BEDFORD COLDWATER
Groundwater Sustainability Authority

SGMA Annual Report
Water Year 2021
Bedford-Coldwater Basin

| MARCH 2022 |

TODD GROUNDWATER

BEDFORD COLDWATER
Groundwater Sustainability Authority

SGMA ANNUAL REPORT WATER YEAR 2021

BEDFORD-COLDWATER BASIN

March 2022

TODD GROUNDWATER

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Acronyms

Actions	Management Actions
AF	acre-feet
AFY	acre-foot per year
Basin	Bedford-Coldwater Subbasin
BCGSA	Bedford-Coldwater Groundwater Sustainability Agency
CIMIS	California Irrigation Management Information System
Corona	City of Corona
DMS	Data Management System
DWR	California Department of Water Resources
DWSAP	Drinking Water Source Water Assessment Program
EMWD	Eastern Municipal Water District
ET	evapotranspiration
EVMWD	Elsinore Valley Municipal Water District
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
InSAR	Interferometric Synthetic Aperture Radar

JPA	Joint Powers Authority
M&I	municipal, commercial, and industrial
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
mg/L	milligrams per liter
MO	Measurable Objective
MODFLOW	United States Geological Survey modular finite-difference flow model
msl	mean sea level
MT	Minimum Threshold
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
Projects	Projects to support sustainability
SCADA	Supervisory Control and Data Acquisition
SGMA	Sustainable Groundwater Management Act
TDS	Total Dissolved Solids
TVWD	Temescal Valley Water District
WMWD	Western Municipal Water District
WRF	Water Reclamation Facility

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EXECUTIVE SUMMARY

This annual groundwater report describes groundwater conditions in the Bedford-Coldwater Subbasin (Basin) of the Elsinore Groundwater Basin (8-004.02). This annual groundwater report fulfills the reporting requirements of California's Sustainable Groundwater Management Act (SGMA) which was enacted in California to regulate and sustainably manage groundwater basins throughout the state. SGMA requires sustainable management of priority groundwater basins and empowers local Groundwater Sustainability Agencies (GSAs) to manage groundwater resources.

The Bedford-Coldwater Groundwater Sustainability Authority (BCGSA) was established in 2017 under SGMA. The BCGSA is responsible for implementing SGMA in the Basin and its goal is to achieve long-term groundwater sustainability. The BCGSA consists of three local agencies – the City of Corona, Elsinore Valley Municipal Water District, and Temescal Valley Water District.

The Bedford-Coldwater GSP was prepared from June 2018 through December 2021 with active outreach and public participation throughout the process. The GSP was adopted by BCGSA on December 18, 2021 and was submitted to the California Department of Water Resources (DWR) in January 2022. The 2022 GSP provides the basic information, analytical tools, and projects and management actions for continued groundwater management, guided by SGMA and by locally defined sustainability goals, objectives, and metrics.

This annual groundwater report for the BCGSA documents water conditions including groundwater elevations and storage, water supplies and use, an updated water balance, and groundwater sustainability progress for water year 2021. This report also details the six Sustainable Management Criteria and their respective Minimum Thresholds (MTs). While Water Year 2021 was a dry year, characterized by below average rainfall and slightly decreased groundwater storage in parts of the Basin, no MTs were triggered during the water year. Water Year 2021 witnessed a continuation of collaborative management efforts by the BCGSA and the completion of the GSP.

This annual report reflects the changing scope of groundwater management in the Basin and thus involves adapted methods, for example, annual model updates to track sustainability. It builds on the GSP and presents updated groundwater conditions and the first post-GSP assessment of sustainability. As the GSP's projects and management actions are implemented, the BCGSA will have the tools to continue to manage the Basin sustainably.

1. INTRODUCTION

The Sustainable Groundwater Management Act (SGMA), effective January 1, 2015, was enacted in California to regulate and sustainably manage groundwater basins throughout the state. SGMA provides a framework to guide local public agencies and newly created Groundwater Sustainability Agencies (GSAs) in the management of their underlying groundwater basins, especially those considered critically affected as defined by the Department of Water Resources (DWR). The Bedford-Coldwater Groundwater Sustainability Authority (BCGSA) prepared a Groundwater Sustainability Plan (GSP) to maintain long-term groundwater sustainability in the Bedford-Coldwater Groundwater Subbasin (Basin, **Figure 1-1**) of the Elsinore Groundwater Basin and submitted the plan to the DWR in January 2022.

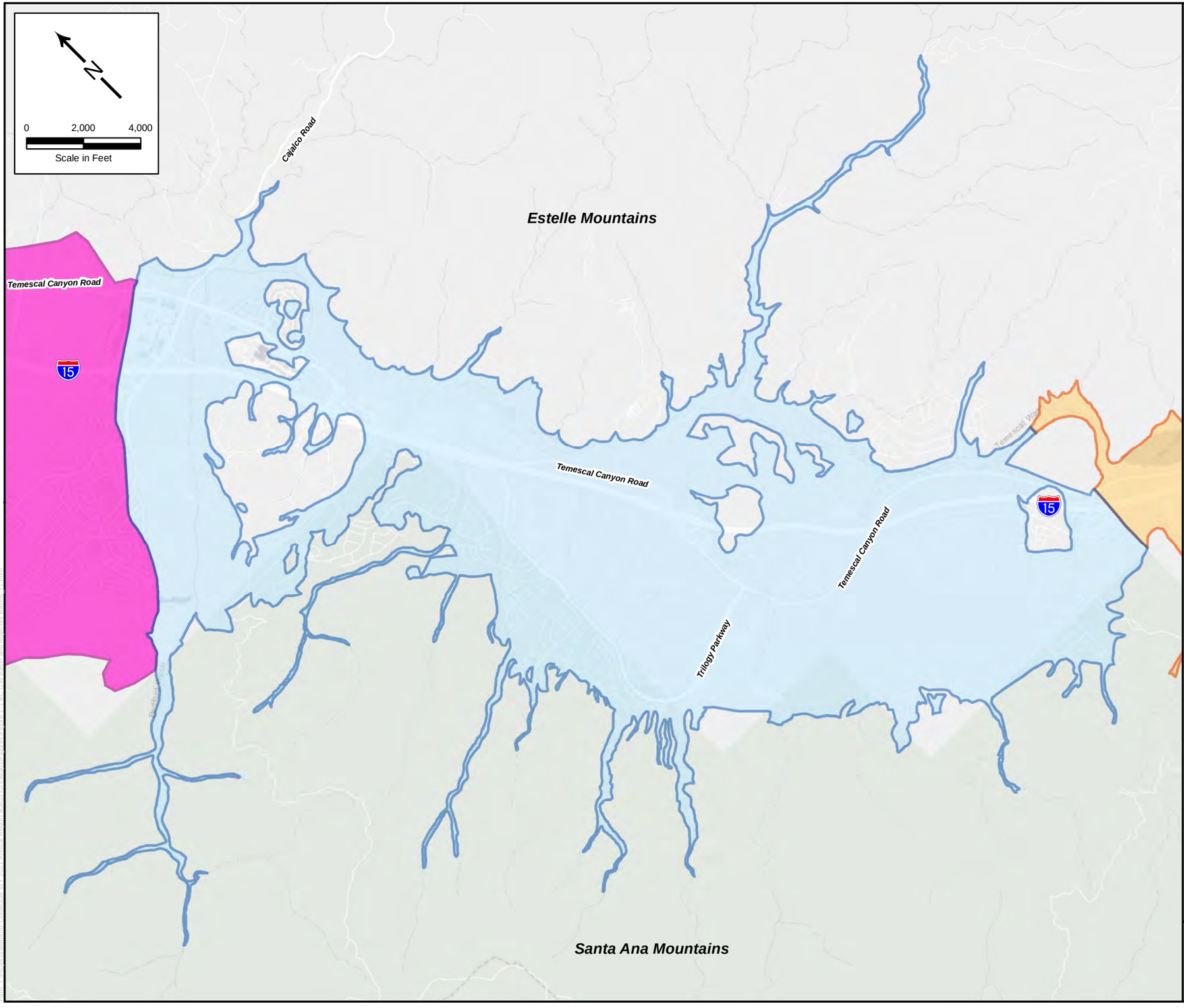
The BCGSA elected to prepare a GSP for the Basin even though it is designated as very low-priority and does not require a GSP. The BCGSA is committed to protecting and maintaining the current sustainable conditions into the future through SGMA.

1.1. PURPOSE OF THE SGMA ANNUAL REPORT

SGMA requires local agencies that have developed a GSP to report annually on groundwater conditions related to sustainability and to show implementation of the plan through the preparation of annual reports.

The purpose of the annual report is to provide basic information on the groundwater conditions in the Basin, report on changes in groundwater storage and water use, and provide an update on implementation in accordance with SGMA.

In accordance with SGMA, this annual report documents water supply sources and use, and groundwater elevations and storage from October 2020 through September 2021. In addition, the report contains water balance information for Water Years 2018 to 2020, updating the numerical model and available data from what was presented in the GSP. The SGMA elements guide, detailing the required SGMA components, is included in **Appendix A**.



Bedford-Coldwater Basin and Groundwater Sustainability Agency

Temescal Basin

Elsinore Valley Basin

TODD GROUNDWATER

Figure 1-1
Bedford-Coldwater Groundwater Basin, GSA, and Adjacent Basins

1.2. SUSTAINABILITY GOAL

The BCGSA prepared the GSP with the goal of sustaining groundwater resources for the current and future beneficial uses of the Bedford-Coldwater Basin in a manner that is adaptive and responsive to the following objectives:

- Provide a long-term, reliable and efficient groundwater supply for municipal, industrial, and other uses;
- Provide reliable storage for water supply resilience during droughts and shortages;
- Protect groundwater quality;
- Support beneficial uses of interconnected surface waters; and
- Support integrated and cooperative water resource management.

This goal is consistent with SGMA and was developed by the BCGSA based on information developed during preparation of the GSP and stakeholder outreach. Additional information related to the sustainability goal is presented in the GSP (Todd et al. 2021).

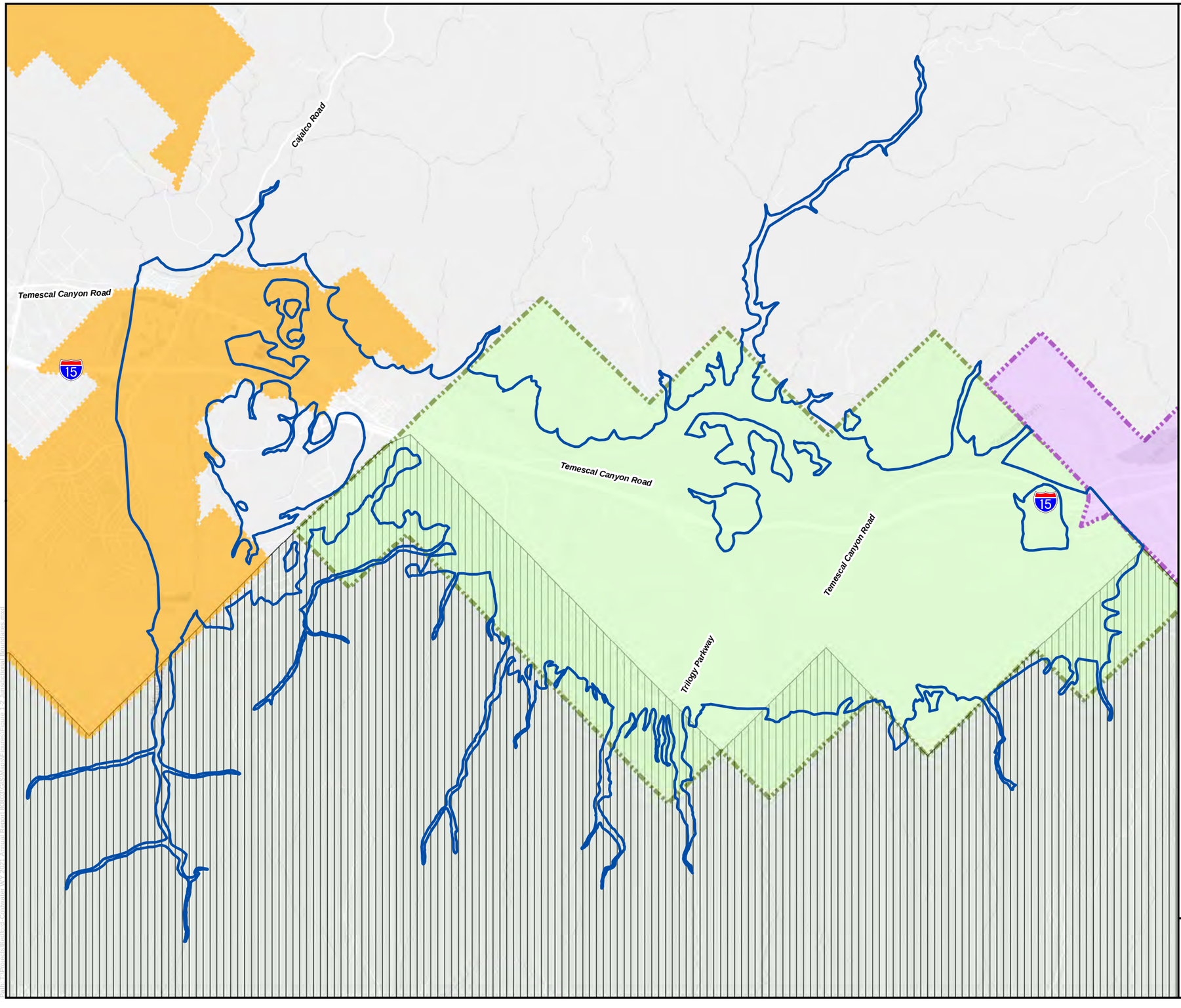
1.3. PLAN AREA

The Basin has been the focus of historical and ongoing collaborative groundwater basin management among three key agencies: the City of Corona (Corona), the Elsinore Valley Municipal Water District (EVMWD), and the Temescal Valley Water District (TVWD). These agencies have been collaborating to manage the Basin for many years prior to SGMA; they formed the BCGSA through a Joint Powers Authority (JPA) agreement in 2017 and have committed to ongoing sustainable management through the GSP.

Figure 1-1 shows the Basin and the adjacent Temescal Basin to the northwest (separated by a groundwater divide near Bedford Wash) and Elsinore Valley Subbasin located on the southern boundary. GSPs were also developed for these neighboring basins by the Temescal Basin GSA and the Elsinore Valley GSA, and preparation of the Bedford-Coldwater GSP was coordinated with those GSAs. The Bedford-Coldwater Basin is bound on the east and west by consolidated rocks of Estelle Mountain and the Santa Ana Mountains, respectively. The major drainage is the Temescal Wash, which traverses the three groundwater basins noted above along its 26-mile course from Lake Elsinore to the Santa Ana River.

Figure 1-2 shows the jurisdictional boundaries of the three agencies of the BCGSA and the area of the federal lands within the Basin, which are the United States Department of Agriculture Forest Service – Cleveland National Forest managed by the United States Forest Service.

There are no disadvantaged communities (DACs) or severely disadvantaged communities (SDACs) mapped within the Basin (DWR 2022).



Bedford-Coldwater Basin and Groundwater Sustainability Agency

City of Corona

Elsinore Valley Municipal Water District

Temescal Valley Water District (formerly Lee Lake WD)

US Forest Service Property

N

0 2,000 4,000

Scale in Feet

TODD GROUNDWATER

Figure 1-2
Jurisdictional Boundaries
Bedford-Coldwater Basin

1.4. WATER SUPPLY SOURCES

Sources for water supply for Municipal and Industrial (M&I), agricultural, and domestic uses include groundwater, imported water, and recycled water. Metropolitan Water District of Southern California (Metropolitan) is the wholesaler for imported water and its sources of water include the Colorado River and the State Water Project. **Figure 1-3** shows the service areas of these providers and imported water wholesalers. Imported water and other water infrastructure are shown on **Figure 1-4**.

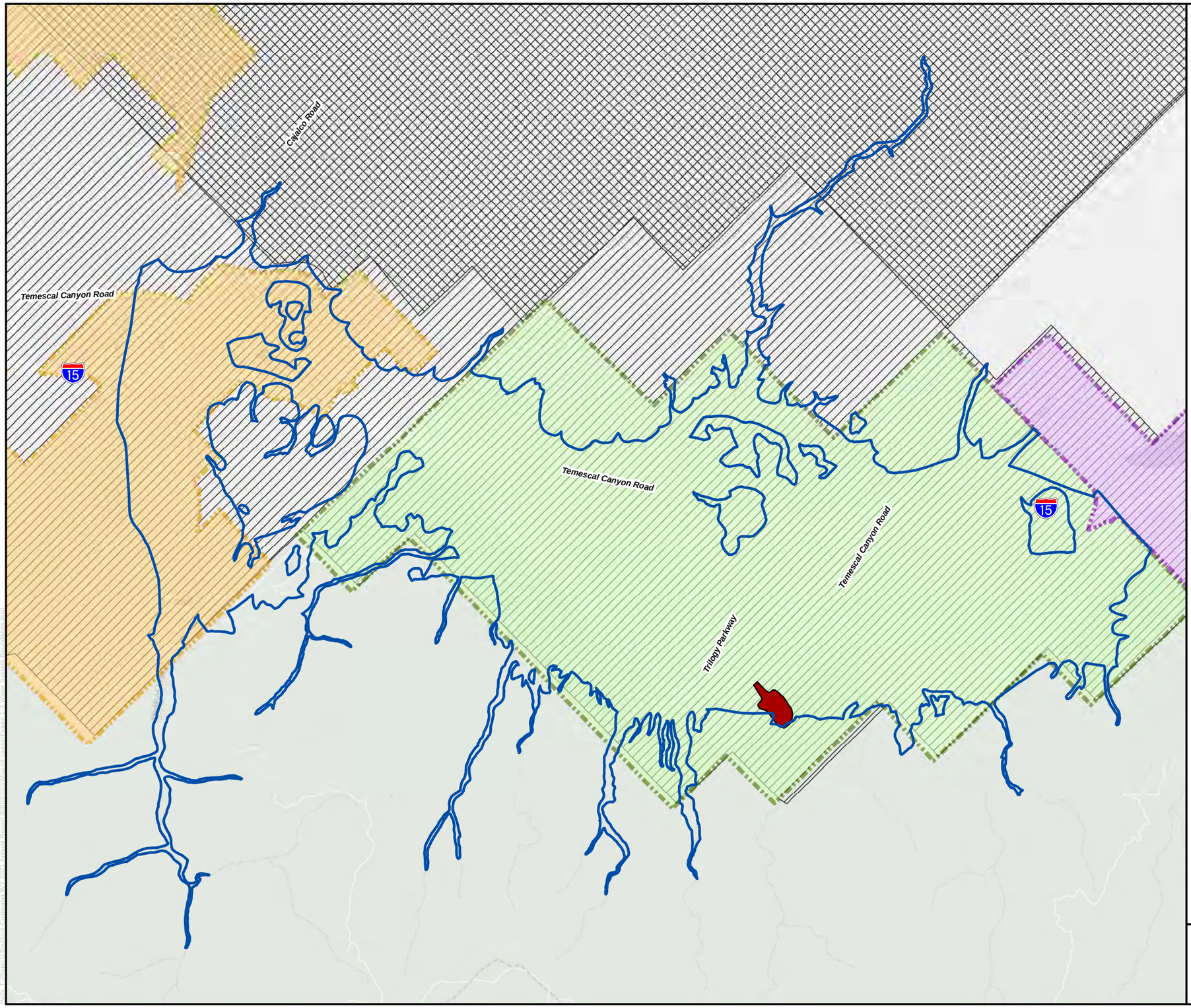
- **Groundwater**. Groundwater is currently a main source of water supply in the Basin. Corona, EVMWD, and TVWD all pump groundwater from the Basin. Corona and EVMWD distribute this supply to users within and outside the Basin, while TVWD only supplies groundwater to users within the Basin. Outside of the three major purveyors, there is only one public water system; Glen Ivy Hot Springs has one well and serves an estimated population of 750 people. The Glen Ivy Hot Springs well is located in the southwestern portion of the Basin (**Figure 1-3**).
- **Imported Water**. Corona, TVWD, and EVMWD rely on imported water from Metropolitan and Western Municipal Water District (WMWD).
- **Recycled Water.** Water recycling occurs in both Corona and TVWD. Recycled water use is a relatively small but increasing supply.

1.5. PHYSICAL SETTING AND TOPOGRAPHY

The Basin underlies a portion of the Elsinore Valley in western Riverside County and covers approximately 11 square miles. The Basin is adjacent to two other groundwater basins: the Temescal Subbasin of the Upper Santa Ana Basin to the north and the Elsinore Valley Subbasin of the Elsinore Basin to the south. **Figure 1-5** illustrates the topography of the Basin and surrounding uplands.

Ground surface elevations along the valley floor are generally flat. Elevations range from approximately 1,000 feet above mean sea level (msl) at the northern boundary to approximately 1,200 feet above msl to the south, as shown by 200-foot contours on **Figure 1-5**. The tributary watersheds reach up to more than 5,600 feet msl at the highest peak in the Santa Ana Mountain watersheds west of the Basin. Watersheds east of the Basin are significantly lower in elevation and rise only to about 1,800 feet.

Annual precipitation varies from below 12 inches to more than 26 inches over the Basin and surrounding watersheds. The long-term average annual rainfall is between 12 and 14 inches per year on the Basin floor and increases to more than 20 inches along the top of the local watersheds in the Santa Ana Mountains to the west.



Bedford-Coldwater Basin and Groundwater Sustainability Agency

City of Corona

Elsinore Valley Municipal Water District

Temescal Valley Water District (formerly Lee Lake WD)

Glen Ivy Hot Springs

Metropolitan Water District of Southern California

Western Municipal Water District of Riverside

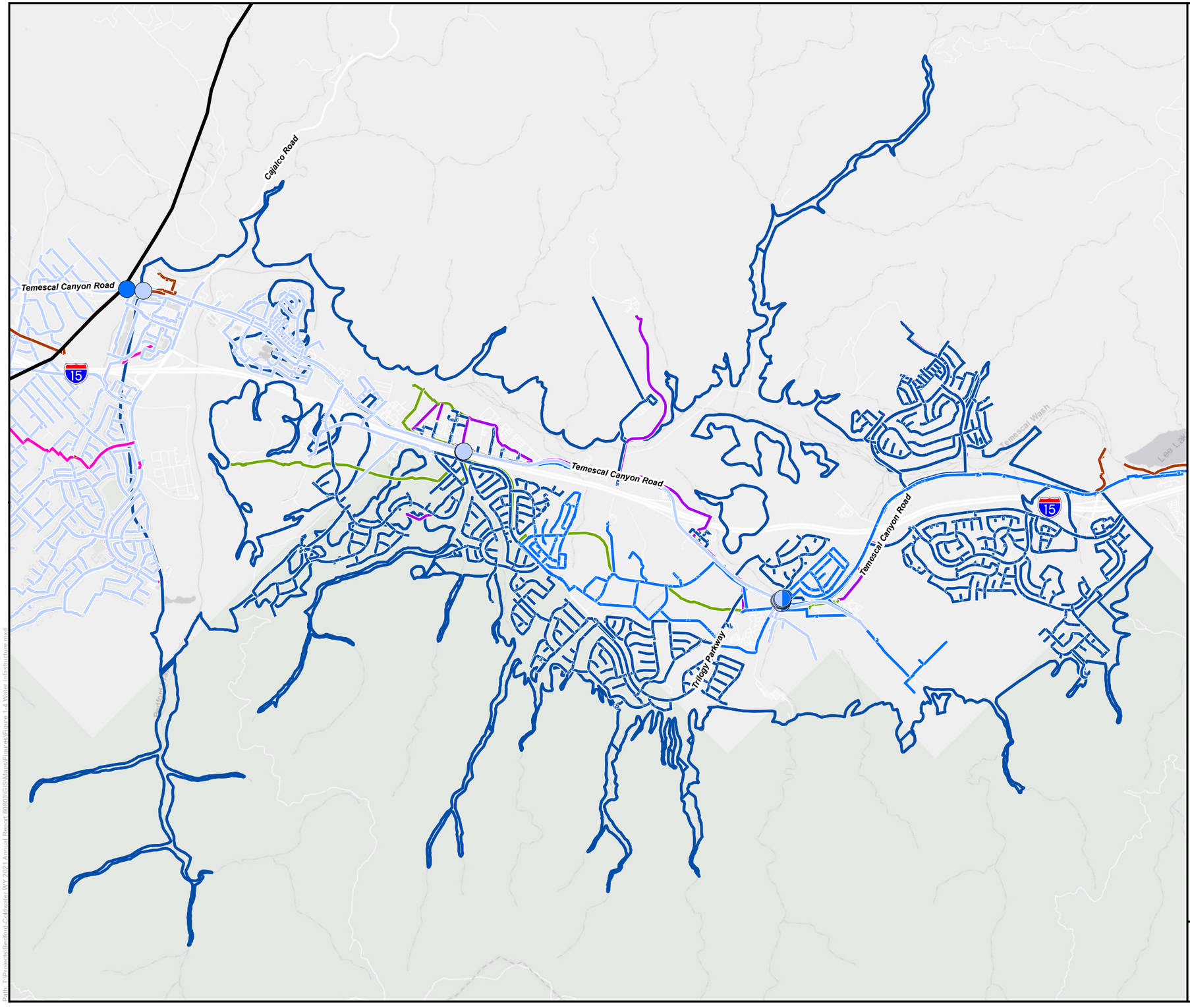
N

0 2,000 4,000

Scale in Feet

TODD GROUNDWATER

Figure 1-3
Water Purveyor Boundaries
Bedford-Coldwater Basin



- City of Corona Potable Water Intertie
- EVMWD Imported Water Connection and Intertie
- Metropolitan Water District Imported Water Pipeline
- Corona Potable Water Main Pipeline
- EVMWD Potable Main Pipeline
- TVWD Potable Main Pipeline
- Corona Non-Potable and Recycled Water Pipeline
- EVMWD Non-Potable Water Pipeline
- TVWD Non-Potable (agricultural) Pipeline
- TVWD Recycled Water Pipeline
- Bedford-Coldwater Basin

