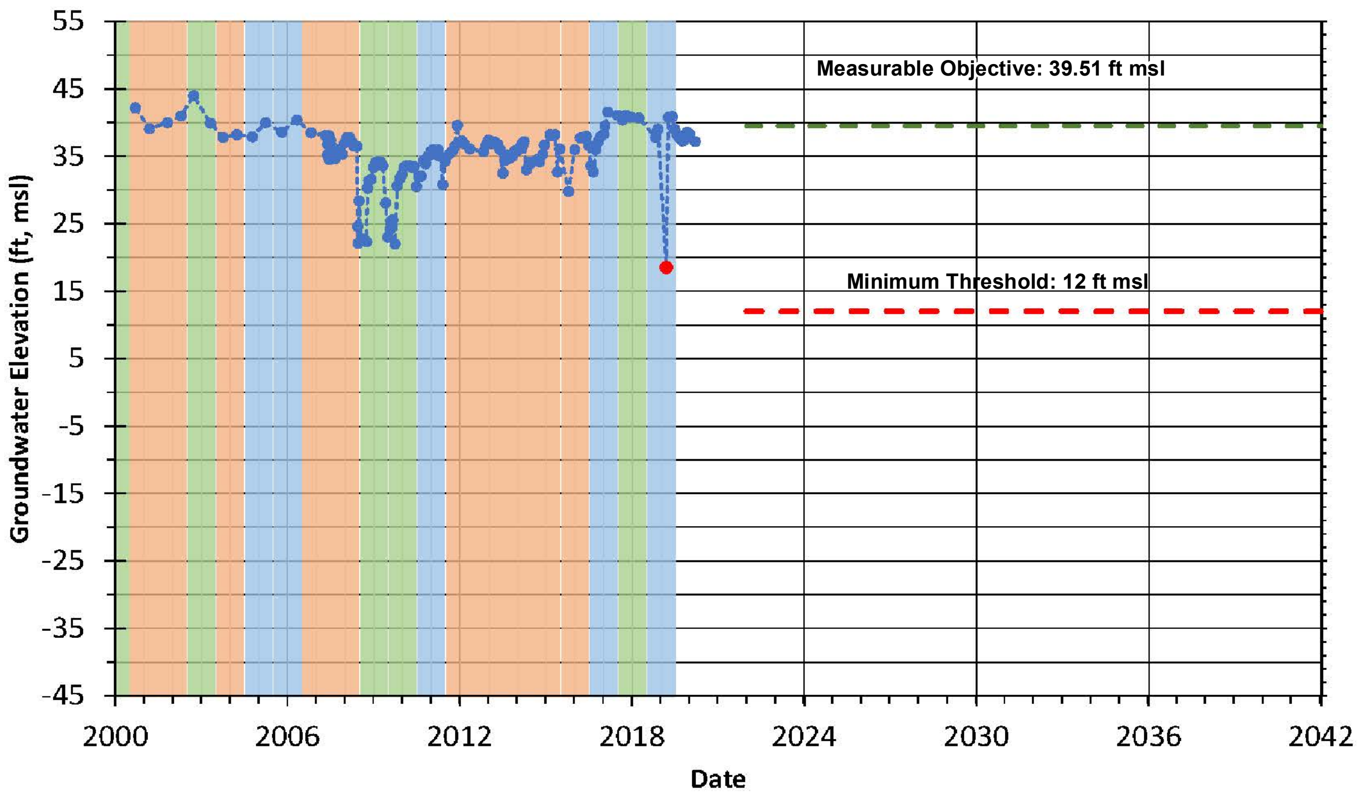
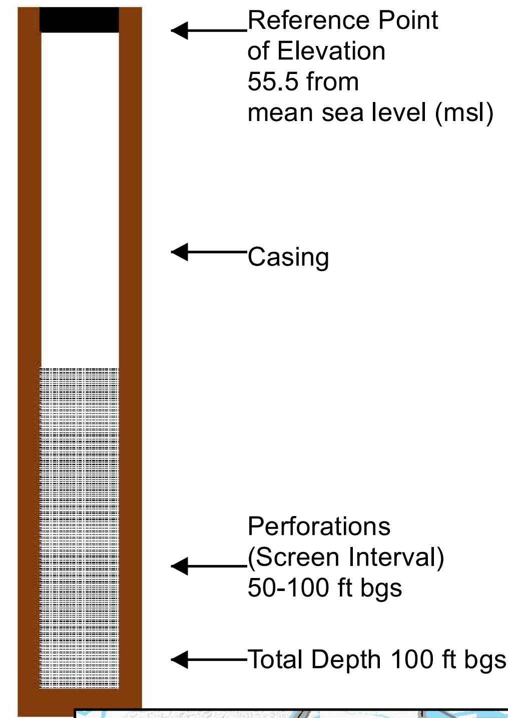
Luhdorff & Scalmanini
Consulting Engineers

**Measurable Objectives and Minimum Thresholds- DWD MW-30**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-4**




**Explanation**

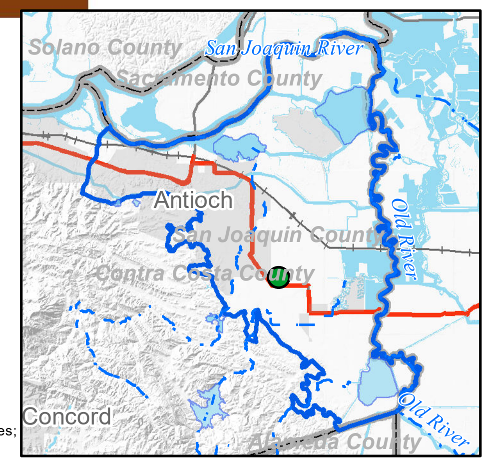
- Groundwater Elevation
- Measurable Objective
- Minimum Threshold
- Questionable Data

**Water Year Hydrologic Classification[1]**

- Wet Water Year
- Normal Water Year
- Dry Water Year

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

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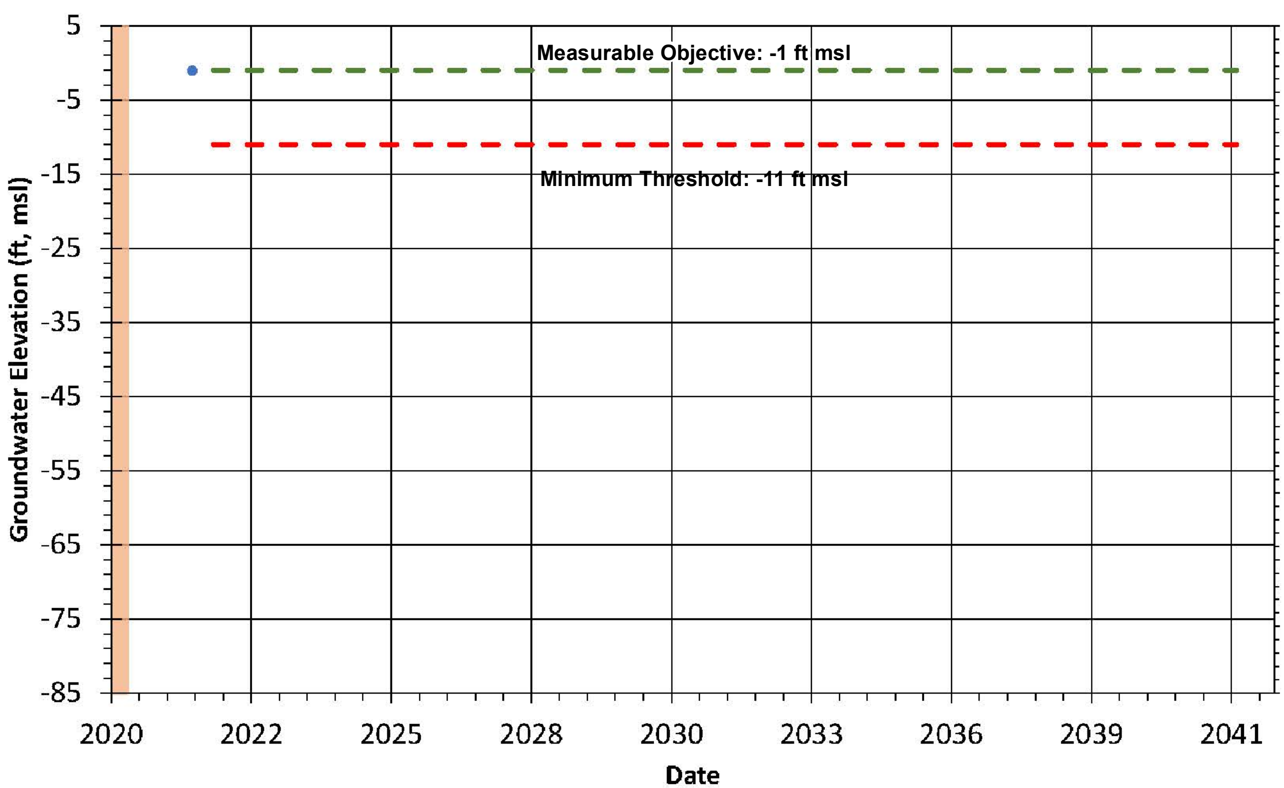
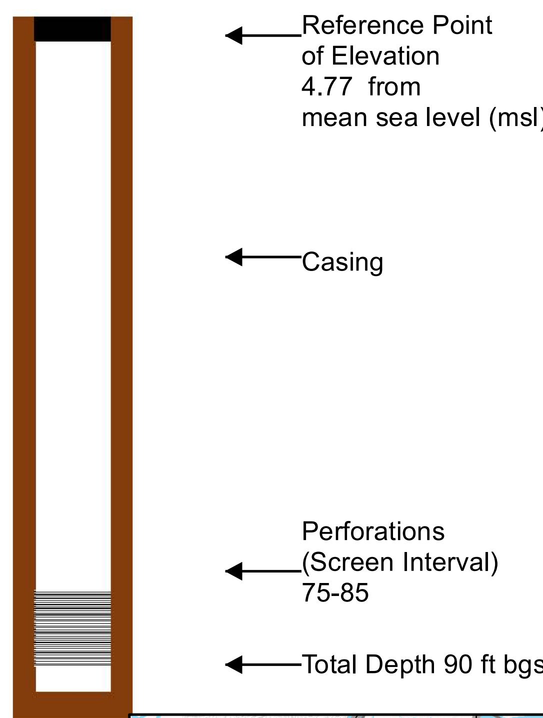
Luhdorff & Scalmanini
Consulting Engineers

**Measurable Objectives and Minimum Thresholds-ECCID Well #11**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-5**



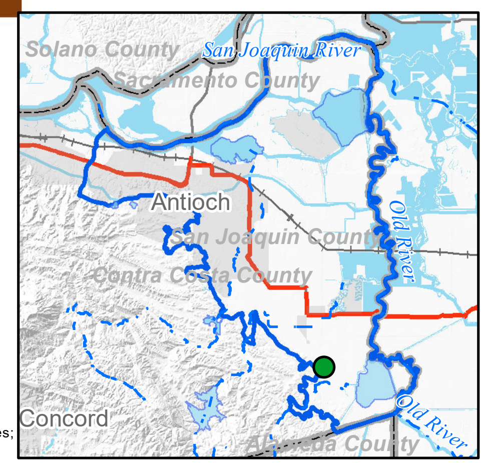

**Explanation**

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

**Water Year Hydrologic Classification[1]**

- Wet Water Year
- Normal Water Year
- Dry Water Year

Note that the MT and MO may be revised as additional data becomes available.




Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

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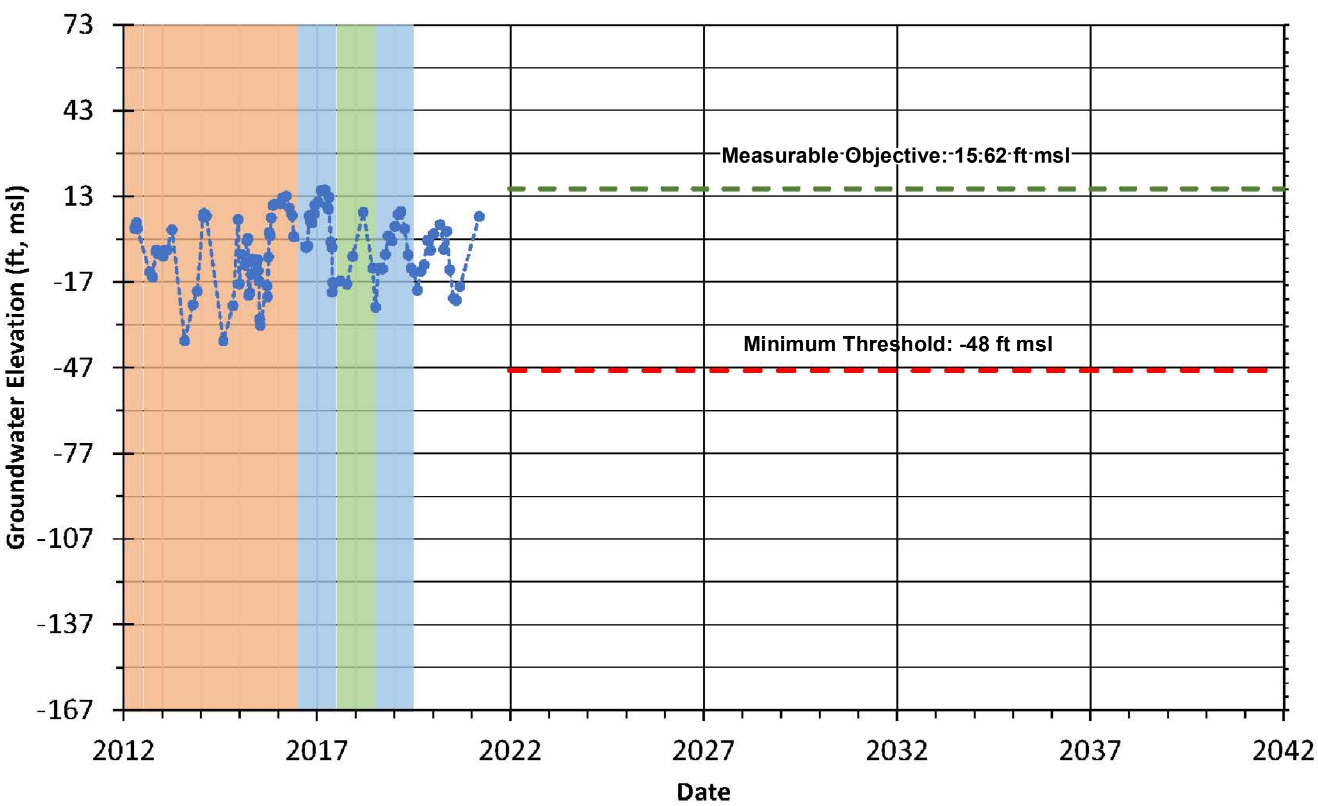
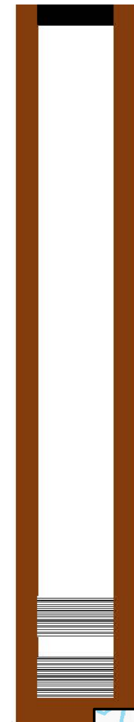
Luhdorff & Scalmanini
Consulting Engineers

**Measurable Objectives and Minimum Thresholds- Antioch MW-90**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-6**




**Explanation**

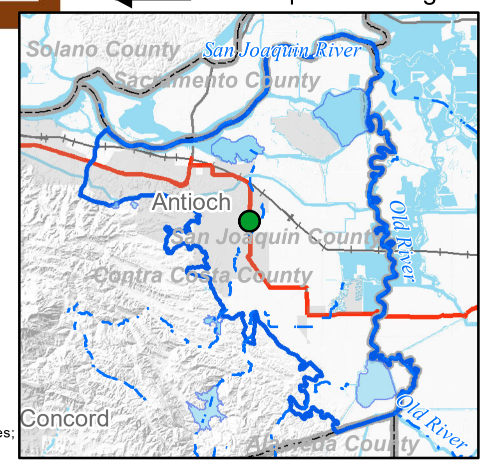
- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

**Water Year Hydrologic Classification**[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

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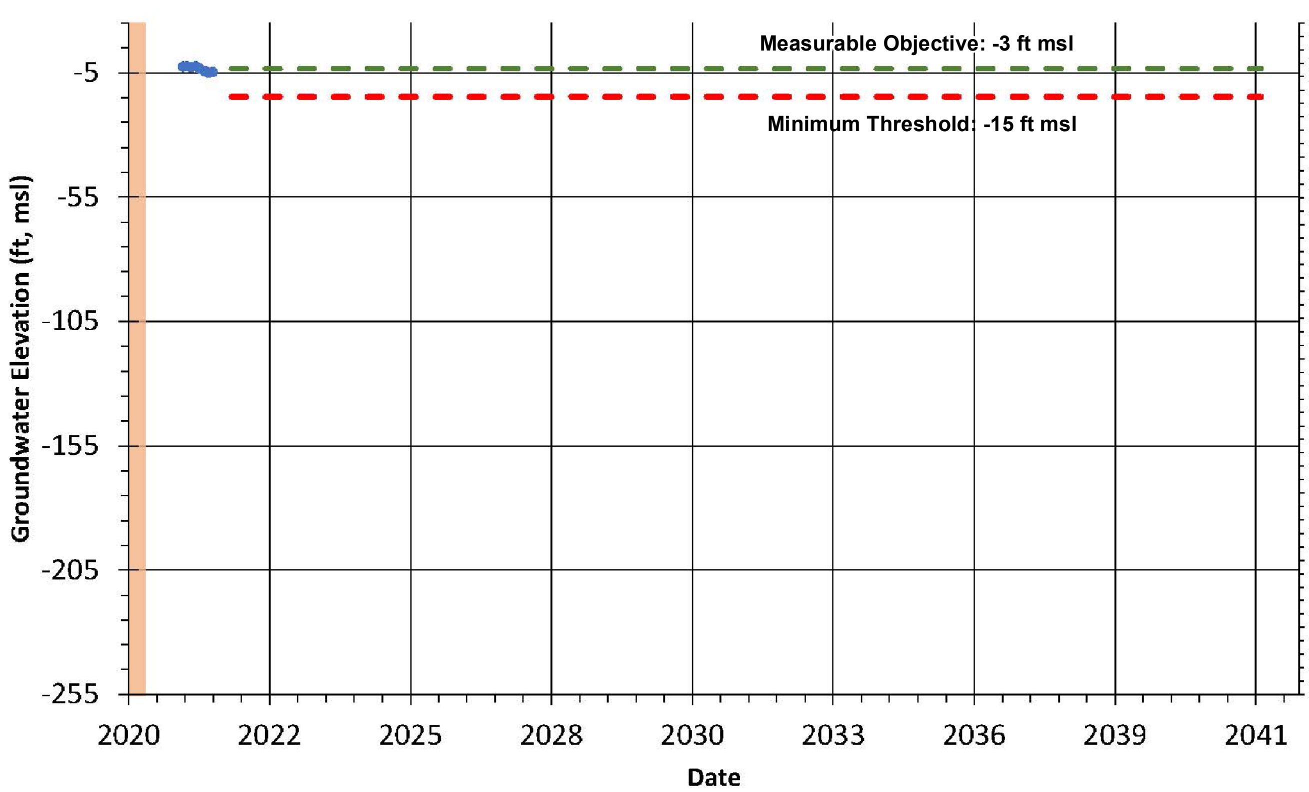
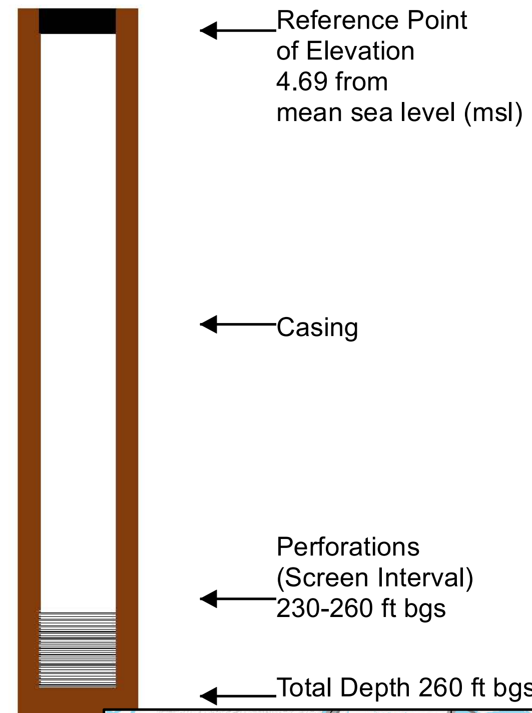
Consulting Engineers

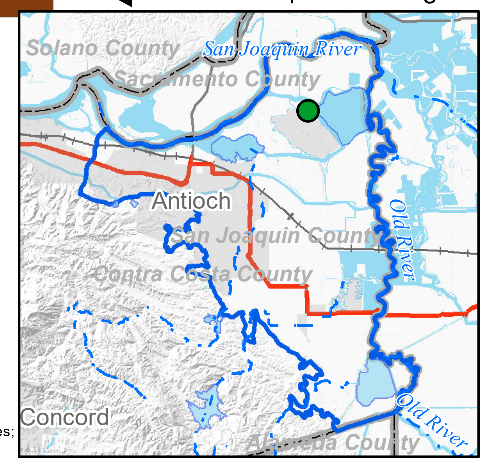
**Measurable Objectives and Minimum Thresholds-Brentwood MW-14 Int.**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-7**




## Explanation

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

## Water Year Hydrologic Classification[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

Note that the MT and MO may be revised as additional data becomes available.

