Public Draft – June 2021

2020 Urban Water Management Plan

Prepared by:

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Comprehensive Water Planning

ZANJERO

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This 2020 Urban Water Management Plan was prepared under the direction of a California licensed civil engineer.

Executive Summary
Layperson's Description

After the devastating drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning, and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA).[1] The UWMPA requires urban water suppliers serving over 3,000 customers or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan every five years,[2] and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon.[3] The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan.[4] And last, beginning in July 2022, each urban water supplier must prepare an annual water supply and demand assessment.[5] The California Legislature asserts that aggregating all of these legal requirements at the urban water supplier level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the Urban Water Management Plan (UWMP) is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP will provide the supplier's elected officials, management, staff, and customers with an understanding of past, current, and future water conditions and management. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects, as well as providing for statewide challenges that may manifest through climate change and evolving regulations. Thoughtful urban water management planning provides an opportunity for the supplier to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

[1] California Water Code Section 10610 *et seq*. (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1).
[2] California Water Code Section 10610 *et seq*.
[3] California Water Code Sections 10631-10635
[4] California Water Code Sections 10632
[5] California Water Code Sections 10632.1

ES-1 El Dorado Irrigation District

The El Dorado Irrigation District (District) is a public water agency that provides potable and recycled water directly to retail customers and the City of Placerville throughout the approximately 220 square mile service area boundary. Formed in 1925 to provide water to El Dorado County, the District serves agricultural needs, urban communities, and rural residences.[6] The District's service area is divided into five political divisions and is governed by a five member, publicly-elected Board of Directors.

The District serves a combination of municipal and agricultural customers throughout the County in 16 unique service zones (see Figure 2-1). While the population of nearly 130,000 residential customers are the primary water users, the number of connections, ratio of different user classifications, and water use characteristics vary across each service zone. The District serves these customers from an array of surface water supplies, diversion points, treatment plants and water infrastructure.

From a water use characteristics and infrastructure perspective, the District have been divided into three water service regions:

- El Dorado Hills Region – includes Service Zones 1, 2 and 4 which represent the communities of Bass Lake, El Dorado Hills and Cameron Park.
- Western Region – includes Service Zones 3, 5, 6, and 7 which represent the communities of Lotus/Coloma, Shingle Springs, Logtown, and Diamond Springs/El Dorado.
- Eastern Region – includes Service Zones 9, 10, 11, 12, 13, 18, and 28 which represent the communities of Swansboro, Camino, Pleasant Valley, Sly Park, Pollock Pines, and Placerville, but also includes the two small independent systems for Service Zones 14 and 15, which represent the communities of Outingdale and Strawberry, respectively.

For purposes of this 2020 UWMP, customer information is organized by these three distinct water service regions, which are collections of the 16 distinct service zones. Figure ES-1 presents the water service regions and associated service zones.

ES-2 Water Service Reliability

The District is in a unique position with ample water supplies to meet current and growing customer demand. Specifically, with an array of surface water assets that can be flexibly managed in a single year and across multiple years, the District can maintain reliability during drought conditions. Nevertheless, the District continues to encourage its customers to use water efficiently and continues to see lowering per-capita water use.

The District's current normal year water supply and demand conditions represent the expected water supply and demand conditions that would likely occur based upon a reasonable assessment of regional and statewide hydrology and limited regulatory constraints. Under these conditions, the District anticipates that its access to its current surface water supplies would be fully available. The District's

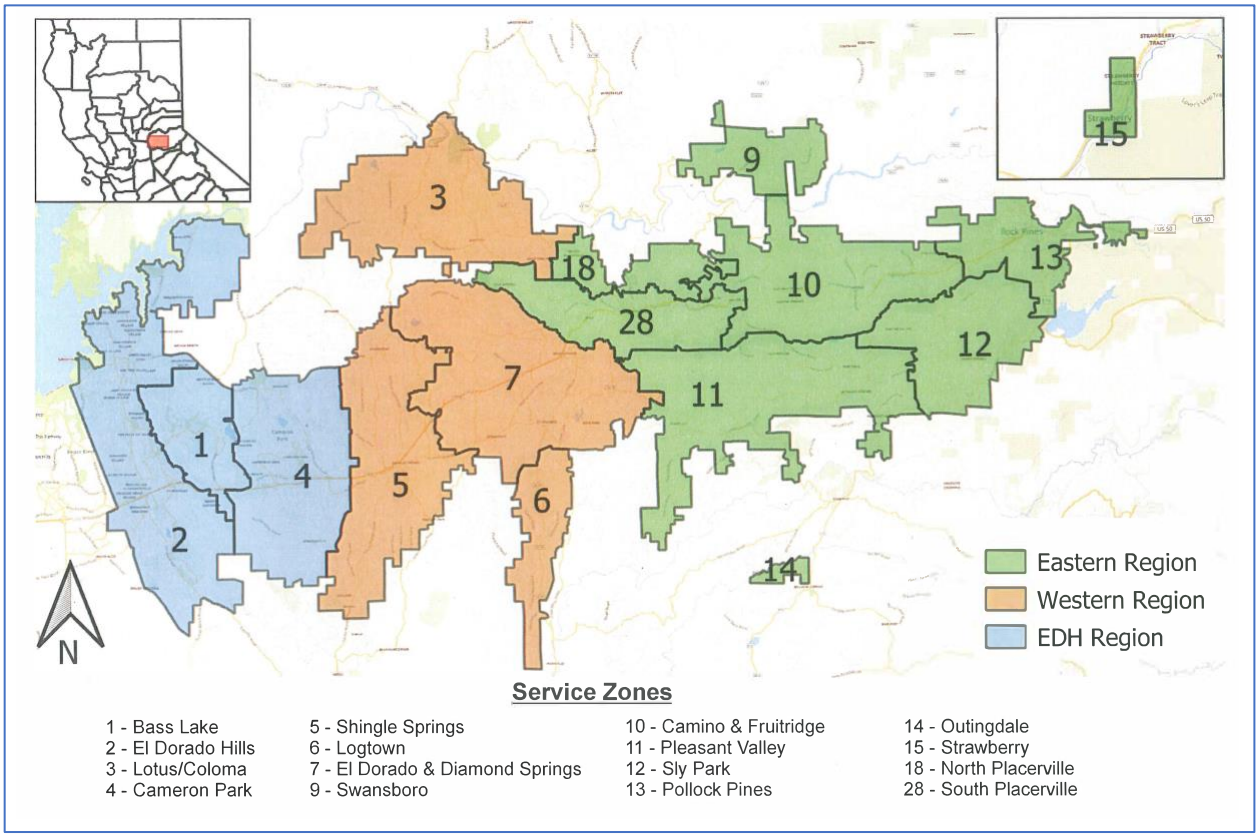
[6] *A Brief History of El Dorado Irrigation District*, December 2011, available at: https://www.eid.org/about-us/document-library

characterization of current water use conditions represent a historical assessment of water use within the District, as well as reasonable characterizations of growth and potential customer use patterns.

However, although the District has sufficient supplies to meet its needs during single-dry years and extended droughts as evaluated in this 2020 UWMP, other regulatory constraints or unique conditions, like the declaration of a drought emergency by the Governor of the State of California, State-ordered curtailment of the District's water rights, low lake levels, and regional supply conditions may require the District to reduce its water service to its customers.

Overall, as documented in this 2020 UWMP, the District's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2020 through 2045.

Figure ES-1: El Dorado Irrigation District Water Service Area



Chapter 1
Introduction

The El Dorado Irrigation District ("EID" or "District") provides retail potable, irrigation, and recycled water services to municipal and agricultural customers throughout a large area of El Dorado County (County), and also provides wholesale treated water to the City of Placerville.[7] The District was organized in 1925 and created to protect water filings, ensure a secure water supply, and increase the value of agricultural lands. With a long history of providing water for irrigation, municipal, and commercial purposes, the District has grown more urbanized over the years. Originally serving 31,500 acres of agricultural lands, the District now serves nearly 130,000 people and nearly 150,000 acres of agricultural needs, urban communities, and rural residences.[8] The District's service area is divided into five political divisions and is governed by a five member, publicly-elected Board of Directors.

The District is the primary water supplier of many unincorporated communities in El Dorado County, including El Dorado Hills at the western edge of the service area and other smaller communities extending east up the western slope of El Dorado County. The service area covers approximately 220 square miles. The District's primary water supply is derived from the natural rainfall and snowpack that falls upon the upper elevations of the Sierra Nevada mountains. The District does not utilize groundwater as a supply, but does capture and treat wastewater from many of the local communities, producing recycled water for irrigation to supplement its potable supplies.

Ensuring an adequate supply of water is available to serve the existing and future needs of the District's customers is a critical component of successful planning. This Urban Water Management Plan (UWMP) draws on local, regional and statewide inputs to synthesize information from numerous sources into a reliable water management action plan designed to be referred to as management and Board level decisions arise and conditions change.

1.1 Background and Purpose

The District has prepared this 2020 UWMP to comply with the Urban Water Management Planning Act (UWMPA) requirements for urban water suppliers. This 2020 UWMP addresses the District's water management planning efforts to assure adequate water supplies to meet forecast demands over the next 25 years. As required by the UWMPA, the District's 2020 UWMP specifically assesses the

[7] Because deliveries to the City of Placerville are only around 1,100 acre-feet annually, EID is not considered a wholesale water purveyor per California Water Code 10608.12(r). This 2020 Urban Water Management Plan is prepared by EID solely from the perspective of a retail water purveyor.

[8] *A Brief History of El Dorado Irrigation District*, December 2011, available at: https://www.eid.org/about-us/document-library

availability of its supplies to meet forecasted water uses during average, single-dry and five consecutive dry years through 2045. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry-year conditions are critical outcomes of this 2020 UWMP.

The 2020 UWMP is an update to EID's 2015 UWMP, and presents new data and analysis as required by the California Department of Water Resources (DWR) and the California Water Code (CWC) since 2015. These updates are detailed in Chapter 2 and throughout the rest of the 2020 UWMP. The 2020 UWMP is also a comprehensive water planning document that describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use.

The UWMP is designed to be a valuable water management and planning tool to guide and inform the EID's Board of Directors, managers, customers and the State of California about its water management practices. It reflects the District's planning assumptions and goals, and should be used in combination with other planning resources and documents over the 2020 UWMP planning horizon.

The State of California's drought vulnerability, and the additional pressures of climate change and population growth, have emphasized the importance of planning ahead to meet water demands with potentially at-risk water supplies. Such forward planning is an important outcome of the 2020 UWMP.

1.2 Basis for Plan Preparation

In addition to operating a Public Water System as described in California Health and Safety Code 116275, the District qualifies as a Retail Urban Water Supplier as described in Water Code Section 10617, providing water for municipal purposes to more than 3,000 customers or more than 3,000 acre/feet of water per year. This qualification requires the preparation of an Urban Water Management Plan every five years. In addition to its main water system, the District also operates two small satellite water systems which do not meet the aforementioned customer/volume qualification, but are registered Public Water Systems. The District's Public Water System detail is listed in Table 1-1.

Table 1-1: Public Water System Information

Public Water System Number	Public Water System Name	Number of Municipal Connections in 2020
CA0910017	Strawberry	193
CA0910018	Outingdale	149
CA0910001	El Dorado Irrigation District	42,353

The State Legislature passed numerous new requirements since the 2015 UMWP, which are detailed throughout this 2020 UWMP.[9] Major updates to the requirements are listed below, along with a reference to the corresponding section in which they are addressed in this document.

[9] California Water Code Section 10608 to 10608.44; Section 10609 to 10609.38; Section 10610 to 10657.

- **Five Consecutive Dry-Year Water Reliability Assessment:** The Legislature modified the dry-year water reliability planning from a "multiyear" time-period, to a "drought lasting five consecutive water years" designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period. This new requirement is addressed in Chapter 3—Water Supply Characterization, Chapter 4—Water Use, and Chapter 5—Water Service Reliability Assessment.
- **Drought Risk Assessment (DRA):** Due to the extensiveness of recent California droughts and the variability associated with climate change predictions, the California Legislature created a DRA requirement for UWMPs. The DRA requires assessment over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability for five consecutive dry years. The DRA is addressed in Chapter 5—Water Service Reliability Assessment and Chapter 6—Water Shortage Contingency Plans.
- **Seismic Risk:** Evaluating seismic risk to water system infrastructure and facilities, and having a mitigation plan, is now required by the Water Code. Incorporating the risk into regional or county hazard mitigation planning is an important aspect of this new statute. Seismic risk is addressed in Chapter 6—Water Shortage Contingency Plans.
- **Water Shortage Contingency Plan:** In 2018, the Legislature modified the UWMPA to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides a Supplier with an action plan for a drought or catastrophic water supply shortage. The WSCP is addressed in Chapter 6—Water Shortage Contingency Plans and the District's updated Drought Plan included as Appendix A.
- **Lay Description:** A synopsis of the fundamental determinations of the UWMP is a new statutory requirement in 2020. This section, included in the Executive Summary of the UWMP, is intended for new staff, new governing members, customers, and the media to ensure a consistent representation of the Supplier's detailed analysis.

1.3 Coordination and Outreach

As required by the UWMPA, the District has coordinated with nearby agencies while developing this UWMP to ensure consistency with other related service area planning efforts such as General Plans, Water Master Plans (WMP) and Water Supply Assessments (WSA). This requirement includes coordination with water suppliers that share a common water source, and relevant public agencies that may have land use or other regulatory relationships with the District. The District has prepared this 2020 UWMP in coordination with regional water purveyors and has appropriately notified and coordinated with other appropriate local government agencies as listed in Table 1-2.

The District is also a member of the Regional Water Authority (RWA), a joint powers authority, created by water purveyors in the Sacramento region to have a unified approach to regional water issues. The RWA provides members and associates significant regional coordination to enhance water management practices.

As stipulated in Water Code Section 10621(b), every urban water supplier shall seek active involvement from diverse elements of the community. EID sought public participation with workshops, hearings and

notices to members of the community. These coordination efforts and Statutory Requirements for Notice are also included in Table 1-2.

Table 1-2: Public and Agency Coordination

Coordinating Agencies	Sent Copy of Draft UWMP	Sent 60-Day Notice	Notice of Public Hearing
City of Folsom	X	X	X
El Dorado County (Planning Dept)	X	X	X
El Dorado Water Agency	X	X	X
El Dorado LAFCO		X	X
Sacramento County (Planning Dept)		X	X
City of Placerville	X	X	X
Regional Water Authority	X	X	X
Sacramento Water Forum		X	X
CABY IRMP		X	X
General Public			X

1.3.1 Water Supplier Information Exchange

Water Code Section 10631 requires wholesale and retail water agencies to provide each other with information regarding water supply and demand. The District has shared water supply interests with the El Dorado Water Agency (EDWA) and overall, with El Dorado County (County), as well as shared water interests with neighboring water agencies and relevant public agencies. The District has shared projected water demands with the City of Placerville (City), since the District provides wholesale water supply to this municipality.

1.3.2 Statutory Requirements for Notice

The District provided formal written notification to the County that the District's UWMP was being updated. In accordance with the UWMPA, this notification was provided at least 60 days prior to the public hearing of the plan as required by Section 10642 of the Water Code. Electronic copies of the final UWMP will be provided to the County and City no later than 30 days after its submission to DWR.

1.4 UWMP Adoption

The District held a workshop on June 14, 2021 to review the draft UWMP and a public hearing regarding its 2020 UWMP on June 28, 2021. Before the hearing, a draft was made available for public inspection at the District's office, and on its website. Pursuant to CWC Section 10642, general notice of the public hearing was provided prior to the hearing.

The District adopted this 2020 UWMP on June 28, 2021. A copy of the adopted 2020 UWMP will be submitted to DWR, provided to the City of Placerville, County, and the California State Library, and posted onto the District's website.

The District plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption. These include the following required DWR Excel workbooks:

- "FINAL Submittal 2020 UWMP Tables 04.02.2021.xls"
- "FINAL SBX7-7 Compliance Form 04.02.2021.xls"
- "FINAL Energy Use Tables 04.01.21.xls"

1.5 Document Organization

This UWMP is organized as follows:

- Chapter 1 provides an overview of the UWMP and describes statutory compliance elements.
- Chapter 2 provides a description of the District's service area, demographic characteristics and climate, and describes the future population the District anticipates needing to serve.
- Chapter 3 describes the District's current and future water supplies and the reliability of the availability of supplies through 2045.
- Chapter 4 details the customer uses, including the past and future estimated uses, and describes the District's past and on-going demand management measures.
- Chapter 5 presents the District's water system service reliability into the future, including an assessment of reliability if a drought occurred over the next five consecutive years.
- Chapter 6 is the District's water shortage contingency plan, incorporated as a chapter in this UWMP, but also available to be shared and utilized separate from the UWMP.

NOTE TO DWR:

El Dorado Irrigation District has written this Urban Water Management Plan (UWMP) primarily as a water resources planning tool to effectively manage water supply, reliability and demand. This UWMP also satisfies all the requirements of the Urban Water Management Planning Act (UWMPA).

The body of the document provides narratives, analysis and data that DWR requests in its 2020 UWMP Guidebook, including changes to the California Water Code since 2015. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2020 UWMP Guidebook.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2020 UWMP Guidebook. These tables are separately uploaded to DWR's web portal. This UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F in the 2020 UWMP Guidebook.

Chapter 2
Water Service and System Description

The District was formed in 1925 to provide water to El Dorado County and was created to secure water supplies, keep irrigation rates reasonable and increase the value of agricultural lands. The District serves approximately 220 square miles on the western slope of El Dorado County. The service area is generally bounded by Sacramento County to the west and the Pollock Pines/Sly Park area to the east and ranges from 500 feet to more than 4,000 feet in elevation. The area north of Coloma and Lotus and the community of Swansboro establish the northern-most part of the service area, while the communities of Pleasant Valley and South Shingle Springs establish the southern boundary. The District also has two satellite water systems, one each in the Strawberry and Outingdale communities.

The District is primarily located in two major watersheds, the South Fork American River and the North Fork of the Cosumnes River. Although a tunnel allows periodic controlled flow between the watersheds, the District is hydrologically split by the Placerville Ridge and Highway 50 between these two drainage watersheds. Although the rivers drain east to west, the minor streams mostly travel northwest toward the American River and southwest toward the Cosumnes River. The ridges generally trend in a west to east direction.

2.1 EID Water Service Areas

The District serves a combination of municipal and agricultural customers throughout the County in 16 unique service zones (see Figure 2-1). While residential customers are the primary water users, the number of connections, ratio of different user classifications, and water use characteristics vary across each service zone (more information regarding water use is provided in Chapter 4). The District serves these customers from an array of surface water supplies, diversion points, treatment plants and water infrastructure.

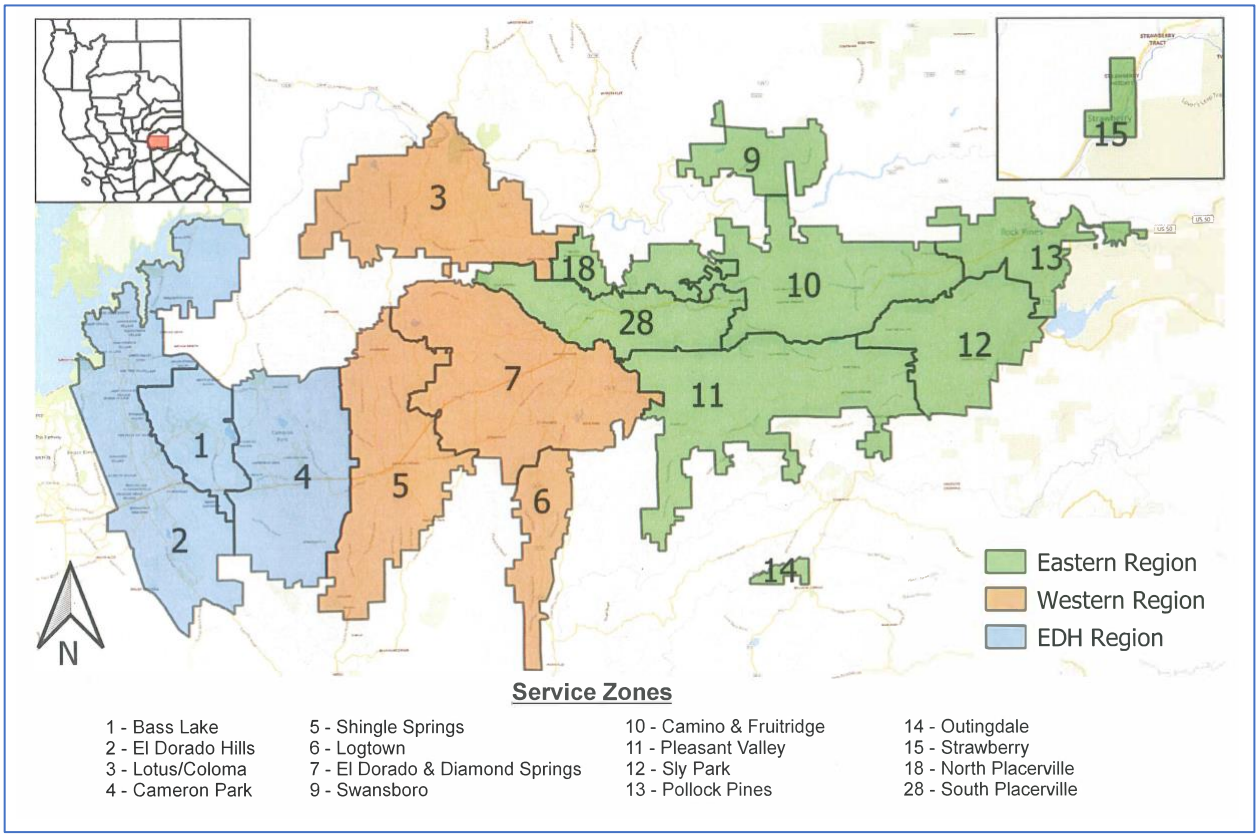
From a source of supply perspective, the District is divided into the El Dorado Hills supply area and the Western/Eastern supply area. From a water use characteristics and infrastructure perspective, the District have been divided into three water service regions:

- El Dorado Hills Region – includes Service Zones 1, 2 and 4 which represent the communities of Bass Lake, El Dorado Hills and Cameron Park.
- Western Region – includes Service Zones 3, 5, 6, and 7 which represent the communities of Lotus/Coloma, Shingle Springs, Logtown, and Diamond Springs/El Dorado.
- Eastern Region – includes Service Zones 9, 10, 11, 12, 13, 18, and 28 which represent the communities of Swansboro, Camino, Pleasant Valley, Sly Park, Pollock Pines, and Placerville, but

also includes the two small independent systems for Service Zones 14 and 15, which represent the communities of Outingdale and Strawberry, respectively.

For purposes of this 2020 UWMP, customer information is organized by these three distinct water service regions, which are collections of the 16 distinct service zones. Figure 2-1 presents the water service regions and associated service zones.

Figure 2-1: Service Zones and Water Service Regions



Traditionally, the El Dorado Hills (EDH) water service region includes only Service Zone 1 and 2. However, depending on future water supply initiatives, the District could have the need to install particular infrastructure to supply Zone 4 customers from Folsom Lake water supplies.[10] Therefore, the existing and future water use for Zone 4 customers is included with the Zone 1 and Zone 2 information to be consistent with previous master planning studies that combined Zone 1, 2 and 4 demands for planning purposes. This area is also unique in that it includes direct recycled water service to over 5,500 residential, commercial and recreational turf customers for outdoor landscape irrigation. Of these, over 5,300 residential recycled water customers – referred to as "Single Family Residential –

[10] EID has existing infrastructure that could be utilized to expand service into Zone 4, which entails an existing tank site in Zone 1 to be equipped with appropriate pumps to lift the water to similar tanks in Zone 4. Pipelines already exist between these locations.

Dual" have two meters for each residence: one to measure indoor potable use and one to measure outdoor recycled water irrigation use.