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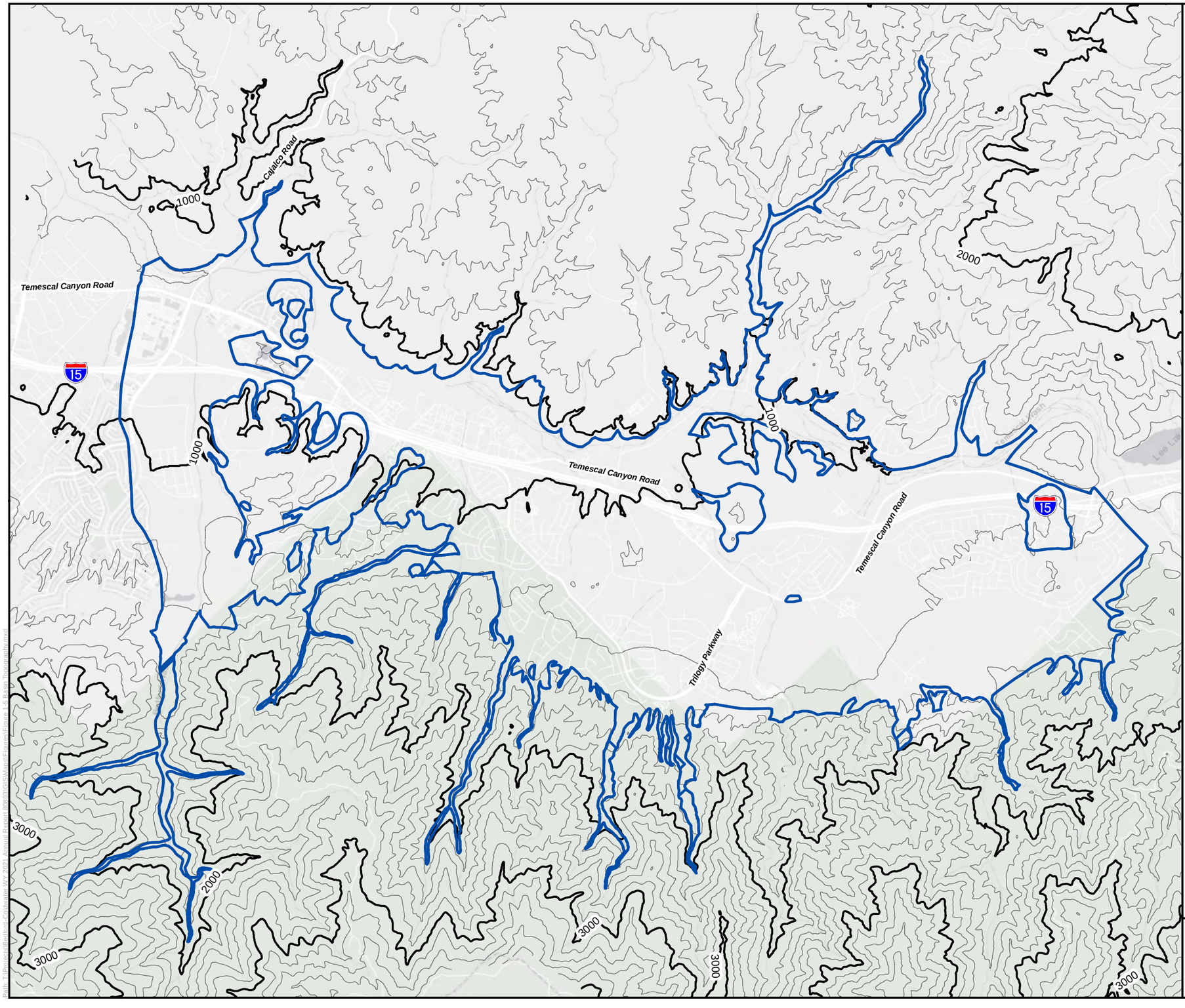
Scale in Feet

TODD GROUNDWATER

Figure 1-4
Water Infrastructure
Bedford-Coldwater Basin



1,000 foot Ground Surface Elevation Contour

200 foot Ground Surface Elevation Contour

Bedford-Coldwater Basin

N

0 2,000 4,000

Scale in Feet

TODD GROUNDWATER

Figure 1-5
Basin Topography

1.6. SURFACE WATER FEATURES

Figure 1-6 shows surface water features including rivers, streams, springs, seeps, lakes, and ponds. The sub-watershed boundaries that drain into and through the Basin are shown on **Figure 1-7**.

The Basin covers a portion of the Santa Ana River watershed. Main tributaries to the Santa Ana River include Temescal Wash which flows through the Basin from the southeast to northwest and the Bedford Wash flowing toward the northeast along the northern boundary of the Basin. These waterways are ephemeral and are dry much of the year, flowing mainly during the winter.

1.7. MANAGEMENT AREAS

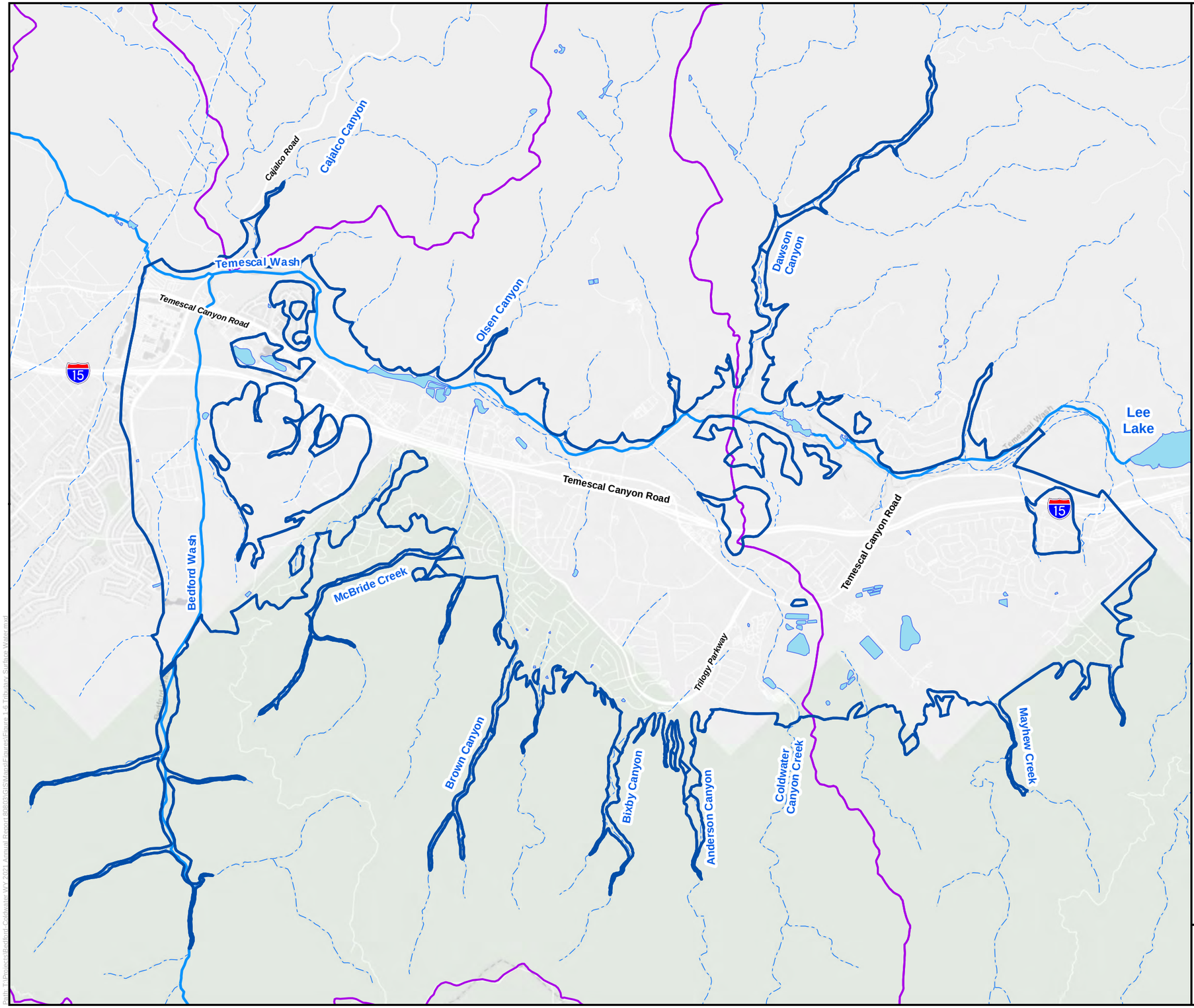
As defined in the GSP regulations, a management area is an area within a basin for which the GSP may identify different minimum thresholds, measurable objectives, monitoring, or projects and management actions based on differences in water use sector, water source type, geology, aquifer characteristics, or other factors. The Basin has been divided into two management areas. They are described below and in more detail in the GSP, and their boundaries are shown in **Figure 1-8**.

1.7.1. Bedford Management Area

The Bedford management area occupies roughly the eastern two-thirds of the Basin. It is separated from the Coldwater management area by the Glen Ivy Fault, which is a partial barrier to groundwater flow. The Bedford management area connects to the Elsinore Subbasin in the south and the Temescal Basin at the north end of the Basin. Some subsurface inflow from the Elsinore Subbasin to the south, and subsurface outflow to the Temescal Basin is also possible. Temescal Wash flows along the length of the Bedford management area. It also exits the north end of the Basin but traverses a bedrock reach before entering the Temescal Basin.

1.7.2. Coldwater Management Area

The Coldwater management area is the part of the Basin west of the Glen Ivy Fault. Because of downward movement on that side of the fault, Basin thickness is much greater than in the Bedford management area. A large open-pit aggregate mine is located in the southern part of this management area. Several streams enter the Coldwater management area from watersheds on the eastern slopes of the Santa Ana Mountains.



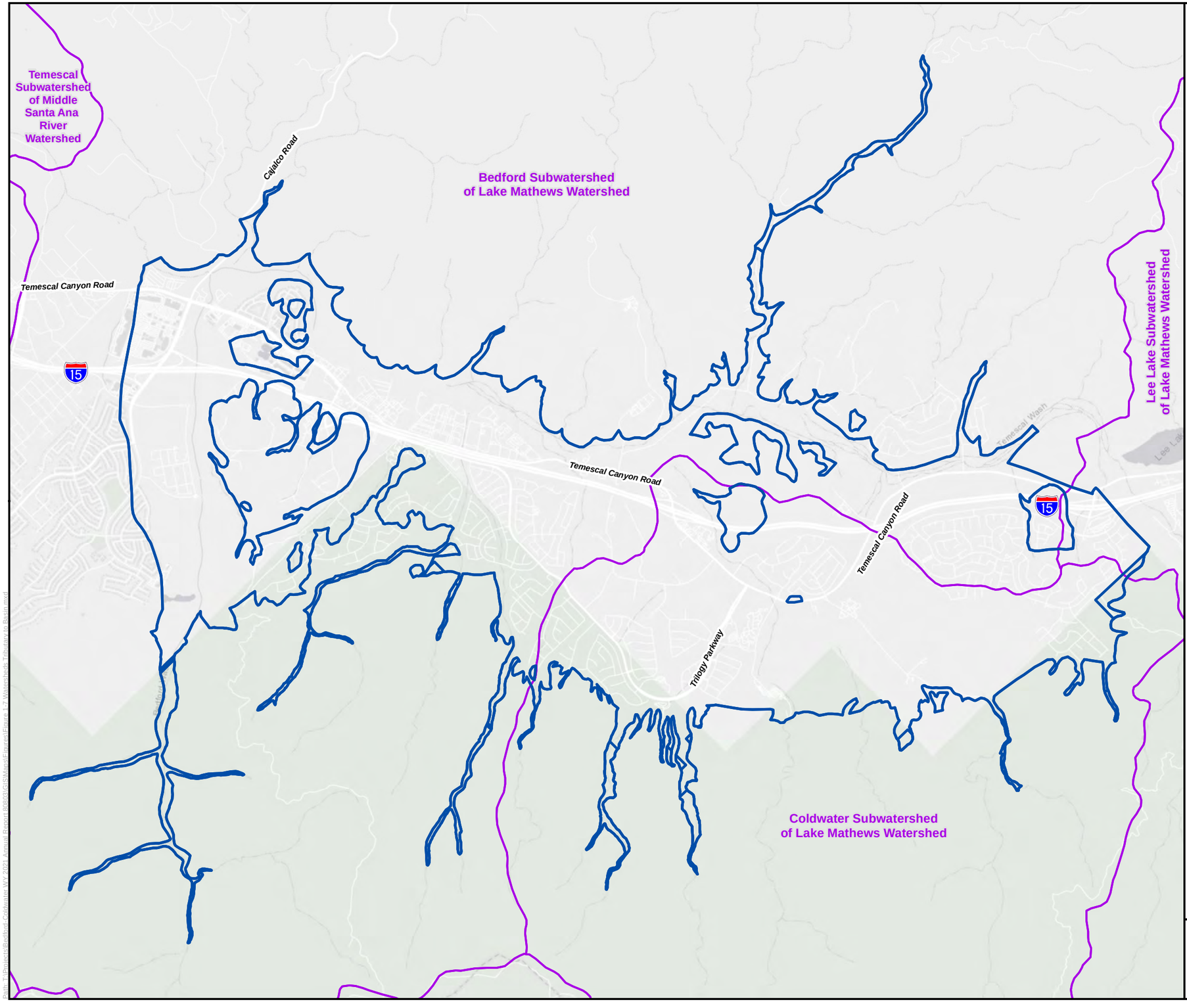
Major Streams
Minor Streams
Bedford-Coldwater Basin
Lake or Pond
Reservoir
Tributary Watershed Boundaries

N

0 2,000 4,000
Scale in Feet

TODD GROUNDWATER

Figure 1-6
Surface Water Bodies Tributary to Basin



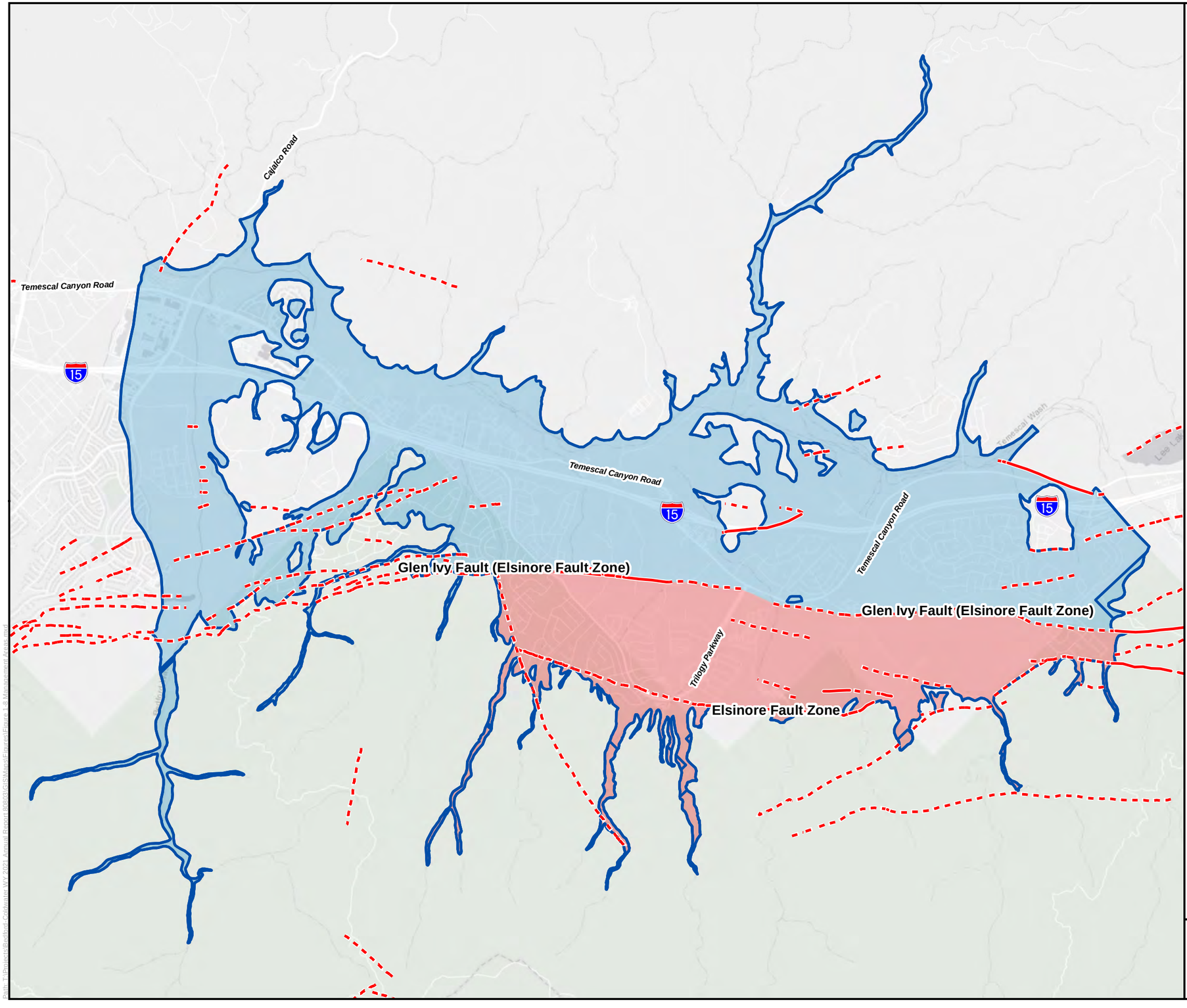
Bedford-Coldwater Basin
Tributary Subwatershed Boundaries

N

0 2,000 4,000
Scale in Feet

TODD GROUNDWATER

Figure 1-7
Subwatersheds Tributary to Basin



Bedford-Coldwater Basin
Bedford Management Area
Coldwater Management Area
Fault Location, dashed where uncertain

N

0 2,000 4,000
Scale in Feet

TODD GROUNDWATER

Figure 1-8
Management Areas

Path: T:\Projects\Bedford_Coldwater\WY2021_Annual_Report\MXD\GIS\Figure1-8_ManagementAreas.mxd

2. GROUNDWATER CONDITIONS

The section summarizes groundwater conditions within the Basin including climate, groundwater elevations, and groundwater level trends.

2.1. CLIMATE

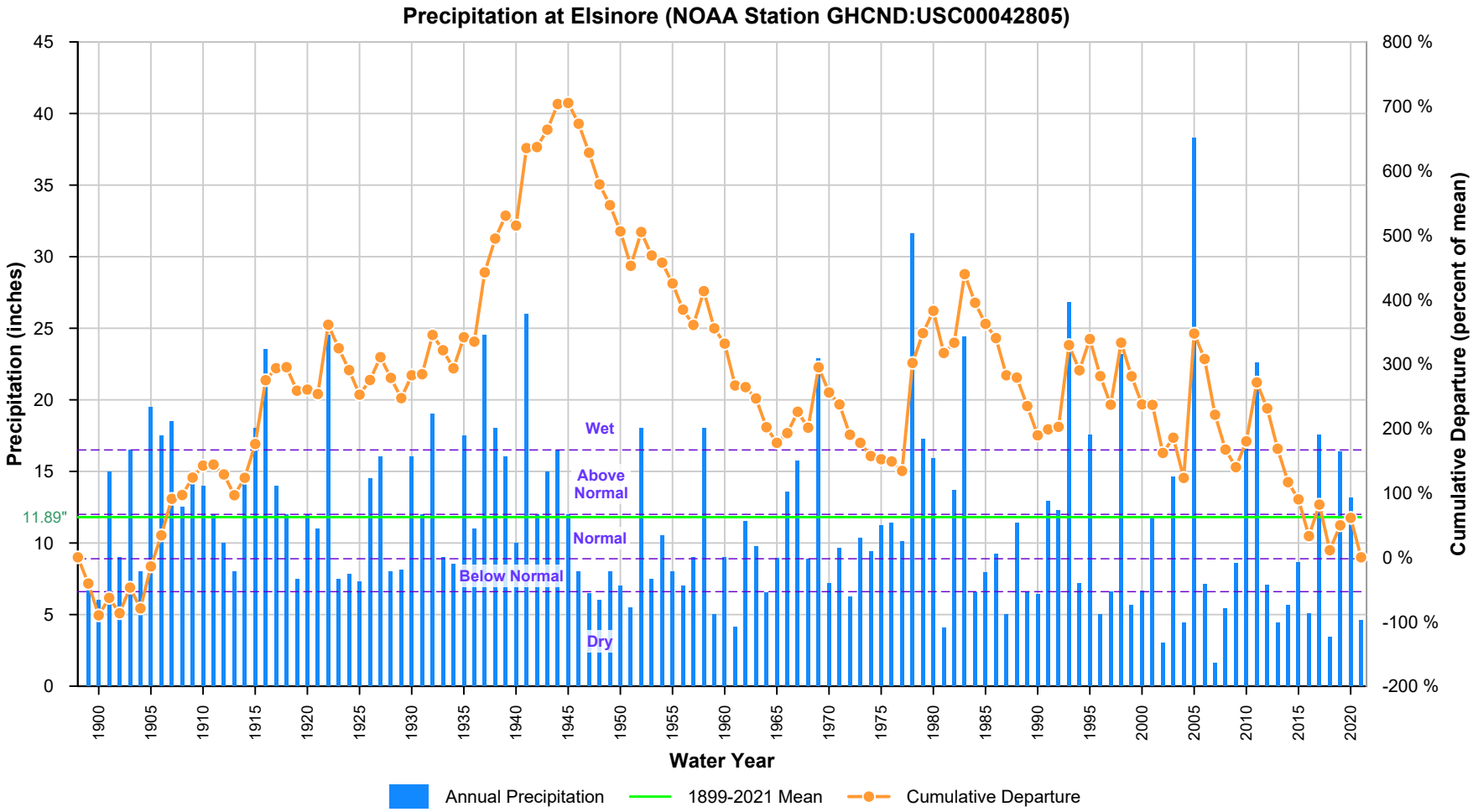
Overall, Water Year 2021 was characterized by below average precipitation. Climate data collection stations and records have been reviewed and assessed for the Basin and surrounding areas. Previous investigations (Todd et al. 2021, Todd and AKM 2008, SAIC 2007, MWH 2004) have revealed substantial variability in precipitation distribution because of elevation differences between the Temescal Valley and the nearby Santa Ana Mountains. These orographic effects result in significantly more precipitation on the upland areas of the watersheds that contribute to the Basin. There are three currently active climate monitoring stations near the Basin: the Lake Elsinore station maintained by the National Oceanic Atmospheric Administration (NOAA), the Santiago Peak station maintained by Orange County, and the UC Riverside California Irrigation Management Information System (CIMIS). The Lake Elsinore and UC Riverside stations include daily precipitation and evapotranspiration data; the Santiago Peak station collects monthly precipitation data. **Figure 2-1** shows annual precipitation at Elsinore (National Oceanic and Atmospheric Administration (NOAA) Station GHCND:USC00042805) for water years 1899 through 2021.

Dry and wet periods in historical hydrology can be identified on the basis of individual years or sequences of dry and wet years. GSP Regulations require assessment of water year type, which is a classification based on the amount of annual precipitation. Water year types are indicated on **Figure 2-1** and are assigned to five categories corresponding to quintiles of annual precipitation and the 1899 to 2021 average of 11.89 inches. The categories used here (dry, below normal, normal, above normal, and wet) accurately describe the quintiles. These categories differ from the nomenclature commonly used in the Central Valley (critical, dry, below normal, above normal, and wet) and elsewhere that do not accurately describe local categories and are based on the Sacramento River Index, which has little relevance to conditions in the Basin. The quintile divisions for precipitation during 1899 to 2021 at the Lake Elsinore station are shown in **Table 2-1**.

Table 2-1. Water Year Type Classification (Lake Elsinore station)

Water Year Type		Range as Percent of Mean	Precipitation Range (inches)
Wet	W	>139	> 16.5
Above Normal	AN	101 to 139	12.0 to 16.5
Normal	N	75 to 101	8.9 to 12.0
Below Normal	BN	56 to 75	6.6 to 8.9
Dry	D	<56	< 6.6

Average precipitation for 1899 to 2021 was 11.89 inches per year



TODD GROUNDWATER

Figure 2-1
Cumulative Departure of Annual Precipitation at Lake Elsinore

2.2. GROUNDWATER ELEVATIONS

Groundwater in the Basin is present in one principal aquifer, as documented in the GSP (Todd et al. 2021). The principal aquifer is unconfined and there are no data to suggest distinct vertical zones or to provide zone-specific groundwater elevation hydrographs or maps.