**Data sources:**
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

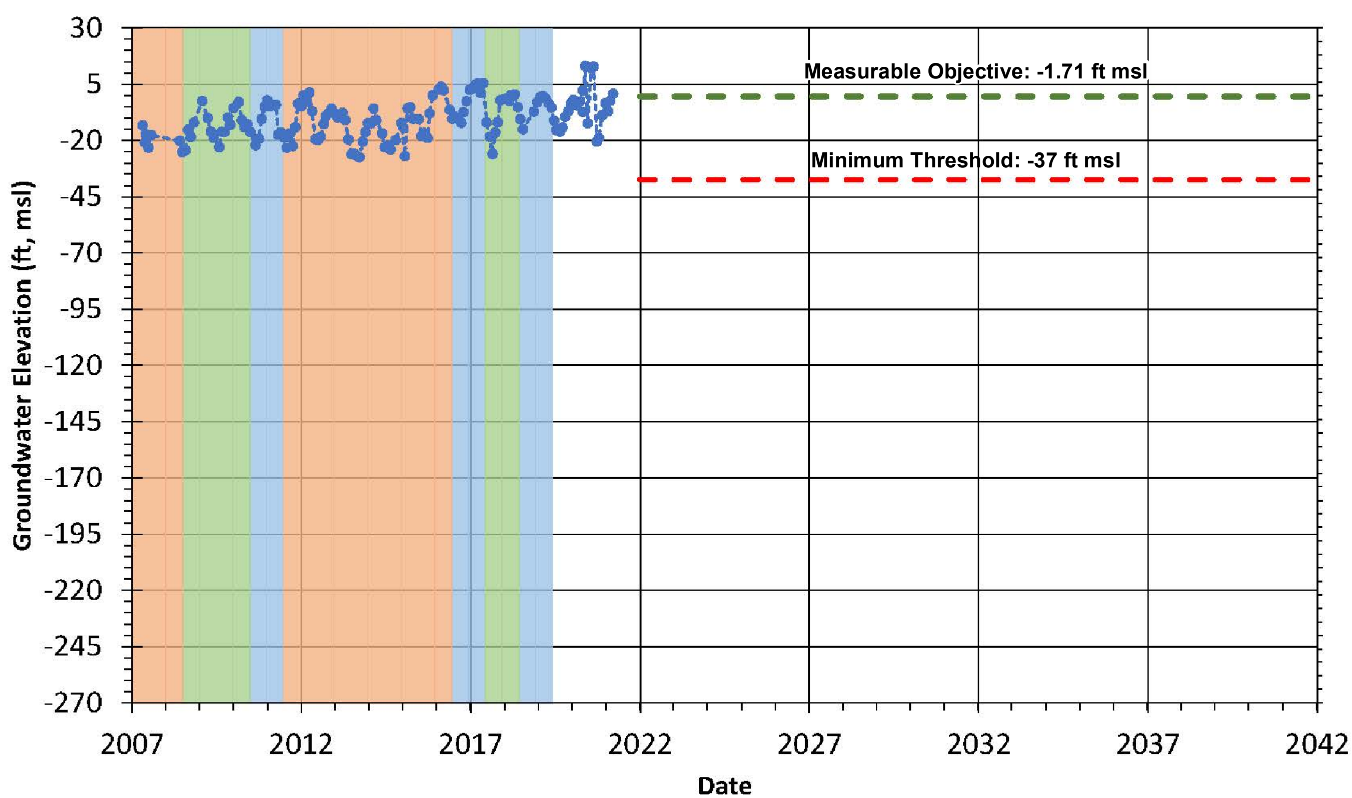
X:\2018\18-060 City of Brentwood - GSP Development\GIS\Appendix 7a-8 MO MT Graphic Bethel-Willow Rd.mxd

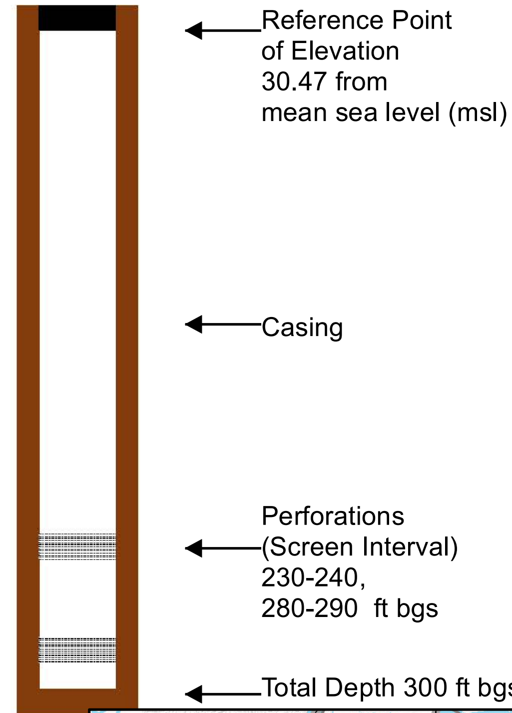
Luhdorff & Scalmanini
Consulting Engineers

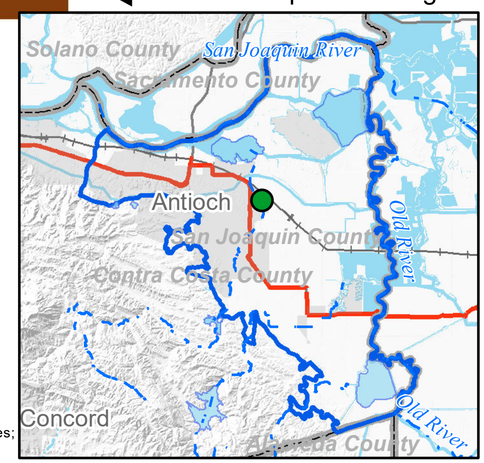
**Measurable Objectives and Minimum Thresholds-Bethel-Willow Rd**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-8**




**Explanation**

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

**Water Year Hydrologic Classification**[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

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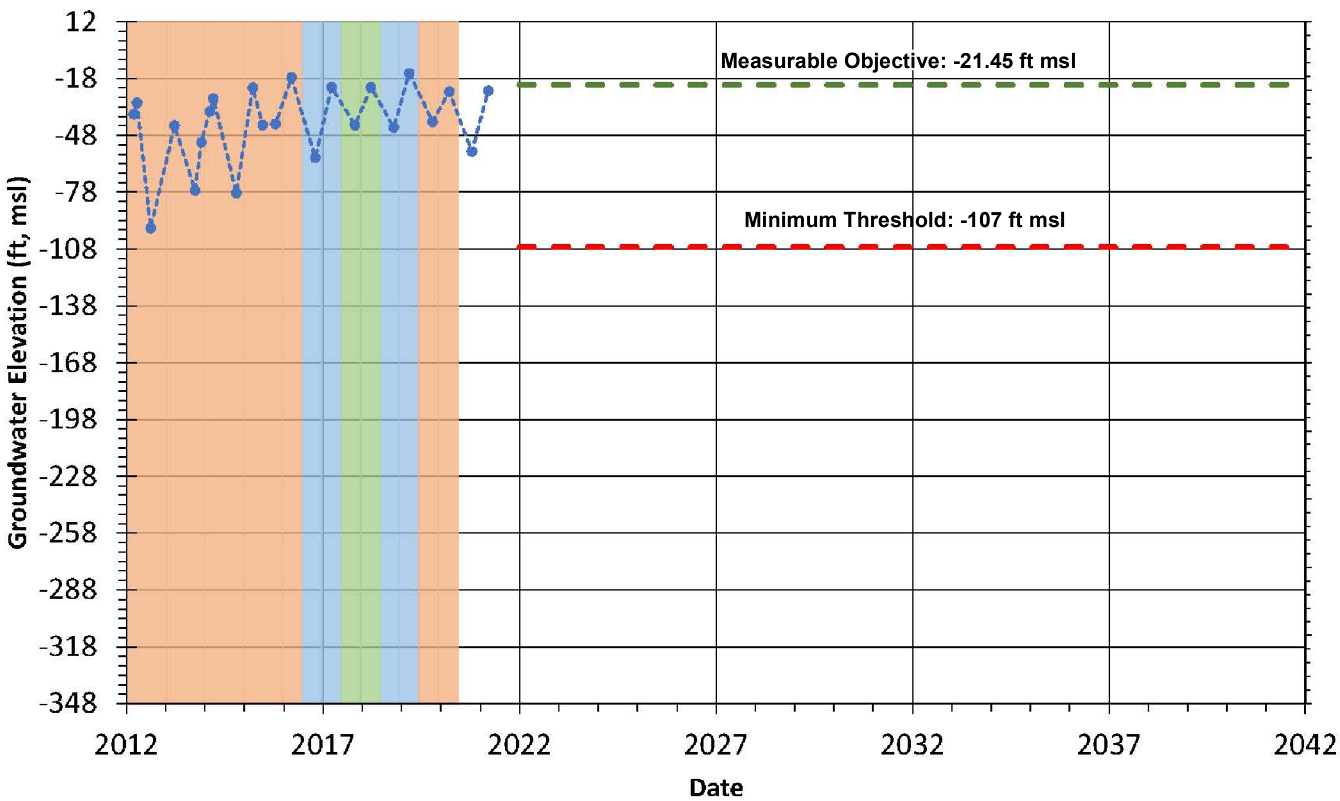
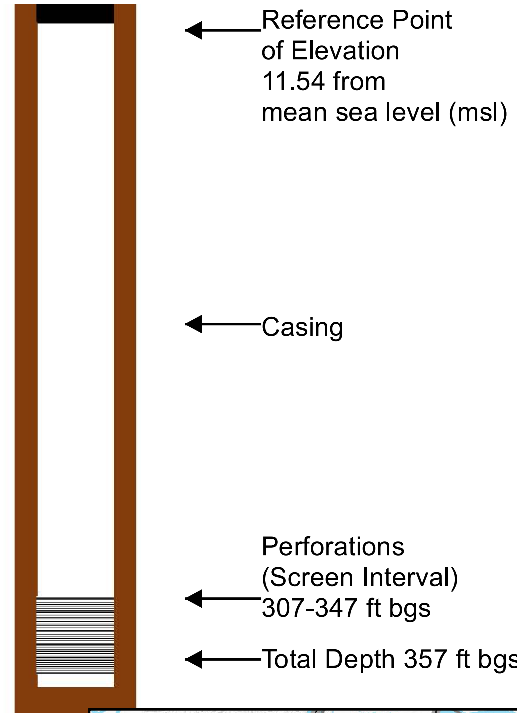
Luhdorff & Scalmanini
Consulting Engineers

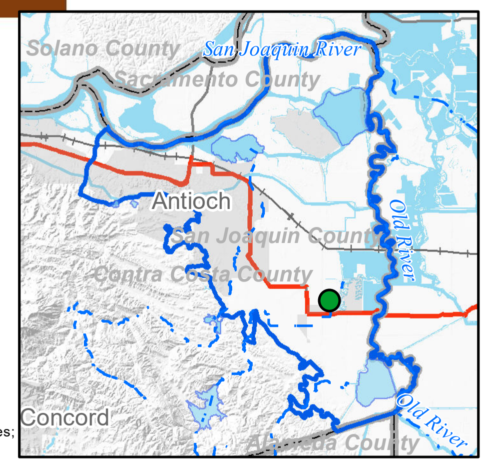
**Measurable Objectives and Minimum Thresholds- Stonecreek MW-300**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-9**




## Explanation

- Groundwater Elevation
- Measurable Objective
- Minimum Threshold

## Water Year Hydrologic Classification[1]

- Wet Water Year
- Normal Water Year
- Dry Water Year

Data sources:
USGS - waterways, DEM;
DWR - subbasin boundaries;
US Census - cities

1. Source of Water Year Type: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST

X:\2018\18-060 City of Brentwood - GSP Development\GIS\Appendix 7a-10 MO MT Graphic 4AM-357.mxd

Luhdorff & Scalmanini
Consulting Engineers

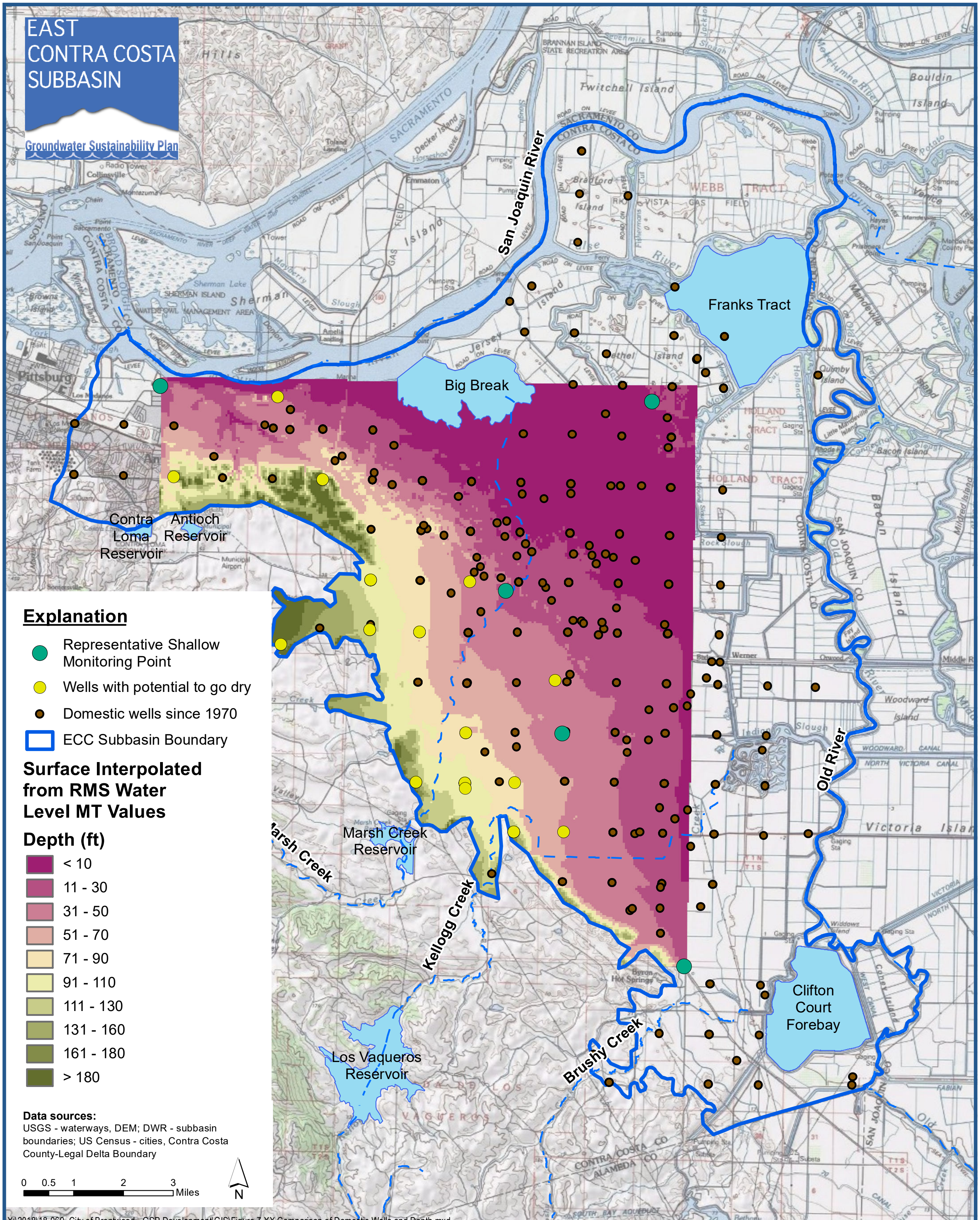
**Measurable Objectives and Minimum Thresholds- 4AMW-357**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7a-10**

# APPENDIX 7b

**Comparison of Domestic Wells and Depth to Minimum Threshold**




Luhdorff & Scalmanini
Consulting Engineers

**Comparison of Domestic Wells and Depth to Minimum Threshold**

*East Contra Costa Subbasin Groundwater Sustainability Plan*
*Contra Costa County, California*

**Appendix 7b-1**

# APPENDIX 9a

**East Contra Costa Groundwater Sustainability Plan Implementation Budget**

## Appendix 9a East Contra Costa Groundwater Sustainability Plan Implementation Budget

| Category | 2020/2022 | Annual | 5-Year |
|---|---|---|---|
| **Community Outreach & Education** | | | |
| Quarterly GSA meeting (4 times/year, consultant, $200* 2hrs=$1,600). Plus: agendas, meeting notes and setting up meetings. | | $5,000 | |
| Update ECC Online Visualization for public viewing of most recent groundwater levels (2 times/year*$1,000 each) | | $2,000 | |
| Board notifications (quarterly, 2 hours x $200=$400x4=1,600each) | | $1,600 | |
| Intra/Inter subbasin coordination (by GSA only for minimum of range) | | | |
| Newsletters to interested parties and others (by GSA for minimum of range) | | | |
| Update website (by GSA for minimum of range) | | | |
| Total | | **$10,000 - $25,000** | |
| **GSP Monitoring and Data Management** | | | |
| **Monitoring[1] and Well Maintenance** | | | |
| Groundwater Elevation: nine new wells, take manual measurements 2x/yr, check SCADA equipment, maintenance is not expected the first two years and will be costed as the need arises. | $4,000 | $4,000 | |
| Groundwater Quality: nine new wells purged and sampled annually (one person, 3 days of 12 hours each=$7,000) and analyses describe in Section 6 (TDS, nitrate, chloride, arsenic, boron, and mercury, $2,000). | | $9,000 | |
| Total Monitoring and Well Maintenance | | **$13,000** | |
| **Data Management** | | | |
| Data collection from online sources and GSAs. Includes groundwater levels, groundwater extractions, streamflow, water quality (groundwater and surface water), Geotracker, other. | | $20,000 | |
| Data Management System update with data from all sources. | | $5,000 | |
| Data analysis including graphing and upload 2x/yr. to DWR Portal | | $7,000 | |
| Total Data Management | | **$32,000** | |
| **Total GSP Monitoring and Data Management** | | **$45,000** | |
| **GSP Reporting** | | | |
| **GSP Annual Reporting[2]** | | | |
| Prepare excel files of: groundwater extraction (by GSA and methods), surface water supply, total water use, change in storage, and elements guide. | $20,000 | $10,000 - $20,000 | |
| Prepare figures: map of the subbasin and GSA boundaries, groundwater elevation contours by zone (2/yr.), hydrographs for basin-wide wells, map of location and volume of extractions, map of changes in GW storage by aquifer, graph of historical GW use by water year type. | $15,000 | $8,000 - $15,000 | |

## Table 1 Draft East Contra Costa Groundwater Sustainability Plan Implementation Budget

| Category | 2020/2022 | Annual | 5-Year |
|---|---|---|---|
| Executive summary and narrative describing findings and recommendations for the period. | $12,000 | $12,000 | |
| Upload to Annual Report Module/Report Submittal | $3,000 | $3,000 | |
| Total GSP Annual Reporting | **$50,000** | **$33,000 - $50,000** | |
| **GSP Five Year Update to include:** | | | |
| **Basin Setting Evaluation**: any changes? Evaluate new information from the last 5 years. | | | $30,000 |
| **Monitoring Network**: evaluation of network and description of data gaps and plan for new facilities if necessary. | | | $40,000 - $75000 |
| **Current Groundwater Conditions** for each sustainability indicator. Includes **update of subbasin model**.[3] | | | $50,000 - $250000 |
| **Evaluation of Sustainability Management Criteria:** revisions proposed if necessary. Progress toward meeting sustainability goal. | | | $20,000 - $35,000 |
| **Implementation of Projects** evaluated | | | $5,000 - $30,000 |
| **Other**: Relevant Actions taken by GSAs impacting the implementation of the GSP. Enforcement or legal actions by the GSA, GSP amendments to the GSP. | | | $5,000 - $30,000 |
| **Outreach and Coordination specific to 5-year update**: of GSAs, adjacent subbasins, and others | | | $20,000 -$50,000 |
| Total GSP Five Year Update | | | **$140,000 - $500,000** |
| **Grant Writing** | | **$25,000** | |
| **SGMA: to address comments from DWR on the GSP** | | **$15,000** | |
| **Contingency (10%)** | | **10%** | |

1. Assumes that each member agency will continue to monitor its own wells for groundwater levels and quality using its own resources. Only groundwater levels and quality from the nine new monitoring wells, that would not otherwise be conducted by the individual member agencies, is assumed to be covered by the ECC member agencies.