Altogether, the District provides potable water to approximately 42,350 residential, commercial, irrigation, industrial, institutional/governmental, and agricultural service connections throughout all the water service regions. Much of the development is single-family housing of varying density, and retail related commercial use. Table 2-1(a), Table 2-1(b) and Table 2-1(c) provide the historical and current number of service connections by customer class for each of the three primary service areas. It is notable that in all three regions, the 2019 single-family connection values were higher than 2020. The District recognizes this resulted from its determination of these values from its billing database and that 2019 in fact was lower than 2020 connections, as noticeable for other customer categories.

Table 2-1(a): EDH Region Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	15,072	15,343	15,736	15,965	16,865	16,683
Single Family Residential - Dual	4,274	4,466	4,901	5,091	5,350	5,244
Multi-Family Residential	267	271	271	272	272	277
Commercial / Industrial	502	504	469	506	512	525
Commercial Landscape	235	240	199	257	260	270
Recreational Turf Services	54	55	55	55	56	56
Small Farm Irrigation	56	49	39	41	40	45
Agricultural Metered Irrigation	3	3	3	3	3	3
Total	20,463	20,931	21,673	22,190	23,358	23,103

Table 2-1(b): Western Region Customer Water Service Connections

Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	6,372	6,507	6,506	6,613	6,855	6,628
Multi-Family Residential	325	340	340	354	361	363
Commercial / Industrial	463	467	466	473	478	488
Commercial Landscape	80	84	84	90	90	91
Recreational Turf Services	31	32	31	32	31	30
Small Farm Irrigation	416	295	293	255	248	252
Agricultural Metered Irrigation	63	62	62	60	61	59
Total	7,750	7,787	7,782	7,877	8,124	7,911

Table 2-1(c): Eastern Region Customer Water Service Connections

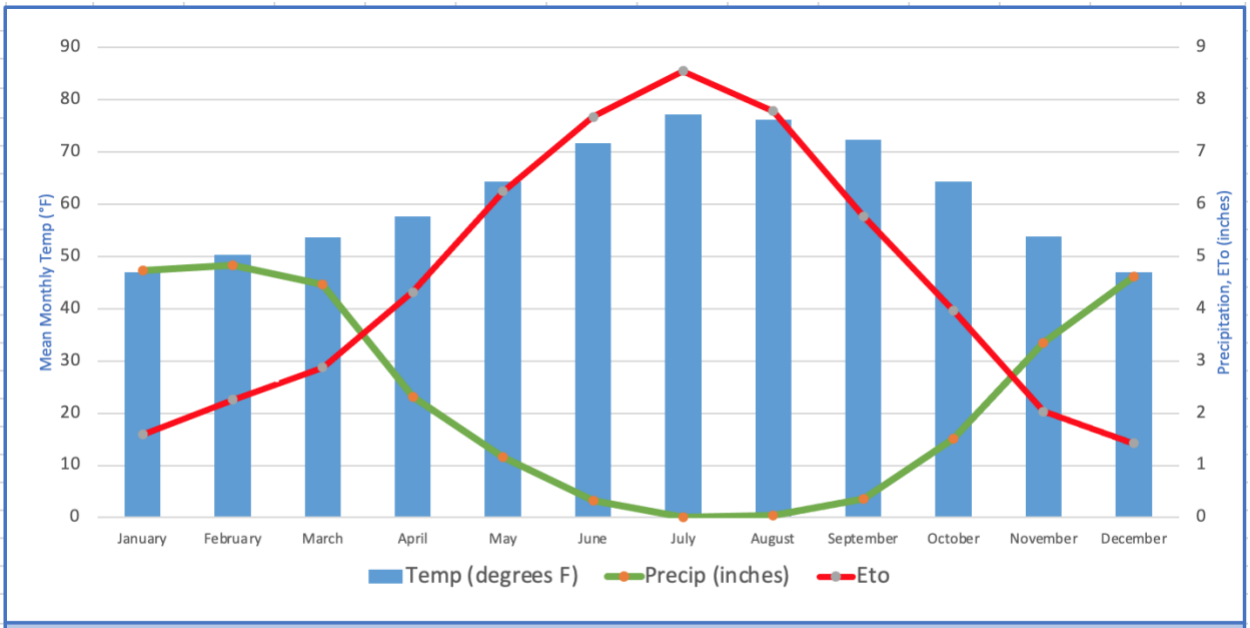
Customer Class	2015	2016	2017	2018	2019	2020
Single Family Residential	8,693	8,733	8,733	8,895	9,279	8,944
Multi-Family Residential	307	313	313	321	328	328
Commercial / Industrial	281	287	287	286	289	239
Commercial Landscape	31	34	34	34	35	27
Recreational Turf Services	19	18	18	17	17	18
Small Farm Irrigation	173	153	153	138	132	135
Agricultural Metered Irrigation	144	144	144	152	154	155
Total	9,648	9,682	9,682	9,843	10,234	9,846

2.2 Service Area Climate

The District service area is located on the western slope of the Sierra Nevada and covers a geographic region with climate variation due to changes in elevation, topography, and associated weather characteristics. For the purpose of climate description, the District can be described by two varying climate areas: The Lower region and the Upper region. Figures 2-2 through Figure 2-5 present climate data representative of these different locations within the service area.

The Lower region is located just above the California Central Valley floor, from El Dorado Hills to Placerville, ranging in elevation from about 500 to 3,000 feet. This zone has a climate typical of California's central valley and Sierra foothills with cool, wet winters and hot, dry summers. Figure 2-2 summarizes climate values for this zone from the CIMIS station in Diamond Springs located in the southern part of the service area and lower zone, and the PRISM Climate Group's data from the community of El Dorado Hills which is the largest community located within this service area zone.

Figure 2-2: Average Climate Conditions[11] - Lower Region



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp	46.9	50.4	53.7	57.7	64.4	71.7	77.2	76.1	72.4	64.4	53.8	46.9
Precip	4.73	4.83	4.46	2.31	1.15	0.32	0.00	0.05	0.35	1.50	3.35	4.61
ETo	1.59	2.26	2.88	4.32	6.25	7.68	8.55	7.78	5.77	3.96	2.03	1.42

Historical averages show January and February as the coolest and wettest months, and July as the hottest and driest. The wet season is from October to April with a 30-year annual average rainfall of 27.68 inches. The annual mean temperature is 61.3 degrees, but the summer months can regularly see maximum highs in the mid-high 90s, and average winter lows hover down in the 30s and 40s. Snow is rare but cold fronts can bring freezing temperatures with trace amounts of snow and ice. Autumn starts warm and dry and becomes cooler and wetter later into the season. The last rains in spring are generally in late April or early May. Actual annual rainfall totals deviate quite significantly from the 30-year average as illustrated in Figure 2-3. In most years, precipitation totals fall below the mean.

The Upper region is at a higher elevation, representing Camino, Pollock Pines and Sly Park area, generally between 3,000 to 4,000 feet and is characterized by a Sierra forest climate with warm summers, cold wet winters, and occasional snow. Figure 2-4 summarizes climate values from the CIMIS Station in Camino and the PRISM Climate Group's data from the Camino area (elevation 3,100 feet) just outside of the community of Placerville. Historical averages show January as the coolest and wettest month, and July as the hottest and driest. The wet season is from October to April with a 30-year annual average rainfall of 39.54 inches.

[11] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.6595 Lon: -121.0763 Elev: 774ft; ETo data is from CIMIS Diamond Springs - Station 228 from Jan 2011 – Dec 2020.

Figure 2-3: Annual Precipitation Variability - Lower Region (1981-2019)

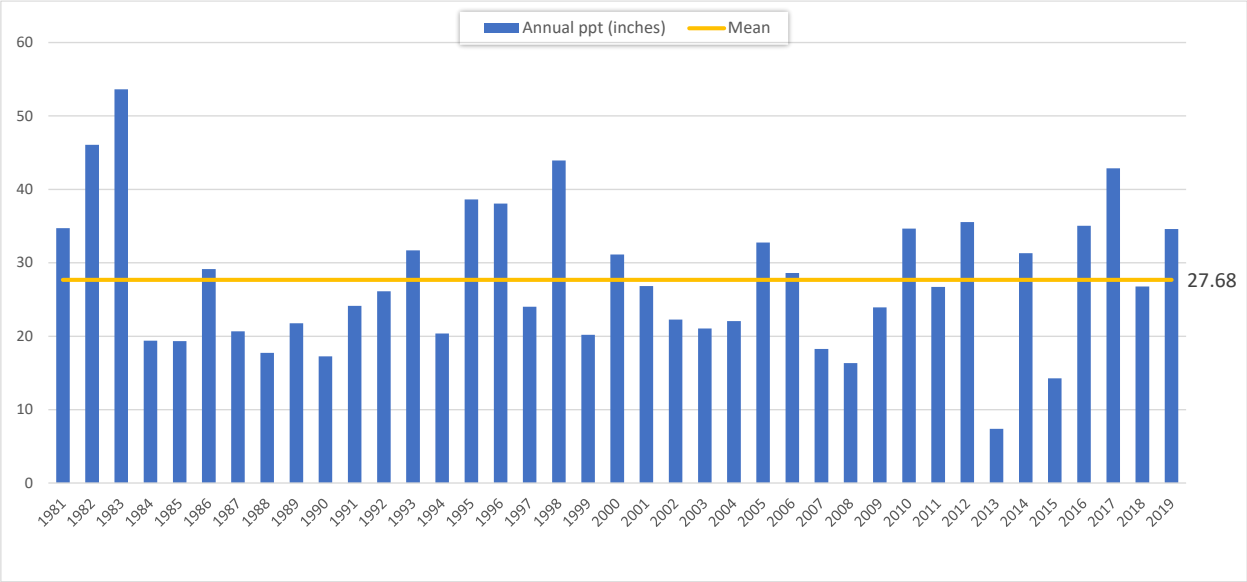
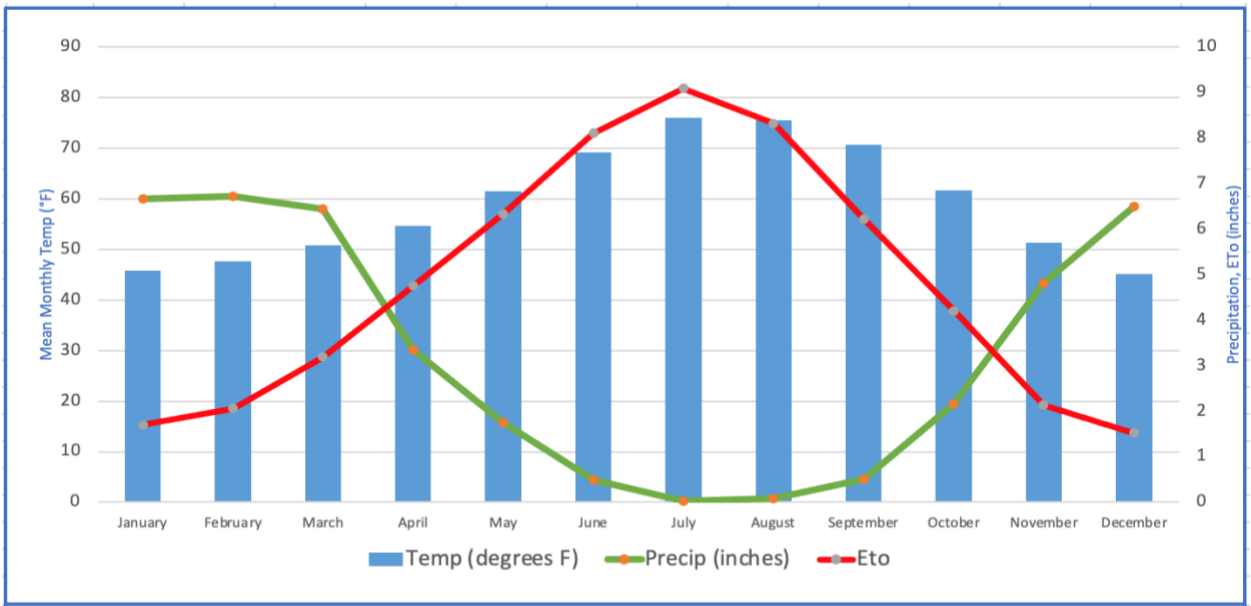


Figure 2-4: Average Climate Conditions[12] - Upper Region



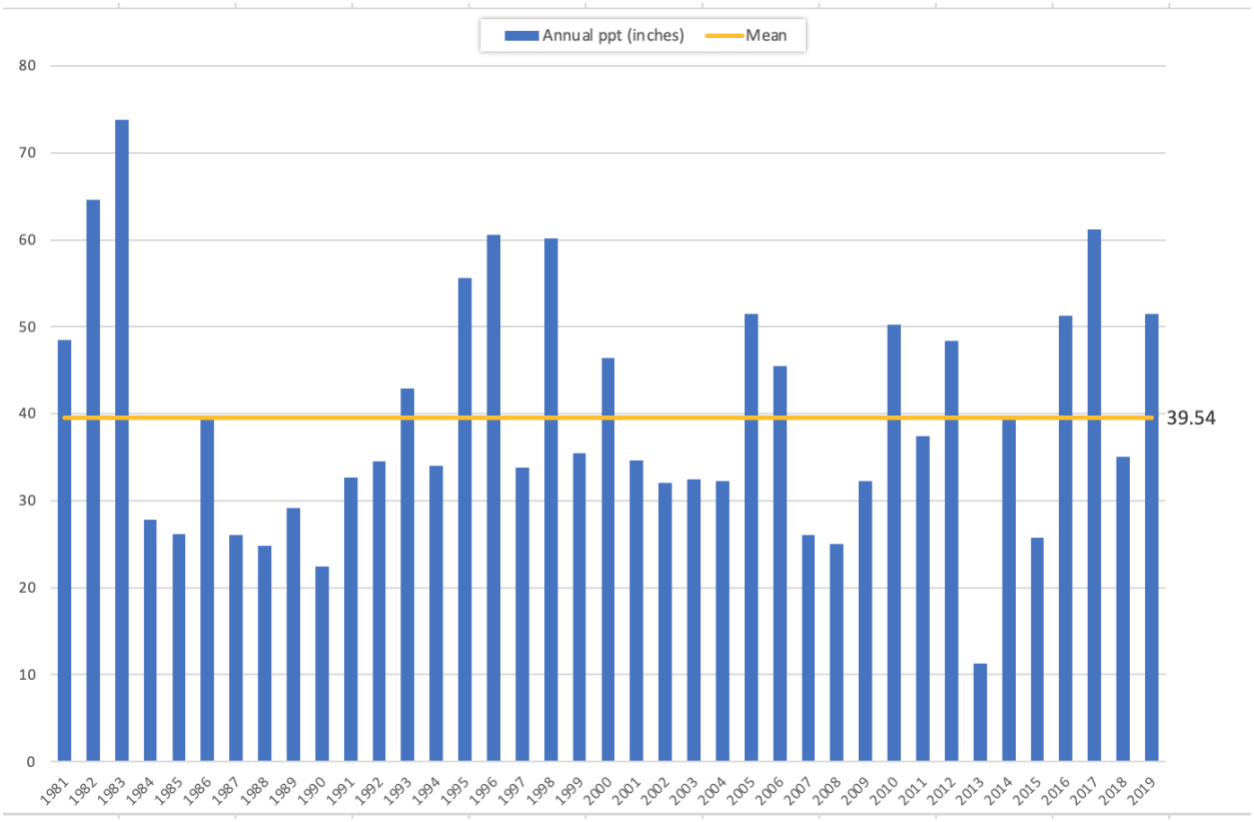
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp	45.8	47.7	50.8	54.6	61.5	69.3	76.1	75.5	70.7	61.8	51.3	45.2
Precip	6.67	6.73	6.45	3.36	1.75	0.50	0.02	0.08	0.50	2.16	4.82	6.51
ETo	1.70	2.07	3.20	4.76	6.34	8.11	9.09	8.33	6.23	4.20	2.14	1.52

[12] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.7150 Lon: -120.7852 Elev: 1959ft; ETo data is from CIMIS Camino - Station 13 from Jan 2010 – Dec 2020.

The annual mean temperature is 59.2 degrees, and the summer months regularly see average highs in the 80s and average winter lows hover down in the 30s and 40s with freezing temperatures common.

Annual precipitation totals in the upper zone of the District are significantly higher than the lower zone as shown in Figure 2-4. Actual annual rainfall totals deviate quite significantly from the 30-year average as illustrated in Figure 2-5. In most years, precipitation totals fall below the mean.

Figure 2-5: Annual Precipitation Variability – Upper Region (1981-2019)



2.2.1 Climate Change

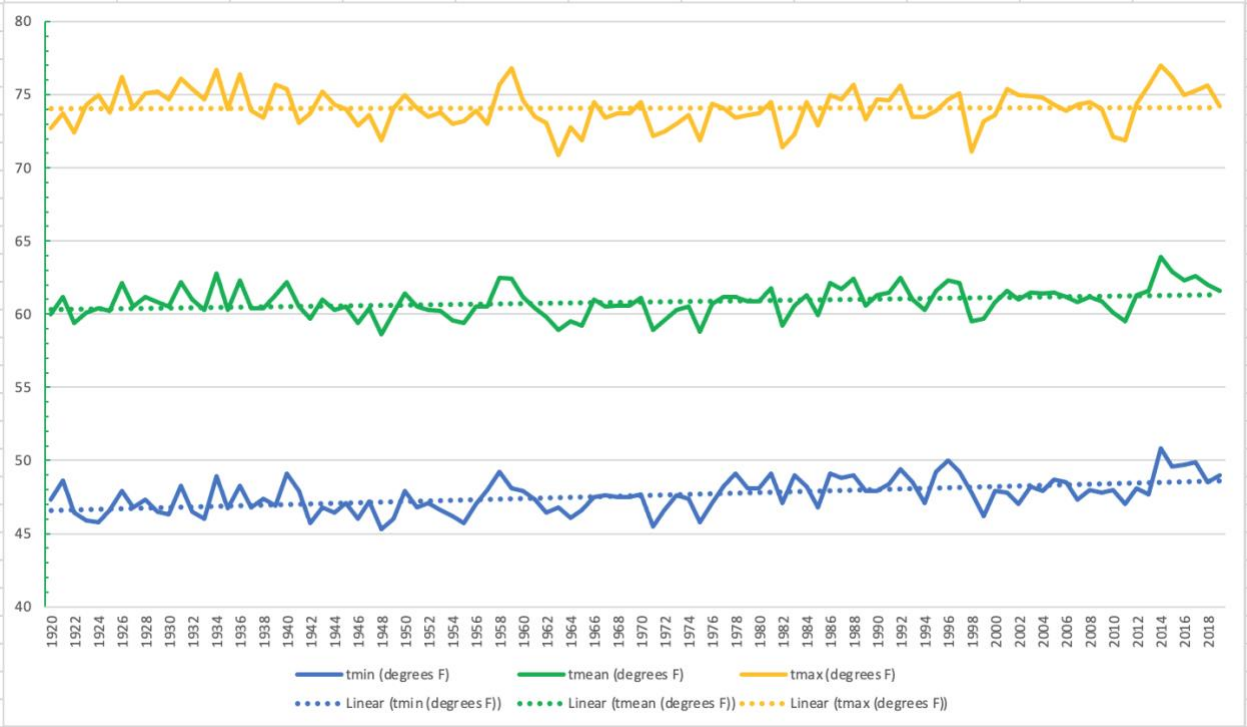
While the California Water Code does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply—both in a historical and projected context.

Climate characteristics within the District's service area are highly variable with respect to precipitation and temperature. Consecutive dry years can make the area susceptible to drought when a deficiency in precipitation and snowpack materializes. The District's water supply comes from direct diversions and storage from the South Fork American River and its tributaries, and storage from Jenkinson Lake.

The Regional Water Authority (RWA), of which the District is a member, partnered with other local water purveyors and the U.S. Department of the Interior, Bureau of Reclamation on the American River

Basin Study (ARBS) with the purpose of developing climate change adaptation strategies specific to the Basin.[13] Much of the District is located in the ARBS study area. The District service area has experienced a general warming trend over the last 100 years, as shown by the trendlines in Figure 2-6 from the El Dorado Hills community in the lower zone of the District.

Figure 2-6: El Dorado Hills Historical Annual Temperature (1920-2019)[14]



Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century, and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum daily temperatures projected to increase as much as 7.3°F during the summer months.

Climate change is generally forecast to bring higher temperatures, more variability in precipitation and more frequent and prolonged droughts. Although there is a lack of a clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation.

[13] The full findings and Final ARBS study is expected to be complete in 2021 and can be found at www.pcwa.net/planning/arbs.

[14] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.6595 Lon: -121.0763 Elev: 774ft

Water supplies in the District region are inextricably tied to the Sierra snowpack runoff, and the ARBS indicates that the Snow Water Equivalent (SWE) is projected to decrease significantly due to higher average surface temperatures and precipitation variability. SWE is a key indicator of water supplies for the District, where runoff is largely influenced by snowmelt. The increasing variability in precipitation combined with increases in surface air temperatures are key drivers in projections of a reduction in annual average SWE. Average SWE is forecasted to decrease by 50-85% across all climate scenarios and future time periods. In addition, areas that accumulate snow above Folsom Reservoir are also projected to have up to a 12-inch decrease in maximum snowpack by end of the century.[15] This will place strain on summer and fall water supplies in the District service area and throughout the state due to earlier runoff. Peak runoff is expected to shift by more than a month earlier by mid-to-late century. Increased evapotranspiration would also accompany the intensification of hotter extreme temperatures.

While climate change does have an impact on the basin, impacts are largely seen closer to the end of the century, and not within the timeline of this UWMP. Through proactive adaptation management actions, the ARBS highlights ways for the region to alleviate climate change impacts by the end of century; therefore, in consideration of the timeline of this UWMP, the District does not reflect any climate change impacts in supply and demand scenarios within this UWMP.

2.3 Current and Projected Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the District's economic, social, and demographic trends give valuable insight to water management and planning. This section of the 2020 UWMP addresses these factors to provide a supportable basis for forecasting future water use in Chapter 4.

2.3.1 Current Population and Historic Trends

The population served by the District includes a mix of users and user classes, ranging from residential and commercial, to agricultural (receiving both potable and raw water supplies) and institutional customers (for instance schools, governmental facilities and fire stations). Population estimates were derived based upon the residential connection data shown in Tables 2-1(a), 2-1(b) and 2-1(c) combined with persons-per-household values obtained from U.S. Census Bureau[16] and California Department of Finance (DoF)[17] data. The historic and current population in the District's service regions are presented in Table 2-2. The estimates do not include the population of Placerville, since the majority of the City's population is not served water directly by the District. However, the District does provide direct water service to some customers within the City boundary, therefore a small amount of the area within the

[15] American River Basin Study.

[16] https://www.census.gov/quickfacts/fact/table/US/PST045219.

[17] California Department of Finance, E-5 City/County Population and Housing Estimates. https://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-5/

legal boundaries of the City of Placerville is included in the population calculations. Overall, the recent annual growth rate has averaged about 1.5% per year between 2015 and 2020.

Table 2-2: Estimated Population – Historical and Current[18]

Region	Occupancy Per Unit	2015	2016	2017	2018	2019	2020
EDH	2.95	67,729	69,101	71,555	72,779	76,199	75,349
Western	2.95	24,326	25,087	25,096	25,459	26,084	25,503
Eastern	2.58	27,449	27,665	27,665	28,078	29,069	28,205
Total Population		119,503	121,853	124,316	126,316	131,351	129,056

2.3.2 Current and Projected Land Use

As described previously, the District provides water supply for three general regions: EDH, Western and Eastern. Expected housing growth in these regions was evaluated and documented in a study commissioned by El Dorado County in 2020 to update housing and job projections to aid with various transportation studies and General Plan refinements (hereafter the "BAE Study").[19] Using information in this study, along with DoF projections for County-wide populations, estimates of future land use and associated customer types were developed for each region. This information can also be used to estimate the future population that will be served by the District. The following subsections detail the land-use growth projections.

Growth in the EDH Region

Growth in this region was recently projected to build-out conditions in conjunction with the District's activities to extend provisions related to its Water Right Permit 21112. This effort developed growth projections using two categories:

1. Facility Improvement Letters (FILs) – this designation reflects all development projects known to the District at a particular point in time that have formally submitted an initial request for service to EID. A full list of current FILs is available from the District.

