FINAL REPORT | MARCH 2023

Elsinore Valley Subbasin 2022 Annual Report

PREPARED PURSUANT TO

Sustainable Groundwater Management Act

PREPARED FOR

Elsinore Valley Groundwater Sustainability Agency

PREPARED BY

WEST YOST
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Elsinore Valley Subbasin 2022 Annual Report

Prepared for

Elsinore Valley Groundwater Sustainability Agency

Project No. 836-80-22-12

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LIST OF ACRONYMS AND ABBREVIATIONS

af	Acre-Feet
afy	Acre-Feet Per Year
Annual Report	Annual Report for The Elsinore Valley Subbasin
Basin	Elsinore Valley Subbasin
Basin Plan	Santa Ana River Basin
CCR	California Code of Regulations
CDFM	Cumulative Departure from Mean
CIMIS	California Irrigation Management Information System Station
CWC	California Water Code
DDW	State Department of Drinking Water
DWR	California Department of Water Resources
EMWD	Eastern Municipal Water District
ET	Evapotranspiration
ETo	Reference Evapotranspiration
EVGSA	Elsinore Valley Groundwater Sustainability Agency
EVMWD	Elsinore Valley Municipal Water District
GIS	Geographic Information System
GSP	Groundwater Sustainability Plan
GWE	Groundwater Elevation
GWMP	Groundwater Management Plan
MA	Management Area
MGD	Million Gallons Per Day
mg/L	Milligrams Per Liter
MO	Measurable Objectives
MT	Minimum Thresholds

MWDSC	Metropolitan Water District of Southern California
MWDCUP	Metropolitan Water District Conjunctive Use Program
NOAA	National Oceanic and Atmospheric Administration
OAL	Office of Administrative Law
PMA	Project Management Actions
QA/QC	Quality Assurance and Quality Control
SAR Watershed	Santa Ana River Watershed
SARCCUP	Santa Ana River Conservation and Conjunctive Use Program
SGMA	Sustainable Groundwater Management Act
SMC	Sustainable Management Criteria
SNMP	Salt And Nutrient Management Plan
State Board	State Water Resources Control Board
TDS	Total Dissolved Solids
TVP	Temescal Valley Pipeline
USFS	United States Forest Service
USGS	U.S. Geological Survey
WMWD	Western Municipal Water District
WRF	Water Reclamation Facilities
WTP	Water Treatment Plant
WY	Water Year

EXECUTIVE SUMMARY

This 2022 Annual Report (Annual Report) for the Elsinore Valley Subbasin (Basin) has been prepared for submittal to the California State Department of Water Resources (DWR) pursuant to the requirements of the Sustainable Groundwater Management Act (SGMA), specifically Article 7, Section 356.2—Annual Reports, of the California Code of Regulations (CCR).[1] This report was prepared by the Elsinore Valley Groundwater Sustainability Agency (EVGSA). The EVGSA, which was formed by its sole member, the Elsinore Valley Municipal Water District (EVMWD) in January 2017 is responsible for managing Basin. The Draft Elsinore Valley Subbasin Groundwater Sustainability Plan (GSP) was adopted on July 7, 2021 and a public hearing was held on December 16, 2021 where the final GSP was adopted. The Basin GSP was submitted to DWR on January 26, 2022.

The GSP includes the requisite scientific and other background information about the Basin and provides a roadmap for how sustainability is to be achieved through monitoring and analysis and development and implementation of projects and management actions (PMAs. The GSP established sustainable management criteria (e.g., sustainability indicators, minimum thresholds, and measurable objectives) that can be compared against measured Basin conditions and trends to track progress over time. Completion of the GSP is a key milestone in achieving groundwater sustainability by 2040.

SGMA regulations require that an annual report be submitted to the DWR by April 1 of each year following the adoption of the GSP or Alternative Plan. This is the second Annual Report for the Basin, which provides an update on the groundwater conditions as of Water Year (WY) 2022 (October 1, 2021 through September 30, 2022). The Plan Area for the purposes of the GSP and this Annual Report is defined as DWR Basin No. 8-004.1: the Elsinore Valley Subbasin, which is shown in Figure 1.

Table 1 is the reference guide that illustrates where each of the required annual reporting elements described in CCR Article 7, Section 356.2 can be found within this report. The following is a summary of the key information and findings presented in this Annual Report.

Section 1 – Introduction. This section provides background information on the Plan Area, important elements of the GSP, including an overview of the sustainable management criteria, sustainability indicators, minimum thresholds, measurable objectives, and identified PMAs.

Section 2 – Data Collection and Monitoring. This section describes the EVMWD's monitoring programs and the data collected in WY 2022. The data collected include climate, surface water, and groundwater data. This section also presents the climate and surface water data for WY 2022.

Section 3 – Current Groundwater Conditions. This section describes the current Basin groundwater level conditions as of WY 2022, as specified by the SGMA regulations (see Table 1). The assessment of Basin conditions includes characterization of: groundwater level trends at all wells; a comparison of spring 2022 water levels with the minimum thresholds, measurable objectives, and 2025 interim milestones for the key indicator wells defined in the GSP; and groundwater elevation contours for spring 2022 and fall 2022; and the change in storage from spring 2021 to spring 2022. Groundwater levels did not significantly change (increase or decrease) from WY 2021 to WY 2022.

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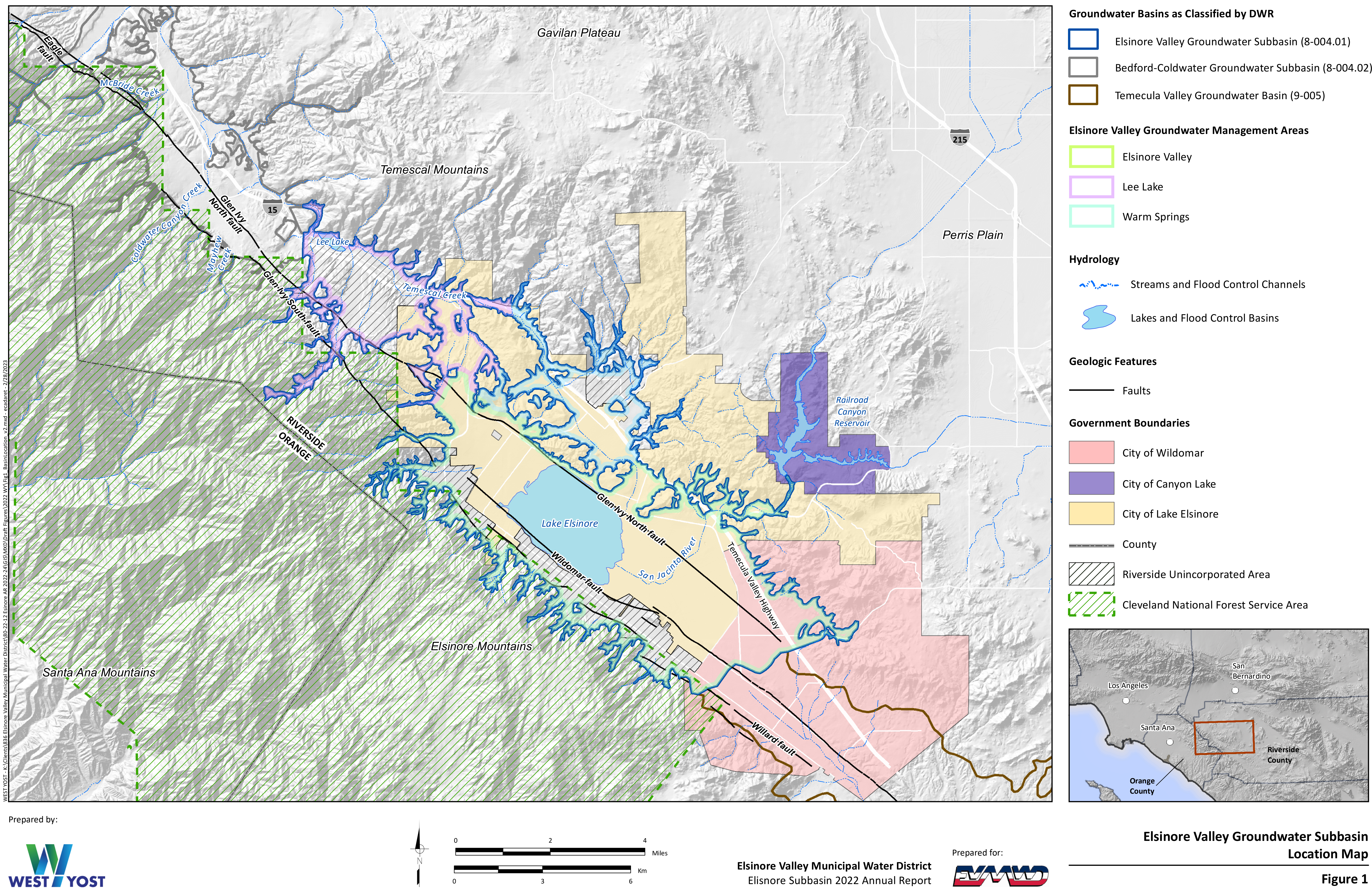
[1] Title 23, Division 2, Chapter 1.5, Subchapter 2 of the California Code of Regulations, which is commonly referred to as the Groundwater Sustainability Plan Regulations (GSP Regulations).

Section 4 – Water Use. This section summarizes the total estimated water use in the Basin for the reporting period. Total water use is equivalent to the sum of all groundwater extractions and surface water use, which includes imported water, surface water from Canyon Lake, and recycled water. Total water use was estimated to be 31,146 acre-feet (af) in WY 2022.

Section 5 – Change in Groundwater Storage. This section describes the methods used to compute the change in storage for the reporting period, reports the change in storage for spring 2021 to spring 2022, and compares the change in storage to the history of storage changes and annual groundwater extractions. The total groundwater in storage from spring 2021 to spring 2022 increased by about 98 af. The cumulative increase in storage since WY 2015 was an increase of about 7,206 af.

Section 6 – GSP Implementation Progress. This section summarizes the key milestones accomplished since the adoption of the GSP in July 2021.



Prepared by:

WEST YOST

Elsinore Valley Municipal Water District
Elsinore Subbasin 2022 Annual Report

Prepared for:

EVMWD

Elsinore Valley Groundwater Subbasin Location Map

Figure 1

Table 1. Alternative Annual Report Elements Guide Map for the 2022 Annual Report		
CCR – GSP Regulation Sections	Groundwater Sustainability Plan Elements	Document which section(s), page number(s), or briefly describe why that Alternative element does not apply to the entity
Article 7	Annual Reports and Periodic Evaluations by the Agency	
§ 356.2	Annual Reports	
Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:		
(a)	General information, including an executive summary and a location map depicting the basin covered by the report.	• Executive Summary: pages 1 – 2 • Elsinore Valley Groundwater Subbasin Map: Figure 1 (page 3) • Section 1 – Introduction: pages 5- 9
(b)	A detailed description and graphical representation of the following conditions of the basin managed in the Plan:	
(1)	Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:	• Section 3 – Current Groundwater Level Conditions: Pages 20 - 27
(A)	Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	• Spring 2022 contours: Figure 6 & 7 (pages 24 & 25) • Fall 2022 contours: Figure 8 & 9 (pages 26 & 27) • Spring 2021 contours: Figure 11 & 12 (pages 35 & 36)
(B)	Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.	• Time History of Groundwater Levels for Selected Wells: Figure 5 (page 21) • Appendix A – Groundwater Level Hydrographs for All Monitored Wells for period 1990 - 2021
(2)	Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.	• Section 4.1 – Groundwater Extractions: Pages 28 – 29 • Groundwater Extraction by Sector: Table 7 (page 28) • Urban Groundwater Extractions: Figure 10 (page 29)
(3)	Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.	• Section 4.2 – Surface Water Use: Page 30 – 31 • Surface Water Use: Table 8 (page 32)
(4)	Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.	• Section 4.3 – Total Water Use: Page 33 • Total Water Use: Table 9 (page 33)
(5)	Change in groundwater in storage shall include the following:	• Section 5 – Change in Groundwater Storage: Pages 34 – 44
(A)	Change in groundwater in storage maps for each principal aquifer in the basin.	• Change in Storage spring 2021 – spring 2022: Figure 15 & 16 (pages 40 & 41)
(B)	A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.	• Change in Groundwater Storage: Table 10 - 12 (page 41 & 42) • Graph depicting water year type, annual change in storage, cumulative change in storage since 2015 to current reporting year – Figure 17 (page 43)
(c)	A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.	• Section 6: GSP Implementation Progress: Page 44 - 46

1.0 INTRODUCTION

1.1 Background

The Elsinore Valley Subbasin (Basin) is designated by the California Department of Water Resources (DWR) as a medium priority basin which requires the development of a Groundwater Sustainability Plan (GSP) in accordance with the 2014 Sustainable Groundwater Management Act (SGMA) within the California Water Code (CWC)[2]. In January 2017, the Elsinore Valley Groundwater Sustainability Agency (EVGSA) was formed by the Elsinore Valley Municipal Water District (EVMWD) to manage the Basin in compliance with SGMA. A draft final GSP[3] that complies with the DWR's GSP Regulations defined in the California Code of Regulations (CCR)[4] was completed in July 2021 and was submitted to DWR on January 26, 2022. The documents submitted to the DWR are available on the DWR's SGMA Portal website[5].

SGMA regulations[6] require that an annual report be submitted to the DWR by April 1 of each year following the adoption of the GSP or Alternative Plan. This second Annual Report for the Basin provides an update on the groundwater conditions as of Water Year (WY) 2022 (October 1, 2021 through September 30, 2022). Table 1 is a reference guide that illustrates where each of the required annual reporting elements described in CCR Article 7, Section 356.2 can be found within this report.

1.2 Plan Area

The Plan Area for the purposes of the GSP and this Annual Report is defined as DWR Basin No. 8-004.01: the Elsinore Valley Subbasin, which is shown in Figure 1. The Basin is located in western Riverside County, within the Santa Ana River Watershed. The Basin has a surface area of approximately 37 square miles (23,600 acres) and is divided into three Management Areas (MAs): Elsinore MA, Warm Springs MA, and Lee Lake MA. The Basin is located within one of the structural blocks of the Peninsular Ranges of Southern California where groundwater basins in this region occupy valleys in linear, low-lying areas between the Santa Ana and Elsinore Mountains on the west and the Temescal Mountains, Perris Plain, and Gavilan Plateau on the east (Norris and Webb, 1990). These valleys were formed by differential movement between parallel strike slip faults to form a pull-apart basin (Dorsey et al., 2012). The Basin is bounded by the Willard fault, a splay of the active Elsinore fault zone, and Santa Ana and Elsinore mountains and non-water bearing rocks of the Peninsular Ranges along the Glen Ivy fault on the northeast boundary. The Basin is also bounded by the Bedford-Coldwater Subbasin (8-004.2) to the northwest and the Temecula Valley Basin (9-005) to the southeast.

The Plan Area consists primarily of private land within the City of Elsinore, City of Canyon Lake, City of Wildomar, and Riverside County jurisdiction. Unincorporated lands are under the jurisdiction of Riverside County. To the southeast, the Plan Area is adjacent to the United States Forest Service (USFS) Cleveland National Forest. Within the Plan Area there are developed and undeveloped land areas. The developed land uses include single family residential, recreational, industrial. The major municipal water

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[2] California Water Code Section 10720–10737.8, et al.

[3] Information regarding the GSP, including its stakeholder process, is available from EVMWD's website (https://www.evmwd.com/who-we-are/water-resources).

[4] California Code of Regulations, Title 23, Section 350 et seq.

[5] https://sgma.water.ca.gov/portal/gsp/preview/119

[6] Citation 5. CCR Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 7

district serving the Plan Area is the EVMWD, which provides water and sewer service to the developed portions of Elsinore Valley within its service area. Some residents and businesses rely on private wells for groundwater.

Historically, the largest source of water supply utilized by the EVMWD has been imported water purchased from the Metropolitan Water District of Southern California (MWDSC) through Western Municipal Water District (WMWD). Imported water has accounted for over 68 percent of the Plan Area water supply. Groundwater from the Basin has been the second largest source of water supply within the Plan Area and has historically accounted for approximately 23 percent of the total water supply. Groundwater is pumped for municipal supply; irrigation of agriculture, golf courses, and other recreational landscapes; and private domestic or commercial supply. Other minor sources of supply within the Plan Area include local surface water and recycled water.

The groundwater system within the Basin has been subdivided into the noted MAs as each has its own set of unique characteristics:

- The Elsinore MA is the main groundwater producing area within the Basin and has a two layered aquifer system; an unconfined aquifer of alluvial deposits underlain by a semi-confined to confined aquifer of the Pauba Formation. The unconfined aquifer alluvial deposits can be more than 300-feet thick locally and are composed of interfingered gravels, sands, silts, and clays (MWH, 2005). The semi-confined Pauba Formation can be more than 2,300 feet thick beneath Lake Elsinore and is composed of medium to coarse-grained sandstones, siltstones, and clay (DWR 2003, 2016; MWH 2005, 2009).
- The Warm Springs MA is located east of the Elsinore MA and south of the Lee Lake MA and is hydraulically connected to both the Elsinore and Lee Lake MAs through the Temescal Wash. The Warm Springs MA has a single aquifer unit of alluvium associated with Temescal Wash and alluvial fan and fluvial deposits.
- The Lee Lake MA is located downgradient and to the north of the Elsinore MA and Warm Springs MA. The Lee Lake MA has limited hydraulic connection with the Elsinore MA and is a single aquifer unit of alluvium composed of interlayered gravels, sands, silts, and clays that are associated with Temescal Wash.

A detailed description of the Plan Area's Basin setting, hydrogeology, historical conditions, and water budget elements is included in Chapters 1 through 5 of the GSP.

1.3 Groundwater Basin Management

In 1990, groundwater levels were steadily declining within the Elsinore MA due to groundwater pumping in excesses of average annual recharge. During this period, there was an estimated decline in groundwater storage of about 35,000 acre-feet (af). The EVMWD developed its first Elsinore Basin Groundwater Management Plan (GWMP) in 2005 to determine the Safe Yield and develop strategies to manage groundwater storage. Since 2010, groundwater storage in the Elsinore MA has rebounded due to reductions in pumping that were implemented to align with GWMP Safe Yield estimate of 5,500 af per year (afy).

The historical groundwater conditions within the Plan Area prompted the DWR to designate the Basin as a medium priority for groundwater management. Through the development of the GSP, the EVMWD will continue to sustainably manage the Basin throughout the planning and implementation horizon of the GSP. The implementation elements of the Basin GSP are described below.

1.3.1 Groundwater Sustainability Plan

The GSP report includes a detailed description of the Basin and other information required by SGMA, including but not limited to: historical groundwater conditions and trends, an estimate of sustainable yield, sustainable management criteria (SMC; e.g., sustainability indicators, minimum thresholds, and measurable objectives), a monitoring program to track progress over time, and proposed projects and management actions (PMAs).

The GSP is intended to ensure that by 2040, and thereafter within the planning and implementation horizon (50 years), the Basin is operated within its sustainable yield such that there are no undesirable results as defined by CWC Section 10721(v). The GSP is intended to provide a roadmap for how groundwater sustainability is to be achieved and represents a key milestone in achieving sustainability within the Plan Area by 2040. Key provisions of the GSP are highlighted below.

1.3.1.1 Overview of Sustainability Goal and Sustainable Management Criteria

The sustainability goal is to manage the Basin to provide sustainably and adequately for all beneficial uses within the Basin over wet and dry climatic cycles. The GSP included initial SMC, including minimum thresholds (MTs) and measurable objectives (MO), for the following sustainability indicators determined to be a current and/or potential future undesirable result:

Chronic Lowering of Groundwater Levels. In the Elsinore MA, MTs are defined by operational considerations to maintain pumping water levels at municipal supply wells that are sufficiently above the current pump intakes to avoid the cost of lowering pump bowls, adding pump stages, and/or increasing pumping energy usage. In the Warm Springs and Lee Lake MAs, MTs are defined based on observed historical-low groundwater levels. Undesirable results are triggered when more than 75 percent of the wells (or 100 percent of the wells in the case of the Warm Springs MA) exceed the MT.

Groundwater in Storage. The sustainability goal for groundwater in storage is to maintain groundwater levels within a historical operating range from observed water levels from 1990 to 2019. The MTs established for the chronic lowering of groundwater levels serve as a proxy for the MT for groundwater in storage.

Land Subsidence. The sustainability goal for land subsidence is to limit land surface displacement (e.g., the decrease in land surface elevation) to one-foot or less over a 50-year period. Land surface displacement will be measured by InSAR and compared to the earliest available InSAR measurement for the Basin from May 2015. The MT is defined as six-inches of land surface displacement occurring over a 50-year period.

Water Quality. The sustainability goals for water quality are to comply with the salt and nutrient management plans (SNMP) for each MA. The Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) includes two specific SNMPs within the Plan Area: the Upper Temescal Valley SNMP and the Elsinore GMZ Maximum Benefit Salt and Nutrient Management Plan (Elsinore SNMP). The Santa Ana Regional Water Quality Control Board approved the two SNMPs for incorporation into the Basin Plan in December 2020 and December 2021, respectively. The Upper Temescal Valley SNMP was accepted by the State Water Resources Control Board (State Board) in June 2021 and became effective in September 2021 when it was accepted by the Office of Administrative Law (OAL). The Elsinore SNMP was accepted by the State Board in May 2022 and is pending acceptance by the OAL. Each SNMP defines water quality objectives for total dissolved solids (TDS) and nitrate (as nitrogen) and an associated monitoring and management program to manage salinity to protect beneficial uses. EVMWD has been implementing the Upper Temescal Valley SNMP and the Elsinore SNMP since November 2017 and January 2021, respectively.

MTs are defined for TDS and nitrate based on the TDS and nitrate water quality objectives established by the SNMPs and the Basin Plan. The MT for TDS is defined as 530 milligrams per liter (mg/L) in the Elsinore MA and 820 mg/L in the Warm Springs and Lee Lake MAs. The MT for nitrate (as N) is defined as 5 mg/L in the Elsinore MA, and 7.9 mg/L in the Lee Lake and Warm Springs MAs.

The assessment of compliance with the MTs will be based on the triennial[7] calculation of ambient water quality required by the SNMPs. The last ambient water quality calculation was completed in July 2020 for the Elsinore Basin (WSC, 2020) and November 2020 for the Warm Springs and Lee Lake MAs (West Yost, 2020). The next calculation of ambient water quality for the three MAs is due to be completed by October 2023.

Interconnected Surface Water. The sustainability goal for interconnected surface water is to maintain sufficient surface water flows in areas supporting phreatophytic riparian trees. The MT is defined as the amount of depletion that occurs when the depth to water in areas supporting phreatophytic riparian vegetation is greater than 35 feet for a period exceeding one year or more.

1.3.1.2 Overview of Projects and Management Actions

The primary management tool to achieve long-term sustainability of the Basin is by implementing the PMAs. The GSP included proposed PMAs in three groups: Baseline PMAs (Group 1), PMAs evaluated against the SMC (Group 2), and PMAs that may be considered in the future (Group 3). Group 1 projects are considered existing or established commitments by the EVGSA. Group 2 projects have been assigned implementation dates. Group 3 projects are conceptual activities that can be considered in the future if any Group 2 projects fail to be implemented or additional intervention is required to achieve Basin sustainability goals. Table 2 provides an overview of the PMAs that were presented in the GSP. A more detailed description of current GSP implementation progress of the PMAs is provided in Section 6 of this report.

[7] The SNMPs provide for flexibility in amending the analysis frequency, up to every five years in accordance with the State Board's 2019 Recycled Water Policy.

Table 2. Elsinore Valley Subbasin GSP Projects and Management Actions

Description	Responsible Agency	Category	Status	Anticipated Timeframe
Group 1 - Baseline PMAs				
Groundwater production well replacements	EVMWD	Project	Ongoing	Ongoing
Managing pumping in Elsinore MA with in-lieu recharge under conjunctive use agreements	EVMWD, MWDSC, WMWD	Management Action	Ongoing	Ongoing
Group 2 - PMAs Evaluated Against SMCs				
Begin groundwater pumping in Lee Lake MA for municipal use	EVMWD	Project	In design	2019 - 2023: design and construction. 2024+ implementation and operation
Rotate pumping locations and flows	EVMWD	Management Action	Not started	Can be implemented as needed dependent on groundwater levels
Recycled water IPR	EVMWD	Project	Planning Phase	Dependent on increases in available wastewater flow
Septic tank conversions	EVMWD	Project	Planning Phase	Dependent on securing funding
Group 3 - Identified PMAs that may be considered in the future				
Imported water recharge and recovery	EVMWD, MWDSC	Project	Inactive	No current anticipated timeline
Stormwater capture and recharge	EVMWD	Project	Not started	No current anticipated timeline
Begin groundwater pumping in Warm Springs MA for municipal use	EVMWD	Project	Not started	No current anticipated timeline

2.0 DATA COLLECTION AND MONITORING

The GSP defines the monitoring program necessary to support the sustainable management of the Basin and includes the collection of climate, surface water, and groundwater data. These data are used to characterize and understand current Basin conditions and trends and to evaluate the Basin response to GSP implementation. All environmental data collected by the EVGSA are post-processed into standardized formats, checked for quality assurance/quality control (QA/QC), and uploaded to a centralized relational database management system managed internally by EVMWD.

This section describes the monitoring programs and data collected in WY 2022.

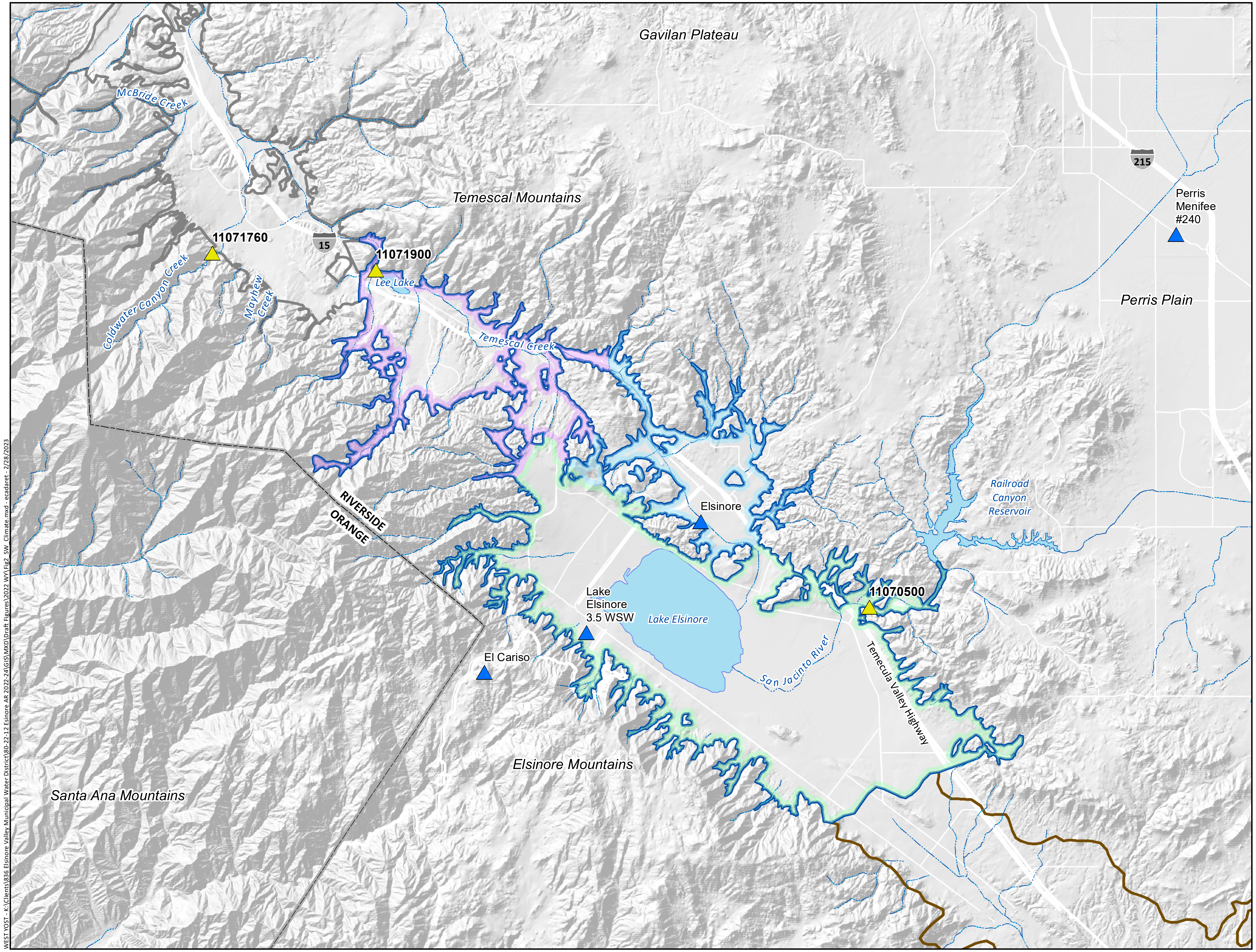
2.1 Climate Data

Figure 2 shows the location of the climate stations in and around the Basin that provide precipitation, temperature, and/or evapotranspiration (ET) data for the Plan Area. Each data type is described below.

2.1.1 Precipitation

Within the Plan Area, average annual precipitation ranges from up to 16 to less than eight inches per year. Precipitation is greater outside the Plan Area in the mountains to the west and east of the Elsinore Valley. The weather station in the Plan Area with the longest and most complete precipitation record is the NOAA/CAL FIRE Station at Lake Elsinore[8] (shown on Figure 2), which has complete water year records from WY 1898 to present. The mean WY precipitation is for the period of record is 12.2 inches. Figure 3 is a plot of the WY annual precipitation totals, the long-term mean, and the cumulative departure from mean (CDFM) precipitation for WYs 1898 to 2022. The CDFM plot is a useful way to characterize the occurrence and magnitude of wet and dry periods (relative to the mean): positive sloping segments (trending upward from left to right) indicate wet periods, minimally sloping segments (no major trend up or down from left to right) indicate normal periods, and negative sloping segments (trending downward from left to right) indicate dry periods. This is also represented by color coded segments along the x-axis where dry periods are represented with red segments, normal years with green segments, and wet years with light blue segments. Precipitation in WY 2022 was 7.1 inches, which is 4.9 inches lower than the average. Based on the CDFM curve, WYs 2021-2022 were a dry period. Over the 124-year record, there have been 42 normal years, 31 wet years, 51 dry years. 71 years had precipitation totals below the mean (or approximately 57% of the total precipitation record).

[8] NOAA, 2022. Station: Elsinore, Network ID - GHCND: USC00042805.



Weather Stations and Stream Gages

- Weather Stations
- USGS Stream Gages

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

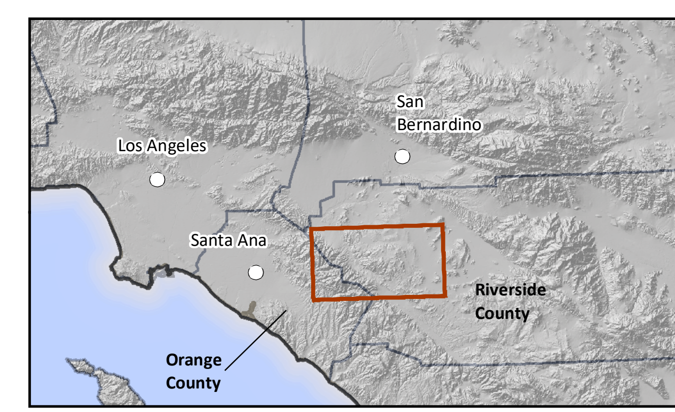
- Elsinore Valley
- Lee Lake
- Warm Springs

Hydrology

- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County



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WEST YOST

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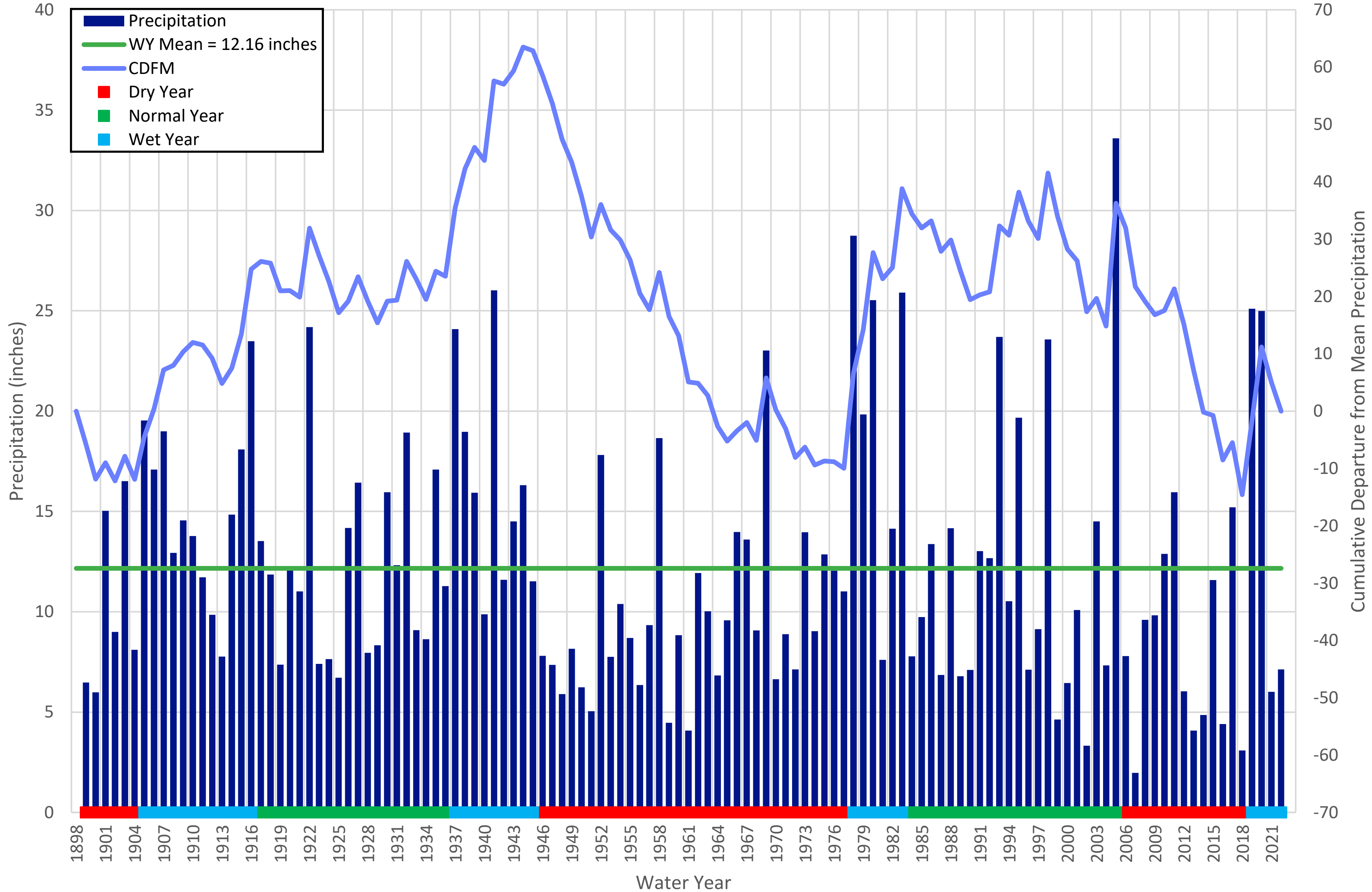
EVMWD

Surface Water Features and Climate Monitoring Stations

Figure 2

Figure 3. Time History of Annual Precipitation and Cumulative Departure From Mean: Elsinore Station



2.1.2 Evapotranspiration

According to the State of California Reference Evapotranspiration Map developed by California Irrigation Management Information System Station (CIMIS), the Plan Area is located within Evapotranspiration Zone 6, with an annual average Reference ET (ETo)[9] of 49.7 inches or 4.14 feet (DWR 2012). This regional average annual ETo estimate is comparable to the ETo measured at the CIMIS Perris Menifee Station (Station 240) in the Plan Area (see station location on Figure 2). Station 240 has nearly complete annual records of daily data since May 2013. The monthly and annual totals are shown in Table 3. The average annual WY ETo measured at CIMIS Station 240 between WY 2015 and WY 2022 is 61.5 inches per year (5.13 feet per year). In WY 2022, the annual total ETo was 67.2 inches (5.6 feet) (CIMIS, 2022).

2.2 Surface Water

The Basin is located within the Santa Ana River Watershed (SAR Watershed), which encompasses a large area within portions of San Bernardino, Riverside, and Orange Counties. The SAR Watershed drains the San Gabriel, San Bernardino, San Jacinto, and Santa Ana Mountains to the west, north, east, and south of the Basin, respectively. Major streams within the Basin include Temescal Wash and the San Jacinto River. The Temescal Wash flows from Lake Elsinore towards the northwest until it reaches the Santa Ana River. The San Jacinto River drains from the northeast side of the Basin from Railroad Canyon Reservoir to the southwest to Lake Elsinore. Tributaries within the Basin include Horsethief Canyon Creek, Rice Canyon Creek, McVicker Canyon Creek, Leach Canyon Creek, Arroyo Del Toro, and Warm Springs Creek and all contribute flow into Temescal Wash. These major streams and tributaries accumulate mountain front recharge and runoff from precipitation that occurs within the Basin mountains and hills that flow into Lake Elsinore. Surface water in the Plan Area is measured at several United States Geological Survey (USGS) managed stream gages within the Basin (Figure 2).

In addition to natural surface water flows, recycled water supply comes from three reclamation facilities within the Plan Area—Regional Water Reclamation Facilities (WRF), Railroad Canyon WRF, and Horsethief Canyon WRF—that discharge to local streams or discharge ponds and may influence surface water flows and recharge. Thus, groundwater recharge occurs through streambed infiltration of stormwater and recycled water and return flows of applied irrigation water and septic recharge. Septic systems also constitute a source of recharge to the Basin and contribute to recharge within the Elsinore MA.

2.2.1 USGS Stream Gages

There are three active stream gages located within the vicinity of the Basin (USGS, 2022), each of which record stream gage height which is used to calculate daily discharge using a rating curve. The USGS maintains daily stream gage height and discharge records from the stream gage stations, as well as periodic manual gage height and flow measurements to validate the rating curves. All three stations were actively monitored in 2022. Table 4 provides a summary of data available for each stream gage station. Table 4 also lists summary statistics for WY 2022 at each station, including minimum, maximum, and average discharge; and the total annual surface water flow at the gage in af.

[9] The ETo values calculated from the CIMIS data reflect the amount of water that could be transpired by grass or alfalfa if supplied by irrigation. The ETo values do not represent the actual transpiration from any specific crop or native vegetation. To calculate the ET rate for a specific crop or vegetation type, the ETo is multiplied by a crop coefficient that adjusts the water consumption for that crop relative to the water consumption for alfalfa.

Table 3. Monthly and Yearly Reference Evapotranspiration (ETo) Totals for CIMIS Station No. 240 -- 2015-2022 (inches, except where noted)													
WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total
2015	4.72	3.21	1.78	2.53	3.26	5.35	5.96	5.66	7.72	6.95	6.76	4.96	58.86
2016	3.56	2.48	1.88	1.71	3.25	4.06	4.78	6.23	8.33	9.01	8.54	6.16	59.99
2017	4.32	3.25	1.92	1.86	2.09	4.86	6.32	6.68	8.21	8.38	7.53	5.69	61.11
2018	4.9	2.73	3.25	2.73	3.22	4.18	6.06	5.94	8.14	7.92	7.56	6.26	62.89
2019	4.18	3.25	1.92	2.02	1.97	3.62	5.41	4.98	6.99	8.33	8	5.66	56.33
2020	5.13	2.92	1.6	2.07	2.63	2.69	3.82	6.66	7.33	9.25	8.67	6.83	59.6
2021	5.03	3.3	2.38	2.74	3.32	4.22	5.88	6.97	8.43	9.29	8.2	6.6	66.36
2022	4.28	3.58	1.73	2.63	3.64	5.32	6.13	7.15	8.76	8.99	8.93	6.04	67.18
8-Year Average (inches)	4.52	3.09	2.06	2.29	2.92	4.29	5.55	6.28	7.99	8.52	8.02	6.03	61.54
8-Year Average (feet)	0.38	0.26	0.17	0.19	0.24	0.36	0.46	0.52	0.67	0.71	0.67	0.50	5.13

Source: CIMIS – Station No. 240 (https://cimis.water.ca.gov/). Values reported for 2022 were downloaded from CIMIS daily data and compiled on 1/3/2023.

K = One or More Daily Values Flagged

Table 4. Summary of USGS Stream Gage Data and Streamflow Statistics within the Vicinity of the Basin										
Station Number	Station Name	Drainage Area, sq mi	Elevation, feet msl	Period of Record		Annual Average Discharge for Period of Record, afy	WY 2022 Discharge, afy	WY 2022 Min Discharge, cfs	WY 2022 Max Discharge, cfs	WY 2022 Average Discharge, cfs
				Starting Year	Ending Year					
11070500	SAN JACINTO R NR ELSINORE CA	723	1,270	1916	Present	11,229	1,971	0	133	2.72
11071760	COLDWATER CANYON C NR CORONA CA	4.2	1,323	2018	Present	1,036	490	0	8.9	0.68
11071900	TEMESCAL C A CORONA LK NR CORONA CA	57.9	1,190	2013	Present	1,514	-	0	-	-

Note: 11071900 had zero discharge measured in WY 2022

2.3 Groundwater

The GSP defines the groundwater monitoring program necessary to support the sustainable management of the Basin and includes the monitoring of groundwater pumping, levels, and quality. The monitoring network is designed to collect sufficient data to evaluate changing conditions that occur through the implementation of the GSP over time.