2. Assumes the first annual report covers 2020 to 2022.

3. The minimum modeling amount covers a one-time effort after 5 years to :extend the future scenarios, update surface water deliveries, pumping, precipitation and ET data; recalibration if necessary. Estimate 5 weeks x 40hrs x $200 = $8,000. Includes figure production, report writing for a total of $20,000. The maximum modeling amount is an expanded effort totalling $220,000

# APPENDIX 10a

**Summary List of Public Meetings and Outreach**

Appendix 10a Summary List of Public Meetings and Outreach (as of 08.21.2021)

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| Antioch | Notice of Public Hearing | Newspaper | Scott Buenting | General Public | 10,000 | 3/9/17 |
| Antioch | Notice of Public Hearing | Newspaper | Scott Buenting | General Public | 10,000 | 3/16/17 |
| Antioch | Public hearing and authorization to execute a MOU for GSP development | Council Report | Scott Buenting | General Public | 200 | 3/28/17 |
| Antioch | Update on GSA and GSP status | Council Report | Scott Buenting | General Public | 200 | 11/13/18 |
| Antioch | Update and First Amendment to GSP MOU | Council Report | Scott Buenting | General Public | 200 | 11/28/17 |
| Antioch | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | Tracy Shearer | General Public | 33,000 | 10/1/19 |
| Antioch | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | Tracy Shearer | General Public | 33,000 | 11/15/19 |
| Antioch | GSA Update and Second Amendment to GSP MOU | Council Report | Scott Buenting | General Public | 200 | 1/28/20 |
| Antioch | GSA Update | Council Report | Tracy Shearer | General Public | 200 | 10/27/20 |
| Antioch | GSP Workshop notification | Utility Bill | Scott Buenting | General Public | 33,000 | 6/1/21 |
| Antioch | GSP Workshop notification | City Website | Scott Buenting | General Public | 25 | 6/21/21 |
| BBID | GSP development updates | BBID webpage on SGMA (https://bbid.org/governance/ groundwater-management/) | Nick Janes | General Public | 300 | Ongoing |
| BBID | comments sought on GSP development | Web posting | Nick Janes | General Public | 300 | 5/7/2020 |
| BBID | GSP development updates | Board report | Nick Janes | General Public | 10 | 6/17/2020 |
| BBID | Notice of Public Meeting on Draft ECC GSP | Web posting | Nick Janes | General Public | 300 | 6/26/2020 |
| BBID | GSP development updates | Board report | Nick Janes | General Public | 10 | 9/29/2020 |
| BBID | Notice of Public Meeting on Draft ECC GSP | Web posting | Nick Janes | General Public | 300 | 11/30/2020 |
| BBID | GSP development updates | Board report | Nick Janes | General Public | 10 | 1/19/2021 |
| BBID | GSP development updates | Board report | Nick Janes | General Public | 10 | 4/20/21 |
| BBID | Notice of Public Meeting on Draft ECC GSP | Web posting | Nick Janes | General Public | 300 | 6/11/2021 |
| BBID | GSP development updates | Board report | Nick Janes | General Public | 10 | 6/29/2021 |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| Brentwood | BBM, East County MOU, SGMA, GSA, GSP | Board Report | Eric Brennan | General Public | 50 | 3/28/2017 |
| Brentwood | GSA MOU and Amendment - SGMA, GSA, GSP, Prop 1 Grant | Board Report | Eric Brennan | General Public | 50 | 12/12/2017 |
| Brentwood | Basin Boundary Modification (BBM), SGMA | Board Report | Eric Brennan | General Public | 50 | 5/8/2018 |
| Brentwood | SGMA, City's GSA Formation, GSP Development | fifty page views per month closing date 8.16.21 | | on going | 1,650 | 11/1/2018 |
| Brentwood | GSP Development Information | Utility Bill | | General Public | 20,300 | 10/1/2019 |
| Brentwood | BBM, Tracy Subbasin, ECCC Subbasin, GSP Development, San Joaquin Project Agreement | Board Report | Eric Brennan | General Public | 50 | 10.22.2019 |
| Brentwood | GSP Development Information | Utility Bill | | General Public | 20,300 | 11/1/2019 |
| Brentwood | SGMA -GSP Update | Provided SGMA / GSP update to East County Water Management Association Governing Board Meeting | Eric Brennan | Public water systems | 25 | 5/14/2020 |
| Brentwood | GSP Chapters 3 & 4 | Website | Team | General Public | 1,000 | 12/1/2020 |
| Brentwood | GSP Chapters 6, 7, 8 ,9 | Website | Team | General Public | 1,000 | 8/18/2021 |
| Brentwood | GSP Chapters 1 & 2 | Website | N/A | General Public | 1,000 | |
| CCC | GSP Progress and Draft Chapters Available to review | Public Meeting before the CCC Transportation, Water, Infrastructure Committee | Ryan Hernandez | General Public | 17 | 2/8/2021 |
| CCC | Public Review of Section 6 Draft and Survey | Website | Ryan Hernandez | General Public | | 4/2/2021 |
| CCC | Public Notice of Section 6 Draft and Optional Survey | District 3 News - Weekly E-newsletter | Supervisor Diane Burgis | General Public | 1,400 | 4/8/2021 |
| CCC | Public Review Notice of Section 6 and Survey | District 3 News - Weekly E-newsletter | Supervisor Diane Burgis | General Public | 1,400 | 4/15/2021 |
| CCC | Public Review of Section 6 Draft and optional Survey | Website | Supervisor Diane Burgis | General Public | | 4/15/2021 |
| CCC | Notice of Public Meeting on Draft ECC GSP | District 3 News - Weekly E-newsletter | Supervisor Diane Burgis | General Public | 1,400 | 6/17/2021 |
| CCC | Public Review Notice of Sections 7-9 and Survey | Website Announcement/Content | Team | General Public | | 7/22/2021 |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| CCC | Public Review Notice of Sections 7-9 and Survey | District 3 News - Weekly E-newsletter | Supervisor Diane Burgis | General Public | 1,400 | 7/29/2021 |
| CCC | Public Review Notice of Sections 7-9 and Survey | District 3 News - Weekly E-newsletter | Supervisor Diane Burgis | General Public | 1,400 | 8/5/2021 |
| CCC | GSP Sections 7, 8 and 9 | Public Meeting before the CCC Transportation, Water, Infrastructure Committee | Ryan Hernandez | General Public | 16 | 8/9/2021 |
| CCC | Public Review Notice of Sections 7-9 and Survey | District 3 News - Weekly E-newsletter | Supervisor Diane Burgis | General Public | 1,400 | 8/12/2021 |
| Diablo WD | Getting the public involved | Utility Bill | | General Public | 5,000 | 10/1/2019 |
| Diablo WD | Prop 68 Letter of Support and GSP Update | Board Report | Dan Muelrath | General Public | 10 | 10/23/2019 |
| Diablo WD | GSP development status and Amended MOU adoption | Board Report | Dan Muelrath | General Public | 10 | 1/22/2020 |
| Diablo WD | DRAFT GROUNDWATER SUSTAINABILITY PLAN AND PUBLIC MEETING | Website | | General Public | 50 | 7/6/2020 |
| Diablo WD | Recap of July's public workshop | Directors Report | Directors Seger and Pastor | General Public | 10 | 7/22/2020 |
| Diablo WD | GSP Plan Update | Board Report | | General Public | 10 | 8/26/2020 |
| Diablo WD | GSP Update | Board Report | | General Public | 10 | 10/28/2020 |
| Diablo WD | GSP Plan Overview and Update and GSP Policy | Board Report | | General Public | 50 | 2/17/2021 |
| Diablo WD | GSP Protection | Board Report | | General Public | 15 | 3/10/2021 |
| Diablo WD | GSP Survey | E-Newsletter | | General Public | 5,600 | 3/17/2021 |
| Diablo WD | Public Comment Period for GSP | Facebook post linking to article | | General Public | 200 | 4/16/2021 |
| Diablo WD | GSP | Board Report | Dan Muelrath | General Public | 20 | 5/10/2021 |
| Diablo WD | GSP Presentation | Sierra Club presentation | Dan Muelrath | Enviros/NGOs | 10 | 6/10/2021 |
| Diablo WD | GSP Public Workshop | Website | | General Public | | |
| Diablo WD | GSP Chapter 7, 8, 9 | Website | | General Public | 1,000 | |
| Diablo WD | GSP Workshop | Facebook post | | General Public | 200 | |
| Diablo WD | GSP Public Notice | posted notice of public meeting | | General Public | | |
| Diablo WD | GSP Public Hearing Notice | Website | | General Public | 40 | |
| Diablo WD | GSP Workshop | Website | | General Public | 40 | |
| Diablo WD | Special Board Meeting regarding groundwater | Website | | General Public | 50 | |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| | sustainability and future planning efforts | | | | | |
| Diablo WD | GSA Education | Website | | General Public | 50 | |
| Diablo WD | GSP Outreach | Website | | General Public | 50 | |
| Diablo WD | Groundwater Sustainability Plan Update | Website | | General Public | 50 | |
| Diablo WD | East Contra Costa Sub basin public workshop | Website | | General Public | 50 | |
| Discovery Bay | Citizen Comments to Draft Chapters 1 & 2 | Website | Michael Davies | General Public | 176 | |
| Discovery Bay | Overview of GSAs and GSP | Website | | General Public | 176 | |
| Discovery Bay | Overview of GSAs and GSP | Utility Bill | | General Public | 6,200 | |
| ECCID | Basin Boundary Modification 2020 GSP Scope and Budget Working Group Minutes | Board Report | Pat Corey | General Public | 50 | 2/12/2019 |
| ECCID | Basin Boundary Modification- Update 2020 GSP Scope/Budget approval | Board Report | Pat Corey | General Public | 50 | 3/19/2019 |
| ECCID | General GSP plan update Grant Funding Update | Board Report | Aaron Trott | General Public | 50 | 11/19/2019 |
| ECCID | General GSP plan update Grant Funding Update | Board Report | Aaron Trott | General Public | 50 | 12/10/2019 |
| ECCID | GSP Draft Section 3 open for comment, July 9th Public Workshop/ Outcome review. | Board Report | Aaron Trott | General Public | 50 | 1/11/2020 |
| ECCID | Amended MOU update | Board Report | Aaron Trott | General Public | 50 | 1/14/2020 |
| ECCID | DRAFT GROUNDWATER SUSTAINABILITY PLAN AND PUBLIC MEETING | Website Announcement/Content | Aaron Trott | General Public | 250 | 1/15/2020 |
| ECCID | Amended and restated MOU | Board Report | Aaron Trott | Agricultural users | 8 | 3/9/2020 |
| ECCID | Board update | Board Report | Aaron Trott | Agricultural users | 10 | 5/12/2020 |
| ECCID | GSP development status, Budget Update, Public outreach meeting schedule/ agenda | Board Report | Aaron Trott | General Public | 50 | 6/9/2020 |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 7/14/2020 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 8/13/2020 |
| ECCID | GSP Draft Section 4 in development, working group update. | Board Report | Aaron Trott | General Public | 50 | 9/8/2020 |
| ECCID | ECC Groundwater Sustainability Plan Update | Website Announcement/Content | Aaron Trott | General Public | 250 | 9/15/2020 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 9/16/2020 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 10/12/2020 |
| ECCID | GSP Draft Section 4 in development, reviewed elements. | Board Report | Aaron Trott | General Public | 50 | 10/13/2020 |
| ECCID | GSP Draft Section 4 near completion, reviewed status and working group update. | Board Report | Aaron Trott | General Public | 50 | 11/10/2020 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 11/12/2020 |
| ECCID | Draft Sections 4 Website Update | Website Announcement/Content | Aaron Trott | General Public | 250 | 11/20/2020 |
| ECCID | GSP Draft Section 4 Posted for public comment, reviewed budget, and GSP status. | Board Report | Aaron Trott | General Public | 20 | 12/8/2020 |
| ECCID | GSP Draft Section 4 Posted for public comment, reviewed budget, and GSP status. | Board Report | Aaron Trott | General Public | 20 | 12/8/2020 |
| ECCID | GSP Draft Section 6 in development, reviewed budget, and GSP status. | Board Report | Aaron Trott | General Public | 50 | 1/12/2021 |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| ECCID | Draft Sections 6 Website Update | Website Announcement/Content | Aaron Trott | General Public | 250 | 3/1/2021 |
| ECCID | GSP Draft Chapter 1-4 & 6 posted for public comment, GSP Draft Sections 5-9 in development, Reviewed draft GSP adoption schedule. | Board Report | Aaron Trott | General Public | 50 | 3/10/2021 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 3/17/2021 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 4/15/2021 |
| ECCID | GSP Draft Section 7,8,9 in development, reviewed budget, and GSP status | Board Report | Aaron Trott | General Public | 50 | 5/12/2021 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 5/12/2021 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 6/16/2021 |
| ECCID | DRAFT GROUNDWATER SUSTAINABILITY PLAN ANNOUNCEMENT FOR JUNE-23 PUBLIC MEETING | Website | Aaron Trott | General Public | 50 | 6/18/2021 |
| ECCID | Draft Sections 7,8,9 Website Update | Request for Chapter Review | Aaron Trott | General Public | 50 | 6/18/2021 |
| ECCID | General GSP status and review June-23 public outreach Workshop. | Board Report | Aaron Trott | General Public | 50 | 7/14/2021 |
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 500 | 7/14/2021 |
| ECCID | Section 10 status review, General GSP status and upcoming September 14 Workshop. | Board Report | Aaron Trott | General Public | 50 | 8/11/2021 |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| ECCID | Info on how to receive more GSA/GSP/ SGMA info | Utility Bill | | General Public | 1,500 | 8/16/2021 |
| ECCID | DRAFT GROUNDWATER SUSTAINABILITY PLAN ANNOUNCEMENT FOR SEPTEMBER 14 PUBLIC WORKSHOP | Website | Aaron Trott | General Public | 50 | 8/18/2021 |
| General | Public Review Notice and Public Meeting, Sections 1 and 2 | East Contra Costa News | Team | General Public | 4,792 | 6/19/2020 |
| General GSP | Public Meeting and Review of Draft Sections 1 and 2 of GSP | Brentwood Press | Team | General Public | 100,000 | 6/19/2020 |
| General GSP | Intro to SGMA and the ECC Subbasin and GSP. Status and findings of technical work. | Public workshop | Team | General Public | 33 | 7/9/2020 |
| General | Public Review Notice of Sections 3 and 4 | East County News | Team | General Public | 4,792 | 11/21/2020 |
| General | Public Review Notice of Section 6 and Survey | East County News | Team | General Public | 4,792 | 4/1/2021 |
| General | Notice of Public Meeting on Draft ECC GSP | East County News | Team | General Public | 4,792 | 6/12/2021 |
| General | Notice of Public Meeting ECC GSP | Brentwood Press | Team | General Public | 100,000 | 6/18/2021 |
| General | Intro to SGMA and the ECC Subbasin and GSP. Status and findings of technical work. | Public workshop | Working Group, Consultant Team, and Supervisor Burgis | General Public | 47 | 6/23/2021 |
| General | Public Review Notice Sections 7-9 and Survey | East County News | Team | General Public | 4,792 | 7/23/2021 |
| General GSP | Public Notice of Section 6 Draft and Optional Survey | Interested Party List | Team | Email Interested Parties List | 126 | 4/13/2021 |
| General GSP | Intro to SGMA and the ECC Subbasin and GSP. Status and findings of technical work. | Public workshop | Team | General Public | 47 | 6/23/2021 |
| General GSP | Public Review of Sections 3 and 4 of Draft GSP | Interested Party List | Team | Email Interested Parties List | 132 | 11/24/2021 |

| Jurisdiction | Topics covered in Outreach | Outreach Method | Presenter | Audience | Number of People | Date |
|---|---|---|---|---|---|---|
| | | | | TOTAL | 424,413 | |

Notes: Antioch=City of Antioch; BBID=Byron-Bethany Irrigation District; Brentwood=City of Brentwood; CCC=Contra Costa County; Diablo WD=Diablo Water District; Discovery Bay=Town of Discovery Bay; ECCID=East Contra Costa Irrigation District.

# APPENDIX 10b

**Summary of Public Comments on the Draft ECC GSP and Responses**

# ECC GSP – Section Review
## ON-LINE COMMENTS

| Section | Date | From | Comment | Notes |
|---|---|---|---|---|
| 6 | *05.11.21* | Katherine Perez<br>Nototomne Cultural Preservation | Presented Information is somewhat clear.<br>Our interest is in protecting Cultural Resources. We need to know if there has been a literature search and if so can you please forward that to us. We would like to offer Mitigation Measures from the perspective of the Native Americans. We would like to see cultural awareness and pre-construction training from the perspective of Native Americans before any ground disturbance accurse. We would like to see some archaeological testing implemented to determine cultural sensitivity and be included in that process. Etc. | Contacted by Lisa Beutler. May be a need for follow-up. |
| 4 | *05.11.21* | Jody London<br>Contra Costa County | I am the Sustainability Coordinator for Contra Costa County, in charge of implementation of the County's Climate Action Plan.<br>The report does not in my opinion do enough to describe the coming reality of drought combined with increased heat and sea level rise. I find it hard to believe that with expected population increases there will be sufficient conservation to meet water demand.<br><br>I didn't see any mention of the Adapting to Rising Tides studies. It is highly likely that water treatment facilities will be impacted by rising water levels in the delta. Not to mention that Bethel Island and Discovery Bay could be flooded by 2050. | At the time this comment was posted, Section 5 Water Budget was not yet posted that considers climate change and sea level rise. Also, the potential for an increase in salinity baywater intrusion is discuss in Section 3. |

| Section | Date | From | Comment | Notes |
|---|---|---|---|---|
| | | | The report also does not discuss the possibility of increasing salinity from the intrusion of waters from the Bay.<br><br>My recommendation is the report be reviewed and amended by an entity that is more familiar with the realities of climate change and water supply, like the Pacific Institute. | |

**Questions and Comments Received**
**During East Contra Costa Subbasin Public Workshops**

| Workshop Date | Commenter | Comment | Response |
|---|---|---|---|
| July 9, 2020 | Dan Muelrath, Diablo Water District General Manager | Has subsidence been documented in the East Contra Costa Subbasin? | Not that we know of, but we are still analyzing and gathering data. |
| July 9, 2020 | Liz Elias, Attendee | Are the GSP Working Group meetings open to the public? | Not right now, but the public is invited to attend GSA Board Meetings. That's something we can take back to the working group. Note, no formal decisions are made at working group meeting. |
| July 9, 2020 | Karen Converse, Attendee | How were GSAs formed? Was this a "mandated" structure, or did municipalities decide themselves to form a GSA? | Not everyone can become a GSA, SGMA requires that an entity has existing land use authority and/or water supply authority. It was determined early by the county, cities, and water districts who was using groundwater and what the boundaries would be. |
| July 9, 2020 | Campbell Ingram, Sacramento San Joaquin Delta Conservancy Executive Director | Looking into the future at places like the City of Oakley, Bethel Island, etc., how does sea level rise relate to seawater intrusion? | We recognize it's important to have a monitoring network in place to look at both groundwater levels and water quality. Levels by themselves don't tell the whole picture. Through modeling, we will look at conditions 50 years out which will include sea level. Modeling will show where there are data gaps and a plan developed for additional monitoring needs. |
| July 9, 2020 | Dan Muelrath, Diablo Water District General Manager | What about the delta...is the sea water line moving farther inland? | We are looking at groundwater-surface water interaction, including salinity, through monitoring. If there are areas that have additional salinity occurring as a result of sea level rise or groundwater development activities, that's something we want to know. It will provide an |

| Workshop Date | Commenter | Comment | Response |
|---|---|---|---|
| | | | important piece of information for adaptive management. |
| July 9, 2020 | Liz Elias, Attendee | What procedures, requirements, precautions will be put in place to prevent developers from overusing the supply and urban development? | The GSAs' powers and authorities are determined locally. DWR likes to emphasize that SGMA is not intended to solve everything, it would not supersede County Plans. GSAs could look at how groundwater pumping would impact the GSP in terms of measurable objectives.<br><br>In the County General Plan, there is an urban limit line. How it relates to groundwater and management? Those are the questions we are trying to ask. The GSAs want to track development and want to thoughtfully respond. The cities also have General Plans, I'm not familiar if they have urban limit lines. |
| July 9, 2020 | Campbell Ingram, Sacramento San Joaquin Delta Conservancy Executive Director | Subsidence is a problem on the islands due to microbial oxidation, but not due to groundwater management and or depletion. Because these areas are in the basin, it would be good to make that distinction. | We have additional information from previously worked with the Water Foundation, DWR, and USGS, on land subsidence on all of California. |
| July 9, 2020 | Liz Elias, Attendee | Will you monitor private wells? Or is there a way to keep track of what's happening with that water? | The GSAs are trying to use public wells for monitoring, not trying to monitor private wells unless a private well owner volunteers. The GSAs have established a monitoring network to maintain the continued health of the basin, but monitoring private wells is not something we are currently considering.<br>De minimis user (well that pumps less than 2 acre-feet per year) are exempt from SGMA. |

| Workshop Date | Commenter | Comment | Response |
|---|---|---|---|
| | | | |
| July 9, 2020 | Jon Duta, Well Owner | I have a small water system (well) that feeds an apartment in a rural area. What kind of restrictions may be placed on my system? | Sounds like you are already complying with the county's well permitting program. The GSAs are looking to maintain the current requirements. No changes are being proposed and we invite you to participate in the future.<br>• **Follow-up Question from John Duta**: The well gets tested monthly, would the results be useful for GSP process?<br>Yes, it would be helpful, thank you so much. |
| July 9, 2020 | Liz Elias, Attendee | I'm just wondering about the threat of some of the oil drilling that's going on. And there seems to always be accidents associated, and that seems like a threat to groundwater. | For oil and gas well drilling, they have to meet criteria in the zoning ordinance such as land use permit. We would need to look into regulations to see if there is anything SGMA would allow us to do anything about that. |
| July 9, 2020 | Paul Seger Diablo Water District Director | SGMA provides an opportunity to have a public advisory committee, however he hasn't seen that discussed or brought up. Are people in community interested in participating in a more formal way? Has that been discussed previously? | This topic is related to a stakeholder process-determined by GSAs. GSAs determine how they want stakeholders engaged.<br>The GSAs sent out some surveys last year. They did not receive a lot of responses. The responses received said, "keep me posted when you have something to tell me". There is no barrier to doing a public advisory committee; it can be accommodated.<br>• **Follow-up Question from Paul Seger**: East Bay Municipal District has something like this laid out in their plan, is this something that should be commented by the 20th?<br>You could comment on it. Ryan could bring it up to the GSP Working Group and then work with Lisa on how to go forward. |

| Workshop Date | Commenter | Comment | Response |
| --- | --- | --- | --- |
| | | | |
| June 23, 2021 | Marylin Tiernan, Diablo Water District | I am an Oakley citizen on well and have seen water quality degradation over the past 37 years. It has degraded more recently. The community is very built out. We do have seawater intrusion; I see sea lions in the Delta. Also, my neighbors didn't know about the meeting—who's responsible for the outreach? | Each GSA is responsible for doing outreach which includes a website, flyers, ads in the newspaper, workshops and so on. We can follow up after the meeting with more information. As for your other questions, we will get to them later in the presentation. |
| June 23, 2021 | Bruce Rank | Is Discovery Bay running out of water? | Our projections show that nobody will run out of water. We understand it's an important question because they are 100 percent on groundwater, but our projections show that there is no reason for concern. |
| June 23, 2021 | Not recorded | Will the raw data be available in one of the draft versions? Or the final version? Interested in the sample space (i.e., density of measurement points, and location of the points). | A technical appendix will be posted online on the SGMA website: SGMA Documents & Reports — East Contra Costa County Integrated Regional Water Management (eccc-irwm.org) |
| June 23, 2021 | Marylin Tiernan, Diablo Water District | What growth (uncontrolled continued building) was considered in this "plan"? | GSP Section 4 looks at the future demands for each GSA. This takes into account projected growth as defined by the general plans. If the projected growth is inconsistent with what we are seeing, it's something we can reevaluate as needed. The GSAs have the authority to limit growth that is unsustainable. |
| June 23, 2021 | Not recorded | Would you test water from private wells as we know it's bad for residents and clearly affecting people? A commercial well is substantially different from a personal well. | We are looking at representative wells in the monitoring network to give an overall picture, but we can do private well testing if people are interested. |

| Workshop Date | Commenter | Comment | Response |
|---|---|---|---|
| | | | |
| June 23, 2021 | Not recorded | Will Contra Costa County make reuse of graywater mandatory so that landscaping may still be part of a homeowner/property owner experience and can Contra Costa County demand that new subdivisions have these installed? Landscaping/gardens actually help groundwater retention based on all the reading I have done. | Graywater isn't something that would show up in the model because it's a small amount of water, but we know that jurisdictions have plans to implement recycled water. Eventually it will get into the ground. There isn't anything specific in the GSP on this topic. |
| June 23, 2021 | Marylin Tiernan, Diablo Water District | How do future land use planning decisions made by government agencies affect future recharge potential? i.e., impermeable surface increases, reduction of native trees, ground cover, construction of flood control channels in new developments. | We know that more urban areas have a flashier system (water moves faster), but we are also trying to implement runoff programs in some developments.<br>The groundwater models include land use changes that are part of the city and County general plans such as conversion of agricultural land to urban which would create more runoff and less recharge. GSAs have a responsibility too—if the GSP identifies a recharge area, but the County comes in with a development plan in the same area, GSAs have the responsibility to work with County to say that impacts sustainability. The County has urban limit line which limits development in unincorporated portion of the County. |
| June 23, 2021 | Not recorded | Will the GSP Working Group meeting agendas with teleconference links be posted on the website going forward? To | Diablo Water District has GSA meetings that are open to the public; we would love to have public participation and hope they attend. Discovery Bay and City of Brentwood have done a lot of outreach |

| Workshop Date | Commenter | Comment | Response |
|---|---|---|---|
| | | date, only minutes have been posted after meetings are held. | too. The GSP Working Group is about the data and purposefully kept small. We do want input from the community though so someone can read the minutes and can then participate through the GSA board. |

# APPENDIX 10c

**East Contra Costa Subbasin Communications Plan**

# East Contra Costa Subbasin Sustainable Groundwater Management Act

# Communications Plan

**DECEMBER 2018**

Prepared for:
East Contra Costa Subbasin GSAs

Prepared by: Lisa Beutler, Stantec
Kirsten Pringle, Stantec

This document was developed with technical support provided by the California Department of Water Resources' (DWR) SGMA Facilitation Support Services Program and completed by the Communication and Engagement Group of Stantec.