2. Future Beyond FILs – this designation reflects additional development beyond the current FILs on existing parcels within Zone 1, 2 and 4 that are greater than 10 acres and are not otherwise designated for any other use. This category is labeled as "Vacant Parcels over 10 acres" in Figure 2-7.

The analysis projected total Equivalent Dwelling Units (EDU) expected within the EDH region, where the EDU value represents the number of residential "dwelling units" that each project would reflect

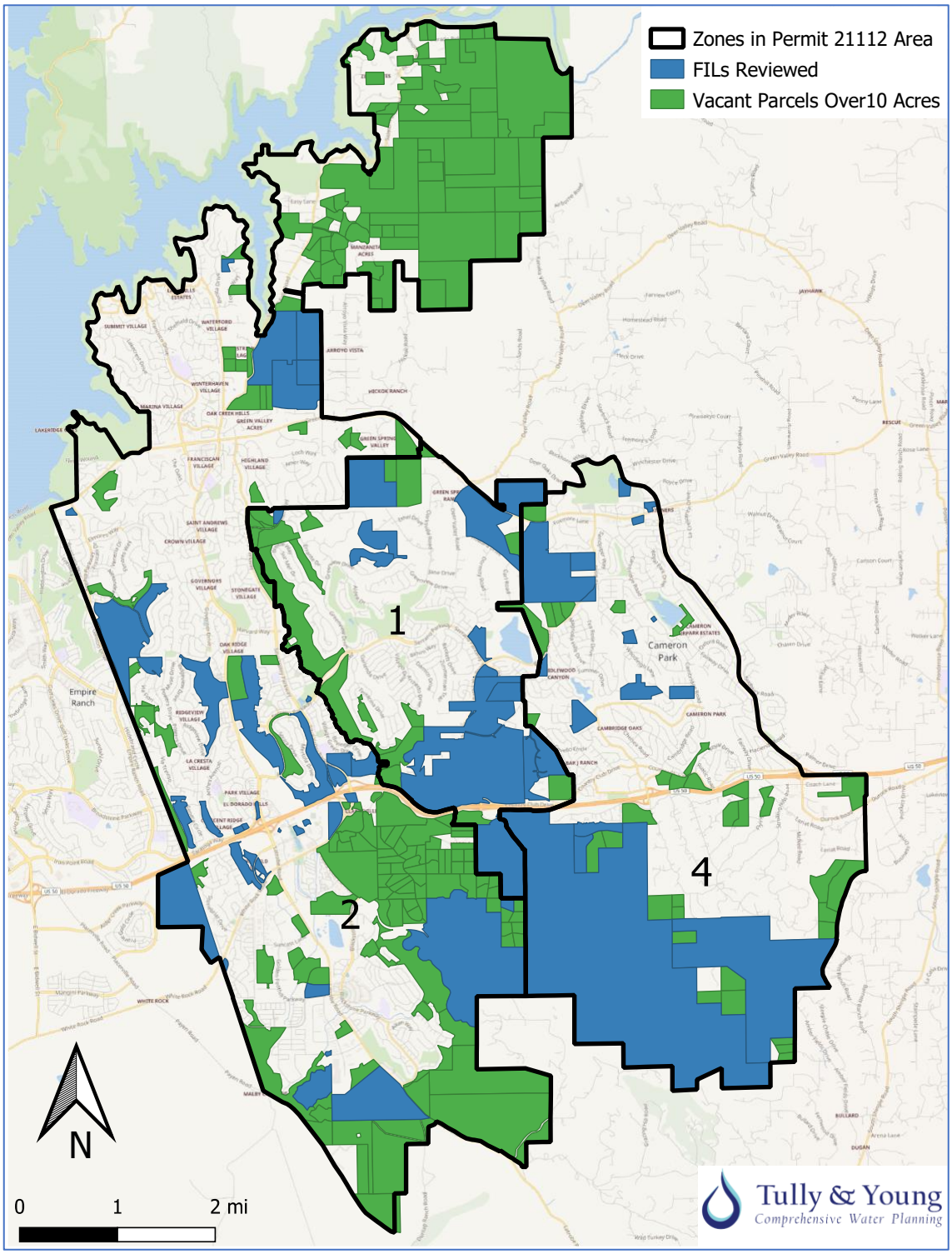
[18] As noted for Tables 2-1(a), 2-1(b) and 2-1(c), the 2019 connection data reflects reported information but the District recognizes that actual 2019 connections for single-family residences fall between 2018 and 2020 connection data. As a result, the 2019 population, which is based upon connection data, is also overestimating actual population. The District chose to be consistent with the publicly reported connection information and this consistency affects the 2019 population.

[19] Memorandum: *El Dorado Countywide Housing and Employment Projections*, 2018-2040, March 17, 2020, from BAE Urban Economics to Natalie Porter, El Dorado County.

regardless of whether the project includes residential or non-residential land uses. The analysis determined over 25,000 EDUs could ultimately occur at build-out within this demand region – about 45% represented in the existing FILs and the remainder projected as part of the "Beyond FILs". This EDU projection was compared to projected housing demand expected by 2040 as documented in the BAE Study to estimate the potential growth rate and determine if build-out would occur beyond this 2020 UWMP's planning horizon of 2045.

According to the BAE Study, the EDH region is expected to add nearly 6,000 new residential units by 2040, at an annual growth rate of just over 1%. Extending this growth rate to 2045 would add about 1,500 additional housing units, resulting in a conservative assumption of about 7,050 new residential units in the EDH region by 2045. These units are expected to be split among single-family and multi-family residences consistent with the region's existing ratio. The resulting expected new housing in the EDH region is presented in Table 2-3.

Figure 2-7: EDH Region Expected Growth Areas[20]



[20] This figure was prepared by the District for estimating potential customers that could be served by water derived under the District's Water Right Permit 21112, further detailed in Chapter 3.

Table 2-3: Expected New Residential Connections in EDH Region per BAE Study

		2025	2030	2035	2040	2045
New Residential Units		1,285	2,683	4,068	5,506	7,054
% Single-family	86%	1,103	2,303	3,492	4,727	6,056
% Multi-family	14%	182	380	576	779	998

Along with the projected residential units in Table 2-3 would be non-residential connections associated with jobs and services interconnected with the additional housing. Per Table 2-1(a), the existing residential connections reflect nearly 95% of the total connections in EDH region. Therefore, conservatively, about 375 additional non-residential connections could be assumed to support the nearly 7,050 new residential units, mostly within the commercial and landscape classifications. The current small farm and metered agricultural connections shown in Table 2-1(a) are not expected to increase in the EDH region. Also, because the existing multi-family connection information in Table 2-1(a) represents multiple residences for each connection, the new multi-family units presented in Table 2-3 need to be adjusted to reflect a "connection" to stay consistent with the District's representation of this classification. For purposes of estimating the number of residences per connection, the existing data for 2020 reported by the District was evaluated. For the EDH region, the District estimates each multi-family connection consists of 10 to 15 units. For estimating purposes, one connection is assumed for every 12 multi-family units shown in Table 2-3.

Table 2-4 presents the expected total connections by classification, combining the new residential and non-residential connections with the existing connections. This connection forecast will be used to estimate future water use, as detailed in Chapter 4.

Table 2-4: Expected Total Connections in EDH Region

Customer Class	2025	2030	2035	2040	2045
Single Family Residential	17,786	20,089	21,278	22,513	23,842
Single Family Residential - Dual	5,244	5,244	5,244	5,244	5,244
Multi-Family Residential	292	324	340	357	375
Commercial / Industrial	575	675	725	775	825
Commercial Landscape	277	291	298	305	312
Recreational Turf Services	59	65	68	71	74
Small Farm Irrigation	45	45	45	45	45
Agricultural Metered Irrigation	3	3	3	3	3
Total Connections	24,281	26,736	28,002	29,313	30,720

Several development projects, many on the District's existing FIL list, have previously been approved by the District or are currently anticipated to be brought to the attention of the District that would contribute to the additional EDUs expected by 2045 as summarized in Table 2-3. Several of these

projects are subject to California Water Code Section 10910.[21] The larger District-known projects are listed in Table 2-5. Because the timing and configuration of various previously approved and proposed development is dynamic and reacts to market conditions and other growth factors, the anticipated EDUs for each listed project are not presumed to be the EDUs that actually occur within the 2045 planning horizon. However, because the water use forecast detailed in Chapter 4 will be based upon the addition of more EDUs than represented by these proposed developments (as recognized in Table 2-3), it is acknowledged by the District that the future water needs of these developments, should they occur within the planning horizon, have been included in the representations of water service reliability detailed in Chapter 5.

Table 2-5: Summary of Known Large Development Projects

Existing or Planned Project	Estimated EDUs[22]
Central El Dorado	1,000
Creekside Village	926
Lime Rock	800
Marble Valley	3,235
Mill Creek	Not defined
Generations	Not defined

Growth in Western and Eastern Regions

Growth in the Western and Eastern regions is also expected to occur over the UWMP planning horizon. Using the BAE Study's projected housing needs and similar approaches described for the EDH region, the Western and Eastern regions are also expected to see growth, with the Western region adding about 900 new housing units and the Eastern region adding over 3,100 new housing units by 2045. Annual growth rates in these regions are expected to be about 0.5%, less than half the rate in the EDH region. The ratios of single-family to multi-family residences is derived from District-reported information associated with Tables 2-1(b) and 2-1(c). These ratios were used to estimate the expected number of residences in each classification. Actual ratios will depend on specific projects, housing market conditions, and other factors.

Table 2-6: Expected New Residential Connections in Western Region per BAE Study

		2025	2030	2035	2040	2045
New Residential Units		218	381	549	724	899
% Single-family	77%	167	292	421	555	689
% Multi-family	23%	51	89	128	169	210

[21] California Water Code Section 10910, commonly referred to as SB610, requires water supply assessments for large developments that meet defined threshold criteria. Most developments with greater than 500 residential units are subject to this requirement.

[22] The estimated EDUs are from an existing District list of Facility Improvement Letters as of December 2020. Other projects identified in the table do not have a FIL with the District but are recognized projects that have been brought to the District's attention.

Table 2-7: Expected New Residential Connections in Eastern Region per BAE Study

		2025	2030	2035	2040	2045
New Residential Units		753	1,316	1,900	2,505	3,110
% Single-family	82%	616	1,077	1,554	2,049	2,545
% Multi-family	18%	137	239	346	456	566

Along with the projected residential units in Table 2-6 and Table 2-7 would be non-residential connections associated with jobs and services interconnected with the additional housing in these regions. Per Table 2-1(b) and Table 2-1(c), the existing residential connections reflect about 88% and 94% of the total connections in the Western and Eastern regions, respectively. Therefore, conservatively, about 110 and 160 additional connections, for the Western and Eastern regions respectively, could be assumed to support the new residential units, mostly within the commercial and landscape classifications.

The current small farm and metered agricultural connections shown in Table 2-1(b) and Table 2-1(c) are expected to continue to increase moderately based on historical data. Also, because the existing multi-family connection information in Table 2-1(b) and Table 2-1(c) represent multiple residences for each connection, the new multi-family units presented in Table 2-6 and Table 2-7 need to be adjusted to reflect a "connection" to stay consistent with the District's representation of this classification. For purposes of estimating the number of residences per connections, the existing data for 2020 reported by the District was evaluated. For the Western and Eastern regions, the District assumes one connection for every 5 new multi-family units.

Table 2-8 and Table 2-9 present the expected total connections by classification for the Western and Eastern regions, combining the new residential and non-residential connections with the existing connections. This forecast will be used to estimate future water use, as detailed in Chapter 4.

Table 2-8: Expected Total Connections in Western Region

Customer Class	2025	2030	2035	2040	2045
Single Family Residential	6,795	7,087	7,216	7,350	7,485
Multi-Family Residential	373	391	399	407	415
Commercial / Industrial	503	533	548	563	578
Commercial Landscape	93	97	99	101	103
Recreational Turf Services	31	33	34	35	36
Small Farm Irrigation	260	276	284	293	301
Agricultural Metered Irrigation	61	65	67	68	70
Total Connections	8,116	8,482	8,647	8,817	8,988

Table 2-9: Expected Total Connections in Eastern Region

Customer Class	2025	2030	2035	2040	2045
Single Family Residential	9,560	10,637	11,115	11,610	12,105
Multi-Family Residential	355	403	424	446	469
Commercial / Industrial	258	296	315	334	353
Commercial Landscape	31	39	43	47	51
Recreational Turf Services	19	21	22	23	24
Small Farm Irrigation	140	149	154	158	163
Agricultural Metered Irrigation	160	171	176	182	187
Total Connections	10,523	11,716	12,249	12,800	13,351

Growth Summary

Combining the projections for all three regions results in a representation of the District's overall expected future connections by land classification. Table 2-10 provides this summary. One additional classification is included on this table to reflect the District's unique potable service to a small number of ditch system customers.

Table 2-10: Expected Total Connections in District

Customer Class	2025	2030	2035	2040	2045
Single Family Residential	34,141	37,813	39,609	41,473	43,431
Single Family Residential - Dual	5,244	5,244	5,244	5,244	5,244
Multi-Family Residential	1,021	1,118	1,163	1,211	1,259
Commercial / Industrial	1,336	1,504	1,588	1,672	1,756
Commercial Landscape	401	427	440	453	466
Recreational Turf Services	109	119	124	129	134
Ditch Systems (potable)	14	14	14	14	14
Small Farm Irrigation	445	470	483	496	509
Agricultural Metered Irrigation	224	239	246	253	260
Total Connections	42,935	46,948	48,911	50,944	53,073

2.3.3 Economic Trends & Other Social and Demographic Factors

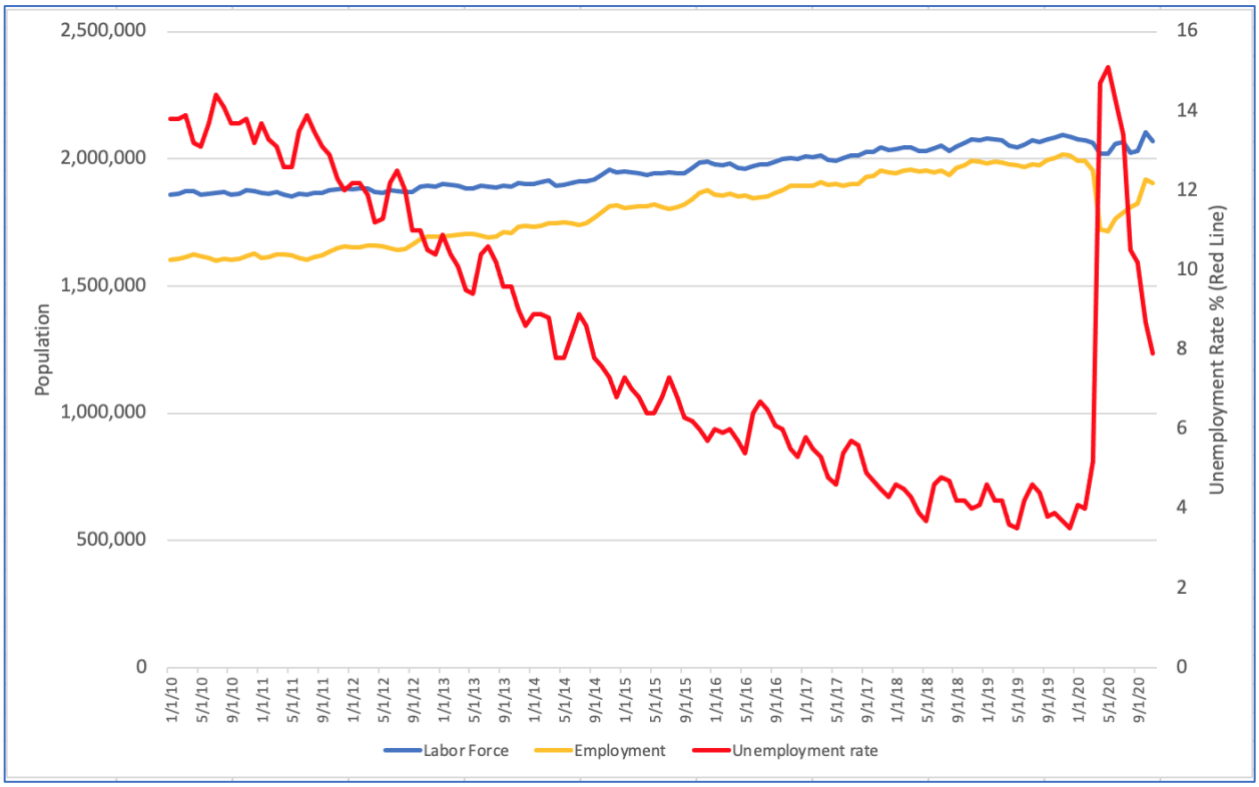
El Dorado County is often identified by the foothills and western slope of the Sierra Nevada Mountains, open space, and recreational opportunities. Much of the District service area is still undeveloped and the economy is dependent on recreation and tourism, along with agriculture, retail and commercial services. The Eldorado National Forest is one of the most heavily used forests areas in the nation, and Highway 50 serves as the main transportation corridor from the Bay Area and greater Sacramento Area to Apple Hill in Camino, Lake Tahoe and other mountain destinations. The County's economic history is tied to the discovery of gold in the mid-1850s. With that, settlement began along the Pony Express

route, much of which is now Highway 50. Agriculture is still an important part of the economy in the county, but other key industries, including a robust housing market, fuel its growth.

Much of the land use in the District's service area is dedicated to residential, commercial, retail, light industrial, and agriculture. The residential community of El Dorado Hills and the City of Placerville are the largest urban centers in the area. Employment sectors include healthcare, education, government and retail. The residential population of the District also has a significant number of commuters that travel outside of the area to the greater Sacramento region for work. Additionally, small businesses and other work place alternatives including home occupations, telecommuting businesses, and technology transfer based industries are seen as economic development priorities for the region.[23] The District's service area is continuing to grow and therefore could see significant residential and commercial growth during the 2020 UWMP planning horizon through 2045.

The coronavirus pandemic crippled the national and global economy in 2020, and the greater Sacramento region was no exception. In Sacramento County, where many residents in the District service area work, the unemployment rate spiked to almost 14% in May 2020. Since then, Sacramento County has regained some of the jobs and the reported unemployment rate has declined sharply but there remains a level of uncertainty with the unknown pace of economic recovery due to the pandemic (see Figure 2-8).

Figure 2-8: Sacramento County Employment Data



[23] El Dorado County General Plan, Amended December 2019. https://www.edcgov.us/government/planning/adoptedgeneralplan/documents/10_econdev.pdf

According to the 2010 US Census, the ethnic makeup of the census designated places within the District service area is 86% White, 12% Hispanic/Latino, 3.5% Asian, 1% African American, and 4% other races or mixed race. The median income in the District's service area is $83,377, largely bolstered by the relatively high median income of the El Dorado Hills community.[24]

Expected Population Based Upon Land-Use Planning

To forecast projected service area population as accurately as possible requires consideration of the past growth rate, local economic predictions, and current and projected land uses. Importantly, one of the recent statutory updates to the UWMPA states urban water suppliers "shall coordinate with local or regional land use authorities"[25] regarding land uses that may affect water management planning.

The District's growth prospects are predominantly defined by the County's General Plan, with variances to that plan from periodic general plan amendments and specific development plans, several of which have been brought before the District requesting water supply assessments.[26] Since boundaries used for various population projections made by the Department of Finance do not correlate to the District's service areas, the projected population for this 2020 UWMP is estimated using the projections of total connections shown in Table 2-4, Table 2-8 and Table 2-9 multiplied by the persons-per-household occupancy rates for each region as presented in Table 2-2. The resulting future population is provided in Table 2-11.

Table 2-11: Forecast Future Population in District Service Area

Region	Occupancy per Unit	Current	2025	2030	2035	2040	2045
EDH	2.95	75,349	79,100	83,300	87,300	91,600	96,200
Western	2.95	25,503	26,100	26,600	27,100	27,600	28,200
Eastern	2.58	28,205	28,800	29,200	29,600	30,100	30,500
Total Population		129,056	134,000	139,100	144,000	149,300	154,900

2.4 Delivery System Details

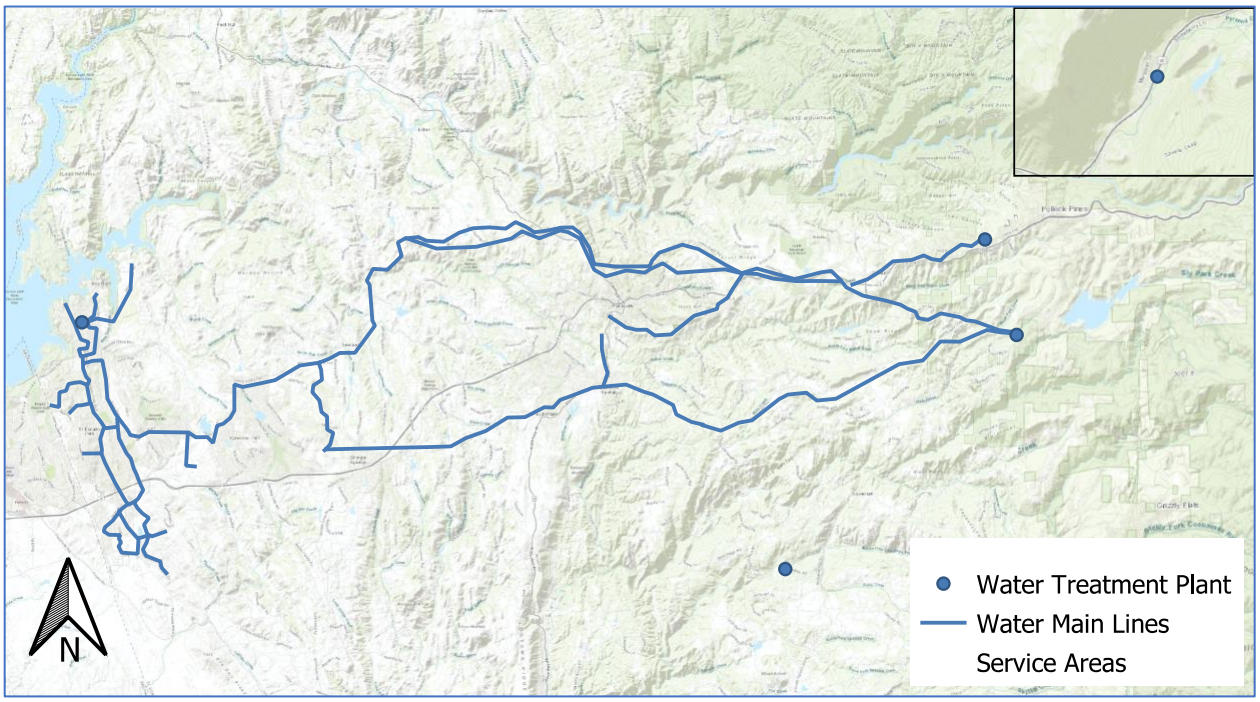
The District serves customers in regional areas through an array of small- and large-scale potable infrastructure systems, as well as a recycled water system that serves EDH. Further discussion of these systems and the water supply used within each is included in Chapter 3, with current and future customer water use described in detail in Chapter 4.

[24] American Community Survey - Income, Poverty, Employment 2019.
[25] CA Water Code Section 10631(a).
[26] Water supply assessments are prepared by a water purveyor pursuant to California Water Code Section 10910 et seq.