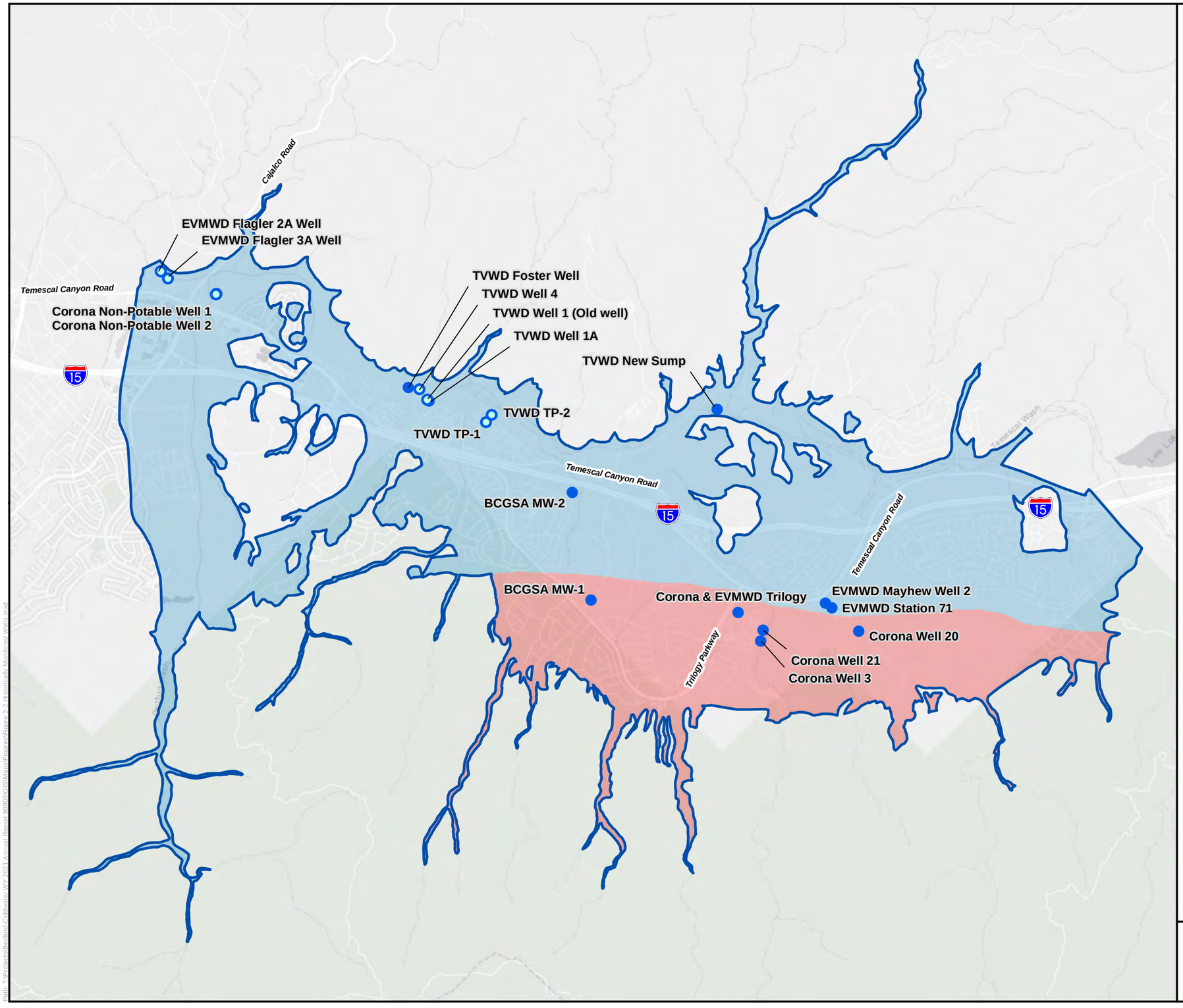
As described in the GSP, there are currently 17 Key Wells in the Basin for which water level and/or interconnected surface water minimum thresholds (MTs) and measurable objectives (MOs) have been established. These 17 wells also comprise the current water level monitoring well network. Two additional wells (BCGSA MW-1 and BCGSA MW-2) have recently been constructed and will be added to the monitoring network in 2022. **Figure 2-2** shows the 19 wells in the monitoring network, including the two new wells. All monitoring wells are monitored by the BCGSA or its member agencies and incorporated into the data management system (DMS) developed as part of the GSP.

2.2.1. Groundwater Elevations and Trends

Hydrographs showing groundwater elevation trends over time were prepared for the 17 Key Wells as shown on **Figures 2-3 through 2-19**.

The hydrographs show the difference in water levels and trends in the two management areas in the Basin. The wells in the Coldwater management area (Corona Wells 20, 21, 3, Corona & EVMWD Trilogy Well, and EVMWD Wells Station 71 and Mayhew 2) all show variable elevations in response to differences in precipitation and resulting recharge in the management area. The water levels in the Coldwater management area track very closely with cumulative departure of annual precipitation (**Figure 2-1**), as shown most clearly in the hydrograph for Corona Well 3 on **Figure 2-5.** The wells in the Bedford management area (Corona Non-Potable Wells 1 and 2, EVMWD Flagler 2A and 3A Wells, and TVWD Wells 1, 1A, 4, TP-1, TP-2, Foster, and New Sump) show more stable water levels that fluctuate very little in response to variations in precipitation (**Figures 2-9 through 2-12 and 2-13 through 2-19**). Groundwater elevations in the management area and these wells are more responsive to conditions in the Temescal Wash.

The GSP assessed conditions through the end of 2018. Since that time water levels in wells in the Coldwater management area rose in response to above normal precipitation in 2019 and 2020 and then fell slightly in 2021. In the Bedford management area, most wells showed little to no response to recent precipitation. One well in the Bedford management area, Corona Non-Potable Well 1, showed more variability in recent years than is present in other wells in the management area. This includes the largest historical decline in the well during water year 2021 (**Figure 2-9**). This reflects increased pumping in Corona Non-Potable Well 1 because Corona Non-Potable Well 2 was non-operational.



Water Level Monitoring Well

Water Level and Interconnected Surface Water Monitoring Well

Bedford-Coldwater Basin

Bedford Management Area

Coldwater Management Area

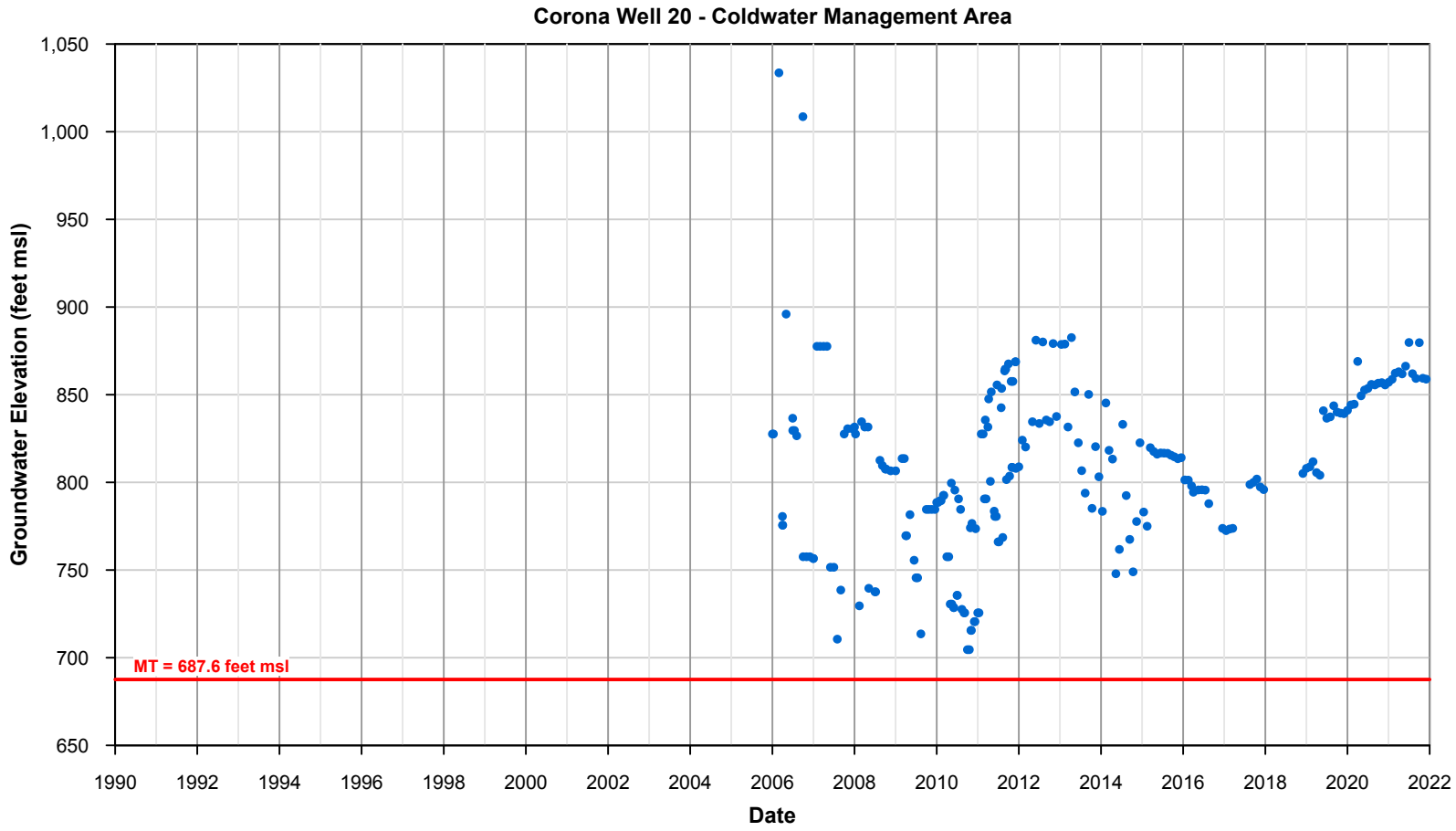
N

0 2,000 4,000

Scale in Feet

TODD GROUNDWATER

Figure 2-2
Water Level and Interconnected Surface Water Key Wells

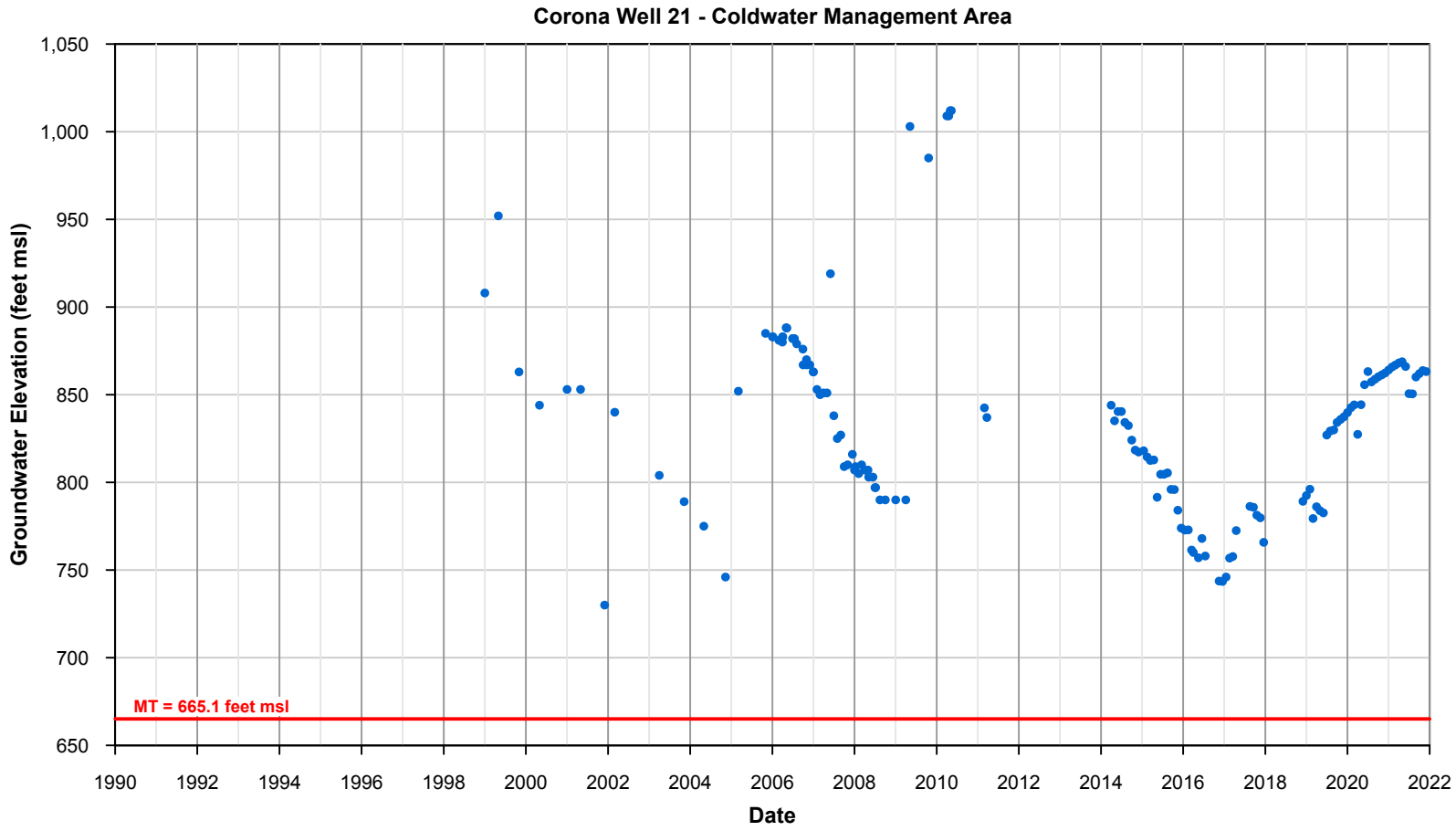


Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-3
Corona Well 20
Hydrograph

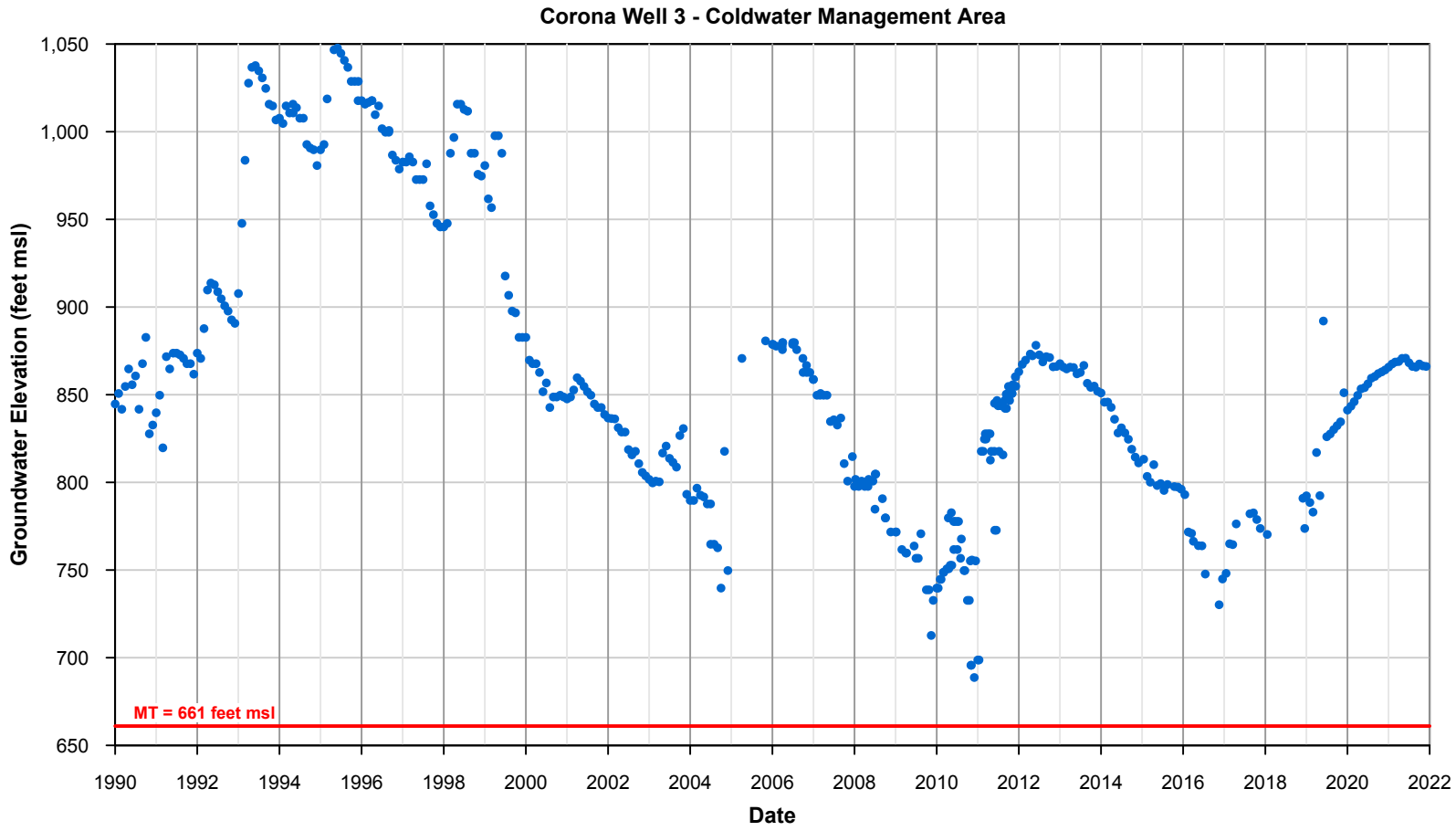


Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-4
Corona Well 21
Hydrograph

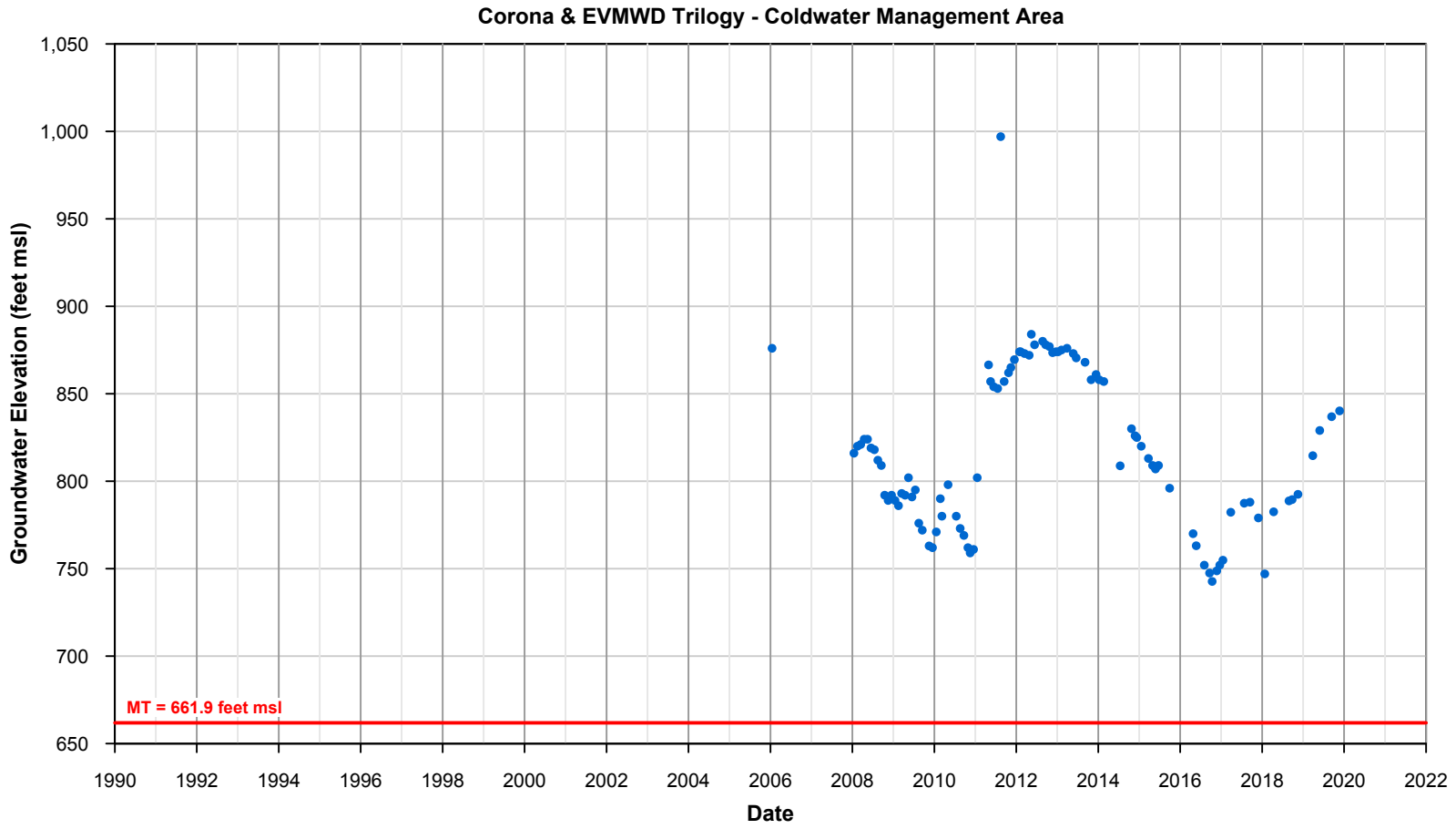


Groundwater Measurement (feet msl)

Minimum Threshold for Water Level (feet msl)

TODD GROUNDWATER

Figure 2-5
Corona Well 3
Hydrograph



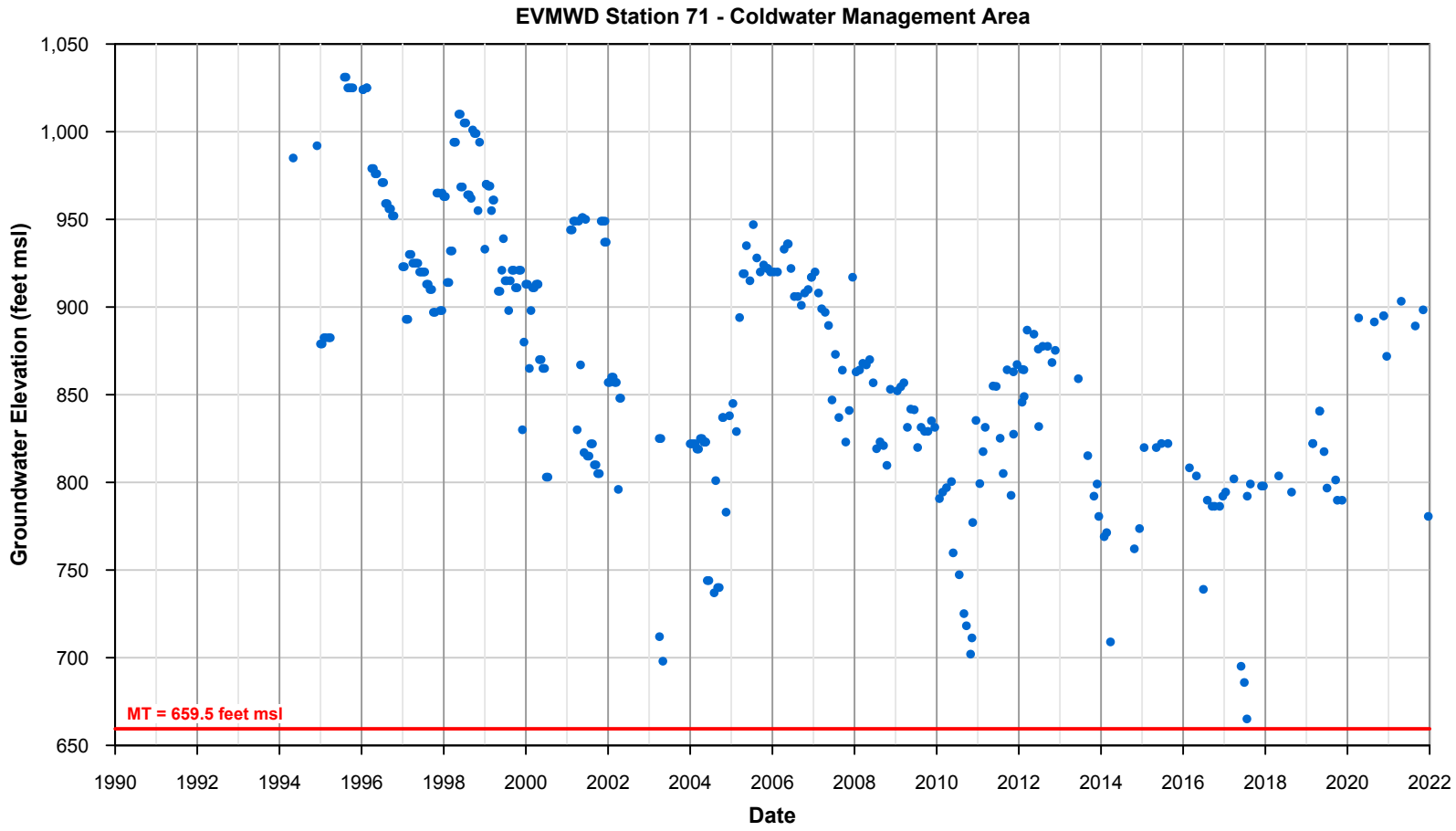
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-6
Corona & EVMWD Trilogy Hydrograph

Path: T:\Projects\Bedford-Coldwater\WY 2021 Annual Report 80803\GRAPHICS\Figure 2-10 Corona & EVMWD Trilogy Hydrograph.gpj