## Table of Contents

**LIST OF TABLES**



**LIST OF FIGURES**

## Abbreviations

| | Description |
|---|---|
| Communications Plan | East Contra Costa Subbasin, Sustainable Groundwater Management Act, Working Draft Communications Plan |
| DWR | California Department of Water Resources |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| PDF | Portable Document Format |
| SGMA | Sustainable Groundwater Management Act |
| State Board | State Water Resources Control Board |
| Subbasin | East Contra Costa Subbasin |

## Revision History

| Revision/Section Title # | Date of Release | Author | Summary of Changes |
|---|---|---|---|
| Working Draft | September 2018 | Beutler | N/A |
| Final Draft | December 2018 | Beutler | Incorporates Group and Consultant Edits |
| | | | |
| | | | |
| | | | |

# 1.0 INTRODUCTION AND BACKGROUND

The purpose of this Communication Plan is to assist the GSAs of the East Contra Costa Subbasin with stakeholder outreach and other related actions as required by SGMA. Its chapters identify key stakeholders and provide a high-level overview of near and long-term outreach and engagement strategies, tactics, and tools. The content of this Communications Plan was developed, in part, through discussions with GSA representatives at Groundwater Sustainability Plan (GSP) Coordination Group meetings and a survey sent out to GSA representatives. This Communications Plan was created with technical support provided by DWR's SGMA Facilitation Support Services Program.

### Public Stakeholder Process

Depending on the number of stakeholders and varying interests, the public process can include the following categories:

- Citizens Groups and General Public
- Governmental and Land Use Agencies
- Commercial and Industrial Self-Supplied
- Private and Public Water Purveyors
- Tribal Governments and Communities
- Agricultural and Aquiculture Interests
- Environmental and Ecosystem Interests
- Remediation and Groundwater Cleanup

Existing groundwater management agencies formed using well-documented interest-based stakeholder processes can continue to use current stakeholder engagement methods and document the process in a **communications section of the GSP**, in addition to any additional requirements per Article 5, Subarticle 1 of the regulations. Given the broad diversity of California's interested stakeholders, the regulations allow the GSA flexibility in deciding how the stakeholder process is conducted.

## 1.1 SGMA BASICS[1]

After decades of debate, California lawmakers adopted SGMA in 2014. This far-reaching law seeks to bring the state's critically important groundwater basins into a sustainable regime of pumping and recharge. The change in water management laws has created new obligations for residents and water managers in the Subbasin

SGMA required, by June 30, 2017, the formation of locally-controlled GSAs in many of the state's groundwater basins and subbasins. A GSA is responsible for developing and implementing a GSP**.** These plans assist the basins in meeting sustainability goals. The primary goal is to maintain sustainable yields without causing undesirable results.

### 1.1.1 GSAs & GSPs

Any local public agency that has water supply, water management, or land use responsibilities in a basin can decide to become a GSA. A single local agency can decide to become a GSA, or a combination of local agencies can decide to form a GSA by using either a Joint Power

[1] Sections on SGMA are largely drawn, in whole or in part, from publicly available materials from the Department of Water Resources. For more see: http://www.water.ca.gov/groundwater/sgm.

Authority, a memorandum of agreement, or other legal agreement. If no agency assumes this role the GSA responsibility defaults to the County; however, the County may decline.

- A GSP may be any of the following (California Water Code Section 10727(b)):
  - A single plan covering the entire basin developed and implemented by one GSA.
  - A single plan covering the entire basin developed and implemented by multiple GSAs.
- Subject to California Water Code Section 10727.6, multiple plans implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers the entire basin.

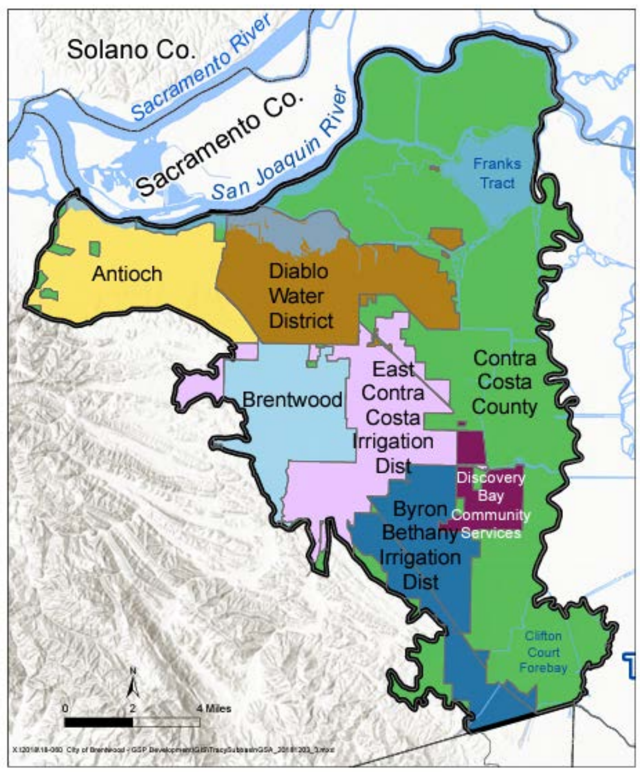
If local agencies are unable to form an approved GSA and/or prepare an approved GSP in the required timeframe, then the basin or subbasin would be considered unmanaged. Unmanaged groundwater basins and subbasins are subject to State Water Resources Control Board oversight. This is true even if the vast majority of the subbasin is covered by a plan. Should intervention occur, the State Water Resources Control Board is authorized to recover its costs from the GSAs.

## 1.2 SGMA AND THE EAST CONTRA COSTA SUBBASIN

### 1.2.1 East Contra Costa Subbasin

The East Contra Costa Subbasin (DWR Bulletin 118, 5-22.15) (**Figure 1**) is a medium-priority subbasin within the larger San Joaquin Valley Groundwater Basin. The Subbasin covers the eastern portion of Contra Costa County. The northern boundary (from west to east) of the Subbasin follows the San Joaquin River west until its convergence with the Mokelumne River by Webb Tract. The eastern boundary (from north to south) follows the Old River south until the Contra Cost-San Joaquin-Alameda County intersection. The southern boundary (from east to west) continues to follow the Contra Costa-Alameda County line. The western boundary (from south to north) follows the Diablo Range north up to the section of the San Joaquin River near the City of Antioch. Adjacent subbasins include the Tracy Subbasin on the east and south, which is also part of the larger San Joaquin Valley Groundwater Basin; as well as the Solano Subbasin of the Sacramento Groundwater Basin to the north.

**Figure 1. Map of the East Contra Costa Subbasin**



The East Contra Costa Subbasin is drained by the San Joaquin River and west side tributaries; Marsh Creek. The San Joaquin River flows northward into the Sacramento and San Joaquin Delta and discharges into the San Francisco Bay.

### 1.2.2 Boundary Modification

Agencies of the Tracy Subbasin submitted a Basin Boundary Modification Request (BBMR) to DWR in September 2018. In order to better facilitate jurisdictional issues, they requested separation of the Tracy Subbasin into two subbasins along the Old River to form the East Contra Costa and Tracy Subbasins. DWR announced a draft decision to approve the basin boundary modification requests (BBMR) in November 2018. Therefore, the new East Contra Costa Subbasin is the subject of this Plan.

### 1.2.3 East Contra Costa Subbasin GSP Decision Making

The GSAs in the Subbasin intend to work together to meet SGMA requirements and collaboratively prepare **a single GSP by January 31, 2022**. The GSAs currently meet in regular coordination meetings to discuss GSP development and public outreach and engagement activities. This GSP Coordination Group is comprised of representatives from each GSA within the Subbasin and follows a consensus-based decision-making structure, where each GSA representative receives an equal vote.

This Communications Plan is offered for the voluntary use of all the GSAs in the Subbasin. A full schedule including calendared outreach timeframes is provided in Appendix A. should be developed in conjunction with the overall GSP development schedule. An important additional step will be establishing the roles and responsibilities outlined in Section 10 of this Communications Plan.

### 1.2.4 East Contra Costa Subbasin GSAs

Following are the DWR identified GSAs (as of December, 2018):

- Byron-Bethany Irrigation District
- City of Antioch
- City of Brentwood
- Contra Costa County
- Diablo Water District
- Discovery Bay Community Services District
- East Contra Costa Irrigation District

# 2.0 SGMA COMMUNICATIONS AND ENGAGEMENT REQUIREMENTS

SGMA includes specific requirements for communications and engagement by each planning phase. **Figure 2** (next page) illustrates the requirements and provides water code references. The GSP submittal guidelines also describe the outreach and engagement documentation to be submitted with the plan. California Code of Regulations Section 354.10 states that each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:

(a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.

(b) A list of public meetings at which the Plan was discussed or considered by the Agency.

(c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.

(d) A communication section of the Plan that includes the following:

(1) An explanation of the Agency's decision-making process.

(2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.

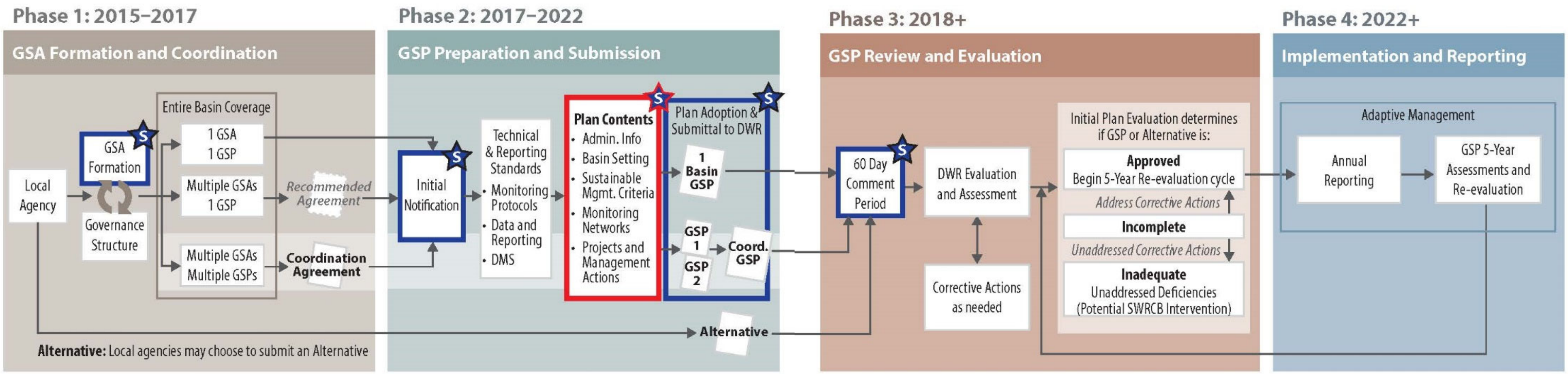
(3) A description of how the Agency encourages the active involvement of diverse social, cultural and economic elements of the population within the basin.

(4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

A full list of codes and requirements is also provided in **Appendix B**.

**Figure 2. Stakeholder Engagement Requirements by SGMA Phase**

## Stakeholder Engagement Requirements by Phase




### Phase 1 Engagement Requirements

- **Establish and Maintain List of Interested Parties** §10723.4
- **GSA Formation Public Notice** §10723(b)
- **GSA Formation Public Hearing** §10723(b)
- **GSA Formation (due 6/30/17)** §10723(b)
  Notify DWR:
  - Include list of interested parties
  - Explain how parties' interests will be considered
- **Pre-GSP Development** §10727.8
  Provide a written statement describing how interested parties may participate to:
  - DWR
  - Cities within the GSA boundary
  - Counties within the GSA boundary

### Phase 2 Engagement Requirements

- **GSP Initial Notification** §353.6*
- **GSP Preparation** §10727.8 and §10723.2
  - Encourage active involvement
  - Consider beneficial uses and users of groundwater when describing *Undesirable Results, Minimum Thresholds, and Projects & Actions*
- **GSP Communications Section** §354.10*
  - GSA decision-making process
  - Opportunities for engagement and how public input is used
  - How GSA encourages active involvement
  - Method of informing the public
- **Public Notice of Proposed Adoption** §10728.4
- **GSP Adoption Public Hearing** §10728.4
- **GSP Submittal** §354.10*
  - Include a summary of communications: description of beneficial uses/users, list of public meetings, comments received/responses

### Phase 3 Engagement Requirements

- **60 Day Comment Period** §353.8*
  - Any person may provide comments to DWR regarding a proposed or adopted GSP via the SGMA Portal at http://sgma.water.ca.gov/portal/
  - Comments will be posted to DWR's website

### Phase 4 Engagement Requirements

- **Public Notices and Meetings** §10730
  - Before amending a GSP
  - Prior to imposing or increasing a fee
- **Encourage Active Involvement** §10727.8

### Engagement Requirements Applicable to ALL PHASES

- **Beneficial Uses and Users** §10723.2
  Consider interests of all beneficial uses and users of groundwater
- **Advisory Committee** §10727.8
  GSA may appoint and consult with an advisory committee
- **Public Notices and Meetings** §10730
  - Before electing to be a GSA
  - Before adopting or amending a GSP
  - Prior to imposing or increasing a fee
- **Encourage Active Involvement** §10727.8
  Encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin
- **Native American Tribes** §10720.3
  - May voluntarily agree to participate
  - See Engagement with Tribal Government Guidance Document
- **Federal Government** §10720.3
  - May voluntarily agree to participate

*Stakeholder Input*

*Stakeholders should be informed throughout the development of Plan Content*

Code References: §(#) = SGMA, §(#)* = GSP Regulations

### 2.1.1 Beneficial Users

Pursuant to Section 10723.2 of the California Water Code, each GSA must consider the interests of all beneficial users and users of groundwater within the Subbasin, as well as those responsible for implementing GSPs. Following are the Required Interested Parties for the purpose of mandated outreach:

- Holders of overlying groundwater rights, including:
- Agricultural users.
- Domestic well owners.
- Municipal well operators.
- Public water systems.
- Local land use planning agencies.
- Environmental users of groundwater.
- Surface water users, if there is a hydrologic connection between surface and groundwater bodies.
- The federal government, including, but not limited to, the military and managers of federal lands.
- California Native American tribes.
- Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.
- Entities listed in Section 10927[2] that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency.

[2] **CA Water Code § 10927 (2017)**
Any of the following entities may assume responsibility for monitoring and reporting groundwater elevations in all or a part of a basin or subbasin in accordance with this part:
(a) A watermaster or water management engineer appointed by a court or pursuant to statute to administer a final judgment determining rights to groundwater.
(b) (1) A groundwater management agency with statutory authority to manage groundwater pursuant to its principal act that is monitoring groundwater elevations in all or a part of a groundwater basin or subbasin on or before January 1, 2010.
(2) A water replenishment district established pursuant to Division 18 (commencing with Section 60000). This part does not expand or otherwise affect the authority of a water replenishment district relating to monitoring groundwater elevations.
(3) A groundwater sustainability agency with statutory authority to manage groundwater pursuant to Part 2.74 (commencing with Section 10720).
(c) A local agency that is managing all or part of a groundwater basin or subbasin pursuant to Part 2.75 (commencing with Section 10750) and that was monitoring groundwater elevations in all or a part of a groundwater basin or subbasin on or before January 1, 2010, or a local agency or county that is managing all or part of a groundwater basin or subbasin pursuant to any other legally enforceable groundwater

### 2.1.2 Mandated Outreach Activities

**Table 1** provides a list of the mandated outreach and the timeframe in which is required.

**Table 1. Mandated SGMA Outreach Activities**

| Timeframe | Item |
|---|---|
| Prior to initiating plan development | • Statement of how interested parties may contact the Agency and participate in development and implementation of the plan submitted to DWR.<br>• Web posting of same information. |
| Prior to plan development | • Must establish and maintain an interested persons list.<br>• Must prepare a written statement describing the manner in which interested parties may participate in GSP development and implementation. Statement must be provided to:<br>• Legislative body of any city and/or county within the geographic area of the plan<br>• Public Utilities Commission if the geographic area includes a regulated public water system regulated by that Commission<br>• DWR<br>• Interested parties (see Section 10927)<br>• The public |
| Prior to and with GSP submission | • Statements of issues and interests of beneficial users of basin groundwater, including types of parties representing the interests and consultation process<br>• Lists of public meetings<br>• Inventory of comments and summary of responses<br>• Communication section in plan that includes:<br>– Agency decision making process<br>– Identification of public engagement opportunities and response process<br>– Description of process for inclusion |

management plan with provisions that are substantively similar to those described in that part and that was monitoring groundwater elevations in all or a part of a groundwater basin or subbasin on or before January 1, 2010.

(d) A local agency that is managing all or part of a groundwater basin or subbasin pursuant to an integrated regional water management plan prepared pursuant to Part 2.2 (commencing with Section 10530) that includes a groundwater management component that complies with the requirements of Section 10753.7.

(e) A local agency that has been collecting and reporting groundwater elevations and that does not have an adopted groundwater management plan, if the local agency adopts a groundwater management plan in accordance with Part 2.75 (commencing with Section 10750) by January 1, 2014. The department may authorize the local agency to conduct the monitoring and reporting of groundwater elevations pursuant to this part on an interim basis, until the local agency adopts a groundwater management plan in accordance with Part 2.75 (commencing with Section 10750) or until January 1, 2014, whichever occurs first.

(f) A county that is not managing all or a part of a groundwater basin or subbasin pursuant to a legally enforceable groundwater management plan with provisions that are substantively similar to those described in Part 2.75 (commencing with Section 10750).

(g) A voluntary cooperative groundwater monitoring association formed pursuant to Section 10935.

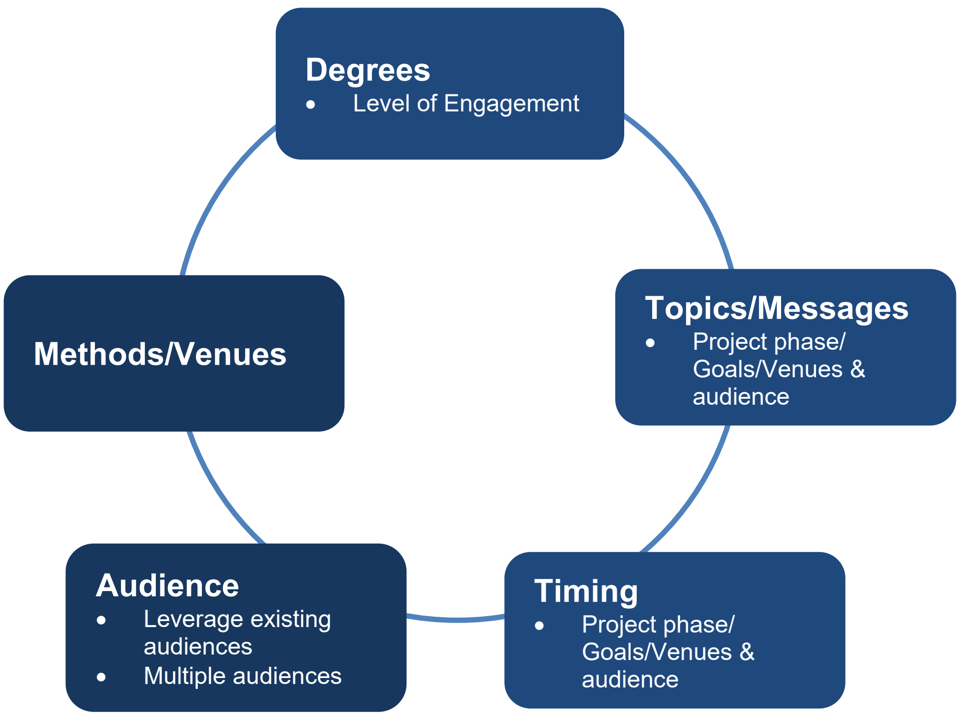
(Amended by Stats. 2014, Ch. 346, Sec. 5. (SB 1168) Effective January 1, 2015.)

| Timeframe | Item |
|---|---|
| | • Method for public information related to progress in implementing the plan (status, projects, actions) |
| 90 days prior to GSP Adoption Hearing | Prior to Public Hearing for adoption or amendment of the GSP, the GSP entities must notify cities and/or counties of geographic area 90 days in advance. |
| 90 days or less prior to GSP Adoption Hearing | • Prior to Public Hearing for adoption or amendment of the GSP, the GSP entities must:<br>– Consider and review comments<br>– Conduct consultation within 30 days of receipt with cities or counties so requesting |
| GSP Adoption or Amendment | GSP must be adopted or amended after a Public Hearing. |
| 60 days after plan submission | 60-day comment period for plans under submission to DWR. Comments will be used to evaluate the submission. |
| Prior to adoption of fees | • Public meeting required prior to adoption of, or increase to fees. Oral or written presentations may be made as part of the meeting.<br>• Public notice shall include:<br>– Time and place of meeting<br>– General explanation of matter to be considered<br>– Statement of availability for data required to initiate or amend such fees<br>– Public posting on Agency Website and provision by mail to interested parties of supporting data (at least 20 days in advance)<br>– Mailing lists for interested parties are valid for 1 year from date of request and may be renewed by written request of the parties on or before April 1 of each year.<br>– Includes procedural requirements per Government Code, Section 6066. |
| Prior to conducting a fee adoption hearing. | Must publish notices in a newspaper of general circulation as prescribed.<br>Publication shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient.<br>The period of notice begins the first day of publication and terminates at the end of the fourteenth day, (which includes the first day.) |

# 3.0 COMMUNICATIONS PLAN OVERVIEW

Communication is the process of transmitting ideas and information. According to the Project Management Institute, 75%-90% of a project manager's time is spent communicating. A Communications Plan provides the purpose, method, messages, timing, intensity, and audience of the communication, then describes who will do the communicating, and the frequency of the communication (see **Figure 3**.)

**Figure 3. Overview of the Communications Plan Elements**




## 3.1 PURPOSE

The purpose of this Communications Plan is to outline the information and communications needs of stakeholders within the Subbasin and provide a roadmap to meet them. This Communications Plan then identifies how communications activities, processes, and procedures will be managed throughout the project life cycle.