2.4.1 Potable System

The District's primary function is delivering potable water to its customers in the previously described service areas. The District's water supply system draws its water from Jenkinson Lake, the upper South Fork American River, and Folsom Reservoir (see Chapter 3). These sources feed its three primary potable water treatment plants and related delivery systems. Combined, the potable water systems extend over 1,200 miles of pipelines, 27 miles of ditches, five treatment plants, 34 storage facilities with a combined capacity of over 100 million gallons, and 38 pump stations. Figure 2-9 indicates the major potable system facilities and routing along with all diversion points associated with the District's water rights.[27] The District's 2013 Integrated Water Resources Master Plan has further detail about the specific infrastructure elements throughout the District's service area.[28]

Figure 2-9: Main Potable Water System



2.4.2 Non-potable System

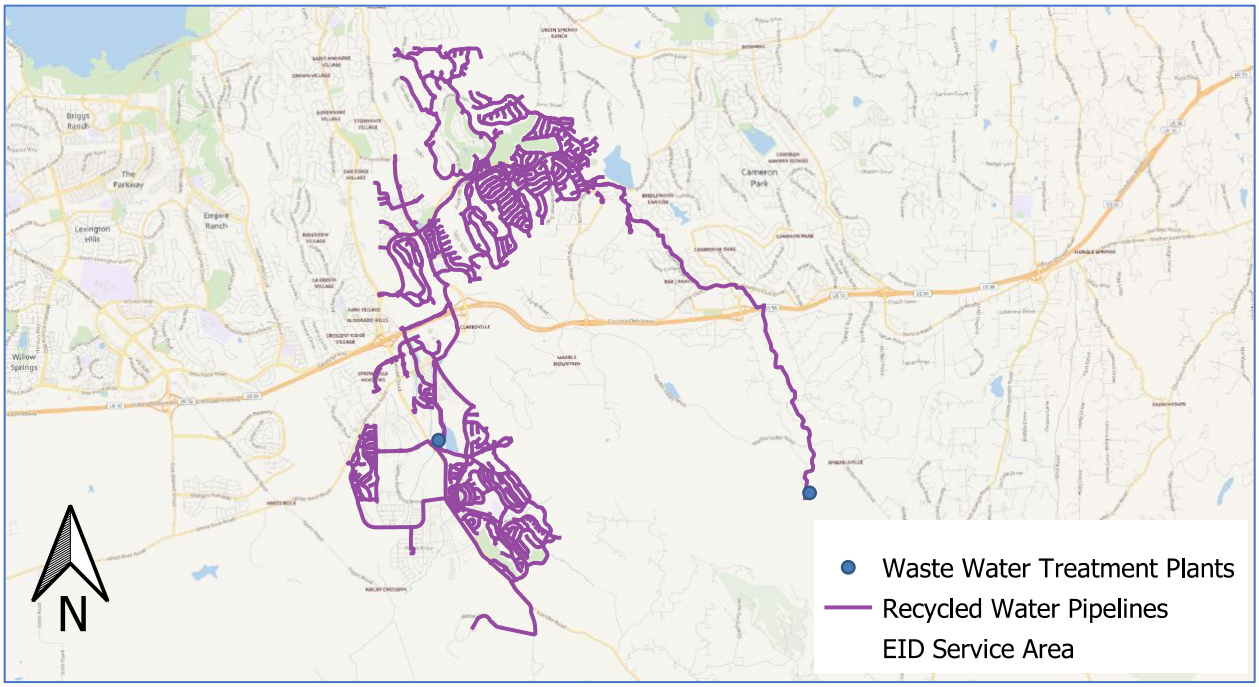
In addition to the potable water system, the District operates a recycled water system that provides tertiary treated recycled water from the Deer Creek and El Dorado Hills wastewater treatment plants to serve portions of the EDH service area that are plumbed for recycled water for irrigation use. The water from both plants meets California State Water Resources Control Board Division of Drinking Water Title 22 requirements.

[27] The SWRCB maintains a list of all approved points of diversion associated with any water right. Although the District has many points of diversion, it primarily diverts water for potable uses at Kyburz, Jenkinson Lake, and Folsom Lake.

[28] The Integrated Water Resources Master Plan is available here: https://www.eid.org/about-us/document-library

The recycled water produced at El Dorado Hills has been used for industrial purposes and golf course irrigation since 1979. Similarly, since the mid-1990's Deer Creek recycled water has been used for road median irrigation in addition to industrial purposes and golf course irrigation. In 1997, the distribution systems of both plants were connected and operated as one recycled water system. In the late 1990's/early 2000's, the District expanded the available use of recycled water to include commercial and residential irrigation use. Figure 2-10 illustrates the boundaries and infrastructure for the recycled water system. The recycled water system is nearing buildout, and the District does not anticipate significant growth in additional connections. Further details on the recycled water system can also be found in the 2013 Integrated Water Resource Master Plan and the Wastewater Master Plan. Recycled water is distributed through a separate set of pipelines and is more fully described in Chapter 3.

Figure 2-10: Recycled Water System



Presently, the peak seasonal demand for recycled water exceeds the quantity of produced recycled water. This has required the District's recycled water supply to be supplemented with potable water as needed during the summer. Currently the District delivers about 4,200 acre-feet of water to its recycled water customers annually (when including real and apparent distribution system losses as explained in Chapter 4). About 3,500 acre-feet is tertiary treated recycled water, with about 700 acre-feet of potable supply supplemented to the recycled water system during the peak summer demand months. The District's wastewater discharge permits for the two wastewater plants place a minimum obligation on available treated wastewater to be delivered instream and therefore unavailable for delivery to customers. Since current demand already exceeds supply, and considering the additional capital costs of recycled water infrastructure, long term operational costs, and sufficient potable water supplies, the expansion of recycled water customers has diminished in recent years.

2.5 Energy Intensity

Among the statutory changes enacted with new requirements for 2020 UMWPs, an urban supplier shall include information it can readily obtain related to the energy needed to produce, treat and deliver water:[29]

Referred to as "Energy Intensity Reporting" for urban water suppliers, energy intensity is defined as: total amount of energy expended in kilowatt-hours (kWh) by the urban water supplier on a per acre-foot basis to take water from the location where the urban water supplier acquires the water to its point of delivery.

Due to the way that water is supplied in the various District service zones, it is not currently possible to separate out extraction, treatment, storage, and distribution energy uses associated with delivery into individual regions. Therefore, the District uses the Total Utility Approach. This method sums the annual net energy consumed for all water management processes, divided by total volume of water in acre feet. These processes include diversion, conveyance, storage, treatment, distribution, and in-conduit hydropower generation within the distribution system.[30] The total energy intensity is reported in Table 2-12.

Table 2-12: Energy Intensity – Total Utility Approach

Sum of All Water Management Processes	
Volume of Water Entering Process (acre-feet)	36,159[31]
2020 Energy Consumed (kWh)	12,965,929
Energy Intensity (kWh/acre-foot)	359

[29] California Water Code Section 10631.2(a).

[30] The District operates one in-conduit generation facility associated with Reservoir 7, which is included in the calculation.

[31] El Dorado Irrigation District 2020 Water Diversion Report

Chapter 3
Water Supply

The District has a diverse portfolio of existing water supplies, the vast majority of which originate as surface water in the American or Cosumnes River Basins on the Western Slope of the Sierra Nevada mountains. The District also has a recycled water supply. The El Dorado Water Agency, in coordination with the District, is developing additional planned water supplies for future use in El Dorado County. This section details the District's secured water supplies and entitlements as well as its planned supplies in normal, single dry, and five consecutive dry years.

The District operates and maintains an interconnected potable water transmission and distribution system in its contiguous service area. Because the District has historically enjoyed reliable diversified supplies that are more than sufficient to meet water demands in all geographic portions of its service area, supplies in this UWMP are presented on a District-wide basis except where otherwise noted. The distinction between the El Dorado Hills and Western/Eastern regions is provided for descriptive purposes only.

The El Dorado Hills region obtains its primary supplies under rights and entitlements from Folsom Reservoir. This water is delivered to the El Dorado Hills water treatment plant and currently serves El Dorado Hills Zone 2. The District also has a separate recycled water system in the El Dorado Hills system, which delivers treated wastewater from the El Dorado Hills Wastewater Treatment Plant (EDHWWTP) and the Deer Creek Wastewater Treatment Plant (DCWWTP) for residential and commercial landscape irrigation. Water supplies conveyed from Folsom Reservoir and the EDHWTP are currently limited to use in the El Dorado Hills system to avoid the costs of pumping to higher elevations.

The Western/Eastern region derives its supplies under rights and entitlements emanating from both the South Fork American River watershed and the Cosumnes River watershed via Sly Park Reservoir. Water derived from upstream American River watershed diversions and storage reservoirs generally use the Reservoir 1 Water Treatment Plant to serve the Western/Eastern area, while the Sly Park Reservoir water supply uses Reservoir A Water Treatment Plant to serve the same area. Water assets from these upstream diversions can also be delivered by gravity through the District's treated water conveyance system all the way to the El Dorado Hills area.

The District also maintains two small satellite systems to serve the communities of Outingdale and Strawberry, which divert water directly from the Middle Fork of the Cosumnes River and the South Fork of the American River, respectively. Neither satellite system is connected to the District's primary system. A map of the service area can be found in Figure 2-1. The following subsections describe the District's water supplies and delivery mechanics in more detail.

3.1 Description of Surface Water Supplies

The District relies on local and regional surface water supplies to meet the vast majority of its customers' demands. Generally, the District's water assets are derived from pre-1914 appropriative water rights, licensed and permitted appropriative water rights, a Central Valley Project (CVP) Contract, Warren Act Contracts (that allow non-federal water assets to be wheeled through the federal storage and conveyance facilities), and recycled water generated from the effluent treated at the District's two largest wastewater treatment plants.

3.1.1 Water Rights

The District holds both pre-1914 appropriative rights and post-1914 appropriative permits and licenses. These surface water rights represent some of the most important sources of supply to the District.

Ditches / Weber Reservoir Rights (License 2184 and Pre-1914 Water)

Water rights associated with Weber Reservoir, Weber Creek (Farmer's Free Ditch), Slab Creek (Summerfield Ditch), Hangtown Creek (Gold Hill Ditch), and Mill Creek (Project 184) are available to be diverted at Folsom Reservoir under a long-term Warren Act Contract, with up to 4,560 acre-feet available each year combined from these sources. A Warren Act Contract allows the use of federal facilities to take non-CVP water such as these supplies. The annual water diversion season generally occurs April through November 15, though the diversion schedule for each source is staggered slightly. The Warren Act Contract authorizes these supplies' use for municipal and industrial purposes in the El Dorado Hills and Cameron Park areas. It should be noted that the season for diversion into storage at Weber Reservoir runs from October 15 through May 15; however, the water can be released and used at other times of the year. Despite these rights being quite senior (pre-1914), supplies from these sources are subject to hydrological and regulatory limitations that can reduce dry year availability by approximately 30-35%, to approximately 3,000 acre-feet per year.

Sly Park Reservoir (Licenses 11835, 11836 and pre-1914 Water Right)

Sly Park Reservoir represents one of EID's largest and most reliable sources of supply. Licenses 11835, License 11836, and a pre-1914 water right from Camp Creek together allow for 33,400 acre-feet of diversion in the District's upstream system from the Cosumnes River watershed. These diversions are stored in Sly Park Reservoir, the largest storage reservoir in the District, formed by two earth and rockfill dams impounding Sly Park Creek (with an associated diversion dam and tunnel on Camp Creek) near Pollock Pines. Sly Park Reservoir's maximum capacity is 41,033 acre-feet. The facilities were constructed as part of the Sly Park Unit of the United States Bureau of Reclamation (USBR) CVP in 1955 and the USBR transferred ownership of the Sly Park Unit to the District in 2003. The District not only holds the water rights, but also operates and maintains the Sly Park Reservoir and dam facilities, including recreational aspects.

Although the District's annual water right is for 33,400 acre-feet of total beneficial use, the normal annual use from this facility ranges between 18,000 and 24,000 acre-feet. This water supply is used

entirely within the District's contiguous service area. Water is released from Sly Park Reservoir to the Reservoir A Water Treatment Plant for subsequent treatment, transmission, and distribution. Sly Park Reservoir contributes approximately 20,920 acre-feet per year to the District's system firm yield, making it the largest single source of supply to the District during dry years.

Project 184 (Pre-1914 Water Rights)

The District acquired Federal Energy Regulatory Commission (FERC) Project 184 from Pacific Gas and Electric (PG&E) in 1999. Project 184 includes Silver Lake, Lake Aloha, Echo Lake, Caples Lake and associated dams, 22 miles of canals, flumes and tunnels, a 21-Megawatt powerhouse, and other ancillary facilities. Prior to the transfer of ownership of Project 184 and its water rights, the District held a contract to purchase water from PG&E and its predecessor, Western States Gas and Electric Co. The original water rights claims date back to 1856, with additional claims being filed in the 1860s and 1870s. Echo Lake is in the Lake Tahoe Basin, and water is diverted through a piped conduit and tunnel into the South Fork American River Basin. The water rights for diversions from Echo Lake were confirmed in 1880 in a California Supreme Court decision. Then, in 1918, the California Railroad Commission (predecessor to the California Public Utilities Commission) recognized the use of water from the El Dorado Canal for irrigation and domestic purposes.

The sources of water supply for Project 184 include natural flows in the South Fork American River and its tributaries, and stored water in Silver, Aloha, Echo, and Caples Lakes. The supply is diverted from the South Fork American River by the El Dorado Diversion Dam at Kyburz, and is conveyed via the El Dorado Canal to the El Dorado Forebay near Pollock Pines. Some additional water is obtained by diversions into the El Dorado Canal from streams tributary to the South Fork American River. El Dorado Forebay is an off-stream storage reservoir at the terminus of the El Dorado Canal. Once water arrives at the Forebay, it is either diverted into the District's Main Ditch (currently being replaced by a raw water pipeline) for treatment at Reservoir 1 WTP and delivery for consumptive uses or it is released through the El Dorado Powerhouse to generate electricity and then returned to the South Fork American River. The District has a consumptive water entitlement of 15,080 acre-feet per year delivery at the Forebay. The entitlement is a pre-1914 water right, and diversions are made in compliance with the 40-year FERC Project 184 operating license issued to the District in October 2006. Because the full entitlement can be provided in all years including the most severe historic single dry years of 1977 and 2015, this source of water is considered 100% reliable, and not subject to shortage during droughts. Project 184 pre-1914 water rights contribute 15,080 acre-feet per year to the District's system firm yield.

Water diversions of up to 156 cubic feet per second (cfs) can be made from the South Fork American River at the diversion dam. These diversions include 70 cfs of direct diversion rights in addition to releases from storage in upper reservoirs for consumptive purposes; the District also maintains 86 cfs of direct diversion rights for power only. In addition to these direct diversion rights, the District has pre-1914 diversion and storage rights and appropriative power rights associated with portions of the waters stored in Silver Lake, Caples Lake, and Lake Aloha and all of the waters stored in Echo Lake.

Permit 21112 (Project 184 Warren Act Contract)

In 1991, the El Dorado County Water Agency (EDWA) and the District applied to the State Water Resources Control Board (SWRCB) to obtain additional water rights for consumptive use of waters previously stored and released for power generation from Caples, Silver, and Lake Aloha, as well as certain direct diversions from the South Fork American River, all of which had been previously diverted by Project 184 for hydroelectric power generation or instream flows. The EDWA later assigned all of its rights under this application to the District. In 2001 the SWRCB granted the right to appropriate 17,000 acre-feet per year of water under Permit 21112, allowing the District to make direct diversions from the South Fork American River at Folsom Reservoir; to store in Caples, Silver, and Lake Aloha; and to redivert the water released from storage. The sole approved point of diversion for consumptive purposes is currently Folsom Reservoir. Hydrologically, the full 17,000 acre-feet is considered a safe yield even during periods of exceptional drought. There are also currently no cutback provisions on this supply. It is conceivable that a future severe drought could trigger new emergency regulations that limit the operational availability of the full right during certain dry-season months, but it is not possible to estimate with certainty what effect new emergency regulations might have. For planning purposes, the full 17,000 acre-feet is considered available during droughts, but this assumption may be revised in the future if needed.

A diversion from Folsom Reservoir under Permit 21112 requires issuance of a Warren Act Contract from USBR. The District diverted water under this right under a temporary urgency basis in 2008 and received a 5-year Warren Act Contract for 8,500 acre-feet in 2015. The long-term Warren Act Contract for the full 17,000 acre-feet was signed on August 2, 2016 and is now in effect. Deliveries under the long-term Warren Act contract are limited to 8,500 acre-feet per year until EID completes the installation of a Reclamation-approved fully operational temperature control device (TCD) at EID's raw water pump station, at which time the contract will allow diversion of the full 17,000 acre-feet per year of non-Central Valley Project (CVP) water. Construction of the TCD is ongoing and is expected to be completed in 2021. The long-term Warren Act contract would allow EID to utilize Project 184 water for consumptive use purposes within their CVP service area through February 2030, at which time the District will seek renewal.[32]

The District plans to submit a petition to the State Water Resources Control Board to change Permit 21112, to allow for water supplies under this right to be diverted upstream in the South Fork American River watershed. Specifically, the District seeks to move the point of diversion to include not only Folsom Reservoir, but also the District's existing facilities near Kyburz and either Slab Creek Dam or White Rock Powerhouse Penstock. The District also seeks to add Sly Park as an authorized storage location for Permit 21112 supply. Long-term water supply planning forecasts (including the District's 2013 Integrated Water Resources Master Plan and the EDWA 2014 West Slope Update to the Water Resources Development & Management Plan) indicate that a portion of the Permit 21112 water supply will be necessary to serve areas of the District that are east of El Dorado Hills.

[32] Saich, J. (2016, August 17). Reclamation and El Dorado Irrigation District Sign Warren Act Contract for Project 184 Water. Retrieved from https://www.eid.org/Home/Components/News/News/552/

Currently, water made available under Permit 21112 rights is acquired at the lowest elevation point in the District's service area and must be pumped uphill to reach customers. Gaining the right for higher elevation diversions would allow the Permit 21112 supply to serve customers in the Western/Eastern area and reduce the energy intensity of this supply by allowing the District to use its existing gravity-fed distribution system. In spring 2020, the District released a Notice of Preparation (NOP) and conducted a public scoping meeting under CEQA, as it works to prepare an Environmental Impact Report (EIR) for the proposed modification to Permit 21112. While this proposed permit modification would not result in additional gross water supplies, successful modification would allow the District greater operational flexibility to serve existing and future customers and reduce the need for energy-intensive uphill pumping.

Outingdale Service Area

The District holds a 1933 appropriative water right for direct diversion from the Middle Fork Cosumnes River to serve the Outingdale Subdivision. The original water right Permit No. 4071 was issued by the State of California in 1933. The original water right applicant, C.T. Oeste, conveyed the water right to Outingdale Water Company before it was conveyed to the District. The water right allows for a total diversion of approximately 104 acre-feet per year. The water system was transferred to the District in 1970 when the subdivision was annexed to the District. All accompanying water rights related to the subdivision were conveyed to the District at that time. Under the terms of Permit 4071, all water was to be put to beneficial use by 1935. However, since the subdivision has not yet reached build-out conditions, the District has requested and been granted multiple time extensions from the SWRCB. This water supply is an independent satellite potable system and therefore does not contribute to the two main systems.

Supplies from this source were severely curtailed during the height of the 2012-2016 drought. In 2014, the State Water Resources Control Board curtailed diversions from May 27, 2014 to November 12, 2014. To comply with this Order, the District ceased all diversions under this water right, except for the public health and safety exemption. From September 9, 2014 to October 7, 2014, limited consumptive demands for this public system were met by trucking of treated water from the District's main system due to the physical unavailability of water and water quality concerns in the Middle Fork Cosumnes River. On October 8, 2014, diversions from the Middle Fork Cosumnes River under the public health and safety exemption resumed and water trucking operations ceased. On November 26, 2014, normal diversions resumed when the curtailment was lifted.

A similar curtailment was ordered by the Water Board the following year in 2015, which again resulted in trucking of treated water to Outingdale from late April to early August 2015. On July 31, 2015, the SWRCB approved a physical solution that enabled EID to resume diversions under this right in exchange for increased releases of stored water from Jenkinson Lake. EID diverted water under this authority from approximately August 3 to August 24, 2015, until low flows in the Middle Fork Cosumnes River necessitated the resumption of trucked water deliveries. On October 20, flows had increased sufficiently for EID to resume operations under the physical solution. On November 6, 2015, normal diversions resumed when the curtailment was lifted.

The approval of the physical solution by SWRCB allowed for limited water deliveries, but this supply is still vulnerable to severe curtailments. Future droughts could cause shortages as severe as those experienced in 2014-15. Under such conditions, trucking of water from the District's main system may again be necessary. During normal years, however, this supply is more than sufficient to meet all demands in the Outingdale Service Area. Water diversions in 2020 totaled 32 acre-feet.

Strawberry Service Area

The Strawberry service area is located 40 miles east of Placerville. A small portion of the Project 184-related pre-1914 water rights, as discussed above, is used to serve the Strawberry satellite service area. This water is diverted from the upper South Fork of the American River before being treated at the Strawberry water treatment plant. Historical deliveries range from approximately 30 acre-feet to 60 acre-feet per year. Because Project 184 Water Rights have a pre-1914 priority date and provide a far larger volume of water than is needed to meet demands in Strawberry along with seasonal storage, the water supplies for the Strawberry Service Area are considered reliable. Supplies for the Strawberry Service Area are reported as part of Project 184 in all Section 3 tables. Water diversions in 2020 totaled 30 acre-feet.

3.1.2 Contracts for Water

The District holds two major types of contracts for water: a contract to purchase water from the USBR Central Valley Project (CVP) at Folsom Reservoir; and Warren Act Contracts that allow non-federal water assets to be wheeled through the federal storage and conveyance facilities. Because Warren Act contracts do not contain the right to use water, they are discussed above in Section 3.1.1 Water Rights. Contracts for water that involve per unit purchase are discussed below.

Central Valley Project (USBR CVP Contract 14-06-200-1375A-LTR1-P)

Surface water from Folsom Reservoir is provided to El Dorado Hills and some of the surrounding area. The District is entitled to 7,550 acre-feet per year by contract with USBR. The contract limits use to a particular area that generally encompasses El Dorado Hills and portions of Cameron Park. Folsom Reservoir is operated by the USBR as part of the CVP, a multipurpose project that provides flood control, hydroelectricity, drinking water, irrigation water, and environmental flows. The El Dorado Hills County Water District entered into a USBR Contract in 1964 for water supply from Folsom Reservoir. The contract had a not-to-exceed limit of 37,500 acre-feet per year. When the District annexed the El Dorado Hills County Water District in 1973, the contract was assigned to the District, and subsequently, in 1979, an amendatory contract replaced the original 1964 contract and reduced the maximum annual supply quantity of Folsom Reservoir water to 6,500 acre-feet per year. In 1983, the USBR increased the maximum annual supply quantity from 6,500 to 7,500 acre-feet per year. The District also annexed and succeeded a USBR Contract for 50 acre-feet per year to supply the Lakehills area in El Dorado Hills. In 2006, these two contracts were consolidated into a single 40-year USBR Contract with a maximum quantity of 7,550 acre-feet per year. In January of 2021, the District converted its existing long-term CVP contract to one that runs in perpetuity, as authorized by the Water Infrastructure Improvements for the Nation (WIIN) Act, which was passed by Congress in 2016. The suffix "-P" in the District's contract

number (USBR CVP Contract 14-06-200-1375A-LTR1-P) indicates that this supply has been secured in perpetuity.

The District's CVP WIIN contract supply is subject to dry year reductions under the USBR's CVP Municipal and Industrial (M&I) Shortage Policy, which can reduce the supply by 50 percent to approximately 3,775 acre-feet during dry years. To be conservative and considering the District's 2021 allocation, the District has assumed the supply is further reduced to only 25 percent of the historical use in the third, fourth, and fifth years of the multiple dry year scenario, equating to 1,235 acre-feet.

3.2 Wastewater and Recycled Water

The District has used recycled water to meet non-potable demands such as industrial processes and irrigation of golf courses, landscaping, outdoor residential irrigation, and road medians within the El Dorado Hills service area. Potable water has been used to supplement the recycled water system since 2002 to meet peak demands. Note that differences in the volumes of recycled water supplied versus consumed in the tables of this 2020 UWMP, and in the DWR required tables in Appendix A, reflect potable water supplementation to the recycled water system; therefore, volumes of recycled water supplied and demanded are not equal most years. Current limitations of the recycled water system primarily have to do with the timing of availability and the District's limited ability to store recycled water seasonally.