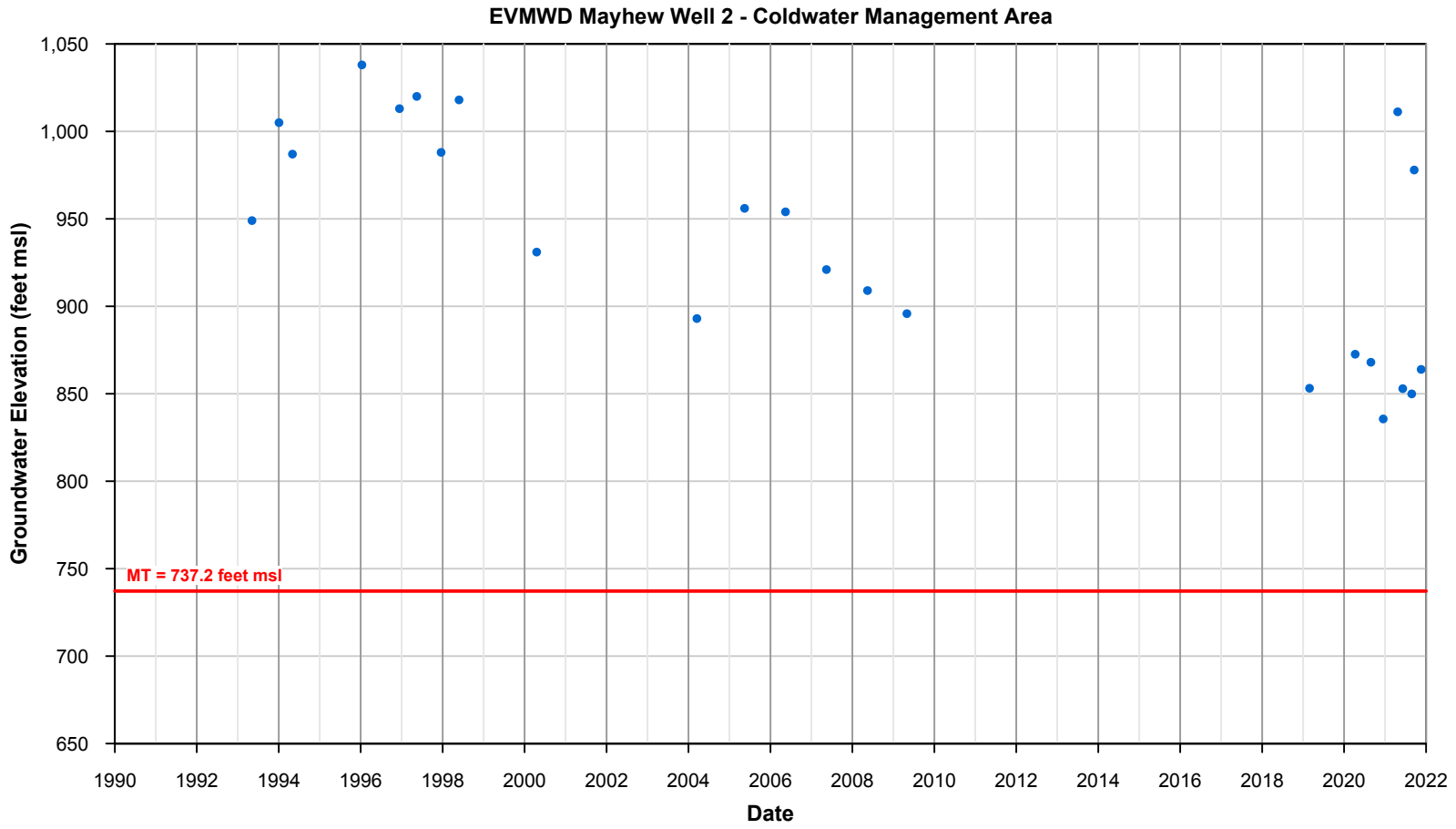


Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-7
EVMWD Station 71
Hydrograph



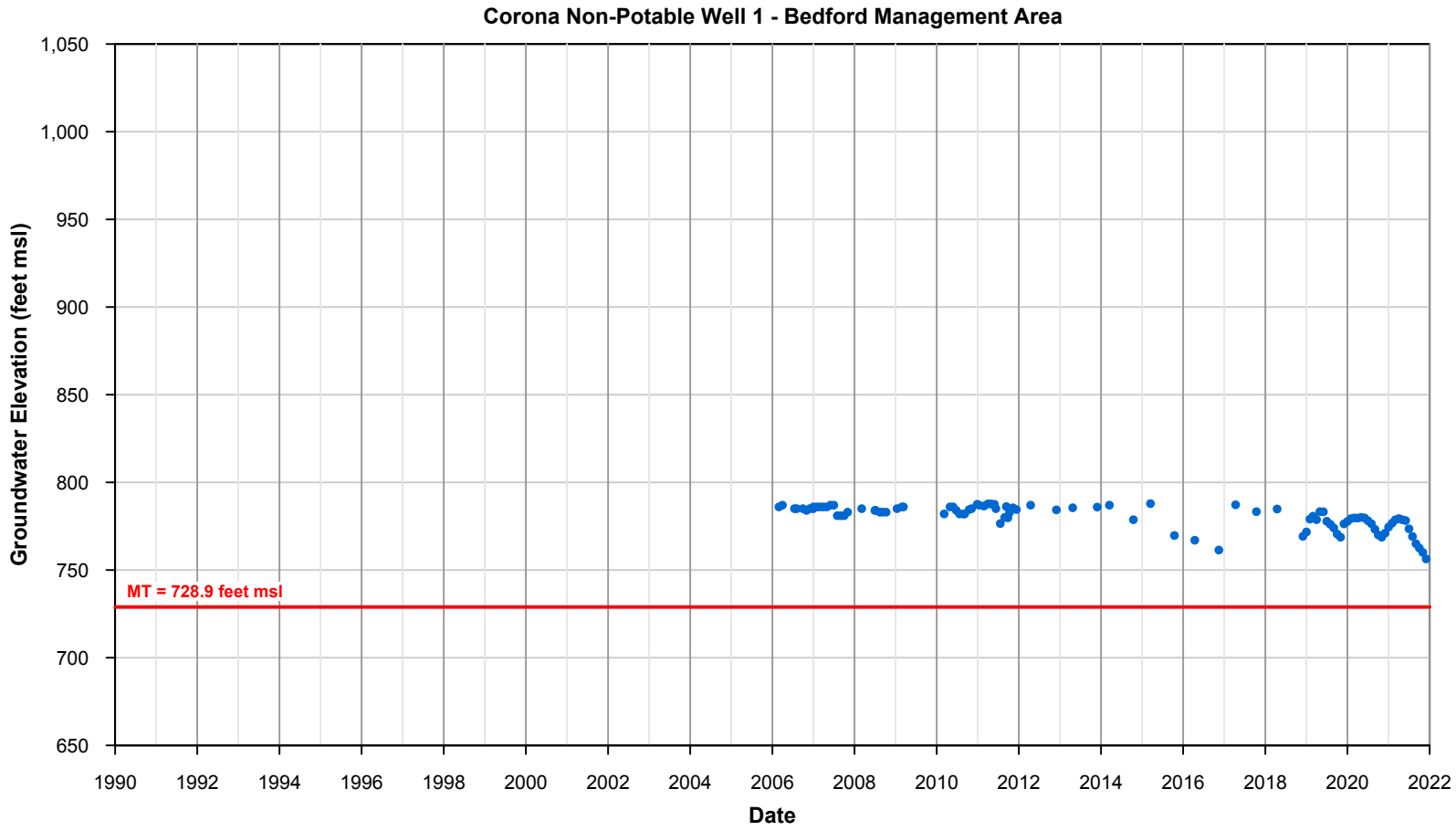
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-8
EVMWD Mayhew Well 2 Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-12 EVMWD Mayhew Well 2 Hydrograph.gpj



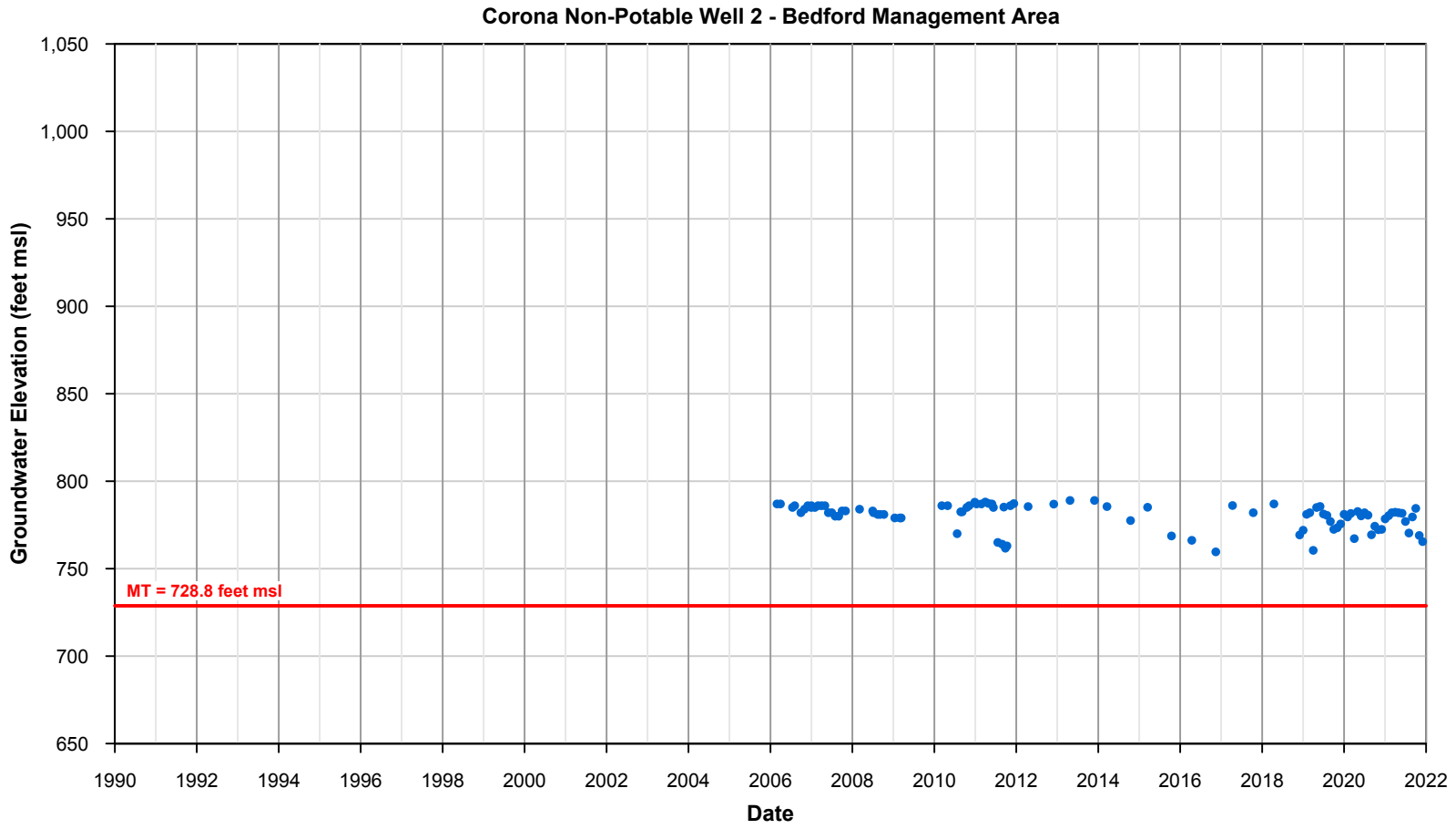
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-9
Corona Non-Potable Well 1 Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-6 Corona Non-Potable Well 1 Hydrograph.gpj

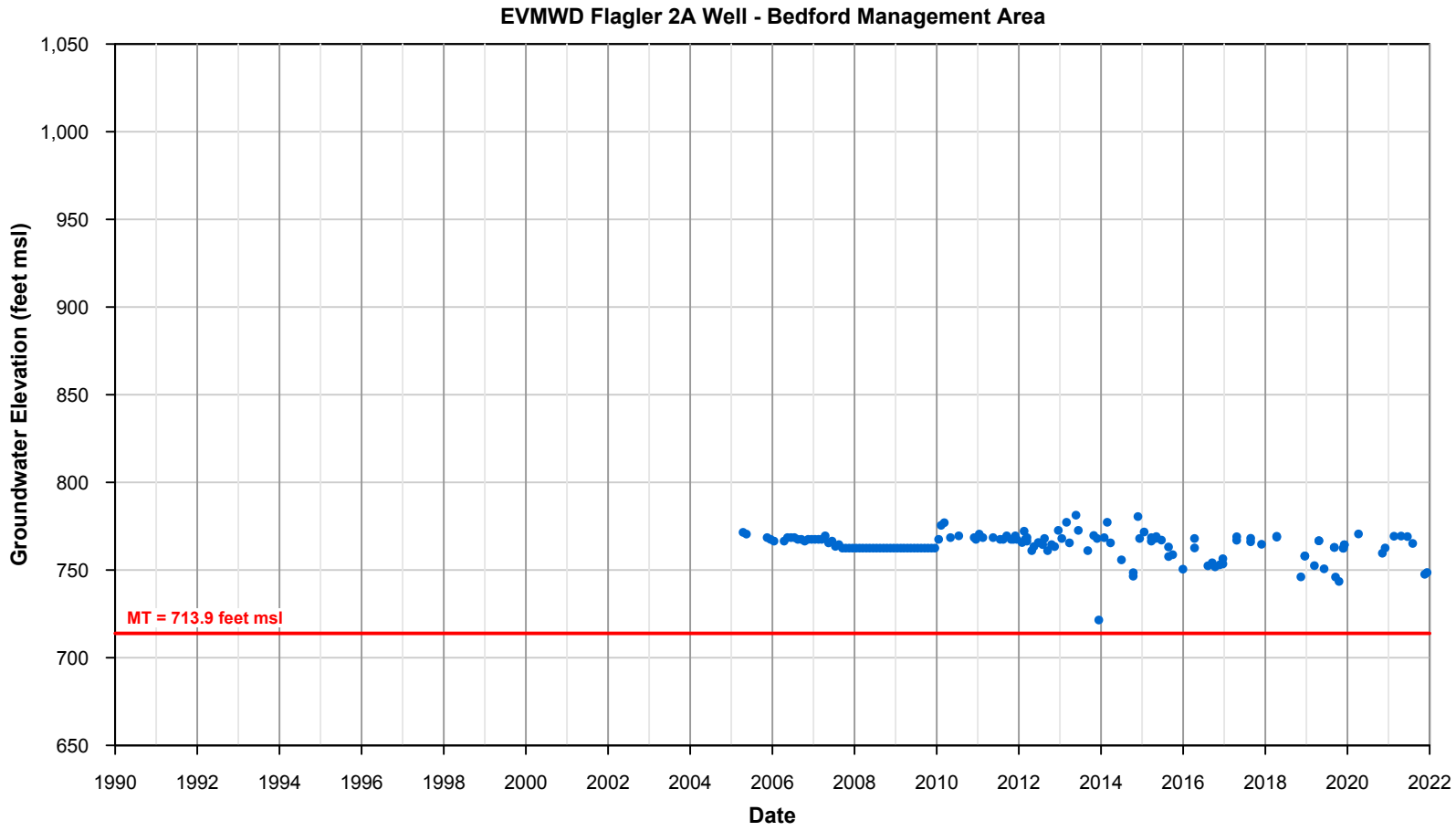


Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-10
Corona Non-Potable Well 2 Hydrograph



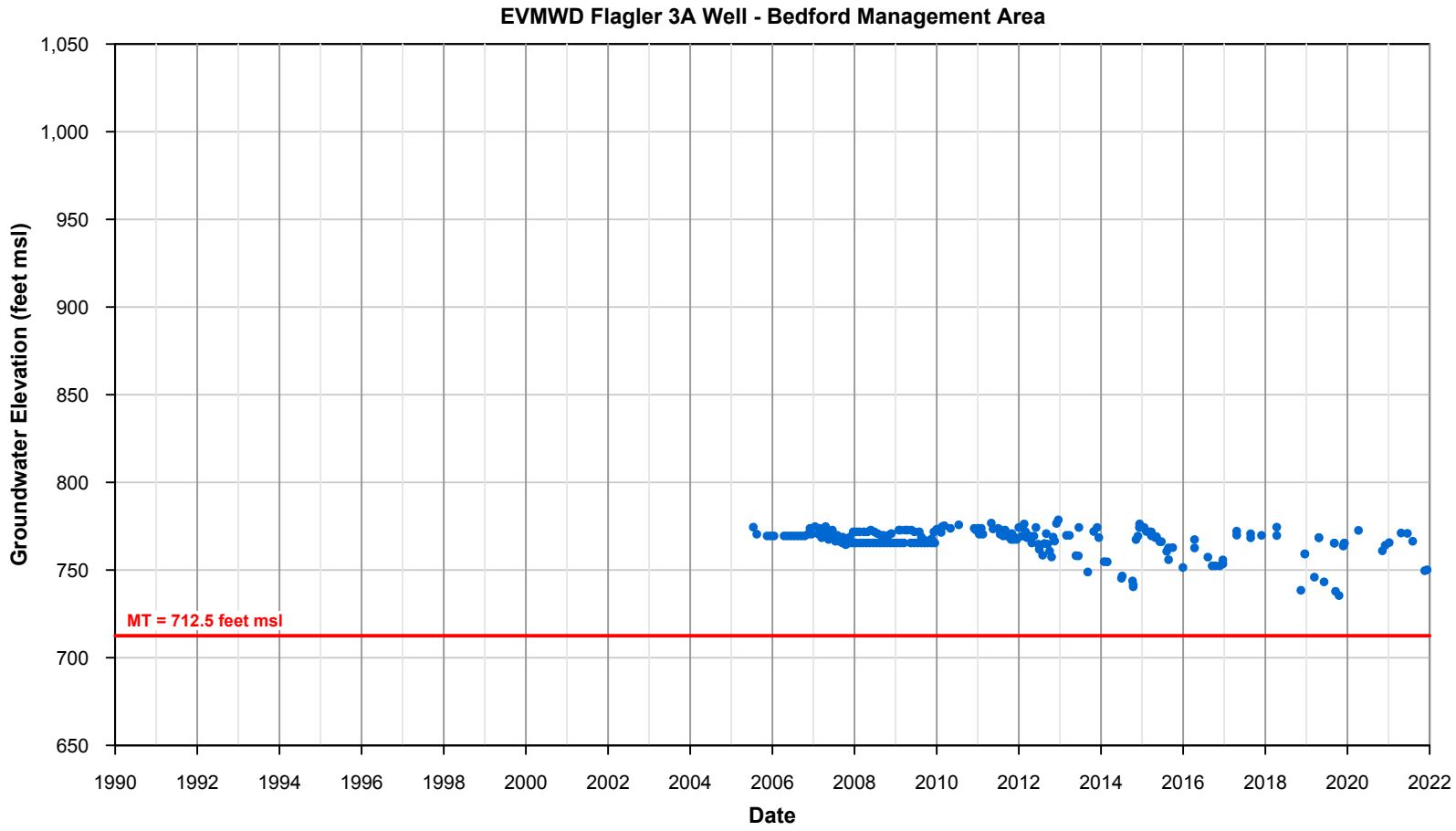
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-11
EVMWD Flagler 2A Well Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-8 EVMWD Flagler 2A Well Hydrograph.gpj



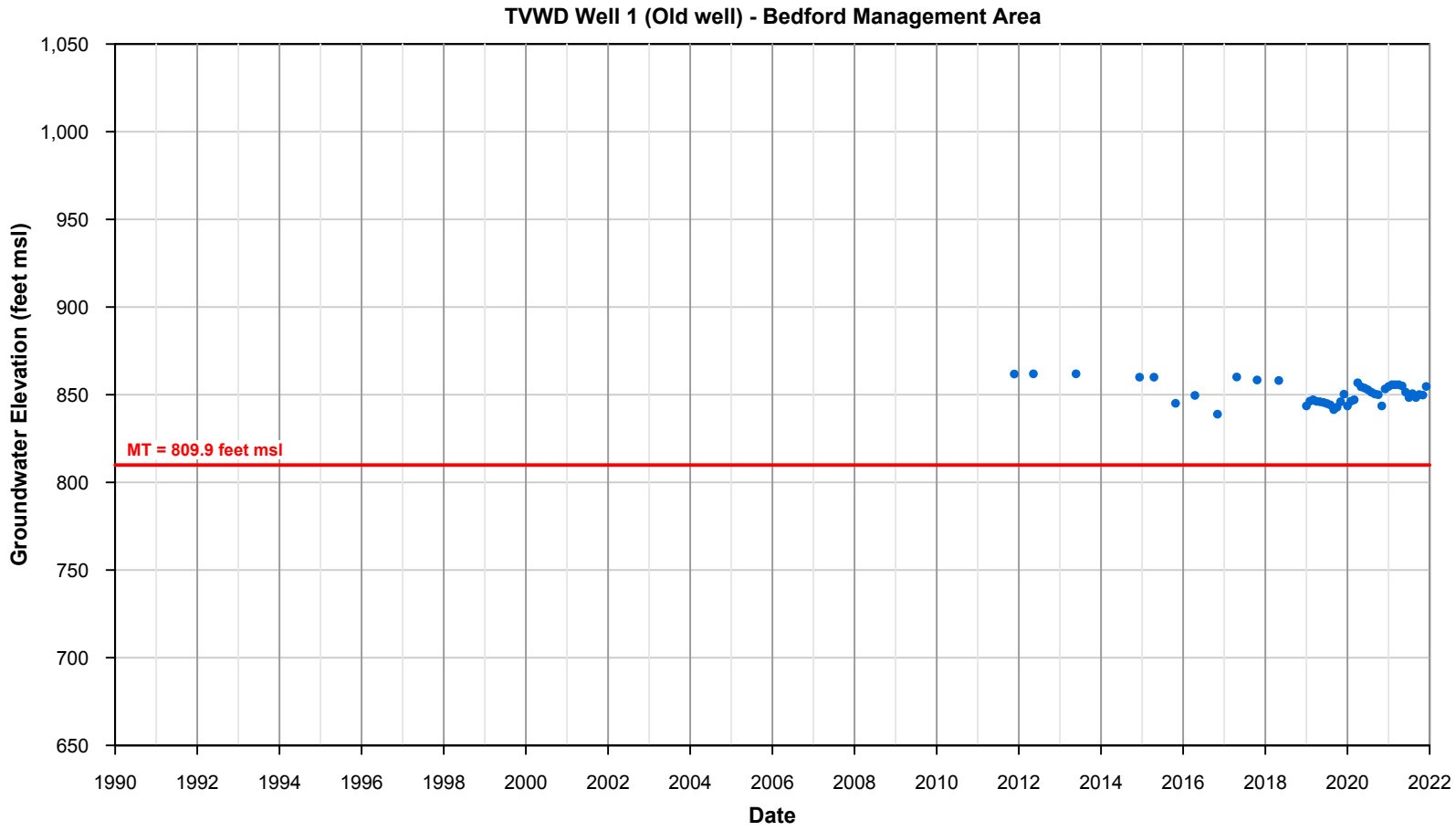
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-12
EVMWD Flagler 3A Well Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-8 EVMWD Flagler 2A Well Hydrograph.gpj



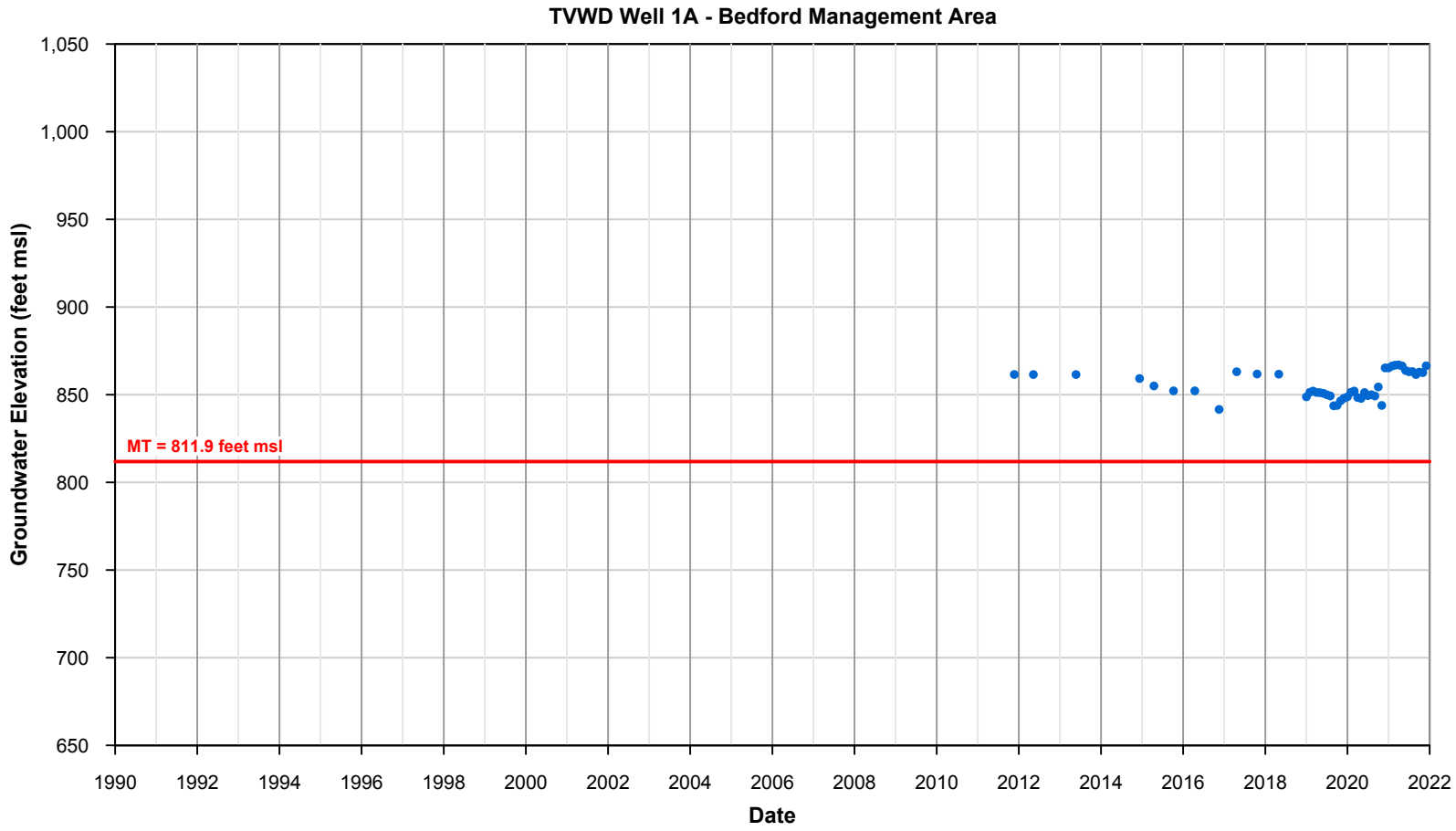
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-13
TVWD Well 1 (Old well) Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-13 TVWD Well 1 (Old well) Hydrograph.gpj