2.3.1 Groundwater Pumping

Groundwater pumpers in the Basin include EVMWD, the City of Lake Elsinore, and other private users. EVMWD groundwater pumping accounts for approximately 99 percent of the total groundwater pumping within the Basin. Per the California Water Code (CWC Division 2, Part 5, Section 5001)[10], users that pump groundwater greater than 25 afy must file an annual "Notice of Extraction and Diversion" with the State Board. Users that pump groundwater less than 25 afy are not required to file and are considered de minimis users. Annual Calendar Year production data are available through the Western-San Bernardino Watermaster (MWH, 2011) and directly from EVMWD.

2.3.2 Groundwater Monitoring Network

Within the Basin, EVMWD monitoring groundwater conditions to satisfy various local, regional, state, and federal regulatory requirements. EVMWD conducts the following programs to monitor groundwater conditions:

- **EVMWD Groundwater Level Monitoring Program:** The program includes collection of data at 38 wells within the Basin. Since 2009, water level data from these wells were submitted to the DWR California Statewide Groundwater Elevation Monitoring (CASGEM) program. Since 2021, water level data from these wells is now submitted to the DWR SGMA Portal Monitoring Network Module which has replaced the CASGEM program for wells within the Basin.
- **EVMWD Groundwater Quality Monitoring Program:** The program includes water quality sampling from production wells to comply with state and federal drinking water regulations. EVMWD also collects water quality samples on their production and monitoring wells in the Upper Temescal Valley per the Upper Temescal SNMP and is in the process of developing a monitoring plan for the Elsinore MA SNMP. EVMWD provides water quality data to the State Department of Drinking Water (DDW) and Santa Ana Water Board.

Groundwater production and monitoring wells included in the water level monitoring program are listed in Table 5 and shown in Figure 4. Table 5 lists the wells by MA and includes the local well name, State Well ID (if assigned), and well use. For groundwater levels, Table 5 also specifies the groundwater water level measurement method as manual or transducer. Short-term trends are tracked by pressure transducers with onboard data loggers that are installed in eight wells. The data loggers record groundwater levels at high-frequency intervals of 15 minutes to 1 hour. Long-term trends are tracked by analysis of data from key indicator wells monitored semi-annually and with data dating back to the late-1980s. Groundwater quality samples are collected from various wells on a monthly to annual basis to determine and track groundwater quality trends to comply with water quality objectives associated with drinking water regulations, and the Upper Temescal Valley SNMP (UTV SNMP), and Elsinore GMZ Maximum Benefit Salt and Nutrient Management Plan (Elsinore SNMP). For more detailed information on groundwater quality

[10] CWC Division 2, Part 5, Section 5001

within the basin, please refer to Chapter 4 of the GSP (Todd, 2021), UTV SNMP (West Yost, 2020), and the Elsinore SNMP (West Yost, 2021).

During WY 2022, groundwater levels were monitored quarterly at most wells, except for a few that had maintenance or access issues. Overall, the spatial distribution of collected water level data was sufficient to perform the requisite characterizations of current groundwater conditions as required by CCR Article 7, Section 256.s. The only observable data gap for are the lack of shallow piezometers for monitoring surface water-groundwater interaction along Temescal Wash. The analysis of groundwater conditions is presented in Sections 3, 4, and 5 of this Annual Report.

Table 5. Groundwater Wells Monitored in Calendar Year 2022

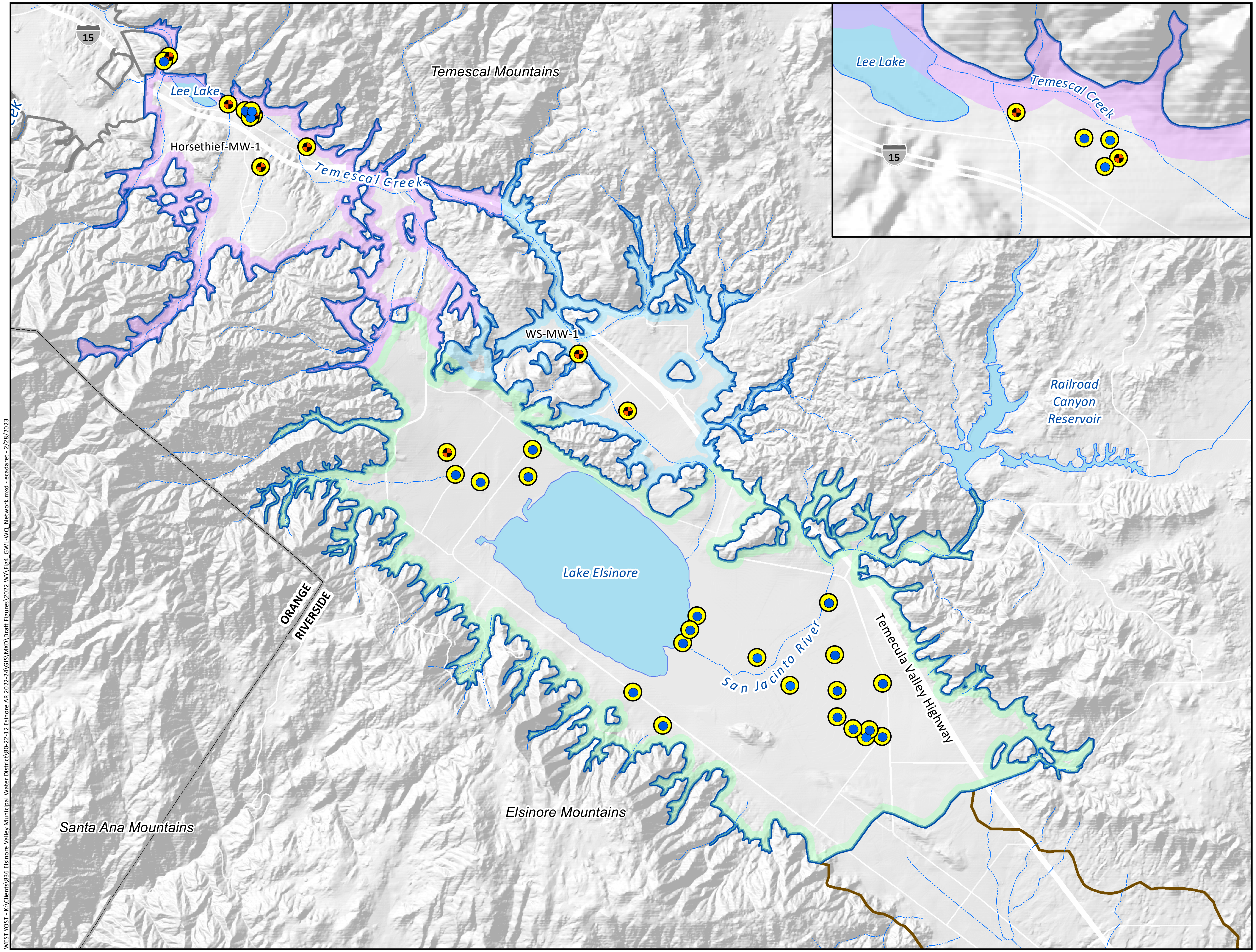
Local Well Name	State Well ID	Well Use	Water Levels				
			Measurement Method	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Elsinore MA							
Beecher	-	Observation	M	X	X	X	X
Cereal 1	06S04W21J03	Potable Supply	M	X	-	-	X
Cereal 3	06S04W17K01	Potable Supply	M	X	X	X	X
Cereal 4	06S04W17L01	Potable Supply	M	X	X	X	X
Corydon[(a)]	06S04W22M08	Potable Supply	M	-	-	-	-
Diamond	-	Potable Supply	T	X	-	X	X
Grand	06S05W24A	Observation	M	X	X	X	X
Joy Street	06S05W02G05	Potable Supply	M	X	X	X	X
Lincoln	06S05W02M04	Potable Supply	M	X	-	X	X
Machado	06S05W03H01	Potable Supply	M	X	X	X	X
Mc Vicker Park[(b)]	-	Observation	M	X	-	-	-
Middle Island	-	Observation	M	X	X	X	X
MW 1 Deep	-	Observation	M	X	X	X	X
MW 1 Shallow	-	Observation	M	X	X	X	X
MW 2 Shallow	-	Observation	M	X	X	X	X
MW 2 Deep	-	Observation	M	X	X	X	X
MW 3 Shallow	-	Observation	M	X	X	X	X
MW 3 Deep	-	Observation	M	X	X	X	X
North Island	-	Non-Potable Supply	M	X	-	X	X
Olive	06S04W22D02	Non-Potable Supply	M	X	X	X	X
South Island	-	Non-Potable Supply	M	X	-	X	X
Stadium Deep	-	Observation	M	X	X	X	X
Stadium Shallow	-	Observation	M	X	X	X	X
Summerly	-	Potable Supply	M	X	-	X	X
Terra Cotta	-	Potable Supply	M	X	X	X	X
Wisconsin	06S05W02A	Observation	M	X	X	X	X
Wood # 2	-	Observation	M	X	X	X	X
Lee Lake MA							
Alberhill 2	-	Observation	T	X	X	X	X
Barney Lee 1	05S05W08N01	Non-Potable Supply	M	X	X	X	X
Barney Lee 2	05S05W08P01	Non-Potable Supply	T/M	X	-	X	X
Barney Lee 3	05S05W08P03	Non-Potable Supply	M	X	-	X	X
Barney Lee 4	05S05W08P02	Non-Potable Supply	M	X	-	X	X
Gregory 1	05S05W07C01	Non-Potable Supply	T	X	-	X	X
Gregory 2	05S05W07E01	Non-Potable Supply	M	X	-	X	X
Horsethief-MW-1	-	Observation	T	-	X	X	X
Station 70	05S05W08N02	Non-Potable Supply	T	X	-	X	X
Warm Springs MA							
Cemetery	-	Observation	T	X	X	X	X
WM-MW-1	-	Observation	T	-	X	X	X

T = Wells denoted with "transducer" have a pressure transducer installed that continuously records water level measurements on a high frequency interval (15-minutes to 1 hour)

M = Well water level measurements on a sounder

(a) Cordyon water level measurements were attempted in 2021, but there are maintenance issues that prevented water level measurements. EVMWD is currently working to resolve these issues.

(b) McVicker Park water level measurements were attempted in 2022, but well may have been paved over by local entity. EVMWD is currently working to located well.



Groundwater Monitoring Network Well Symbolized by Data Collection

- Manual Water-level Data
- Transducer Water-level Data
- Water Qualiy Data

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

- Elsinore Valley
- Lee Lake
- Warm Springs

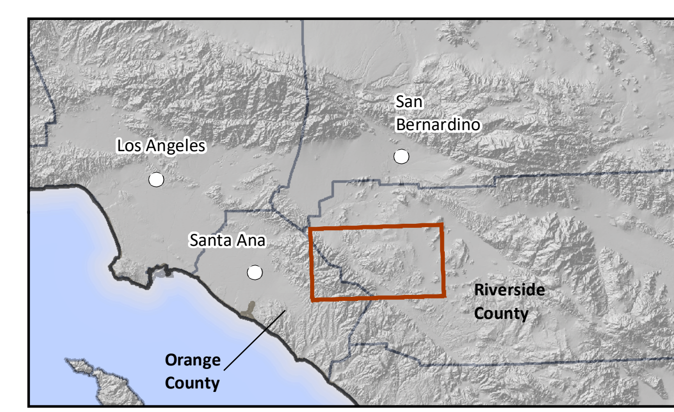
Hydrology

- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County

EVMWD added two new wells to the monitoring network, WS-MW-1 and Horsethief-MW-1. These wells have not been assigned a Minimum Threshold and have not been formally incorporated into the GSA monitoring network.



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Groundwater Level and Quality Monitoring Network

Figure 4

3.0 CURRENT GROUNDWATER LEVEL CONDITIONS

This section describes the current Basin groundwater level conditions as of WY 2022, as specified in the Alternative Annual Reporting Elements Guide (see Table 1).

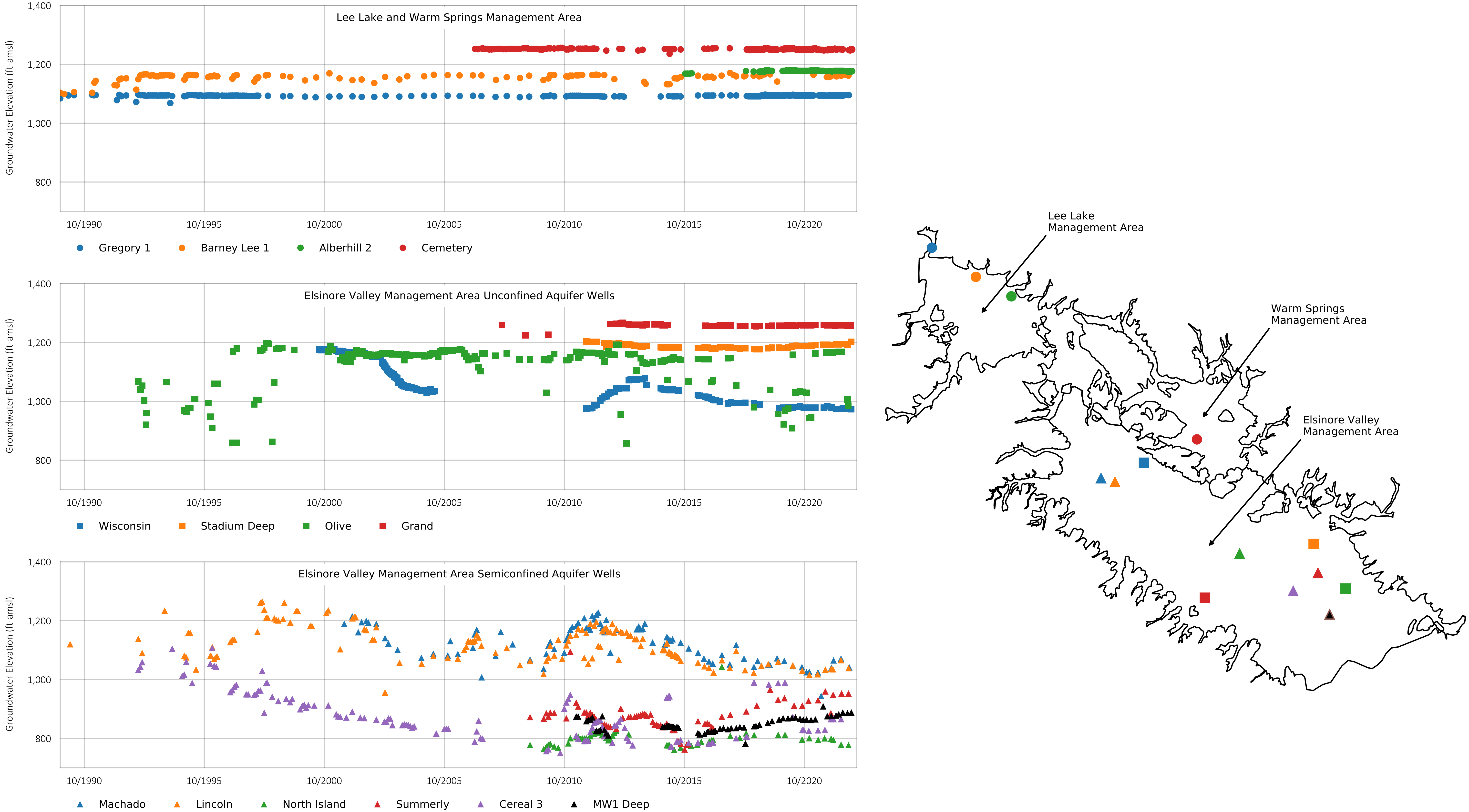
3.1 Groundwater Level Trends

From the late 1990's to 2007, groundwater extractions in the Basin exceeded recharge, causing declines in groundwater levels in the Elsinore MA. Groundwater pumping increased over this period to support rapid growth within the region. Through the implementation of the 2005 GWMP, which included efforts to reduce pumping to within the Safe Yield of the Basin groundwater levels have stabilized and, in some cases have risen. Time history charts of available groundwater level data for each well in the monitoring network were plotted for the period of record from 1990 through 2022 and are included with this Annual Report as Appendix A.

Figure 5 is a time history chart that shows the long-term trend in groundwater levels in selected wells in the Lee Lake and Warm Springs MA, Elsinore Valley MA unconfined aquifer, and Elsinore Valley MA semiconfined aquifer. The long-term decline in groundwater levels within the Basin is most pronounced in the Elsinore Valley MA's confined aquifer system and the decline generally decreases in magnitude in wells closest to Lake Elsinore. Conversely, groundwater levels in the Lee Lake, Warm Springs, Elsinore Valley MA unconfined/semiconfined aquifer generally show little to no change except for one well that is screened in both the deep confined and unconfined aquifers (Wisconsin – Blue Square on Figure 5).

One of the key objectives of the groundwater level monitoring program is to track and monitor trends to demonstrate progress toward meeting the sustainability goals, including comparing current conditions to minimum thresholds and measurable objectives for the relevant sustainability indicators for the Basin. The sustainability goal for groundwater levels is to ensure groundwater is maintained at adequate levels at key wells. Key groundwater level indicator wells were identified in the GSP to establish minimum thresholds (MTs) and measurable objectives in each management area of the Basin. MTs are defined based on observed historical-low groundwater levels at each indicator well. Undesirable results are triggered when more than 75 percent (or 100 percent of the wells in the case of the Warm Springs MA) of the key indicator wells within a MA exceed the MT.

Table 6 shows the water levels relative to MTs for select key indicator wells compared to the groundwater levels measured in spring 2021 and spring 2022. For the purpose of tracking water levels relative to MTs, the start of the GSP implementation period is spring 2021. Table 6 also shows the change in depth to water from spring 2021 and spring 2022 at each indicator well. In spring 2022, no MTs were triggered. Water levels have gradually risen in WY 2022 compared to WY 2021.



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Water. Engineered.

Groundwater Level Trends in Select Key Monitoring Wells in Elsinore Valley Groundwater Subbasin

Figure 5

Table 6. Water Levels Relative to Minimum Thresholds at Key Indicator Wells					
Local Well Name	State Well ID	Minimum Threshold[a], ft bgs	Spring 2021 Depth to Water[b], ft bgs	Spring 2022 Depth to Water[b], ft bgs	1-Year Change in Groundwater Level, ft
Lee Lake and Warm Springs Management Area					
Gregory 1	05S05W07C01	20	8.1	8.9	-0.8
Aberhill 2	-	20	8.8	10.0	-1.1
Barney Lee 1	05S05W08N01	70	17.0	20.0	-3.0
Station 70	05S05W08N02	60	22.6	21.7	0.9
Cemetery	-	25	6.4	8.1	-1.6
Elsinore Valley Management Area Unconfined/Semiconfined Aquifer Wells					
Wood #2	-	40	29.4	31.0	-1.6
Grand	06S05W24A	40	32.2	33.1	-0.9
Olive	06S04W22D02	390	107.3	102.0	5.3
Stadium Deep	-	110	91.2	87.8	3.4
Wisconsin	06S05W02A	350	298.4	301.4	-3.0
Elsinore Valley Management Area Confined Aquifer Wells					
Cereal 3	06S04W17K01	484	430.0	391.5	38.5
Lincoln	06S05W02M04	350	262.6	214.1	48.5
Machado	06S05W03H01	350	287.7	241.6	46.2
North Island	-	600	467.9	486.0	-18.1
MW-1 Deep	-	484	397.7	377.5	20.2
Summerly	-	540	339.4	315.6	23.8

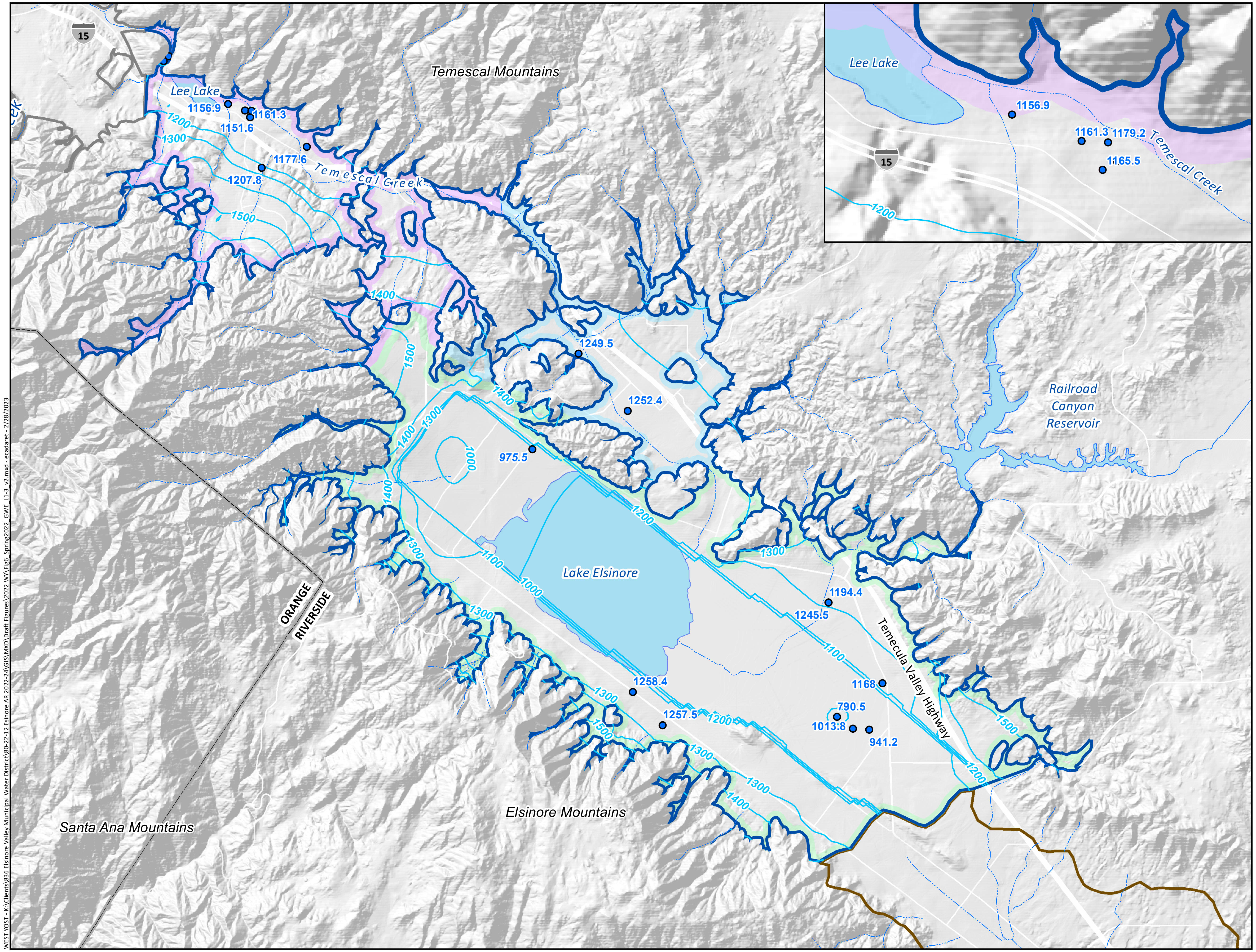
(a) The Minimum Threshold is the maximum allowable decline in groundwater levels as measured at the beginning of GSP Implementation through 2040.

(b) If a spring 2021/2022 water level was not measured, the reported measurement is the value nearest to April 15 or an interpolated value. These values are shown in italics.

3.2 Groundwater Elevation Contour Maps

To estimate seasonal high and low groundwater elevations in the Basin for WY 2022, all wells in the study area with reliable groundwater-elevation measurements during spring and fall 2022 were mapped to develop groundwater elevation contours. Each well location was assigned a representative groundwater-elevation for each time period. Groundwater elevation contours for spring and fall 2022 were developed using contours from the WY 2021 Annual Report as a starting point and modified based on WY 2022 water level data. Contours developed as part of the WY 2021 Annual Report were based on model-generated groundwater elevation contours from the GSP. These model-generated contours account for existing geologic structure, faulting, and aquifer types (shallow unconfined and semi-confined deep aquifer) within the subbasin. The shallow unconfined aquifer covers all three MAs and consists of model layers 1 through 3. The deep semiconfined aquifer is located only within the Elsinore MA, is bounded by the Wildomar and Glen Ivy faults within the Elsinore Fault Zone, and consists of model layer 4. For further discussion and justification for this approach, please refer to Section 5.0 Groundwater Change in Storage of this report.

Figure 6 and Figure 7 show the groundwater wells with data and groundwater elevation contours for spring 2022 in the shallow unconfined aquifer and deep semiconfined aquifer, respectively. Figure 8 and Figure 9 show the same information for fall 2022. Changes in groundwater elevations and how they relate to change in storage are described in Section 5.



Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Spring 2022 (ft-amsl)

Groundwater Elevation Contours
Spring 2022 (ft-amsl)

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

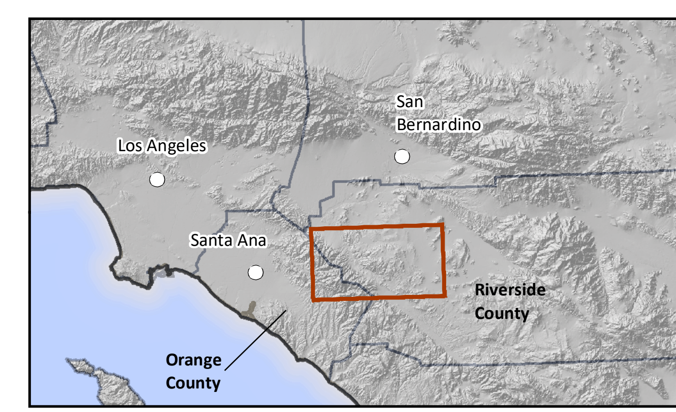
- Elsinore Valley
- Lee Lake
- Warm Springs

Hydrology

- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County



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Spring 2022 Groundwater Elevation in Shallow Unconfined Aquifer (Layers 1-3)

Figure 6

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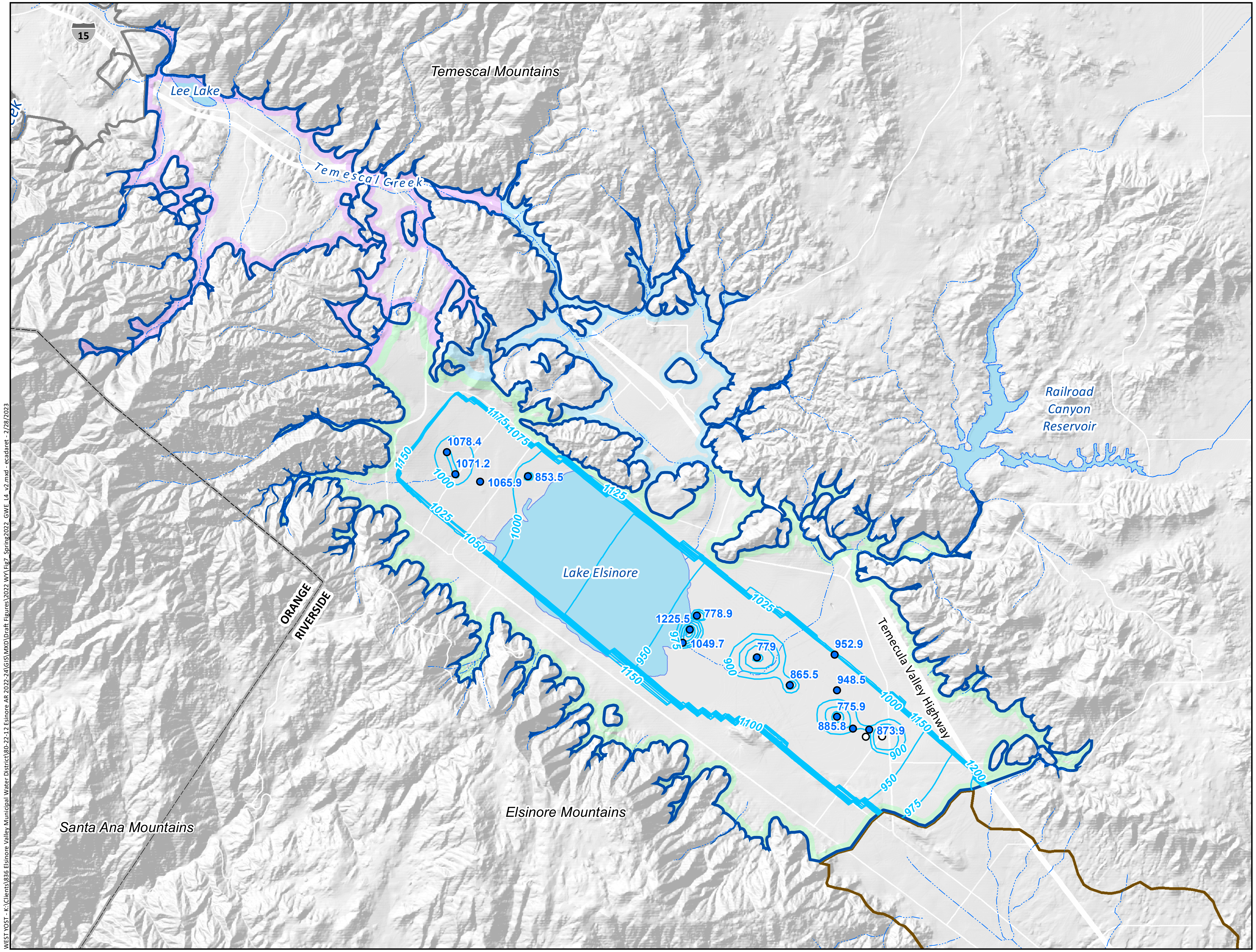

Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Spring 2022 (ft-amsl)

Other Groundwater Monitoring Wells

Groundwater Elevation Contours
Spring 2022 (ft-amsl)

Groundwater Basins as Classified by DWR

Elsinore Valley Groundwater Subbasin (8-004.01)

Bedford-Coldwater Groundwater Subbasin (8-004.02)

Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

Elsinore Valley

Lee Lake

Warm Springs

Hydrology

Streams and Flood Control Channels

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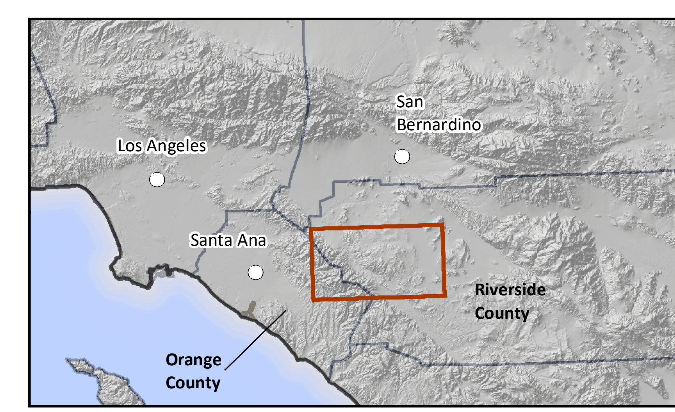
Government Boundaries

County



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Elsinore Valley Municipal Water District
Elsinore Subbasin 2022 Annual Report

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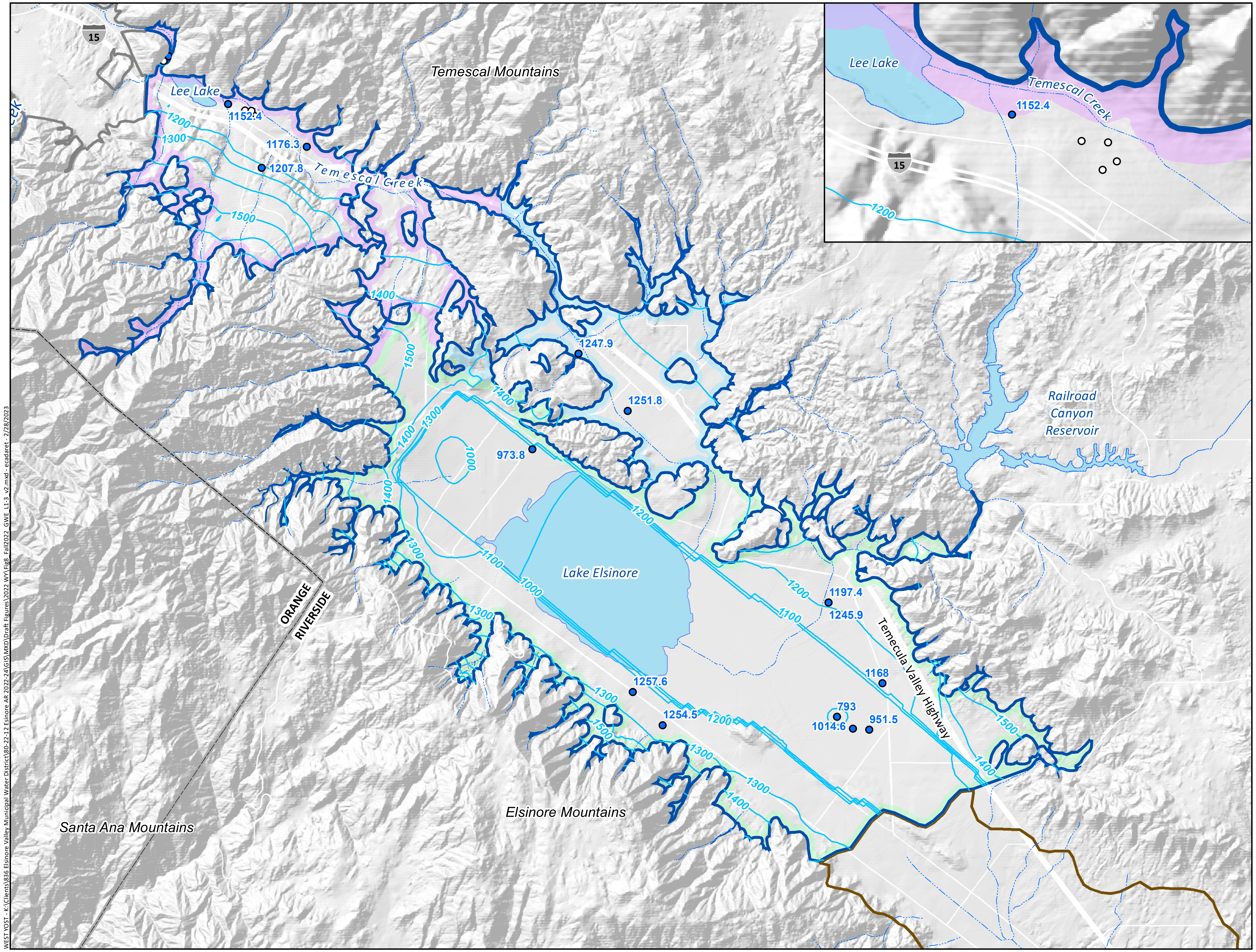
Spring 2022 Groundwater Elevation in Deep Semiconfined Aquifer (Layer 4)

Figure 7



Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Fall 2022 (ft-amsl)

Other Groundwater Monitoring Wells

Groundwater Elevation Contours
Fall 2022 (ft-amsl)

Groundwater Basins as Classified by DWR

Elsinore Valley Groundwater Subbasin (8-004.01)

Bedford-Coldwater Groundwater Subbasin (8-004.02)

Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

Elsinore Valley

Lee Lake

Warm Springs

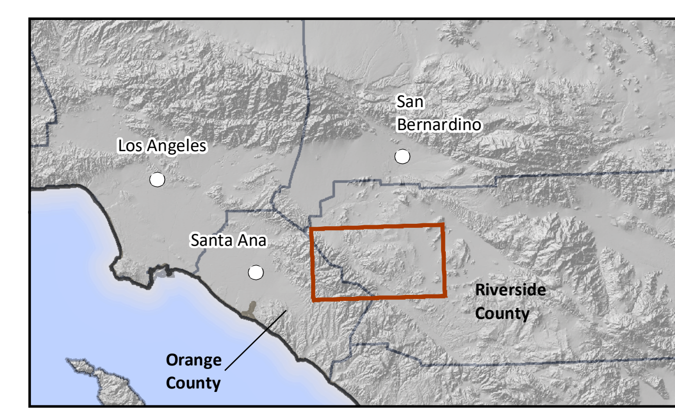
Hydrology

Streams and Flood Control Channels

Lakes and Flood Control Basins

Government Boundaries

County



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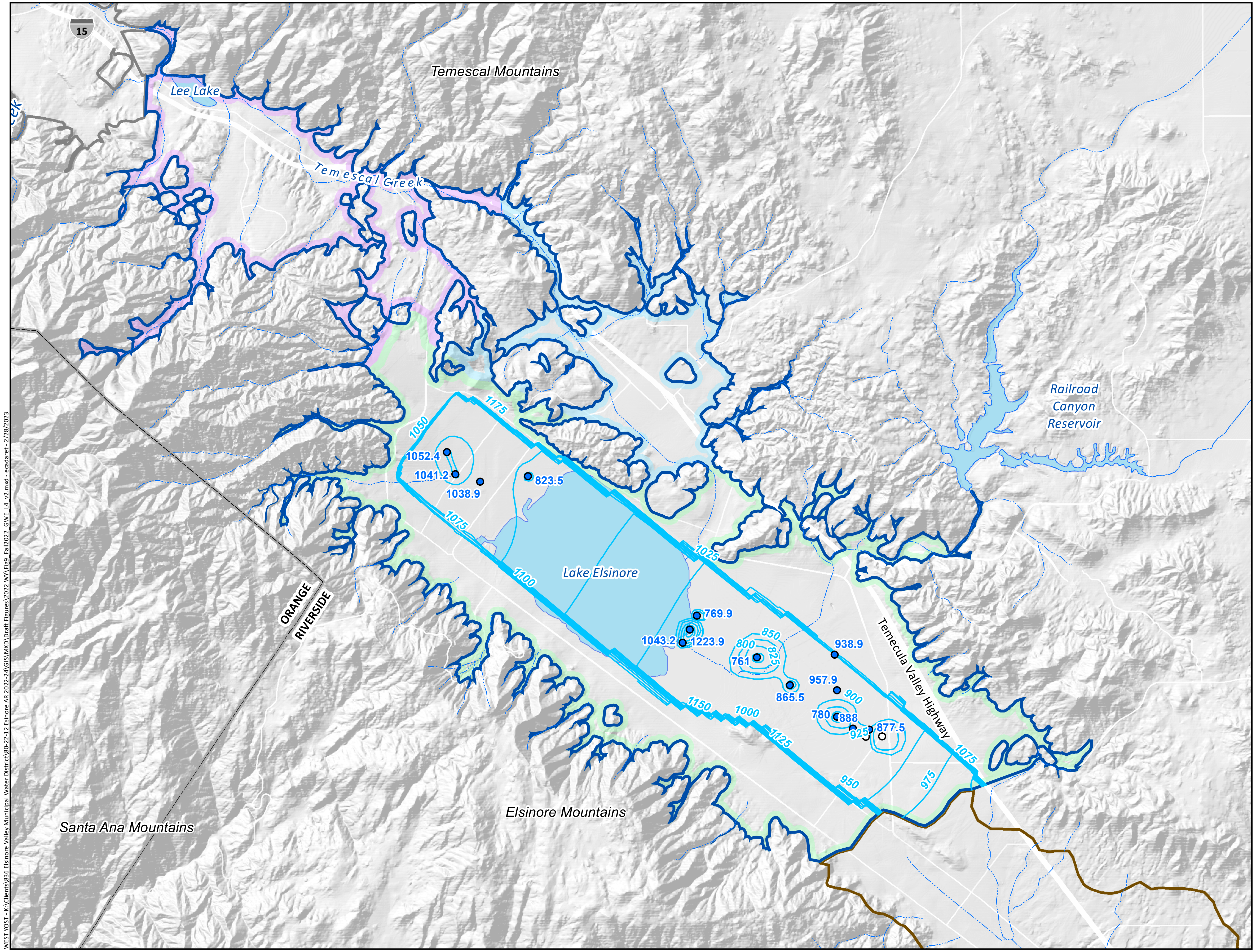
Fall 2022 Groundwater Elevation in Shallow Unconfined Aquifer (Layers 1-3)

Figure 8



Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Fall 2022 (ft-amsl)

Other Groundwater Monitoring Wells

Groundwater Elevation Contours
Fall 2022 (ft-amsl)

Groundwater Basins as Classified by DWR

Elsinore Valley Groundwater Subbasin (8-004.01)

Bedford-Coldwater Groundwater Subbasin (8-004.02)

Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

Elsinore Valley

Lee Lake

Warm Springs

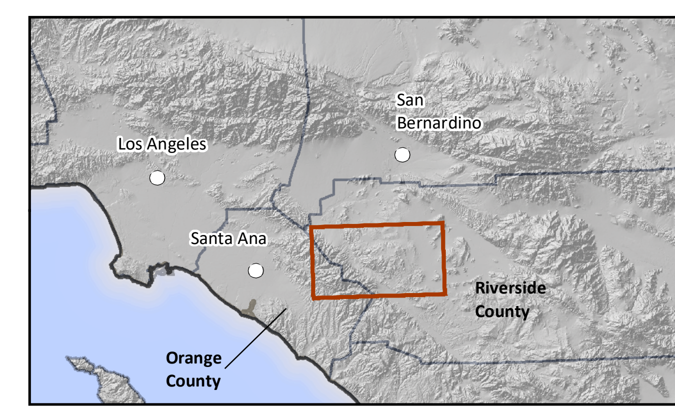
Hydrology

Streams and Flood Control Channels

Lakes and Flood Control Basins

Government Boundaries

County



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0 2 4 Miles

0 3 6 Km

Elsinore Valley Municipal Water District
Elisnore Subbasin 2022 Annual Report

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Fall 2022 Groundwater Elevation in Deep Semiconfined Aquifer (Layer 4)

Figure 9

4.0 WATER USE

4.1 Groundwater Extractions

The primary sectors that extract groundwater in the Basin include:

- **Agriculture**. Agricultural pumping is used to irrigate citrus in the Lee Lake MA.
- **Urban**. Urban pumping is mostly done by EVMWD (approximately 99 percent) and remaining is done by local private pumpers and the City of Lake Elsinore.