The District's recycled water system consists of supply from the EDHWWTP and the DCWWTP. These wastewater treatment plants have an interconnected network of recycled water transmission and distribution pipelines, pump stations, storage tanks, pressure reducing stations, and appurtenant facilities located within the communities of El Dorado Hills and portions of Cameron Park, as illustrated in Figure 2-10. The District has a 70 million-gallon (215 acre-feet) storage reservoir located at the EDHWWTP to help balance the rate of recycled water generation with recycled water demands, and to allow the plant to operate without discharging to Carson Creek during the dry season. The peak period for recycled water demand occurs at night. However, nighttime is also the time when wastewater inflows are lowest. To account for this imbalance between recycled water production and demand, several storage tanks are used to in the distribution system to store supplies generated during the day that are then withdrawn at night as demand increases. These tanks are also supplemented with potable water when recycled water demands exceed recycled water production. While this storage helps balance the daily timing offset of recycled water supply and demand, a much larger storage facility would be needed to accommodate the seasonal differences in recycled water supply availability and demand. The District has considered building a 2,500 acre-foot seasonal storage reservoir as another method to increase the District's recycled water supply, but has determined that the reservoir project is not financially viable at this time.[33]

The District mandates the use of recycled water through Board Policy 7010, wherever economically and physically feasible as determined by the Board, for non-domestic purposes. Recycled water availability is an outcome of increased municipal and domestic potable water demand, and resulting wastewater

[33] El Dorado Irrigation District Wastewater Facilities Master Plan, July 2013 at page 158.

production as a byproduct of this demand. In other words, annual recycled water production capabilities are based on the wastewater flows to the wastewater treatment plants.

The availability of recycled water will increase with the anticipated growth described in Section 2 associated with new wastewater connections. The District previously calculated the anticipated availability of recycled water based upon its current production levels, estimated regional population growth as described in Section 2.1.2, wastewater facility expansion identified in its 2013 IWRMP and WWFMP, treated water discharge requirements, and its ability to capture and store recycled water supplies in the future. Currently the District delivers about 4,200 acre-feet of water to its recycled water customers annually. About 3,500 acre-feet is tertiary treated recycled water, with about 700 acre-feet of potable supply supplemented to the recycled water system during the peak summer demand months.

The District is not currently anticipating any significant expansion of the recycled water system in the future, due to the current supply and demand imbalance, the additional cost of recycled water infrastructure, long term operational costs, and sufficiency of potable water supplies. This 2020 UWMP uses the conservative assumption that the recycled water supply is 3,500 acre-feet per year and remains at 3,500 acre-feet throughout the planning period, to avoid the risk of potentially overestimating the availability of recycled water supplies. This supply is considered reliable in all future years, regardless of the length or severity of drought. Recycled water supply is shown in Table 3-1 below and included in the summary tables of District supplies presented at the end of Section 3.

Table 3-1 – Projected Recycled Water Supply (values in acre-feet)

Source	2025	2030	2035	2040	2045
Recycled Water	3,500	3,500	3,500	3,500	3,500

The District has specific criteria for determining whether recycled water is feasible for a particular property or non-domestic use. These include:

- Property is located in the area defined in the most recent Master Plan.
- Recycled water is available at a reasonable cost.
- Recycled water is of adequate quality for the intended use.
- Use of recycled water is consistent with all applicable federal, state, and local rules.
- Use of recycled water will not be detrimental to public health and will not adversely affect plant life, fish and wildlife.

The District has examined expansion opportunities and augmentation alternatives for the recycled water supply, including in the 2009 Seasonal Storage Basis of Design Report (BODR). However, as this time, these options are not considered cost effective and are not scheduled for implementation. The District does not expect a significant increase in recycled water demand over the planning horizon of this 2020 UWMP.

3.3 Other Water Supplies

The District does not currently have other supplies beyond those discussed above.

3.4 Planned Water Supplies

In addition to the District's secured water supplies, the District has identified other water supplies that could be pursued by the District in the future. While these planned supplies are not necessary to meet current or projected demands over the planning horizon of this UWMP (through 2045), the planned supplies will continue to be evaluated and may be pursued and secured in the future if deemed necessary by the District.

3.4.1 Fazio CVP Supply

The District has the ability to secure at least 7,500 acre-feet of additional CVP water supplies in conjunction with a future water service contract with EDWA. In 1990, Congress directed the Secretary of the Interior, through the USBR, to enter into a new CVP Municipal and Industrial (M&I) water service contract with EDWA for up to 15,000 acre-feet of water annually (Section 206 of P.L. 101-514). The CVP water service contract requires compliance by EDWA and the USBR with CEQA, NEPA, and ESA statutes.

In June 2019, the EDWA executed a contract with the USBR for up to 15,000 acre-feet of CVP water, of which at least 7,500 acre-feet would be made available to the District by subcontracts with EDWA.[34] Diversions by the District would occur at its existing intake in Folsom Reservoir, conveyed to the El Dorado Hills Water Treatment Plant, and delivered to a specific place of use location in El Dorado Hills and Cameron Park areas.

With ample District water supplies from Folsom Reservoir available, the District is not currently pursuing a near term agreement for this water supply.[35] District staff have estimated this water supply will be secured by 2035, as indicated by Table 3-4 at the end of this section and the long-range supply projections provided in section 5. While the analysis in this UWMP indicates that the Fazio CVP Supply is not necessary to meet District's near-term demands, securing this water asset would improve the District's supply reliability in the event that another supply source was interrupted.

3.4.2 El Dorado-SMUD Cooperation Agreement

The District's additional planned supplies include assignment of two existing water right applications totaling approximately 40,000 acre-feet of water. This supply was being developed by the El Dorado Water and Power Authority (EDWPA). EDWPA was a Joint Powers Authority consisting of the County, EDWA and the District (collectively, El Dorado Parties). EDWPA existed in part to pursue additional water supplies for the western slope of the El Dorado County to serve planned land uses that will develop over time. In 2005, EDWPA negotiated and the El Dorado Parties signed the "El Dorado –SMUD Cooperation Agreement",[36] which requires SMUD to make annual deliveries of up to 30,000 acre-feet of

[34] Central Valley Project Water Supply Contracts Under Public Law 101-514 (Section 206): Proposed Contract Between the U.S. Bureau of Reclamation and the El Dorado County Water Agency, and Proposed Subcontracts Between the El Dorado County Water Agency and the El Dorado Irrigation District, and Between the El Dorado County Water Agency and the Georgetown Divide Public Utility District Final Environmental Impact Report at ES-1, January 2011.

[35] El Dorado Irrigation District. (2019). *2019 Water Supply and Demand Report* (Tech.). Placerville, CA.

[36] Detailed information regarding this water asset can be obtained by contacting the District.

water through 2025 and 40,000 acre-feet thereafter from SMUD's Upper American River Project (UARP) to the El Dorado Parties.

In 2008, EDWPA petitioned the SWRCB for partial assignment of two State-filed water rights applications for diversion and storage to obtain water supplies necessary to trigger SMUD's obligations under the El Dorado –SMUD Cooperation Agreement. The SWRCB noticed the applications as complete in May 2009. EDWPA prepared a Draft EIR (SCH #2008102090) in support of these applications that was circulated for public review in July 2010. Comments were received on the Draft EIR. EDWPA elected not to complete the Final EIR, choosing instead to refine the project's objectives for broader, regional water reliability benefits. EDWPA initiated a new CEQA environmental review process by filing a Notice of Preparation (NOP) of a Draft Environmental Impact Report in March 2014 (then deferred EIR preparation due to changing conditions) and issued an NOP again in December 2017. Two environmental scoping meetings were held in April 2014 and again in February 2018, with a new Draft EIR being developed as well as addressing stakeholder concerns as part of the water rights protest settlement phase at the SWRCB. EDWPA was dissolved in February 2019 with all functions assumed by EDWA.

The El Dorado-SMUD Cooperation Agreement also obliges SMUD to provide carryover storage and delivery of up to 15,000 acre-feet of drought protection water supply. Based on demand projections, the District anticipates that only 30,000 acre-feet of the 40,000 acre-feet identified in the water right applications and the El Dorado–SMUD Cooperative Agreement will be available to the District in normal years. Moreover, the District has planned that 5,000 acre-feet of the water supply will be available for the District's uses in each dry year when diverted from the White Rock point of take; the remaining 25,000 – 35,000 acre-feet can be claimed at Folsom Reservoir without restrictions. These supply estimates are derived from Appendix H of the El Dorado–SMUD Cooperation Agreement describing deliveries available from carryover storage.[37]

The District does not project that this supply will be necessary over the planning horizon of this UWMP, based on slow growth in demand and ample current and projected supplies, as described in detail in the Water Service Reliability Assessment presented in section 5. However, this supply is currently being pursued by the EDWA and the supply is described in this UWMP as a future planned supply if determined to be necessary in subsequent planning efforts. Because the implementation timing of this potential supply remains uncertain, El Dorado – SMUD Cooperation Agreement water is not included in Table 3-4 at the end of this section or in the long-term supply projections provided in section 5.

[37]El Dorado Parties and SMUD. (2005). El Dorado – SMUD Cooperation Agreement. https://www.edcgov.us/waterandpower/water_power_pdf/El_Dorado_SMUD_Cooperation_Agreement_FINAL.pdf

3.5 Description of Groundwater Supplies

The District currently does not use groundwater as a source of supply, nor does it overlie any groundwater basins identified by DWR Bulletin 118. Given the lack of any groundwater basins on the western slope of El Dorado County, it is extremely unlikely that the District will ever utilize groundwater as a supply in the future. While the District remains open to considering opportunities for conjunctive use projects within or outside of its service area, no such projects have been identified at this time.

3.6 Water Transfers and Exchanges

The District as a whole enjoys highly reliable and diversified water assets that have generally proved sufficient even in the most severe drought years of the past decade. As a result, the District has not developed opportunities nor plans to develop opportunities to transfer other sources of water into the District's service area. Transfers are not practical or necessary.

However, the District has transferred its water assets to others outside of the District's service area when not needed to meet the current or planned needs of its customers. Due to the success of these transfers, the District will continue to seek opportunities to transfer its water assets when not needed for its customers.

3.7 Desalination Opportunities

Due to its location in the Sierra Nevada mountains, the District has no opportunities for using desalinated water as a supply source.

3.8 Climate Change Impacts

Climate change impacts are discussed in section 2.2.1, including analysis from the American River Basin Study. [38] In addition to these impacts, there are specific regulatory issues related to climate change which may have the potential to affect District supplies or operations, as briefly summarized below.

3.8.1 2006 Bay-Delta Plan Update

The 2006 Bay-Delta Plan Update is currently being developed by the SWRCB. Proposed changes have the potential to impact District surface water supplies. In general, the SWRCB is recommending new and modified flow requirements for the Sacramento River (and its tributaries), Delta interior flows and outflows, cold water habitat, and ecosystem protection. Information on the 2006 Bay-Delta Plan Update can be accessed at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/.

[38] Study not yet published.

The potential for impact on the District's supplies include increased regulatory control on surface water diversions from Folsom Reservoir and/or new requirements for instream flows.

3.8.2 SWRCB Mandatory Conservation Orders

In response to the California drought from 2014 through 2016, the Governor issued various executive orders that required mandatory conservation, including prohibitions on water waste and certain uses. Impacts to urban water suppliers included mandatory reduction in potable water production and submission of monthly monitoring reports.

In addition to the mandatory conservation orders from emergency drought declarations and emergency regulations imposed by the SWRCB, the SWRCB, beginning in 2026, is authorized to impose mandatory conservation orders to urban water suppliers who do not meet their Water Use Objective.

3.8.3 Future Regulatory Conditions

It is anticipated that effects from the above regulatory conditions and projects could impact the amount of supply available to the District, although the magnitude of such impacts are not yet fully known.

Beyond these specific regulatory conditions, it is conceivable that new emergency regulations could be imposed during future droughts that limit the availability of the District's full rights even when supplies are hydrologically available. Such restrictions would likely be a result of a future drought condition throughout the state, so it is not possible to estimate with certainty what effect future emergency regulations might have.

3.9 Water Quality

The water quality of the District's supply sources is generally excellent and is able to meet all Title 22 drinking water standards after treatment. As described above, most of the District's supplies originate as surface water in sparsely developed watersheds on the western slope of the Sierra Nevada mountains, which protects supplies from many sources of contamination.

The last updated assessments of EID's drinking water sources for its main system were completed in 2018 and showed that the District meets or exceeds all state and federal drinking water standards. The *2020 Water Quality Report* summarizes potential threats to water quality.[39] The District's source water is considered most vulnerable to potential contamination from recreation, residential sewer, septic systems, and urban runoff activities, which are all associated with constituents detected in the water supply. The District's source water is also considered vulnerable to illegal activities, dumping, fertilizer, pesticide and herbicide application, forest activities, and wildfires, although constituents associated with these activities were not detected during the 2018 sampling. The District's two satellite systems,

[39] El Dorado Irrigation District 2020 Water Quality Report, Main Water System

Strawberry and Outingdale, also have these potential contamination sources but currently comply with all applicable water quality standards.[40] [41]

One specific location where the influence of urban runoff contaminants is a concern is in the District's Upper Main Ditch, which connects Forebay Reservoir to the Reservoir 1 Water Treatment Plant. Significant solids, contaminants and organic materials enter the Ditch from local drainage and run-off during storm events, which impacts the raw water quality and creates challenges for the treatment plant processes.[42] The District is underway with a project to replace the Upper Main Ditch conveyance with an enclosed raw water pipeline. Construction is planned to be complete in 2022.

3.10 Water Supply Reliability

As described in prior sections, the District has significant water assets to meet its short-term and long-term needs. These assets include pre-1914 appropriative water rights, post-1914 appropriative water rights and entitlements, as well as recycled water. As required by the California Water Code, the District needs to address the reliability of these assets for average, single dry, and five consecutive dry year conditions. The reliability for each asset under each hydrologic condition is governed by the specific right's conditions or entitlement's provision. Supply availability is summarized in section 3.11 in Table 3-5.

3.10.1 Average Year Water Supply Availability

The District's total water entitlements under its existing and planned supplies are not representative of the supply available on average. Rather, as a result of operational management policies and practices, the average supply equates to 70,794 acre-feet per year of existing supplies and 7,500 acre-feet per year of planned supplies. Combined, the District anticipates the total average future water supplies to equal 78,294 acre-feet annually by 2045. Average Year Water Supply Availability is based on the following assumptions:

1. Ditches / Weber Reservoir Rights (License 2184 and Pre-1914 Water Rights) are appropriative water rights associated with Slab, Hangtown, Mill, and Weber Creeks. The maximum value of 4,560 acre-feet has historically been available in average years and is assumed to be available in future average years.
2. Sly Park Reservoir (License 11835 and 11836 and pre-1914 Camp Creek right), also called Jenkinson Lake, is the District's only existing supply source whose value during average years is less than the maximum water right. Although the rights allow up to 33,400 acre-feet, and the District has diverted as much as 25,745 acre-feet, 23,000 acre-feet is used for planning purposes for an average year due to the need to set aside carryover storage for future years.

[40] El Dorado Irrigation District 2020 Water Quality Report, Outingdale Water System
[41] El Dorado Irrigation District 2020 Water Quality Report, Strawberry Water System
[42] The El Dorado Irrigation District Integrated Water Resources Master Plan, March 31, 2013

3. Central Valley Project water (Contract 14-06-200-1375A-LTR1-P) has historically been available at its maximum value of 7,550 acre-feet in average years and is assumed to be available in future average years.
4. Project 184 (Pre-1914 appropriative rights from the Upper South Fork American River) have an early priority date that has allowed this source of water, 15,080 acre-feet, to be fully available in average years and is assumed to be available in future average years. Supplies for the District's Strawberry system are included in this supply.
5. Permit 21112 allows the District to divert up to 17,000 acre-feet of water per year at Folsom Reservoir through a Warren Act Contract. This supply has not historically been available in its full amount pending the completion of a temperature control device at the District's intake from Folsom Reservoir, which is expected to be completed in 2021. Based upon the availability of the supply in Permit 21112, the ability to store the water in Caples, Silver, and Lake Aloha, and the long-term Warren Act Contract with USBR, the average-year availability of this supply is 17,000 acre-feet.
6. Outingdale/ Middle Fork Cosumnes Supplies (Permit 4071) provides up to 104 acre-feet per year of water during average years, and is expected to remain at this level in future average years.
7. Recycled Water is projected to provide 3,500 acre-feet in average years. Note that this supply is non-potable, in contrast to the other District supplies presented in this section.
8. Central Valley Project Fazio Water is expected to include 7,500 acre-feet or more as authorized by federal law. Once secured, projected to occur by 2035, the District is expected to receive its full entitlement in average years. While the District's existing supplies are sufficient to meet demands throughout all scenarios examined in the planning period based on current conditions and assumptions, securing the Fazio CVP Supply will further improve future reliability.

The District's projected average year supplies are summarized in Table 3-2.

Table 3-2 – Projected Average Year Water Supply (values in acre-feet)

Water Right or Entitlement	Maximum Water Assets Available	Average Year Planned Availability				
		2025	2030	2035	2040	2045
Existing Supplies						
Ditches / Weber Reservoir Rights (License 2184 and Pre-1914 Water Rights)	4,560	4,560	4,560	4,560	4,560	4,560
Sly Park Reservoir (Licenses 11835 and 11836)	33,400	23,000	23,000	23,000	23,000	23,000
CVP Contract (Contract 14-06-200-1375A-LTR1)	7,550	7,550	7,550	7,550	7,550	7,550
Project 184 (Pre-1914 at Forebay)	15,080	15,080	15,080	15,080	15,080	15,080
Permit 21112 (Project 184 Warren Act Contract)	17,000	17,000	17,000	17,000	17,000	17,000
Outingdale/ Middle Fork Cosumnes (Permit 4071)	104	104	104	104	104	104
Recycled Water (Non-potable)	3,500	3,500	3,500	3,500	3,500	3,500
Subtotal Existing	81,494	70,794	70,794	70,794	70,794	70,794
Planned Supplies						
CVP Fazio Water entitlement	7,500	0	0	7,500	7,500	7,500
Subtotal Planned	7,500	0	0	7,500	7,500	7,500
Total	88,694	70,794	70,794	78,294	78,294	78,294

3.10.2 Single and Five Consecutive Dry-Year Water Supply Availability

The District anticipates less water being available in dry years than is otherwise available in normal years as described in Section 3.10.1. Dry-year supplies include supply reductions attributable to hydrologic droughts and regulatory curtailments. The dry-year water supplies are described in this section. By 2045, the District's future total water supplies are projected to equal 67,129 acre-feet in a single dry year. Of this total supply, 63,379 acre-feet are secured water assets and 3,750 acre-feet are planned water assets. The basis for this analysis was the District's actual supply availability during the severe drought year 2015 for Single Dry-Year Water Supply Availability. The District's supply availability from 2012-2016 and recent conditions in 2021 was used as the basis for the multiple-dry year analysis.

Water availability is based on the following assumptions for single dry years and multiple dry years:

1. Ditches / Weber Reservoir Rights (License 2184 and Pre-1914 Water Rights) are appropriative water rights associated with Slab, Hangtown, Mill, and Weber Creeks. The maximum value of 4,560 acre-feet has historically not been available in dry years, due to hydrological constraints. Based on historical experience, 3,000 acre-feet is available from this source even in the driest years experienced by the District. It is assumed 3,000 acre-feet from this source is reliably available in future single and multiple dry years.
2. Sly Park Reservoir (License 11835 and 11836), also called Jenkinson Lake, is subject to reduced supply availability during dry years due to reduced inflow and the need to preserve carryover water for use in future years. Accordingly, based upon the OASIS hydrologic modeling report, the District reduces this supply's availability to 20,920 acre-feet in a single dry year. Thus, 20,920 acre-feet per year is assumed as the available supply for a single dry year. For conservative planning purposes, the District plans for this supply to be further reduced during consecutive dry years. A 1991 Investigation of Sly Park Reservoir Yield by Sierra Hydrotech determined the Safe Yield of Sly Park Reservoir is 17,700 acre-feet. This UWMP conservatively uses 17,000 acre-feet as the available supply in year two of a drought and 15,500 acre-feet as the available supply in years three, four, and five.
3. Central Valley Project water (Contract 14-06-200-1375A-LTR1-P) has a maximum entitlement of 7,550 acre-feet per year. The USBR, however, assesses the dry-year supply availability of its CVP M&I contracts through the CVP M&I Shortage Policy. Based on inflow and storage criteria, USBR can reduce contract water supplies under the CVP M&I Shortage Policy related to historic use with various adjustments made for population, use of non-CVP water and extraordinary conservation actions.[43] With these adjustments in mind, USBR calculates the reduced CVP M&I delivery essentially based upon the average of the three previous normal allocation years of use under the CVP contract. Under the strictest interpretation of this policy, if the water under the CVP contract was not used, then the dry year water is not available. But, USBR has considered that use of non-CVP supplies in lieu of CVP water use may be used to calculate use under this shortage policy. For purposes of this analysis, however, the District has determined that based upon normal growth in demand in the District's service area, the District's customers would

[43] Reclamation has the authority to reduce the supply volumes even further under extreme conditions –Health and Safety criteria. The District's drought contingency plans address these situations.

utilize the entire contract entitlement in normal years in the future. As such, the District calculates its dry-year reduction for this Proposed Project based upon five years of full use of its contract allocation as well as meeting its Health and Safety baseline needs. Accordingly, the dry year supply under this water contract entitlement is 3,775 acre-feet per year (50 percent of contract amount). However, for conservative planning purposes given the allocation in 2021, this supply is further constrained in the third, fourth, and fifth year of the three-year multiple dry year scenario, equating to 1,235 acre-feet (25 percent of historical use).

4. Project 184 Pre-1914 appropriative rights from the Upper South Fork American River have a normal-year reliability of 15,080 acre-feet per year. Based upon the early priority date of these water assets, the storage capability within the District's system associated with these water assets, and water available and delivered under these rights in 2012-2016, they are not reduced in a single dry year or five consecutive dry years.
5. Permit 21112 (taken at Folsom Reservoir through a Warren Act Contract) allows the district to divert up to 17,000 acre-feet of water per year. This supply has not historically been available in its full amount pending the completion of a temperature control device at the District's intake from Folsom Reservoir, which is expected to be completed in 2021. However, the contractual limitations are totally unrelated to drought; under the two driest years on record –1977 and 2015 –the District would experience no cutback in this supply. Based upon the availability of the supply in Permit 21112, the ability to store the water in Caples, Silver, and Aloha lakes, and the long-term Warren Act Contract with USBR, the availability of this supply is assumed to be 17,000 acre-feet in all dry years.
6. Outingdale/Middle Fork Cosumnes Supplies (Permit 4071) can be severely curtailed in multiple dry years, as shown by the District's recent experience in 2014-15. However, for a single dry year, the availability of this supply is assumed to be 104 acre-feet. The District used the lowest actual diversion made during the 2012-16 drought to project the available supply of 13 acre-feet during the second through fifth years of a multiple dry year scenario.
7. Recycled Water is projected to provide the District 3,500 acre-feet of non-potable recycled water in all future years, regardless of the length or severity of drought, as shown in Table 3-1 earlier in Section 3.
8. Central Valley Project Fazio Water is a new planned supply of 7,500 acre-feet which District staff have projected will be secured by 2035 and is expected to be subject to the same CVP M&I Shortage Policy described above for the existing supply of Central Valley Project water (Contract 14-06-200-1375A-LTR1-P). Therefore, the same assumptions about percentage reductions in allocations were used. This would result in the dry year supply under this water contract entitlement is 3,750 acre-feet per year. However, for conservative planning purposes given the allocation in 2021, this supply is further constrained in the third, fourth, and fifth year of the multiple dry year scenario, equating to 1,235 acre-feet. While the District's existing supplies are sufficient to meet demands throughout all scenarios examined in the planning period based on current conditions and assumptions, securing the Fazio CVP Supply will further improve future reliability.