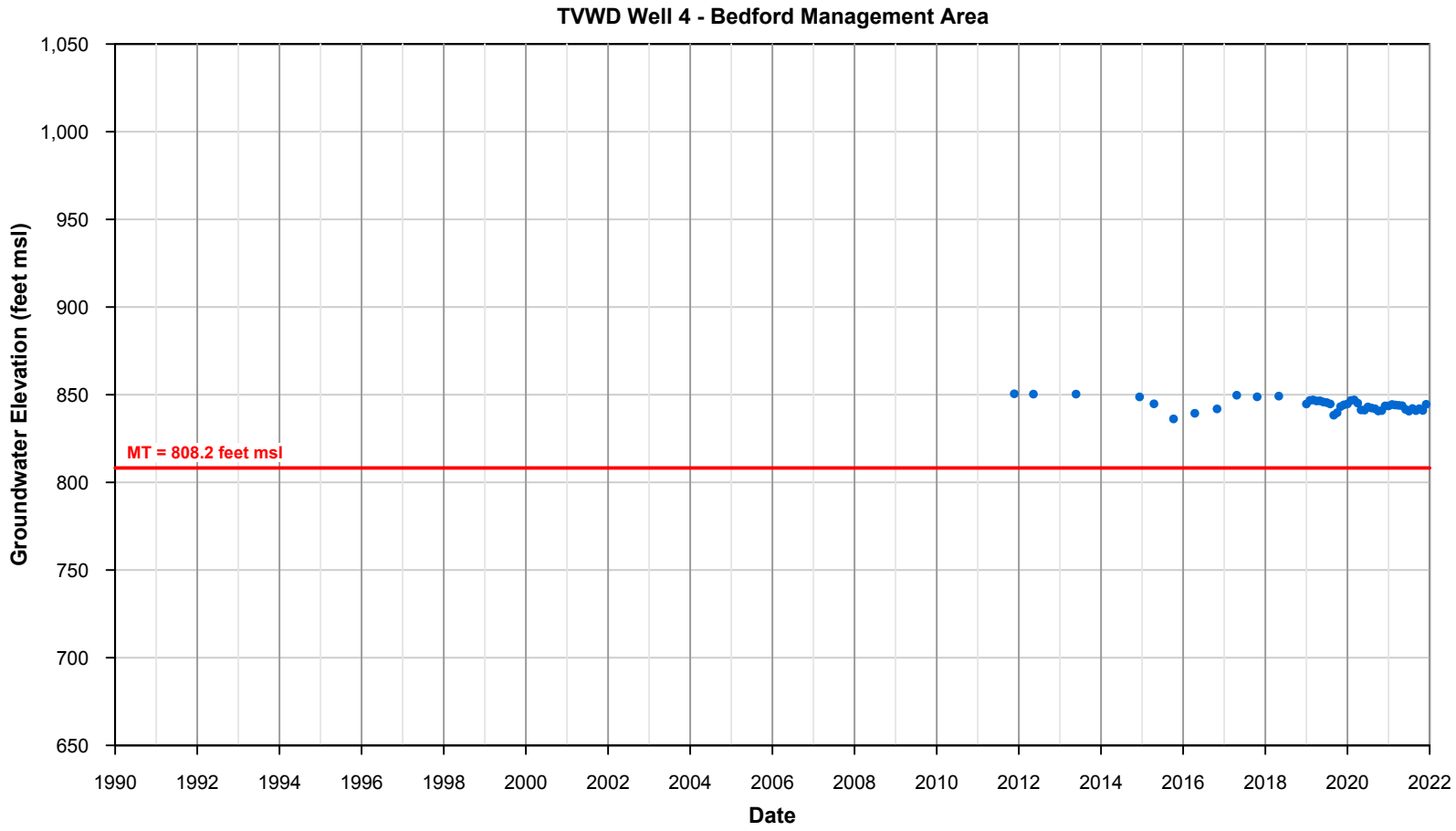
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-14
TVWD Well 1A
Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-14 TVWD Well 1A Hydrograph.gpj



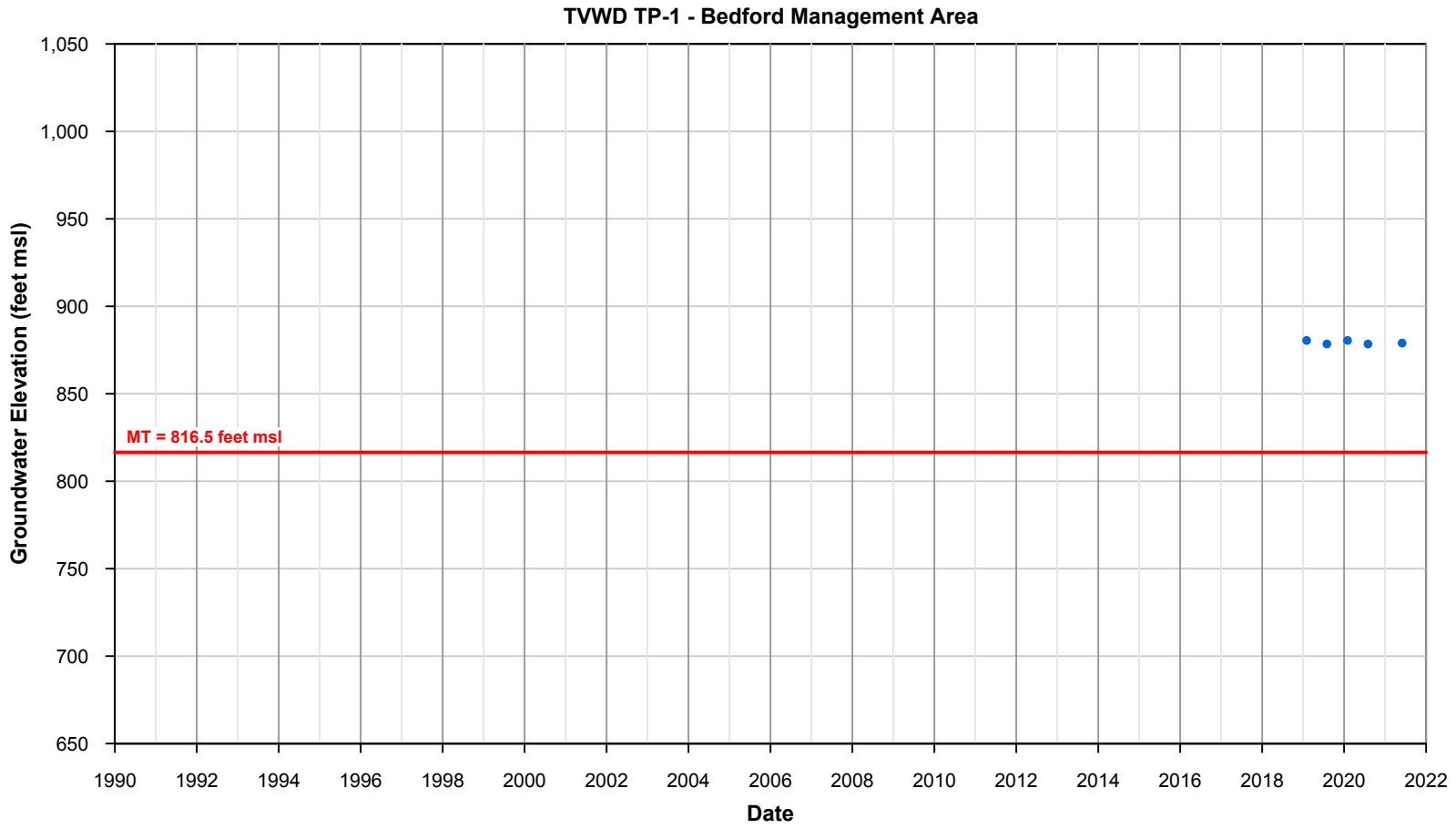
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-15
TVWD Well 4 Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-15 TVWD Well 4 Hydrograph.gpj

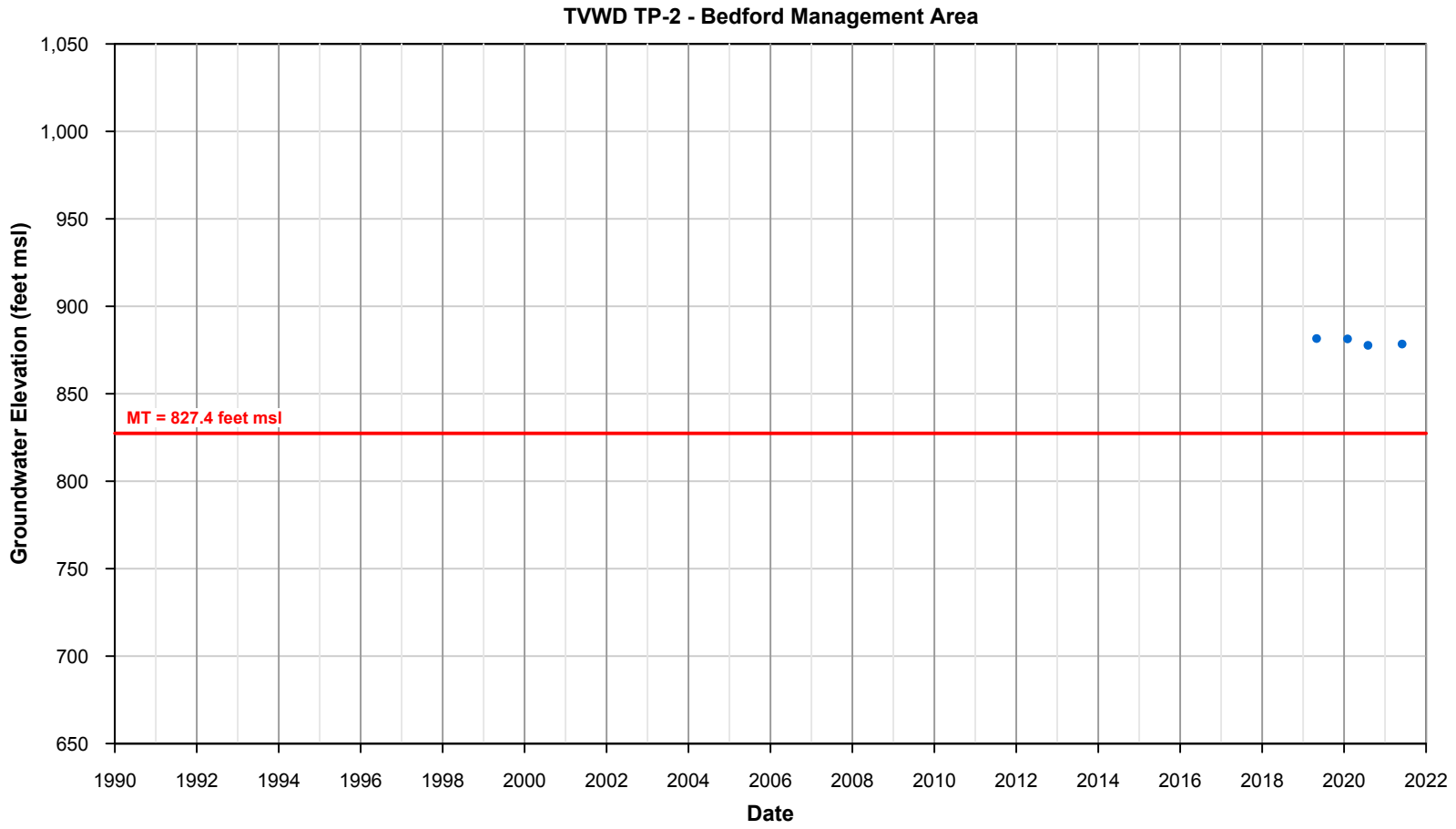


Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-16
TVWD TP-1
Hydrograph



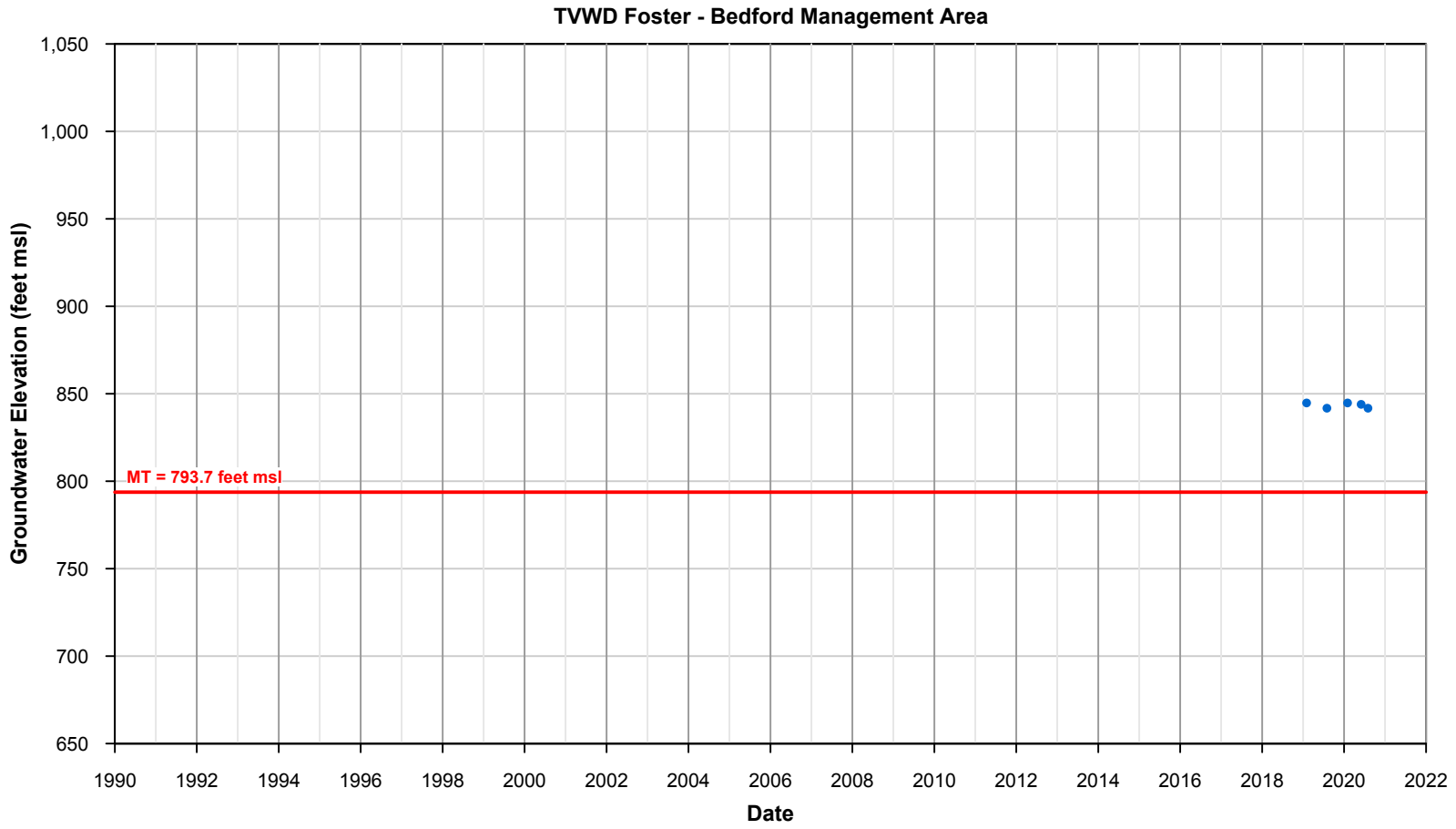
Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-17
TVWD TP-2
Hydrograph

Path: T:\Projects\Bedford-Coldwater WY 2021 Annual Report 80803\GRAPHICS\Figure 2-17 TVWD TP-2 Hydrograph.gpj

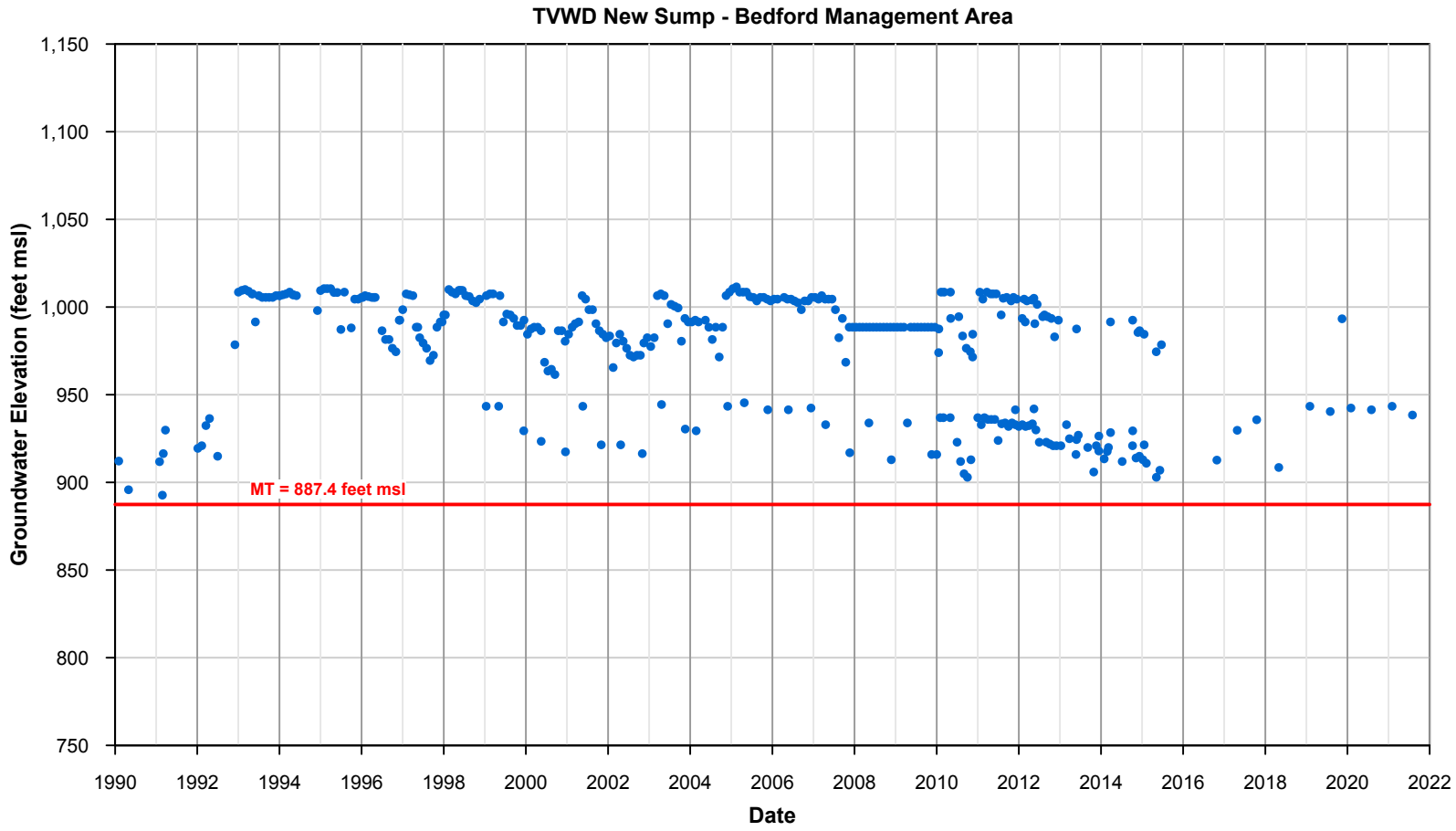


Minimum Threshold for Water Level (feet msl)

Groundwater Measurement (feet msl)

TODD GROUNDWATER

Figure 2-18
TVWD Foster Hydrograph



Groundwater Measurement (feet msl)

Minimum Threshold for Water Level (feet msl)

TODD GROUNDWATER

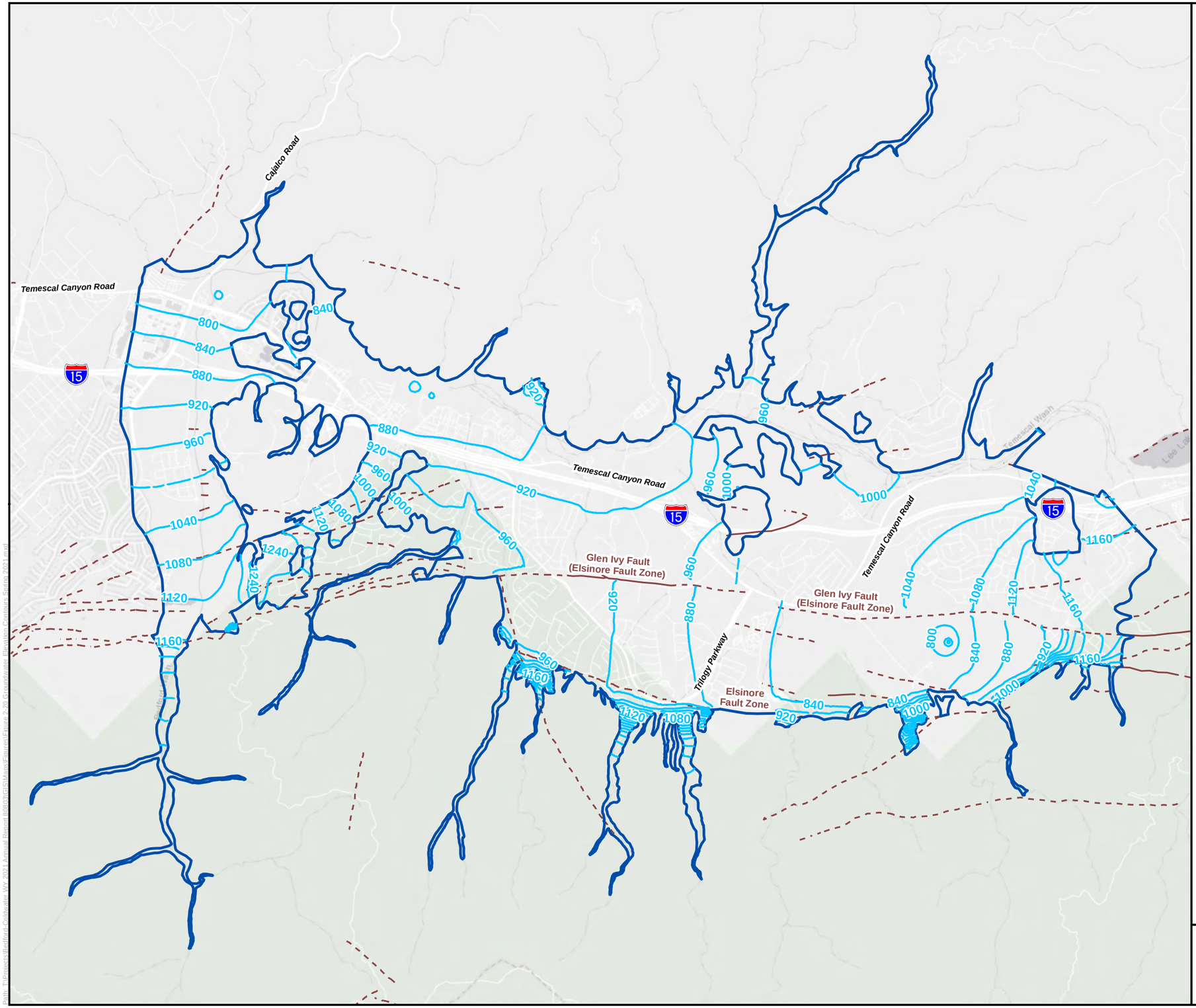
Figure 2-19
TVWD New Sump Hydrograph

2.3. GROUNDWATER FLOW

Figures 2-20 and 2-21 are groundwater elevation contour maps that show groundwater elevation surface conditions in the spring and fall of 2021 representing seasonal high and low conditions, respectively. The groundwater elevation surface represented by these contours were generated using the calibrated numerical model of the Basin constructed as part of GSP preparation. The groundwater model provides estimates of water levels throughout the Basin for every month of the model period.