## 3.2 IMPORTANCE

While communications are important in every project, a well-executed communications strategy will be essential to the success of the GSP development and adoption process. The financial and regulatory stakes are high and communication missteps can create project risks. Further, development of a viable GSP will require an on-going collaboration among all the stakeholders, both organizational and external. The plan will be comprehensive and consider multiple variables, a range of system elements and project costs and benefits. Stakeholder input will be needed to refine GSP requirements and fully define the water management system, and potential impacts, costs and benefits that may result in managing for sustainability.

### 3.2.1 Communication Phases

Communications are unique for each GSP development phase. Following are Phases where communication messages will be needed.

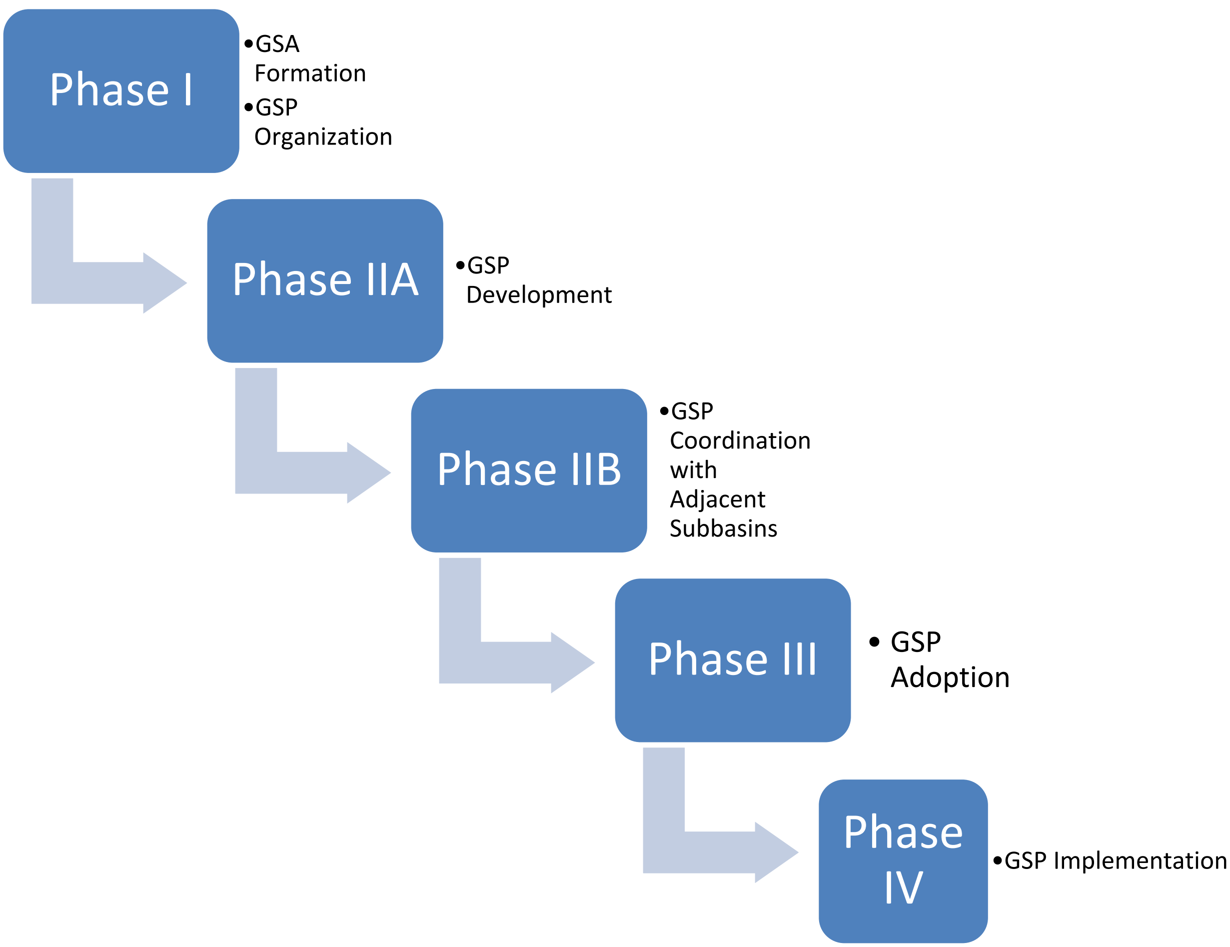



**Figure 4. Communication Phases**

For each Communications Phase, the GSAs also need to determine:

1. Level of Engagement (Degrees) – How much outreach is needed?
2. Topics, Messages – What do people need to know?
3. Timing – When should this occur?

4. Audience – Who are the right people to talk with?
5. Methods/Venues – What is the best method to reach them?

## 3.3 SCOPE

This Communications Plan focuses on formal communication elements. Other communication channels exist on informal levels and enhance those discussed within this plan. This plan is not intended to limit, but to enhance communication practices. Open, ongoing communication between stakeholders is critical to the success of the project.

## 3.4 COMMUNICATIONS GOALS

Development, adoption and implementation of the GSP will require basin external stakeholders, other agencies, staff, managers, and the multiple GSA Boards to evaluate choices, make decisions, and commit resources.

The core communications goal is to plan for and efficiently deliver clear and succinct information: (1) at the right time, (2) to the right people, (3) with a resonating message. This is done to facilitate quality decision making and build accompanying public support

## 3.5 COMMUNICATIONS OBJECTIVES

The objectives of this Communications Plan are to present strategies and actions that are:

- Realistic and action-oriented
- Specific and measurable
- Minimal in number (a few well delivered are better than many mediocre efforts)
- Audience relevant

## 3.6 STRATEGIC APPROACH

Three primary communications strategies have been identified for the GSP development.

6. Fully leverage the activities of existing groups. This practical approach is cost effective and respectful of the limited time that stakeholders have to participate in collaborative processes.
7. Provide targeted, communications and outreach to opinion leaders in key stakeholder segments.
8. Provide user friendly information and intermittent opportunities through existing communication channels, surveys, and open houses or workshops to allow interested stakeholders (internal and external) to engage commensurate with their degree of interest.

## 3.7 CONSTRAINTS

All projects are subject to limitations and constraints as they must be within scope and adhere to budget, scheduling, and resource requirements. These constraints can be even more challenging in projects with multiple agencies as will be the case with the coordination of multiple GSAs. There are also legislative, regulatory, technology, and other organizational policy requirements which must be followed as part of communications management. These limitations must be clearly understood and communicated where appropriate. While communications management is arguably one of the most important aspects of project management, it must be done in an effective and strategic manner recognizing and balancing the multiple constraints.

All project communication activities should occur within the project's approved budget, schedule, and resource allocations. The GSP project managers and the leadership of the participating GSAs should have identified roles in ensuring that communication activities are performed. To the extent possible, to support collaboration and reduce costs, GSA partners should utilize standardized formats and templates as well as project file management and collaboration tools.

# 4.0 INITIAL OUTREACH OPPORTUNITIES

As part of development of this Communications Plan, a neutral, 3rd party facilitator conducted a survey with GSA representatives to collect information on outreach opportunities in the Subbasin. In addition, the facilitator conducted a series of discussions with GSA representatives at GSP Coordination Group meetings. The purpose of these activities was to inform development of this Communications Plan, as well as develop an initial list of outreach opportunities in the Subbasin.

The outreach opportunities survey asked GSA representatives to identify potential outreach venues within the Subbasin. The survey was provided in an electronic format to GSA representatives in the Subbasin. Seven GSAs completed the survey. The results of the survey and other discussions with GSA representatives are summarized below.

## 4.1 OUTREACH VENUES

GSA representatives have identified a list of potential outreach venues in the Subbasin, shown in **Table 2** below. Note that this is only an initial list of outreach venues. The GSAs will continue to expand this list and develop a full Outreach Venues Database, described in Subsection 7.2.7.

**Table 2. Potential Outreach Venues in the East Contra Costa Subbasin**

| Organization/Event Name | Type of Organization/Event | Location |
|---|---|---|
| Contra Costa County Farm Bureau | Agricultural | Contra Costa County |
| Brentwood Lions Club | Civic/Community | Brentwood |
| Discovery Bay Chamber of Commerce | Commercial | Discovery Bay |
| Oakley Chamber of Commerce | Commercial | Oakley |
| Discovery Bay Lions Club | Civic/Community | Discovery Bay |
| Earth Day | Event | Multiple locations throughout Subbasin |
| Brentwood City Council | Government/Municipal | Brentwood |
| Brentwood Planning Commission | Government/Municipal | Brentwood |
| Contra Costa County Board of Supervisors | Government/Municipal | Contra Costa County |
| Contra Costa County Municipal Advisory Council – Byron and Bethel Island | Government/Municipal | Contra Costa County |
| Contra Costa County Municipal Advisory Council - Knightsen | Government/Municipal | Contra Costa County |
| Contra Costa County Transportation, Water, Infrastructure Committee | Government/Municipal | Contra Costa County |
| Oakley City Council | Government/Municipal | Oakley |

| | | |
|---|---|---|
| Building Industrial Association - East Bay Chapter | Industrial | Contra Costa County |
| Industrial Association of Contra Costa County | Industrial | Contra Costa County |
| Farmers Market | Other | Brentwood |
| East County Water Management Association Board Meeting | Other | Contra Costa County |
| Realtor groups | Other | Multiple locations throughout Subbasin |

# 5.0 AUDIENCE AND MESSAGES

## 5.1 AUDIENCES

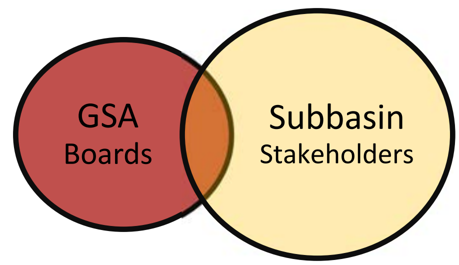



**Figure 5. Core Audience Segments**

This Communications Plan anticipates two core audience segments. First is the East Contra Costa Subbasin GSA Boards and the communications among and between themselves. This audience segment is large given that seven GSAs will be working to develop a GSP and each GSA has its own Board and audiences. The second audience is the Subbasin stakeholders, as identified in SGMA. This audience is also large. Many of the stakeholders are shared by the GSA Boards and some of the larger stakeholder segments are also represented on the GSA Boards (see **Figure 4**). Nearly all of the communications tactics identified in this Communications Plan apply to both segments; however, some strategies apply to one or the other specifically and are so identified.

### 5.1.1 Subbasin Stakeholders

Pursuant to Section 10723.2 of the California Water Code, each GSA must consider the interests of all beneficial users and users of groundwater within the Subbasin, as well as those responsible for implementing GSPs. These interests include the following:

- Agricultural users, including farmers, ranchers, and dairy professionals.
- Domestic well owners.
- Municipal well operators.
- Public water systems.
- Local land use planning agencies.
- Environmental users of groundwater.
- Surface water users, if there is a hydrologic connection between surface and groundwater bodies.
- The federal government, including, but not limited to, the military and managers of federal lands.
- California Native American tribes.
- Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.
- Entities monitoring or reporting groundwater elevations in the subbasin

As part of the GSA formation process, each GSA was required to provide a list of interested parties developed pursuant to California Water Code Section 10723.2, and explain how these interested parties would be considered in the development and operation of the GSA and development and implementation of the GSP. This list has been augmented by the facilitation and technical teams with input from the GSAs. GSAs should periodically assess their list of beneficial users and develop tactics or activities to refine the list, identify and fill any gaps.

The County of Contra Costa, supported by the Diablo Water District, has established and maintained a mailing list and Interested Parties Database (**Appendix B or 2**?).

### 5.1.2 Messages Tied to Decision-Making

Communications will be linked to decision making. For each anticipated decision, GSAs should answer the following questions:

1. Who is the stakeholder?

    a) An impacted party?
    b) A potential planning partner?
    c) A potential provider of services or resources?
    d) A regulator of the activity?

    (Note: Some stakeholders may be in more than one category.)
2. What is the interest of the stakeholder? How will the stakeholder be affected? What are the stakeholders' needs?
3. Who is the right messenger for the information?
4. How should the information be delivered? What are the best methods?
5. What is the appropriate timing for the messages?
6. How do we create two-way communication?

**Figure 6** illustrates some of these ideas.

**Figure 6. Communications Planning Questions**


## 5.2 TAILORING MESSAGES TO AUDIENCES

There are several core stakeholder groups that will require ongoing communications and tailored messaging throughout the planning process. They are:

- GSA Boards
- Agriculture
- Disadvantaged Communities
- Municipalities

Other stakeholders requiring special consideration include:

- Industrial Users/ Business
- Regulators (State and Federal)
- Potential Partners
- Environmental Organizations
- Federal Agencies

While all of the stakeholder types are important to engage for development of a GSP, the core stakeholder groups will be most affected by any changes that might be proposed as a result of the GSP(s).

### 5.2.1 GSA Boards

Due to the multiple GSAs in the Subbasin, specific focus is needed on communications to keep them informed, provide consistent updates and information that the Boards can use in their own outreach, and support their decision making. Primary objectives for communications with the GSA Boards are to ensure:

- Consistent understanding of the requirements for a GSP and/or GSP coordination
- On-going access to current information
- Timely notice of any significant developments or decision points that may require changes to policies and/or require some other board action
- Confidence that the GSP will be accepted by the GSA's stakeholders

Key communications activities involving the Board include:

1. Providing short and digestible pieces of information to ensure each Board member can quickly articulate to his/her constituents on key matters and remain sufficiently informed so that no decision points are surprises.

2. Provide user-friendly informational materials to be used with public audiences, and will support the Board with their own constituent outreach.

3. Utilize regular Board communications for routine updates and reserve specific Board agenda items for highly significant discussion items.

The GSAs have agreed to:

1. Share standardized information that can be used by managers and executives with all of their Boards.

2. Utilize Managers Reports and standing items in Board agendas.

### 5.2.2 Primary Audiences

The following provides an outline of key messages and activities in support of each of the audience types.

#### 5.2.2.1 Agricultural

The East Contra Costa Subbasin includes a significant portion of the County's agriculture footprint. A 2013 report on the Economic Contributions of Contra Costa County Agriculture indicates county-wide agriculture contributes a total of $225.0 million to the local economy, and provides 2,277 jobs in Contra Costa County economy. It was found to have exceptional diversity that provides critical economic stability within agriculture and the broader economy.

Humberto Izquierdo, the Contra Costa Agricultural Commissioner, in the annual crop report reported the total **gross value** of County agricultural crops in 2017 was $120,441,000 which was a decrease of $7,615,000 or 6% from 2016. The report indicates that "in general, demand and prices have remained strong for agricultural crops in Contra Costa County. Crop values vary from year to year due to factors such as production, weather, and market conditions. Some notable changes include an 31% increase in nursery product value and a significant decrease of 43% of field crop values. Approximately 2.5% or 4,861 acres of the total cultivated acreage was farmed organically on 15 farms. Several crop categories exceeded one million dollars in value. These categories in decreasing order include cattle and calves, tomatoes, sweet corn, grapes, miscellaneous vegetables, cherries, rangeland, walnuts, irrigated pasture, field corn, peaches and alfalfa hay. The economic benefit of agricultural production is generally thought to be about three times the gross production value."

GSAs should monitor any agricultural trends within their jurisdiction and make adjustments to tailor messages appropriate to the audience. Messages about the GSP development should feature the overall desirability of a sustainable management approach and describe how the plan will contribute to management certainty and protect against regulatory oversight. In thinking about irrigation users it is also important to remember that one size does not fit all. Where possible, GSAs should leverage existing outreach channels for reaching agricultural stakeholders, such as local Farm Bureaus and the County Agricultural Commissioner. This will be all the more important given the diversity of crop types.

#### 5.2.2.2 Disadvantaged Communities

Messages developed for this sector should be tailored and specific to the community. This type of outreach is often best served by use of surrogates and trusted messengers. These messages should be aligned with activities of the Integrated Regional Water Management (IRWM) Plan. Messages about ways to access the increased availability of resources due to grant incentives should also be considered. ECC Subbasin Disadvantaged Communities and Economically Disadvantaged Areas are illustrated in **Figure 7**.

**Figure 7**. Disadvantaged Communities and Economically Disadvantaged Area, ECC Subbasin.

#### 5.2.2.3 Municipalities

Some care will be needed to address any tensions that may arise as GSP implementation actions are developed. Concerns may relate to the relative percentages of use by municipal agencies and the determination of what constitutes the highest and best beneficial uses within the region. A promising interaction with this community would involve collaboration on messaging with the IRWM planning process to achieve mutually beneficial goals.

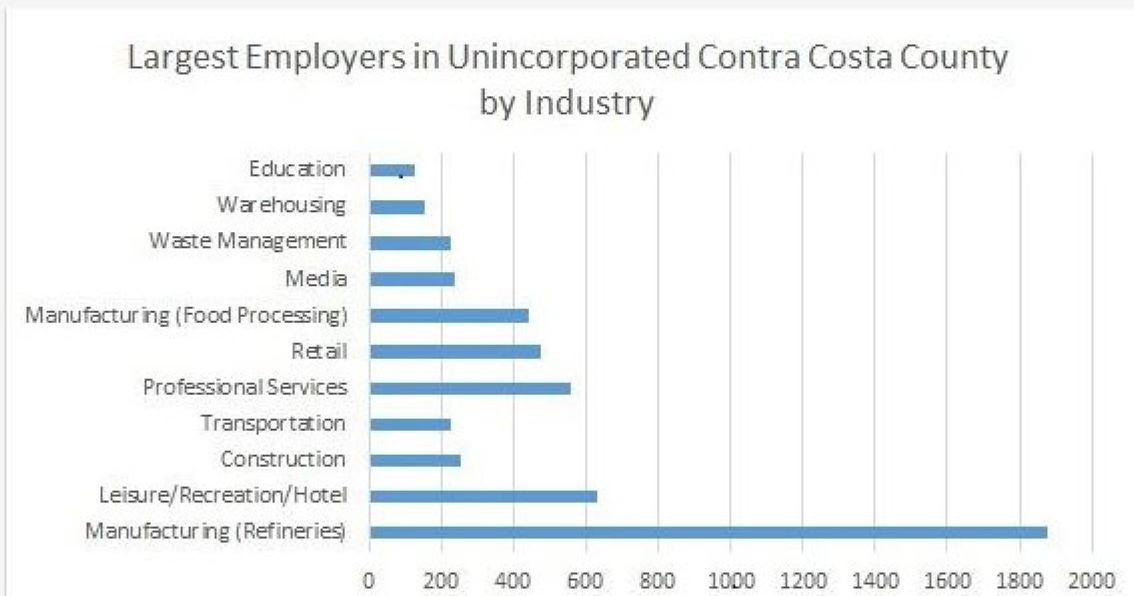
Municipal agencies have been providing in-kind support to the GSP development process through support for project websites and mailing lists, production of meeting notices, assistance to the planning process from in-house public information professionals, and offering access to physical meeting spaces.

Municipalities not already engaged may need assistance in making the case for the need to think at a basin or subbasin scale rather than more local terms.

#### 5.2.2.4 Business and Industry Interests

Business and industry interests seek assurances about the availability of water for operations. Following (**Table 3**) are the top employers in unincorporated Contra Costa County, unlike agriculture, many of the larger employers are outside of the East Contra Costa Subbasin but the employees may live in the subbasin.

**Table 3. Employers***




*Source: America's Labor Market Information System Database, downloaded via State of California Employment Development Department, March 1, 2018 & County of Contra Costa.

Rather than the listed major employers, the primary business interests for this GSP is likely to be the realtor and building industries. Outreach should focus on professional associations.

Messages for these audiences should focus on how the GSP development will contribute to sustainability and how these audiences can participate in discussions specific to their interests.

#### 5.2.2.5 Regional/Statewide Interests and Regulators

Some degree of uncertainty remains in the overall legal, legislative and regulatory environment as it relates to SGMA implementation. It is in the interest of the Subbasin stakeholders to engage state and federal agencies and regulators throughout the process. These parties may have resources to assist the subbasin and a cooperative attitude will build good will in the event that adjustments are needed to achieve SGMA compliance.

#### 5.2.2.6 Potential Agency Partners

A variety of collaborations to achieve GSP development goals may be possible. The GSAs should consider the potential for collaboration with non-GSA members and inter/intra-basin (adjacent subbasin(s)) partners, as part of plan deliberations.

#### 5.2.2.7 Environmental Community

The focus of messaging for this group being on how the GSP development will contribute to a sustainable regional water portfolio which includes surface water sustainability. Special effort should be made to identify specific topics of interest. For example, as part of GSP development, a list of groundwater dependent species may be created, or impacts to wetlands may be identified. These types of lists would highlight where input from the environmental community might be needed.

#### 5.2.2.8 Federal Government

Federal representatives interviewed for the assessment asked to be kept informed of subbasin SGMA activities. These agencies have a direct interest in surface water integration as well as SGMA activities that could impact wetlands restoration efforts or groundwater dependent ecosystems and species.

## 5.3 COMMUNICATIONS AND CHANGE MANAGEMENT

The process of adopting and implementing a GSP will require significant change management. Communications planning should encompass basic change management approaches. Messages should also evolve over time and be tied to the planning process and key decision points. Then, for each audience and each major planning step, communications must do the following:

3. Describe what the actual proposed plan (change) is.
4. Articulate how the change will directly impact the category of stakeholder involved.
5. Outline the methods that will be used to implement the plan (change).
6. Define the costs and benefits of changing and not changing, and what future conditions will be if change does not occur.
7. Consider unintended consequences and others that may also be impacted by the same change then develop a strategy to engage them.
8. Offer opportunities for input and for stakeholders and others to improve the approach.

The communications requirements for large changes are often underestimated. Some experts indicate that messages may need to be delivered up to 8 different times to be fully absorbed. Communications needs will also evolve as the GSP planning progresses. **Table 4** on the following page provides a sample of early communications that focus on SGMA and groundwater basics.

As part of the GSP planning process, the next phase of communications will also need to communicate the requirements for sustainability and how they are achieved in the context of the Subbasin.

Once the GSP begins to be formulated and again as projects are proposed, a message tables, similar to **Table 4** and should be developed for each major project phase (see Chapter 3). For the purposes of the GSP required Communication plan these primary messages should be documented and shared with the GSAs for use in developing GSA communications.