The District's projected single dry year water availability is presented in Table 3-3.

Table 3-3 – Projected Single Dry-Year Water Supply (values in acre-feet)

Water Right or Entitlement	Maximum Water Assets Available	Single Dry-Year Planned Availability				
		2025	2030	2035	2040	2045
Existing Supplies						
Ditches / Weber Reservoir Rights (License 2184 and Pre-1914 Water Rights)	4,560	3,000	3,000	3,000	3,000	3,000
Sly Park Reservoir (Licenses 11835 and 11836)	33,400	20,920	20,920	20,920	20,920	20,920
CVP Contract (Contract 14-06-200-1375A-LTR1)	7,550	3,775	3,775	3,775	3,775	3,775
Project 184 (Pre-1914 at Forebay)	15,080	15,080	15,080	15,080	15,080	15,080
Permit 21112 (Project 184 Warren Act Contract)	17,000	17,000	17,000	17,000	17,000	17,000
Outingdale/ Middle Fork Consumnes (Permit 4071)	104	104	104	104	104	104
Recycled Water (Non-potable)	3,800	3,500	3,500	3,500	3,500	3,500
Subtotal Existing	81,494	63,379	63,379	63,379	63,379	63,379
Planned Supplies						
CVP Fazio Water entitlement	7,500	0	0	3,750	3,750	3,750
Subtotal Planned	7,500	0	0	3,750	3,750	3,750
Total	88,994	63,379	63,379	67,129	67,129	67,129

The District's projected water supply during five consecutive dry years is presented in Table 3-4.

Table 3-4 – Projected Five Consecutive Dry-Year Water Supply (values in acre-feet)

Year of Drought	Five Consecutive Dry-Year Planned Availability				
	2025	2030	2035	2040	2045
Existing Supplies					
Year 1	63,400	63,400	63,400	63,400	63,400
Year 2	59,400	59,400	59,400	59,400	59,400
Year 3	55,300	55,300	55,300	55,300	55,300
Year 4	55,300	55,300	55,300	55,300	55,300
Year 5	55,300	55,300	55,300	55,300	55,300
Planned Supplies					
Year 1	0	0	3,750	3,750	3,750
Year 2	0	0	3,750	3,750	3,750
Year 3	0	0	1,235	1,235	1,235
Year 4	0	0	1,235	1,235	1,235
Year 5	0	0	1,235	1,235	1,235
Total Supplies					
Year 1	63,400	63,400	67,150	67,150	67,150
Year 2	59,400	59,400	63,150	63,150	63,150
Year 3	55,300	55,300	56,535	56,535	56,535
Year 4	55,300	55,300	56,535	56,535	56,535
Year 5	55,300	55,300	56,535	56,535	56,535

3.11 Summary of Existing and Planned Sources of Water 2020 – 2045

The District has two broad categories of water assets that are available for its use in its service area – secured water assets and planned water assets. Collectively, by 2045 the District's secured and planned supplies total 78,294 acre-feet in normal water years and 67,129 acre-feet in a single dry water year. In the later years of a multi-year drought, supplies are further reduced.

As described above, the secured water assets include appropriative water right License 2184 and the accompanying pre-1914 appropriative water rights exercised under Warren Act Contract 06-WC-20-3315; appropriative water right Licenses 11835, 11836 and pre-1914 water rights to Camp Creek; CVP Contract 14-060200-1375A-LTR1-P; the pre-1914 American River storage and diversion appropriative water rights; Permit 21112; and recycled water.

The normal year water supplies available to the District under the secured assets total 70,794 acre-feet per year. In a single dry year, the water supplies available to the District under the secured assets total 63,379 acre-feet per year. By the fifth year of a multi-year drought, the District's secured supplies are further reduced to 55,328 acre-feet per year.

The planned CVP Fazio Water assets, although partially secured, are not yet available for the District's use to serve the District's needs contemplated in this 2020 UWMP. The District has identified 2035 as the date these planned supplies are anticipated to come online. In normal years, the water supplies under these assets total 7,500 acre-feet. In dry years, the water supplies under these assets total 3,750 acre-feet, conservatively reducing further to 1,235 acre-feet in the later years of consecutive dry years (see Table 3-5). Current analysis, as shown in Section 5, indicates that this planned supply is not necessary to meet demands in any scenario examined in this UWMP, but securing Fazio CVP can further improve supply reliability above existing levels.

Table 3-5 – Water Supply Summary 2020 – 2045 (values in acre-feet)

Water Right or Entitlement	Maximum Water Assets Available	Normal Year	Single Dry Year	Multiple Dry Years				
				Year 1	Year 2	Year 3	Year4	Year 5
Existing Supplies								
Ditches / Weber Reservoir Rights (License 2184 and Pre-1914 Water Rights)	4,560	4,560	3,000	3,000	3,000	3,000	3,000	3,000
Sly Park Reservoir (Licenses 11835 and 11836)	33,400	23,000	20,920	20,920	17,000	15,500	15,500	15,500
CVP Contract (Contract 14-06-200-1375A-LTR1-P)	7,550	7,550	3,775	3,775	3,775	1,235	1,235	1,235
Project 184 (Pre-1914 at Forebay)	15,080	15,080	15,080	15,080	15,080	15,080	15,080	15,080
Permit 21112 (Project 184 Warren Act Contract)	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000
Outingdale/ Middle Fork Consumnes (Permit 4071)	104	104	104	104	13	13	13	13
Recycled Water (non-potable)	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Subtotal Existing	81,194	70,794	63,379	63,379	59,368	55,328	55,328	55,328
Planned Supplies								
CVP Fazio Water entitlement	7,500	7,500	3,750	3,750	3,750	1,235	1,235	1,235
Subtotal Planned	7,500	7,500	3,750	3,750	3,750	1,235	1,235	1,235
Total	88,694	78,294	67,129	67,129	63,118	56,563	56,563	56,563

Chapter 4
Water Use

Understanding water use characteristics is essential to enable the District to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This chapter characterizes the District's retail and wholesale customer water needs – current and forecasted over the next few decades. Characteristics such as how water uses vary among different land use classifications, throughout the year, and under differing hydrologic conditions, all help with that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon the District's past and current water use, in addition to considerations of anticipated growth, new regulations, changing climate conditions and trends in customer water use behaviors. A thorough analysis examines each water use sector for a variety of factors, then aggregates the information into a comprehensive projection of customer water use that becomes the foundation for integration with the District's water supplies (see Chapter 3) to assess long-term water system reliability (see Chapter 5).

Several legislative changes were enacted since the District completed its 2015 UWMP. The new requirements must be addressed in the 2020 UWMP in addition to completing requirements from the prior statutory language. While there have been many changes, the critically important items the District must address are highlighted below:

- Provide quantified distribution system losses for each of the 5 preceding years. [CWC 10631(d)(3)(A) and (C)]
- Include a drought risk assessment (DRA) for a drought period that lasts five consecutive water years, starting from the year following the assessment, which would be 2021 for this round of UWMPs. The DRA requires a comparison of water supplies with total projected water use. Therefore, the District must estimate projected water use for the years 2021 through 2025 as part of the water use projections. [CWC 10635(b)]
- Conduct an annual water supply and demand assessment on or before July 1 of each year (following adoption of its 2020 UWMP) where the annual assessment includes current year unconstrained demand. The District will consider "unconstrained demand" as the expected water use in the upcoming year, based on historical unconstrained water use and other factors, before any projected response actions it may trigger under its Water Shortage Contingency Plan (see Chapter 6). [CWC 10632.1]

This Chapter is organized as follows:

- Current Customer Water Use – This subsection presents water use data reflecting the District's residential and non-residential customers for 2016 through 2019, a separate table for actual 2020 water use, and the District's distribution system losses and wholesale treated water deliveries to the City of Placerville for the same periods.
- Compliance with 2020 Urban Water Use Target – This subsection documents the derivation of the 2020 GPCD value and comparison to the 2020 GPCD target.
- Demand Management Measures – This subsection provides a narrative description of each water demand management measure implemented by the District over the past five years, and describes the District's planned measures for the foreseeable future.
- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable and non-potable water within the District's service area, including land-use classifications, unit demand factors, and estimation of distribution system losses. This subsection also estimates the variations in customer water use the District should expect during years with low precipitation, and discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the 5-year DRA and defining the "unconstrained demand" for purposes of the District's annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to California Water Code 10631.1.

4.1 Current Customer Water Use

As described in Chapter 2, the District serves potable water to about 42,350 customer connections. Water supplied to its customers is drawn from the District's multiple sources (see Chapter 3), treated at one of the water treatment plants, and delivered through an array of transmission and distribution pipelines to the customer's meter (see Figure 2-9). The current customer's recent and expected water use trends, and the District's on-going demand management efforts targeting these customers provide a foundational basis for this UWMP's water use forecast to 2045.

Furthermore, the actual water use in 2020 is the basis for determining the District's compliance with its 2020 gallons per capita per day (GPCD) target established in its 2015 UWMP. This subsection presents this relevant information.

4.1.1 Customer Water Use: 2015 to 2019

Recent customer water use can help the District understand water use trends, effects of temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary

restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. Water Code Section 10631(d)(1) also requires the District to quantify past customer water use.[44]

As described in Chapter 2, the District provides water service to several "zones" that are grouped within three primary service areas: El Dorado Hills region, Western region, and Eastern region. The relationship of zones within each service area is described in Chapter 2.

The District's service area includes retail potable water to urban uses, potable water to irrigated agricultural operations, wholesale potable water to the City of Placerville (City), and recycled water supplies to portions of the El Dorado Hills region. Tables 4-1(a) through 4-1(c) present the District's past retail customer water use by customer classification for 2015 through 2019 for each of its service regions. The District records water use within several primary categories, though each is not present in all three supply areas:

- Single-family residential – reflecting residential customers with indoor and outdoor water uses.
- Single-family residential - Dual – this classification reflects the customers in the El Dorado Hills region that receive potable water for indoor use and recycled water for outdoor irrigation use.
- Multi-family residential – reflecting multi-unit complexes with single water connections for multiple residences.
- Commercial and Industrial – including large and small retail, governmental services, small industry and other non-residential municipal uses.
- Commercial Landscape – reflecting dedicated irrigation meters for commercial facilities.
- Recreational Turf Services – reflecting primarily water used for parks, and recreational landscapes.
- Agricultural – including both "small farm irrigation" and "agricultural metered irrigation."
- Other Authorized Consumption – including temporary water use permits, bulk water stations, aesthetic flow requirements, system flushing, recycled water system supplementation, and other standard operational uses.
- Municipal – this is the classification for wholesale deliveries to the City of Placerville.

[44] California Water Code Section 10631(d)(1).

Table 4-1(a): EDH Region Retail Customer Use: 2015 to 2019 (values in acre-feet)

	2015	2016	2017	2018	2019
Single Family	6,383	6,974	7,652	7,779	7,517
Single Family - Dual	621	675	754	799	824
Multifamily	536	560	604	599	585
Agricultural Metered Irrigation	28	29	27	28	26
Small Farm	194	104	99	112	111
Commercial/Industrial	645	652	678	763	763
Commercial Landscape	580	616	673	700	680
Recreational Turf	583	587	612	605	572
Region Total	9,570	10,197	11,099	11,385	11,078

Table 4-1(b): Western Region Retail Customer Use: 2015 to 2019 (values in acre-feet)

	2015	2016	2017	2018	2019
Single Family	2,306	2,641	2,654	2,826	2,750
Multifamily	340	376	375	407	382
Agricultural Metered Irrigation	893	928	980	1,003	855
Small Farm	741	614	614	621	596
Commercial/Industrial	464	510	508	556	571
Commercial Landscape	53	59	59	68	68
Recreational Turf	165	171	170	179	166
Region Total	4,962	5,299	5,360	5,660	5,388

Table 4-1(c): Eastern Region Retail Customer Use: 2015 to 2019 (values in acre-feet)

	2015	2016	2017	2018	2019
Single Family	1,990	2,210	2,210	2,412	2,320
Multifamily	280	304	302	326	306
Agricultural Metered Irrigation	1,720	1,975	1,975	2,181	1,854
Small Farm	230	463	463	442	361
Commercial/Industrial	275	317	326	301	282
Commercial Landscape	23	22	22	37	28
Recreational Turf	64	85	85	113	95
Region Total	4,582	5,376	5,383	5,812	5,246

Table 4-2 provides a summary of the regional totals by customer classification. Table 4-3 provides the total use by region, as well as service to the City of Placerville, ditch customers served from the potable system, other authorized uses, and supplementation of the recycled water system.

Table 4-2: Total District Retail Customer Use: 2015 to 2019 (values in acre-feet)

	2015	2016	2017	2018	2019
Single Family	10,679	11,825	12,516	13,017	12,587
Single Family - Dual	621	675	754	799	824
Multifamily	1,156	1,240	1,281	1,332	1,273
Agricultural Metered Irrigation	2,641	2,932	2,982	3,212	2,735
Small Farm	1,165	1,181	1,176	1,175	1,068
Commercial/Industrial	1,384	1,479	1,512	1,620	1,616
Commercial Landscape	656	697	754	805	776
Recreational Turf	812	843	867	897	833
Subtotal	19,114	20,872	21,842	22,857	21,712

Table 4-3: Total District Potable Water Use: 2015 to 2019 (values in acre-feet)

	2015	2016	2017	2018	2019
EDH	9,570	10,197	11,099	11,385	11,078
West	4,962	5,299	5,360	5,660	5,388
East	4,582	5,376	5,383	5,812	5,246
Subtotal	19,114	20,872	21,842	22,857	21,712
City of Placerville	909	1,306	1,306	1,177	1,000
Ditch Service (Potable)	438	440	440	486	395
Other Authorized Use	1,780	1,874	1,906	2,573	2,564
Recycled Supplement	198	571	511	576	612
Total	22,241	25,063	26,005	27,669	26,283

This historic data also provides insight into the relative ratio of differing customer classifications to each other as well as seasonal variations. For instance, use across nearly all classifications was relatively consistent for 2017 through 2019. In contrast, the "Other Authorized Uses" increased in 2018 and 2019 and the City's use dropped slightly.

4.1.2 Customer Use in 2020

Customers served by the District are metered at their connection to the District's potable water distribution system. These metered values are collected bi-monthly for each customer account and summarized into annual reports prepared by the District and for reporting to the SWRCB Division of Drinking Water and to DWR.[45] The 2020 actual customer use presented in Table 4-4 represents the summarized delivery to all the District's potable municipal and agricultural customers. It does not,

[45] The annual SWRCB report is referred to as the 'electronic Annual Report' or eAR, and the annual DWR report is known as the Public Water System Statistics report.

however, include the distribution system losses inherent in a pressurized water delivery system that occur during the District's efforts to treat, store and deliver the water throughout the extensive distribution system to each customer's connection.

Table 4-4: Total District Potable Customer Use by Region: 2020 (values in acre-feet)

Use Category	EDH	Western	Eastern	Total
Single Family	8,574	3,216	2,616	14,406
Single Family - Dual	918	0	0	918
Multifamily	655	437	327	1,419
Agricultural Metered Irrigation	29	1,047	2,234	3,310
Small Farm	132	668	426	1,226
Commercial/Industrial	755	496	291	1,542
Commercial Landscape	780	88	36	904
Recreational Turf	617	193	109	919
Ditch Service (Potable)	-	15	508	523
City of Placerville	-	-	1,149	1,149
Subtotal	12,460	6,160	7,696	26,316

Further, comparing to the total values in Table 4-2, the 2020 annual single-family customer use is over 10% higher than the 2017 through 2019 average use, which was fairly equal across that time period. The Single Family-Dual customers saw a 15% increase, which is an increase in what is generally considered indoor use only.

While new customers in 2020 would account for some of the increase, the higher-than-average use is likely due to a combination of an increasing usage trend coming out of the last drought, complicated by the pandemic that dominated 2020 and the multiple advisories and even government-imposed restrictions that resulted in many people working from, learning from, or simply staying at home. This is apparent from the dual use customers where the water use reflects indoor use and the increase likely reflects an increase in the indoor use due to the pandemic.

4.1.3 Existing Distribution System Losses

Distribution system water losses (also known as "real and apparent losses") are the water losses from the District's water distribution system up to the point of delivery to the customer's system (e.g., up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association Method (Title 23 California Code of Regulations Section 638.1 et seq.). An electronic copy of the audit in Excel format is to be submitted to the Department by October 1 of each year for the prior year's estimated system losses, using DWR's online submittal tool pursuant to Code of Regulations Section 638.5.

The 2020 estimate has not been officially submitted to DWR as of the drafting of this UWMP but is estimated to be approximately 6,500 acre-feet over the year, or about 18% of the water entering the

distribution system. This value reflects real losses as well as apparent losses, such as from meter inaccuracies.

Table 4-5 presents the distribution loss – representing both real and apparent losses. These values are derived from calculating the total billed and unbilled water compared to the total diverted supplies.[46] As can be anticipated given the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. On average, however, the District's distribution system loss represents about 17% of the water entering the District's distribution system. The District is actively working to reduce transmission and distribution system real losses through pipeline and conveyance replacement, and apparent losses through meter replacement, and anticipates this value to significantly reduce over the planning horizon.[47] For purposes of this 2020 UWMP, the District is using an improved distribution loss factor of 12% beginning in 2025.

Table 4-5: Distribution System Loss: 2016 through 2020

2016	2017	2018	2019	2020
16.8%	17.4%	18.8%	16.8%	18.1%
			Average =	17.6%

4.2 Compliance with 2020 Urban Water Use Target

Pursuant to California Water Code Section 10608.24(b),[48] the District must demonstrate its 2020 water use met the GPCD target adopted in its 2015 UWMP. As set forth in the 2015 UWMP, the District's 2020 GPCD target was established as 241 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under California Water Code Section 10608.20(b). The District's 2020 actual GPCD must use the same methodology to derive "gross water use" for 2020, and then divide by the estimated 2020 population presented in Chapter 2.

As presented in the District's 2015 UWMP, gross water was determined to be the total water diversions entering the system at the various points (see Figure 2-8). This value corresponds to the total "All Sources" for 2020 as recorded by the District in its 2020 Water Diversion Report, which was reported at 36,221 acre-feet and reflects customer deliveries, and transmission and distribution system losses. This diversion value, however, includes deliveries to the City of Placerville as well as deliveries to the metered agricultural customer classification. Deliveries to these two classifications are removed from

[46] The District annually prepares a Consumption Report and Water Diversion Report. These reports were used as the source for calculating values in the table.

[47] The District is tracking the State Water Resource Control Board's efforts to set a new distribution system loss standard and intends to comply with future regulations. https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/water_loss_control.html

[48] 10608.24. (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

the total diversion value to derive the 2020 gross water use value.[49] As shown in Table 2-2, the District's population in 2020 was estimated to be 129,056. This results in a calculated 2020 compliance value of 208 GPCD, which is less than the District's established target. Thus, the District is in compliance with CWC Section 10608.24(b). The important compliance calculation parameters are summarized in Table 4-6.

Table 4-6: Demonstration of Compliance with 2020 GPCD Target[50]

2020 Volume into Distribution System =	36,221	acre-feet
City of Placerville =	1,148	acre-feet
Water Delivered for Agricultural Use =	5,059	acre-feet
2020 Gross Water Use =	30,014	acre-feet
2020 Population =	129,056	people
2020 Actual GPCD =	208	
2020 Target GPCD =	241	
Compliance Achieved?	Yes	

4.3 Demand Management Measures

Pursuant to California Water Code Section 10631(e), the District needs to provide a narrative discussion of the water demand management measures it has implemented, is currently implementing, and plans to implement. The historic and on-going measures can help the District understand the effectiveness of managing existing customer uses so as to help guide refinements, emphasis, or augmentation that will help position the District to best meet its to-be-established water use objective.[51] It should be noted that since the District is a retail and wholesale supplier it implements demand management measures with both its retail and wholesale customers.

The District's demand management measures are highlighted in this subsection.

[49] The Small Farm Irrigation classification was not removed as District supplies to this customer classification are similar to rural residential type uses and their use and population is part of necessary evaluation and long-term management of urban per-capita water use within the District.

[50] Absent the 2020 Census data, the population estimates presented in Chapter 2 are based upon connection and best available persons-per-household data. The resulting population is higher than the District has been using in its annual Comprehensive Annual Financial Report (CAFR) and other reporting, and thus the actual GPCD for 2020 may be lower than reported in CAFR. However, even if the CAFR population estimate of 113,234 were used, the resulting compliance GPCD would be 236 and in compliance.

[51] Beginning in 2023, all urban water suppliers will be required to begin reporting their use compared to a "Water Use Objective" that is being established pursuant to the recently enacted California Water Code Section 10609.20.

4.3.1 Foundational Demand Management Measures

This section describes the foundational demand management measures (DMMs) that underpin the District operations and customer deliveries. These particular DMMs represent adopted ordinances, policies, and long-standing budgeted conservation programs.

Water Waste Prevention Ordinances

The District prohibits water waste through the adoption of Board Policies and Administrative Regulations (AR). AR 1041 outlines baseline water waste regulations and AR 5011 has additional water waste regulations that apply during declared drought conditions. Full text of the regulations can be found on the District's website.[52]

Metering

All District retail customers are metered. Wholesale interconnections that supply the City are also metered, as are agricultural deliveries.

Conservation Pricing

The District's water rate structure is set to generate the necessary funds to efficiently operate the District's water system and maintain reliable water supplies. The District uses a base rate which varies depending on the size of the water meter and usage type. It also uses a 3-tier commodity rate based on usage rate for single-family residential customers, which increases as water use increases. Per cubic foot commodity charge rates also vary depending on usage type. The fee structure will continue to help customers manage their water use in an efficient manner. Under normal water supply conditions, this rate structure has effectively reduced customer water use.

Public Education and Outreach

The District engages its customer base with a number of conservation and demand management outreach programs. Promoting water wise activities, watering schedules, and educational programs such as protecting water supply, are part of the District's regular outreach efforts.

In addition to local public education and outreach programs, the District also participates in a regional public education and outreach program through the Regional Water Authority. The Regional Water Authority (RWA) is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, El Dorado, Yolo and Sutter counties. In collaboration with 19 water provider members and other wastewater, stormwater and energy partners, RWA formed the Water Efficiency Program (WEP) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities. The main function of the WEP is to develop and distribute public outreach messages to customers in the region by

[52] https://www.eid.org

collaborating with its water provider members. Additionally, the RWA Be Water Smart website[53] offers a comprehensive set of resources for individuals, educators and organizations. The 2020 Be Water Smart End-Year Recap report and detailed information about the regional WEP program, including a table of Regional Rebates and Installations from 2016-2020 is available on the RWA website.[54]

Programs to Assess and Manage Distribution System Real Loss

The District's water loss assessment and management program includes annual water audits and an ongoing repair plan. This includes an ongoing meter calibration and replacement program for all production and distribution meters. The District's activities include:

- Annual water audit and water balance
- Production meter data collection and validation
- Repair in the District distribution system

Water Conservation Program Coordination and Staffing Support

Implementing and monitoring the District's water efficiency activities is managed by 2 full-time water use efficiency staff members in the District's Customer Service Division. Water Efficiency staff provide complimentary in-person and customized recommendations through water wise house or business calls as well as the Irrigation Management Service for our commercial agricultural customers. Also offered are various complimentary water saving devices, educational materials and rebates for approved water saving upgrades. The District's website offers a link to a sprinkler scheduler application to generate your own unique watering schedule and an interactive plant database of native and drought-tolerant plants.

4.3.2 Recent DMM Activities

The District implements a robust suite of other demand management measures, both within the District and as a part of the RWA WEP. The District's water efficiency programs are available and tailored to both residential and commercial customers. Table 4-7 describes DMM activities from 2016 through 2020. Detailed information can be found on the District's water efficiency webpage.[55]

4.3.3 Planned DMM Activities

In its commitment to ongoing water efficiency and proactive demand management activity, the District is developing a new set of programs and actions, which will be used to achieve water use objectives in compliance with California Water Code Section 10609.20.