Table 7 summarizes the groundwater extractions by sector for 2015 through 2022. The general locations and magnitude of groundwater pumping by sector are shown on Figure 10. Urban municipal and industrial pumping are estimated from groundwater extraction volumes metered at wells within the Basin. Note that since 2019, agricultural irrigation is assumed to be the average of the model-estimated extractions from 2015 – 2018 since not all irrigation wells are regularly monitored. EVMWD has two conjunctive use programs in place: the Metropolitan Water District Conjunctive Use Program (MWDCUP) and the Santa Ana River Conservation and Conjunctive Use Program (SARCCUP). The MWDCUP has a capacity of 4,000 afy and the SARCCUP has a capacity of 1,500 afy. Both programs operate on similar schedules which consist of recharging water at the capacity rate for three years during wet periods and extracting from the basin over several years during droughts. Over time, implementation of these programs will result in a balance of imported water recharged and stored in the aquifer and extractions of imported water from the aquifer. MWDCUP and SARCCUP recharge occurs through in-lieu means by EVMWD reducing pumping by the capacity amount in exchange for an equal increase in imported water deliveries. MWDCUP and SARCCUP extractions consist of increase in pumping in exchange for an equal decrease in imported water deliveries (Todd, 2021). MWDCUP and SARCCUP extractions occurred from WY 2013 to WY 2015 and MWDCUP and SARCCUP recharge occurred from WY 2017 to 2020. Groundwater extraction volumes were not adjusted to account for MWDCUP and SARCCUP recharge and extraction events in the WY 2021 Annual Report. This annual report accounts for the MWDCUP and SARCCUP recharge and extraction events in the accounting of groundwater extraction. Groundwater extraction has increased over the past eight years and has been in balance with imported water use due to MWDCUP and SARCCUP. In WY 2022, approximately 7,225 af of groundwater was extracted. Compared to WY 2021, groundwater extractions increased due to previously offline wells were put back in operation.

Table 7. Groundwater Extractions by Sector - WY 2015 to 2022

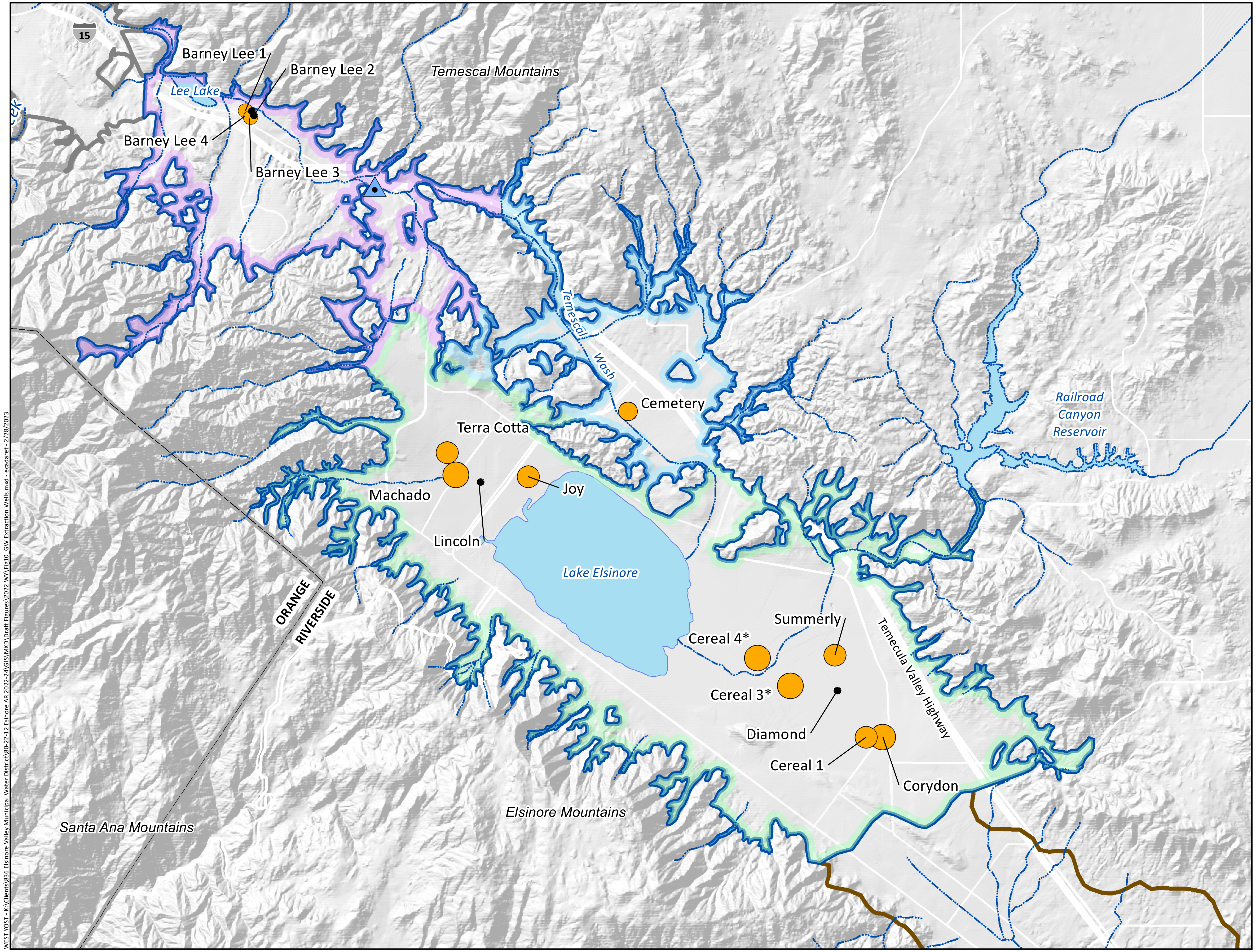
Groundwater Use Type	Annual Groundwater Extraction[(a)], acre-feet							
	2015	2016	2017	2018	2019	2020	2021	2022
Agricultural	296	346	317	345	336	336	336	336
Urban & Industrial	3,753*	5,354*	4,767*	5,837*	4,632*	6,627*	4,323	6,889
Total Groundwater Extraction	**4,049**	**5,700**	**5,084**	**6,182**	**4,968**	**6,963**	**4,659**	**7,225**

Source: Todd, 2021: agricultural pumping from 2015 - 2018 that occurred in the Lee Lake MA was estimated in the GSP using the model based on evaporative demand and crop characteristics. Values for 2019 - 2021 were averaged from the 2016 - 2018 values.

(a) EVMWD 2020 UWMP water use calculations are based on calendar year and in this report water use calculations are based on water year which resulted in differences.

* Years with an asterisk represent year when there were recharge and extraction events under the MWDCUP and SARCCUP. The imported water use volumes were adjusted to account for these activities.

Note: Urban & Industrial groundwater extractions values reported in the WY 2021 Annual Report double counted pumping from Lee Lake MA. The groundwater extractions values included herein are the correct volumes



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Groundwater Extractionin WY 2022 (af)

- No pumping
- 0.01 - 0.5
- >0.5 - 1
- >1 - 50
- >50 - 500
- >500 - 2000
- Private Well with Unknown Groundwater Extraction

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

- Elsinore Valley
- Lee Lake
- Warm Springs

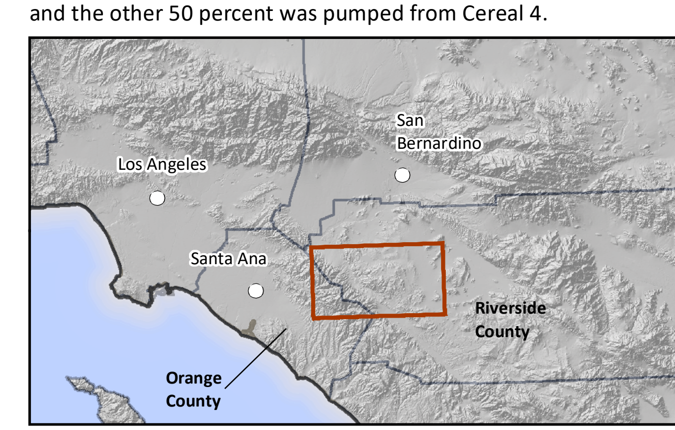
Hydrology

- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County

*Note: Pumping from Cereal 3 and Cereal 4 are combined and treated at the Back Basin Groundwater Treatment Plant (BBGWTP). Individual pumping volume for these wells are not provided and only total volume for the BBGWTP is provided in 2022. It is assumed that 50 percent of total treated volume was pumped from Cereal 3 and the other 50 percent was pumped from Cereal 4.



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Elsinore Valley Municipal Water District
Elisnore Subbasin 2022 Annual Report

Prepared for:

Urban Groundwater Extraction in 2022

Figure 10

4.2 Surface Water Use

Table 8 summarizes imported water, local surface water, and recycled water use within the Basin over the past eight years from WY 2015 through WY 2022. The following is a summary of each surface water supply, its sources, uses, and change in use over this period:

- **Imported Water**. Imported water delivered to EVMWD comes from two surface water treatment facilities: Skinner Filtration Plant and Miller Filtration Plant. Treated water from Skinner Filtration Plant is conveyed to EVMWD via the Auld Valley Pipeline, and EVMWD has the rights to purchase up to 27,000 afy of that conveyance, but annual use is limited by hydraulic conditions to approximately 22,500 afy (MWH, 2016). Water purchased from WMWD is treated at MWDSC's Mills Filtration Plant. Treated water from Mills Filtration Plant is conveyed to EVMWD via the Mills Gravity Pipeline and the Temescal Valley Pipeline (TVP). EVMWD may obtain up to 12,700 afy of imported water via the TVP (MWH, 2016) and can increase its use of water from Mills Filtration Plant with implementation of additional pumping capacity. Imported water is also used for a conjunctive water management program where EMVWD uses imported water in-lieu of groundwater to recharge the Basin. Imported water is now use conjunctively to offset groundwater pumping that occurs in dry years when there's additional imported water supply available in wet years. Imported water makes up over two thirds of the water used in the Basin.

  As noted in Section 4.1, EVMWD has two conjunctive use programs in place. Imported water volumes were not adjusted to account for MWDCUP and SARCCUP recharge and extraction events in the WY 2021 Annual Report. This annual report accounts for the MWDCUP and SARCCUP recharge and extraction events in the accounting of imported water use.

  In WY 2022, approximately 15,933 af of imported water was used to meet potable water supply demand. Imported water use over the past eight years has been relatively stable and in balance with groundwater pumping due to use of MWDCUP and SARCCUP. Compared to WY 2021, imported water deliveries decreased in WY 2022 due to several groundwater wells that were previously inactive for several months for maintenance or repair being brought back online that offset imported water deliveries.

- **Local Surface Water**. Local surface water from the San Jacinto River, Salt Creek, and other local surface runoff is impounded at Canyon Lake (i.e., Railroad Canyon Reservoir). Water from Canyon Lake is imported into the Basin and treated at the Canyon Lake Water Treatment Plant (WTP) before being distributed to the potable water system. The Canyon Lake WTP is a conventional WTP with a design capacity of 9 MGD. Production typically ranges from 4.5 to 7 MGD based on water quality conditions and operational limitations. In WY 2022, no local surface water was used to meet potable water supply demand due to drought conditions when the minimum Canyon Lake level drops below 1,372 ft-amsl. Local surface water use over the past eight years has decreased by 2,509 af.

- **Recycled Water** Recycled water is used as the source of supply for both non-potable use for irrigation and managed wetlands. Four wastewater reclamation facilities (WRFs) supply non-potable recycled water for irrigation of recreational landscape areas. They include Railroad Canyon WRF, Horsethief Canyon WRF, Santa Rosa WRF, and Regional WRF. The Railroad Canyon WRF and Horsethief Canyon WRF have capacities of 1.12 MGD and 0.5 MGD, respectively. Both deliver recycled water for landscape irrigation within the Basin. The Santa Rosa WRF delivers recycled water for landscape irrigation purposes through the Wildomar Recycled Water System through Eastern MWD's Temescal Valley Recycled Water Pipeline (TVRWP). The Regional WRF plant has a treatment capacity of 7.5 MGD and delivers recycled water for landscape irrigation within the Basin. Regional WRF also discharges recycled water into Temescal Wash, San Jacinto River and Lake Elsinore for managed wetland use at approximately 0.5 MGD. In WY 2022, approximately 7,987 af of recycled water was used to meet irrigation and managed wetlands water demand. Recycled water use over the past eight years has increased by 689 af. The increase in recycled water use may be driven by increased recycled water utilization from Santa Rosa WRF over this period.

Table 8. Imported Water, Local Surface Water, and Recycled Water Use - WY 2015 to 2022

Water Type	Primary Water Use	Annual Water Use, acre-feet							
		2015	2016	2017	2018	2019	2020	2021	2022
Imported Water[(a)]	Potable Use	15,787*	16,311*	14,582*	17,025*	14,336*	14,124*	18,954	15,933
Local Surface water from Canyon Lake WTP	Potable Use	2,509	168	2,351	1,158	1,832	582	0	0
	Imported and Surface Water Subtotal	18,296	16,479	16,933	18,183	16,169	14,706	18,954	15,933
Recycled Water from Railroad Canyon WRF	Non-potable use, irrigation	228	506	474	556	441	487	509	457
Recycled Water from Horsethief Canyon WRF	Non-potable use, irrigation	430	234	227	248	197	206	241	221
Recycled Water from Santa Rosa WRF[(b)]	Non-potable use, irrigation	171	257	232	332	362	362	411	469
Recycled water from Regional WRF for irrigation	Non-potable use, irrigation	5	5	5	5	5	5	5	4
Recycled water from Regional WRF discharged to Temescal Wash	Managed wetlands	625	642	589	622	520	569	540	725
Recycled water from Regional WRF discharged to Lake Elsinore	Managed wetlands	5,598	4,853	5,265	4,757	6,118	6,037	5,915	5,948
Supplemental Recycled Water from Eastern MWD[(c)]	Non-potable use, irrigation	241	139	178	175	159	114	171	164
	Recycled Water Subtotal	7,298	6,636	6,970	6,696	7,803	7,780	7,791	7,987
	Total Surface Water Use	**25,594**	**23,115**	**23,903**	**24,879**	**23,971**	**22,485**	**26,745**	**23,921**

(a) Imported water from Mills and Skinner Plants.

(b) Under a three-agency agreement between Elsinore Valley MWD, the Eastern MWD, and the Rancho California Water District (RCWD), recycled water from the Santa Rosa WRF is conveyed to the Wildomar recycled water system through the Eastern MWD's Temecula Valley Recycled Water Pipeline (TVRWP). Under this agreement, Elsinore Valley MWD has the right to access recycled water supply from the Santa Rosa WRF in an amount equal to the wastewater generated in Elsinore Valley MWD's Southern sewershed.

(c) Elsinore Valley MWD purchases recycled water from Eastern MWD to supplement recycled water supply during summer months when irrigation demand is high.

* Years with an asterisk represent year when there were recharge and extraction events under the MWDCUP and SARCCUP. The imported water use volumes were adjusted to account for these activities.

4.3 Total Water Use

Total water use in the Basin is sourced from groundwater, imported water, local surface water, and recycled water. Table 9 summarizes the total water use in the Basin over the past eight years from WY 2015 to WY 2022. Total water use increased by 1,504 af over this period. In WY 2022, we saw a decrease in imported water and an increase in pumping of groundwater due to several wells that were offline for part of or for the entire WY 2021 being brought back online.

Table 9. Total Water Use - WY 2015 to 2022

Water Type	Annual Water Use(c), acre-feet							
	2015	2016	2017	2018	2019	2020	2021	2022
Groundwater	4,049*	5,700*	5,084*	6,182*	4,968*	6,963*	4,659	7,225
Imported Water(a)	15,787*	16,311*	14,582*	17,025*	14,336*	14,124*	18,954	15,933
Local Surface Water from Canyon Lake WTP	2,509	168	2,351	1,158	1,832	582	0	0
Recycled Water(b)	7,298	6,636	6,970	6,696	7,803	7,780	7,791	7,987
Total Water Use	**29,643**	**28,815**	**28,988**	**31,061**	**28,939**	**29,449**	**31,405**	**31,146**

(a) Imported water from Mills and Skinner Plants

(b) Includes recycled water from Railroad Canyon WRF, Horsethief Canyon WRF, Santa Rosa WRF, Regional WRF, and supplemental recycled water from Eastern MWD.

(c) EVMWD 2020 UWMP water use calculations are based on calendar year and in this report water use calculations are based on water year which resulted in differences.

* Years with an asterisk represent year when there were recharge and extraction events under the MWDCUP and SARCCUP. The imported water use volumes were adjusted to account for these activities.

5.0 CHANGE IN GROUNDWATER STORAGE

This section describes the methods used to compute the change in storage for the reporting period, reports the change in storage for spring 2021 to spring 2022, and compares the change in storage to the history of storage changes and annual groundwater extractions. Note that the storage change estimates reported herein are preliminary estimates and are not intended to be used to change management actions under the GSP. Detailed evaluations of changes in groundwater conditions will be performed every five years consistent with SGMA and the GSP. For the purpose of this compliance report, the change in storage methods applied herein will be used for each Annual Report for the Basin to the DWR in order to provide year-over-year comparisons reported therein. Future reports may include revised estimates of historical changes in storage based on changes in the methods over time.

5.1 Change in Storage Methods

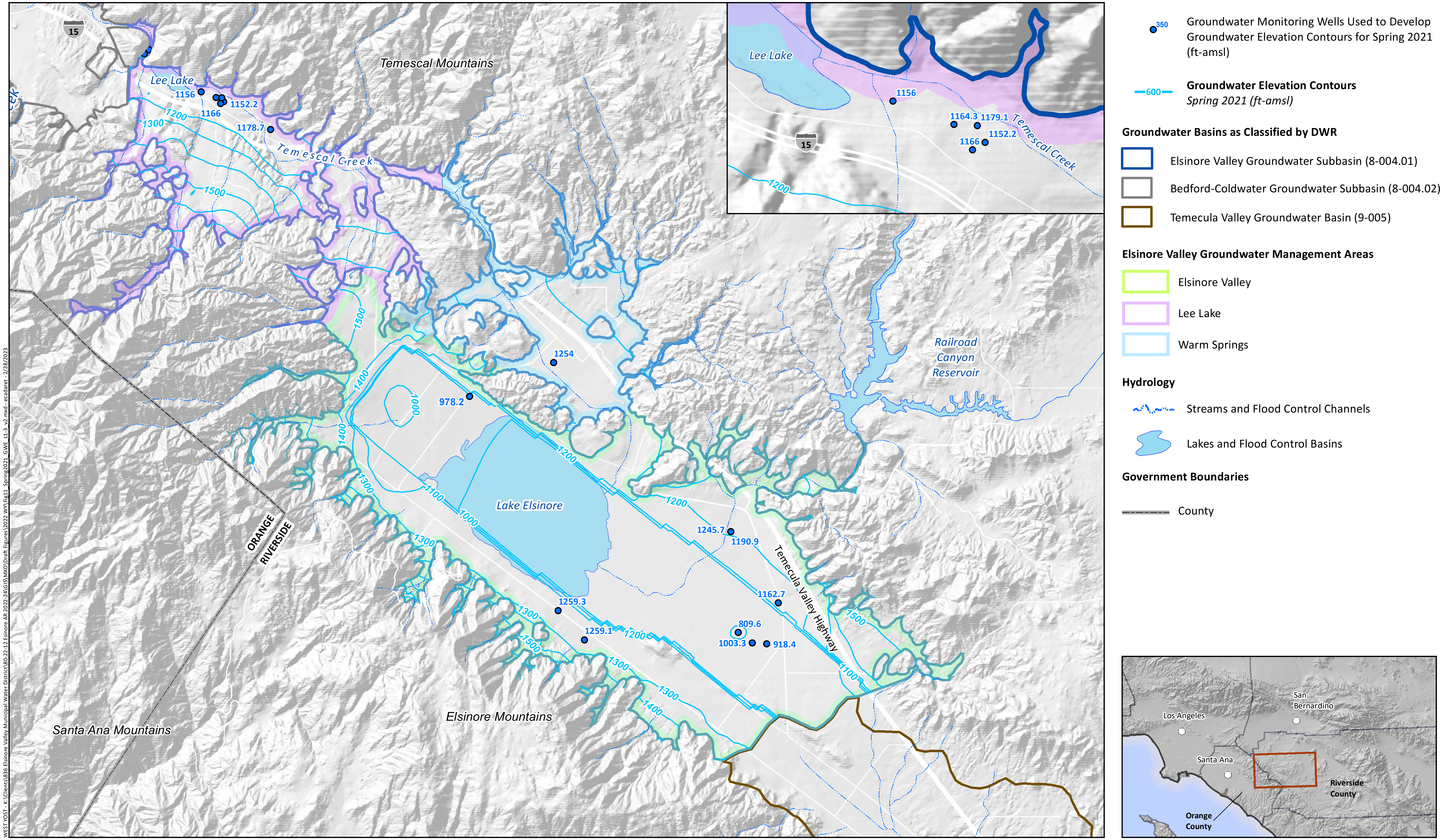
As previously noted in Section 1.2, the four principal aquifers of the Basin are considered to comprise two aquifers: shallow unconfined and deep semiconfined. The change in volume of groundwater stored in the Basin subsurface is not a parameter that can be directly measured; rather, change in storage must be estimated using model aquifer properties and groundwater elevation data collected at monitoring wells. For this reporting period, the one-year change in storage was computed for spring 2021 to spring 2022.

The information required to estimate the change in storage for the Basin includes:

- Groundwater elevation maps for spring 2021 generated from the WY 2021 Annual Report and spring 2022 generated in this WY 2022 Annual Report.
- 100 x 100 ft cell storage grid for the shallow aquifer and deep aquifer superimposed over the Basin area to assign groundwater elevations and aquifer properties.
- The specific yield of the aquifer sediments where the change in groundwater elevations occurred. Specific yield is a ratio of the volumetric fraction that a bulk aquifer volume will yield when the water drains out by gravity.

Figure 11 and Figure 12 show the groundwater-elevation contours for spring 2021 for the shallow unconfined aquifer (layers 1- 3) and spring 2021 for the deep semiconfined aquifer (layer 4), respectively.

Figure 13 shows the storage change grid superimposed over the basin for the shallow and deep aquifer. The shallow aquifer and deep aquifer grid domains include a total of 96,786 cells and 31,636 cells, respectively. To assign aquifer properties to each grid cell, the storage grid was superimposed over the model grid. The model grid is subdivided vertically into four layers. Each layer within a Basin model grid cell has specific yield values unique to each layer based on textural analysis of the lithologic logs. The estimated average specific yield of the shallow aquifer is 6.0 percent, while the deep aquifer is 2.8 percent. Because the entire Basin behaves in a predominantly unconfined to semi-confined/confined manner, the specific yield values for each model grid cell were averaged across the upper three layers of the model to create one value of average specific yield per grid cell and the lowest aquifer used the specific yield that was originally assigned in the model. Then, a one-to-one spatial join using a closest match option was performed to join the Basin grid averaged specific yield values to the 100 ft by 100 ft storage change grid shown on Figure 13. A specific yield of zero (0) was assigned to all grid cells outside the model grid domain. Figure 13 shows the grid cells included in the change in storage calculation.



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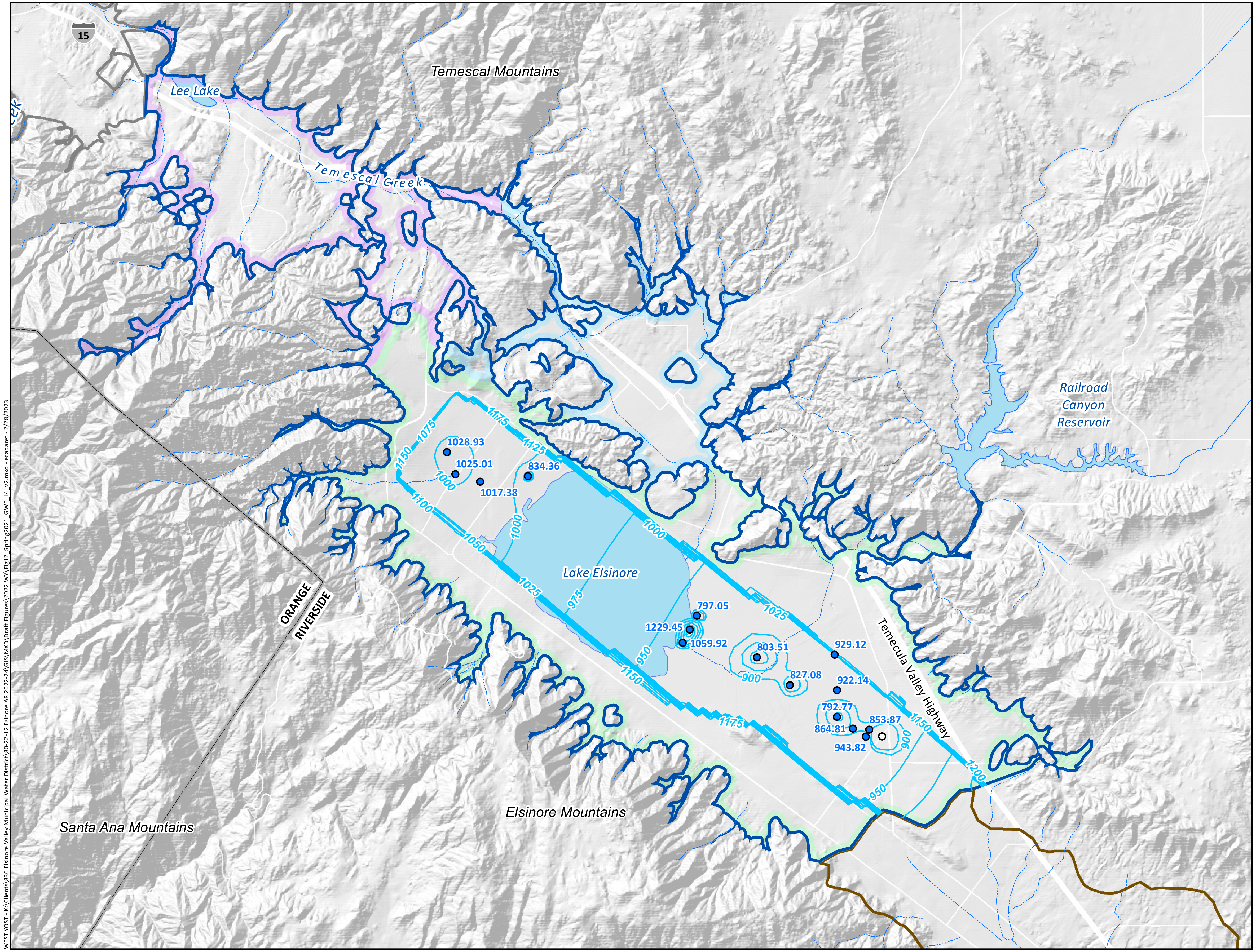
Elsinore Valley Municipal Water District
Elsinore Subbasin 2022 Annual Report

Prepared for:

Spring 2021 Groundwater Elevation in Shallow Unconfined Aquifer (Layers 1-3)

Figure 11



Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Spring 2021 (ft-amsl)

Other Groundwater Monitoring Wells

Groundwater Elevation Contours
Spring 2021 (ft-amsl)

Groundwater Basins as Classified by DWR

Elsinore Valley Groundwater Subbasin (8-004.01)

Bedford-Coldwater Groundwater Subbasin (8-004.02)

Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

Elsinore Valley

Lee Lake

Warm Springs

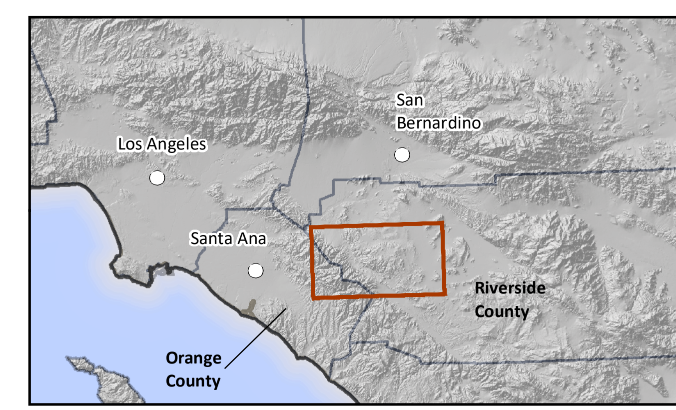
Hydrology

Streams and Flood Control Channels

Lakes and Flood Control Basins

Government Boundaries

County



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Elsinore Subbasin 2022 Annual Report

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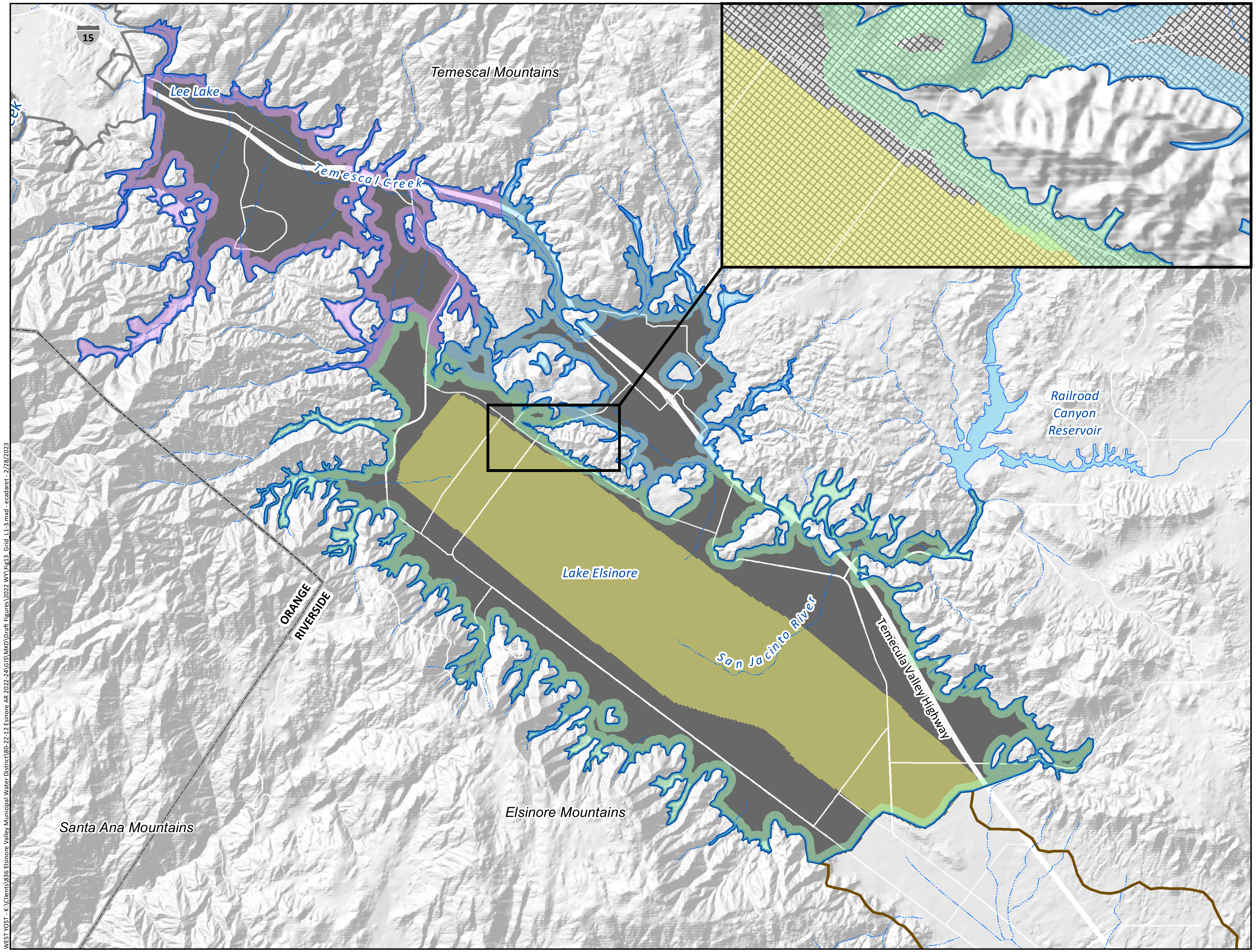
Spring 2021 Groundwater Elevation in Deep Semiconfined Aquifer (Layer 4)

Figure 12



Groundwater Storage Change Grid

- Storage Change Grid *(100 ft x 100 ft cell)*
- Grid Cells Used to Compute Storage Change (Layers 1-3)
- Grid Cells Used to Compute Storage Change (Layer 4)

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

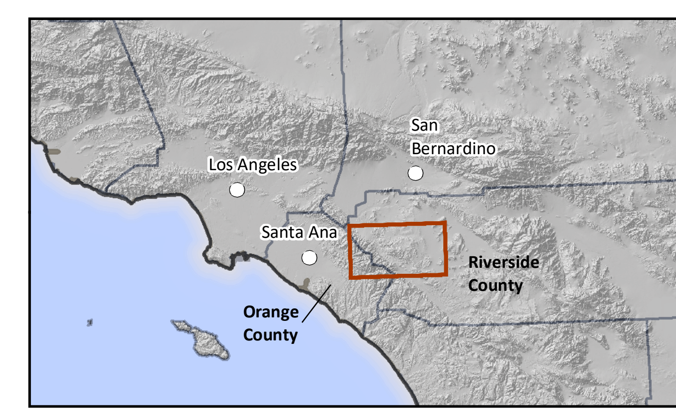
- Elsinore Valley
- Lee Lake
- Warm Springs

Hydrology

- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County



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Elsinore Valley Municipal Water District
Elsinore Subbasin 2022 Annual Report

Prepared for:

Storage Change Grid Used to Compute Storage Change for Layers 1--4

Figure 13

The annual change in storage was calculated at the grid-cell level using the following equation:

$$Change\ in\ Storage_i = \left(GWE_i^{t1} - GWE_i^{t0}\right) \times S_{y_i} \times A$$

where *i* represents a unique cell within the storage change calculation grid, *GWE* is the interpolated groundwater elevation at cell *i*, S*y* is the specific yield defined at cell *i*, A is the area of each cell, and *t1* and *t0* are the two years between which storage change is calculated.

For the purposes of calculating change in storage, water level data and aquifer properties for all four model layers described in the model appendices (Todd, 2021) were reviewed. It was determined that model layers 1 through 3 consist of wells that are representative of the shallow unconfined aquifer and model layer 4 consists of wells that are representative of the deep semiconfined aquifer. Figure 14 shows a schematic of layering in the model and layer thickness. Model layers 1 through 3 consist of consist of alluvial deposits and weathered bedrock (all MAs), Bedford Canyon Formation (Lee Lake MA), Silverado Formation (Warm Springs MA), and a semi-confining clay (Elsinore MA). Model layer 4 consists of the semi-confining to confining Pauba Formation.

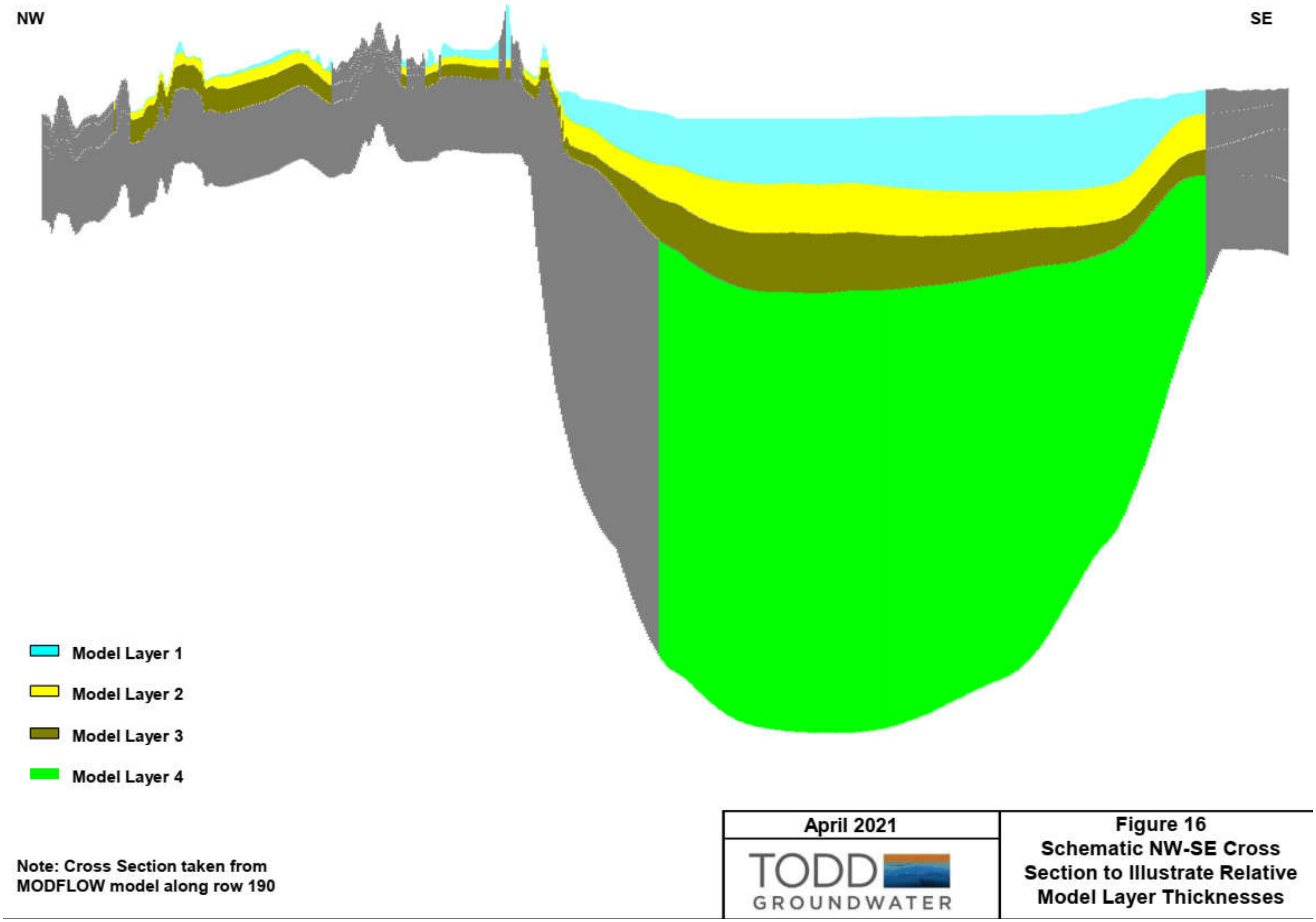
Contours generated from the model for spring 2018 were used as a basis for hand contouring spring 2019, spring 2020, spring 2021, and fall 2021 contours for both the shallow and deep aquifers because the model generated contours account for complex geologic structures and aquifer properties. These results were reported in the WY 2021 Annual Report. Spring and Fall 2022 contours were generated by hand for the WY 2022 Annual Report for both the shallow and deep aquifers based on the spring and fall 2021 contours. These hand-generated contours were digitized in a Geographic Information System (GIS). Interpolated groundwater elevation values for each set of contours were generated in GIS. The groundwater elevation values for each grid cell were assigned to the Basin grid that contained the averaged specific yield values as described above. The sum of the change in storage values by grid cell provided an estimate of the total annual change in groundwater in storage in the Basin and for each management area.

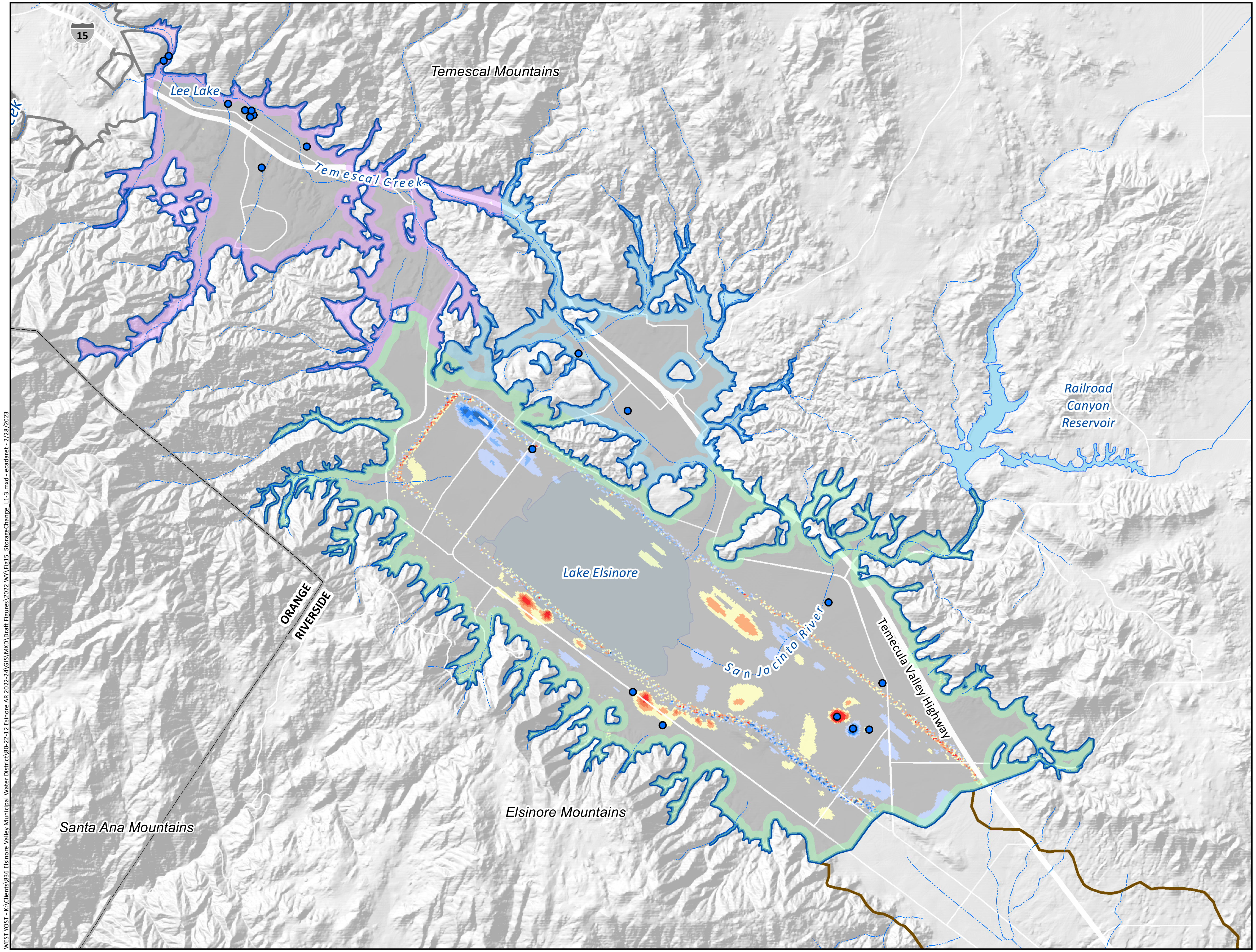
5.2 Annual and Cumulative Change in Storage

Figure 15 and Figure 16 show the spatial distribution of the change in groundwater storage volume from spring 2021 to spring 2022 for the shallow and deep aquifers and the location of monitored wells within the Basin. The total change in storage from spring 2021 to spring 2011 was about 98 af.