SGMA requires the inclusion of groundwater contours for the entire Basin in each annual report. A consequence of this basin-wide requirement is inclusion of areas with limited or no groundwater monitoring. As a result, contouring with relatively simple software tools or by hand is difficult, subjective, and often inconsistent from year to year. However, the calibrated groundwater model, which will now be updated annually, provides simulation of groundwater elevations for every month of the model period in a way that is internally consistent with the hydrogeologic conceptualization of the Basin and the water budget. Using contours from the model produces groundwater surface elevation representations that are consistent with the water budget and change in storage estimates.

The pattern of contours in **Figures 2-20 and 2-21** are similar for both the spring and fall seasons. Groundwater in the Coldwater management area flows from the high elevation areas in the west of the management area and then towards a local depression in the southern part of the management area. In the Bedford management area groundwater flows from the south and west towards and along the Temescal Wash.



40-foot groundwater elevation contours, feet msl

Fault Location, dashed where uncertain

Bedford-Coldwater Basin

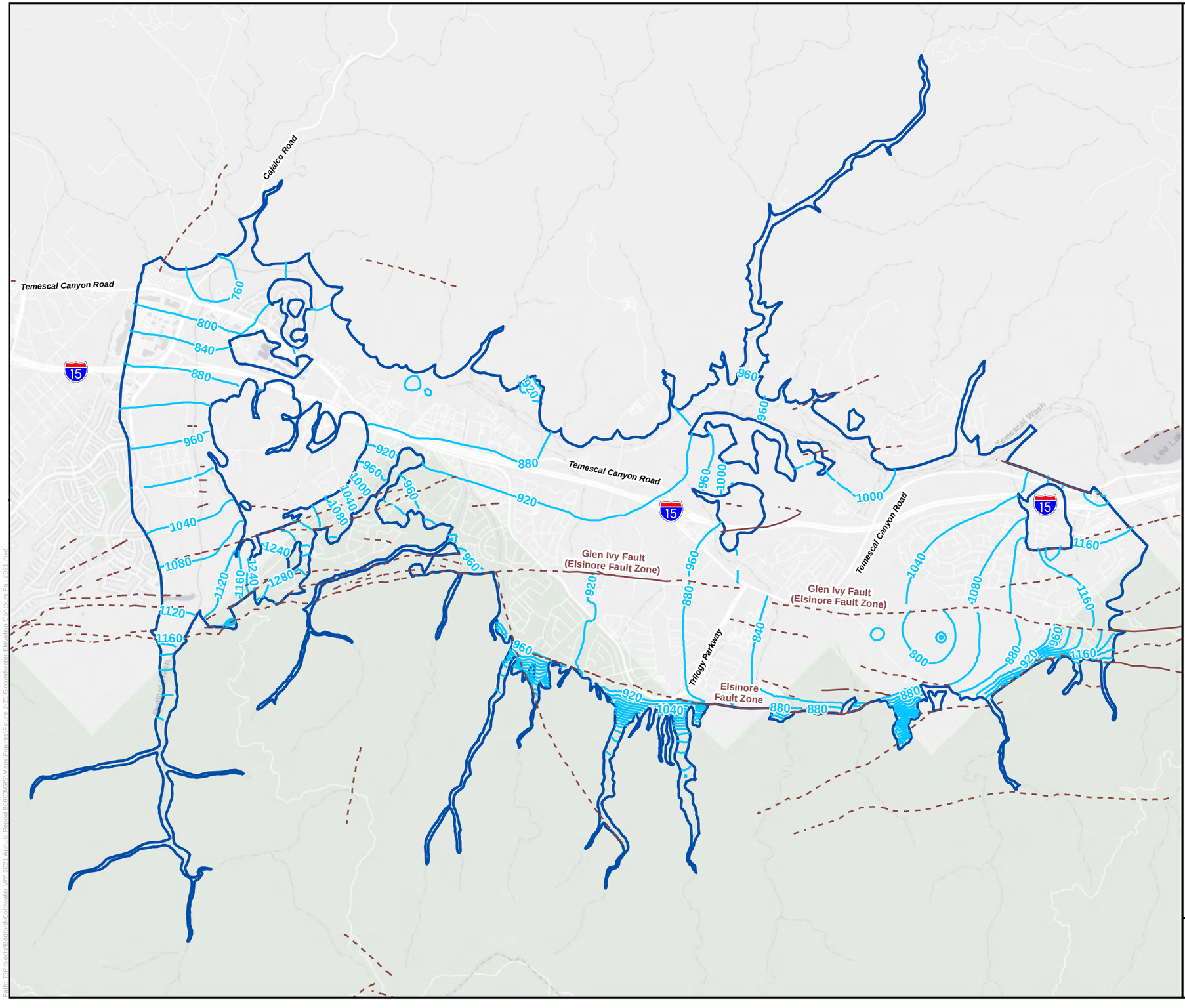
N

0 2,000 4,000

Scale in Feet

TODD GROUNDWATER

Figure 2-20
Groundwater Elevation Contours March 2021



40-foot groundwater elevation contours, feet msl

Fault Location, dashed where uncertain

Bedford-Coldwater Basin

N

0 1,750 3,500

Scale in Feet

TODD GROUNDWATER

Figure 2-21
Groundwater Elevation Contours
September 2021

2.4. SUSTAINABLE MANAGEMENT CRITERIA FOR GROUNDWATER LEVELS

The GSP defined MTs and MOs for each of the Key Wells shown in **Figure 2-2**. These MTs and MOs were defined to avoid undesirable results in the Basin, which is described in detail in the GSP (Todd et al. 2021). The MTs for each well are shown on the individual Key Well hydrographs (**Figures 2-3 through 2-19**) and the MTs and MOs are also in **Table 2-2**. The sustainable management criteria are discussed on more detail in Section 5.

Table 2-2. Minimum Thresholds for Groundwater Levels

Local Well Name	State Well Number	DWR Well Number	Management Area	Agency	Monitoring Frequency	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Threshold Depth to Water (feet)	Minimum Threshold Elevation (ft NAVD 88)
Corona Well 20	005S006W11D001	337556N1174811W001	Coldwater	Corona	Static - Monthly	1147.58	1145.58	460	687.58
Corona Well 21	005S006W03J005	337622N1174890W001	Coldwater	Corona	Static - Monthly	1125.09	1123.09	460	665.09
Corona Well 3	005S006W03K001	337615N1174901W001	Coldwater	Corona	Static - Monthly	1140.02	1138.02	479	661.02
Corona Non-Potable Well 1	004S006W16G004S	338227N1175073W001	Bedford	Corona	Continuous (SCADA)	808.92	813	80	728.92
Corona Non-Potable Well 2	004S006W16G005S	338227N1175072W001	Bedford	Corona	Continuous (SCADA)	808.77	813	80	728.77
EVMWD Flagler 2A Well	004S006W16C003S	338280N1175100W001	Bedford	EVMWD	Continuous (SCADA)	793.88	791.88	80	713.88
EVMWD Flagler 3A Well	004S006W16C002S	338270N1175100W001	Bedford	EVMWD	Continuous (SCADA)	792.52	790.52	80	712.52
Corona & EVMWD Trilogy		337650N1174896W001	Coldwater	EVMWD	Quarterly	1101.86	1099.86	440	661.86
EVMWD Station 71	005S006W11C001	337496N1174753W001	Bedford	EVMWD	Quarterly	1166.45	1164.45	507	659.45
EVMWD Mayhew Well 2	005S006W11G001	338031N1174988W001	Coldwater	EVMWD	Quarterly	1244.2	1242.2	507	737.2
TVWD Well 1 (Old well)	004S006W22P003S	338010N1174983W001	Bedford	TVWD	Continuous (SCADA)	879.9	894	70	809.9
TVWD Well 1A		338009N1174983W001	Bedford	TVWD	Continuous (SCADA)	881.88	895	70	811.88
TVWD Well 4	004S006W22P004S	338023N1174981W001	Bedford	TVWD	Continuous (SCADA)	878.22	883	70	808.22
TVWD TP-1		337954N1174952W001	Bedford	TVWD	Continuous (SCADA)	901.46	899.46	85	816.46
TVWD TP-2		337954N1174941W001	Bedford	TVWD	Continuous (SCADA)	902.37	900.37	75	827.37
TVWD Foster	004S006W22N002	337544N1174806W001	Bedford	TVWD	Continuous (SCADA)	871.74	869.74	78	793.74
TVWD New Sump	004S006W35G002	337810N1174740W001	Bedford	TVWD	Continuous (SCADA)	953.4	951.4	66	887.4

3. WATER SUPPLIES AND USE

This SGMA annual report documents groundwater extractions and water use from other sources in the Basin. Groundwater use volumes by management area are shown on **Table 3-1**. In addition to groundwater, the Basin also uses water from imported and recycled water sources, as shown on **Table 3-1.** These data are also reported to DWR; copies of the tables submitted to DWR are included in **Appendix B**.

Imported water and other water infrastructure are shown on **Figure 1-4**. A map showing the locations of agricultural and municipal, commercial, industrial, and domestic pumping is presented in **Figure 3-1**. Measured and estimated annual pumping volumes are displayed as circles with areas proportional to annual pumping in water year 2021.

3.1. GROUNDWATER

3.1.1. Municipal Groundwater Use

Pumping from M&I wells has been measured and recorded for many years by Corona, EVMWD, and TVWD. These data along with other significant groundwater production are reported to the Santa Ana River Watermaster, with WMWD serving as the party responsible for data production. M&I pumping data are used in the groundwater model. Total pumping for both management areas was about 11,000 acre feet per year (AFY) in the 1990s and decreased to around 3,000 AFY by 2018. This trend was caused by the replacement of groundwater-supplied citrus orchards to urban land uses supplied almost entirely by imported water. In the Bedford management area, TVWD and Corona pump groundwater to supplement recycled water used for irrigation and other non-potable uses. In the Coldwater management area, groundwater is pumped for municipal use in the Corona and EVMWD service areas in the Bedford-Coldwater Basin and the Temescal and Elsinore Subbasins. Pumping is expected to remain around current volumes in the Coldwater management area, consistent with the existing agreement between Corona and EVMWD. However, pumping in the Bedford management area is expected to increase to accommodate future TVWD non-potable water demands.

3.1.2. Other Groundwater Use

There is limited private groundwater pumping within the Basin. Significant groundwater uses are reported to WMWD in their role as stewards of the Santa Ana River and fulfilling the requirements of California Water Code Section 4999. There is also a limited amount of agricultural groundwater use, the volume of which is estimated from land use and weather records. Known and estimated private groundwater pumping data are included in the water budget and modeling and reported in **Table 3-1** and to DWR (**Appendix B**)

Bedford-Coldwater Basin

Groundwater Production by Location

- 0 to 10 Acre Feet
- 10 to 50 Acre Feet
- 50 to 100 Acre Feet
- 100 to 200 Acre Feet
- 200 to 500 Acre Feet
- 500 to 700 Acre Feet

N

0 2,000 4,000

Scale in Feet

TODD GROUNDWATER

Figure 3-1
Groundwater Production
Water Year 2021

Table 3-1. Bedford-Coldwater Water Use, Water Year 2021

Water Year	Groundwater Pumping (acre-feet)				Imported Water (acre-feet)	Recycled Water (acre-feet)
	Bedford Management Area		Coldwater Management Area			
	M&I[1]	Ag[2]	M&I[1]	Ag[2]	M&I[1]	M&I[1]
2019	1,981	0	694	562	4,864	884
2020	2,221	125	1,083	1,179	5,690	1,098
2021	2,292	249	1,177	732	6,082	1,188

Notes:

1: Municipal and industrial (M&I)

2: Agricultural (Ag)

3.1.3. Quarry Operations and Losses

Quarry outflows represents outflows associated with active or passive quarry operations to account for observed water conditions within the deeper quarry pits. In the Coldwater management area, excavations continued within the large quarry pits following periods of high groundwater levels for the period from 1990 to 2010. During model calibration, it was necessary to assume that additional pumping or other groundwater removal occurred during these operational periods to maintain the observed groundwater levels. Since 2010, it is our understanding that no additional pumping to maintain quarry water levels at the elevations necessary for deepening pits has occurred, which is supported by the historical model calibration.

In the Bedford management area, the rim of the Mobile Sand quarry located just north of the TVWD water reclamation facility (WRF) is low enough to allow surface flow between the pit and Temescal Wash when water levels in the pit or Wash are high. To estimate these flows, the groundwater model applies a boundary condition based on the observed water levels in the pit and Wash to estimate the volume of into or out of the pit. This is a head-dependent boundary condition that is able to calculate either quarry recharge or outflow based on groundwater conditions.

3.2. IMPORTED WATER

Corona, TVWD, and EVMWD rely on imported water from Metropolitan. Metropolitan imports water to Southern California from two main sources: the Sacramento and San Joaquin Rivers through the State Water Project and the Colorado River via the Colorado River Aqueduct. Corona receives imported water from Metropolitan through WMWD. TVWD receives State Water Project imported by Metropolitan and treated at the Henry J. Mills Treatment Plant in Riverside. EVMWD also receives imported water from Metropolitan through WMWD, but only distributes to domestic users if groundwater is insufficient.

3.3. RECYCLED WATER

Water recycling occurs in both Corona and TVWD. Recycled water use is a relatively small but increasing supply. In TVWD, recycled water is distributed to multiple sites within TVWD's service area, including the Retreat Golf Course in the northern portion of the Basin and the Deleo Sports Park along Sycamore Creek in the south Basin (RMC and Woodard & Curran 2017).

4. WATER BALANCE

For the GSP, a quantitative assessment of the water balance (or water budget) of the Basin was developed. That water balance included estimates of inflows and outflows for the two management areas and used the GSP numerical model to simulate surface water and groundwater flow over the period 1990 through 2018. The numerical model was updated for this annual report to include water years 2019 through 2021. The model provides a dynamic and comprehensive quantification of the water balance wherein all estimated water balance elements are reconciled and are calibrated to groundwater level changes over time. Accordingly, the model is the best tool to quantify those water balance components.

Basic information about the numerical model is presented below, and additional information can be found in the GSP. **Table 4-1** shows the updated water balances for each management area. **Figure 4-1** shows the inflows and outflows to the water balance for the entire model period.

4.1. METHOD OF ANALYSIS

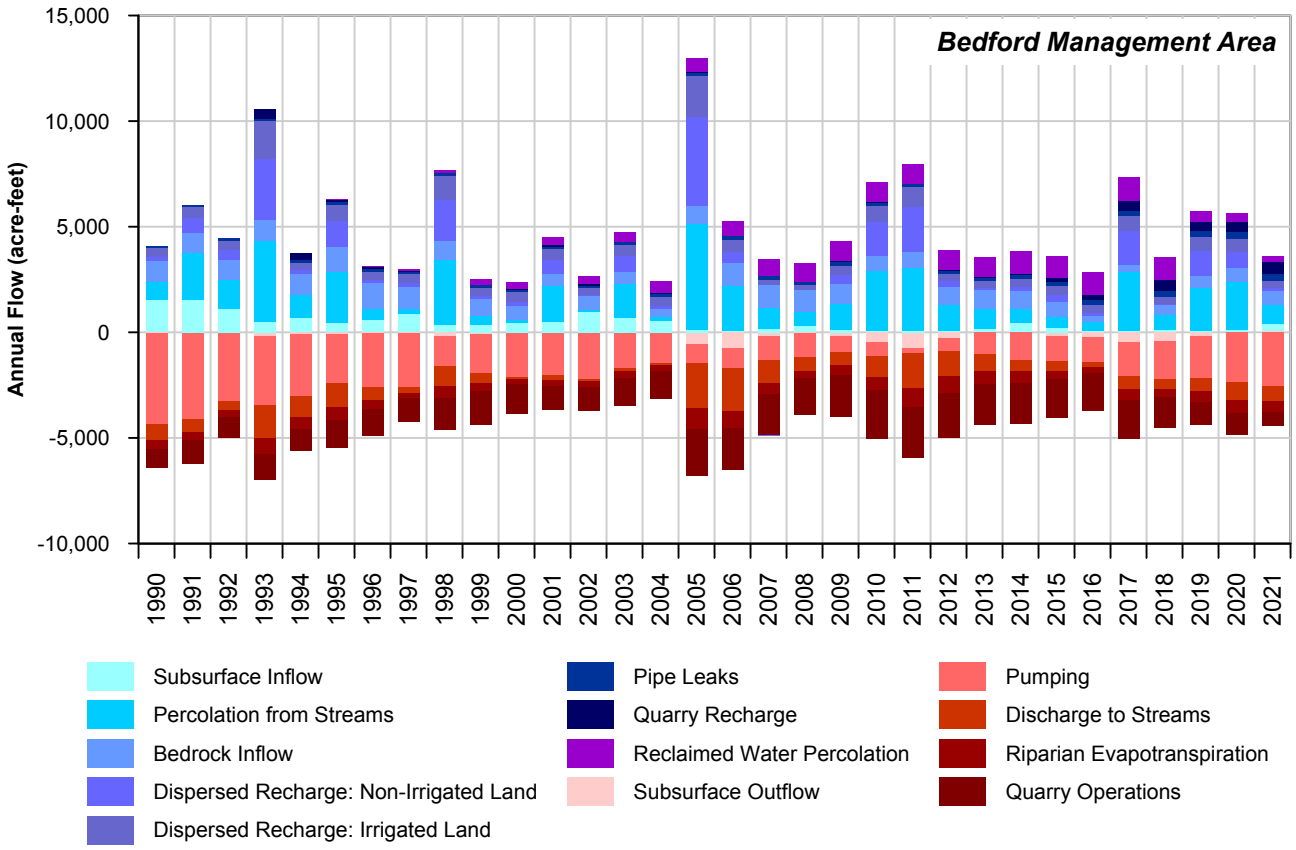
The water balance used for the GSP and updated here is a combined rainfall-runoff-recharge surface water model and groundwater flow model. Complete, itemized surface water and groundwater balances were estimated by combining measured data (e.g., rainfall, stream flow, municipal pumping, wastewater percolation) with model-simulated values. Collectively, the models simulate the entire hydrologic system, but each model or model module focuses on part of the system, as described below. In general, the models were used to estimate flows in the surface water and groundwater balances that are difficult to measure directly or that depend on current groundwater levels. These include surface and subsurface inflows from tributary areas, percolation from stream reaches within the Basin, groundwater discharge to streams, subsurface flow to and from neighboring basins and between Management Areas, locations and discharges of flowing wells, consumptive use of groundwater by riparian vegetation, and changes in groundwater storage. The two separate models collectively referred to as the Bedford-Coldwater Basin GSP model are:

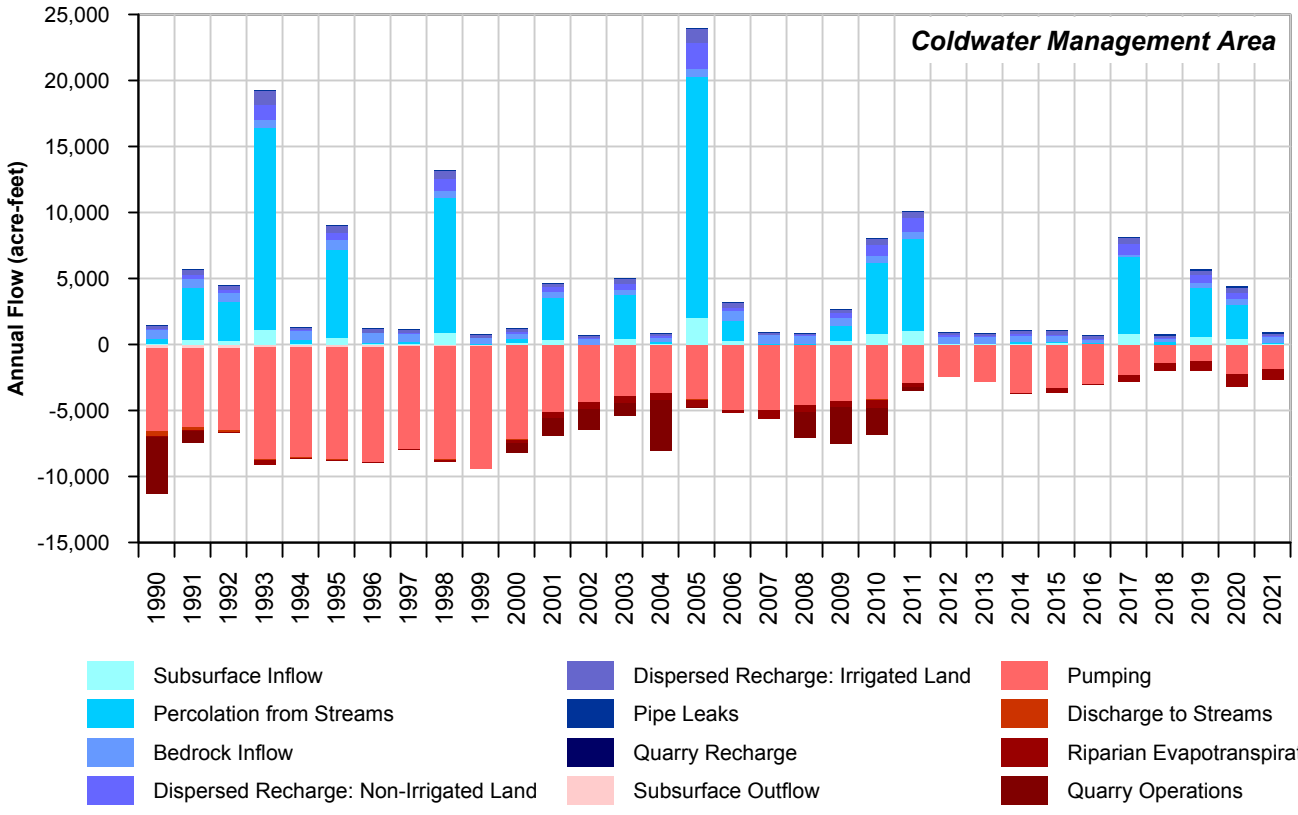
4.1.1. Surface Water Model

The surface water model simulates hydrologic processes that occur over the entire land surface, including precipitation, interception, infiltration, runoff, evapotranspiration, irrigation, effects of impervious surfaces, pipe leaks in urban areas, deep percolation below the root zone, and shallow groundwater flow to streams and deep recharge.

Table 4-1. Water Balance Update

Water Balance Items	Bedford Management Area			Coldwater Management Area		
	Water Year 2019	Water Year 2020	Water Year 2021	Water Year 2019	Water Year 2020	Water Year 2021
Groundwater Inflow						
Subsurface inflow	80	95	331	122	121	113
Percolation from streams	2,045	2,310	907	3,725	2,513	25
Bedrock inflow	558	632	647	328	456	524
Dispersed recharge: non-irrigated land	1,181	791	179	594	482	55
Dispersed recharge: irrigated land	661	631	337	373	354	181
Pipe leaks	282	293	298	87	90	92
Reclaimed water percolation	506	411	248	0	0	0
Quarry recharge	424	486	561	0	0	0
Total Inflow	**5,738**	**5,648**	**3,509**	**5,228**	**4,016**	**991**
Groundwater Outflow						
Subsurface outflow	-216	-15	63	0	0	0
Pumping	-1,952	-2,346	-2,541	-1,255	-2,262	-1,909
Groundwater discharge to streams	-628	-859	-745	-2	-3	0
Riparian evapotranspiration	-495	-616	-498	-726	-916	-789
Quarry Operations / Losses	-1,057	-995	-649	0	0	0
Total Outflow	**-4,349**	**-4,831**	**-4,369**	**-1,983**	**-3,181**	**-2,698**
Net Change in Storage						
Inflows minus outflows	1,389	817	-861	3,245	835	-1,708





TODD GROUNDWATER

Figure 4-1
Annual Groundwater Budgets, 1990 to 2021

4.1.2. Groundwater Model

The groundwater flow model uses the MODFLOW 2005 code developed by the U.S. Geological Survey, with pre- and post-processing facilitated using Groundwater Vistas, a readily available commercial software package. The model produces linked simulation of surface water and groundwater, as described below. MODFLOW simulates subsurface flow by combining equations representing flow through porous sediments (the Darcy Equation) with equations that enforce conservation of mass. The equations are implemented numerically, which means they are applied simultaneously between all adjoining cells in a model grid through an iterative process. Dispersed recharge to the top layer of the model grid from deep percolation of rainfall, irrigation water and pipe leaks is obtained from the rainfall-runoff-recharge model.

4.2. WATER BALANCE INFLOWS

The rainfall-runoff-recharge model and groundwater model were updated to reflect conditions from Water Years 2019 through 2021. Data, assumptions and calculations for individual hydrologic processes and groundwater inflows are described below. Most groundwater inflows to the basin are controlled by hydrologic conditions. Natural stream percolation and deep percolation from rainfall are related to the volume and distribution of rainfall. The availability of imported water similarly reflects wet and dry conditions in the source area, which for imported water is the Sierra Nevada and Rocky Mountains. Because they are related to rainfall, almost all Basin inflows are higher in wet years and lower in dry years. In contrast, deep percolation from return flows is generally similar from year to year.

4.2.1. Precipitation and Evaporation

Precipitation and evaporation on the land surface are accounted for in the rainfall-runoff-recharge model. Data are obtained from local climate stations as described above.

4.2.2. Imported Water

Imported water delivered to and distributed by the municipal water agencies in the Basin is tracked and reported by those agencies. These data are incorporated into the water balance as they affect groundwater, specifically imported water are a component of M&I water supply in the Basin and a portion of that water results in pipe leaks and other return flows.