[53] https://bewatersmart.info/
[54] https://rwah2o.org/2019-water-efficiency-program-annual-report-available/
[55] https://www.eid.org/customers/water-efficiency

Table 4-7: Recent Demand Management Measures

Demand Management Measure	Description
Water Efficiency Rebates	$100 per service account for qualifying water efficient devices.
Complimentary Devices	Low-flow faucet aerators, pre-rinse spray nozzles, showerheads, toilet tank dams or bags to reduce flush volume, toilet flappers (3-inch) garden hose shut-off nozzles, moisture meters.
Water Wise Business Calls	Site visits with recommendations for ways to save water and money both inside and outside. Leak detection, plumbing retrofits, irrigation system improvements.
Toilet Leak Detection Supplies	Dye packets, complimentary toilet flappers, low flow plumbing fixtures.
Home Landscape Water Surveys	Personalized water efficiency evaluations and advice covering both indoor and outdoor water use.
Enforcement of State Water Board Prohibited Activities	Permanent potable water use restrictions
Irrigation Management Service (IMS)	Assists commercial agricultural customers by providing suggested irrigation run times based off of gathered soil moisture content readings.

4.4 Forecasting Customer Use

Forecasting future water demands begins with an understanding of existing customer demands and trends, recognizing the additional customers expected through growth, and considering the factors that will influence the water use of both existing and new customers well into the future – especially factors that directly affect the efficiency of water use.

Pursuant to California Water Code 10610.4(c), an urban water supplier "*shall be required to develop water management plans to actively pursue the efficient use of available supplies*." One challenge from this directive is reflecting how the pursuit of efficient use is best represented in the forecast water uses that are the cornerstone of good planning. As required by the Act, the future water uses of both existing customers and those added over the planning horizon should reflect the "efficient use" of water.

4.4.1 Representing Current Customer Water Use

Table 4-2 and Table 4-4 provided the actual customer water use for 2016 through 2020 by classification. From this information, an estimate of the representative "current" water use by existing customers has been developed. Knowing that actual use by existing customers varies slightly year-to-year based on a variety of factors (e.g., total rainfall and the timing of spring rain events impacting when landscape irrigation may begin), the recent data provides a basis for estimating current water use. The 2020 customer use data is used as a conservative proxy for "current" water use for each customer classification, which allows a baseline from which to estimate the future use of these existing customers. For purposes of the proxy estimate, the 2020 conditions may be conservatively high for existing customers when compared to the recent averages for 2017 through 2019 – even when considering

some growth. But the District also has a desire to conservatively assure long-term water system reliability (see Chapter 5), thus the demand from 2020 is a useful proxy. The result is a proxy for "current" water use for each customer classification, which allows a baseline from which to estimate the future use of these existing customers.

This target total 'current water demand' was then estimated using customer-type demand factors and 2020 connection data by classification (see Table 2-1) to generate a comparable estimate. This representative water use for current conditions provides the foundation for estimating the future needs of these existing customers. Table 4-8 provides the representative annual current water use, excluding distribution system losses.[56]

Table 4-8: Representative Current Annual Retail Potable Water Use (acre-feet)

	EDH	Western	Eastern	Total
Single Family	8,570	3,210	2,620	14,400
Single Family - Dual	840	0	0	840
Multifamily	660	440	420	1,520
Commercial/Industrial	680	500	230	1,410
Commercial Landscape	780	90	40	910
Recreational Turf	690	190	110	990
Agricultural Metered Irrigation	[These are not separated by region for forecast]			3,300
Small Farm				1,200
Ditch Service (Potable)				520
City of Placerville				1,150
Region Total				26,240

In addition to the potable water use, the District has a long history of serving recycled water to both residential and non-residential customers. Table 4-9 shows the current recycled water use categories and quantities and a proxy value reflecting a rounding of recent use to accommodate annual variations.

Table 4-9: Representative Current Recycled Water Use

Classification	# of Services	Annual Acre-feet	
		2020 Use	Proxy
Commercial/Industrial	169	989	990
Recreational Turf	12	493	490
Single Family - Dual	5,212	2,439	2,450
Distribution System Loss		310	310
Total		4,231	4,240

[56] The values in Table 4-8 will not exactly match the reported 2020 use in Table 4-4 as these values represent approximations using unit demand factors that are used during forecasting in the following sections.

4.4.2 Factors Affecting Future Customer Use

There are several factors that affect the forecast of future customer use, ranging from State and local landscape regulations, building code requirements, other water-use mandates, and changes in the types of housing products being offered. These factors are incorporated into determining appropriate per-dwelling unit or per customer connection water demand values for use in forecasting future water needs. Relevant characteristics of the factors are described here.

Water Conservation Objectives

In 2009, Governor Arnold Schwarzenegger signed Senate Bill No. 7 (SBX7-7), which established a statewide goal of achieving a 20 percent reduction in urban per capita water use by 2020 for urban retail water suppliers.[57] As presented previously, the District has met this mandated target.

Furthermore, the efforts undertaken by the District and its customers to meet these targets, as well as efforts throughout the State by other urban retail suppliers, have changed the availability and use of appliances, fixtures, landscapes and other water using features, through changes or additions to ordinances and/or through a continuing "conservation ethic."

In response to the recent multi-year drought conditions, Governor Brown issued Executive Order B-37-16 in May 2016 entitled "*Making Water Conservation a California Way of Life*." In May 2018, Governor Brown signed into law SB 606 and AB 1668, which imposed additional statutory requirements above and beyond the 20 percent by 2020 target reflected in the 2009 legislation. This is expected to result in continued efforts to increase water use efficiency, reduce water losses, and ultimately to reduce water demands of existing water users and continue to influence the expected demands of future water users.

Requirements in California Code

Beginning in January 2010, the California Building Standards Commission adopted the statewide mandatory Green Building Standards Code (hereafter the "CAL Green Code") requiring the installation of water-efficient indoor and outdoor infrastructure for all new projects starting January 1, 2011. The CAL Green Code was incorporated as Part 11 of the Title 24 of the California Code of Regulations, and was revised in 2013 and in 2016 to address changes to the State's Model Water Efficient Landscape Ordinance ("MWELO") adopted during the drought.[58] Revisions to the CAL Green Code in 2019 modified sections to direct users to MWELO regulations contained in other regulatory sections.[59]

The CAL Green Code applies to the planning, design, operation, construction, use and occupancy of every newly constructed or remodeled building or structure. All new residential and non-residential

[57] California Water Code § 10608.20.

[58] The 2016 Triennial Code Adoption Cycle consisted primarily of the MWELO updates adopted in response to the drought. Indoor infrastructure changes were limited to some minor non-residential fixture changes and changes to the voluntary Tier 1 and Tier 2 requirements. Additionally, the Code was updated to match the new Title 20 Appliance Efficiency Regulations.

[59] The 2019 updated sections to direct CAL Green code users to Title 23 of the California Code of Regulations to allow Title 23 to be the sole location of MWELO requirements.

customers must meet the water use requirements of the CAL Green Code as well as the outdoor requirements described by MWELO. The CAL Green Code's requirements generally manifest through: (1) installation of plumbing fixtures that meet the 20 percent reduced flow rate specified in the CAL Green Code, or (2) by demonstrating a 20 percent reduction in water use from the building "water use baseline."[60] Future customers are expected to satisfy one of these two requirements through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, on-demand water heaters, or other fixtures, as well as Energy Star and California Energy Commission-approved appliances.

California Model Water Efficient Landscape Ordinance and County Ordinance

The Water Conservation in Landscaping Act was enacted in 2006, and has since been revised and expanded multiple times by DWR resulting in today's MWELO.[61] In response to Governor Brown's executive order dated April 1, 2015, (EO B-29-15), DWR updated the MWELO and on July 15, 2015 the California Water Commission approved the adoption and incorporation of the updated State standards for MWELO. MWELO requires a retail water supplier or a county to adopt the provisions of the MWELO or to enact its own provisions equal to or more restrictive than the MWELO provisions. El Dorado County uses the State's standard.

The changes included a reduction to 55 percent of reference evapotranspiration rates for the maximum amount of water that may be applied to residential landscapes, and non-residential projects to 45 percent, which effectively reduces the landscape area that can be planted with high water use plants, such a turf. For residential projects, the allowable maximum coverage of high-water use plants is reduced to 25% of the landscaped area (down from 33%). The newly updated MWELO also now applies to new construction with a landscape area greater than 500 square feet (the prior MWELO only applied to landscapes greater than 2,500 square feet).[62] The County reviews all new development for conformance with these standards.

Metering, Volumetric Pricing, and Water Budgets

California Water Code section 525 requires water purveyors to install meters on all new service connections after January 1, 1992. California Water Code Section 527 requires water purveyors to charge for water based upon the actual volume of water delivered if a meter has been installed. This action alone is not expected to substantially reduce water use. However, it is anticipated that the retail billing system will encourage and help maintain reasonable use (e.g., through implementation of a tiered rate structure and/or water budgets), so that individual customer water demands are reasonably

[60] See CAL Green Code. For Residential construction, Section 4.303.1 provides the residential water conservation standard and Table 4.303.2 identifies the infrastructure requirements to meet this standard. Table 4.303.1 and Worksheets WS-1 and WS-2 are to be used in calculating the baseline and the reduced water use if Option 2 is selected. For non-residential construction, Section 5.303.2.3 provides the water conservation standard as well as the baseline and reduced flow rate infrastructure standards. Note that Worksheets WS-1 and WS-2 incorporate both residential and non-residential fixtures, yet the water use is still to be analyzed by "building or structure" as specified in Chapter 1, Section 101.3.

[61] Gov. Code §§ 65591-65599

[62] CCR Title 23, Div. 2, Ch. 27, Sec. 490.1.

not expected to increase over time. The District is fully metered and has implemented volumetric pricing.

4.4.3 Customer Water Use Forecast

The following subsections detail the assumptions used to forecast customer water use and gross water needs for the District's water service area, separated into the needs of (a) existing potable water use customers, (b) new potable water use customers, and (c) recycled water users.

Existing Customer Future Use

To be conservative and assure the analysis of water system reliability is adequate (see Chapter 5) for future demands of existing customers, the District is maintaining the annual "current" retail customer potable water use as shown in Table 4-8. This amounts to a total annual potable demand of about 26,240 acre-feet, with a total diversion for potable needs of about 31,000 acre-feet when considering system loss. When adding the other allowed potable uses including, the District's ditch customers served from the potable system, other authorized uses, and recycled water supplementation, the overall diversion increases to over 36,000 acre-feet.

While these existing customers may undertake a variety of efficiency measures – actively through decisions to modify a behavior or a water use, or passively through the purchase of appliances and fixtures that simply use less water – they may also maintain their use as-is. Holding the current use as a constant for all existing customers into the future will provide a conservative number that can be re-evaluated prior to the 2025 UWMP and the compliance with forthcoming water use objectives.[63]

New Retail Potable Municipal Customer Future Use

Chapter 2 detailed the District's anticipated new residential and non-residential growth over the 2020 UWMP planning horizon. This growth provides the basis for the estimated future customer water needs. The District anticipates these new customer connections will be built in accordance with all applicable building codes including the Cal Green Code discussed previously, and relevant District regulations.

Distinct demand factors are provided for each of the customer types in each region. These values are derived from adjustments to the District's existing customer-based demand factors, while considering the effects of the aforementioned factors affecting per-connection water use.

- The single family use factors reflect a 15% lower value than existing customer use for each region. These lower factors are expected to be consistent with new homes built to CalGreen Code and the newer MWELO standards.

[63] Per California Water Code Section 10609.20, urban water suppliers shall calculate a water use objective composed of, among other factors, aggregated efficient indoor water use based upon standards of no more than 55 gpcd.

- The multi-family use factor uses the existing multi-family use factor estimated for the EDH region. This is calculated by dividing the total multi-family water sector water use by the total multi-family units using the 2020 data from the District's Consumption Report.
- The commercial/industrial demand factor represents a wide array of different uses from neighborhood retail centers, to large retail centers, to office and government buildings, to light and even heavy industrial uses. To reflect this variety, each new commercial/industrial connection is assumed to use of 1 acre-foot. The District's current customers in this classification have average annual use in this range within the three supply regions.
- The commercial landscape factor is an estimate to represent likely landscaping associated with non-residential land uses, other than recreational facilities. A value of 1 acre-foot per connection is assumed. The District's current users in this classification average between 1 and 3 acre-feet. New connections, however, will be subject to the MWELO requirements of non-residential landscaping. This is expected to result in lower use per connection than current customers.
- The recreational turf factor assumes one connection per acre, even though one connection may serve a recreational facility larger than one acre (e.g., a community park). This classification includes passive and active parks, golf courses, and other recreational facilities. A unit demand factor of 85% of the reference evapotranspiration rate (ETo) is used, which represents a practical blend of the MWELO Special Landscape Allowance equivalent to the ETo for recreational turf, combined with the lower ETo factor of 45% of ETo for non-turf areas and no water demand for play structures, pathways and other hardscape areas. Using ETo of approximately 48 inches across the entire District service area, this results in a per-acre demand factor of 3.5 acre-feet per year.

The per-connection factors for the District's existing customers and the related factor for the new customers are provided in Table 4-10.

Table 4-10: Municipal Customer Water Use Factors (acre-feet per connection per year)

	Existing Customer (per connection)			New Customer		
	EDH	Western	Eastern	EDH	Western	Eastern
Single Family	0.51	0.48	0.29	0.44	0.41	0.25
Single Family - Dual (indoor)	0.16	Not Applicable		Not applicable. New customers are assumed to be full potable.		
Single Family - Dual (outdoor)	0.47					
Multifamily	0.18	0.22	0.21	0.18		
Commercial/Industrial	1.29	1.02	0.97	1.0		
Commercial Landscape	2.89	0.97	1.33	1.0		
Recreational Turf	12.3	6.43	5.45	3.5 (per acre)		

Future Non-Potable Use

As presented in Chapter 2, the District has an extensive recycled water delivery system in the EDH region. As presented in Table 4-9, the District currently serves three recycled water customer types, with the residential customers the largest, with all use averaging about 4,200 acre-feet annually.[64] The District does not expect any significant expansion of recycled water connections in the planning horizon.

Other Growth (City and Agricultural Uses)

The District also anticipates minor growth of potable supplies to its agricultural customers. For this UWMP, growth estimates for agricultural uses, including metered agriculture, small farms and potable ditch customers, are estimated to be 0.6% per year (3% per 5 years) based on historical growth trends in these categories, through the planning horizon.

For the City of Placerville, the District anticipates the City to add approximately 480 additional connections through 2045, based upon information detailing projected growth within the City.[65]

4.4.4 Summary of Forecast Water Use

Based upon the estimated water use of the existing and new customers, the District anticipates a continued increase in potable water use over the planning horizon. Table 4-11 presents the resulting customer water use forecast. Values in the table have been rounded to the nearest 10 acre-feet to recognize the approximate nature of this forecast. This information will be used to evaluate the District's water system reliability in Chapter 5.

[64] As discussed previously, about 3,500 acre-feet of this is recycled water with the remainder supplemental water diverted from the potable system into the recycled water system.

[65] https://www.sacog.org/sites/main/files/file-attachments/appendix_d_-_land_use_documentation_0.pdf?1573685694 (p. 60)

Table 4-11: Forecast Future Water Use (values in acre-feet per year)

Land-class		2025	2030	2035	2040	2045
Existing Potable Uses	Single Family	14,400	14,400	14,400	14,400	14,400
	Single Fam. (dual potable)	840	840	840	840	840
	Multi-family	1,520	1,520	1,520	1,520	1,520
	Commercial (all)	2,320	2,320	2,320	2,320	2,320
	Recreational Turf	990	990	990	990	990
	City of Placerville	1,150	1,150	1,150	1,150	1,150
	Subtotal	21,220	21,220	21,220	21,220	21,220
New Customers	EDH Region	580	1,210	1,830	2,480	3,170
	Western Region	100	180	260	340	420
	Eastern Region	200	360	530	700	870
	City of Placerville	10	40	70	140	140
	Subtotal	890	1,790	2,690	3,660	4,600
Total Municipal		22,110	23,010	23,910	24,880	25,820
Other	Other Authorized Uses/Recycled Water Supplementation	3,300	3,300	3,300	3,300	3,300
	Agriculture (potable)	5,210	5,360	5,510	5,660	5,810
	Distribution System Loss	4,120	3,860	3,960	4,050	4,150
Total Potable Demand		34,740	35,530	36,680	37,890	39,080
Recycled	Single Family - Dual (landscape)	2,450	2,450	2,450	2,450	2,450
	Commercial	990	990	990	990	990
	Recreational Turf	490	490	490	490	490
	Distribution System Loss	310	310	310	310	310
	Total Recycled Demand	4,240	4,240	4,240	4,240	4,240
Total District Demand		38,980	39,770	40,920	42,130	43,320

4.4.5 Adjusting Water Use Forecasts for Single Dry Year and Multiple Dry Year Conditions

The demand forecasts presented in the prior subsection represent expected water needs under normal hydrologic conditions. To accurately forecast potential maximum future water use, the forecasted normal-year water uses must be modified to reflect anticipated increases in demand during drier conditions.

Conservative modifications to the forecasted normal year water use to more likely reflect use conditions during dry years are warranted to help adequately address water service reliability in Chapter 5. For purposes of this 2020 UWMP, the following adjustments were made:

- Single dry year: Landscape irrigation needs would increase to reflect the generalized earlier start of the landscape irrigation season due to limited rainfall in a single dry year. Since this increase only applies to the outdoor portion of a customer's forecast use, an adjustment factor of 5% is applied to the total normal-year forecasts to conservatively reflect the expected increase in water demand for landscaping. This adjustment reflects rudimentary relationships between historic use variances and other conditions, and is meant only to highlight the anticipated increase in demands for purposes of District planning.

- Multiple dry years: During multiple dry years, demands are also expected to increase similar to the single dry year. For multiple dry year conditions, the single dry year increase of 5% is held in each of the subsequent years. This is representative of an "unconstrained demand" as should be represented when evaluating whether Water Shortage Contingency Plan actions may be warranted.[66]

These values are reflected in tables provided for the Drought Risk Assessment and Annual Reliability Assessment presented in later subsections.

4.4.6 Climate Change Considerations

Including climate change analysis into a water use analysis will assist the District in understanding the potential effects on long-term reliability, which in turn, allows the District to proactively begin planning appropriate responses. For example, hotter and drier weather may lead to an increased demand in landscape irrigation, especially during spring and fall months, increasing the pressure on water supplies that may have availability restrictions during these periods.

This potential is reflected in the consideration of the single dry year increase of 5% that is used for the water service reliability analysis, as discussed previously. Whether the elevated single dry year water forecast becomes more akin to the "normal" demand will become more apparent in the future as the District continues to assess monthly water use trends throughout its service area.

4.5 Forecasting Water Use for the DRA and Annual Assessment

The California Legislature created two new UWMP requirements to help suppliers assess and prepare for drought conditions: The Drought Risk Assessment,[67] and the Annual Water Supply and Demand Assessment.[68] These new planning requirements were established in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change.

[66] California Water Code Section 10632(a)(2) states water suppliers should use "unconstrained demand" when performing their annual water supply and demand assessment.
[67] California Water Code Section 10635(b)
[68] California Water Code Section 10632.1

The Drought Risk Assessment (DRA) requires assessing water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water demands, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

As a slight variant, the Annual Water Supply and Demand Assessment (Annual Assessment) undertakes a similar analytical exercise as the DRA but is designed to focus on actual, and not hypothetical, conditions anticipated for the upcoming water year. The previously presented water use forecasts facilitate both of these planning exercises as described in the following subsections.

4.5.1 Projecting Water Use for 5-year Drought Risk Assessment

A critical component of new statutory language for the 2020 UWMP cycle is the requirement to prepare a five-year DRA using a supplier-defined hypothetical drought condition expected to occur from 2021 through 2025. This drought condition is meant to allow suppliers to test the resiliency of their water supply portfolio and their Water Shortage Contingency Plan (WSCP) actions to meet severe conditions.

DWR recommends that suppliers first estimate expected water use for the next five years without drought conditions (also known as unconstrained demand). In other words, unconstrained demand is water demand absent any water supply restrictions and prior to implementing any short-term WSCP demand reduction actions. If normal water use includes water conservation programs, either currently implemented or planned for implementation, estimated water use values would incorporate the effect of those conservation programs when reporting projected water use during this period.

Total water use for 2021, for example, is developed by modifying the water use representation for "current" conditions (see Table 4-8) taking into consideration the anticipated factors affecting water use, with each subsequent year further adjusted, as appropriate. Year-to-year adjustments reflect several factors the District anticipates may occur, including increases from growth. To make these adjustments, the difference in annual water use between the "current" condition and the forecast potable use in 2025 is prorated equally across each of the years 2021 through 2025, so that the same 2025 forecast water use is matched.

With an initial annual estimate, each year is further adjusted to reflect anticipated increases in the "unconstrained demand" during a single dry year. As noted previously, this is reflected by applying a 5% increase to the total potable water use forecast. For instance, the normal year 2021 estimated use is increased by 5% to represent an unconstrained demand during a dry year. The resulting forecast use for 2021 through 2025 is shown in Table 4-12.

Table 4-12: Forecast DRA Water Use for 2021 through 2025 (acre-feet per year)

	2021	2022	2023	2024	2025
Total Municipal Use	21,520	21,940	22,360	22,780	23,220
Total Agricultural and Other (including losses)	12,410	12,620	12,830	13,040	13,260
Total Potable Use	33,930	34,560	35,190	35,820	36,480
Total Recycled Water Use (including losses)	4,450	4,450	4,450	4,450	4,450
Total Water Use in Service Area	38,380	39,010	39,640	40,270	40,930

4.5.2 Projecting Water Use for Annual Assessments

The District will need to perform an Annual Assessment and submit the findings to DWR beginning in 2022. To evaluate the plausible water service reliability conditions for 2021 or 2022 as described in Chapter 5, requires two separate representative "current" water use conditions to be developed. The first condition uses the "current" water use characterization included in Table 4-8 plus system losses. These demands represent the water use under a normal condition. Alternatively, a "single-dry year current" forecast is also calculated to provide the District with representative current unconstrained demands. This second characterization of current water use applies the same single-dry year adjustment described previously, represented by a 5% increase in the current water use values. Table 4-13 provides the Normal Year and Single Dry Year current water use for the District's water service area.

Table 4-13: Normal and Single Dry Year "Current" Water Use (acre-feet)

	Normal	Single-Dry
Total Municipal Use	20,070	21,070
Total Agricultural, City of Placerville and Other Uses (including losses)	11,600	12,180
Total Potable Use	31,670	33,250
Total Recycled Water Use (including losses)	4,240	4,450
Total Water Use in Service Area	35,910	37,700

4.6 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, retail suppliers are required to include the projected water use for lower income households in 2020 UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household has an income below 80 percent of area median income, adjusted for family size. For purposes of this UWMP, annual median income was derived from 2019 U.S. Census Bureau and determined to be about $83,400 for the District. Therefore, 80% of this median income is estimated to be about $67,000 per year. According to the detailed data, approximately 40% of the households in the District's service area earn at or below this 80-percentile income.

For purposes of estimating the future water needs, 40% of the total single-family and multi-family connections are presumed to represent disadvantaged households. Applying this condition to the forecast water use for the entire District results in the estimate provided in Table 4-14. However, according to the State of California's designations, there are only a very limited number of disadvantaged communities within the District's Retail service area.[69]

Table 4-14: Estimated Low-Income Water Use Forecast (values in acre-feet)

	2025	2030	2035	2040	2045
Total Retail Treated	38,980	39,770	40,920	42,130	43,320
Low Income	7,520	7,880	8,240	8,628	9,004
% of treated	19.3%	19.8%	20.1%	20.5%	20.8%

[69] https://gis.water.ca.gov/app/dacs/

Chapter 5
Water System Reliability

This chapter provides the El Dorado Irrigation District's water system reliability findings as required under Water Code Section 10635 and provides reliability information that the District may use in completing an annual supply and demand assessment pursuant to Water Code Section 10632.1.