**Table 4. Early Phase Message Elements for Subbasin Stakeholders**

| Element | What the Change Is | How it will affect the Stakeholder | How the change will be Implemented | Why it is a good idea |
|---|---|---|---|---|
| Early Phase GSP Development | Locally governed GSAs will work together to sustainably manage ground water.<br>The Subbasin /Basin is required to ensure Sustainable Groundwater Management by submitting a sustainability plan by 2022<br>The plan must be implemented and found to result in sustainable management by 2042. | (Unique to audience type)<br>Changes in the current methods of acquiring and utilizing groundwater may occur.<br>May affect future decisions related to crop types and decisions related to conjunctively using surface water.<br>May provide additional project resources to the DAC communities. | A collaborative approach is being undertaken to prepare the plan with multiple GSAs coordinating with the __________ (NAME) as the planning organizer. | Sustainable and wise use of groundwater allows for the success of future generations and creates greater certainty for today's beneficial users.<br>Failure to act may result in negative regulatory consequences. |

# 6.0 RISK MANAGEMENT

Risk management is the identification, assessment, and prioritization of risks (defined as *the effect of uncertainty on achieving objectives*) followed by coordinated, efficient and economical strategies and actions to minimize, monitor, and control the probability and/or impact of negative events. Strategies and actions may also be used to avert risk by leveraging strengths and opportunities.

Risks can come from uncertainty in economic factors, threats from project failures (at any phase), regulatory and legal uncertainties, natural causes and disasters (drought, flood, etc.), as well as dissention from adversaries, or events of uncertain or unpredictable circumstances. Several risk management standards have been developed. This analysis utilizes those from the Project Management Institute.

**Table 5** outlines standardized risk categories and translates them to outreach risks.

**Table 5. Risk Factors**

| Risk Category | Outreach Risk Factors |
|---|---|
| Technical, quality, or performance | • Realistic performance goals, scope and objectives |
| Project management | • Quality of outreach design<br>• Outreach deployment and change management<br>• Appropriate allocation of time and resources<br>• Adequate support for outreach in project management plans |
| Organizational / Internal | • Executive Sponsorship<br>• Proper prioritization of efforts<br>• Conflicts with other functions<br>• Distribution of workload between organizational and consultant teams |
| External | • Legal and regulatory environment<br>• Changing priorities<br>• Risks related to political dynamics |
| Historical | • Past experiences with similar projects<br>• Organizational relations with stakeholders<br>• Policy and data adequacy<br>• Media and stakeholder fatigue |

## 6.1 TECHNICAL, QUALITY, OR PERFORMANCE

GSAs in the Subbasin are expected to meet the SGMA requirements related to GSP development. However, a potential concern in this category is fulfilling SGMA requirements for stakeholder outreach and engagement. GSA representatives have previously expressed concern about the degree of engagement that may be expected from their boards. In addition, some GSA representatives may be unfamiliar or inexperienced with conducting outreach, especially on a subbasin-wide scale.

Outreach requirements should be an ongoing consideration and currently appears to be underestimated in emphasis at both the Subbasin- and GSA-level. Additional organizational capacity and resources may be required to ensure that stakeholders within the Subbasin are kept informed of GSP development activities and are provided meaningful opportunities to engage in the GSP development process. GSAs should collaborate and work closely with their consultants to identify stakeholders, refine their Interested Parties Databases, conduct a variety of outreach tactics, and maintain documentation of all outreach activities.

## 6.2 PROJECT MANAGEMENT

Project management is currently being delegated to a technical consultant, with oversight from the GSP Coordination Group. The primary concern in this category relates to ensuring that the consultant’s scope and budget meets all the necessary requirements to achieve both technical and outreach goals. The GSP Coordination Group should make sure that adequate resources are being allocated to outreach activities. This includes both the consultant’s time and support, as well as GSA staff time and resources to guide the consultant team. GSAs should evaluate the current resources available for GSP development and outreach activities and consider if additional support is required. Some outreach tools and tactics also require a high level of participation from GSA staff. GSAs should identify where GSA-level resources are most required and plan accordingly.

## 6.3 ORGANIZATIONAL / INTERNAL

One concern in this category is potential competition for resources with other programs or projects. GSA representatives often work on multiple projects or serve other roles within their agency. Staff time or resources may be re-allocated to other projects or programs. Small agencies or water districts also contend with existing constraints on resources. GSA representatives should ensure that organizational resources for SGMA are balanced with other programs. GSAs should also take advantage of funding and technical support services offered through DWR and other state agencies to augment local resources.

Another concern in this category is the distribution of workload between the GSA and consultant teams. Clear roles and responsibilities must be defined and continuous interactions in place to ensure successful execution. High-level spokespersons or champions within the GSAs should be identified during the GSP development process. These individuals should be able to discuss Subbasin planning with the media, regulators, or stakeholders, with support from the technical consultant.

## 6.4 EXTERNAL

The legal and regulatory environment of the GSP development process is complex and evolving. Ongoing issues with surface water deliveries and changing market conditions are outside of the control of the parties. It will be important for mechanisms to be in place that allow for relatively rapid responses to changing conditions.

## 6.5 HISTORICAL

Agencies in the Subbasin have a long and successful history working together to manage water, especially regarding issues related to the Integrated Regional Water Management. Therefore, historical risk factors are considered to be low.

One concern in this category may be stakeholder fatigue. Where possible, GSAs should try to leverage existing outreach efforts and communications channels. For example, GSA should attempt to leverage disadvantaged communities outreach activities being conducted as part of the Integrated Regional Water Management program.

# 7.0 TACTICAL APPROACHES

This section describes specific tactical tools and approaches to deliver the activities, messages, and recommendations of the previous chapters. These approaches are based on best communication practices and grounded in the public participation philosophy of the International Association for Public Participation, Public Participation Spectrum as illustrated in **Figure 8**. The Spectrum represents a philosophy that outreach should match the desired level of input from both the stakeholder and the organizational entity.

**Figure 8. IAP2 Public Participation Spectrum**

## IAP2 Public Participation Spectrum

Developed by the International Association for Public Participation

INCREASING LEVEL OF PUBLIC IMPACT →

| INFORM | CONSULT | INVOLVE | COLLABORATE | EMPOWER |
|---|---|---|---|---|
| **Public Participation Goal:** | **Public Participation Goal:** | **Public Participation Goal:** | **Public Participation Goal:** | **Public Participation Goal:** |
| To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions. | To obtain public feedback on analysis, alternatives and/or decisions. | To work directly with the public throughout the process to ensure that public issues and concerns are consistently understood and considered. | To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution. | To place final decision-making in the hands of the public. |
| **Promise to the Public:** | **Promise to the Public:** | **Promise to the Public:** | **Promise to the Public:** | **Promise to the Public:** |
| We will keep You informed. | We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision. | We will work with you to ensure that your concerns and issues are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision. | We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible. | We will implement what you decide. |
| **Example Tools:** | **Example Tools:** | **Example Tools:** | **Example Tools:** | **Example Tools:** |
| • Fact sheets<br>• Web Sites<br>• Open houses | • Public comment<br>• Focus groups<br>• Surveys<br>• Public meetings | • Workshops<br>• Deliberate polling | • Citizen Advisory Committees<br>• Consensus-building<br>• Participatory decision-making | • Citizen juries<br>• Ballots<br>• Delegated decisions |

The level of engagement should be adapted to the type and needs of the stakeholder, as well as the stakeholder's interest in and nexus to SGMA. Many stakeholders simply seek to be informed, unless there is a potential for significant changes that may include them. Tactics and tools for this group may include fact sheets, website, open houses, briefings to community groups such as the Chamber of Commerce or Rotary, and informational items placed in publications they already read.

Other stakeholders, such as groundwater pumpers or disadvantaged communities, may seek to be consulted. This group should have access to all the outreach materials, as well be invited to provide comments or written materials and planning concepts. These stakeholders may also participate in focused workshops and/or briefings and should be invited to attend larger public meetings.

The development of some GSP features may also require a higher degree of involvement. This would focus on engagement of a subset of stakeholders that may experience significant impacts associated with SGMA.

Collaboration opportunities are of a different character than defined in the Spectrum. Collaboration in this GSP development process will focus on working with partners that have mutual goals to achieve those goals together. This will more resemble a partnership than a public engagement activity.

## 7.1 COMMUNICATIONS COORDINATION

Each GSA is required to perform legally mandated outreach activities and the GSP submission guidelines require a minimum level of engagement. The GSAs in the Subbasin should coordinate outreach activities. In addition to efficiency and cost savings (the GSAs can share resources), coordinated communications will allow for consistency in messaging and reduce confusion for stakeholders that may not know what GSA jurisdiction they are in, and/or are in multiple GSA jurisdictions. The following are suggested tools and tactics for communications coordination:

- Website
- Meeting calendar
- Branded informational Flyers, Templates, PowerPoint Presentations, etc.
- Periodic newsletter
- GSP related mailing lists
- Descriptions of interested parties
- Issues and interest statements for legally mandatory interested parties
- Public workshops
- Press releases and guest editorials
- Speakers Bureau
- Existing group venues
- Outreach documentation
- Some of these tools and tactics are further described in Sections 7.2 and 7.3.

## 7.2 OUTREACH TOOLS

Outreach tools are used to identify, track engagement with, and disseminate information to stakeholders. This section describes a suite of tools that could be utilized by GSAs in the Subbasin to conduct SGMA outreach activities. GSAs should provide materials in multiple languages. A minimum, outreach materials should be available in Spanish. In 2015, the most common non-English language spoken in Contra Costa County, CA was Spanish. 16% of the overall population of Contra Costa County, CA are native Spanish speakers while 2.88% speak Chinese and 2.84% speak Tagalog, the next two most common languages.

A common visual identity or branding should be implemented for all printed and electronic informational materials intended for public and stakeholder audiences.

### 7.2.1 Website

An internet website(s) has been established and is utilized to provide background information and context; promote public engagement activities; and develop an Interested Parties Database. In addition, Section 10725.2(b) of the California Water Code states that each GSA must "provide notice of the proposed adoption of the groundwater sustainability plan on its Internet Web site and provide for electronic notice to any person who requests electronic notification."

A website for the ECC Subbasin has been developed by Contra Costa Water District (https://www.eccc-irwm.org/sgma/sgma-news-meetings/). This website will serve as the centralized location for SGMA information within the Subbasin. The GSAs should develop a procedure for maintaining, updating, and sharing the costs associated with the centralized websites. Central points of contact for information about the individual GSAs and the GSP process should be identified on the website. Related to the GSP process the group could designate on knowledgeable individual that could route any requests for information as appropriate.

Those GSAs with their own SGMA webpages link to and from the centralized SGMA websites and some provide their own customized information. For those GSAs without their own website, courtesy pages will be provided as an added feature of the central sites. The courtesy pages will all use a single template with the same information to facilitate easy management and updates. Individual GSAs choosing to take advantage of the courtesy pages will be responsible for ensuring that information is current. The page should include a "Last Updated" box to indicate the timeliness of the information.

Basic features of the website should include the following:

- Background information, including map of the Subbasin
- Information on how stakeholders or interested members of the public can get involved
- Method to enroll on the Interested Parties Database
- Public meeting notices and summaries
- Informational materials, including a separate link for Spanish (or other secondary language) materials
- Frequently asked questions
- Links to GSA webpages
- Contact information (name, email, phone) for each GSA point of contact

Should a GSA decide to not participate in the central website, a similar website structure could be utilized for the individual GSA.

### 7.2.2 Meeting Calendar

A shared meeting calendar on the GSP website will provide a one-stop shop for stakeholders and assist in preventing meeting conflicts while creating more potential for shared activities. This calendar should include current and scheduled meetings and workshops, as well as serve as the repository for agendas and meeting summaries, along with copies of meeting materials and presentation slides. An integrated project calendar should also be developed that links planning project milestones with communications milestones. The meeting calendar should be incorporated as part of the centralized GSA websites.

### 7.2.3 Outreach Materials

The GSAs should collaboratively develop a suite of Subbasin-level outreach materials. These outreach materials should have a single look and feel to create ongoing consistency and visual recognition by stakeholders. Template materials may be refined or modified by individual GSAs to be fit-for-purpose or incorporate specific GSA-level information, while maintaining the key messages. The use of templates, shared presentations, and flyers will create efficiencies and reinforce messaging across the Subbasin. Outreach materials should evolve over time as the GSP is completed, adopted, and implemented. Potential outreach materials are futher described below.

#### 7.2.3.1 Brochures and Fact Sheets

The purpose of these types of documents is to inform the public and stakeholders about a specific issue. Information in these materials should be kept at a high-level and avoid technical jargon, unless defined in the material itself. The materials should also include the address for the Subbasin website(s) and GSA or GSP contact information. The materials can be formatted or printed by each GSA, as needed. Template brochures or fact sheets may be developed to address Subbasin-level issues and incorporate key messages.

#### 7.2.3.2 Presentation Slides

Template presentation slides provide visual and text content to verbal presentations. The presentation slides should utilize the key messages and answer basic questions about SGMA and the Subbasin, including:

- What is SGMA?
- What and when are the major SGMA milestones?
- What is a GSA?
- Who/where are the GSAs in the Subbasin?
- What is a GSP?
- What is timeline for developing the East Contra Costa Subbasin GSP?
- How can stakeholders and interested members of the public stay involved?
- Template presentation slides should be primarily visual with accompanying talking points or notes and avoid technical jargon, unless defined in the presentation. Presentation slides may be posted on the centralized or individual GSA websites to inform stakeholders unable to attend public meetings or workshops.

#### 7.2.3.3 Utility Bill Inserts

Many GSA members are or serve as utilities that deliver monthly billing statements to customers. These monthly mailings often have space available to insert additional documents at little or no cost to the GSA (if the utility bill's total weight does not exceed the base rate for first class U.S. Mail). Utility bill inserts are often a single-sheet of paper cut to fit a standard #10 envelope without folding. GSAs in the Subbasin may utilize inserts as needed to inform their customers about upcoming public meetings and workshops, GSP public comment and adoption proceedings, and other SGMA activities.

#### 7.2.3.4 Other Outreach Materials

Other SGMA outreach materials may include, but are not limited to, the following:

- Fliers
- Letterhead
- Comment Cards
- Sign-in Sheets

### 7.2.4 Interested Parties Database

SGMA requires each GSA to establish and maintain an Interested Party Database. Section 10723.4 of the California Water Code states that any person may request, in writing, to be placed on a list to receive notices regarding GSP preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents. In addition, each GSP must include a description of interested parties within the Subbasin.

The GSP has established an Interested Parties Database (**Appendix C**) for use by all the GSAs. This shared approach provides efficiencies given the number of shared stakeholders and need for consistent communications within the subbasin. GSAs should also develop a process for new stakeholders to add themselves to the database. A separate procedure has also been added to tailor the list specific to a particular GSA if an issue or topic only affects a subset of the subbasin. Interested Parties may self-select to be added to the database through an electronic form located on the GSA or Subbasin SGMA website, or enroll through written request to their GSA. The Interested Parties Database should seek to fully include beneficial users, consistent with California Water Code Section 10723.2 (see Subsection 2.1.1). Interested Parties Databases should be continually updated throughout GSP development and implementation.

GSAs within the Subbasin should utilize their own standard mailing lists for publicly noticed meetings and use the Interested Parties Database as the email and mailing list for sending out notices regarding GSA and GSP related meetings, workshops, and other activities. In addition, newsletters or other information regarding GSP milestones should be distributed using the Database. Contra Costa County has developed a centralized email address [groundwaterinfo@dcd.cccounty.us] that will be used for distributing information and receiving comments.

### 7.2.5 Outreach Venues Database

In addition to conducting targeted outreach to beneficial users, GSA should seek to leverage the activities of existing community groups to conduct broader outreach related to SGMA and GSP development. An initial list of outreach venues has been identified by the GSAs and is provided in Section 4.1. GSAs should expand upon this list and maintain a database of existing civic, non-profit, and other community organizations in the Subbasin. This may include:

- Local chambers of commerce
- Service clubs (e.g. Rotary Club, Lions Club)
- Industry associations (e.g. Industrial Association of Contra Costa County, Local Building Industry Association chapters)
- Community fairs or farmers markets
- Gatherings of elected officials

This Outreach Venues Database should identify the organization name, organization type, typical meeting schedule, and contact information of each potential venue. Each group or organization will require a different level of involvement, depending on the group's interest in and nexus to groundwater management. The Outreach Venues Database may be used to inform stakeholders, receive feedback on GSP development and implementation, or seek collaboration on addressing existing or emerging issues.

### 7.2.6 Outreach Documentation

Pursuant to Section 354.10 of the California Water Code, the GSP must include a list of public meetings public meetings at which the GSP was discussed or considered by the GSA. In addition, the GSP must describes the GSA(s)' processes for encouraging the involvement of a diverse elements within the subbasin; and identify opportunities for public engagement in the GSA formation, GSP development, and GSP implementation processes.

GSAs should maintain a record of all outreach activities related to SGMA. For this GSP, GSAs will provide documentation on a quarterly basis to the technical consultants for incorporation into a master file.  This topic should be included as a standing agenda item on the regularly scheduled meetings of the GSP coordination group. The record should document all outreach activities conducted to all stakeholder audiences including, but not limited to:

- Presentations to GSA Boards, city councils, boards of supervisors, or other elected bodies
- Presentations to stakeholder or community groups or associations
- Presentations at any meeting open to members of the public
- Public workshops
- Newsletters or other regular methods of communications
- Distribution of informational materials, including bill inserts
- Media alerts, op-eds, or newspaper postings

The information in the outreach record should be used to conduct follow-up with stakeholders and as documentation as part of the GSP. The record should include the date, time, audience, and attendance of each activity. The record may also include a list of upcoming outreach and local and regional media contacts. GSAs should develop a process for updating the record and consolidating the outreach records for inclusion in the GSP.

## 7.3 OUTREACH TACTICS

GSAs in the Subbasin should conduct a variety of public outreach activities to inform, engage, and respond to stakeholders and other interested parties during GSP development, adoption, and implementation. These activities function to inform stakeholders about SGMA and the GSP, collect information important to groundwater sustainability planning, and receive feedback on the GSP or other public documents.

Regular communication with stakeholders and the public will be a key component to the successful adoption and implementation of the GSP. Some outreach activities identified in this section should be timed with GSP development milestones, while others should be conducted on regular or semi-regular basis. GSAs in the Subbasin should collaboratively develop a stakeholder communications and outreach calendar in association with the overall planning schedule.

Outreach tools identified in Section 6.2 should be used promote, conduct, and track implementation of the tactics identified in this section. As described in Subsection 7.2.8, all outreach activities described in this section should be documented.

### 7.3.1 Communications Workbook

A separate East Contra Costa Subbasin Communications Workbook (**Appendix D**) provides lists of required activities for each GSA. The workbook will also assist in document outreach activities.

### 7.3.2 Outreach Survey

A survey to all interested parties was distributed in November-December 2018. The purpose of the survey was two-fold, first to provide some basic GSP education and second to receive input from the interested parties on any topics or concerns for inclusion in the GSP deliberations. The questions were framed to facilitate input on GSP topics. While limited, input provided during the survey was useful.

### 7.3.3 GSA Board Meetings and Workshops

GSA board meetings are the forum where key GSA decisions are presented, discussed, and decided. Presentations at GSA Board meetings also provide an opportunity to engage with the public and stakeholders in the decision-making process for development of the GSP. GSA representatives should verify with their legal counsel whether their GSA board's meetings are subject to the Brown Act and may be conducted with existing meetings for that agency's board or elected body (e.g. city council, board of supervisors, board of directors). The GSP Coordination Group members should provide regular updates to their GSA boards regarding the status of GSP development and public outreach activities. These representatives should assess their Board's level of knowledge regarding groundwater topics early in GSP development process and assess the need for a "groundwater 101" type workshop.

### 7.3.4 Public and Stakeholder Workshops

In support of GSP development, GSAs may host workshops to present technical findings, exchange information with stakeholders, and solicit public and stakeholder feedback on the public draft GSP or other public documents. Workshops may be planned and implemented by individuals GSAs or coordinated as a Subbasin-wide activity. Coordinated workshops will be planned at GSP Coordination Group meetings.

At this time, it anticipated that individual Boards will have publicly noticed workshop items as part of their regular Board meeting agendas. The workshops will be primarily informational, with the purpose of informing stakeholder and members of public about the basics of SGMA and the GSP development process. Further opportunities for stakeholders to get involved should be identified at that time.

The GSAs should hold additional workshops throughout the GSP planning process to inform stakeholders about and receive feedback on key GSP topics. The timing of these workshops should be aligned with key milestones as identified in the project schedule.

### 7.3.5 Speaking Engagements

Efforts should be made to conduct outreach at events or meetings that already occur (e.g. Farm Bureau meetings, Rotary Club, etc.). The purpose of these presentations is to build and maintain awareness about SGMA and the GSP, encourage participation at public GSP development workshops, and encourage enrollment in the Interested Parties Databases.

The GSAs should develop a list of knowledgeable presenters in the event that an organization or other entity would like a presentation. Branded outreach materials, such as template presentation slides and handouts, should be readily available for these presenters. The initial round of presentations should focus on increasing awareness of SGMA and expanding the Interested Parties Database.

Speaker engagements should be recorded in the overall outreach record and reported at Coordination Group meetings.

### 7.3.6 Existing Outreach Venues

GSAs should fully leverage the activities of existing groups. A list of potential presentation venues is provided in Section 4.1. This list should be developed into a full Outreach Venues Database, described in Subsection 7.2.7. This database should be referenced when there is a need to deploy information. GSAs may conduct informal outreach with the leaders of such groups to determine the best way to interact. GSAs should also determine what communications channels these groups are using and equally leverage these. For example, GSAs may place articles or event postings in group newsletters at little or no charge.

### 7.3.7 Press Releases and Guest Editorials

At some point in the GSP development and implementation process, it is likely that stakeholders will be asked to make changes and/or financially support a sustainability effort. It will be more productive for the GSAs and their GSP collaboration partners to frame discussions about these changes than to have others, perhaps with less knowledge, do so on their behalf. For that reason, there is a need for press releases and/or guest editorials to offer the media and stakeholders accurate information offered in the context of SGMA. This type of outreach should be closely coordinated as consistency in messages is critical to stakeholder acceptance.

GSAs may also use press releases, guest editorials, or media alerts to draw media attention to a significant events or GSP milestones. For example, GSAs may use this tactic to promote a public meeting or workshop or alert stakeholders about release of the public draft GSP.

## 7.4 ITEMS FOR FUTURE CONSIDERATION

This Communications Plan outlines an outreach effort based on project and stakeholder needs and preferences. This document has been prepared as a working draft, living document and should be updated as new information and the GSP development process needs are developed..

# 8.0 GSP ADOPTION

Adoption of a GSA is governed by California Water Code Section 10728.4 and provides the following requirements:

A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing, held at least 90 days after providing notice to a city or county within the area of the proposed plan or amendment. The groundwater sustainability agency shall review and consider comments from any city or county that receives notice pursuant to this section and shall consult with a city or county that requests consultation within 30 days of receipt of the notice. Nothing in this section is intended to preclude an agency and a city or county from otherwise consulting or commenting regarding the adoption or amendment of a plan.