Table 10 summarizes the annual spring to spring change in storage for each MA, and the Basin as whole, and the cumulative change in storage for spring 2015 through spring 2022. The spring 2015 to spring 2018 annual change in storage values were derived from the model-estimated change in storage calculations found in the GSP Appendices (Todd, 2021). Since spring 2015, the volume of groundwater in storage in the Basin increased by about 7,206 af.

Figure 14. Model Layering and Thickness (Todd, 2021).





Groundwater Storage Change
Spring 2021 to Spring 2022 (af)

- < -0.4
- -0.4 - -0.3
- -0.3 - -0.2
- -0.2 - -0.1
- -0.1 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- > 0.4

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

- Elsinore Valley
- Lee Lake
- Warm Springs

Hydrology

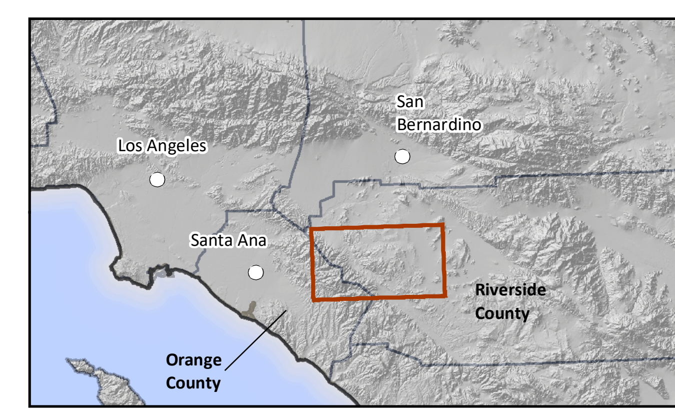
- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County

Wells

- Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Spring 2022 (ft-amsl)



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Prepared by:
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Elsinore Valley Municipal Water District
Elsinore Subbasin 2022 Annual Report

Prepared for:

Change in Groundwater Storage in Shallow Aquifer (Layers 1-3)
Spring 2021 to Spring 2022

Figure 15

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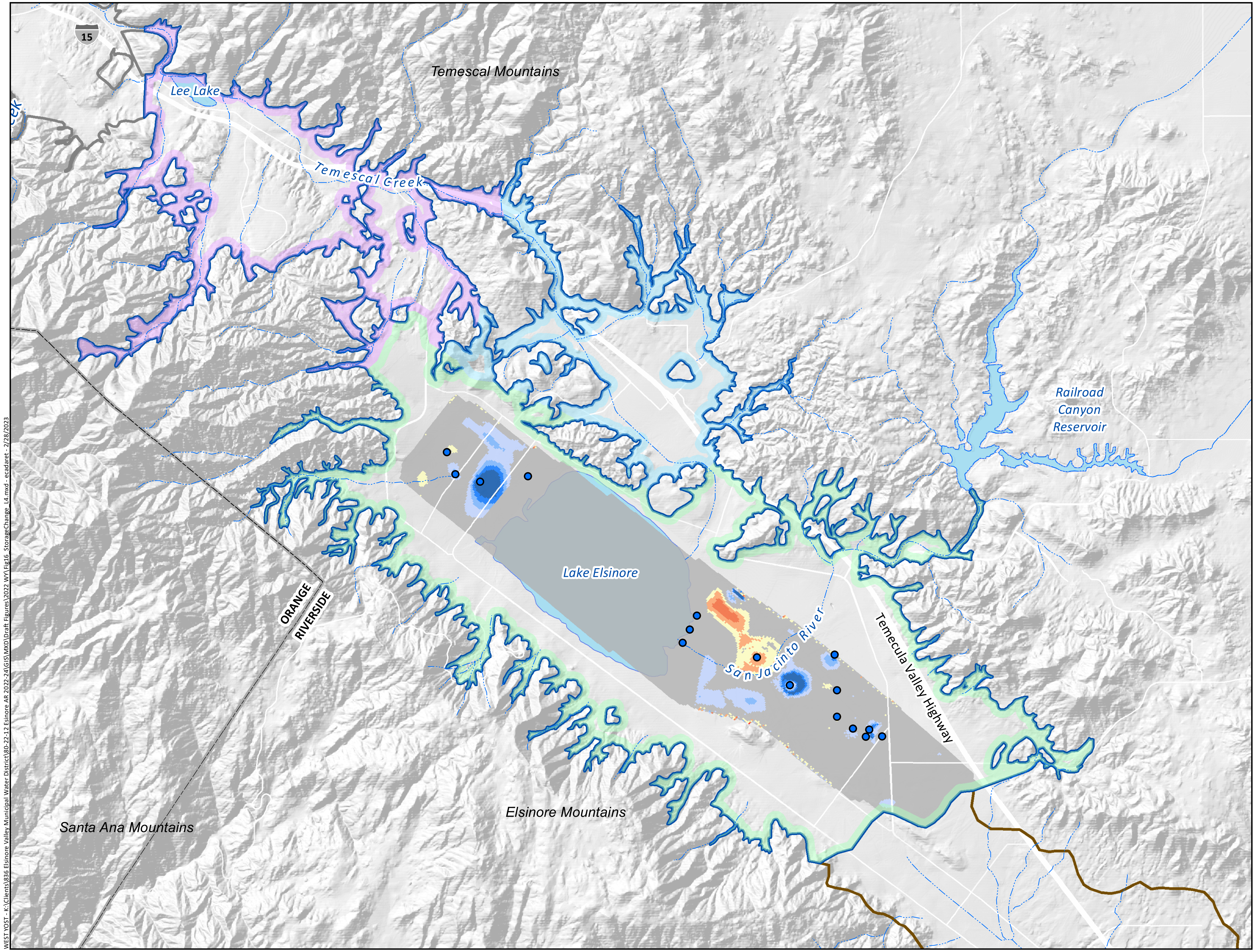


Groundwater Storage Change
Spring 2021 to Spring 2022 (af)

- < -0.4
- -0.4 - -0.3
- -0.3 - -0.2
- -0.2 - -0.1
- -0.1 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- > 0.4

Groundwater Basins as Classified by DWR

- Elsinore Valley Groundwater Subbasin (8-004.01)
- Bedford-Coldwater Groundwater Subbasin (8-004.02)
- Temecula Valley Groundwater Basin (9-005)

Elsinore Valley Groundwater Management Areas

- Elsinore Valley
- Lee Lake
- Warm Springs

Hydrology

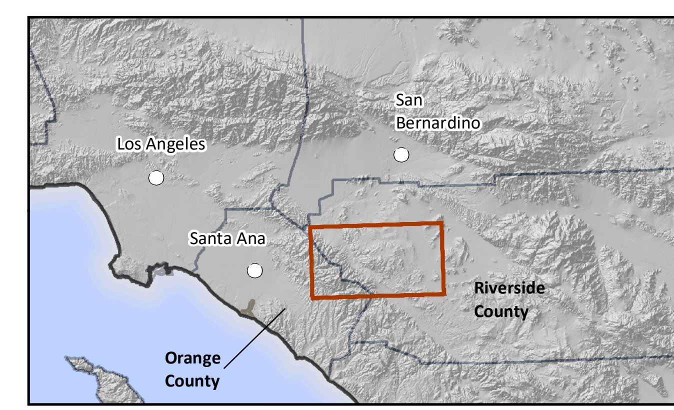
- Streams and Flood Control Channels
- Lakes and Flood Control Basins

Government Boundaries

- County

Wells

- Groundwater Monitoring Wells Used to Develop Groundwater Elevation Contours for Spring 2022 (ft-amsl)



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Elsinore Valley Municipal Water District
Elsinore Subbasin Annual Report

Prepared for:

Change in Groundwater Storage in Deep Aquifer (Layer 4)
Spring 2021 to Spring 2022

Figure 16

Table 10. Annual and Cumulative Change in Groundwater Storage and Annual Groundwater Extractions in Basin

Water Year	Shallow Unconfined (Layers 1 - 3) and Deep Semiconfined Aquifers (Layer 4)				
	Annual Change in Storage in the Lee Lake MA, af	Annual Change in Storage in the Warm Springs MA, af	Annual Change in Storage in the Elsinore Valley MA, af	Annual Change in Storage for the Basin, af	Cumulative Change in Storage, af
Spring 2015	45	-38	-2,774	-2,767	-2,767
Spring 2016	-87	-234	-1,406	-1,727	-4,494
Spring 2017	1,349	255	8,943	10,547	6,053
Spring 2018	-467	-203	373	-297	5,756
Spring 2019	31	1	1,573	1,605	7,361
Spring 2020	0	0	-77	-77	7,284
Spring 2021	-16	0	-160	-176	7,108
Spring 2022	-59	-19	176	98	7,206

Note: Annual change in storage values for Warm Springs MA, Elsinore Valley MA, and the Basin were incorrect in the WY 2021 annual report and had no impact on the cumulative change in storage values. They have been corrected in this report.

Table 11 summarizes the annual spring to spring change in storage for the shallow unconfined aquifer at each MA, the Basin as a whole, and the cumulative change in storage for spring 2019 through spring 2022. Over this period, the volume of groundwater in storage in the shallow aquifer decreased by about -231 af.

Table 11. Annual and Cumulative Change in Groundwater Storage in the Shallow Unconfined Aquifer from Spring 2019 – Spring 2022

Period	Shallow Unconfined Aquifer (Layers 1-3)				
	Annual Change in Storage in the Lee Lake MA, af	Annual Change in Storage in the Warm Springs MA, af	Annual Change in Storage in the Elsinore Valley MA, af	Annual Change in Storage for the Basin, af	Cumulative Change in Storage, af
Spring 2019	31	1	105	137	137
Spring 2020	0	0	-117	-117	20
Spring 2021	-16	0	141	125	145
Spring 2022	-59	-19	-298	-376	-231

Note: Annual change in storage values for Warm Springs MA, Elsinore Valley MA, and the Basin were incorrect in the WY 2021 annual report and had no impact on the cumulative change in storage values. They have been corrected in this report.

Table 12 summarizes the change in storage within the deep semi-confined aquifer in the Elsinore MA annual change in storage from spring to spring and the cumulative change in storage for spring 2019 through spring 2022. Over this period, the volume of groundwater in storage in the deep aquifer increased by 1,681 af.

Table 12. Annual and Cumulative Change in Groundwater Storage in the Deep Semiconfined Aquifer from Spring 2019 – Spring 2022

Period	Deep Semiconfined Aquifer (Layer 4)	
	Annual Change in Storage Elsinore Valley, af	Cumulative Change in Storage, af
Spring 2019	1,468	1,468
Spring 2020	40	1,508
Spring 2021	-301	1,207
Spring 2022	474	1,681

Figure 17 shows the water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the Basin from WY 2015 to WY 2022. As shown in the tables and figures mentioned above, the magnitude of change in storage varies from year to year. Change in storage appears to be generally correlated with an changes in imported water deliveries and pumping since that has allowed groundwater storage in the Basin to increase.

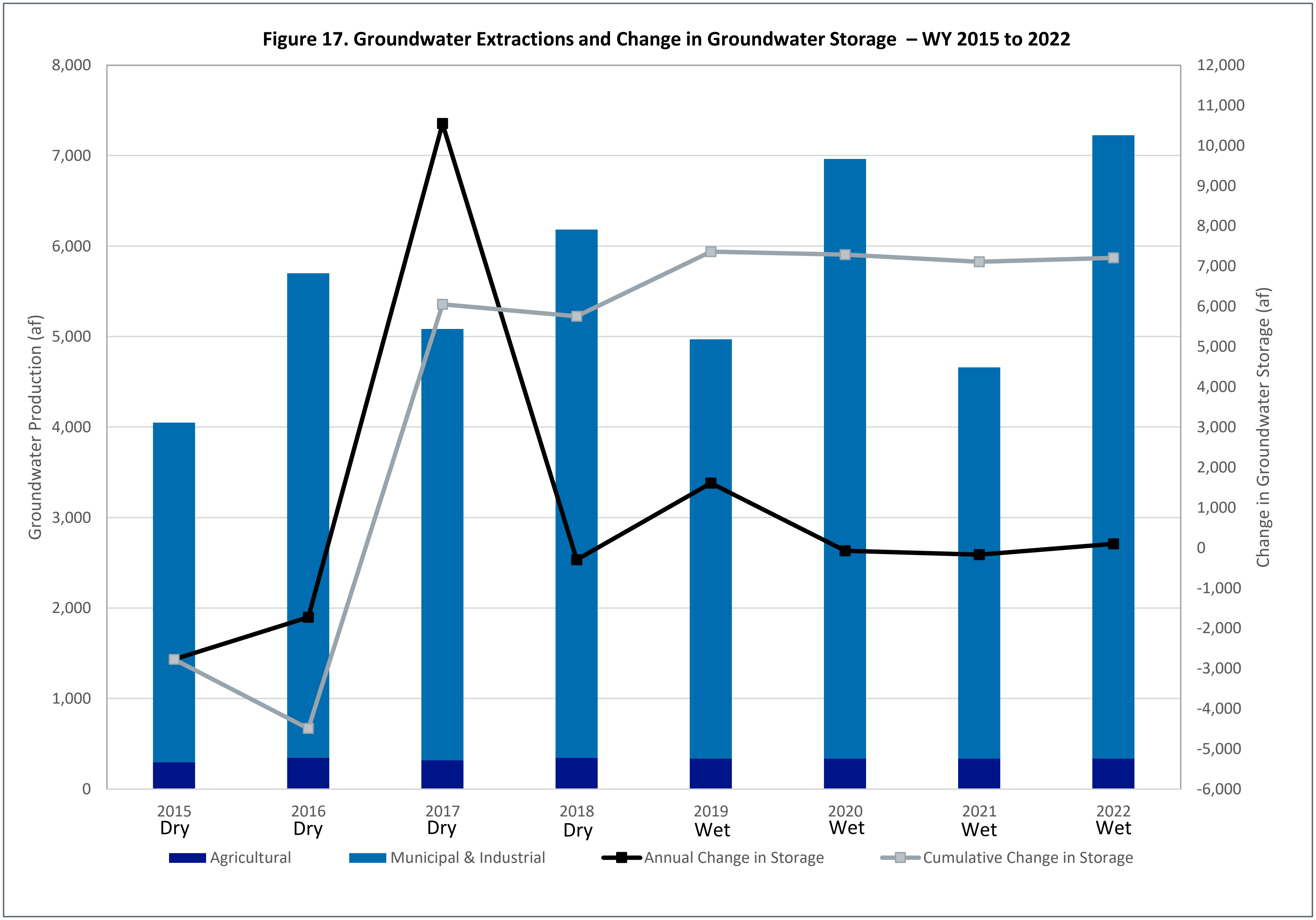

Figure 17. Groundwater Extractions and Change in Groundwater Storage – WY 2015 to 2022
Groundwater Production (af)
Change in Groundwater Storage (af)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000
-5,000
-6,000
2015 Dry
2016 Dry
2017 Dry
2018 Dry
2019 Wet
2020 Wet
2021 Wet
2022 Wet
Agricultural
Municipal & Industrial
Annual Change in Storage
Cumulative Change in Storage

6.0 GSP IMPLEMENTATION PROGRESS

As described in Section 1, completion of the GSP represents a key milestone in achieving groundwater sustainability within the Basin by 2040. Through the formation of the EVGSA and execution of the GSP, the EVGSA has made measurable progress in the initial steps of implementation. The EVGSA was formed in January 2017 and, as of the writing of this report, has held four Regular or Special meetings of the Board to advance the implementation of the GSP.

The following are some of the key milestones accomplished since the formation of the EVGSA:

- Completed the draft GSP in July 2021.
- Adopted the draft GSP on December 16, 2021.
- Submitted the draft GSP to the DWR on January 26, 2022.
- Submitted the Water Year 2021 Elsinore Valley Subbasin Annual Report to DWR on April 1, 2022.
- Submitted the Water Year 2022 Elsinore Valley Subbasin Annual Report to DWR on April 1, 2023.
- Implemented continued groundwater level and water quality monitoring.
- Completed the construction of two monitoring wells located in the Lee Lake and Warm Springs sub-basins in April 2021. Pressure transducers that record groundwater levels and electrical conductivity periodically, are installed in the monitoring wells.

Additional information about all of the activities of the EVGSA can be found on its website at www.evmwd.com.

Table 13 shows the status of sustainable management criteria, and if any MTs were triggered in WY 2022. No MTs were triggered in 2022 and therefore, no mitigation actions were required to be implemented to address a triggered MT.

Table 13. WY 2022 Status of Sustainable Management Criteria

Sustainability Criteria	WY 2022 Status
Chronic Lowering of Groundwater Levels	No exceedance/thresholds were triggered during the reporting period.
Reduction of Groundwater Storage	No exceedance/thresholds were triggered during the reporting period. Fulfilled by MT related to Chronic Lowering of Groundwater Levels.
Degradation of Water Quality	No exceedance/thresholds were triggered during the reporting period. Water quality is managed according to the UTV SNMP and Elsinore SNMP.
Land Subsidence	No exceedance/thresholds were triggered during the reporting period. TRE Altamira InSAR Dataset Vertical Displacement (SGMA Data viewer) (DWR, 2023) data shows no land subsidence occurred in the Basin from 10/1/2021 – 10/1/2022. A full assessment of land subsidence will be completed during the 5-year GSP update.
Depletion of Interconnected Surface Water	No exceedance/thresholds were triggered during the reporting period.

Table 14 provides an overview of PMAs and their status as of 2022. Group 1 Baseline PMAs are currently ongoing and several Group 2 PMAs evaluated against SMCs are in the planning and in design phases. No Group 3 PMAs have been started as of 2022.

Table 14. Projects and Management Actions

Description	Agency	Category	2021 Status	Anticipated Timeframe
Group 1 - Baseline PMAs				
Groundwater production well replacements	EVMWD	Project	Ongoing	Ongoing
Managing pumping in Elsinore MA with in-lieu recharge due to conjunctive use agreements	EVMWD, MWDSC, WMWD	Management Action	Ongoing	Ongoing
Group 2 - PMAs Evaluated Against SMCs				
Begin groundwater pumping in Lee Lake MA for municipal use	EVMWD	Project	In design	2019 - 2023: design and construction. 2024+ implementation and operation
Rotate pumping locations and flows	EVMWD	Management Action	Not started	Can be implemented as needed dependent on groundwater levels
Recycled water IPR	EVMWD	Project	Planning Phase	Dependent on wastewater flow increases
Septic tank conversions	EVMWD	Project	Planning Phase	Dependent on funding sources
Group 3 - Identified PMAs that may be considered in the future				
Imported water recharge and recovery	EVMWD, MWDSC	Project	Inactive	No current anticipated timeline
Stormwater capture and recharge	EVMWD	Project	Not started	No current anticipated timeline
Begin groundwater pumping in Warm Springs MA for municipal use	EVMWD	Project	Not started	No current anticipated timeline

7.0 REFERENCES

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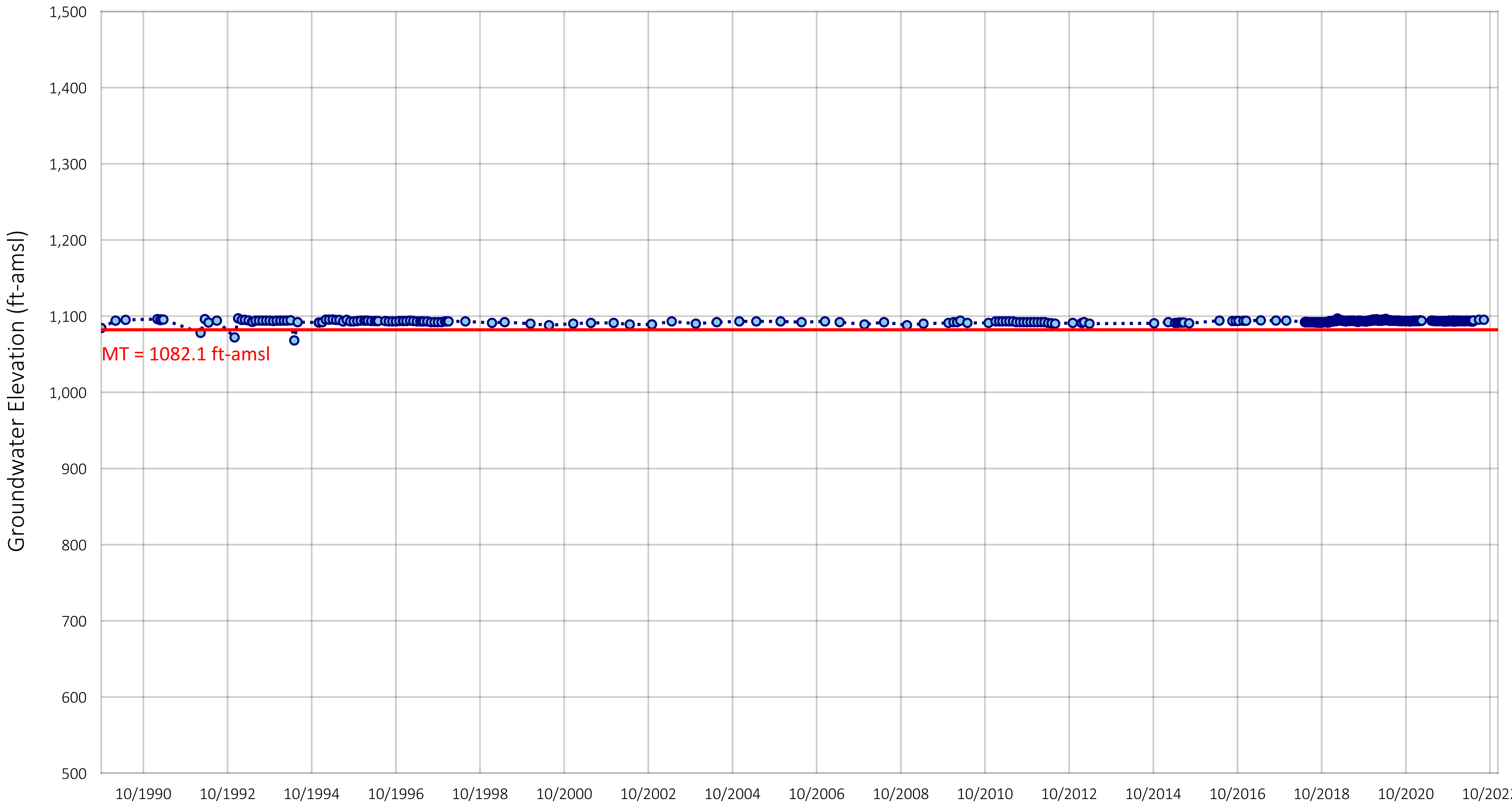
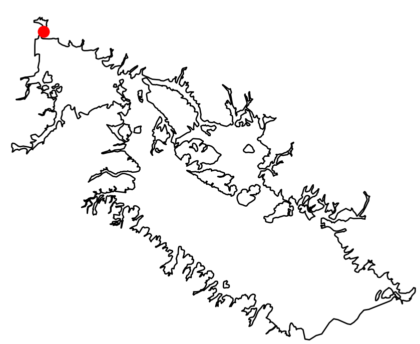
Appendix A

Groundwater Level Time Histories at Monitoring Wells – 1990 to 2022



Location of Well in Elsinore Valley

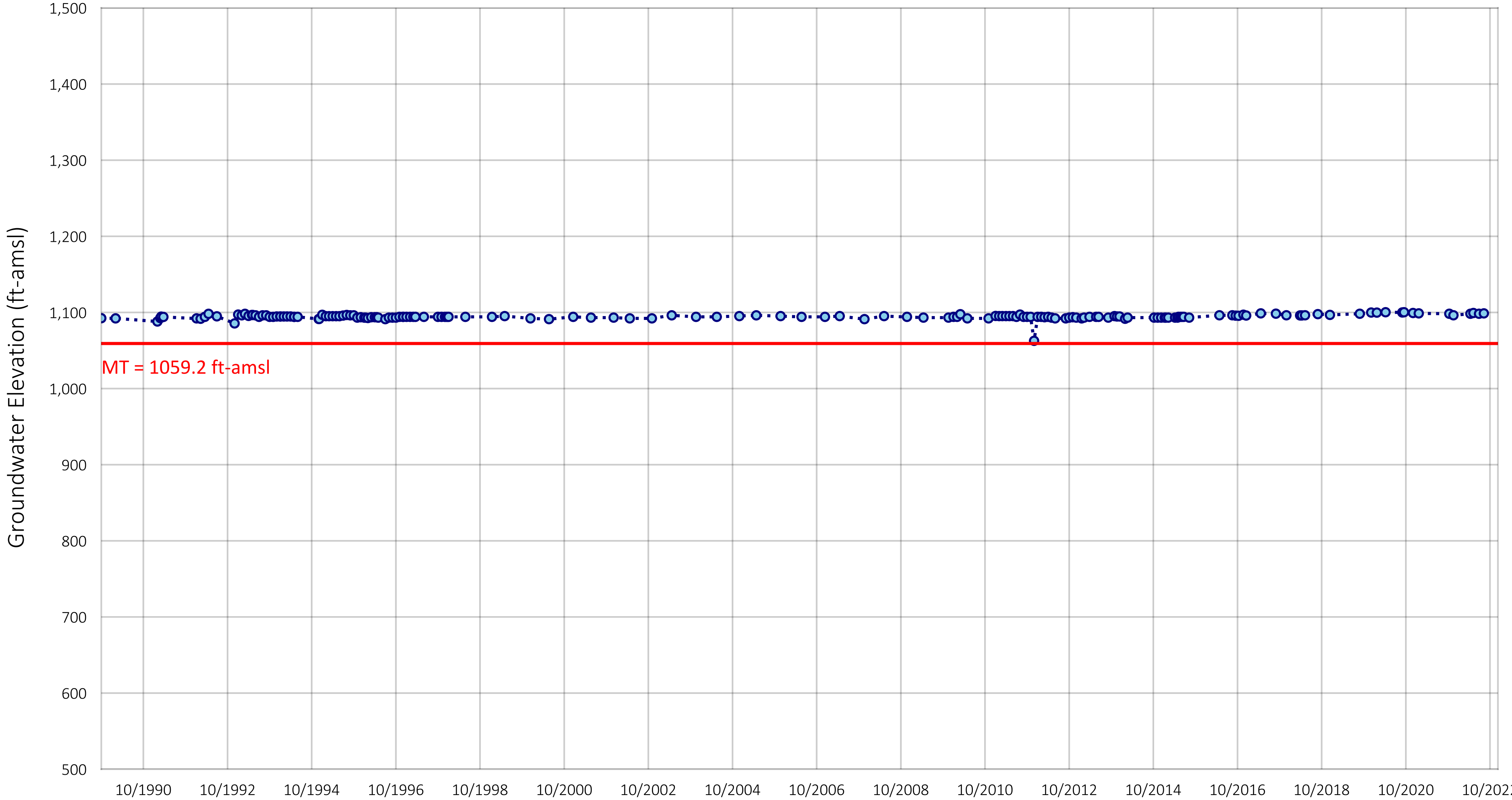


Prepared by:

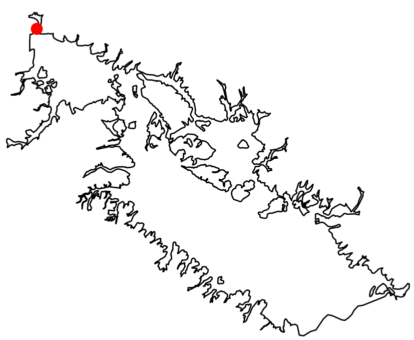
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005774
Well Name: Gregory 1
State Well ID: 05S05W07C01

Figure A-1



Location of Well in Elsinore Valley



Prepared by:

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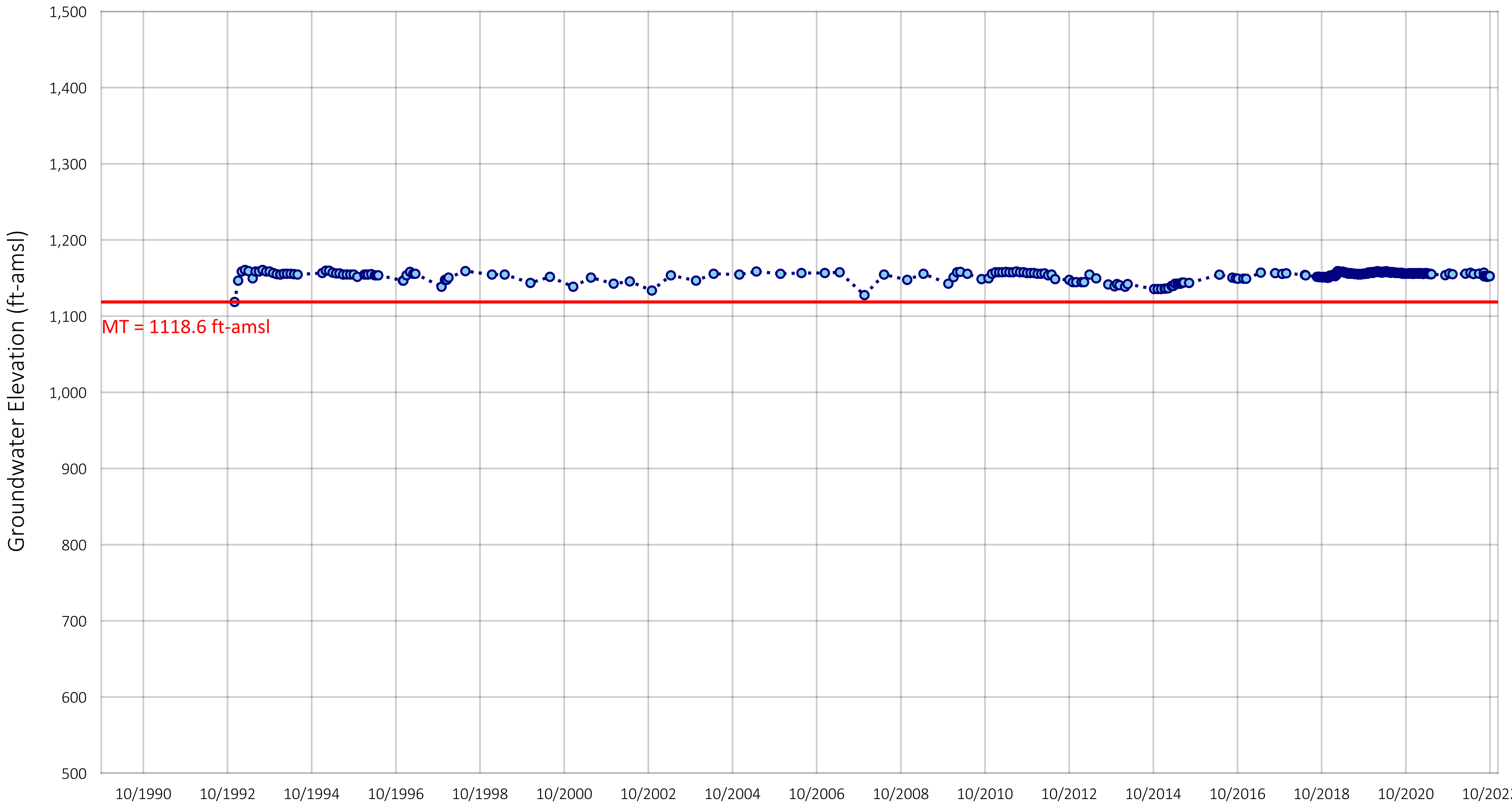
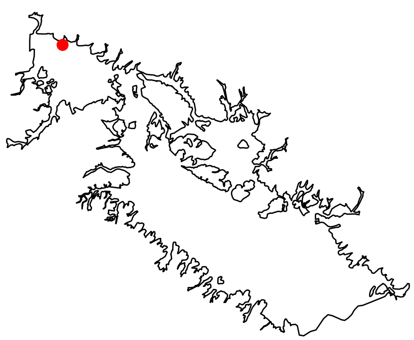
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005775
Well Name: Gregory 2
State Well ID: 05S05W07E01

Figure A-2



Location of Well in Elsinore Valley



Prepared by:

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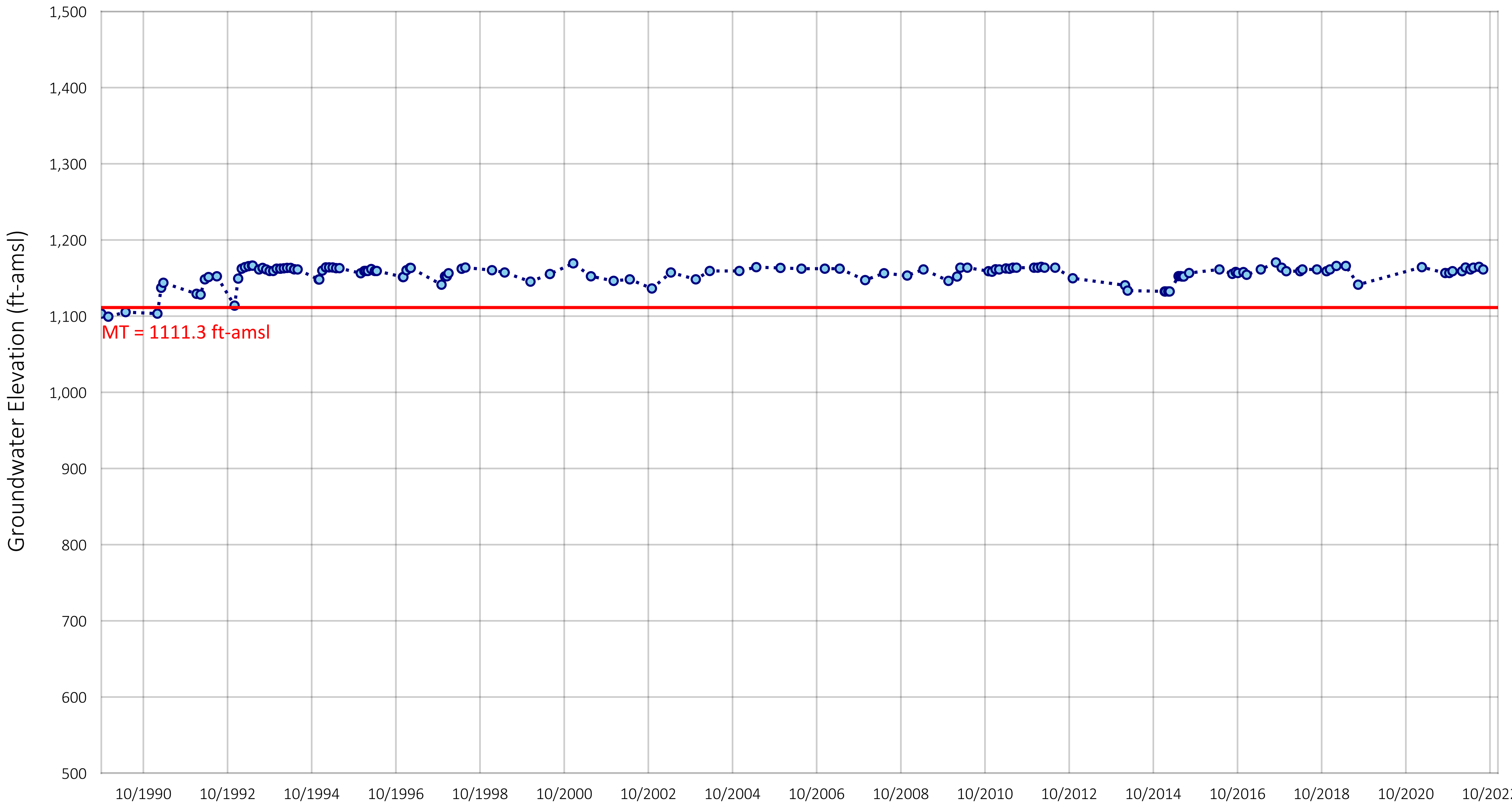
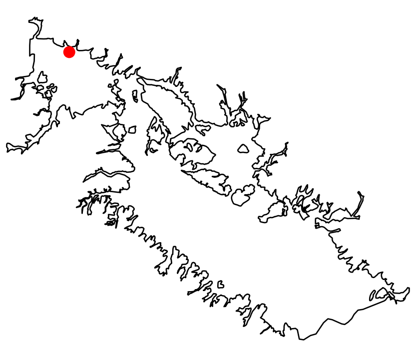
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005777
Well Name: Station 70
State Well ID: 05S05W08N02

Figure A-3



Location of Well in Elsinore Valley



Prepared by:

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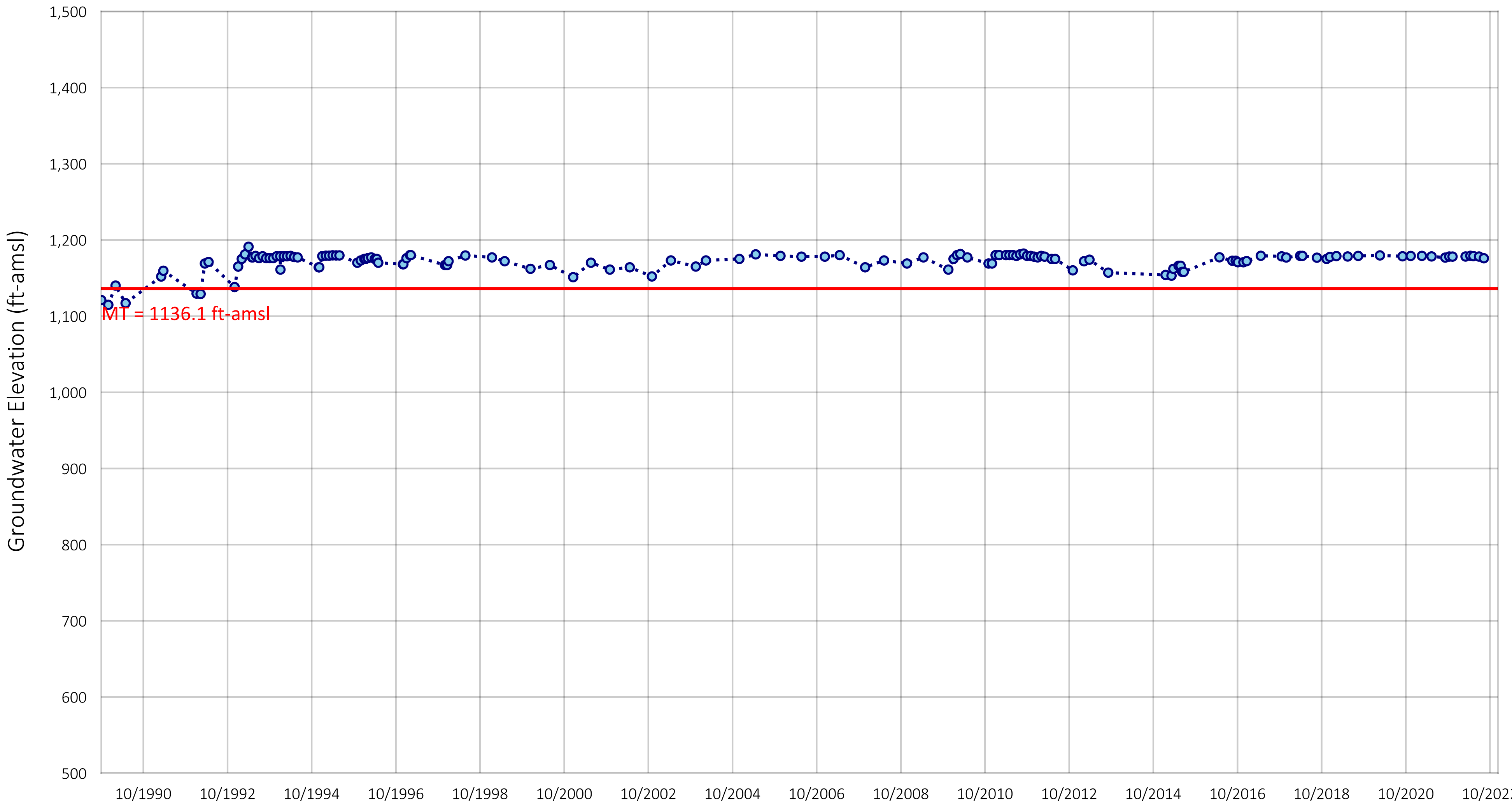
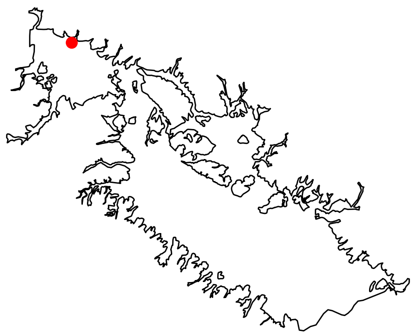
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005776
Well Name: Barney Lee 1
State Well ID: 05S05W08N01