4.2.3. Dispersed Recharge

Dispersed recharge from rainfall and to a lesser extent applied irrigation water is estimated by the rainfall-runoff-recharge model. The model simulates soil moisture storage in the root zone, which derives from rainfall infiltration and irrigation, and outflows to evapotranspiration and deep percolation. Simulation is on a daily basis. When soil moisture exceeds the root zone storage capacity, any excess rainfall or irrigation becomes deep percolation. Rainfall and irrigation water comingle in the root zone and in deep percolation. In urban recharge zones, pipe leaks are included in the amount shown as rainfall recharge. The resulting net recharge is passed to the top layer of the groundwater model.

4.2.4. Percolation from Streams

Percolation from streams depends on the flow, stage, width, length, and bed permeability of stream reaches, as well as the elevation difference between the stream surface and groundwater in the underlying model cell. Point sources of recharge (such as wastewater percolation facilities) are entered into the top model layer as if they were injection wells. Surface inflows to the stream network in the surface water module of the groundwater model include a combination of gauged flows, and simulated runoff from tributary watersheds and valley floor areas obtained from the rainfall-runoff-recharge model. Valley floor areas are flatter than the tributary watersheds, and the amount of runoff per acre is consequently smaller. The rainfall-runoff-recharge model simulates runoff from valley floor areas, and those flows are added to the inflows of nearby stream segments in the groundwater model.

4.2.5. Reclaimed Water Percolation

Percolation of reclaimed water in wastewater disposal ponds has historically occurred in the Bedford management area at facilities operated by the TVWD. These agencies track WRF discharge locations. When WRF discharges go to ponds, percolation is assumed to be the plant inflow less net evaporation.

4.2.6. Subsurface Groundwater Inflow

Two types of subsurface inflow are listed separately in the water balance tables. Subsurface inflow enters the Basin from the upstream Elsinore Valley Subbasin at the southern end of the Bedford management area. This inflow is estimated as the outflow from the Elsinore Valley Subbasin based on modeling completed during GSP preparation for that subbasin. Subsurface flow also occurs between the two management areas within the Basin and is included in the Subsurface inflow term in **Table 4-1**. Along the rest of the Basin perimeter, small amounts of subsurface inflow result from recharge percolating through fractured bedrock in tributary watershed areas. Bedrock inflow is simulated as shallow injection wells along the perimeter of the Basin.

4.3. WATER BALANCE OUTFLOWS

Major outflows from the Basin are pumping (municipal, industrial, and agricultural), groundwater seepage into streams, subsurface outflow, and evapotranspiration by riparian vegetation.

4.3.1. Pumping

Pumping by municipal providers is measured, as is pumping by smaller community water systems and self-supplied commercial and industrial facilities. Actual pumping and well locations are used in the numerical model. Additional pumping for agricultural use was estimated by inventorying the land uses and estimating demands based on crop type and weather conditions. As noted in previous sections of this report, there is also limited pumping

for private agricultural water use in the Basin that is estimated based on land use and weather conditions. Groundwater production by location is shown on **Figure 3-1**.

4.3.2. Subsurface Outflow

Subsurface outflows to other basins and between management areas were calculated using the groundwater model by the same methods used to simulate subsurface inflows.

4.3.3. Groundwater Discharge to Streams

Discharges from the groundwater basin to surface water bodies are simulated by the groundwater model based on stream bed wetted area and permeability and on the amount by which the simulated groundwater elevation in a model stream cell is higher than the simulated surface water elevation. This occurs primarily in the Bedford management area where there is often discharge to the Temescal Wash.

4.3.4. Riparian Evapotranspiration

The presence of dense, vigorous trees and shrubs along a stream channel is often a sign that the roots of the vegetation extend to the water table and have access to groundwater throughout the dry season. Plants that draw water directly from groundwater are called phreatophytes. In the groundwater model, riparian evapotranspiration (ET) is a function of water table depth, decreasing from unrestricted water use when the water table is at the ground surface to zero when it is 15 feet or more below the ground surface. This reflects a reasonable range of root depth distribution for a mix of riparian shrub and tree species.

4.4. CHANGE IN GROUNDWATER STORAGE

Figure 4-2 shows the annual change in storage, pumping, and water year type along with cumulative change in storage from the model for the two management areas from 1990 through 2021.

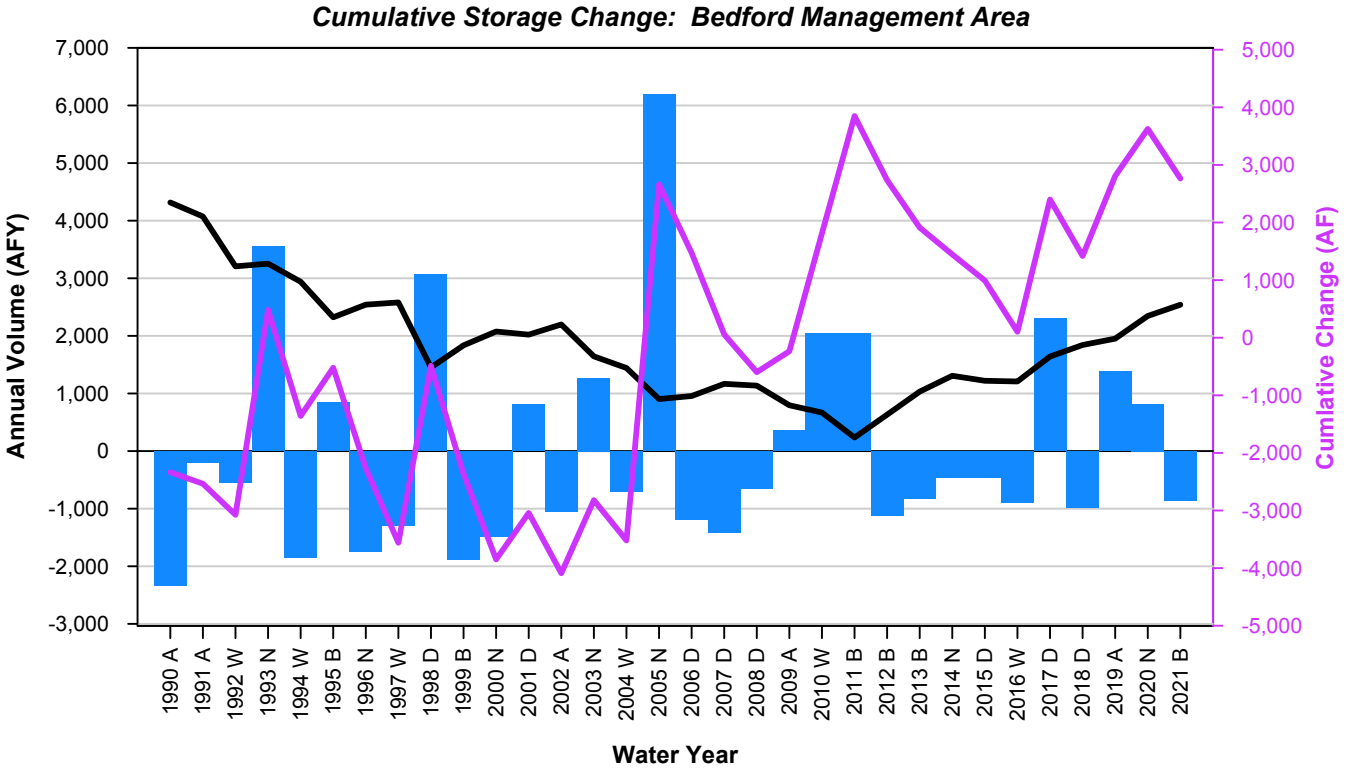
As shown, groundwater storage in the Bedford management area generally increased from 1990 to 2021, presumably as a result of the decrease in total groundwater pumping from 1990 to 2010. In recent years, groundwater pumping has begun to increase and the annual change in storage has remained small. The change in storage was negative in water year 2021 reflecting the dry hydrologic conditions. The water balance shows significantly more inflow to the management area during wet periods as a result of the interaction with Temescal Wash.

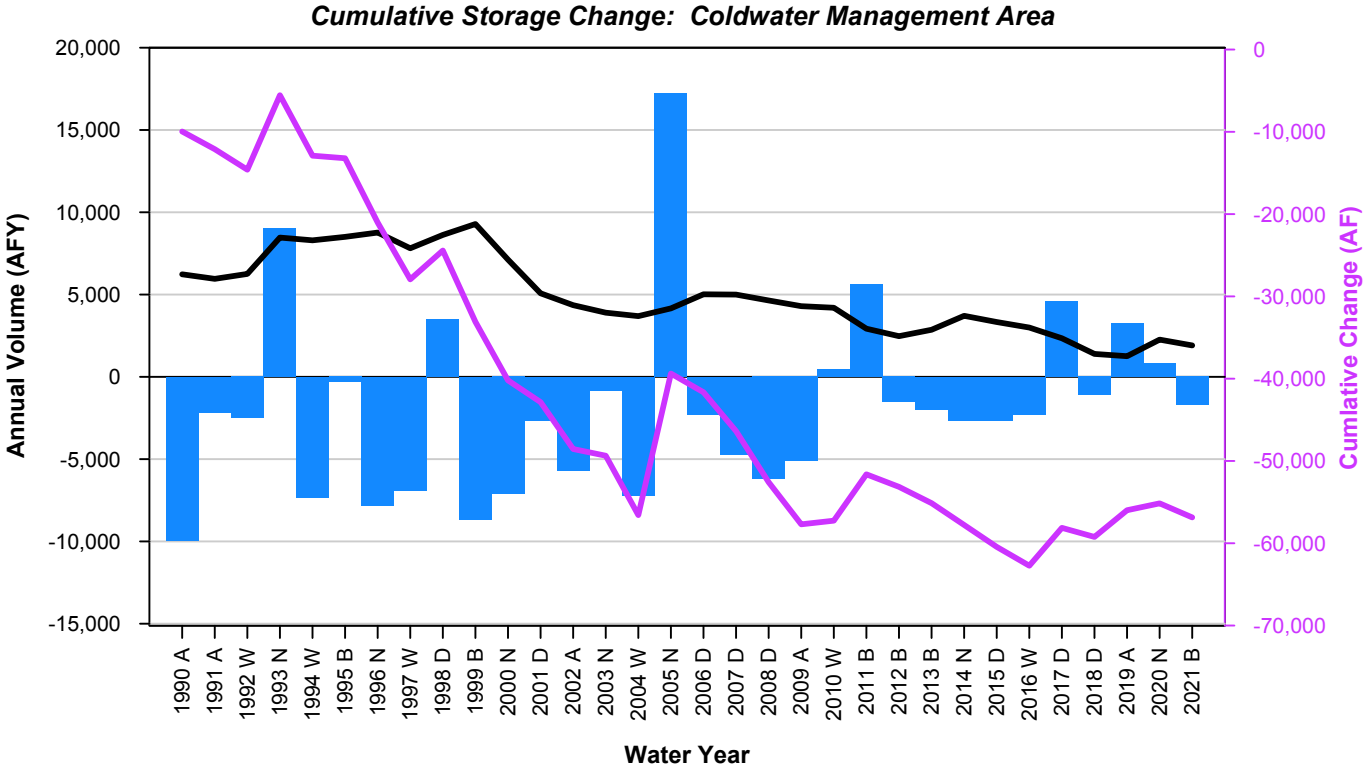
Figure 4-2 also shows the cumulative change in storage for the Coldwater management area. Simulated historical storage in the Coldwater management area declined by a cumulative total of 60,000 AF from 1990 to 2004. EVMWD and Corona entered into an agreement to limit pumping to the safe (or sustainable) yield in the management area (Corona and EVMWD 2008). As a result, there was little additional cumulative decline from 2005 to 2021. The annual change in storage over the past ten years has also remained stable in the management

area. Similar to the Bedford management area, the dry conditions during water year 2021 also resulted in a slight decrease in storage in the Coldwater management area.

Figure 4-3 shows the net change in groundwater elevation during the water year from September 2020 to September 2021. The net change during water year 2021 was negative almost everywhere, reflecting decreased recharge due to below-average rainfall. The net decline exceeded 50 feet in the southern Coldwater management area where contours show concentric contours where individual wells had much different pumping amounts in 2020 and 2021. Changes in the Bedford management area were less significant, but still show water level decline. Even with these declines, water levels were not below the minimum thresholds in either management area.

The numerical model is the best tool to quantify the water balance and it will continue to be updated for future annual reports, providing a better understanding of the surface water-groundwater system and a tool to evaluate future conditions and management actions.



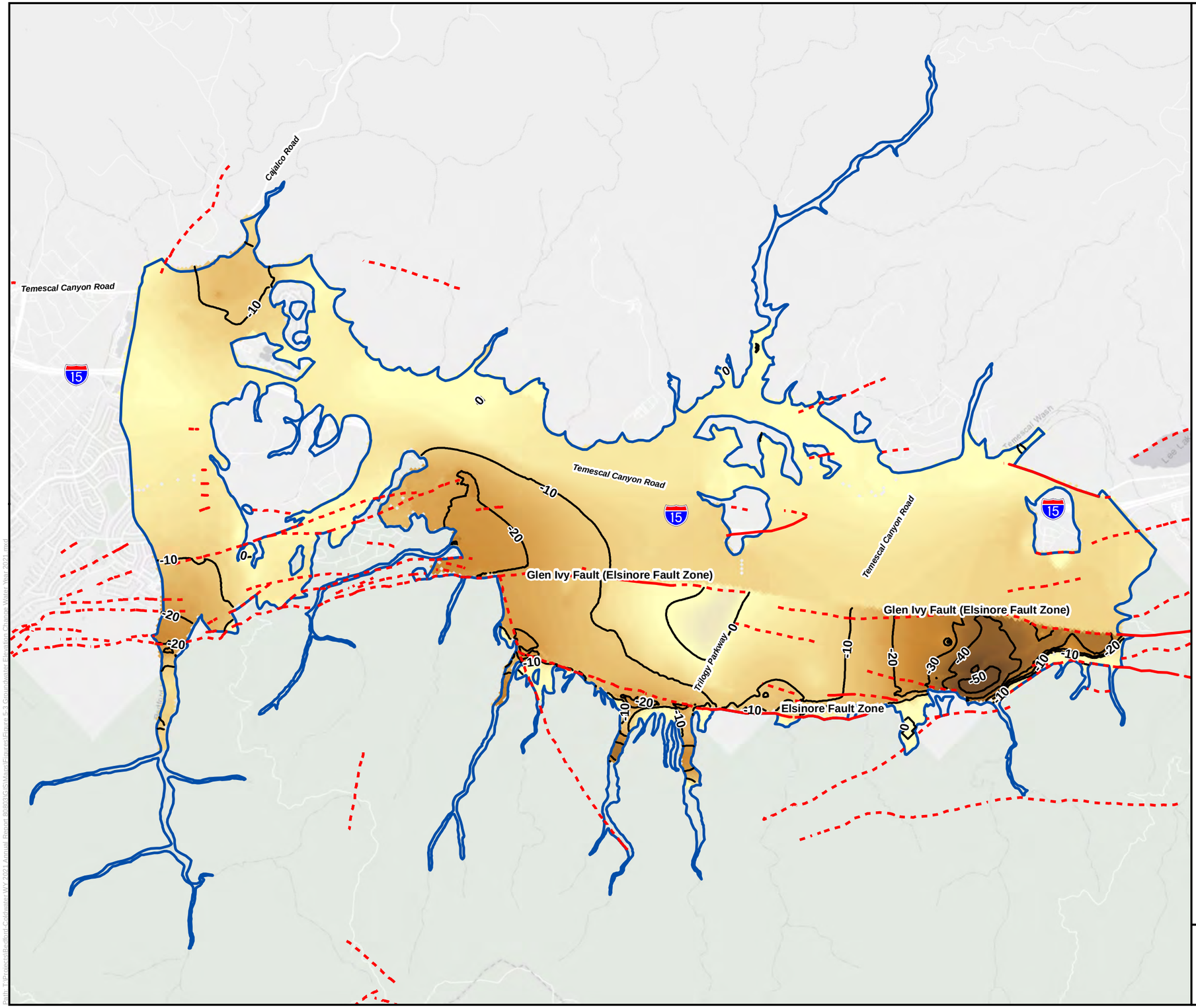


Cumulative Storage Change
Pumping
Annual

W - Wet
A - Above Normal
N - Normal
B - Below Normal
D - Dry

TODD GROUNDWATER

Figure 4-2
Cumulative Storage Change 1990 to 2021



40-foot groundwater elevation contours, feet msl

Groundwater Elevation Change

High : 50

Low : -50

Fault Location, dashed where uncertain

Bedford-Coldwater Basin

N

0 1,750 3,500

Scale in Feet

TODD GROUNDWATER

Figure 4-3
Groundwater Elevation Change
Water Year 2021

5. GROUNDWATER SUSTAINABILITY

5.1. SUSTAINABILITY INDICATORS AND MINIMUM THRESHOLDS

There are six sustainability criteria that must be assessed for SGMA, and five of these are relevant in the Basin (seawater intrusion is not relevant to the Basin because it is more than 20 miles from a high-salinity water body). As documented in the GSP, the Basin has been and is being managed sustainably relative to all criteria. Accordingly, sustainability does not need to be achieved, but it does need to be maintained through planning and implementation. This involves continuation and improvement of existing management actions—most notably ongoing use of imported and recycled water and conjunctive use with groundwater. It also will include improvement and expansion of management actions and monitoring, as defined in the GSP.

While the Basin has been managed sustainably, the following sustainability criteria were defined in the GSP (Todd et al. 2021) because the potential exists for future undesirable results:

- The Minimum Threshold for defining undesirable results relative to chronic lowering of groundwater levels is defined at each Key Well by operational considerations to maintain water levels at or above current pump intakes or screen bottoms (whichever is higher) in municipal water supply wells. Undesirable results are indicated when two consecutive exceedances occur in each of two consecutive years, in two-thirds or more of the currently monitored wells in each Management Area.
- The Minimum Threshold for reduction of groundwater storage for all Management Areas is fulfilled by the minimum threshold for groundwater levels as proxy.
- The Minimum Threshold for land subsidence is defined as a cumulative decline equal to or greater than one foot of decline since 2015, which represents current conditions and the SGMA start date. This is equivalent to a rate of decline equal to or greater than 0.2 feet in any five-year period. The extent of cumulative subsidence across the Basin will be monitored and evaluated using Interferometric Synthetic Aperture Radar (InSAR) data available through the SGMA Data Viewer during the 5-year GSP updates. Subsidence as a result of groundwater elevation decline is closely linked to groundwater levels and it is unlikely that significant inelastic subsidence would occur if groundwater levels remain above their minimum thresholds.
- The Minimum Thresholds for degradation of water quality address nitrate and total dissolved solids (TDS) for the entire Basin.
    - The Nitrate Minimum Threshold (in both Management Areas) is defined as 5-year average concentrations of all monitored wells not exceeding the 10 milligrams per liter (mg/L) drinking water maximum contaminant level (MCL) for Nitrate as Nitrogen.
    - The TDS Minimum Threshold (in both Management Areas) is defined as the 5-year average concentrations not exceeding the 1,000 mg/L secondary MCL for TDS.

- The Minimum Threshold for depletion of interconnected surface water is the amount of depletion associated with the lowest water levels recorded during the 2010 to 2015 drought. Specifically, undesirable results would occur if more than half of monitored wells near Temescal Wash had static water levels lower than 35 feet below the adjacent riparian vegetation ground surface elevation for a period of more than one year.

Table 5-1. SGMA Sustainability Indicators and Assessment

Sustainability Indicator		Annual Sustainability Assessment
	Lowering Groundwater Levels	Compile water level data and compare elevations in Key Wells with minimum threshold(s)
	Reduction of Groundwater Storage	Estimate groundwater storage change and compare elevations in Key Wells with minimum threshold(s)
	Degraded Water Quality	Compile and review water quality data from all sources
	Land Subsidence	Download and review InSAR data from DWR
	Depletion of Interconnected Surface Water	Review depth to water at interconnected surface water Key Wells/locations

5.2. SGMA SUSTAINABILITY INDICATOR UPDATES

5.2.1. Chronic Lowering of Groundwater Levels

Sustainability criteria (minimum thresholds and measurable objectives) for groundwater levels rely on a network of representative monitoring wells (Key Wells). The minimum threshold for specific wells was established to avoid undesireable results associated with operational parameters, as defined in the GSP. **Table 5-2** lists the 17 keys wells and their respective minimum thresholds, as well as the minimum groundwater elevation for water year 2021. The locations of the Key Wells are shown on **Figure 2-2**. Two wells were not monitored in water year 2021 due to access issues. Current water levels in all monitored Key Wells are above their respective minimum threshold. This indicates the Basin has not been subject to chronic lowering of groundwater levels in 2021.

Table 5-2. Key Well Groundwater Elevation Minimum Thresholds and 2021 Minimum Groundwater Elevations

Local Well Name	State Well Number	DWR Well Number	Management Area	Agency	Active Production Well	Monitoring Frequency	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Minimum Threshold Depth to Water (ft-bgs)	Minimum Threshold Elevation (ft NAVD 88)	Water Year 2021 Minimum Groundwater Elevation (ft NAVD 88)	Water Year Minimum Elevation Above Minimum Threshold?
Corona Well 20	005S006W11D001	337556N1174811W001	Coldwater	Corona	No	Static - Monthly	1147.58	1145.58	460	687.58	5/4/1902	Yes
Corona Well 21	005S006W03J005	337622N1174890W001	Coldwater	Corona	No	Static - Monthly	1125.09	1123.09	460	665.09	4/29/1902	Yes
Corona Well 3	005S006W03K001	337615N1174901W001	Coldwater	Corona	No	Static - Monthly	1140.02	1138.02	479	661.02	5/12/1902	Yes
Corona Non-Potable Well 1	004S006W16G004S	338227N1175073W001	Bedford	Corona	Yes	Continuous (SCADA)	808.92	813	80	728.92	1/25/1902	Yes
Corona Non-Potable Well 2	004S006W16G005S	338227N1175072W001	Bedford	Corona	Yes	Continuous (SCADA)	808.77	813	80	728.77	2/3/1902	Yes
EVMWD Flagler 2A Well	004S006W16C003S	338280N1175100W001	Bedford	EVMWD	Yes	Continuous (SCADA)	793.88	791.88	80	713.88	1/16/1902	Yes
EVMWD Flagler 3A Well	004S006W16C002S	338270N1175100W001	Bedford	EVMWD	Yes	Continuous (SCADA)	792.52	790.52	80	712.52	1/18/1902	Yes
Corona & EVMWD Trilogy		337650N1174896W001	Coldwater	EVMWD	No	Quarterly	1101.86	1099.86	440	661.86	Not Available	Not Available
EVMWD Station 71	005S006W11C001	337496N1174753W001	Bedford	EVMWD	Yes	Quarterly	1166.45	1164.45	507	659.45	2/18/1902	Yes
EVMWD Mayhew Well 2	005S006W11G001	338031N1174988W001	Coldwater	EVMWD	Yes	Quarterly	1244.2	1242.2	507	737.20	4/14/1902	Yes
TVWD Well 1 (Old well)	004S006W22P003S	338010N1174983W001	Bedford	TVWD	No	Continuous (SCADA)	879.9	894	70	809.90	4/22/1902	Yes
TVWD Well 1A		338009N1174983W001	Bedford	TVWD	Yes	Continuous (SCADA)	881.88	895	70	811.88	4/22/1902	Yes
TVWD Well 4	004S006W22P004S	338023N1174981W001	Bedford	TVWD	Yes	Continuous (SCADA)	878.22	883	70	808.22	4/19/1902	Yes
TVWD TP-1		337954N1174952W001	Bedford	TVWD	Yes	Continuous (SCADA)	901.46	899.46	85	816.46	878.96	Yes
TVWD TP-2		337954N1174941W001	Bedford	TVWD	Yes	Continuous (SCADA)	902.37	900.37	75	827.37	878.43	Yes
TVWD Foster	004S006W22N002	337544N1174806W001	Bedford	TVWD	Yes	Continuous (SCADA)	871.74	869.74	78	793.74	Not Available	Not Available
TVWD New Sump	004S006W35G002	337810N1174740W001	Bedford	TVWD	Yes	Continuous (SCADA)	953.4	951.4	66	887.40	7/26/1902	Yes

5.2.2. Reduction of Groundwater Storage

This indicator is tracked using the groundwater levels at key wells as a proxy and the change in storage simulated by the model, as described in Section 4. While groundwater storage has decreased over the past water year, it is due to dry hydrological conditions and so far there is no indication of lowering groundwater levels. The basin is not at risk for reduction of storage at this time.

5.2.3. Degraded Water Quality

Water quality (i.e., TDS, nitrate, etc.) continues to be monitored in the Basin by the BCGSA agencies. Water quality data from 2019 through 2021 were collected from from the BCGSA agencies as well as the State Division of Drinking Water (for the Glen Ivy Water System), and the Regulated Facilities program. These data were reviewed for trends and added to the DMS.

The water quality minimum thresholds are based on five year average conditons, which will be assessed in the periodic update of the GSP. Until that time, water quality data will continue to be collected, reviewed, and incorporated into the DMS.

5.2.4. Land Subsidence

InSAR data provided by DWR on its SGMA Data Viewer (DWR 2022) provide information on vertical displacement of the land surface across a broad area of California. During GSP preparation monthly InSAR data from from June 2015 through June 2018 were assessed and there was no indication of land surface changes in the Basin; this represents current conditions as defined in the GSP. DWR recently released additional InSAR data through October 1, 2021, which also shows no negative displacement in the Basin. InSAR data were downloaded and incorporated into the DMS for the Basin. A more comprehensive analysis of the potential for subsidence will be included in the periodic update of the GSP.