Potential outreach tactics and key milestones during the GSP adoption phase are described below. These tactics and milestones should be identified early in the GSP development process and included as part of the GSP planning schedule.

## 8.1 GSP ADOPTION PROCEEDINGS

### 8.1.1 Media Relations, Email, and Social Media

The GSAs should notify the public and stakeholders of availability of the Public Draft GSP via email or print notices, (if already used by a GSA) social media posts, and other communication channels established during the GSP development process. At a minimum, beneficial users and individuals on the Interested Parties Database should be notified.

The GSAs may also issue a news release or media advisory in advance of and during the public comment period to alert the public and stakeholders to the availability of the Public Draft GSP.

### 8.1.2 Public Comment Process

Pursuant to California Code of Regulations Section 354.10, the GSP must include a summary of comments regarding the GSP, as well as a summary of any responses to those comments by the GSA. The GSAs in the Subbasin should establish a procedure for receiving and responding to comments on the GSP. This may include a public hearing and/or a formal or informal public comment and response period. Public comments and responses to comments on the GSP should be documented and included either directly in or as an attachment or appendix to the plan. The format for the public comment and response process should be adapted to the type and needs of the stakeholders and best use of available GSA resources.

Following the public comment process, the GSAs may hold a series of briefings with GSA boards to present the proposed GSP, describe the development and stakeholder engagement process, and provide an overview of public comments. The GSAs should also establish a collaborative process for addressing stakeholder comments on the GSP.

### 8.1.3 Newspaper Advertisements

Pursuant to Government Code Section 6066, the GSAs must publish two newspaper advertisements at least five days apart, 14 days prior to a public hearing to adopt the GSP.

### 8.1.4 Public Hearing to Adopt

Pursuant to California Water Code Section 10728.4, adoption of the final GSP must occur after a public hearing. This hearing must be preceded by newspaper advertisements pursuant to Government Code Section 6066 and, if required, notification to the California Public Utilities Commission pursuant to California Water Code Section 10727.8(a).

## 8.2 POST ADOPTION PROCEEDINGS

Following submission of the GSP to State, DWR will hold a 60-day public comment period (California Water Code Section 10733.4(c)) for the public, stakeholders and other interested parties on submitted plans. Comments submitted to the State assist in the DWR evaluation of the submitted GSPs and are relayed to the submitting agency for their reference.

# 9.0 MEASUREMENTS & EVALUATIONS

A guiding principle for evaluation and measurement of the Communications Plan's success is to provide regular, unbiased reporting of progress toward achieving goals. Success may be evaluated in several ways, including process measures, outcome measures, and an annual evaluation of accomplishments. Optional evaluation measures are described below.

## 9.1 PROCESS MEASURES

Process measures track progress toward meeting the goals of the Communications Plan. These include:

- Level of attendance/ participation in outreach activities
- Shared understanding of the overarching aims, activities, and opportunities presented by different planning approaches and project activities
- Productive dialogue among participants at meetings and events
- Sense of authentic engagement; people understand why they have been asked to participate, and feel that they can contribute meaningfully
- Timely and accurate public reporting of planning milestones
- Feedback from Coordinating Body and GSA members, regulators, stakeholders, and interested parties about the quality and availability of information materials
- Level of stakeholder interest in the GSP development process information

## 9.2 OUTCOME MEASURES

Outcome measures track the level of success of the Communications Plan in meeting its overall goals. Some outcome measures considered for the GSP development process include the following:

- Consistent participation by key stakeholders and interested parties in essential activities
- Participants have no difficulty locating the meetings, and are informed as to when and where they will be held
- Responses from meeting participants that the engagement methods provided for a fair and balanced exchange of information
- Feedback from interested parties that they understand how their input is used, where to track data, and what results to expect
- The project receives quality media coverage that is accurate, complete and fair

# 10.0 COMMUNICATION GOVERNANCE

Given the relatively large number of stakeholders and the legal requirements for outreach, some form of coordination and communications governance is recommended.

Execution of communications activities can be accomplished by an individual or multiple individuals, and/or include or be solely managed by project consultants. The actual form of the governance is less important than a clear understanding of the roles and responsibilities of those responsible for ensuring required communication. Also essential is a clear chain of command that ensures the elected representatives of GSAs are able to retain communications leadership and guidance.

A driving consideration for establishing a communications governance structure is the level of effort associated with required activities and the fact that communications are highly time dependent. That means that communications activities should be occurring that may happen outside of regularly scheduled GSA meetings. In this case delegation with guidance to a communications team is efficient and effective.

## 10.1 ROLES AND RESPONSIBILITIES

This GSP development Communications Plan outlines numerous strategies, activities and tactics. While none are highly complex, there is a requirement for coordination and clarity regarding who will be responsible for executing the tasks.

A description of the initial key roles and responsibilities is provided below:

Responsible

Those who do the work to achieve the task. There is at least one person with a role of *responsible*, although others can be delegated to assist in the work required.

Accountable (also approver or final approving authority)

This is the person ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those responsible. There *may only* be only one *accountable* specified for each task or deliverable.

Consulted

Those whose opinions are sought, typically subject matter experts were people that are impacted by the activity; and with whom there is two-way communication.

Informed

Those who are kept up-to-date on progress, typically on the launch and completion of the task or deliverable. This is one-way communication.

Role Distinction

There is a distinction between a role and the individual assigned the task. Role is a descriptor of an associated set of tasks that could be performed by just one or many people. In the case of the RACI Chart, the team may list as many people as is logical except for the Accountable role.

### 10.1.1 Initial Roles

Initial communication roles (**Table 6**) have been identified as follows.

**Table 6**. Initial Communication Roles

| Task | Roles & Responsibilities | Timeframe |
|---|---|---|
| GSP Fiscal Agent and Manager | Accountable - City of Brentwood. GSAs responsible for providing necessary materials & input | All Project Phases |
| Preparation of Information sheets, flyers and other project related Information | Consultant team responsible for preparation with review and approval by GSA representatives | All Project Phases |
| Website | Site maintained by Contra Costa Water District. GSAs and consultants provide approved content to the site. | All Project Phases |
| Maintenance of Interested Parties List | Consultant maintains list. GSAs and consultants provide approved additions for the list. | All Project Phases |
| *Planning Outreach meetings to discuss SGMA and expand Interested Parties list* | Who?) organizes outreach meetings calendar with leaders of existing groups. Notification is sent by via email (CCC) and if no email DWD sends cards. Consultant provides technical support. GSAs provide assistance with list. Meeting documentation sent back to consultant to record. | All Project Phases |
| *List of presenters* | Who? to prepare and organize presenters if an | All Project Phases |

| Task | Roles & Responsibilities | Timeframe |
| --- | --- | --- |
| | entity would like a presentation | |
| *Social Media??* | Any GSA with Social Media presence will post GSP notices. | |
| *DAC and EDA outreach* | | |
| *Public workshops* | | |
| *Press releases and guest editorials* | | |
| *Utility bill insert timing and content* | | |

# 11.0 LIST OF APPENDICES

**Appendix A. – Project Schedule**
**Appendix B. Public Outreach Requirements under SGMA**
**Appendix C. – Interested Parties List**

# Appendix A. PROJECT SCHEDULE

Project Plans Incorporate outreach based on Legal meeting requirements and mindful of key decision points that require stakeholder input.

| Grant Agreement Component | New Task No. for Kelly/City | | Task from ECCC Prop 1 GSP Work Plan | Solano Subbasin GSP TOC (Cross Reference to | 2018 | 2019 | | | | 2020 | | | | 2021 | | | | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4th Qtr | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Jan |
| | | 10 | Outreach and Communication | | | | | | | | | | | | | | | |
| 2(a) | 10.1 | 3.6 | Notice and Communication<br>Post notifications on Subbasin website. Deliverables: Sept. 2018 website; Oct 2018 O&C Plan; Nov stakeholder contacts; a list of planned public meetings; GSP Outline posted on website. presentation handouts, a digital version of the presentation slides, the agenda, and meeting summaries<br>**1 Meeting:** Project kickoff and GSP Development Process Meeting-March/Ap 2019 after BBMR finalization. | | x x x | x | | | | | | | | | | | | |
| | 10.2 | 4.5 | Outreach Component (**3 potential meetings**): 1) Data Collection (Data Gaps and Management) and request for data from stakeholders 2) Review Data Sufficiency and Potential Management Areas; 3) HCM, Groundwater Conditions, and Preliminary Water budget and how subbasin could be managed to achieve sustainability. Meeting materials (including presentation slides, meeting agendas, handouts, etc.) | | | | 1st | 2nd and 3rd? | | | | | | | | | | |
| | 10.3 | 5.5 | Outreach Component (1 Meeting 5/2020) Discussing Sustainability elements for the Subbasin and/or Management Areas. Present initial sustainability goals, measurable objectives, minimum thresholds, undesirable results, and any revisions to the water budget for stakeholders and the public to deliberate and provide feedback.<br>**Deliverable:** presentation slides, meeting agenda, handouts, etc.) | | | | | | | | x | | | | | | | |
| | 10.4 | 6.6 | Outreach Component (Publication of Monitoring Network and representative monitoring sites) via agency website | | | | | | x | | | | | | | | | |
| | 10.5 | 7.5 | Outreach Component (**1 Meeting [9/2020], 3 Conference calls**): Meeting to discuss GSP Projects and Management Actions to Achieve Sustainability Goals. Projects/management actions that optimize the benefits for long-term sustainability will be selected. | | | | | | | | x | x x x | | | | | | |
| | 10.6 | 8.6 | Outreach Component (**1 Meeting, 11/2020**) Held by GSA and open to the public. Solicits public engagement and provide platform for discussion on how GSP is implemented and how this will lead to sustainability.<br>**Deliverable:** Meeting materials (including presentation slides, meeting agenda, handouts, etc.) | | | | | | | | | | x | | | | | |
| | 10.7 | 9.5 | Outreach Component (**2 Meetings**)<br>1. Draft GSP Workshop/Presentation (see Task 9.3 above),<br>2. Present Final GSP (see Task 9.4 above). Followed by Adoption by City of Brentwood. (Need to confirm how long it takes for City Council to have document before it can be adopted, then back up schedule from there) | | | | | | | | | | | | 1 | 2 | Adoption by City and GSAs. Final GSP Adopted by City submitted to DWR by Jan. 31, 2022. | |

# Appendix B. Public Outreach Requirements under SGMA

## GSP Regulations

| California Code of Regulations Section | Public Outreach Requirement |
|---|---|
| **§ 353.6. Initial Notification**<br>(a) Each Agency shall notify the Department, in writing, prior to initiating development of a Plan. The notification shall provide general information about the Agency's process for developing the Plan, including the manner in which interested parties may contact the Agency and participate in the development and implementation of the Plan. The Agency shall make the information publicly available by posting relevant information on the Agency's website. | 1. Statement of how interested parties may contact the Agency and participate in development and implementation of the plan submitted to DWR.<br>2. Web posting of same information.<br><br>**Timing**: *Prior to initiating development of a plan.* |
| **§ 353.8. Comments**<br>(a) Any person may provide comments to the Department regarding a proposed or adopted Plan.<br>(b) Pursuant to Water Code Section 10733.4, the Department shall establish a comment period of no less than 60 days for an adopted Plan that has been accepted by the Department for evaluation pursuant to Section 355.2.<br>(c) In addition to the comment period required by Water Code Section 10733.4, the Department shall accept comments on an Agency's decision to develop a Plan as described in Section 353.6, including comments on elements of a proposed Plan under consideration by the Agency. | 1. 60-day comment period for plans under submission to DWR. Comments will be used to evaluate the submission.<br>2. Parties may also comment on a GSA's (or GSAs') statements submitted under section 353.6<br><br>**Timing**: For GSP Submittal - *60 days after submission to DWR* |
| **§ 354.10. Notice and Communication**<br>Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:<br>(a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.<br>(b) A list of public meetings at which the Plan was discussed or considered by the Agency.<br>(c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.<br>(d) A communication section of the Plan that includes the following: | 1. Statements of issues and interests of beneficial users of basin groundwater, including types of parties representing the interests and consultation process<br>2. Lists of public meetings<br>3. Inventory of comments and summary of responses<br>4. Communication section in plan that includes:<br>• Agency decision making process<br>• ID of public engagement opportunities and response process<br>• Description of process for inclusion<br>• Method for public information related to progress in implementing the plan (status, projects, actions)<br><br>**Timing**: For GSP Submittal – *with plan*<br>For GSP Development – *continuous. [Note: activities should be included in the project schedule and information posted on web.]* |

| California Code of Regulations Section | Public Outreach Requirement |
|---|---|
| (1) An explanation of the Agency's decision-making process.<br>(2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.<br>(3) A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.<br>(4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions. | |
| **§ 355.2. (c) Department Review of Adopted Plan**<br>(c) The Department (DWR) shall establish a period of no less than 60 days to receive public comments on the adopted Plan, as described in Section 353.8. | 1. 60-day public review period for public comment on submitted plan.<br><br>**Timing**: After GSP Submittal to DWR – *60 days* |
| **§ 355.4. & 355.10 Criteria for Plan Evaluation**<br>The basin shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act. The Department shall evaluate an adopted Plan for compliance with this requirement as follows:<br>(b) (4) Whether the interests of the beneficial uses and users of groundwater in the basin, and the land uses and property interests potentially affected by the use of groundwater in the basin, have been considered.<br>…<br>(10) Whether the Agency has adequately responded to comments that raise credible technical or policy issues with the Plan. | 1. Required public outreach and stakeholder information is submitted, including statement of issues and interests of beneficial users.<br>2. Public and stakeholder comments and questions adequately addressed during planning process.<br><br>**Timing**: For GSP Submittal – *with plan*<br>For resubmittal related to corrective action – *with submittal* |

## California Water Code

| California Water Code Section | Public Outreach Requirement |
|---|---|
| **10720. This part shall be known, and may be cited, as the "Sustainable Groundwater Management Act."**<br><br>**10720.3**<br>(a) This part applies to all groundwater basins in the state.<br>…<br>(c) The federal government or any federally recognized Indian tribe, appreciating the shared interest in assuring the sustainability of groundwater resources, may voluntarily agree to participate in the preparation or administration of a groundwater sustainability plan or groundwater management plan under this part through a joint powers authority or other agreement with local agencies in the basin. A participating tribe shall be eligible to participate fully in planning, financing, and management under this part, including eligibility for grants and technical assistance, if any exercise of regulatory authority, enforcement, or imposition and collection of fees is pursuant to the tribe's independent authority and not pursuant to authority granted to a groundwater sustainability agency under this part. | 1. Tribes and the federal government may voluntarily participate in GSA governance and GSP development.<br><br>**Timing**: *Prior to initiating development of a plan.* |
| **CHAPTER 4. Establishing Groundwater Sustainability Agencies [10723 - 10724]** | |
| **10723.**<br>a) Except as provided in subdivision (c), any local agency or combination of local agencies overlying a groundwater basin may decide to become a groundwater sustainability agency for that basin.<br>(b) Before deciding to become a groundwater sustainability agency, and after publication of notice pursuant to Section 6066 of the Government Code, the local agency or agencies shall hold a public hearing in the county or counties overlying the basin. | 1. Must hold public hearing in the county or counties overlying the basin, prior to becoming a GSA<br><br>**Timing**: *Prior to becoming a GSA.* |
| **10723.2**<br>The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. These interests include, but are not limited to, all of the following:<br>(a) Holders of overlying groundwater rights, including:<br>(1) Agricultural users.<br>(2) Domestic well owners.<br>(b) Municipal well operators.<br>(c) Public water systems.<br>(d) Local land use planning agencies. | 1. Must consider interest of all beneficial uses and users of groundwater.<br>2. Includes specific stakeholders as listed.<br><br>**Timing**: *During development of a GSP.* |

| California Water Code Section | Public Outreach Requirement |
|---|---|
| (e) Environmental users of groundwater.<br>(f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies.<br>(g) The federal government, including, but not limited to, the military and managers of federal lands.<br>(h) California Native American tribes.<br>(i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.<br>(j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency. | |
| **10723.4.**<br>The groundwater sustainability agency shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents. Any person may request, in writing, to be placed on the list of interested persons. | 1. Must establish and maintain an interested persons list.<br>2. Any person may ask to be added to the list<br><br>**Timing**: *On forming a GSA.* |
| **10723.8.**<br>(a) Within 30 days of deciding to become or form a groundwater sustainability agency, the local agency or combination of local agencies shall inform the department of its decision and its intent to undertake sustainable groundwater management. The notification shall include the following information, as applicable:<br>…<br>(4) A list of interested parties developed pursuant to Section 10723.2 and an explanation of how their interests will be considered in the development and operation of the groundwater sustainability agency and the development and implementation of the agency's sustainability plan. | 1. Creates notification requirements that include:<br>a. A list of interested parties<br>b. An explanation of how interests will be considered<br><br>**Timing**: *On forming a GSA & with submittal of GSP* |
| **10727.8**<br>(a) Prior to initiating the development of a groundwater sustainability plan, the groundwater sustainability agency shall make available to the public and the department a written statement describing the manner in which interested parties may participate in the development and implementation of the groundwater sustainability plan. The groundwater sustainability agency shall provide the written statement to the legislative body of any city, county, or city and county located | 1. Agencies preparing a GSP must prepare a written statement describing the manner in which interested parties may participate in its development and implementation.<br>2. Statement must be provided to:<br>a. Legislative body of any city and/or county within the geographic area of the plan<br>b. Public Utilities Commission if the geographic area includes a regulated public water system regulated by that Commission<br>c. DWR<br>d. Interested parties (see Section 10927) |

| California Water Code Section | Public Outreach Requirement |
|---|---|
| within the geographic area to be covered by the plan. The groundwater sustainability agency may appoint and consult with an advisory committee consisting of interested parties for the purposes of developing and implementing a groundwater sustainability plan. The groundwater sustainability agency shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin prior to and during the development and implementation of the groundwater sustainability plan. If the geographic area to be covered by the plan includes a public water system regulated by the Public Utilities Commission, the groundwater sustainability agency shall provide the written statement to the commission.<br>(b) For purposes of this section, interested parties include entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency. | e. The public<br>3. GSP entities may form an advisory committee for the GSP preparation and implementation.<br>4. The GSP entities are to encourage active involvement of diverse social, cultural and economic elements of the affected populations.<br><br>**Timing**: *On initiating GSP* |
| **10728.4 Public Notice of Proposed Adoption, GSP Adoption Pubic Hearing**<br>A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing, held at least 90 days after providing notice to a city or county within the area of the proposed plan or amendment. The groundwater sustainability agency shall review and consider comments from any city or county that receives notice pursuant to this section and shall consult with a city or county that requests consultation within 30 days of receipt of the notice. Nothing in this section is intended to preclude an agency and a city or county from otherwise consulting or commenting regarding the adoption or amendment of a plan. | 1. GSP must be adopted or amended at Public Hearing.<br>2. Prior to Public Hearing for adoption or amendment of the GSP, the GSP entities must:<br>a. Notify cities and/or counties of geographic area 90 days in advance.<br>b. Consider and review comments<br>c. Conduct consultation within 30 days of receipt with cities or counties so requesting |
| **10730 Fees.**<br>(a) A groundwater sustainability agency may impose fees, including, but not limited to, permit fees and fees on groundwater extraction or other regulated activity, to fund the costs of a groundwater sustainability program, including, but not limited to, preparation, adoption, and amendment of a groundwater sustainability plan, and investigations, inspections, compliance assistance, enforcement, and program administration, including a prudent reserve. A groundwater sustainability agency shall not impose a fee pursuant to this subdivision on a de minimis extractor unless | Related to GSAs<br>1. Public meeting required prior to adoption of, or increase to fees. Oral or written presentations may be made as part of the meeting.<br>2. Public notice shall include:<br>a. Time and place of meeting<br>b. General explanation of matter to be considered<br>c. Statement of availability for data required to initiate or amend such fees<br>d. Public posting on Agency Website and provision by mail to interested parties of supporting data (at least 20 days in advance) |

| California Water Code Section | Public Outreach Requirement |
|---|---|
| the agency has regulated the users pursuant to this part.<br>(b) (1) Prior to imposing or increasing a fee, a groundwater sustainability agency shall hold at least one public meeting, at which oral or written presentations may be made as part of the meeting.<br>(2) Notice of the time and place of the meeting shall include a general explanation of the matter to be considered and a statement that the data required by this section is available. The notice shall be provided by publication pursuant to Section 6066 of the Government Code, by posting notice on the Internet Web site of the groundwater sustainability agency, and by mail to any interested party who files a written request with the agency for mailed notice of the meeting on new or increased fees. A written request for mailed notices shall be valid for one year from the date that the request is made and may be renewed by making a written request on or before April 1 of each year.<br>(3) At least 20 days prior to the meeting, the groundwater sustainability agency shall make available to the public data upon which the proposed fee is based.<br>(c) Any action by a groundwater sustainability agency to impose or increase a fee shall be taken only by ordinance or resolution.<br>(d) (1) As an alternative method for the collection of fees imposed pursuant to this section, a groundwater sustainability agency may adopt a resolution requesting collection of the fees in the same manner as ordinary municipal ad valorem taxes.<br>(2) A resolution described in paragraph (1) shall be adopted and furnished to the county auditor-controller and board of supervisors on or before August 1 of each year that the alternative collection of the fees is being requested. The resolution shall include a list of parcels and the amount to be collected for each parcel.<br>(e) The power granted by this section is in addition to any powers a groundwater sustainability agency has under any other law. | 3. Mailing lists for interested parties are valid for 1 year from date of request and may be renewed by written request of the parties on or before April 1 of each year.<br>4. Includes procedural requirements per Government Code, Section 6066.<br><br>**Timing**: *Prior to adopting fees.* |

## California Government Code

| CODE | PUBLIC OUTREACH REQUIREMENT |
|---|---|
| **6060**<br>Whenever any law provides that publication of notice shall be made pursuant to a designated section of this article, such notice shall be published in a newspaper of general circulation for the period prescribed, the number of times, and in the manner provided in that section. As used in this article, “notice” includes official advertising, resolutions, orders, or other matter of any nature whatsoever that are required by law to be published in a newspaper of general circulation.<br><br>**6066**<br>Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day. | 1. Must publish notices in a newspaper of general circulation as prescribed.<br>2. Publication shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient.<br>3. The period of notice begins the first day of publication and terminates at the end of the fourteenth day, (which includes the first day.)<br><br>**Timing**: *Prior to adopting fees* |