Figure A-4



Location of Well in Elsinore Valley

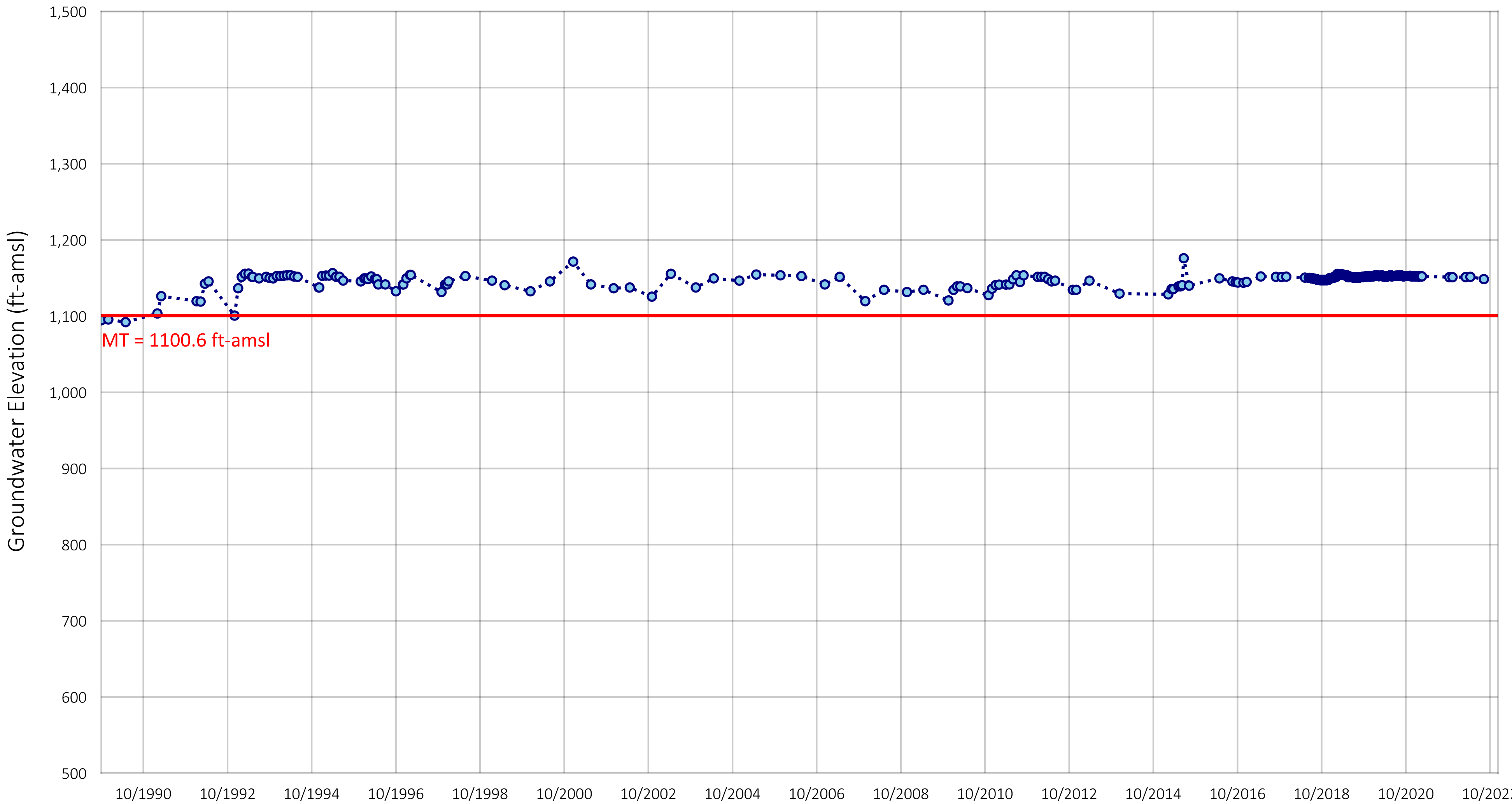


Prepared by:

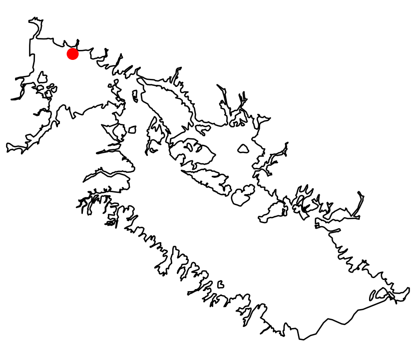
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005779
Well Name: Barney Lee 4
State Well ID: 05S05W08P02

Figure A-5



Location of Well in Elsinore Valley

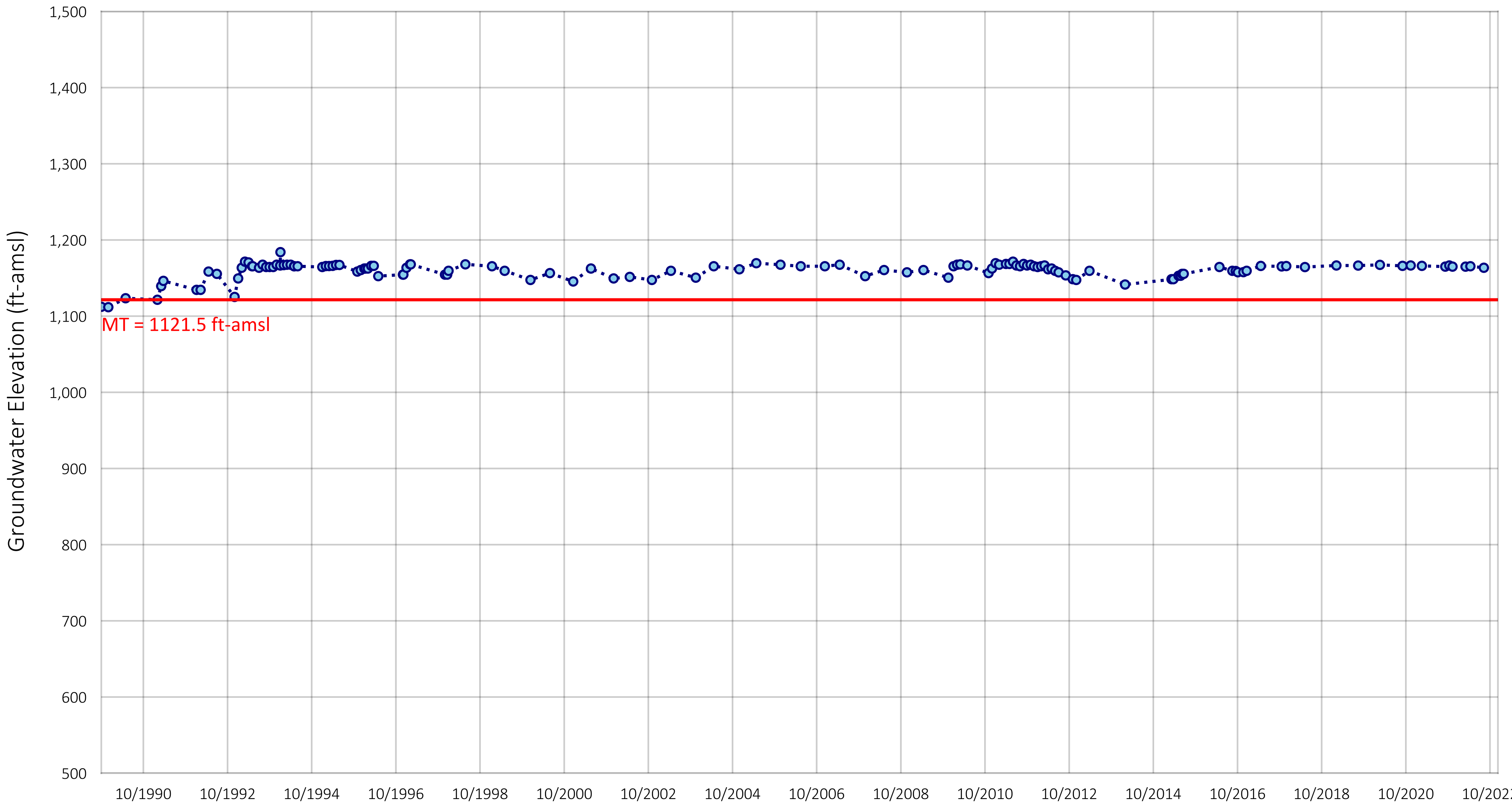


Prepared by:

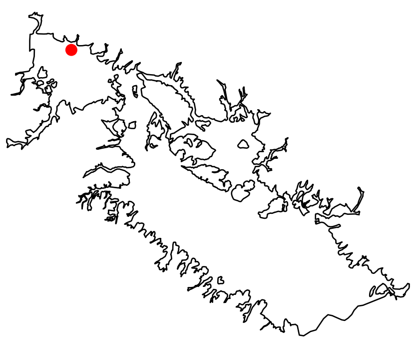
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005778
Well Name: Barney Lee 2
State Well ID: 05S05W08P01

Figure A-6



Location of Well in Elsinore Valley



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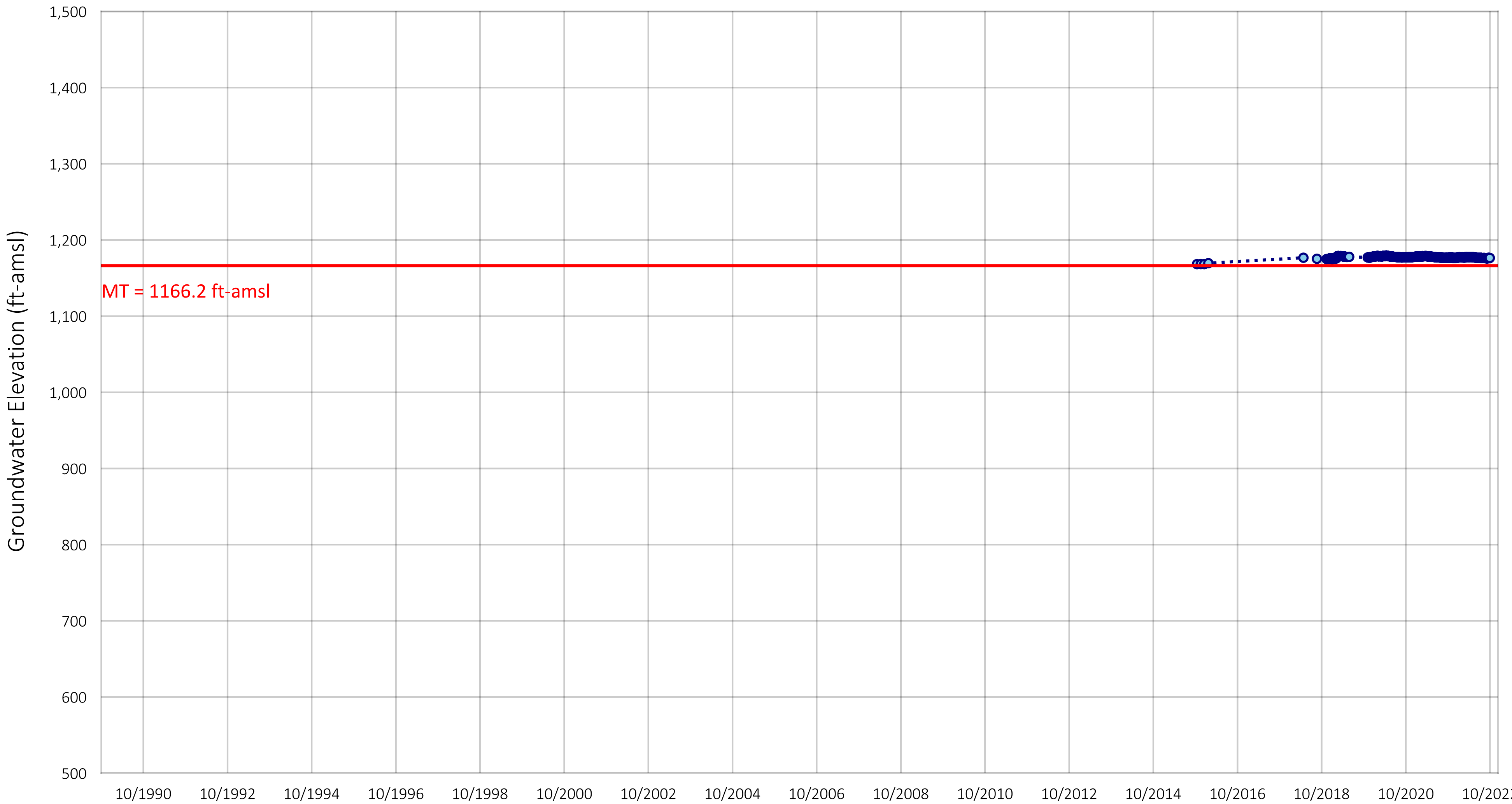
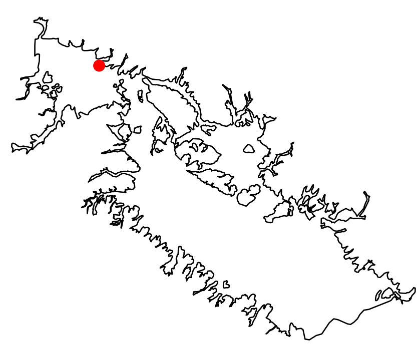
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005780
Well Name: Barney Lee 3
State Well ID: 05S05W08P03

Figure A-7



Location of Well in Elsinore Valley



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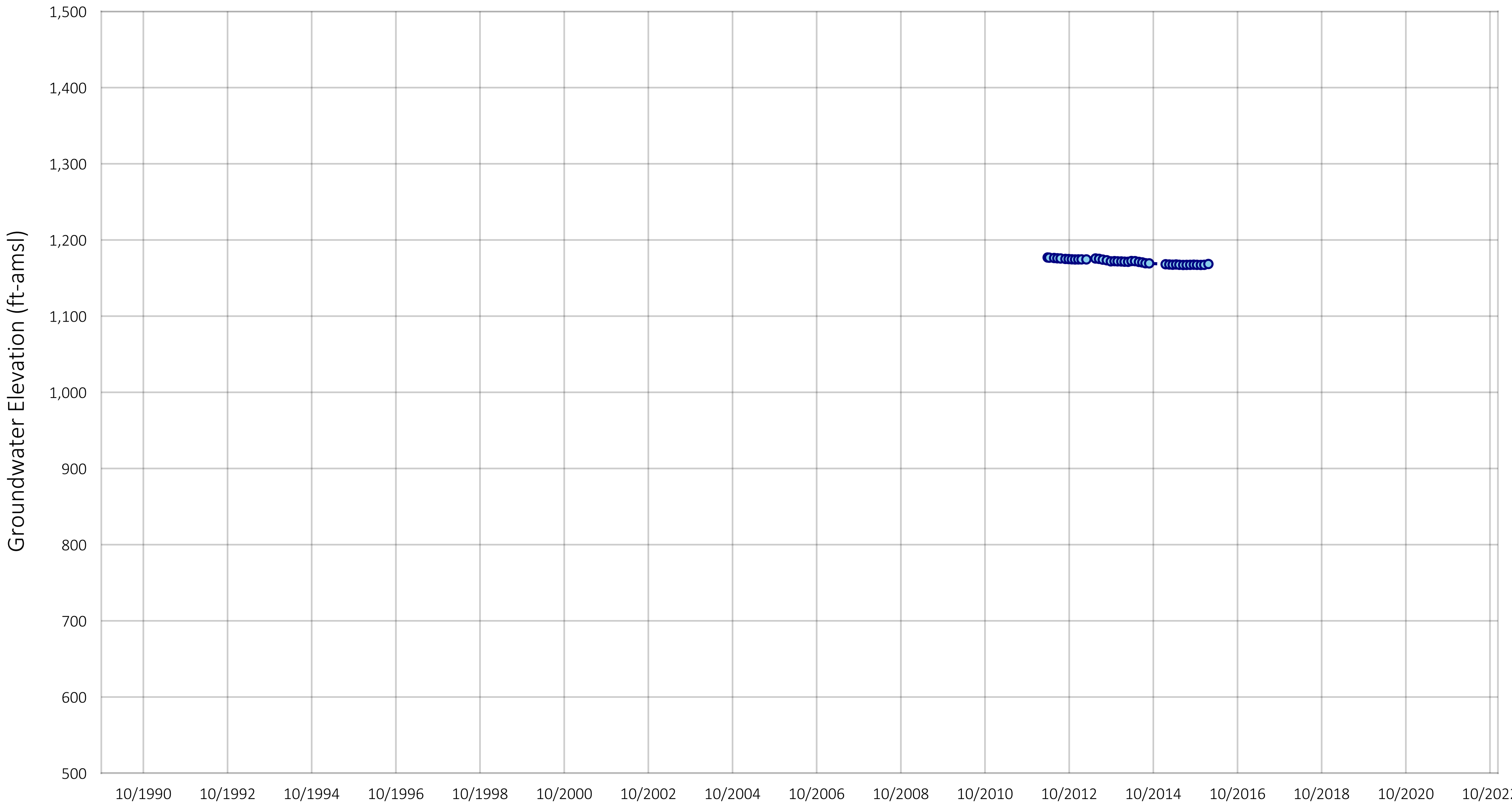
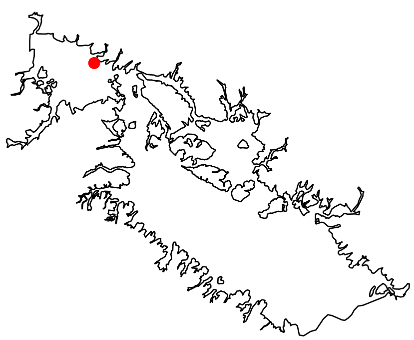
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1234088
Well Name: Alberhill 2

Figure A-8



Location of Well in Elsinore Valley

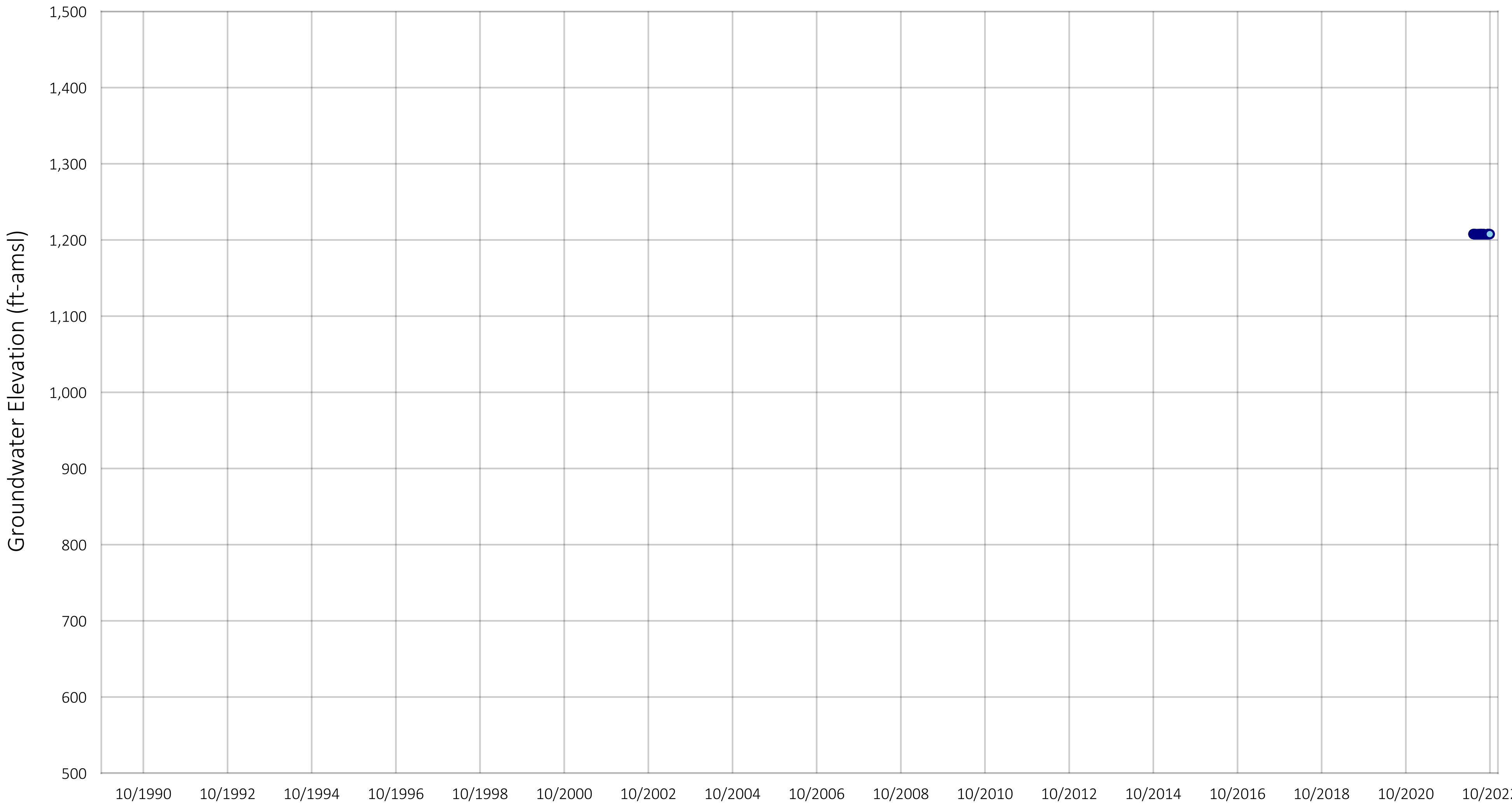


Prepared by:

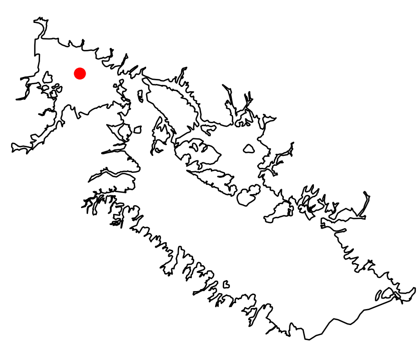
WEST YOST Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1234087
Well Name: Alberhill 1

Figure A-9



Location of Well in Elsinore Valley



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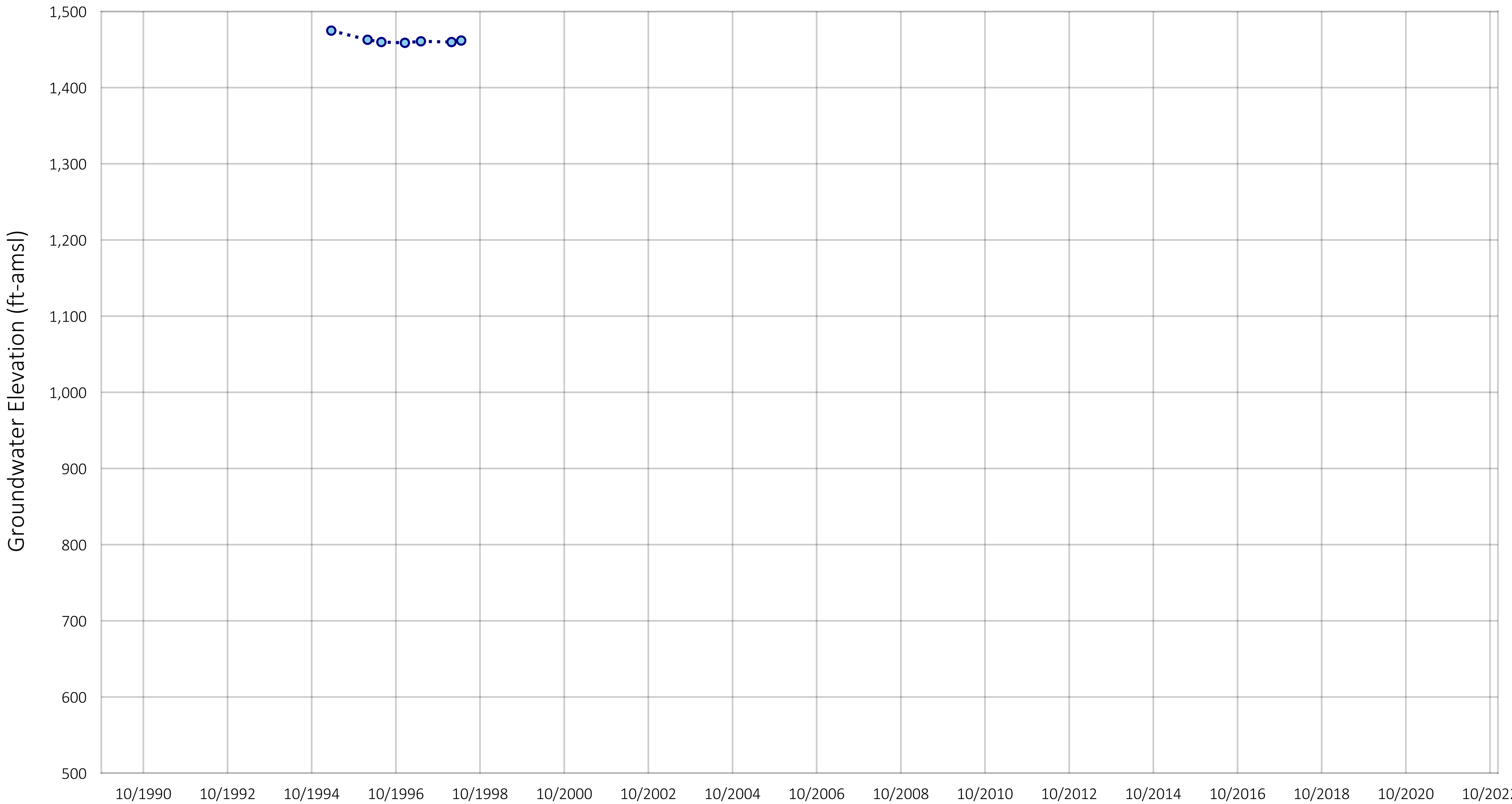
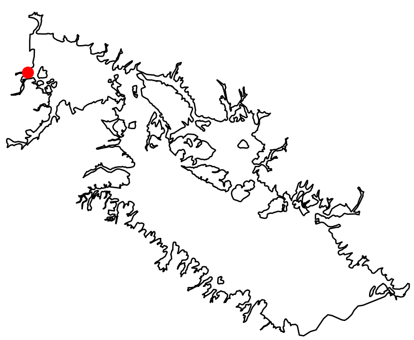
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1246331
Well Name: Horsethief-MW-1

Figure A-10



Location of Well in Elsinore Valley



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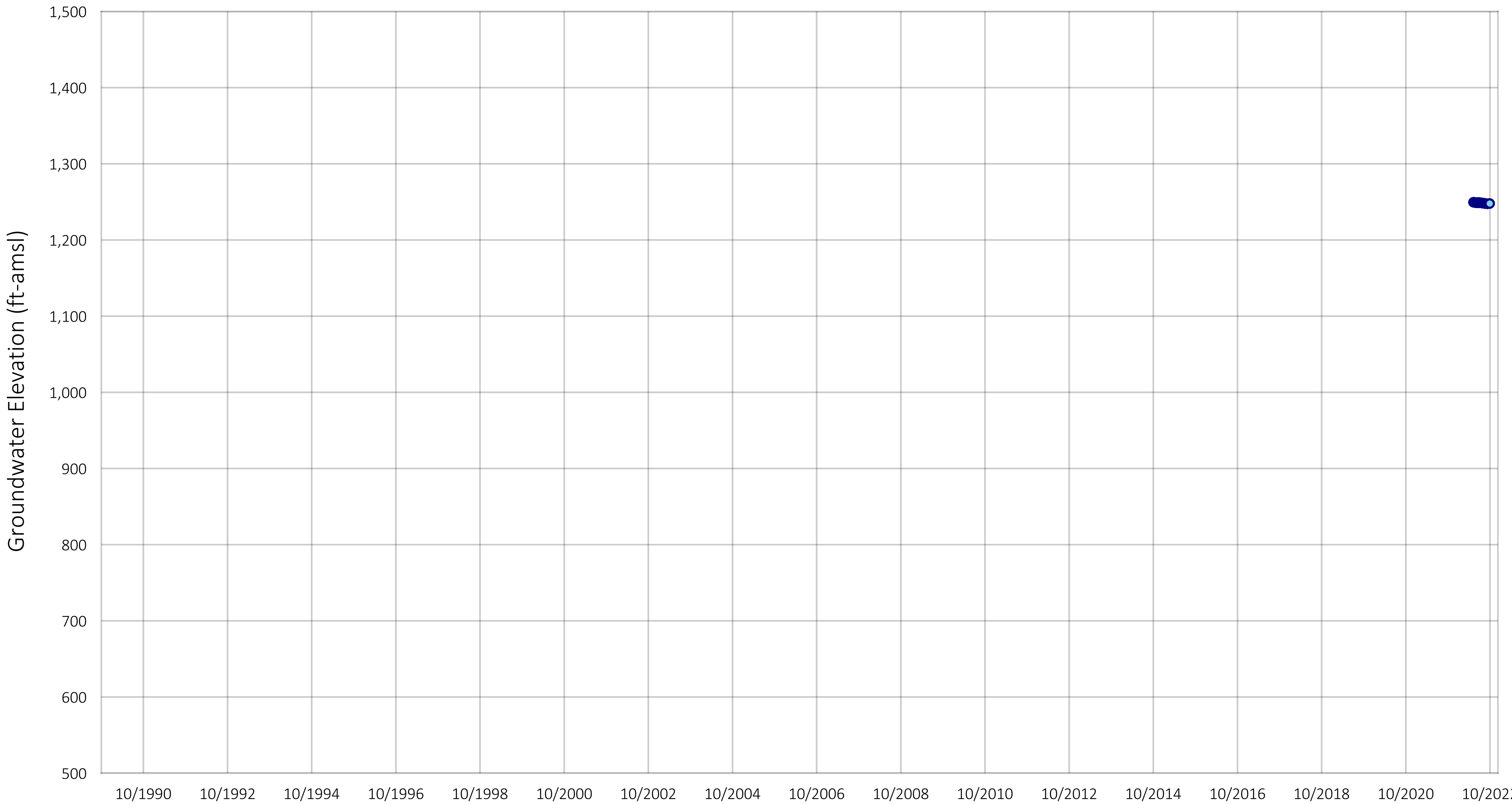
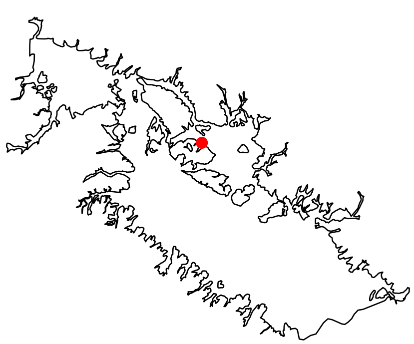
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1203666
Well Name: Indian Truck Trail
State Well ID: 05S06W13, SE 1/4

Figure A-11



Location of Well in Elsinore Valley



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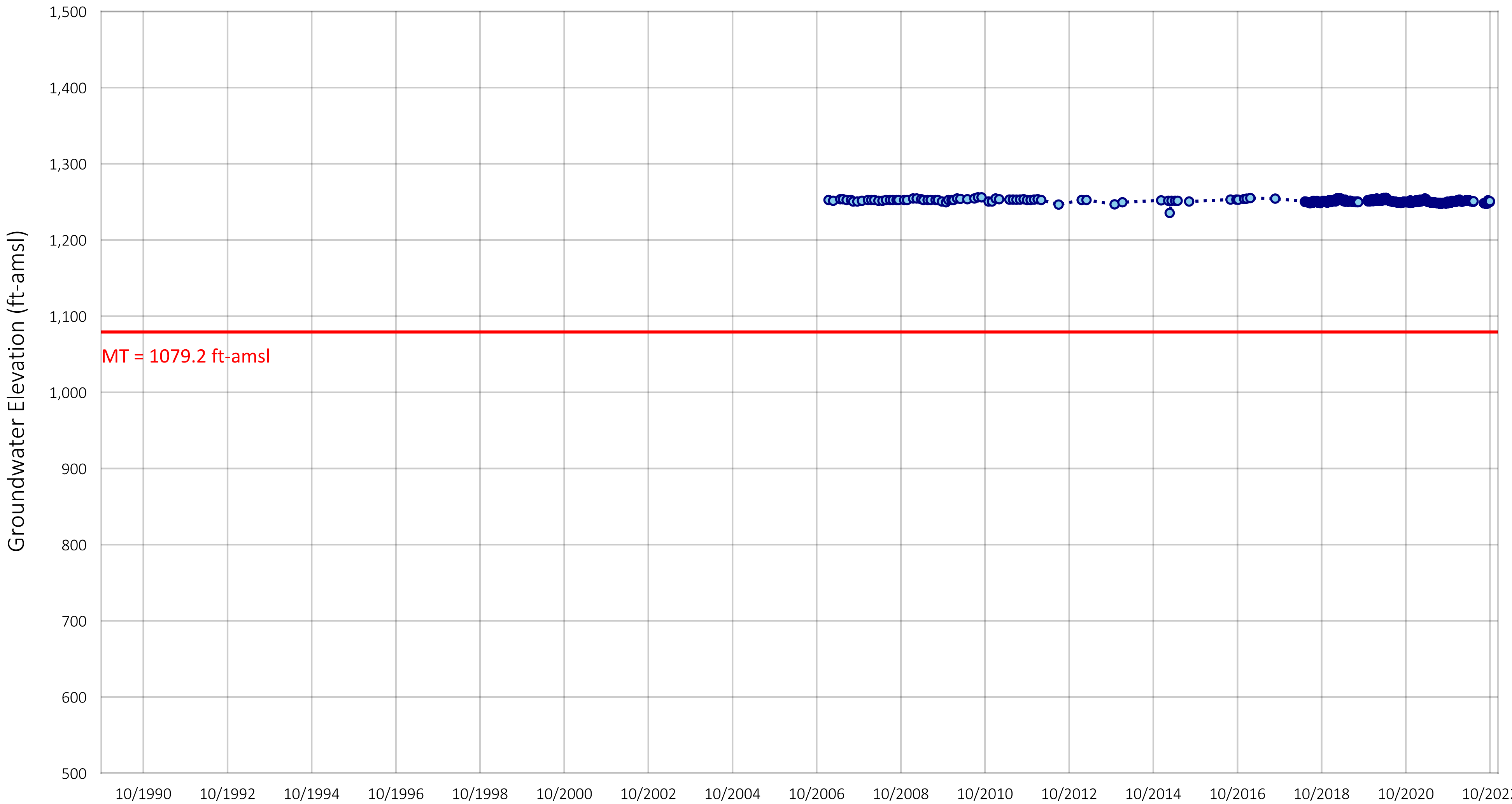
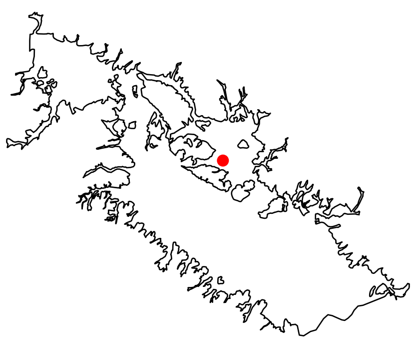
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1246330
Well Name: WS-MW-1

Figure A-12



Location of Well in Elsinore Valley



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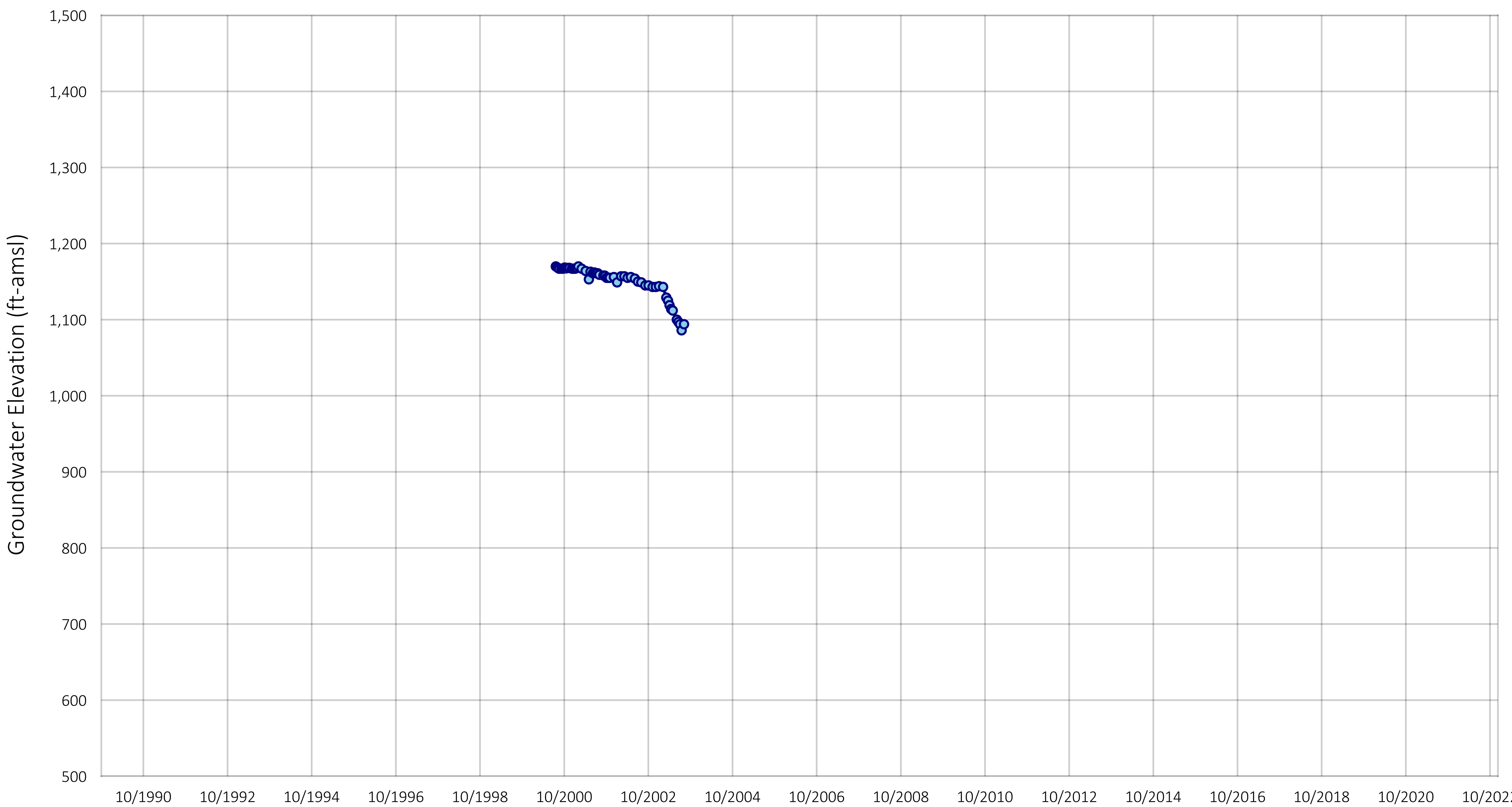
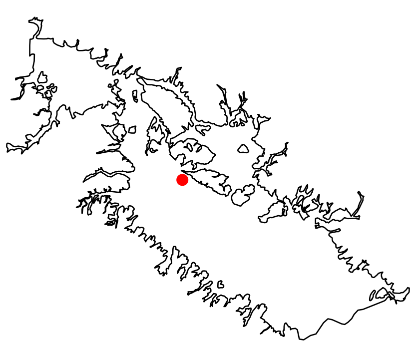
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232298
Well Name: Cemetery