5.2.5. Depletion of Interconnected Surface Water.

Eight wells that are currently monitored for water levels are near stream reaches where interconnected surface water has been identified. These wells are listed below and shown on **Figure 2-2**:

- TVWD TP-1 and TP-2
- TVWD Well 1 (old well)
- TVWD Well 4
- EVMWD Flagler 2A and 3A
- Corona Non-Potable Wells 1 and 2

The minimum threshold for interconnected surface water is water levels lower than 35 feet below the adjacent riparian vegetation ground surface elevation for a period of more than one year. **Table 5-3** shows the eight Key Wells for interconnected surface water and the range of depth to water measurements for water year 2021. The table also identifies the ground

surface elevation of the nearby riparian vegetation. Three of the eight wells fell below the 35-foot threshold for a portion of the year. However, water levels were not below the threshold in any well for the entire year and the criteria for the SGMA minimum threshold of half the Key Wells exceeding 35 feet for a year did not occur in 2021. Water levels and the connection to groundwater dependent ecosystems in this area should continue to be monitored.

Shallow monitoring wells are needed in riparian areas to provide accurate water table information and clarify the relationship between deep water levels and vegetation conditions. One of the management actions in the GSP is to assess the potential for construction of shallow monitoring wells at several locations where riparian vegetation is present in the Basin. Over time, the interconnected surface water minimum threshold can be modified to reflect conditions in the shallow wells constructed for this purpose. This will help the BCGSA better define undesirable results related to interconnected surface water in the Basin.

Table 5-3. Key Well Interconnected Surface Water Minimum Thresholds and 2021 Groundwater Elevations

Local Well Name	State Well Number	DWR Well Number	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Adjacent Riparian Vegetation Ground Surface Elevation (ft NAVD 88)	Water Year 2021 Minimum Groundwater Elevation (ft NAVD 88)	Water Year 2021 Maximum Groundwater Elevation (ft NAVD 88)	Water Year 2021 Range of Groundwater Depth Below Riparian Vegetation (ft-bgs)	
								Maximum	Minimum
Corona Non-Potable Well 2	004S006W16G004S	338227N1175072W001	808.77	813	801	770.37	782.27	30.63	18.73
Corona Non-Potable Well 1	004S006W16G005S	338227N1175073W001	808.92	813	801	765.02	779.32	35.98	21.68
EVMWD Flagler 3A Well	004S006W16C002S	338270N1175100W001	792.52	790.52	781	760.97	771.12	20.03	9.88
EVMWD Flagler 2A Well	004S006W16C003S	338280N1175100W001	793.88	791.88	782	759.6	769.38	22.4	12.62
TVWD TP-1		337954N1174952W001	901.46	899.46	891	878.96	878.96	12.04	12.04
TVWD TP-2		337954N1174941W001	902.37	900.37	898	878.43	878.43	19.57	19.57
TVWD Well 1 (Old well)	004S006W22P003S	338010N1174983W001	879.9	894	889	843.6	855.7	45.4	33.3
TVWD Well 4	004S006W22P004S	338023N1174981W001	878.22	883	877	840.62	844.42	36.38	32.58

6. SUSTAINABLE MANAGEMENT ACTIVITIES

As presented in the GSP, the BCGSA agencies have been actively managing their local groundwater resources for decades with various projects and management actions. The GSP summarizes ongoing efforts, indicates supplementary work on those efforts, and identifies potential future projects and management actions (Todd et al. 2021). As defined in the GSP, *Projects* are substantial efforts designed to reduce uncertainty in areas where data gaps were identified in the GSP. The three projects outlined in the GSP are:

- **Project 1** – Investigate Groundwater/Surface Water Interaction at Temescal Wash and Install Monitoring Wells
- **Project 2** – Initiate a Survey of Active Private Wells
- **Project 3** – Evaluation of the Effects of Aggregate Pits on Groundwater Flow and Quality

Actions defined in the GSP are focused on data collection, storage, and reporting necessary to monitor sustainability and assess when additional tasks may be required (e.g., when minimum thresholds are approached or exceeded). The five Management Actions identified in the GSP were:

- **Action 1** – Provide for Collection, Compilation, and Storage of Information Required for Annual Reports and Submit Annual Reports
- **Action 2** – Routinely Record Groundwater Levels and Take Action if Necessary
- **Action 3** – Monitor Selected Groundwater Quality Constituents and Coordinate with the Regional Water Quality Control Board as Appropriate
- **Action 4** – Track Trends in Groundwater Levels near Temescal Wash and Take Action as Necessary
- **Action 5** – Review Interferometric Synthetic Aperture Radar (InSAR) Data on the California Department of Water Resources (DWR) DataViewer During 5-Year Updates

The projects and management actions were presented in the GSP with an Implementation Plan that extends to 2045 in five-year intervals; the last interval includes the 2042 deadline for the 20-year implementation to achieve and demonstrate sustainability. Not all projects and management actions are updated specifically in this first annual report. This recognizes that the GSP was adopted in late 2021 and submitted to DWR in January 2022 and this annual report is being prepared in February and March of 2022. Therefore, this section of this annual report focuses on projects and management actions with active implementation. Specifically, the three GSP Projects have not begun as of early 2022, but the five Management Actions are underway as demonstrated in previous sections of this annual report.

7. ONGOING IMPLEMENTATION ACTIVITIES

BCGSA agency policies and programs have served to effectively manage water resources in the Basin for many years. The BCGSA agencies have developed and managed multiple sources of supply to address drought, established active and effective water conservation programs, has initiated programs to protect water quality, has improved delivered water quality to many municipal customers, and has repeatedly committed to sustainably managing groundwater in the Basin. The BCGSA will continue to manage the Basin sustainably and will pursue the following ongoing implementation activities.

- Continue to implement management actions and improve the collection and reporting of groundwater condition and water use information. Specifically:
    - Monitor water levels consistently in all Key Wells
    - Initiate monitoring in newly constructed dedicated monitoring wells
    - Refine and improve agency water use monitoring and reporting, including tracking all groundwater production and tracking where imported water is used within the Basin
    - Work with WMWD to collect water use data earlier so that it is available for use in SGMA annual report preparation
- Implement projects to investigate interconnected surface water and shallow groundwater monitoring along Temescal Wash
- Continue and expand conjunctive use throughout the Basin

8. REFERENCES

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MWH, 2004, Elsinore Valley Municipal Water District, Coldwater Basin Recharge Feasibility Study, March.

RMC and Woodard & Curran, 2017, 2015 Urban Water Management Plan, Temescal Valley Water District, December, available at: https://www.temescalvwd.com/pdf/TVWD_UWMP_Public%20Draft%20w%20Appendices.pdf

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Todd Groundwater, Stantec, and H&H Water Resources, 2021, Groundwater Sustainability Plan, Bedford-Coldwater Basin, November.

APPENDIX A

SGMA Annual Report Elements Table

Groundwater Sustainability Plan Annual Report Elements Guide

Basin Name	8-004.02 Bedford-Coldwater		
GSP Local ID			
California Code of Regulations - GSP Regulation Sections	***Groundwater Sustainability Plan Elements***	**Document *page number(s) that address the applicable GSP element.***	***Notes: Briefly describe the GSP element does not apply.***
Article 5	**Plan Contents**		
Subarticle 4	***Monitoring Networks***		
§ 354.40	**Reporting Monitoring Data to the Department**		
	Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.	72:84	
	Note: Authority cited: Section 10733.2, Water Code. Reference: Sections 10728, 10728.2, 10733.2 and 10733.8, Water Code.		
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.	8,10	
	(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:		
	(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	43:44	
	(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.	21:22,24:41	
	(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.	48:49,85:89	
	(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.	49,85:89	
	(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.	49,85:89	
	(5) Change in groundwater in storage shall include the following:		

California Code of Regulations - GSP Regulation Sections	*Groundwater Sustainability Plan Elements*	Document *page number(s) that address the applicable GSP element.*	*Notes: Briefly describe the GSP element does not apply.*
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	59	
	(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.	58	
	(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.	60:67	

APPENDIX B

Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	12/1/2018	805.08
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	1/1/2019	807.98
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	2/1/2019	808.88
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	3/1/2019	811.78
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	4/1/2019	805.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	5/1/2019	804.08
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	6/1/2019	840.88
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	7/1/2019	836.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	8/1/2019	837.38
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	9/1/2019	843.68
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	10/1/2019	840.08
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	11/1/2019	839.48
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	12/1/2019	839.18
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	1/1/2020	841.08
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	2/1/2020	844.18
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	3/1/2020	844.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	4/1/2020	868.98
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	5/1/2020	849.38
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	6/1/2020	852.68
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	7/1/2020	853.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	8/1/2020	855.88
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	9/1/2020	855.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	10/1/2020	856.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	11/1/2020	856.88
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	12/1/2020	855.58
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	1/1/2021	857.08
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	2/1/2021	858.78
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	3/1/2021	862.28
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	4/1/2021	863.08
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	5/1/2021	861.88
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	6/1/2021	866.28
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	7/1/2021	879.78
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	8/1/2021	861.98
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	9/1/2021	859.28
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	10/1/2021	879.68
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	11/1/2021	859.38
Corona Well 20	337556N1174811W001	Coldwater	1147.58	1145.58	12/1/2021	858.88

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	12/1/2018	789.19
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	1/1/2019	792.49
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	2/1/2019	796.09
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	3/1/2019	779.39
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	4/1/2019	786.09
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	5/1/2019	783.89
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	6/1/2019	782.59
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	7/1/2019	826.99
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	8/1/2019	829.29
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	9/1/2019	829.89
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	10/1/2019	834.19
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	11/1/2019	835.89
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	12/1/2019	837.39
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	1/1/2020	839.79
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	2/1/2020	842.59
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	3/1/2020	844.19
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	4/1/2020	827.39
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	5/1/2020	844.29
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	6/1/2020	855.69
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	7/1/2020	863.19
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	8/1/2020	857.29
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	9/1/2020	858.79
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	10/1/2020	860.19
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	11/1/2020	861.29
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	12/1/2020	862.39
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	1/1/2021	864.09
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	2/1/2021	865.79
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	3/1/2021	866.89
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	4/1/2021	868.09
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	5/1/2021	868.79
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	6/1/2021	866.09
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	7/1/2021	850.59
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	8/1/2021	850.49
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	9/1/2021	860.09
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	10/1/2021	861.99
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	11/1/2021	863.79
Corona Well 21	337622N1174890W001	Coldwater	1125.09	1123.09	12/1/2021	863.19

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	12/1/2018	790.92
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	12/17/2018	773.7
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	1/1/2019	792.32
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	2/1/2019	788.52
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	3/1/2019	783.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	4/1/2019	817.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	5/1/2019	792.42
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	6/1/2019	892.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	7/1/2019	826.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	8/1/2019	827.62
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	9/1/2019	830.12
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	10/1/2019	832.32
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	11/1/2019	834.52
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	12/1/2019	851.12
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	1/1/2020	841.22
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	2/1/2020	843.42
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	3/1/2020	846.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	4/1/2020	849.62
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	5/1/2020	853.32
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	6/1/2020	854.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	7/1/2020	856.22
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	8/1/2020	859.42
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	9/1/2020	860.42
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	10/1/2020	862.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	11/1/2020	863.02
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	12/1/2020	864.12
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	1/1/2021	865.72
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	2/1/2021	867.52
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	3/1/2021	868.62
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	4/1/2021	868.92
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	5/1/2021	870.72
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	6/1/2021	870.82
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	7/1/2021	868.22
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	8/1/2021	866.12
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	9/1/2021	865.72
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	10/1/2021	867.52
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	11/1/2021	866.42
Corona Well 3	337615N1174901W001	Coldwater	1140.02	1138.02	12/1/2021	866.12

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	12/1/2018	769.22
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	1/1/2019	771.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	2/1/2019	779.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	3/1/2019	780.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	4/1/2019	778.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	5/1/2019	783.32
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	6/1/2019	783.22
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	7/1/2019	777.82
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	8/1/2019	776.12
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	9/1/2019	774.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	10/1/2019	770.52
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	11/1/2019	768.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	12/1/2019	776.32
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	1/1/2020	777.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	2/1/2020	779.32
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	3/1/2020	779.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	4/1/2020	779.62
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	5/1/2020	780.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	6/1/2020	779.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	7/1/2020	778.12
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	8/1/2020	776.42
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	9/1/2020	773.22
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	10/1/2020	770.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	11/1/2020	768.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	12/1/2020	771.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	1/1/2021	774.52
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	2/1/2021	776.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	3/1/2021	778.62
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	4/1/2021	779.32
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	5/1/2021	778.72
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	6/1/2021	778.22
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	7/1/2021	773.52
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	8/1/2021	769.12
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	9/1/2021	765.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	10/1/2021	762.52
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	11/1/2021	760.02
Corona Non-Potable Well 1	338227N1175073W001	Bedford	808.92	813	12/1/2021	756.32

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	12/1/2018	769.27
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	1/1/2019	771.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	2/1/2019	781.07
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	3/1/2019	781.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	4/1/2019	760.47
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	5/1/2019	784.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	6/1/2019	785.57
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	7/1/2019	781.27
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	8/1/2019	780.47
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	9/1/2019	776.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	10/1/2019	772.47
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	11/1/2019	773.37
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	12/1/2019	775.57
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	1/1/2020	781.07
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	2/1/2020	779.57
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	3/1/2020	781.57
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	4/1/2020	767.17
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	5/1/2020	782.67
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	6/1/2020	780.17
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	7/1/2020	781.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	8/1/2020	780.57
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	9/1/2020	769.37
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	10/1/2020	774.27
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	11/1/2020	772.27
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	12/1/2020	772.47
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	1/1/2021	778.47
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	2/1/2021	780.27
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	3/1/2021	781.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	4/1/2021	782.27
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	5/1/2021	781.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	6/1/2021	781.67
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	7/1/2021	776.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	8/1/2021	770.37
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	9/1/2021	779.57
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	10/1/2021	784.47
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	11/1/2021	768.97
Corona Non-Potable Well 2	338227N1175072W001	Bedford	808.77	813	12/1/2021	765.47

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	11/13/2018	746.1
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	12/18/2018	758
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	12/18/2018	758
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	3/13/2019	752.5
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	4/22/2019	766.7
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	4/22/2019	766.7
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	6/7/2019	750.7
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	9/6/2019	762.9
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	9/6/2019	762.9
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	9/17/2019	746
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	10/18/2019	743.5
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	11/25/2019	762.45
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	11/25/2019	762.45
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	12/4/2019	764.4
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	12/4/2019	764.4
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	4/8/2020	770.58
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	11/6/2020	759.6
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	12/1/2020	762.58
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	2/18/2021	769.28
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	4/22/2021	769.38
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	6/17/2021	769.08
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	8/3/2021	765.18
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	11/18/2021	747.58
EVMWD Flagler 2A Well	338280N1175100W001	Bedford	793.88	791.88	12/9/2021	748.58

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	11/13/2018	738.45
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	12/18/2018	759.2
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	12/18/2018	759.2
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	3/13/2019	745.95
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	4/22/2019	768.45
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	4/22/2019	768.45
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	6/7/2019	743.25
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	9/6/2019	765.35
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	9/6/2019	765.35
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	9/17/2019	737.85
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	10/18/2019	735.45
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	11/25/2019	763.79
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	11/25/2019	763.79
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	12/4/2019	765.35
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	12/4/2019	765.35
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	4/8/2020	772.62
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	11/6/2020	760.97
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	12/2/2020	764.12
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	1/6/2021	765.62
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	4/22/2021	771.12
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	6/17/2021	770.92
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	8/3/2021	766.42
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	11/18/2021	749.62
EVMWD Flagler 3A Well	338270N1175100W001	Bedford	792.52	790.52	12/9/2021	750.12

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
Corona & EVMWD Trilogy	337650N1174896W001	Coldwater	1101.86	1099.86	11/16/2018	792.5
Corona & EVMWD Trilogy	337650N1174896W001	Coldwater	1101.86	1099.86	3/28/2019	814.6
Corona & EVMWD Trilogy	337650N1174896W001	Coldwater	1101.86	1099.86	5/29/2019	829
Corona & EVMWD Trilogy	337650N1174896W001	Coldwater	1101.86	1099.86	9/12/2019	836.9
Corona & EVMWD Trilogy	337650N1174896W001	Coldwater	1101.86	1099.86	11/22/2019	840.2
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	2/27/2019	822.16
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	2/27/2019	822.16
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	4/29/2019	840.64
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	4/29/2019	840.64
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	6/7/2019	817.54
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	7/3/2019	796.75
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	9/18/2019	801.37
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	10/3/2019	789.82
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	11/14/2019	789.82
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	4/9/2020	893.8
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	8/27/2020	891.5
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	11/18/2020	895
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	11/18/2020	895
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	12/15/2020	871.9
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	4/23/2021	903.3
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	8/26/2021	889.2
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	11/4/2021	898.4
EVMWD Station 71	337496N1174753W001	Coldwater	1166.45	1164.45	12/20/2021	780.6
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	2/27/2019	853.14
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	4/9/2020	872.6
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	8/27/2020	868
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	12/15/2020	835.6
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	4/23/2021	1011.2
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	6/7/2021	852.92
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	8/26/2021	849.92
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	9/17/2021	977.92
EVMWD Mayhew 2	338031N1174988W001	Coldwater	1244.2	1242.2	11/18/2021	863.92

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	1/1/2019	843.6
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	2/1/2019	846.3
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	3/1/2019	847.1
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	4/1/2019	846.2
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	5/1/2019	846
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	6/1/2019	845.6
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	7/1/2019	845
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	8/1/2019	844.2
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	9/1/2019	841.5
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	10/1/2019	842.9
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	11/1/2019	846
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	12/1/2019	850.3
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	1/1/2020	843.6
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	2/1/2020	846.3
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	3/1/2020	847.1
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	4/1/2020	856.8
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	5/1/2020	854.5
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	6/1/2020	853.8
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	7/1/2020	852.8
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	8/1/2020	851.4
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	9/1/2020	850.4
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	10/1/2020	850
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	11/1/2020	843.6
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	12/1/2020	853.3
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	1/1/2021	854.7
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	2/1/2021	855.7
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	3/1/2021	855.7
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	4/1/2021	855.7
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	5/1/2021	855
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	6/1/2021	851.5
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	7/1/2021	848.4
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	8/1/2021	850.6
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	9/1/2021	848.4
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	10/1/2021	850.1
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	11/1/2021	849.8
TVWD Well 1 (Old well)	338010N1174983W001	Bedford	879.9	894	12/1/2021	854.7

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	1/1/2019	848.78
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	2/1/2019	851.38
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	3/1/2019	852.08
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	4/1/2019	851.28
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	5/1/2019	851.18
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	6/1/2019	850.78
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	7/1/2019	849.98
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	8/1/2019	849.28
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	9/1/2019	843.68
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	10/1/2019	843.88
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	11/1/2019	846.48
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	12/1/2019	847.98
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	1/1/2020	848.78
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	2/1/2020	851.38
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	3/1/2020	852.08
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	4/1/2020	848.38
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	5/1/2020	847.88
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	6/1/2020	851.23
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	7/1/2020	849.48
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	8/1/2020	849.98
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	9/1/2020	849.28
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	10/1/2020	854.43
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	11/1/2020	843.88
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	12/1/2020	865.28
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	1/1/2021	865.28
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	2/1/2021	866.38
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	3/1/2021	866.88
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	4/1/2021	866.98
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	5/1/2021	866.38
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	6/1/2021	863.78
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	7/1/2021	863.08
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	8/1/2021	863.18
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	9/1/2021	861.48
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	10/1/2021	862.88
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	11/1/2021	862.58
TVWD Well 1A	338009N1174983W001	Bedford	881.88	895	12/1/2021	866.48

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	1/1/2019	844.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	2/1/2019	846.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	3/1/2019	847.02
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	4/1/2019	846.42
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	5/1/2019	846.52
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	6/1/2019	845.82
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	7/1/2019	845.52
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	8/1/2019	844.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	9/1/2019	838.32
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	10/1/2019	839.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	11/1/2019	843.22
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	12/1/2019	844.22
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	1/1/2020	844.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	2/1/2020	846.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	3/1/2020	847.02
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	4/1/2020	845.22
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	5/1/2020	841.32
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	6/1/2020	841.22
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	7/1/2020	843.02
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	8/1/2020	842.42
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	9/1/2020	842.02
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	10/1/2020	840.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	11/1/2020	840.95
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	12/1/2020	843.62
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	1/1/2021	843.62
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	2/1/2021	844.42
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	3/1/2021	844.12
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	4/1/2021	843.92
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	5/1/2021	843.72
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	6/1/2021	841.62
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	7/1/2021	840.62
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	8/1/2021	842.12
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	9/1/2021	840.92
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	10/1/2021	842.02
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	11/1/2021	841.02
TVWD Well 4	338023N1174981W001	Bedford	878.22	883	12/1/2021	844.52

Appendix B. Key Well Groundwater Elevations, Water Years 2019, 2020, and 2021

Local Well Name	DWR Well Number	Management Area	Reference Point Elevation (ft NAVD 88)	Ground Surface Elevation (ft NAVD 88)	Measurement Date	Groundwater Elevation (ft NAVD 88)
TVWD TP-1	337954N1174952W001	Bedford	901.46	899.46	2/1/2019	880.46
TVWD TP-1	337954N1174952W001	Bedford	901.46	899.46	8/1/2019	878.46
TVWD TP-1	337954N1174952W001	Bedford	901.46	899.46	2/1/2020	880.46
TVWD TP-1	337954N1174952W001	Bedford	901.46	899.46	8/1/2020	878.46
TVWD TP-1	337954N1174952W001	Bedford	901.46	899.46	6/1/2021	878.96
TVWD TP-2	337954N1174941W001	Bedford	902.37	900.37	5/1/2019	881.57
TVWD TP-2	337954N1174941W001	Bedford	902.37	900.37	2/1/2020	881.37
TVWD TP-2	337954N1174941W001	Bedford	902.37	900.37	8/1/2020	877.69
TVWD TP-2	337954N1174941W001	Bedford	902.37	900.37	6/1/2021	878.43
TVWD Foster	337544N1174806W001	Bedford	871.74	869.74	2/1/2019	844.74
TVWD Foster	337544N1174806W001	Bedford	871.74	869.74	8/1/2019	841.74
TVWD Foster	337544N1174806W001	Bedford	871.74	869.74	2/1/2020	844.74
TVWD Foster	337544N1174806W001	Bedford	871.74	869.74	6/1/2020	843.94
TVWD Foster	337544N1174806W001	Bedford	871.74	869.74	8/1/2020	841.74
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	2/1/2019	943.4
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	8/1/2019	940.4
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	11/14/2019	993.3
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	2/1/2020	942.4
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	8/1/2020	941.4
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	2/1/2021	943.4
TVWD New Sump	337810N1174740W001	Bedford	953.4	951.4	8/1/2021	938.4

APPENDIX C

SGMA Required Water Use Tables

Bedford Coldwater Annual SGMA Portal A Groundwater Extractions

Basin Number	8-004.02
Water Year	2021 (Oct. 2020 - Sept. 2021)
Total Groundwater Extractions (AF)	4,450
Water Use Sector Urban (AF)	3,469
Water Use Sector Industrial (AF)	
Water Use Sector Agricultural (AF)	980
Water Use Sector Managed Wetlands (AF)	-
Water Use Sector Managed Recharge (AF)	-
Water Use Sector Native Vegetation (AF)	-
Water Use Sector Other (AF)	-
Water Use Sector Other Description	Urban includes industrial

Basin Number	8-004.02
Water Year	2021 (Oct. 2020 - Sept. 2021)
Meters Volume (AF)	3,469
Meters Description	Flow meters from retailers
Meters Type	
Meters Accuracy (%)	20%
Meters Accuracy Description	
Electrical Records Volume (AF)	
Electrical Records Description	
Electrical Records Type	
Electrical Records Accuracy (%)	
Electrical Records Accuracy Description	
Land Use Volume (AF)	
Land Use Description	
Land Use Type	
Land Use Accuracy (%)	
Land Use Accuracy Description	
Groundwater Model Volume (AF)	980
Groundwater Model Description	Expected Ag/irrigation not met by municipal purveyors
Groundwater Model Type	MODFLOW
Groundwater Model Accuracy (%)	50
Groundwater Model Accuracy Description	MODFLOW Developed for GSP
Other Method(s) Volume (AF)	
Other Method(s) Description	
Other Method(s) Type	
Other Method(s) Accuracy (%)	
Other Method(s) Accuracy Description	

Basin Number	8-004.02
Water Year	2021 (Oct. 2020 - Sept. 2021)
Methods Used To Determine	Meters
Water Source Type Central Valley Project (AF)	-
Water Source Type State Water Project (AF)	6,082
Water Source Type Colorado River Project (AF)	
Water Source Type Local Supplies (AF)	
Water Source Type Local Imported Supplies (AF)	
Water Source Type Recycled Water (AF)	1,188
Water Source Type Desalination (AF)	
Water Source Type Other (AF)	-
Water Source Type Other Description	

Basin Number	8-004.02
Water Year	2021 (Oct. 2020 - Sept. 2021)
Total Water Use (AF)	
Methods Used To Determine	
Water Source Type Groundwater (AF)	4,450
Water Source Type Surface Water (AF)	6,082
Water Source Type Recycled Water (AF)	1,188
Water Source Type Reused Water (AF)	
Water Source Type Other (AF)	
Water Source Type Other Description	
Water Use Sector Urban (AF)	10,740
Water Use Sector Industrial (AF)	
Water Use Sector Agricultural (AF)	980
Water Use Sector Managed Wetlands (AF)	
Water Use Sector Managed Recharge (AF)	
Water Use Sector Native Vegetation (AF)	-
Water Use Sector Other (AF)	
Water Use Sector Other Description	Urban includes industrial