# Appendix C. Interested Parties

## HOLDERS OF OVERLYING GROUNDWATER RIGHTS

(1) Agricultural Users

- Contra Costa County Farm Bureau
- East Contra Costa Irrigation District
- Contra Costa County Agricultural Commissioner
- Ron Nunn Farms
- RRS Farms
- Dwelley Farms
- Mr. Stuart
- Ron Nunn
- Eugene Mangini,
- Marian & Louis Mangini,
- Louis Volpone,
- David Roche,
- Pierina Maggiora,
- Reclamation Districts (RD)
  - RD 799 (Hotchkiss Tract)
  - RD 800 (Byron Tract)
  - RD 830 (Jersey Island)
  - RD 2024 (Orwood and Palm Tracts)
  - RD 2025 (Holland Tract)
  - RD 2026 (Webb Tract)
  - RD 2059 (Bradford Island)
  - RD 2065 (Veale Tract)
  - RD 2090 (Quimby Island)
  - RD 2117 (Coney Island)
  - RD 2121 (Bixler Tract)
  - RD 2137

***(2) Domestic Well Owners***

- Mr. Shatting
- Mr. Critchfield
- Mr. Rozenski
- Mr. Larson
- Mr. & Mrs. Driscoll
- MS. Lomax
- Mr. & Mrs. Boro
- Mr. & Mrs. Gil
- Gang Sun
- Ernest Rodriguez
- Ernest Dominguez
- Ronald Stinnette
- Frank Williams
- Luis Colmenares
- Walter Li
- Anna Rivera
- Elia Garcia
- Jose L. Cabada
- Thomas Trimble
- Sengchanh Panyachith
- Suzan M Ferrer
- Ron & Jean Tennison
- Arturo Martinez
- Susan Corrie
- Esthela Rodriguez
- L L G Group
- Josefina Torres
- Juan Rivera
- Agripina Valle
- Jennifer Vallis
- Jim & Cheryl Hammers
- Oscar Hernandez
- Jesus Campos
- Louden LLC
- Brian Stewart
- Tammi Van Alstyne
- Lela Peterson
- Harvest Time Assembly
- Lee Munoz
- Arcangel Camacho
- Profirio Medina
- Baymark Financial Inc
- Pat Vanden Broek
- Margarito Meza
- Eric Avalos
- Alicia Cruz
- Mario Sanchez Gonzale
- Esperanza Lopez
- Cinda Nagel
- Victor Chavez
- Tiana Flores
- Francisco Sanchez
- Mario Cabada
- Lone Tree Drive Inn
- Irma Gamez
- Wes Tilton
- Claire Keith

- Pedro Guitron
- Maria Aguayo
- Michael Mcpoland
- Randy Peterson
- Ian Robertson
- Kim Silva
- Delta Fence C/O Martin II
- Rodney L Kraber
- Francisca Sandoval
- Daniel Mendoza
- Salome Quintanilla
- Esperanza Magana
- Alice Bloodworth
- Michael W Driskill
- Christine Curiel
- Jim Price Heidolf Property
- Tim Bigelow
- Kristin Pipkins
- Darlene Gonzalez
- Marcial Cruz
- Gloria Mcgarath
- Annette Beckstrand
- Josefina Zesati

**(3) Municipal Well operators or Systems**

- City of Brentwood
- City of Oakley
- Discovery Bay Community Services District

**(4) Public Water Systems.**

- Aloha Club
- Anchor Marina SWS
- Angler's Ranch #3 - SWS
- Angler's Subdivision #4
- Bay Standard Water System
- Beacon West Water System
- Bethel Baptist Church -SWS
- Bethel Harbor
- Bethel Island Golf Course
- Bethel Island Mutual Water Co
- Bethel Market
- Bethel Missionary Baptist
- Big Oak Mobile Home Park Water
- Brentwood Creek Farm - Farm Land LP
- Bridgehead Cafe
- Byron Airport Water System
- Byron Corners Inc SWS
- Byron Inn Cafe Water System
- Byron United Methodist Church
- Camino Mobile Home Park
- Cecchini Water Service - Farm Land LP Delete
- Colonia Santa Maria
- Country Junction Deli
- Cruiser Haven Marina - SWS
- Delta Bar & Grill
- Delta Mutual Water Company
- Delta Sportsman
- Doc's Marina
- Dutch Slough Water Works
- EBRPD Round Valley Water Sys
- Excelsior Middle School
- Farrar Park Water System
- Flamingo Mobile Manor SWS
- Frank's Marina
- Gas N Save
- Holland Riverside Marina Water
- Knightsen Community Water Sys
- Knightsen Elementary School
- Lazy M Marina
- Lindquist Landing Marina SWS
- Lone Tree Medical & Dental SWS
- Mac's Old House
- Marin Food Specialties SWS
- Marina Mobile Manor SWS
- Neighborhood Church SWS
- New Life Marina
- Oakley Mutual Water Company
- Orin Allen Youth Rehab Facility
- Orwood Resort
- Pleasantimes Mutual Water Co
- Riverview Water Association
- Russo's Mobile Park
- Sandmound Mutual
- Sandy Point Mobile Home Park
- Sugar Barge Water System
- Sunset Harbor
- Tess' Farm Market
- Tugs Boat House Lounge
- Wahl Family Water System
- Willow Mobile Home Park - SWS
- Willow Park Marina - SWS
- Willowest Marina WS
- City Of Antioch
- City Of Brentwood

- Town of Discovery Bay
- Santiago Island Village
- Contra Costa Water District
- Diablo Water District

**(5) Local Land Use Planning Agencies.**

- Contra Costa County
- City of Oakley
- City of Antioch
- City of Brentwood

***(6) Environmental Users of Groundwater***

- East Bay Regional Park District, Big Break
- Dutch Slough Restoration Project
- Contra Costa Watershed Forum
- Contra Costa County Watershed Program (CWP)
- East Contra Costa Habitat Conservancy

***(7) Surface Water Users (if there is a hydrologic connection between surface and groundwater bodies)***

- City of Antioch
- Contra Costa Water District
- East Contra Costa Irrigation District
- Byron Bethany Irrigation District

***(8) The Federal Government (including, but not limited to, the military and managers of federal lands)***

- U.S. Bureau of Reclamation
- US Fish & Wildlife

***(9) California Native American Tribes***

- Wilton Rancheria Tribe
- Bay Miwok Tribe

***(10) Disadvantaged Communities***

All residents on Bethel Island*

***(11) Entities listed in Section 10927 (monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency).***

- Statewide Groundwater Elevation Monitoring (CASGEM) data with DWR for Eastern Contra Costa County.

**(12) Other:**

- Delta Diablo Sanitary District
- Iron House Sanitary District
- Knightsen Town Advisory Council

## Appendix D. East Contra Costa Subbasin Communication Plan Workbook

# East Contra Costa Subbasin Communication Plan Workbook

Contents

## 1. Mandated SGMA Outreach Activities

| Timeframe | Item |
|---|---|
| Prior to initiating plan development | Statement of how interested parties may contact the Agency and participate in development and implementation of the plan submitted to DWR.<br>Web posting of same information. |
| Prior to plan development | Must establish and maintain an interested persons list.<br>Must prepare a written statement describing the manner in which interested parties may participate in GSP development and implementation.<br><u>Statement must be provided to:</u><br>Legislative body of any city and/or county within the geographic area of the plan<br>Public Utilities Commission if the geographic area includes a regulated public water system regulated by that Commission<br>DWR<br>Interested parties (see Section 10927)<br>The public |
| Prior to and with GSP submission | Statements of issues and interests of beneficial users of basin groundwater, including types of parties representing the interests and consultation process<br>Lists of public meetings<br>Inventory of comments and summary of responses<br>Communication section in plan that includes:<br>Agency decision making process<br>Identification of public engagement opportunities and response process<br>Description of process for inclusion<br>Method for public information related to progress in implementing the plan (status, projects, actions) |
| 90 days prior to GSP Adoption Hearing | Prior to Public Hearing for adoption or amendment of the GSP, the GSP entities must notify cities and/or counties of geographic area 90 days in advance. |
| 90 days or less prior to GSP Adoption Hearing | Prior to Public Hearing for adoption or amendment of the GSP, the GSP entities must:<br>– Consider and review comments<br>– Conduct consultation within 30 days of receipt with cities or counties so requesting |
| GSP Adoption or Amendment | GSP must be adopted or amended at Public Hearing. |
| 60 days after plan submission | 60-day comment period for plans under submission to DWR. Comments will be used to evaluate the submission. |
| Prior to adoption of fees | Public meeting required prior to adoption of, or increase to fees. Oral or written presentations may be made as part of the meeting.<br>Public notice shall include:<br>Time and place of meeting<br>General explanation of matter to be considered<br>Statement of availability for data required to initiate or amend such fees<br>Public posting on Agency Website and provision by mail to interested parties of supporting data (at least 20 days in advance)<br>Mailing lists for interested parties are valid for 1 year from date of request and may be renewed by written request of the parties on or before April 1 of each year.<br>Includes procedural requirements per Government Code, Section 6066. |
| Prior to conducting a fee adoption hearing. | Must publish notices in a newspaper of general circulation as prescribed.<br>Publication shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient.<br>The period of notice begins the first day of publication and terminates at the end of the fourteenth day, (which includes the first day.) |

# GSP COMMUNICATIONS WORKBOOK

California Code of Regulations Section 354.10 states that each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties.

## GSP Submittal Requirements

Table 6. GSP Submittal Requirements3

| GSP Regulations Section | Requirement | Description | √ |
|---|---|---|---|
| **Article 5. Plan Contents, Sub-article 1. Administrative Information** | | | |
| 354.10 | Notice and Communication | • Description of beneficial uses and users | |
| | | • List of public meetings with dates | |
| | | • GSP comments and responses | |
| | | • Decision-making process | |
| | | • Public engagement process | |
| | | • Method(s) to encouraging active involvement | |
| | | • Steps to inform the public on GSP implementation progress | |

### 2. Beneficial Use

| | |
|---|---|
| Description of the beneficial use(s) | |
| Users of groundwater (as related to the beneficial activity) | |

### 3. Land Use and Property Interests

| | |
|---|---|
| Land uses and property interests potentially affected by the use of groundwater in the basin | |
| Types of parties representing those interests | |
| Nature of consultation with those parties. | |

### 4. Meeting Records

[3] Guidance Document for the Sustainable Management of Groundwater, Preparation Checklist for GSP Submittal, Department of Water Resources, December 2016

List of public meetings at which the Plan was discussed or considered by the Agency.

| DATE | LOCATION | CONVENER | TOPIC(S) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

### 5. GSP Plan Comments

| DATE | AGENCY | COMMENTER/ COMMENT | RESPONSE |
|---|---|---|---|
| | | | |
| | | | |

### 6. Communications Section

| | |
|---|---|
| Agency's decision-making process | |
| Identification of opportunities for public engagement | |
| How public input and response will be used | |
| How the Agency encourages the active involvement of diverse social, cultural and economic elements of the population | |
| Method the Agency follows to inform the public about progress | |
| Method the Agency follows to inform the public about implementation, including the status of projects and actions | |

## 7. GSP Checksheet

Following Is a summary of requirements for Groundwater Sustainability Plans (GSP) that focus on plan elements with some form of decision making or discretionary activity associated with that section of the plan. Thinking about the community and its interests, what types of questions need to be addressed for this section of the plan to be adequate? What, if any, minimum standards or best practices should be considered as this plan section is prepared?

| Technical and Reporting Standards | | | Issues, Interests, Needs, Options |
|---|---|---|---|
| Article 3. 352.2 | Monitoring Protocols | • Monitoring protocols adopted by the GSA for data collection and management<br>• Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin | |

| Administrative Information | | | Issues, Interests, Needs, Options |
|---|---|---|---|
| Article 5. 354.8(f) 10727.2(g) | Land Use Elements or Topic Categories of Applicable General Plans | • Summary of general plans and other land use plans<br>• Description of how implementation of the GSP may change water demands or affect achievement of sustainability and how the GSP addresses those effects<br>• Description of how implementation of the GSP may affect the water supply assumptions of relevant land use plans<br>• Information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management | |

| Administrative Information | | | Issues, Interests, Needs, Options |
|---|---|---|---|
| 354.14 | Hydrogeologic Conceptual Model | • Selection/Description of the Hydrogeologic Conceptual Model | |
| 354.18<br><br>10727.2(a)(3) | Water Budget Information | • Description of inflows, outflows, and change in storage<br>• Quantification of overdraft<br>• Estimate of sustainable yield<br>• Quantification of current, historical, and projected water budgets | |
| 354.24 | Sustainability Goal | • Description of the sustainability goal | |
| 354.28<br><br>10727.2(d)(1)<br>10727.2(d)(2) | Minimum Thresholds | • Description of each minimum threshold and how they were established for each sustainability indicator<br>• Relationship for each sustainability indicator<br>• Description of how selection of the minimum threshold may affect beneficial uses and users of groundwater<br>• Standards related to sustainability indicators<br>• How each minimum threshold will be quantitatively measured | |
| 354.44 | Projects and Management Actions | • Description of projects and management actions that will help achieve the basin's sustainability goal<br>• Measurable objective that is expected to benefit from each project and management action<br>• Circumstances for implementation<br>• Public noticing<br>• Permitting and regulatory process<br>• Time-table for initiation and completion, and the accrual of expected benefits<br>• Expected benefits and how they will be evaluated<br>• • Management of groundwater extractions and recharge | |
| 354.44(b)(2)<br><br>10727.2(d)(3 | | • Overdraft mitigation projects and management actions | |

The GSP also includes additional planning elements involving descriptions of existing conditions, features, activities and jurisdictional topics. Those sections are based on existing factual information and should be reviewed for tone, approach, accuracy, and completeness.

Thinking about the GSP planning requirements that involve descriptions of existing conditions, features, activities and jurisdictional topics what issues, interests, needs and/or options would you and/or your community like considered in the planning process?

| **Administrative Information** | | | **Issues, Interests, Needs, Options** |
|---|---|---|---|
| 354.10 | Notice and Communication | • Description of beneficial uses and users<br>• List of public meetings<br>• GSP comments and responses<br>• Decision-making process<br>• Public engagement<br>• Encouraging active involvement<br>• Informing the public on GSP implementation progress | |
| 354.20 | Management Areas | Reason for creation of each management area<br>• Minimum thresholds and measurable objectives for each management area<br>• Level of monitoring and analysis<br>• Explanation of how management of management areas will not cause undesirable results outside the management area<br>• Description of management areas | Note (may not apply) |
| 354.26 | Undesirable Results | • Description of undesirable results<br>• Cause of groundwater conditions that would lead to undesirable results<br>• Criteria used to define undesirable results for each sustainability indicator<br>• Potential effects of undesirable results on beneficial uses and users of groundwater | |
| 10727.2(d)(5) | Surface Water Supply | • Description of surface water supply used or available for use for groundwater recharge or in-lieu use | |

## 8. Legally required GSA /GSP Web Posting Requirements

| GSP Code Section | Item to be Posted | Responsible | Timing | √ |
|---|---|---|---|---|
| § 353.6. Initial Notification | 1. General information about the Agency's process for developing the Plan<br>2. Manner in which interested parties may contact the Agency<br>3. How parties may participate in the development and implementation of the Plan | GSP developing agencies | Prior to initiating plan development | |
| **Water Code Section** | **Item to be Posted** | **Responsible** | **Timing** | **√** |
| §10725.2(c) | 1. In addition to any other applicable procedural requirements, provide notice of the proposed adoption of the groundwater sustainability plan and provide for electronic notice to any person who requests electronic notification. | GSA | Prior to adoption | |
| § 10730 Fees | 1. Notice of the time and place of meetings involving imposition or increasing of fees<br>2. General explanation of the matter to be considered<br>3. Statement that the data required by this section is available and the method by which to acquire it. | Agency imposing or increasing fees | Prior to imposing or increasing a fee | |
| **Government Code Section** | **Item to be Posted** | **Responsible** | **Timing** | **√** |
| § 54954.2 Agendas | 1. Post Meeting Agenda<br>*Requirements*<br>a. Direct link must be standalone and cannot only be part of a "contextual" menu which would require users to search for the link on the website - If a direct link is provided, then a second | Any local agency subject to Brown Act *(Note – only applies to agencies with a website; however, under SGMA* | After January 1, 2019<br>72 hours in Advance of a Regular Meeting | |

| | | | | |
|---|---|---|---|---|
| | link can be provided in a contextual menu.<br>b. If an agency uses an integrated agenda management platform that is specifically for posting board agenda meetings, then the agency does not have to comply with this requirement if:<br>i. the agency posts a direct link to the platform which contains the agency agenda on its primary website;<br>ii. the current agenda is the first available at the top of the platform; and<br>iii. the agency complies with specific open format requirements.<br>c. Agenda must be in a format that is retrievable, downloadable, index able, and electronically searchable by commonly used Internet search applications.<br>d. Must be platform independent, machine readable, and in a form that is available free of charge to the public so that they may reuse or redistribute the agenda. (For example - PDF) | *the GSP agencies are required to have a website.)* | | |

**Other - Optional**

| Government Code Section | Item to be Posted | Responsible | Timing | √ |
|---|---|---|---|---|
| § 6253 Public Records Request | 1. Allows for agencies to post documents subject to a Public Records Act request on the web and for the web location to be given as a reference in lieu of the document. frequently requested documents | | | |

| | | | | |
|---|---|---|---|---|
| | a. Provides an exception for individual requestors without internet access | | | |

## California Government Code Requirements - Newspapers

| CODE | PUBLIC OUTREACH REQUIREMENT | √ |
|---|---|---|
| **6060**<br>Whenever any law provides that publication of notice shall be made pursuant to a designated section of this article, such notice shall be published in a newspaper of general circulation for the period prescribed, the number of times, and in the manner provided in that section. As used in this article, "notice" includes official advertising, resolutions, orders, or other matter of any nature whatsoever that are required by law to be published in a newspaper of general circulation.<br><br>**6066**<br>Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day. | 4. Must publish notices in a newspaper of general circulation as prescribed.<br>5. Publication shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient.<br>6. The period of notice begins the first day of publication and terminates at the end of the fourteenth day, (which includes the first day.)<br><br>**Timing**: *Prior to adopting fees* | |

### 9. Outreach Venues

GSA representatives have identified a list of potential outreach venues in the Subbasin, shown in **Table 2**

Table 7. Potential Outreach Venues in the Tracy Subbasin

| Organization/Event Name | Type of Organization/Event | Location |
|---|---|---|
| Contra Costa County Farm Bureau | Agricultural | Contra Costa County |
| Brentwood Lions Club | Civic/Community | Brentwood |
| Discovery Bay Chamber of Commerce | Commercial | Discovery Bay |
| Oakley Chamber of Commerce | Commercial | Oakley |
| Discovery Bay Lions Club | Civic/Community | Discovery Bay |
| Earth Day | Event | Multiple locations throughout Subbasin |
| Brentwood City Council | Government/Municipal | Brentwood |
| Brentwood Planning Commission | Government/Municipal | Brentwood |
| Contra Costa County Board of Supervisors | Government/Municipal | Contra Costa County |
| Contra Costa County Municipal Advisory Council – Byron and Bethel Island | Government/Municipal | Contra Costa County |

| | | |
|---|---|---|
| Contra Costa County Municipal Advisory Council - Knightsen | Government/Municipal | Contra Costa County |
| Contra Costa County Transportation, Water, Infrastructure Committee | Government/Municipal | Contra Costa County |
| Oakley City Council | Government/Municipal | Oakley |
| Building Industrial Association - East Bay Chapter | Industrial | Contra Costa County |
| Industrial Association of Contra Costa County | Industrial | Contra Costa County |
| Farmers Market | Other | Brentwood |
| East County Water Management Association Board Meeting | Other | Contra Costa County |
| Realtor groups | Other | Multiple locations throughout Subbasin |

## Interbasin Coordination under the Sustainable Groundwater Management Act (SGMA)

Agencies preparing a Groundwater Sustainability Plan (GSP) under SGMA are encouraged to work with other agencies in adjacent basins to facilitate exchange of technical information, assist with preparation of GSPs, coordinate basin boundary modifications, and conduct outreach to regional stakeholders.

Interbasin coordination is also important to ensure that implementation of a GSP will not adversely affect an adjacent basin's ability to implement is GSP or impede its ability to achieve its sustainability goal. GSAs may develop a voluntary Interbasin Agreement to establish compatible sustainability goals and understanding regarding the fundamental elements of each agency's GSP. Interbasin agreements should facilitate the exchange of technical information between agencies and include a process to resolve disputes concerning the interpretation of that information. (23 CCR § 357.2). A summary of elements to be included in an interbasin agreement is provided below.

### Interbasin Coordination Agreement Checklist

| | Interbasin Coordination Agreement Element | CA Code of Regulations |
|---|---|---|
| **General Information** | | |
| ☐ | Identity of each basin participating in and covered by the terms of the agreement. | 23 CCR § 357.2 (a)(1) |
| ☐ | A list of the Agencies or other public agencies or other entities with groundwater management responsibilities in each basin. | 23 CCR § 357.2 (a)(2) |
| ☐ | A list of the Plans, Alternatives, or adjudicated areas in each basin. | 23 CCR § 357.2 (a)(3) |
| **Technical Information** | | |
| ☐ | An estimate of groundwater flow across basin boundaries, including consistent and coordinated data, methods and assumptions. | 23 CCR § 357.2 (b)(1) |
| ☐ | An estimate of stream-aquifer interactions at boundaries. | 23 CCR § 357.2 (b)(2) |
| ☐ | A common understanding of the geology and hydrology of the basins and the hydraulic connectivity as it applies to the Agency's determination of groundwater flow across basin boundaries and description of the different assumptions utilized by different Plans and how the Agencies reconciled those differences. | 23 CCR § 357.2 (b)(3) |
| ☐ | Sustainable management criteria and a monitoring network that would confirm that no adverse impacts result from the implementation of the Plans of any party to the agreement. If minimum thresholds or measurable objectives differ substantially between basins, the agreement should specify how the Agencies will reconcile those differences and manage the basins to avoid undesirable results. The Agreement should identify the differences that the parties consider significant and include a plan and schedule to reduce uncertainties to collectively resolve those uncertainties and differences. | 23 CCR § 357.2 (b)(4) |
| **Conflict Resolution** | | |
| ☐ | A description of the process for identifying and resolving conflicts between Agencies that are parties to the agreement. | 23 CCR § 357.2 (c) |
| **Submission to DWR** | | |

| | Interbasin Coordination Agreement Element | CA Code of Regulations |
|---|---|---|
| ☐ | Interbasin agreements submitted to the Department shall be posted on the Department's website. | 23 CCR § 357.2 (d) |