Figure A-13



Location of Well in Elsinore Valley



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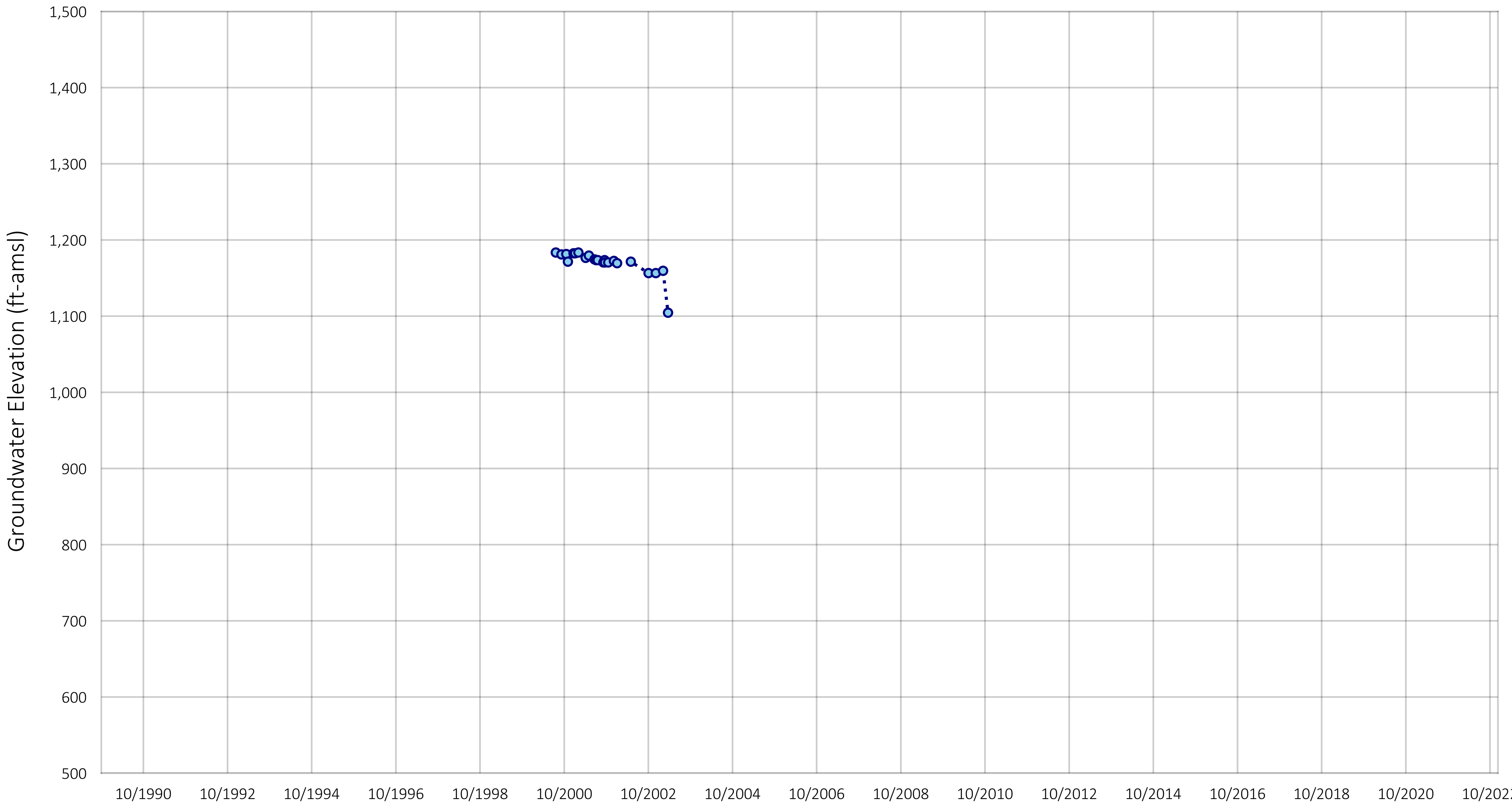
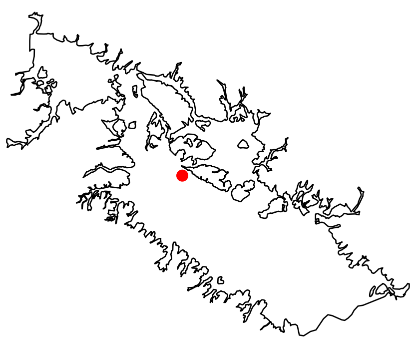
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1203646
Well Name: Fraiser
State Well ID: 06S05W02B

Figure A-14



Location of Well in Elsinore Valley



Prepared by:

WEST YOST
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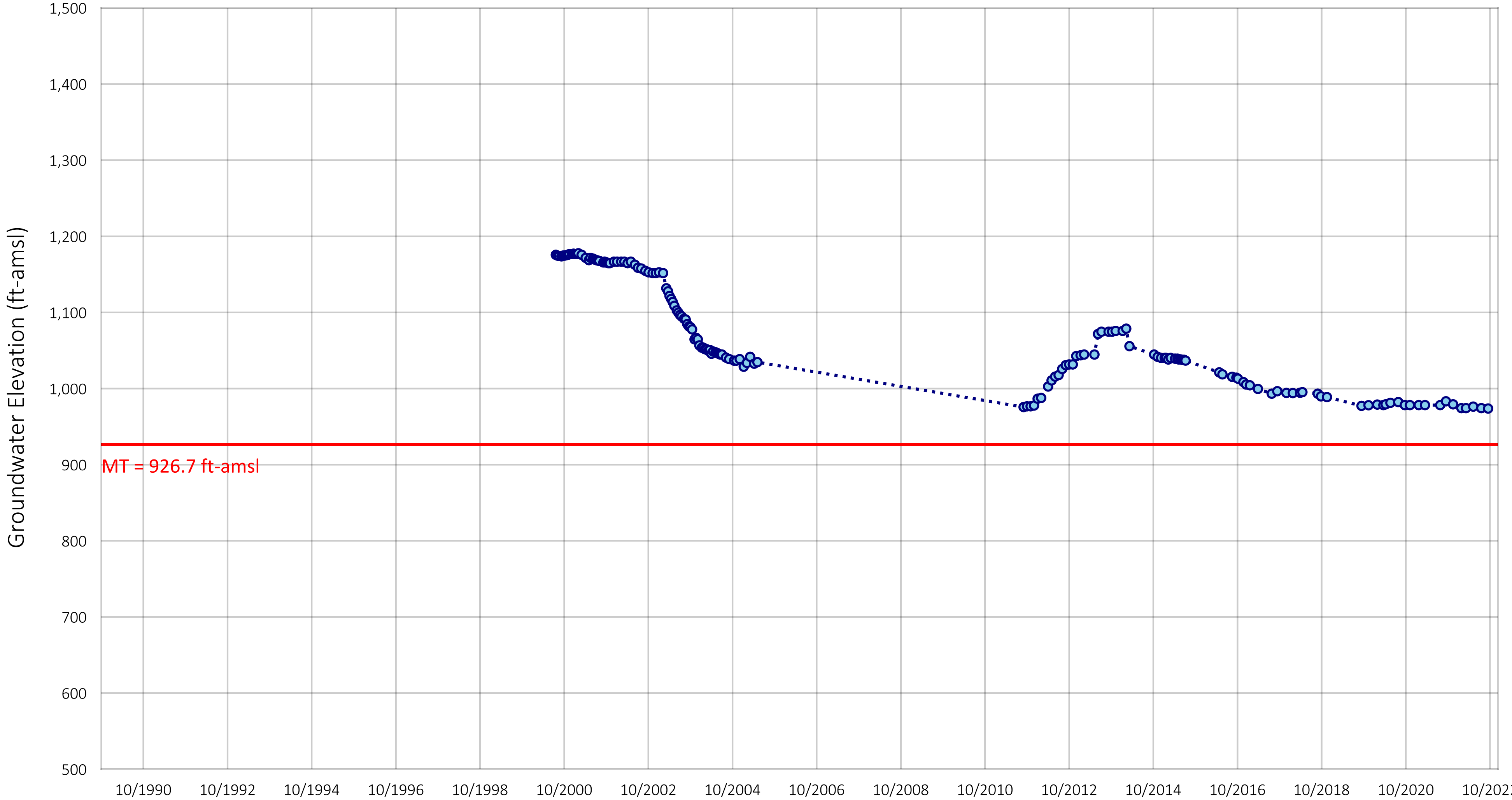
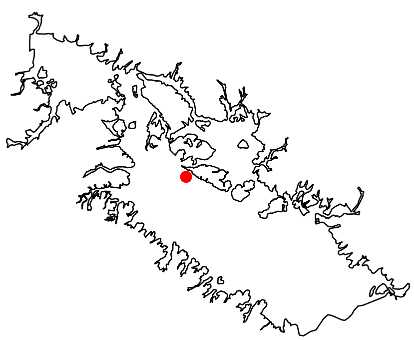
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1203677
Well Name: Fraiser II
State Well ID: 06S05W02B03

Figure A-15



Location of Well in Elsinore Valley

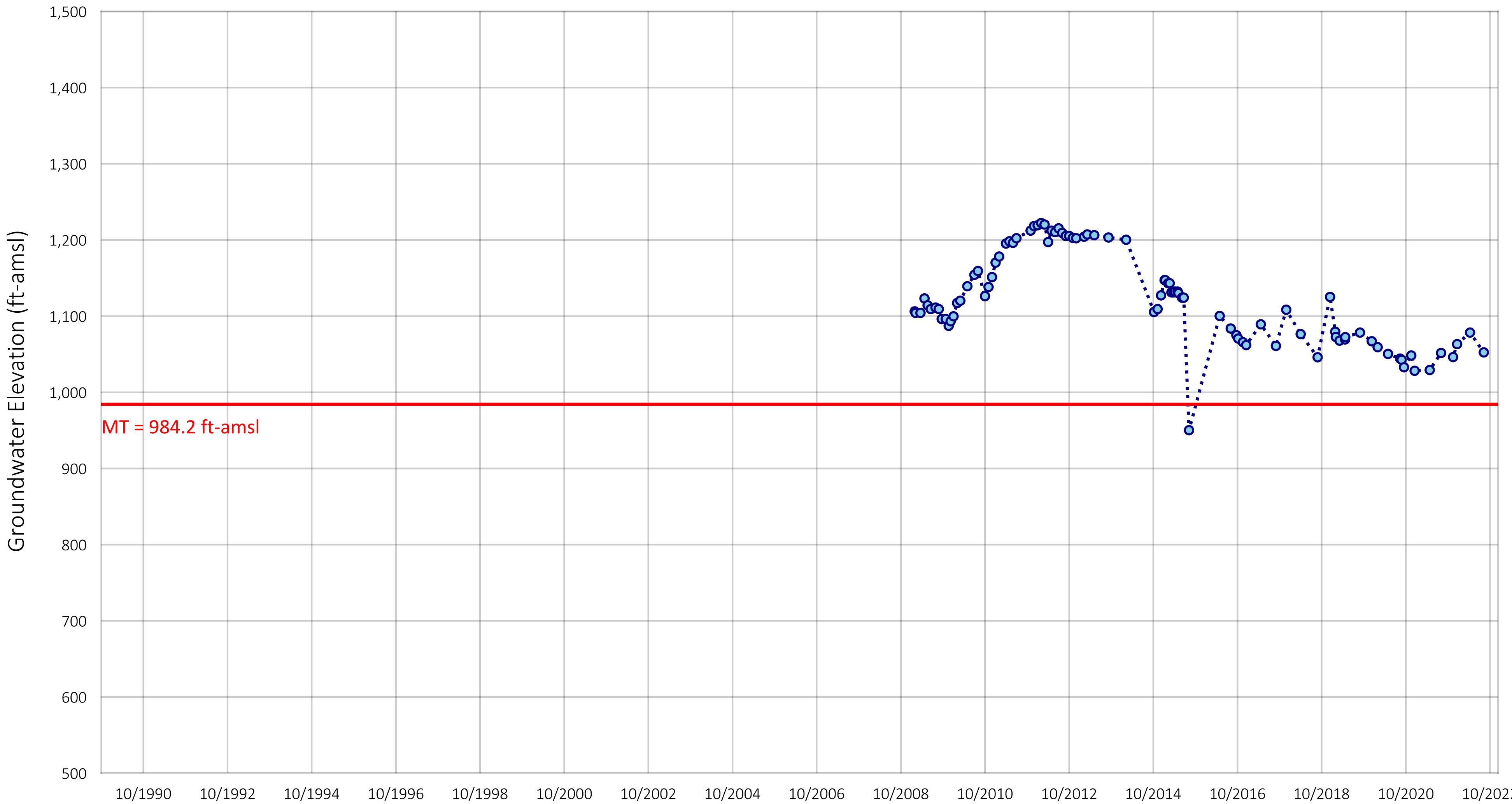


Prepared by:

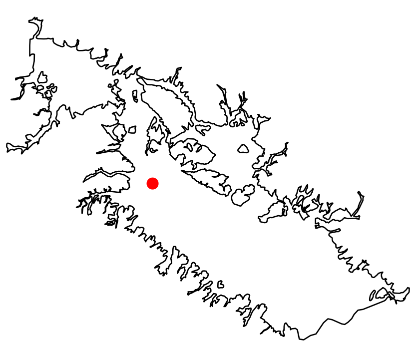
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1203676
Well Name: Wisconsin
State Well ID: 06S05W02A

Figure A-16



Location of Well in Elsinore Valley

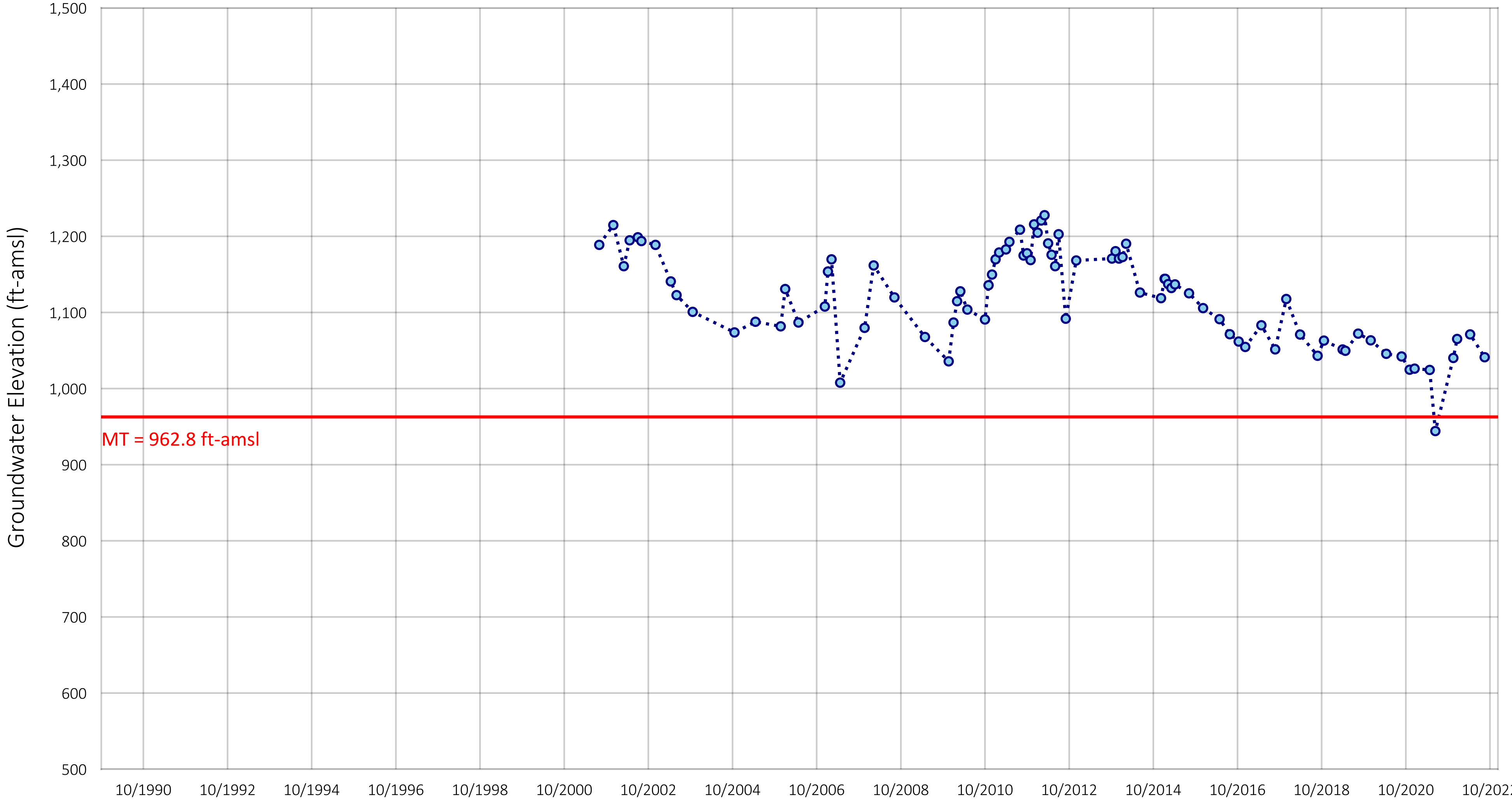


Prepared by:

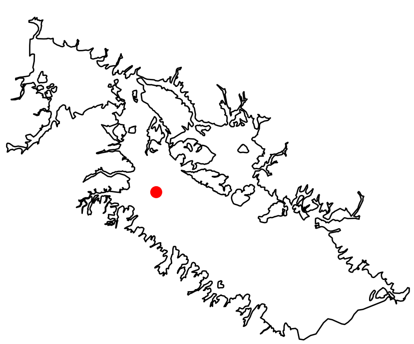
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232310
Well Name: Terra Cotta

Figure A-17



Location of Well in Elsinore Valley

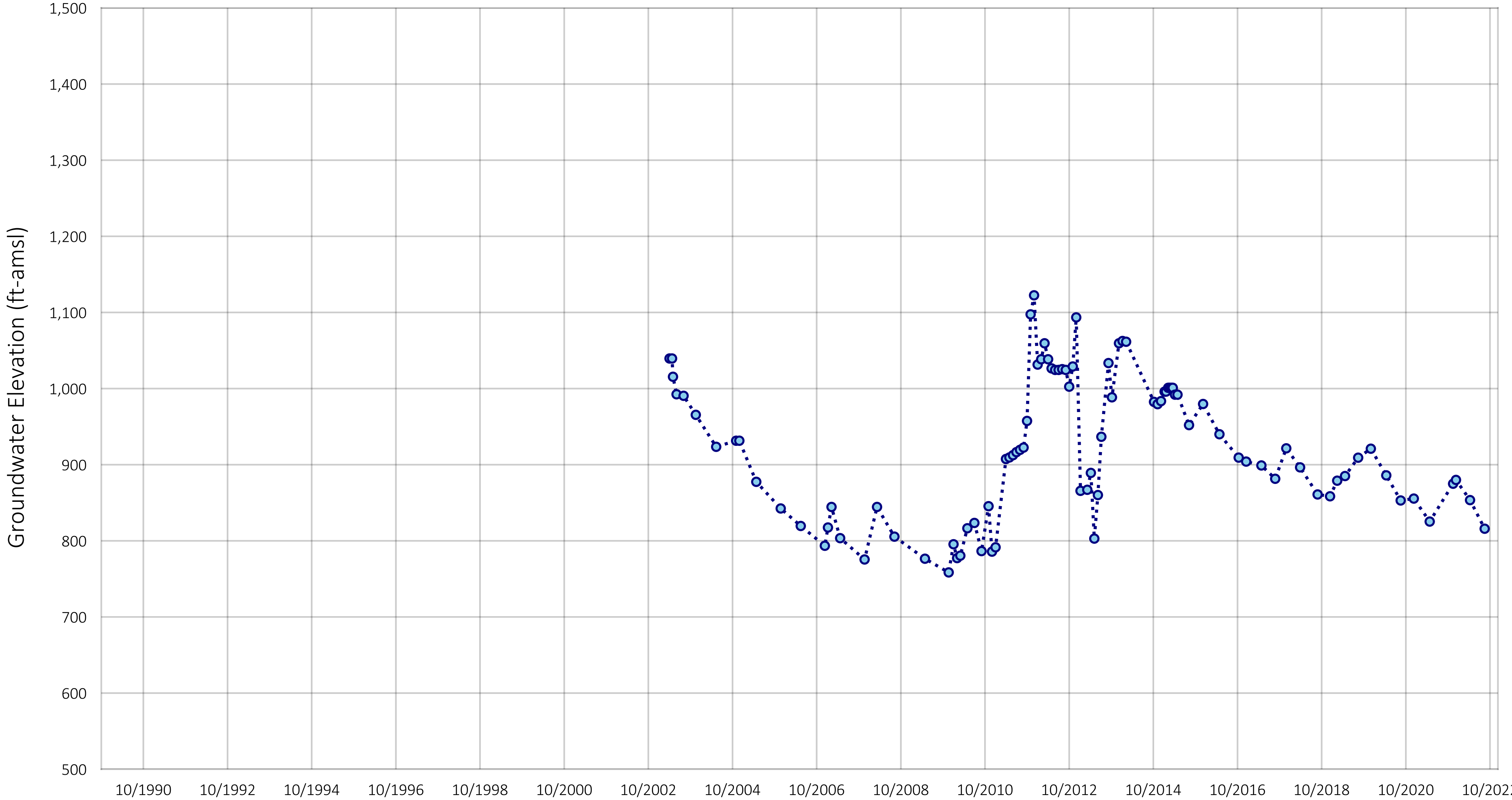


Prepared by:

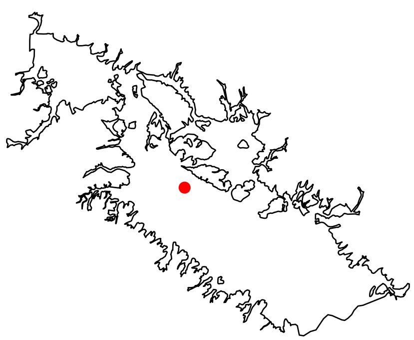
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1208006
Well Name: Machado
State Well ID: 06S05W03H01

Figure A-18



Location of Well in Elsinore Valley

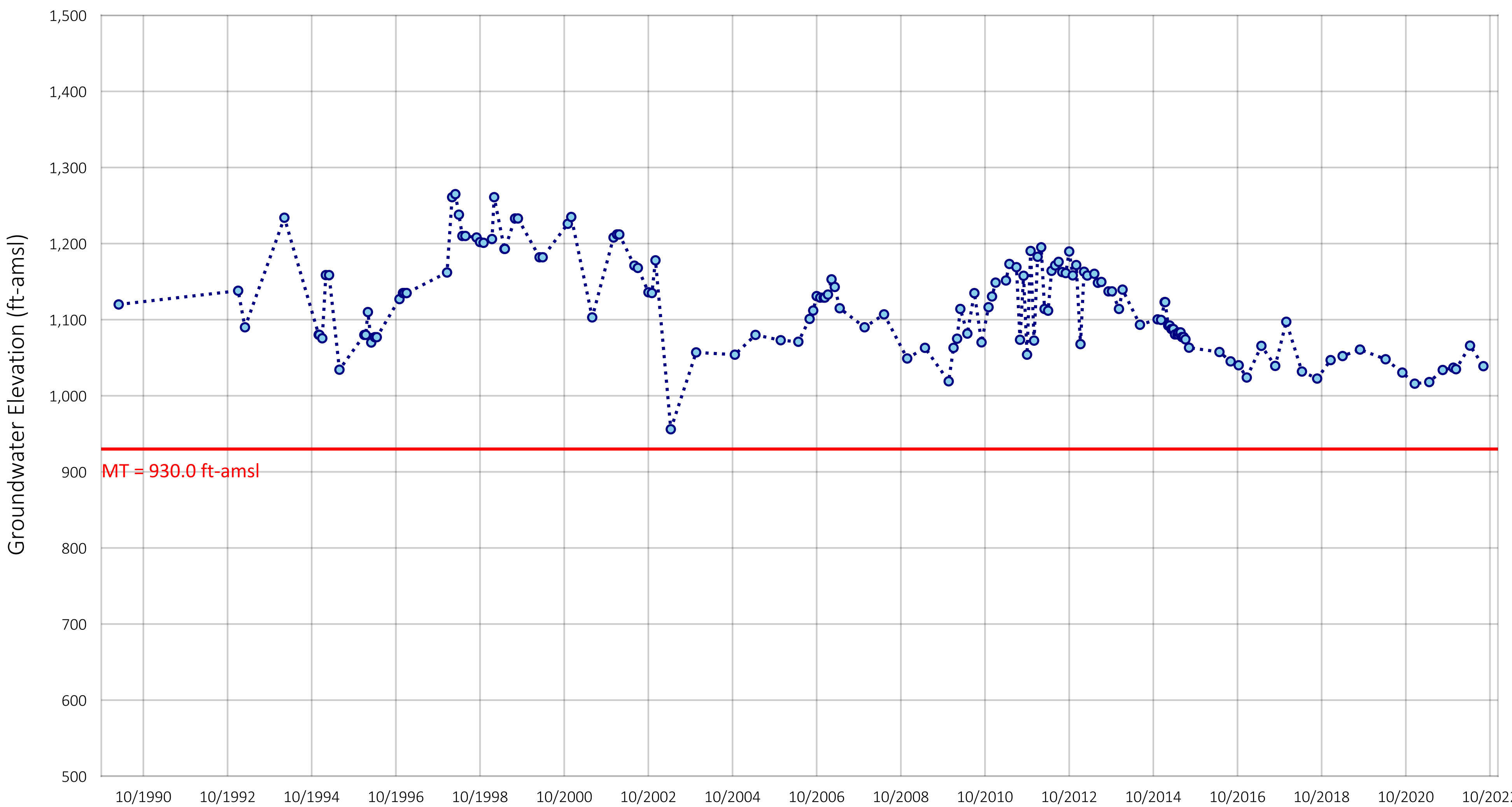


Prepared by:

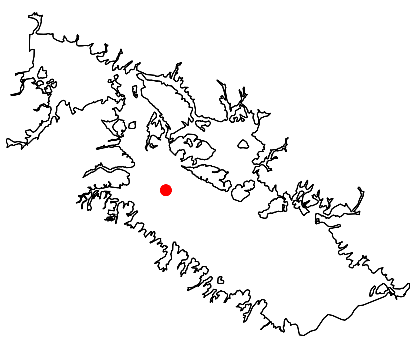
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1208005
Well Name: Joy St.
State Well ID: 06S05W02G05

Figure A-19



Location of Well in Elsinore Valley

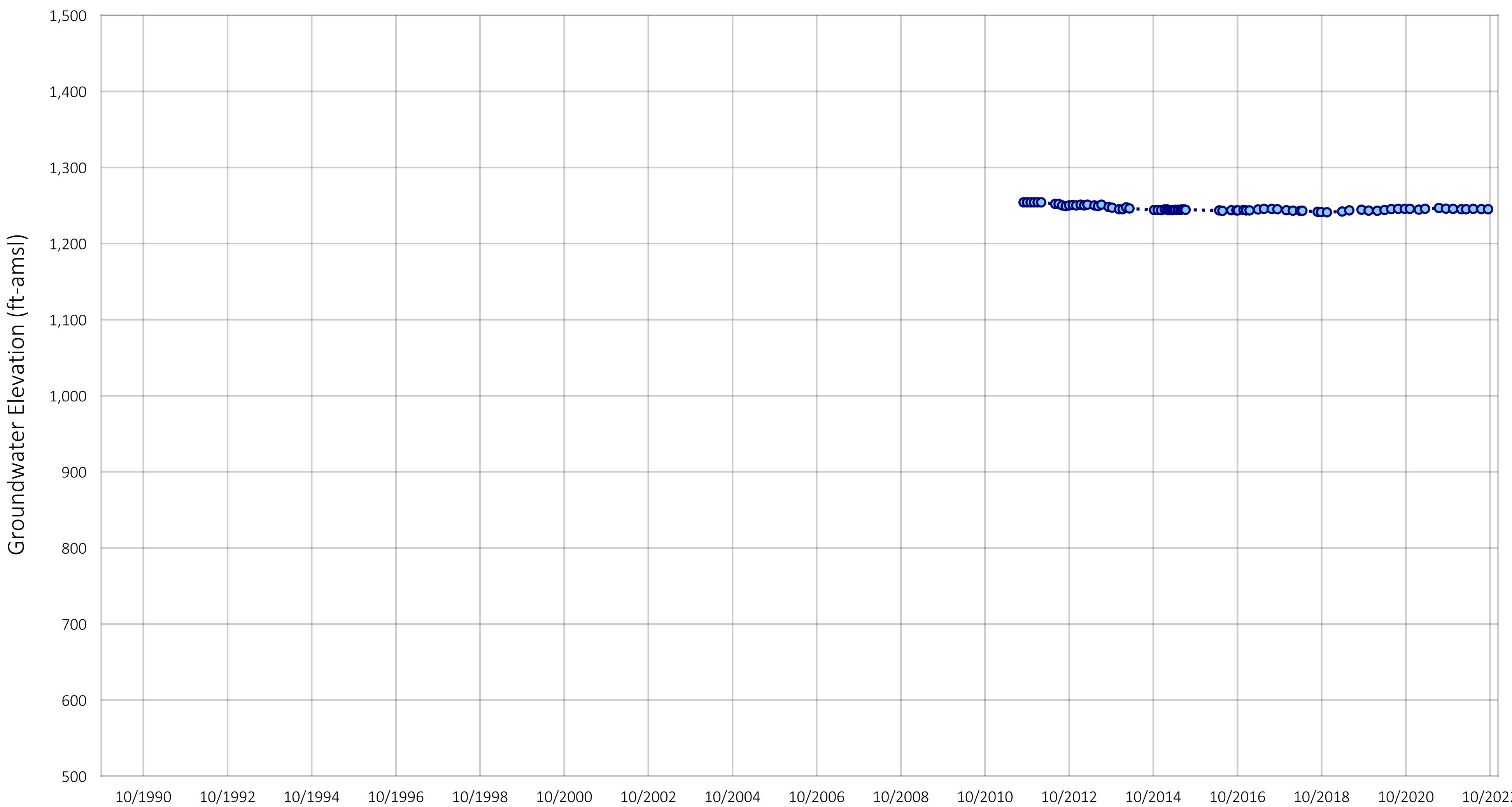


Prepared by:

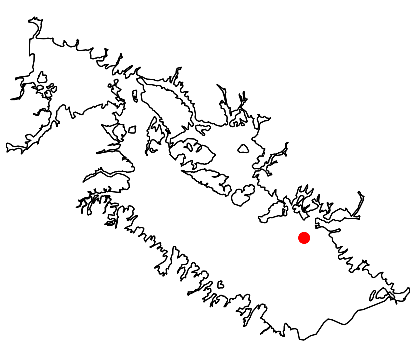
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005921
Well Name: Lincoln
State Well ID: 06S05W02M04

Figure A-20



Location of Well in Elsinore Valley

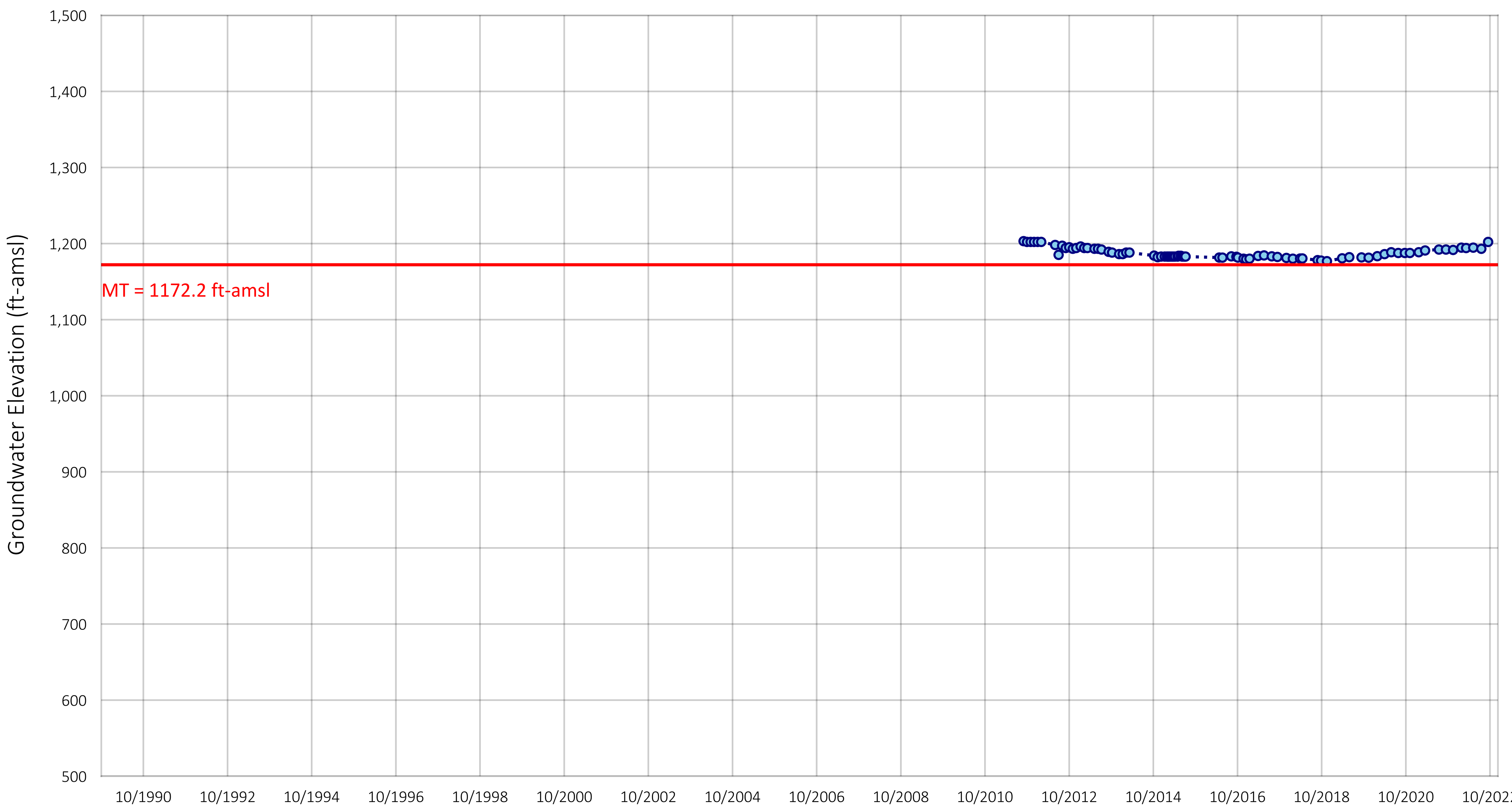


Prepared by:

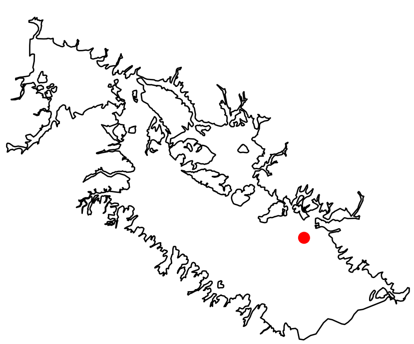
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232309
Well Name: Stadium Shallow

Figure A-21



Location of Well in Elsinore Valley

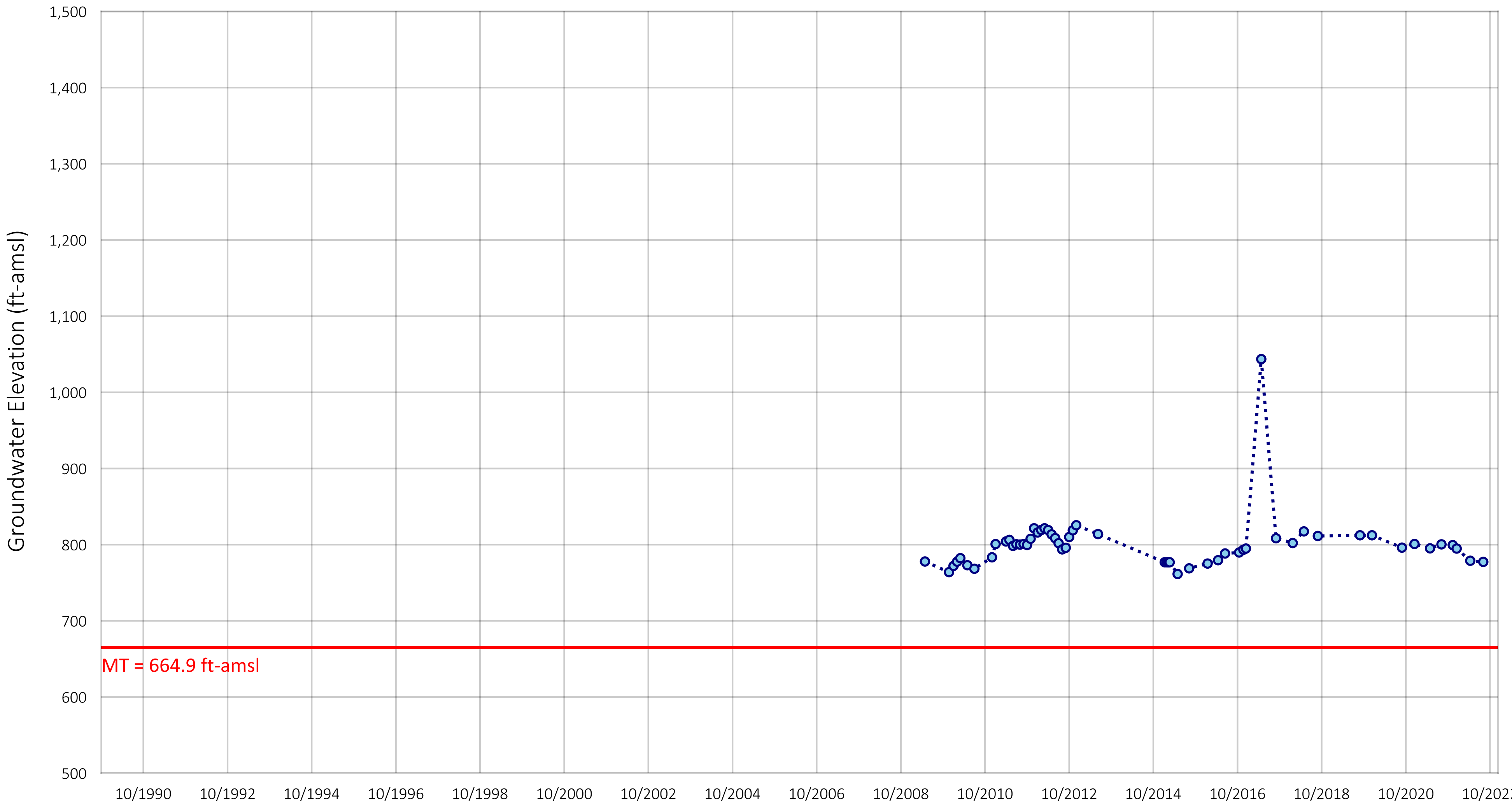


Prepared by:

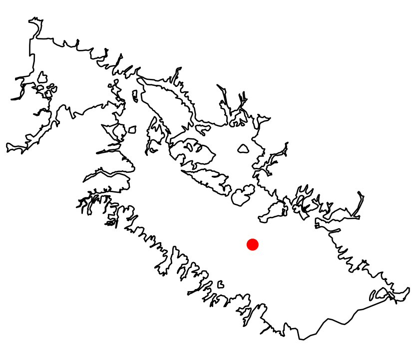
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232308
Well Name: Stadium Deep

Figure A-22



Location of Well in Elsinore Valley

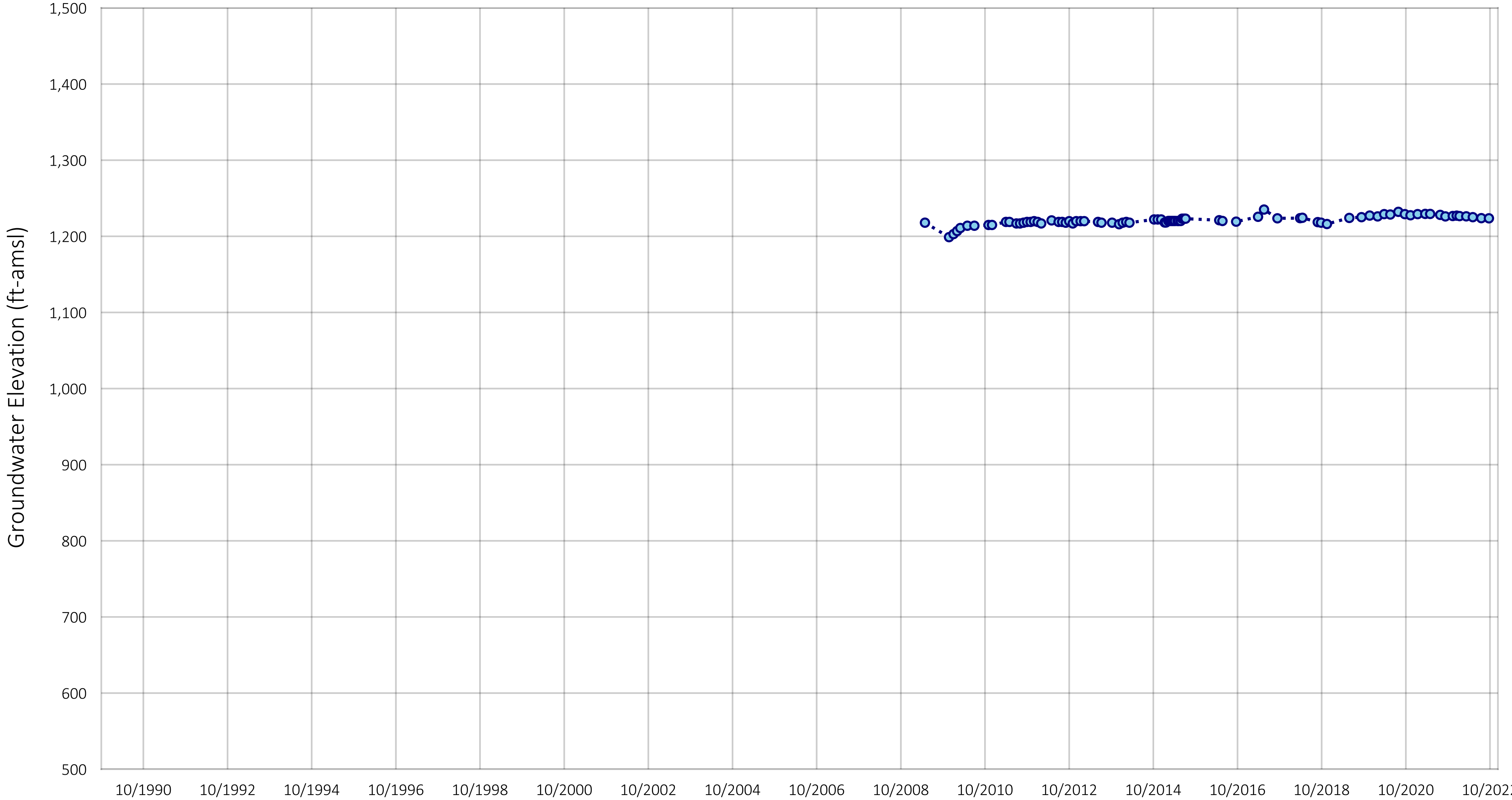


Prepared by:

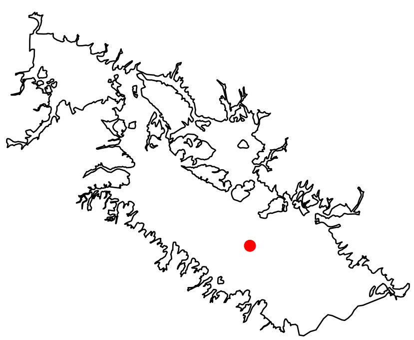
WEST YOST Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1222271
Well Name: North Island

Figure A-23



Location of Well in Elsinore Valley

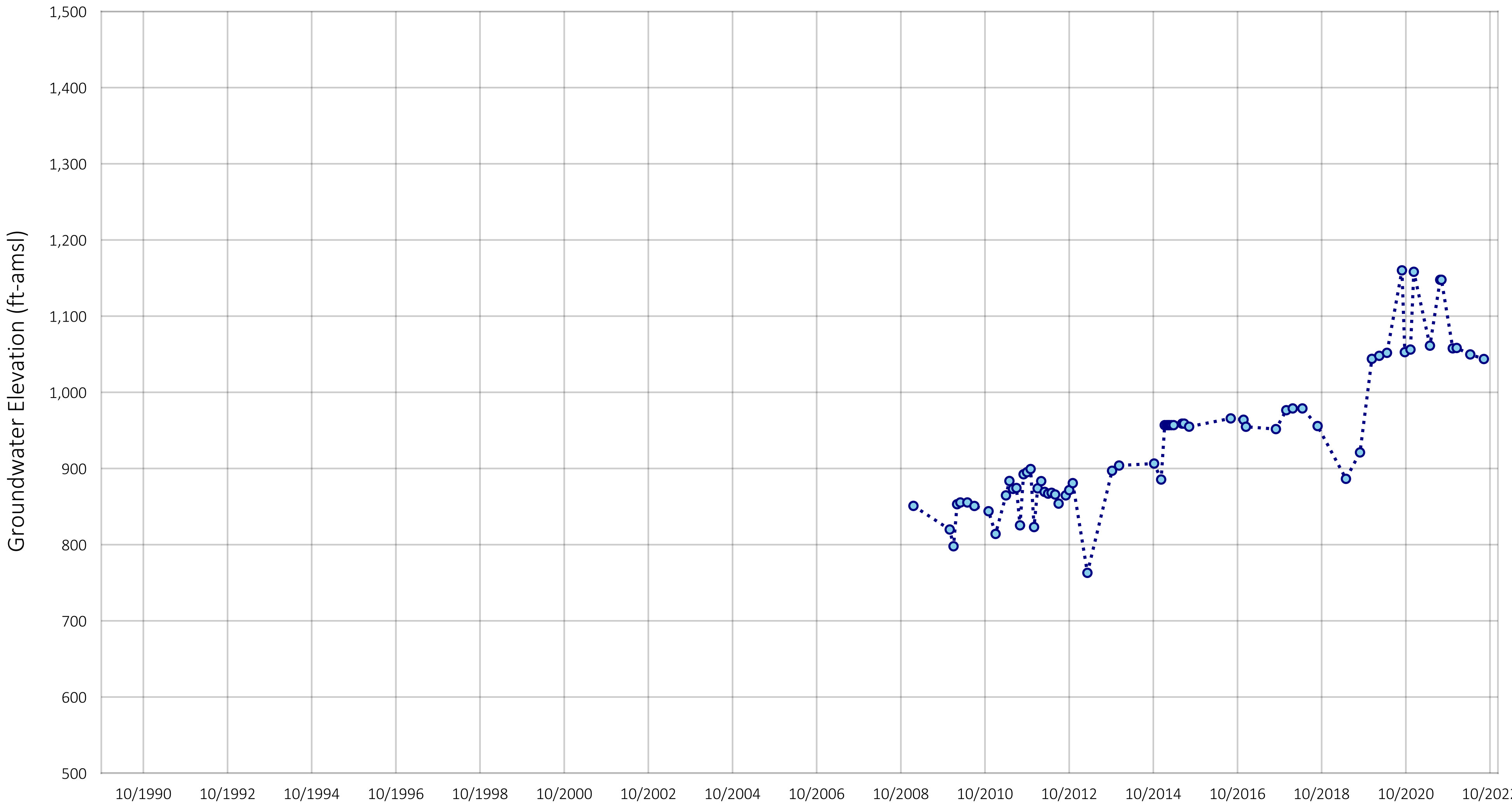


Prepared by:

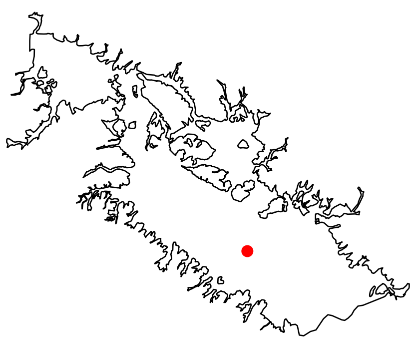
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1222272
Well Name: Middle Island

Figure A-24



Location of Well in Elsinore Valley



Prepared by:

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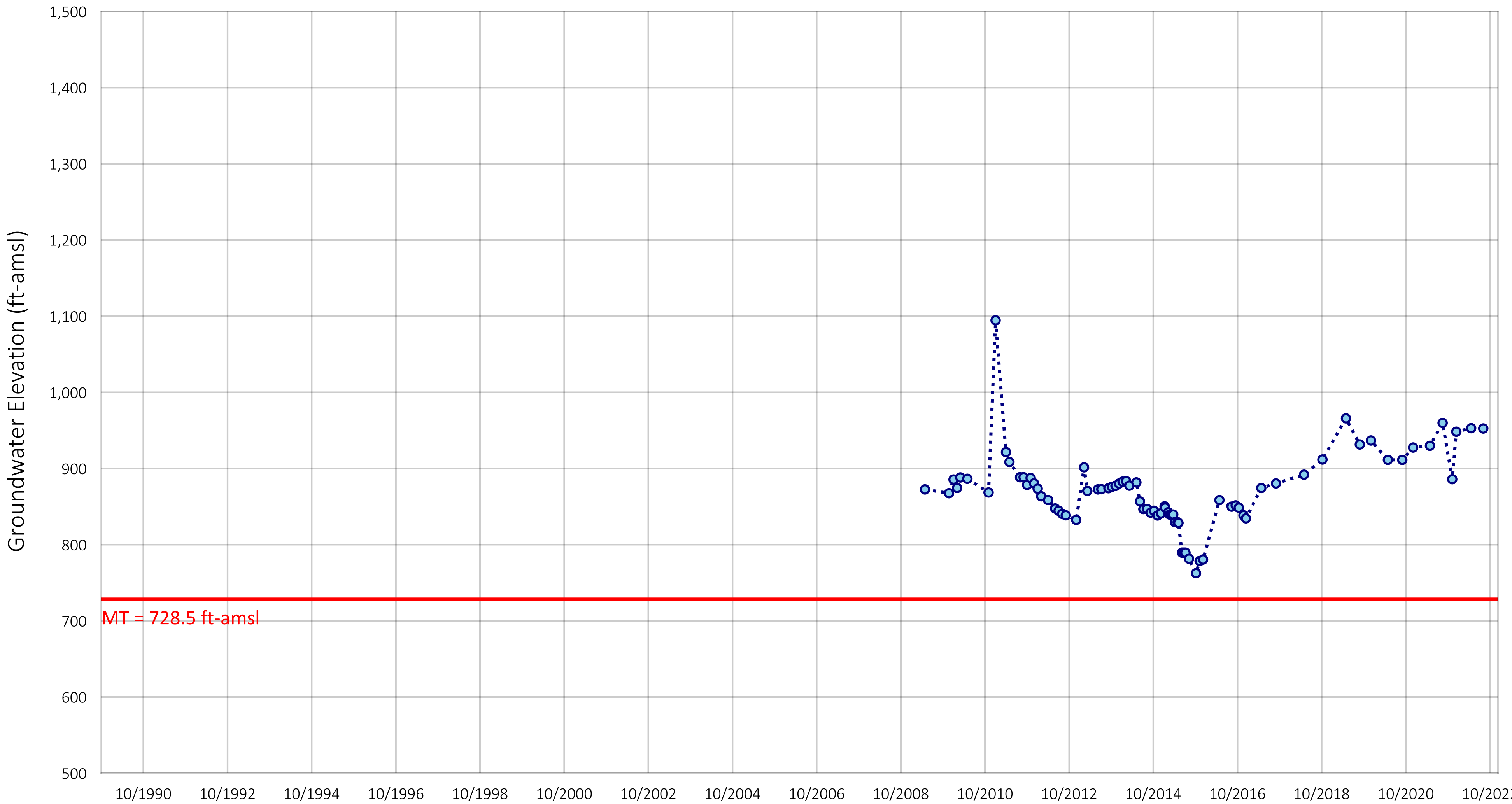
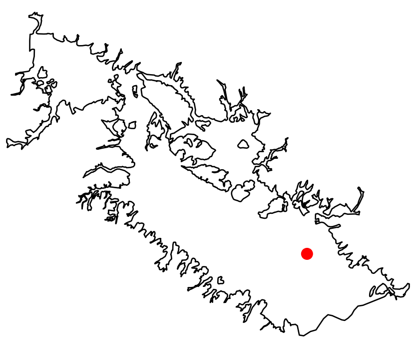
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1222273
Well Name: South Island

Figure A-25



Location of Well in Elsinore Valley



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WEST YOST
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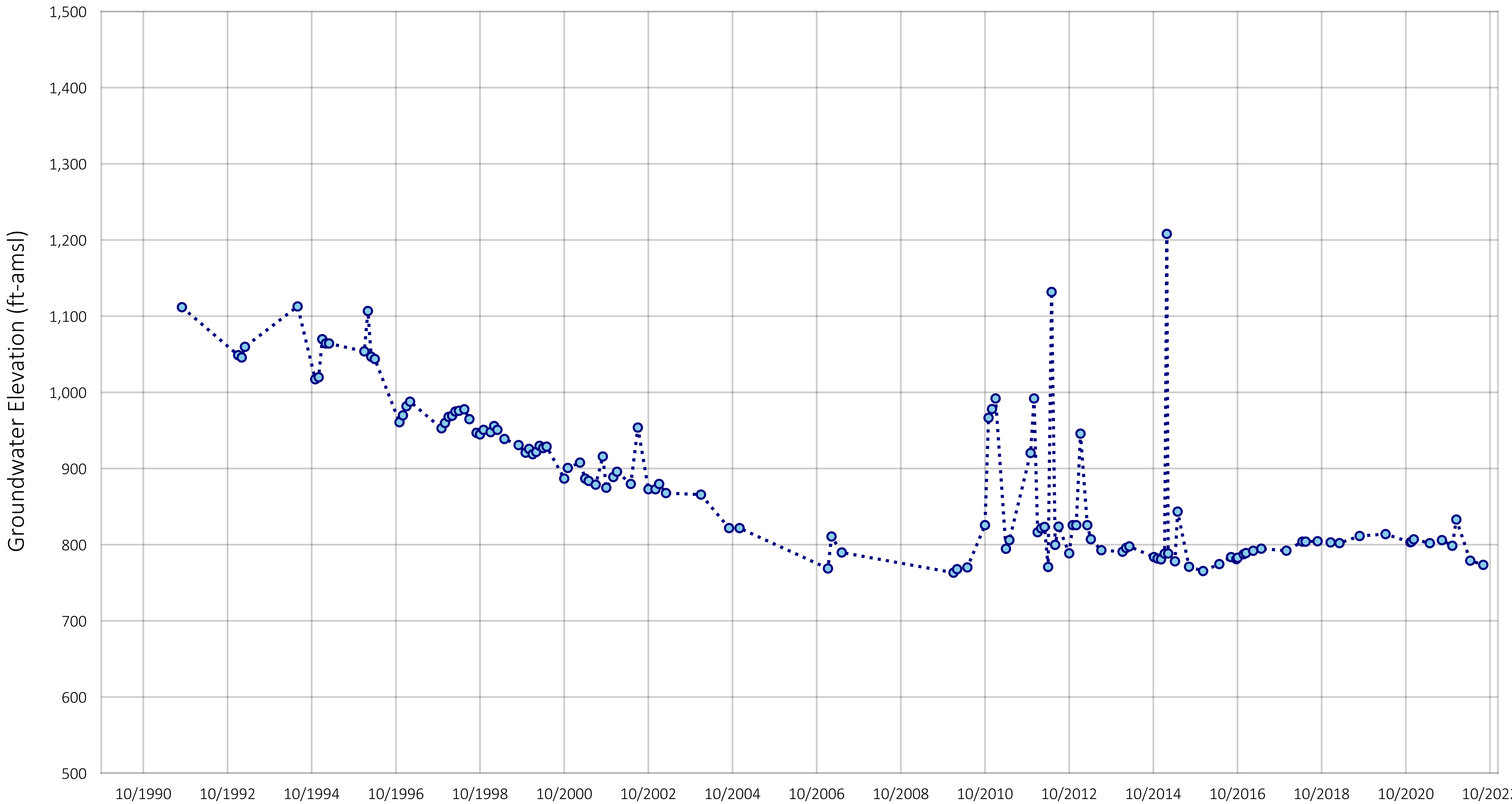
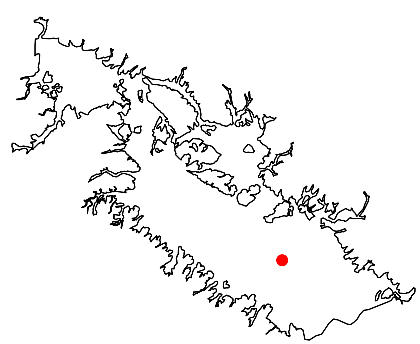
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1222270
Well Name: Summerly

Figure A-26



Location of Well in Elsinore Valley



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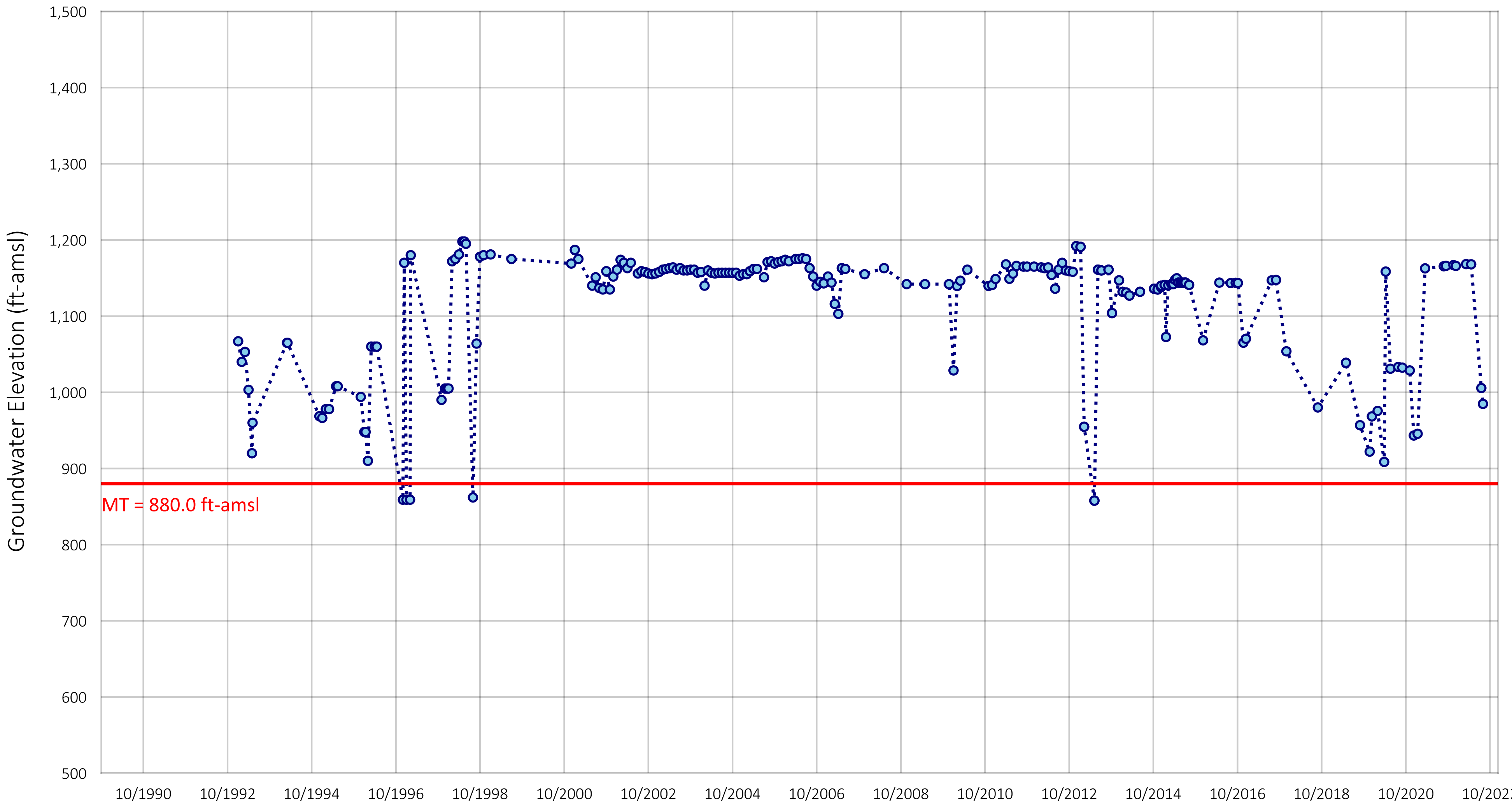
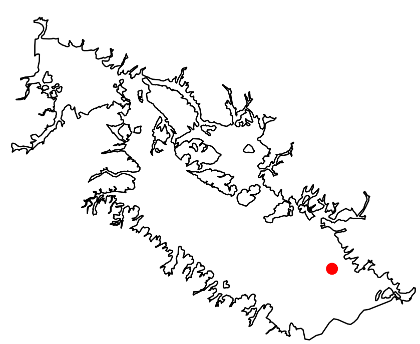
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005914
Well Name: Cereal 4
State Well ID: 06S04W17L01

Figure A-27



Location of Well in Elsinore Valley



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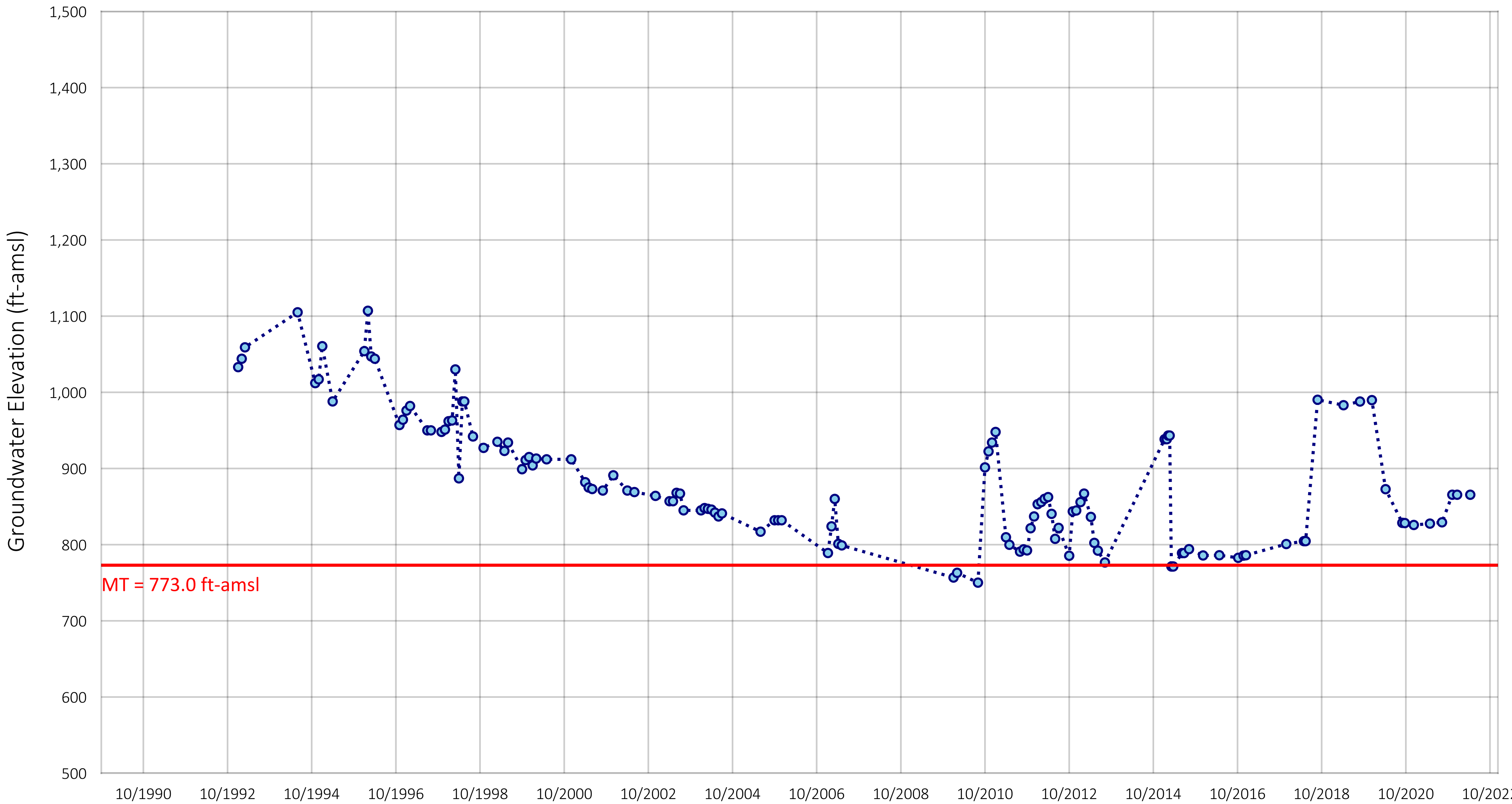
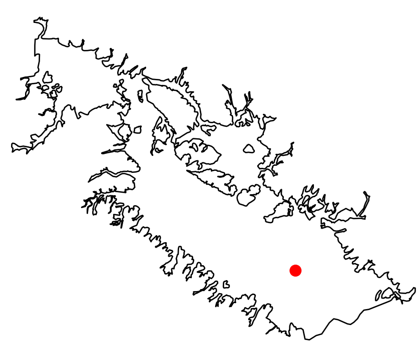
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005917
Well Name: Olive
State Well ID: 06S04W22D02

Figure A-28



Location of Well in Elsinore Valley



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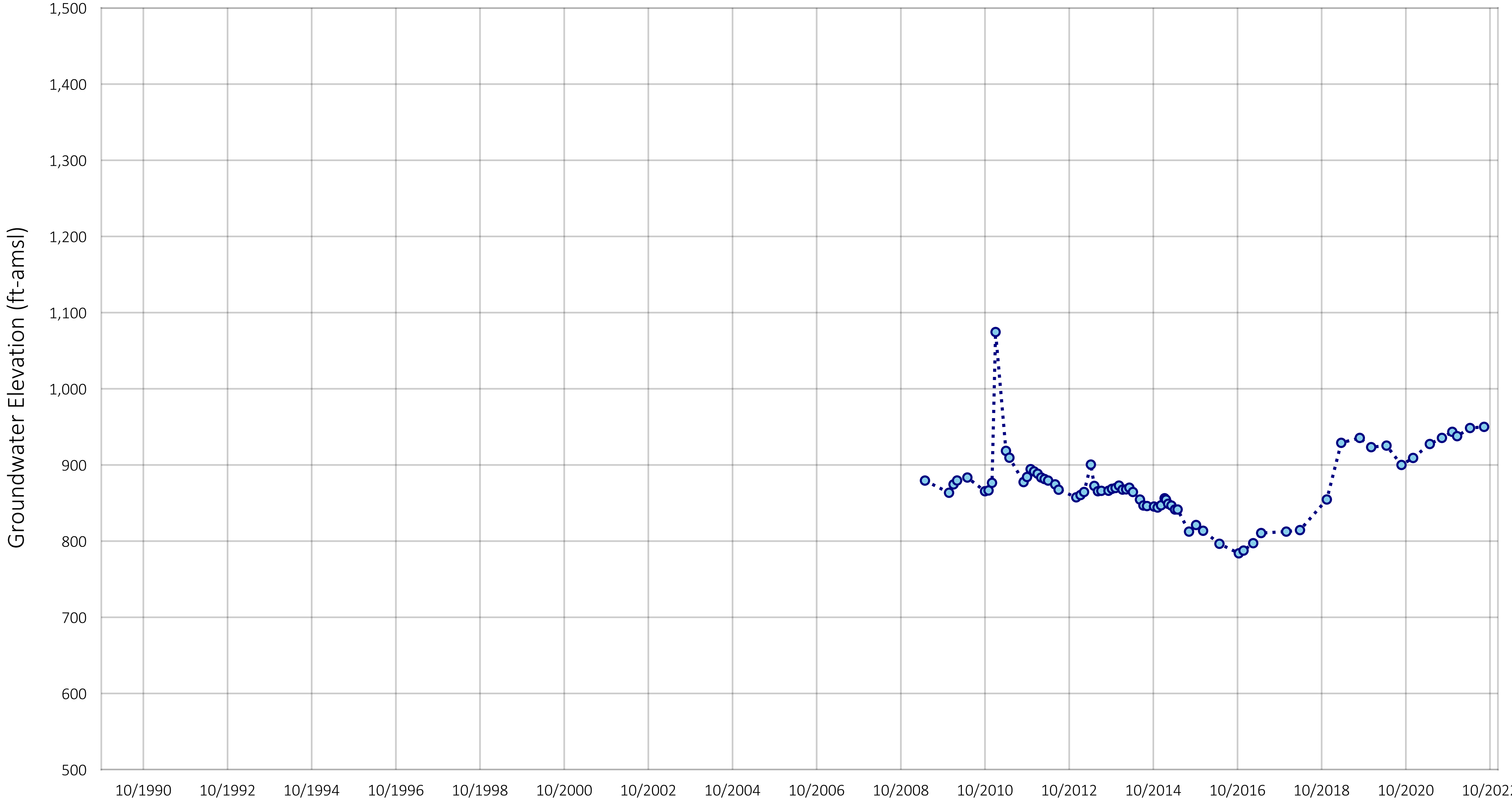
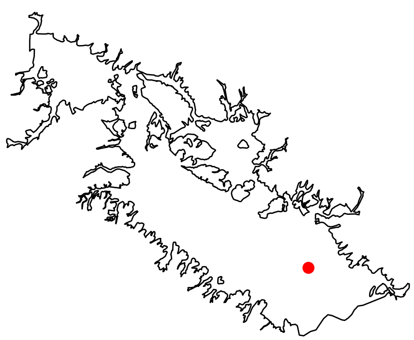
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005913
Well Name: Cereal 3
State Well ID: 06S04W17K01

Figure A-29



Location of Well in Elsinore Valley



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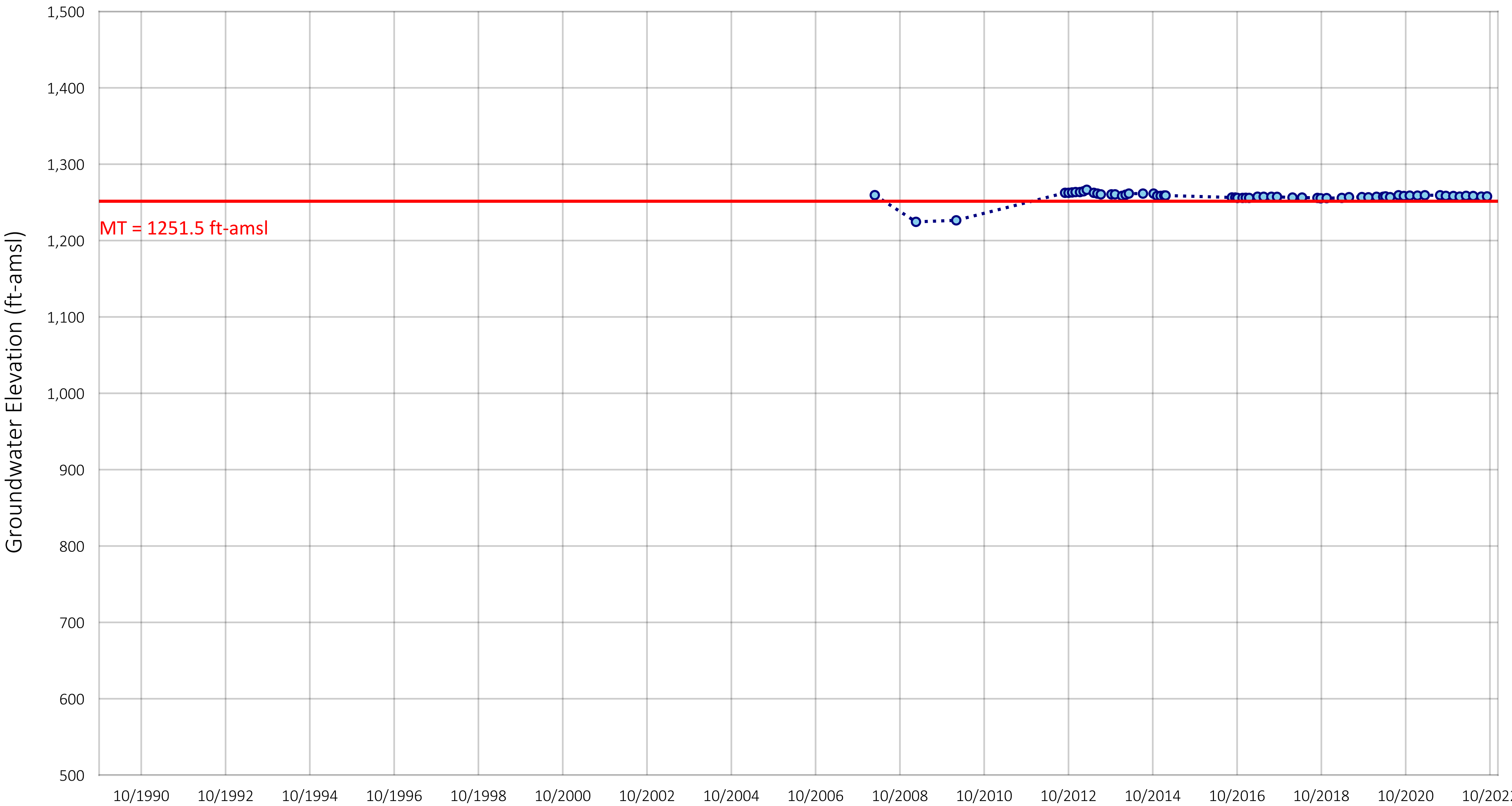
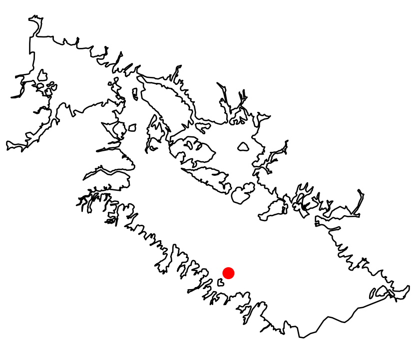
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1222269
Well Name: Diamond

Figure A-30



Location of Well in Elsinore Valley



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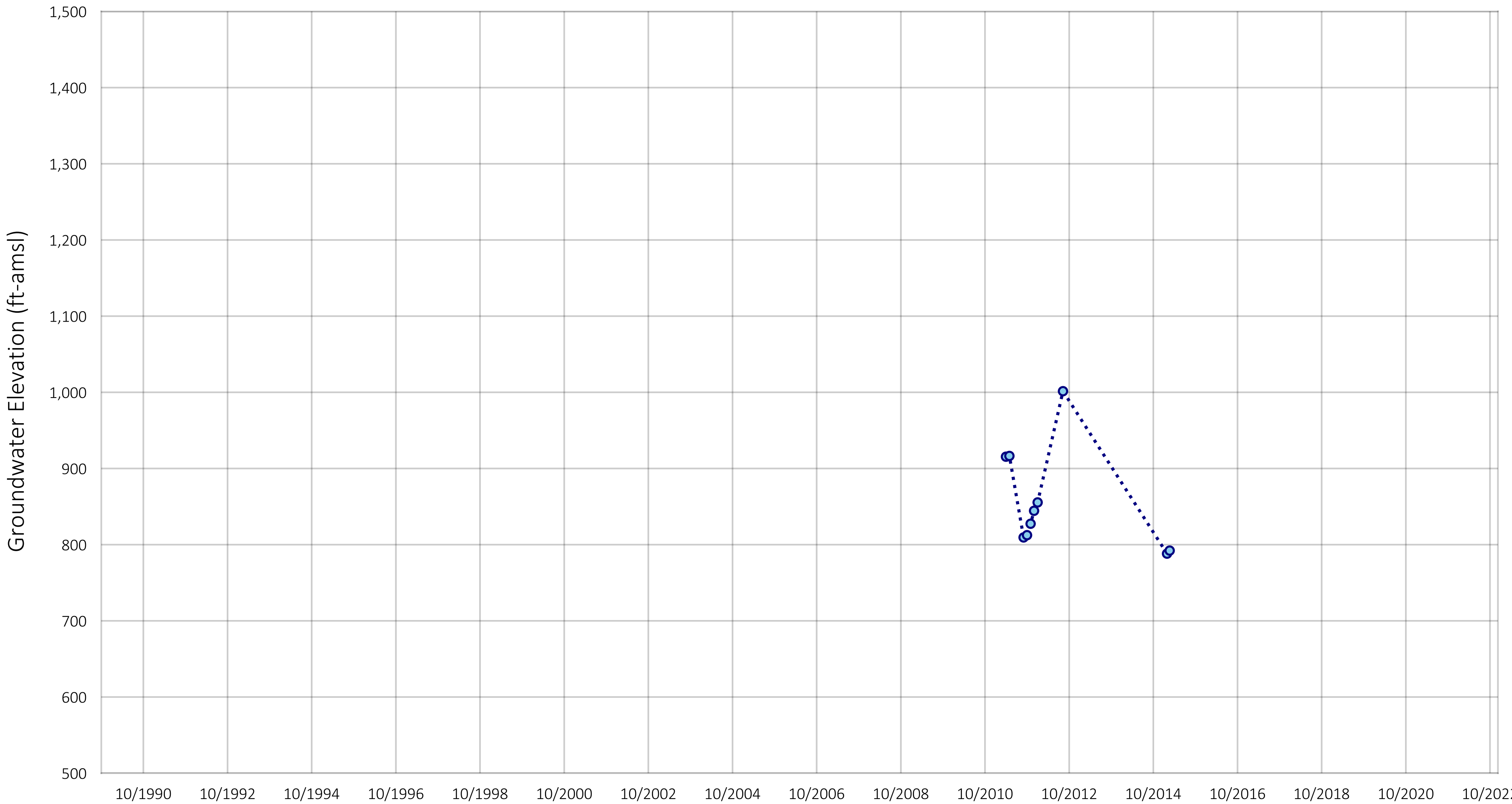
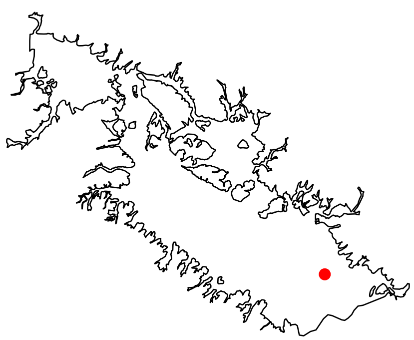
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1203678
Well Name: Grand
State Well ID: 06S05W24A

Figure A-31



Location of Well in Elsinore Valley



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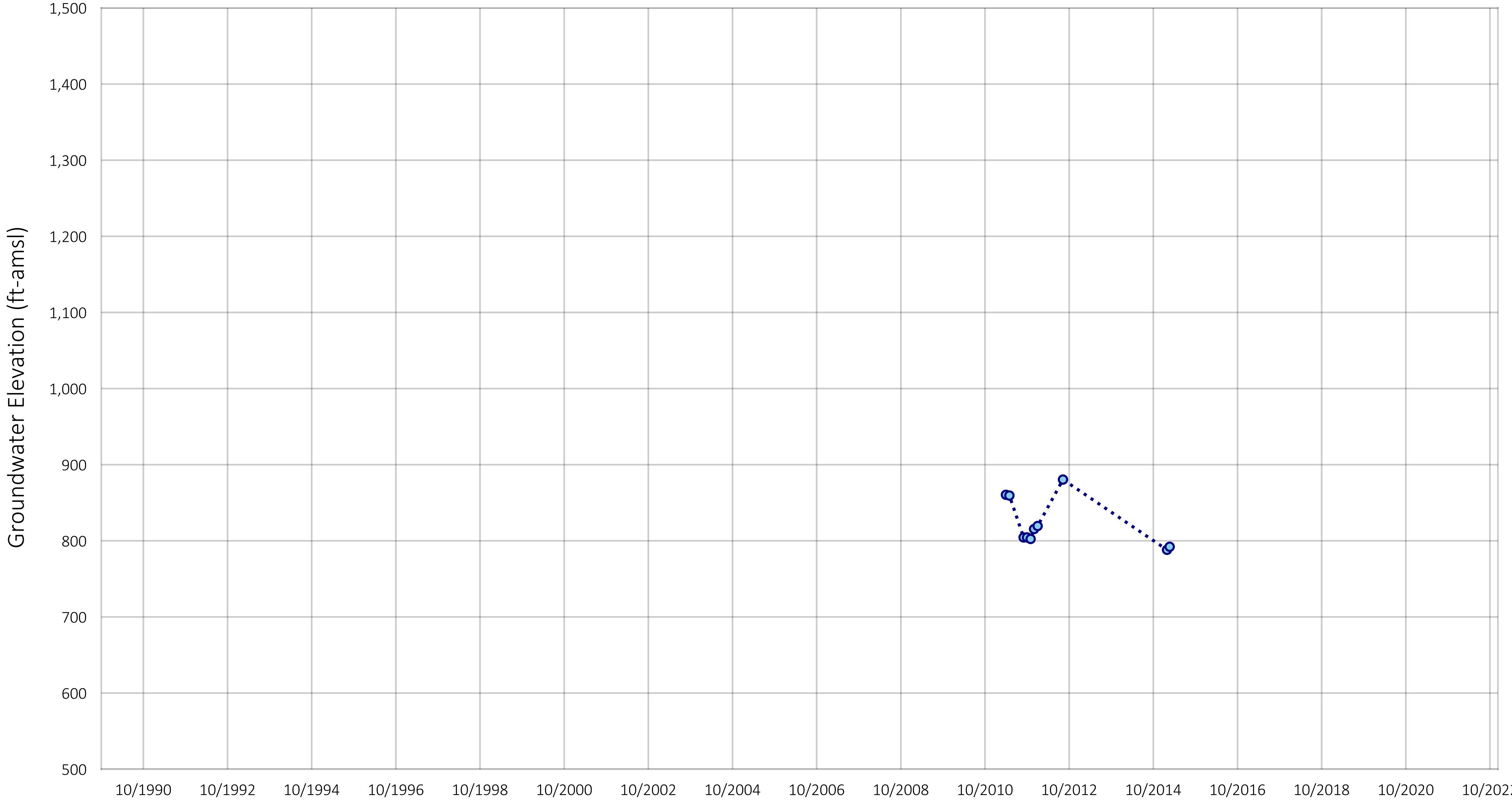
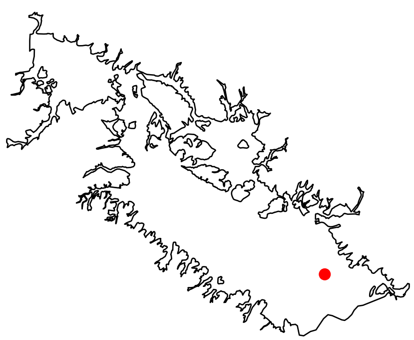
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232306
Well Name: MW4 Shallow

Figure A-32



Location of Well in Elsinore Valley

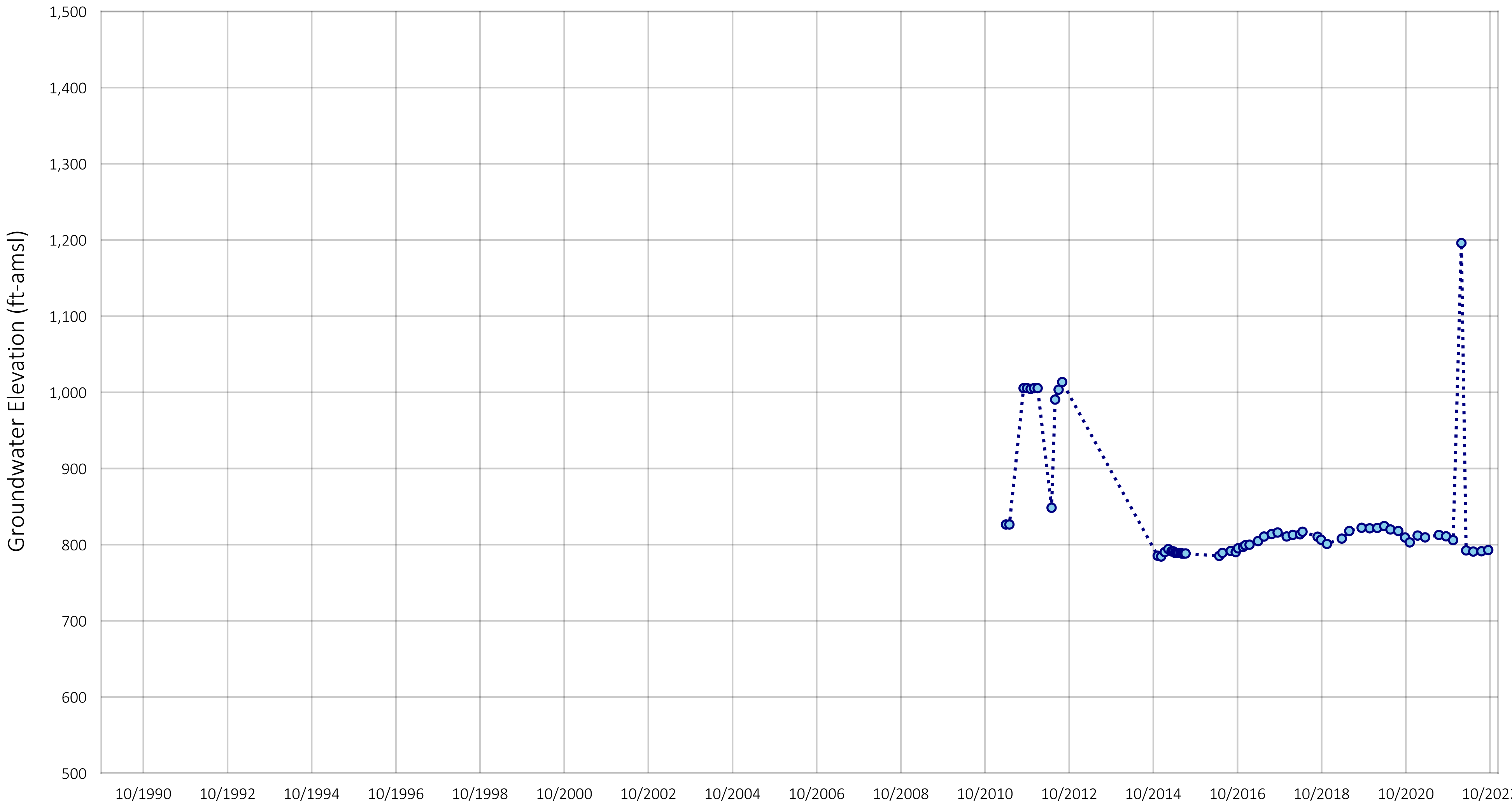


Prepared by:

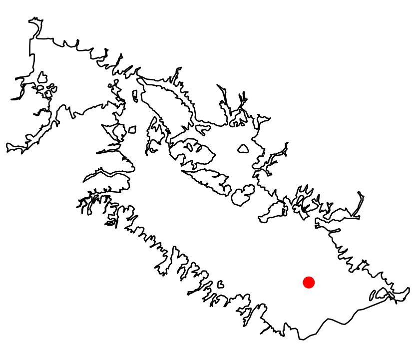
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232305
Well Name: MW4 Deep

Figure A-33



Location of Well in Elsinore Valley

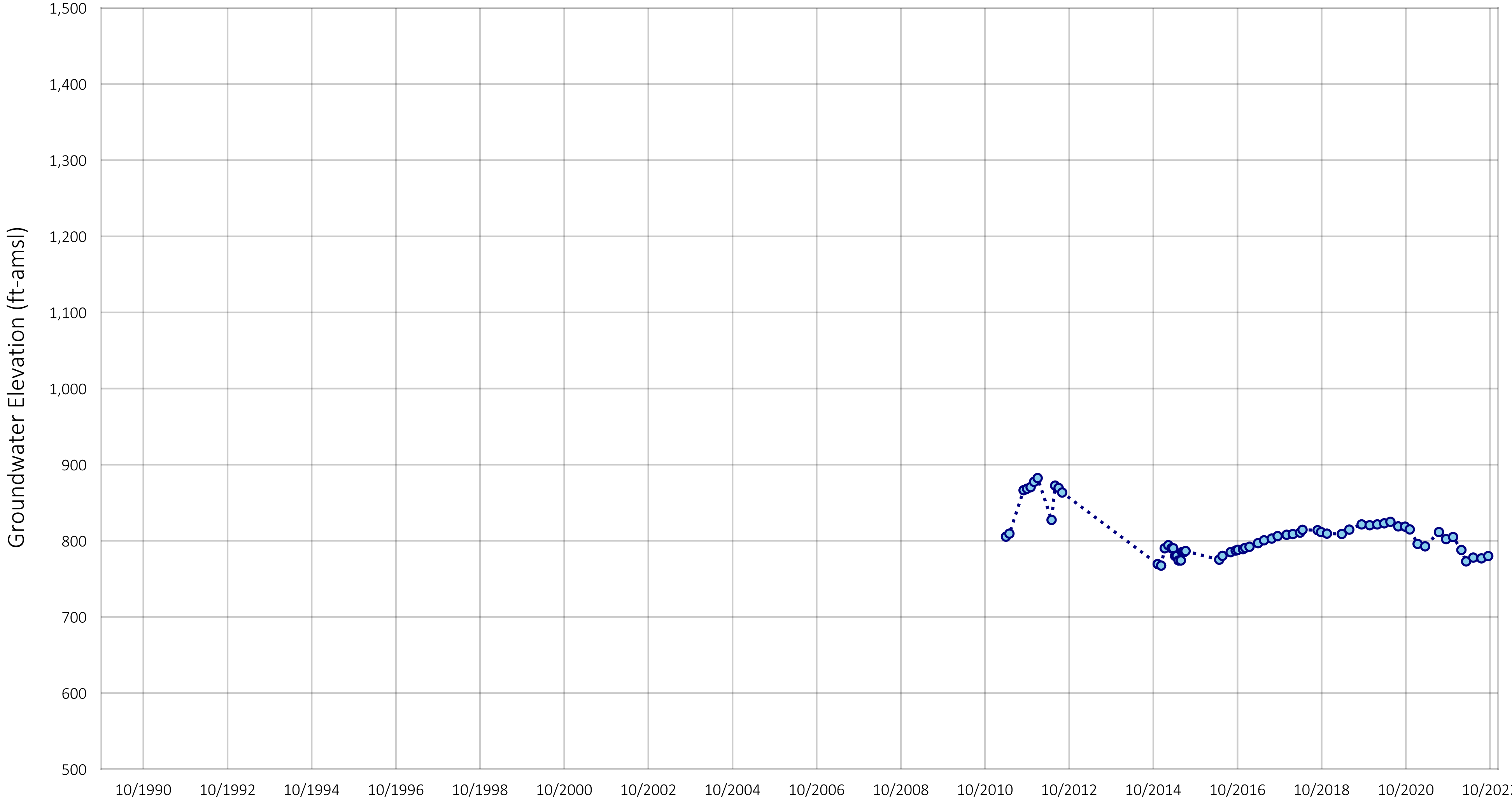


Prepared by:

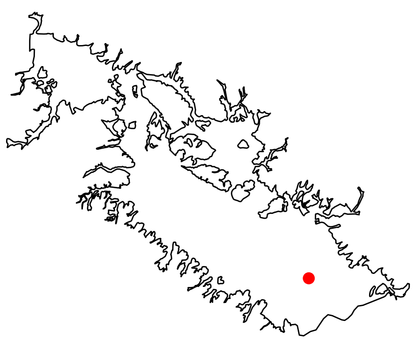
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232304
Well Name: MW3 Shallow

Figure A-34



Location of Well in Elsinore Valley



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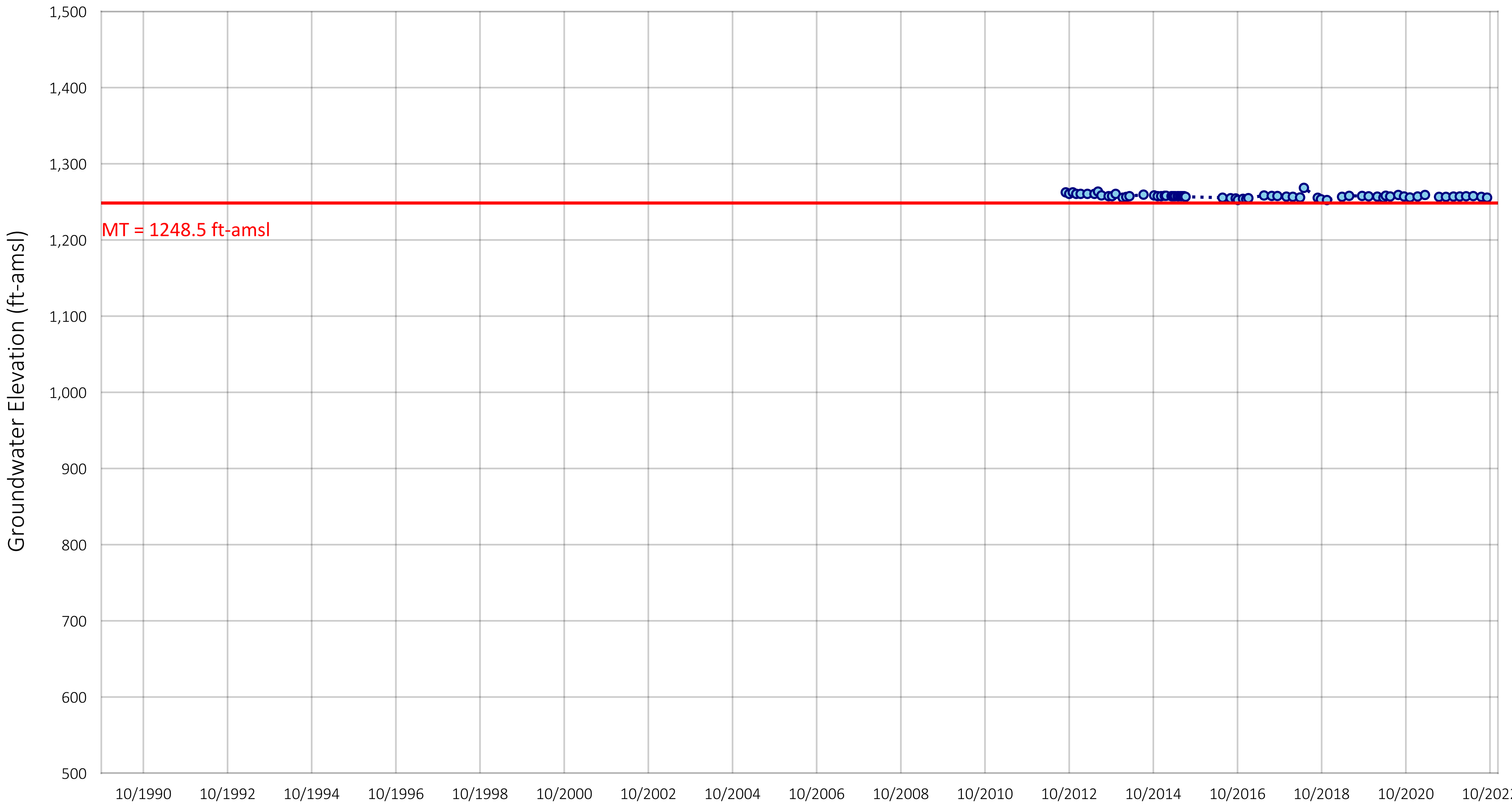
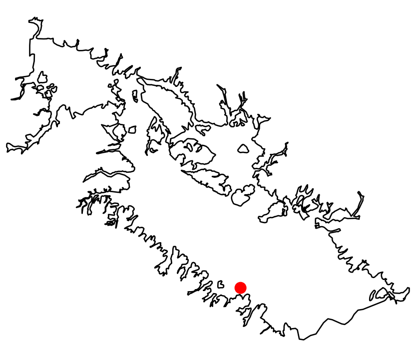
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232303
Well Name: MW3 Deep

Figure A-35



Location of Well in Elsinore Valley



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WEST YOST
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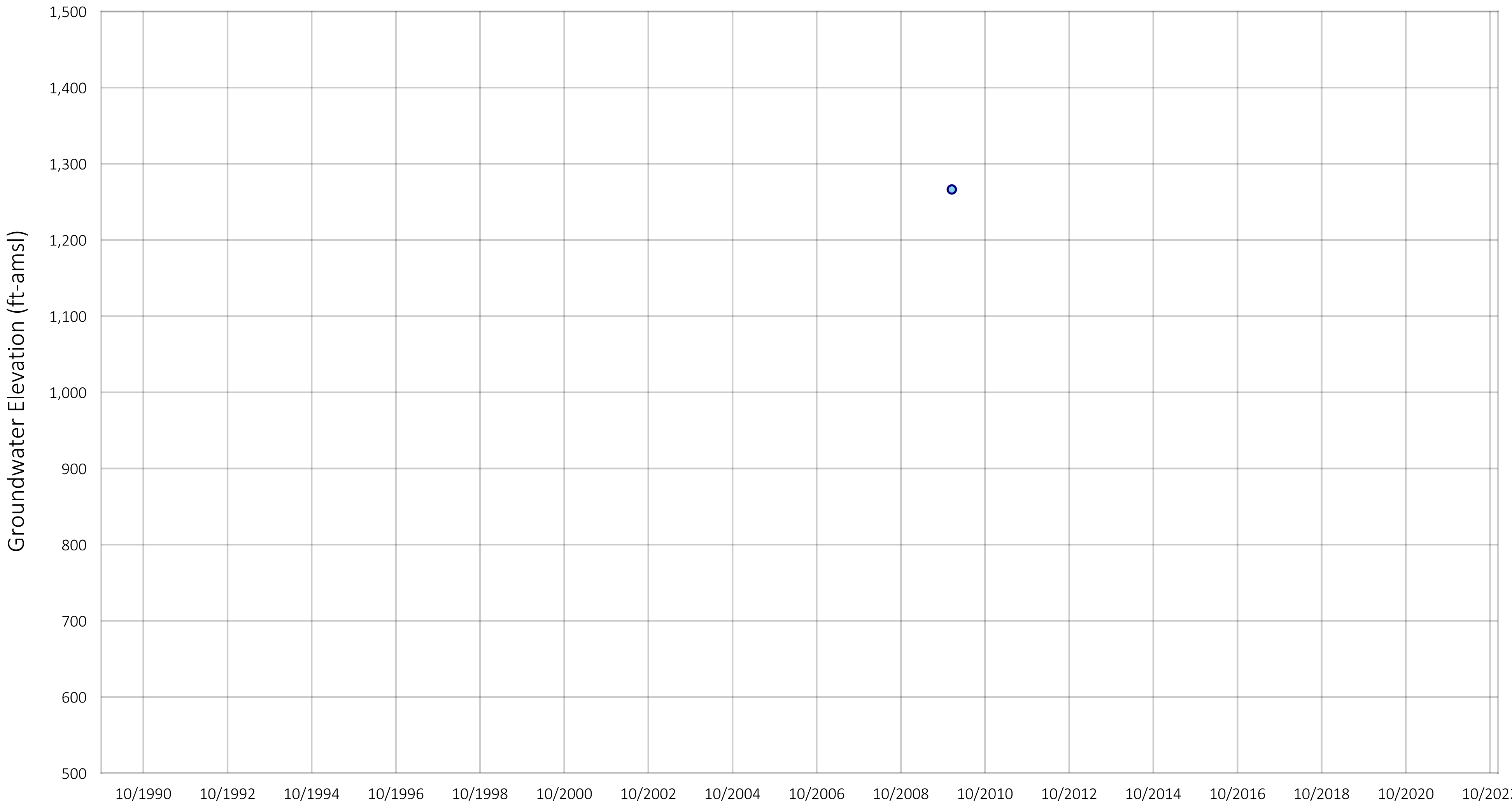
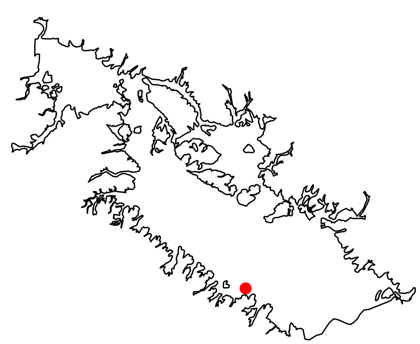
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232311
Well Name: Wood 2

Figure A-36



Location of Well in Elsinore Valley

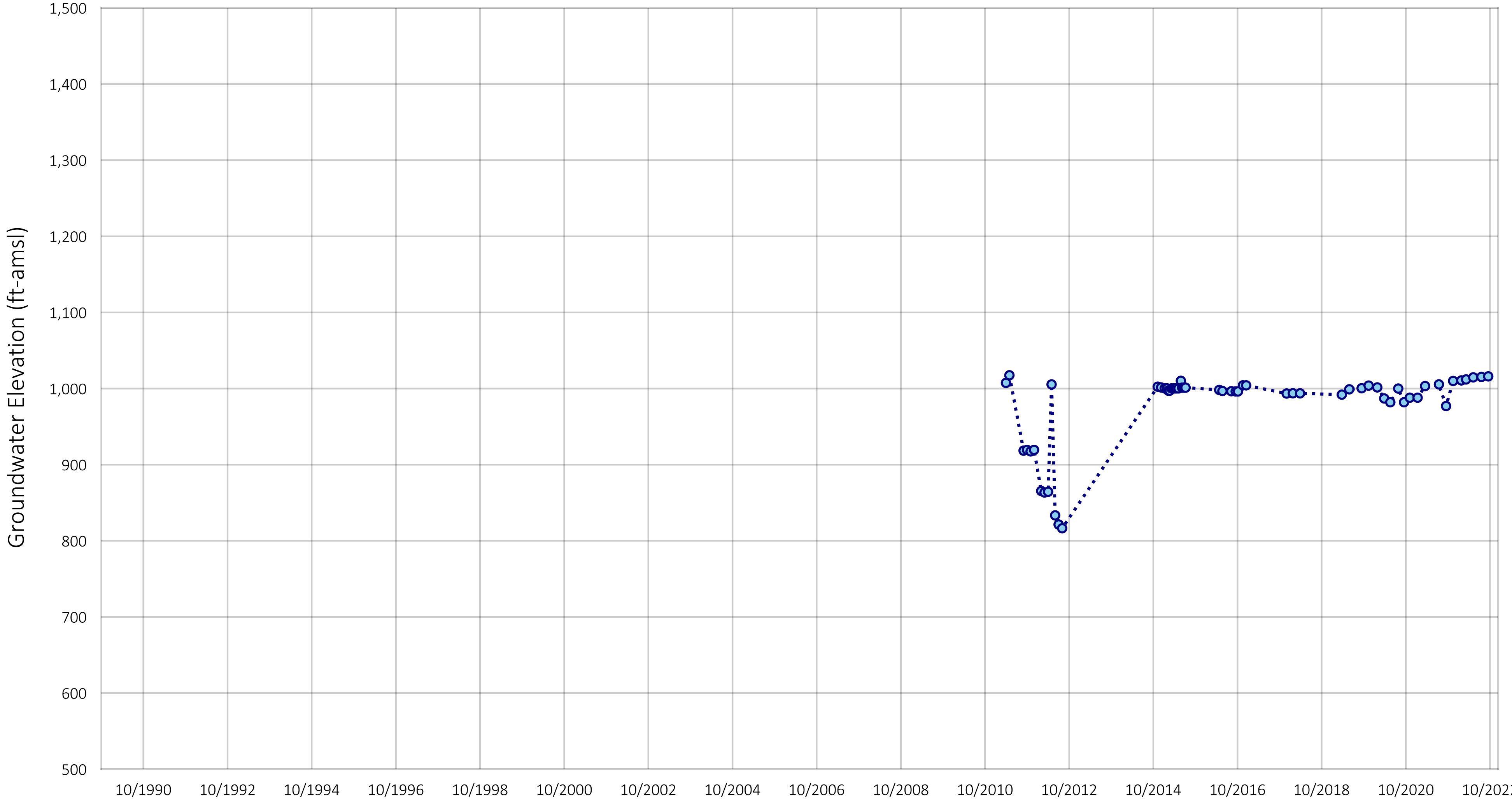


Prepared by:

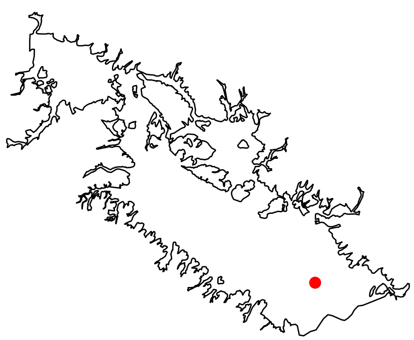
WEST YOST Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1208217
Well Name: Wood Well
State Well ID: 06S04W19F01

Figure A-37



Location of Well in Elsinore Valley



Prepared by:

WEST YOST
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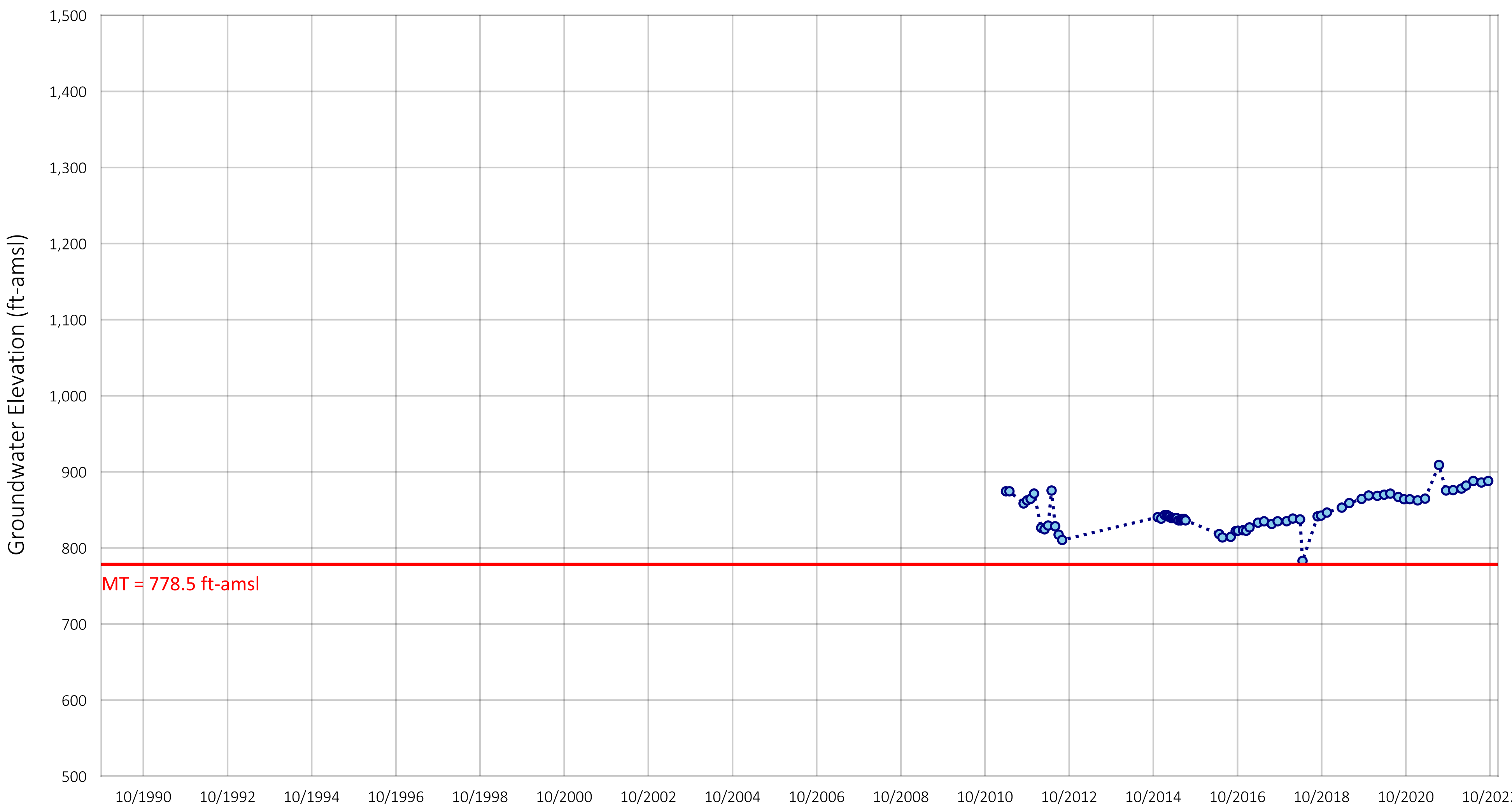
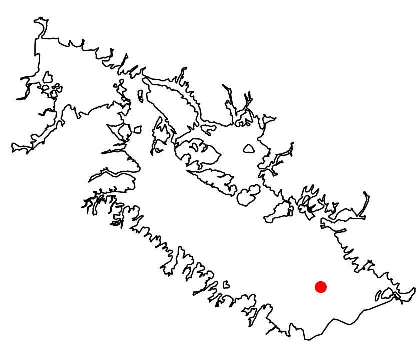
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232300
Well Name: MW1 Shallow

Figure A-38



Location of Well in Elsinore Valley

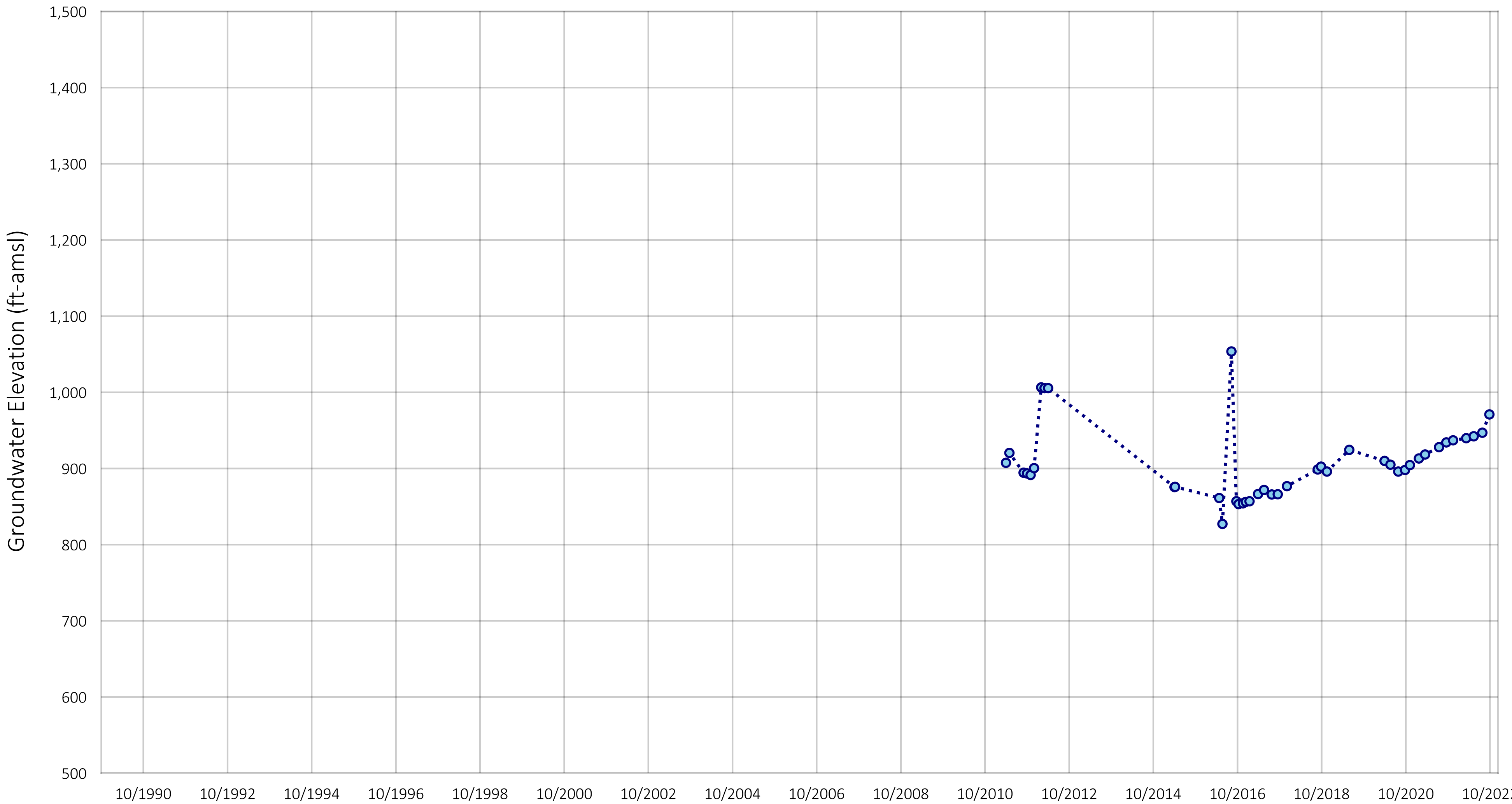


Prepared by:

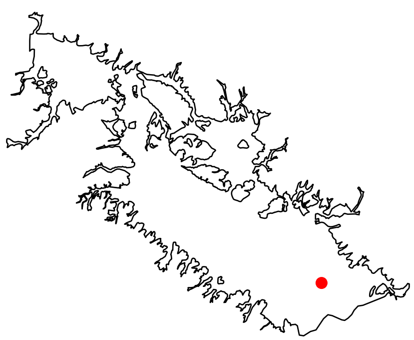
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232299
Well Name: MW1 Deep

Figure A-39



Location of Well in Elsinore Valley



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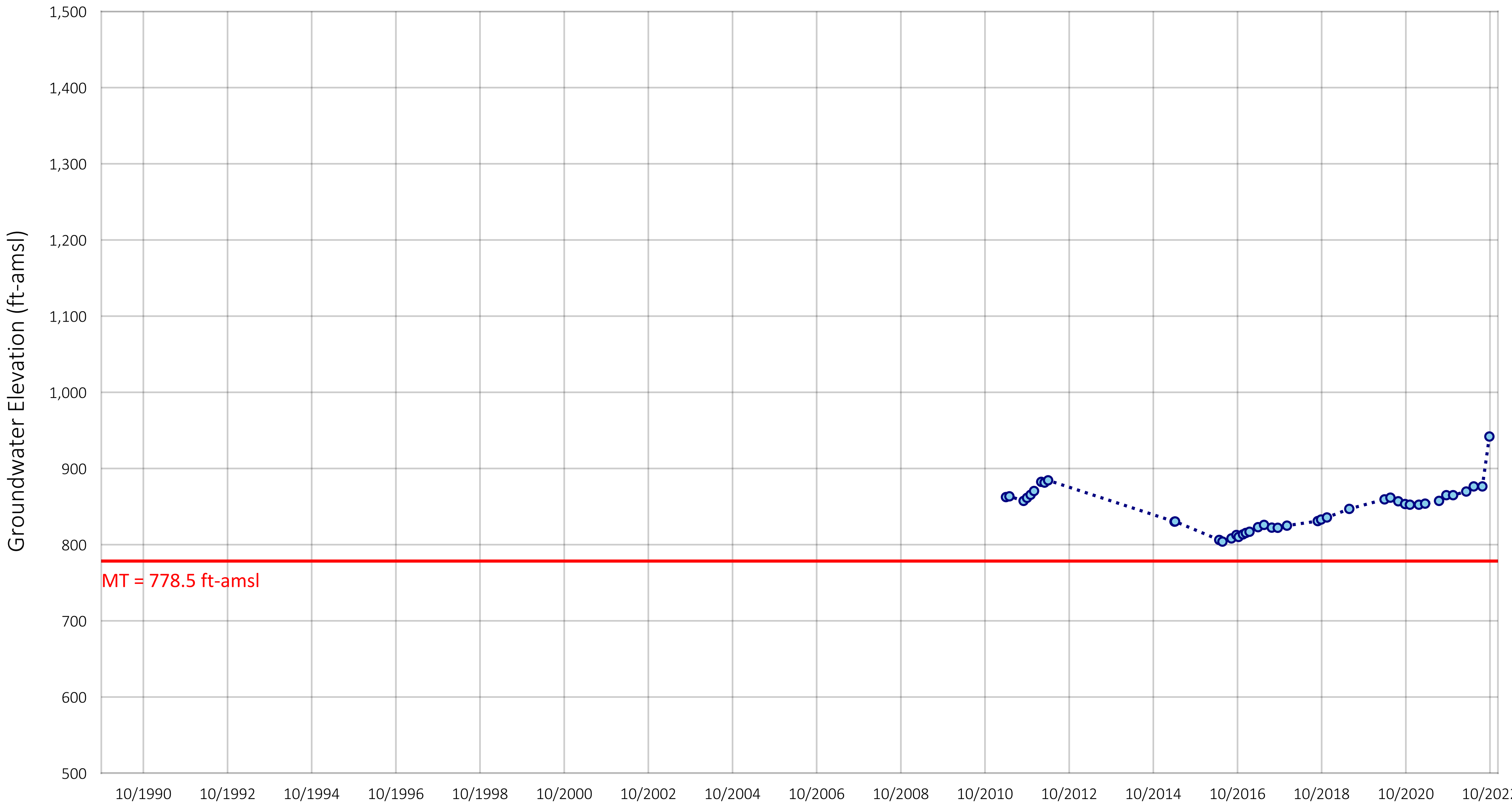
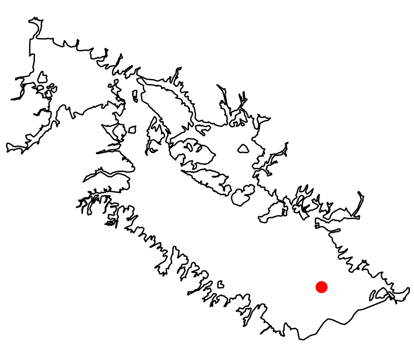
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232302
Well Name: MW2 Shallow

Figure A-40



Location of Well in Elsinore Valley

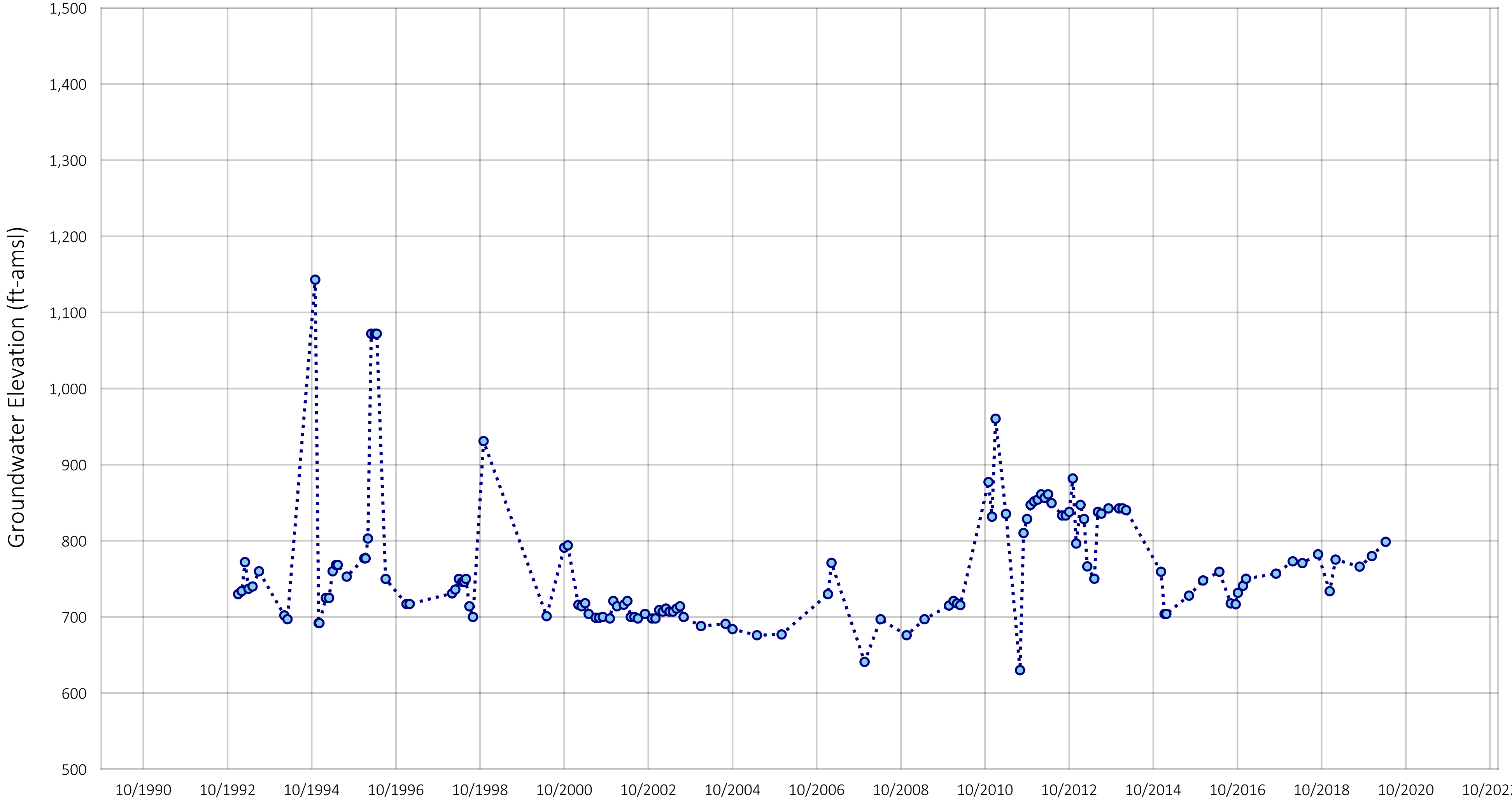


Prepared by:

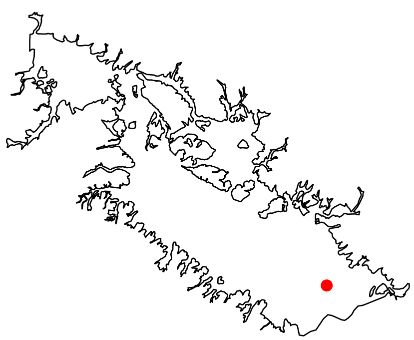
WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1232301
Well Name: MW2 Deep

Figure A-41



Location of Well in Elsinore Valley



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WEST YOST
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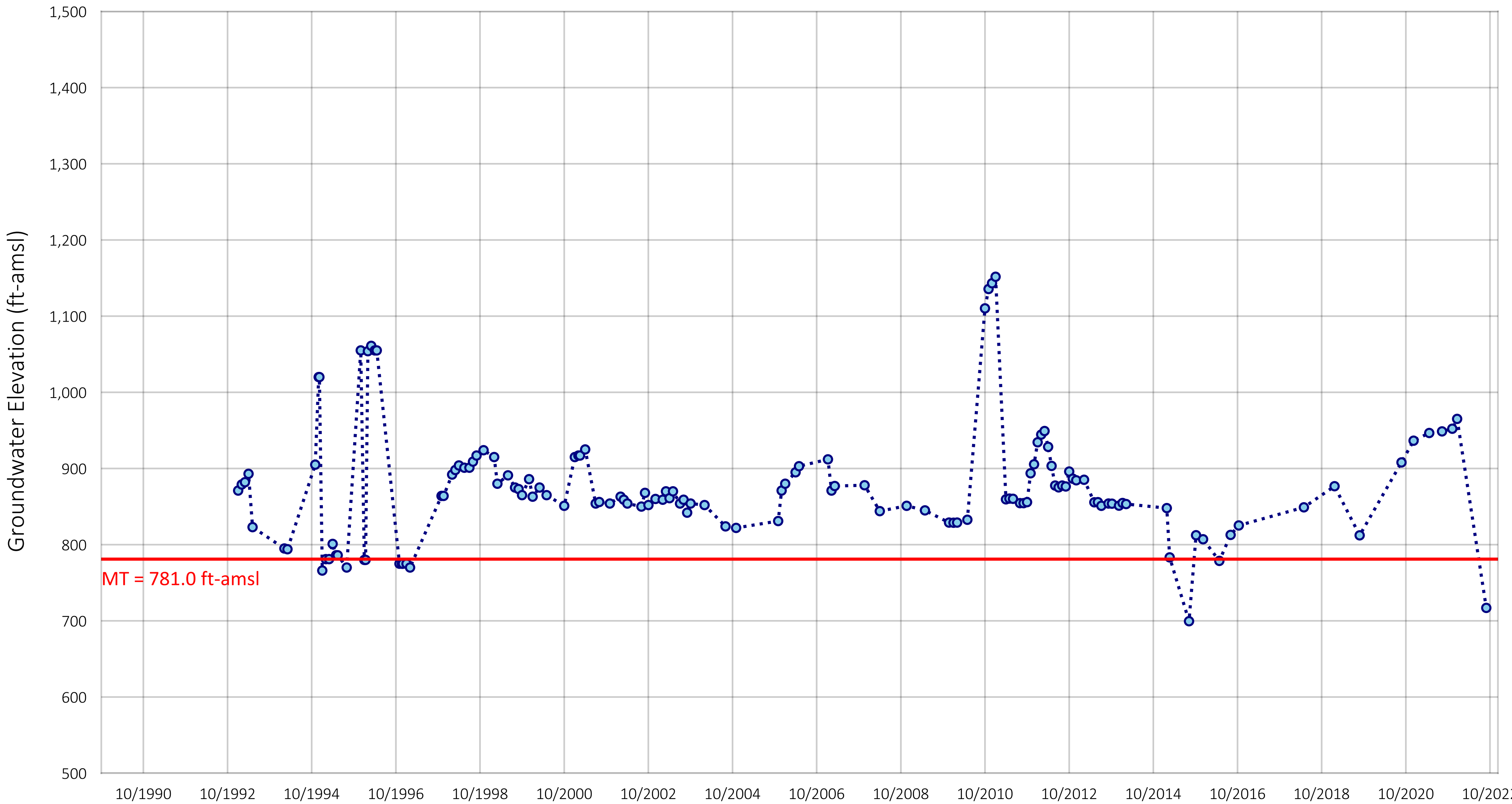
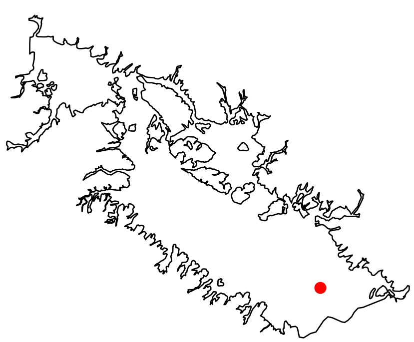
Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1203675
Well Name: Corydon
State Well ID: 06S04W22M08

Figure A-42



Location of Well in Elsinore Valley



Prepared by:

WEST YOST
Water. Engineered.

Historical Groundwater Level Elevation
Elsinore Valley Well ID: 1005916
Well Name: Cereal 1
State Well ID: 06S04W21J03

Figure A-43