Assessing water service reliability is the fundamental purpose for the District in preparing its 2020 UWMP. Water service reliability reflects the District's ability to meet the water needs of its customers under varying conditions. The District's 2020 UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact the District's water supply and its customers' water uses. The reliability assessment looks beyond past experience and considers what could be reasonably foreseen in the future. This chapter synthesizes the details imbedded in Chapters 3 and 4, and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents three system reliability findings:

- Five Year Drought Risk Assessment: The 2021 through 2025 Drought Risk Assessment (DRA) for the District's service area.
- Long-Term Service Reliability: The reliability findings for a normal year, single dry year, and five consecutive dry years in five-year increments through 2045.
- Annual Reliability Assessment: The reliability findings for an existing condition for both a normal year and single dry year that can inform an annual supply and demand assessment for 2021 or 2022.

The analysis shows the District has reliable water supplies available for its service area through 2045.

5.1 Five Year Drought Risk Assessment

The Drought Risk Assessment is a new requirement for the 2020 UWMP cycle. The DRA requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years.

The District maintains ample water supplies to meet current and growing customer demand. Specifically, with an array of surface water assets that can be flexibly managed in a single year and across multiple years (see Chapter 3), the District can maintain reliability during drought conditions. Nevertheless, the District continues to encourage its customers to use water efficiently and continues to see lowering per-capita water use (see Chapter 4).

Although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California, or State-ordered curtailment of water rights, may require the District to reduce its water service to its customers.

Table 5-1 below shows the District's DRA that integrates its supplies for 2021 through 2025 as described in Chapter 3, and reflects the dry year unconstrained water uses described in Chapter 4. As the table shows, the District has sufficient water assets available in all years.

Table 5-1: Five Year Drought Risk Assessment (values in acre-feet)

	2021	2022	2023	2024	2025
Supply	63,400	59,400	55,300	55,300	55,300
Demand	38,380	39,010	39,640	40,270	40,930
Difference	25,020	20,390	15,660	15,030	14,370

5.2 Long Term Service Reliability

The Urban Water Management Planning Act directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2020 UWMP Guidebook recommends extending that period to twenty-five (25) years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The following subsections describe the long-term water service reliability through a 25-year planning horizon.

5.2.1 Long Term Service Reliability

The District's long term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2020 through 2045.

Normal and Single Dry Conditions 2025-2045

The District's future water supplies in normal and single dry conditions reflect the same conditions described for the DRA and as detailed in Chapter 3. Specifically, the District has sufficient and reliable water supplies to meet forecasted customer water needs through 2045 considering water use forecasts for both normal and dry conditions. The customer use information is detailed in Chapter 4 and reflected in the numbers shown in the tables below.

Table 5-2 shows the normal year and single dry year supplies and demands from 2025 through 2045.

Table 5-2: Normal and Single Dry Year Water Supply and Demand through 2045 (values in acre-feet)

Normal Year	2025	2030	2035	2040	2045
Supply	70,800	70,800	78,300	78,300	78,300
Demand	38,980	39,770	40,920	42,130	43,320
Difference	31,820	31,030	37,380	36,170	34,980

Single Dry Year	2025	2030	2035	2040	2045
Supply	63,400	63,400	67,100	67,100	67,100
Demand	40,930	41,760	42,970	44,240	45,490
Difference	22,470	21,640	24,130	22,860	21,610

Five Consecutive Dry Years 2025 – 2045

The Districts surface water supplies have constraints in dry years, but are manageable over time such that they are considered reliable. However, although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California, or State-ordered curtailment of the District's water rights, may require the District to reduce its water service to its customers. Nevertheless, the District assumes that these conditions that would require reduced water supply availability to the District's customers do not manifest in assessing the supply availability in the future.

The District also assumes that dry year water use conditions would remain unconstrained during the dry years, causing a slight increase in the actual water need of the District's customers. This characterization of water demands provides a conservative estimation of demand conditions in a five year drought scenario. Together, the supply availability as paired against the slightly increased demand conditions demonstrate that the District has sufficient supplies to meet five consecutive dry year conditions through 2045.

Table 5-3 below shows the annual water supply and demand conditions in five consecutive dry years from 2025 through 2045. Actual supply and demand conditions experienced during a multi-year drought could vary from the representations presented here and as described in detail in Chapter 3 and Chapter 4.

Table 5-3: Five Consecutive Dry Years Water Supply and Demand through 2045 (values in acre-feet)[70]

		2025	2030	2035	2040	2045
Year 1	Supply	63,400	63,400	63,400	63,400	63,400
	Demand	40,930	41,760	42,970	44,240	45,490
	Difference	22,470	21,640	20,430	19,160	17,910
Year 2	Supply	59,400	59,400	63,100	63,100	63,100
	Demand	41,100	42,000	43,220	44,490	45,490
	Difference	18,300	17,400	19,880	18,610	17,610
Year 3	Supply	55,300	55,300	56,600	56,600	56,600
	Demand	41,270	42,240	43,470	44,740	45,490
	Difference	14,030	13,060	13,130	11,860	11,110
Year 4	Supply	55,300	55,300	56,600	56,600	56,600
	Demand	41,440	42,480	43,720	44,990	45,490
	Difference	13,860	12,820	12,880	11,610	11,110
Year 5	Supply	55,300	55,300	56,600	56,600	56,600
	Demand	41,610	42,720	43,970	45,240	45,490
	Difference	13,690	12,580	12,630	11,360	11,110

5.3 Annual Reliability Assessment

The District will consider current supply and demand conditions and perform an annual water supply and demand assessment (Annual Assessment) pursuant to Water Code Section 10632.1 to evaluate real-time or near-term circumstances that are different than the DRA scenario. This assessment would evaluate actual current water supply and use conditions, including the potential for state-imposed curtailments on water rights. For purposes of this UWMP, the "current" water use conditions as described in Chapter 4 are compared to the availability of the District's existing water supplies as described in Chapter 3. Two scenarios are illustrated:

- Normal Year condition: reflecting the availability of supplies under normal conditions and the "current" water uses
- Single-Dry Year condition: reflecting the availability of supplies under a single-dry year and elevated "current" water uses reflecting increased demands expected in a single dry year.

5.3.1 Normal Year Supply and Current Water Use

The District's current normal year water supply and demand conditions represent the expected water supply and demand conditions that would likely occur based upon a reasonable assessment of regional and statewide hydrology and limited regulatory constraints. Under these conditions, the District anticipates that its access to its current surface water supplies would be fully available.

The District's characterization of current water use conditions represent a historical assessment of water use within the District, as well as reasonable characterizations of growth and potential customer use

[70] The demand in intervening years between each 5-year increment is prorated such that the forecast use in the next 5-year increment is evenly spread among the intervening years.

patterns. The combination of these considerations present a normal water year use assessment that is incorporated into this reliability determination. Water use in normal conditions are generally lower in wetter months and higher in drier months. The demands also account for reasonable water conservation measures for existing and future customers derived from improved efficiencies in indoor fixtures, improved management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. These water use conditions are described in significant detail in Chapter 4. Table 5-4 below shows the 2021 normal year water supply and demand conditions for the District's service area.

Table 5-4: Current Normal Year Water Supply and Demand (values in acre-feet)

Normal Year	Current
Supply	70,800
Demand	35,910
Difference	34,890

5.3.2 Single Dry Year Supply and Dry-Year Current Demand

The District defines a single dry year condition as one that may result in reduced water supply availability depending on each source, as noted in 5.2.1. Nevertheless, the District's water supplies are reliable in single dry year conditions as described in Chapter 3.

Single dry year demands include the anticipated demands based upon historical trends in water usage in dry conditions by the District's customers. Water use in dry conditions may increase in the normally wetter months as limited rainfall cause an increase in customer uses for outdoor irrigation. These conditions are described in Chapter 4 and reflected in the tables below. Table 5-5 below shows the single dry year water supply and demand conditions.

Table 5-5: Current Single Dry Year Water Supply and Demand (values in acre-feet)

Single Dry Year	Current
Supply	63,400
Demand	37,700
Difference	25,700

5.4 Water Supply Reliability Summary

The District's water supply portfolio is capable of meeting the water uses in its service area in normal, single dry, and five consecutive dry years from 2020 through 2045.

Chapter 6
Water Shortage Contingency Plan

The District has updated its Drought Action Plan (Plan) in conjunction with this 2020 Urban Water Management Plan. The updated Plan was adopted on June 14, 2021 and subsequently included in the UWMP as the Water Shortage Contingency Plan for purposes of the public hearing on June 28, 2021. The District's updated 2021 Plan complies with Section 10632 of the California Water Code (CWC), which lists new requirements for urban water suppliers regarding development of a Water Shortage Contingency Plan. The District's updated Plan serves as a work plan for District staff and customers, and includes detailed actions for management of the District's water supplies and customer water demands during periods of temporary supply shortage. The updated Plan is included in the District's 2020 UWMP as Appendix A.

The District has recently updated a Local Hazard Mitigation Plan (LHMP), which includes an assessment of seismic risk.[71] The LHMP assesses vulnerability and risk and identifies the "Likelihood of Occurrence" for an earthquake as "Possible" (between one and ten percent annual probability), with the potential impact identified as "Minor".[72] Pursuant to CWC Section 10632.5(c), the District will submit to DWR the LHMP as part of the UWMP submittal process.

[71] The Local Hazard Mitigation Plan Revision 3.1 Revision Date: March 27, 2019, is available from the District upon request.

[72] EID's Local Hazard Mitigation Plan defines "Minor Potential Impact" as, "very few injuries, if any. Only minor infrastructure, roadways and transportation facility damage and minimal disruption on quality of life. Temporary shutdown of facilities."

Appendix A
Drought Action Plan

A.1 El Dorado Irrigation District Drought Action Plan

The El Dorado Irrigation District Board of Directors adopted the Drought Action Plan on June 14, 2021. A copy is included on the following pages.

El Dorado Irrigation District

DROUGHT ACTION PLAN

2021 UPDATE

PURPOSE. This Drought Action Plan serves as a detailed work plan for El Dorado Irrigation District staff and our customers, not only during drought conditions, but before and after as well. It includes specific actions for management of the District's water supply and demand, addresses the impacts associated with drought, and facilitates the timely implementation of effective drought responses.

CHANGES. The original foundation of this action plan is the District's 2008 Drought Preparedness Plan. The drought action plan was created and underwent several changes in 2014 and 2015 to reflect the then-current conditions and to comply with State-mandated conservation levels and actions applicable at that time. Recent changes to the plan include removal of some of the specific conservation levels required by the state at the time and a return to the original drought stages and corresponding target conservation levels. The Plan has also been updated to comply with California Water Code (CWC) §10632, which lists new requirements for urban water suppliers regarding development of a Water Shortage Contingency Plan. Accordingly, this Drought Action Plan 2021 Update includes new sections and information specifically aimed at addressing the requirements. For purposes of compliance with CWC §10632, the terms Drought Action Plan (or Plan) and Water Shortage Contingency Plan are considered synonymous.

ADOPTION. The Drought Action Plan was first adopted by the Board on February 4, 2014. Subsequent revisions to the Plan were approved in 2014 and 2015 as the District navigated through that drought. The Board adopted the 2021 Drought Action Plan on June 14, 2021.

Table of Contents

1.0 Introduction

1.1 Purpose of this Plan

In 2007, the El Dorado Irrigation District (EID or District) and the El Dorado County Water Agency (EDCWA) completed comprehensive drought preparedness plans that provided indicators and modeling tools to determine when El Dorado County, and specifically each water purveyor, might enter into drought conditions. In January of 2008, the EID Board of Directors adopted the District's Drought Preparedness Plan. District staff then developed an internal action plan to address specific tasks and detailed actions, which was completed in March of 2009, and was based upon the drought metrics and customer responses provided in EID's Drought Preparedness Plan. The plan was then updated in 2014 and 2015.

This 2021 Drought Action Plan Update (Plan) continues to serve as a detailed work plan for District staff in order to prepare for and address supply shortages, including shortages from drought conditions and catastrophic interruption of supplies. It includes specific actions regarding the management of water supply and demand, addresses the impacts associated with supply shortage conditions, and facilitates a District-wide supply shortage response that is both timely and effective. This Plan is also listed in Part III of the District's Emergency Operations Plan.

The Plan complies with California Water Code (CWC) §10632, which lists requirements for urban water suppliers regarding development of a Water Shortage Contingency Plan. Accordingly, this 2021 Drought Action Plan Update includes new sections and information specifically aimed at addressing those requirements. For purposes of compliance with CWC §10632, the terms Drought Action Plan (or Plan) and Water Shortage Contingency Plan are synonymous.

1.2 Adoption, Submittal, and Availability

The Plan (including subsequent updates) shall be adopted in accordance with standard District procedures, including requirements for public participation, and adoption by the EID Board of Directors. Upon adoption, the Plan will be provided to the City of Placerville, El Dorado County, and submitted to DWR within 30 days. The adopted Plan will be available on the District's website.

1.3 Summary of Reliability Assessments

As part of EID's 2020 Urban Water Management Plan (UWMP), two separate assessments were conducted to evaluate both the near- and long-term reliability of the District's supplies. The District's Water Reliability Assessment was conducted for normal year, single-dry year, and a drought lasting five consecutive years, and is used to evaluate long-term supplies with demands over the next 25 years, in five year increments. The Drought Risk Assessment assumes the occurrence of a drought over the next five years, and aims to assess EID's near-term reliability.

Results from the Water Reliability Assessment indicate EID has ample supplies through 2045 to meet expected customer demands under the normal year, single-dry year, and five-year drought conditions. Similarly, the District's Drought Risk Assessment indicates sufficient supplies to meet expected demands during an assumed drought occurring in the next five consecutive years (2021-2025). For a more detailed description of the assessments, the reader is referred to the District's 2020 UWMP.

1.4 Summary of Drought Stages

All declarations of drought stages occur by action of the EID Board of Directors. As a policy, EID implements the same drought stage and employs the same response measures throughout its

geographical water supply regions whenever possible, making public outreach and implementation consistent and effective. However, different stages can and have been applied to the District's two satellite water systems compared to the main system to account for system-specific conditions. To see an example of a drought declaration, resolution, and staff report, refer to the February 4, 2014 Board packet and Public Hearing Item Number 1.

The drought stages defined by this Plan are consistent with the 2010 recommendations of a Regional Water Authority (RWA) work group, which consisted of ten member agencies in the Sacramento region. The group was tasked with developing a regional water shortage contingency plan that would provide consistent messaging for the region, and ranges from Stages 1 through 4 as the water shortage becomes progressively worse. When a drought stage is declared by the water purveyor's governing body, as deemed necessary, the individual purveyors would also determine the actual water demand reductions for each declared stage. If conditions warrant, the District will coordinate with the City of Placerville and El Dorado County for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

The four stages of the EID Drought Action Plan depend upon District water supply conditions, and the corresponding response requested of our customers. For normal water supply conditions, the District would continue to implement water efficiency measures and prohibit water waste, while raising public awareness regarding water efficiency practices. Prohibitions on water waste during all stages, including Normal Water Supply are outlined in Administrative Regulation (AR) 1041 (Water Waste Prohibition).

If water supplies become slightly restricted, the Plan calls for an introductory **Stage 1** drought response, during which customers are informed of possible shortages and asked to voluntarily conserve up to 15 percent. At **Stage 2** when water supplies become moderately restricted, both voluntary and mandatory measures are implemented to achieve a demand reduction goal of up to 30 percent. If water supplies subsequently become severely restricted, a **Stage 3** drought can be called with the enforcement of mandatory measures to achieve a demand reduction goal of up to 50 percent. Lastly, if drought conditions persist and the District experiences extremely restricted water supplies, then a **Stage 4** can be implemented that requires water rationing for health and safety purposes in order to achieve a greater than 50 percent reduction of demands.

Table 1 summarizes these water supply conditions and the corresponding drought stages, titles, and objectives; along with the expected response actions and demand reduction targets.

Table 1 - Drought Stages Summary				
Water Supply Conditions	**Drought Stage**	**Stage Title**	**Stage Objective**	**Response Actions**
Normal Water Supply	**None** - Ongoing water conservation and enforcement of water waste prohibition.	Normal Conditions	Public awareness of water efficiency practices and prohibition of water waste.	Public outreach and education for ongoing water efficiency practices and the prohibition of water waste.
Slightly Restricted Water Supplies Up to 15% Supply Reduction	**Stage 1** Introductory stage with voluntary reductions in use.	Water Alert	Initiate public awareness of predicted water shortage and encourage conservation.	Encourage voluntary conservation measures to achieve **up to a 15% demand reduction.**
Moderately Restricted Water Supplies Up to 30% Supply Reduction	**Stage 2** Voluntary and mandatory reductions in water use.	Water Warning	Increase public awareness of worsening water shortage conditions. Enforce mandatory measures such as watering restrictions.	Voluntary conservation measures are continued, with the addition of some mandatory measures to achieve **up to a 30% demand reduction.**
Severely Restricted Water Supplies Up to 50% Supply Reduction	**Stage 3** Mandatory reductions in water use.	Water Crisis	Enforce mandatory measures and/or implement water rationing to decrease demands.	Enforce mandatory measures to achieve **up to a 50% demand reduction.**
Extremely Restricted Water Supplies Greater than 50% Supply Reduction	**Stage 4** Water rationing for health and safety purposes.	Water Emergency	Enforce extensive restrictions on water use and implement water rationing to decrease demands.	Enforce mandatory measures to achieve **greater than 50% demand reduction.**

Water Code Section 10632(a)(3) calls on suppliers to identify six standard water shortage levels from the normal reliability (10, 20, 30, 40, 50 and greater than 50 percent shortage) in their Water Shortage Contingency Plan. EID has instead chosen to use the existing four shortage levels identified in this Drought Action Plan for consistency with past droughts and ease of implementation. Pursuant to Water Code Section 10632(a)(3)(B), Table 2 cross-references this Plan's shortage levels to the State identified levels.

Table 2

State Mandated Shortage Levels	EID Drought Action Plan Levels	
Stage 1: 0 – 10%	Stage 1 – Water Alert	0 – 15%
Stage 2: 10 – 20%	Stage 1 – Water Alert Stage 2 – Water Warning	0 – 15% 15 – 30%
Stage 3: 20 – 30%	Stage 2 – Water Warning	15 – 30%
Stage 4: 30 – 40%	Stage 3 – Water Crisis	30 – 50%
Stage 5: 40 – 50%	Stage 3 – Water Crisis	30 – 50%
Stage 6: >50%	Stage 4 – Water Emergency	>50%

1.5 Action Plan Organization

This document will focus on those activities directly impacting the management of water supply and demand, along with the customer services that would be modified to address changing drought conditions. The tasks and duties in this Plan are organized by function rather than by department. There are a number of policies that are identified as drought conditions occur. Revisiting and updating drought policies during and after a drought are essential to continuing the benefit and effectiveness of this Plan.

1.6 Applicable Water Codes and Legal Authorities

During times of water shortage, there are actions the District may take that are not solely based upon internal policies and regulations. Several California Water Code Sections and California Codes of Regulation grant authority to or mandate that the water purveyor declare drought conditions and implement drought stages. Below are **summaries** of specific actions required during water shortage conditions; however, the official California Water Code or California Code of Regulations should be

referenced for the complete language of the section. Where not otherwise indicated, citations are to the California Water Code.

Title 23, California Code of Regulation, Section 864 – End-User Requirements in Promotion of Water Conservation – To prevent the waste and unreasonable use of water and to promote water conservation, various actions are prohibited, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency.

Title 23, California Code of Regulation, Section 865 – Mandatory Actions by Water Suppliers – To promote water conservation, each urban water supplier shall provide prompt notice of leaks within an end-user's control, submit monthly monitoring reports to the state, and meet a state-prescribed water conservation mandate..

Section 350 – The governing body of the water purveyor may declare a water shortage emergency condition whenever it determines that ordinary demands cannot be satisfied without depleting supplies to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

Section 351 – The declaration shall be made only after a public hearing is held, at which consumers have an opportunity to protest and to present their respective needs to the governing body. There is an exception for a breakage or failure that causes an immediate emergency.

Section 352 – At least seven days prior to the date of the public hearing, a notice of the time and place of the hearing shall be published in a newspaper that is distributed within the water purveyor's service area.

Section 353 – When the governing body has declared a water shortage emergency condition within its service area, it shall adopt regulations and restrictions on the delivery and consumption of water supplied for public use in order to conserve water supply for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection.

Section 354 – After allocating the amount of water, which in the opinion of the governing body will be necessary to supply domestic use, sanitation, and fire protection, the regulations may establish priorities in the use of water for other purposes – without discrimination between consumers using water for the same purpose.

Section 355 – These regulations and restrictions shall remain in effect during the water shortage emergency condition, and until the water supply has been replenished or augmented.

Section 356 – These regulations and restrictions may prohibit new or additional service connections, and authorize discontinuing service to consumers willfully in violation of a regulation or restriction.

Section 357 – These regulations and restrictions prevail over any conflicting laws governing water allocations while the water shortage emergency condition is in effect.

Section 22257 – An irrigation district may impose equitable rules and regulations, including controls on the distribution and use of water, as conditions of ongoing service to its customers.

1.7 Evaluation and Improvement Procedures

This Drought Action Plan is an adaptive plan that allows for active refinement in response to particular shortage conditions. The general procedures for refinement are presented below.

1. For each shortage response action, compare expected results with actual shortage response and identify any shortfall or over-achievement.
2. Revise expected reduction for a specific shortage response action based on updated information.
3. Assess the aggregate expected reductions (from revised shortage response actions) for each shortage stage.
4. Revise stage declaration or modify stage shortage response actions to better balance demands with supplies.

The procedures presented above aim to ensure an adaptive Drought Action Plan is maintained that can be relied upon under various and changing circumstances.

1.8 Drought and Water Management Tools

There are resources available to aid water purveyors and individuals before, during, and after a drought. Below is a brief description of a few of these tools.

- **California Urban Drought Guidebook** – a publication providing help to water managers facing water shortages by showing them how to use tried-and-true methods of the past, such as demand management, conservation analysis, and fiscal considerations; as well as new methods and technology such as ET controllers and cooling system efficiencies. Download the Urban Drought Guidebook, 2008 Updated Edition at: https://cawaterlibrary.net/document/urban-drought-guidebook-2008-updated-edition/

- **DWR Office of Water Use Efficiency** – makes available technical expertise, manages the CIMIS weather station network, carries out demonstration projects and data analysis to increase efficiency where possible, and provides loans and grants to achieve efficiency in water and energy. This information can be found at https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency

- **DWR Drought Conditions** – a webpage providing State and regional updates with regards to water conditions. More information can be found at https://water.ca.gov/Current-Conditions

- **U.S. Bureau of Reclamation Drought Response Program** – aids federal water contractors and other interested parties in a wider view of drought conditions, encompassing the western United States. Staff from this program will also provide technical assistance, grant and loan funding, and expertise in drought planning. Information on this Bureau program can be found at https://www.usbr.gov/drought/

- **SWRCB Drought Information and Updates** – provides the latest information and updates on drought conditions in California, actions by SWRCB, and resources for conservation strategies and funding opportunities. More information can be found at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/

2.0 Coordination and Guidelines

EID's drought response should be managed by participants in the District's Drought Response Team (DRT), which should include department heads and/or their appointed representative and the General Manager. The DRT may coordinate with other agencies in the county and region through other organized Drought Committees. Responding to a drought in El Dorado County should include a number of tactics and agencies, and a multi-level management team with function-specific responsibilities is an important planning device for collaborative and comprehensive drought event management.

2.1 Drought Response Team

The 2008 Drought Preparedness Plan emphasized the importance of a DRT for inter-department drought management. Initially, the DRT should be made up of staff representing the following functions.

- Engineering and Operations
- Finance and Customer Services
- OGM/Legal
- Public Outreach
- Recreation
- Water Efficiency

This list may be narrowed down due to staff availability and specific needs, as different functions may not be necessary in all situations nor at all times.

2.2 Role and Responsibilities

The DRT will be responsible for monitoring the activities of the District with regard to general drought management, including issues of timing, policy, public relations, financial solvency, customer education, facility operations, environmental considerations, and public health. The EID Board of Directors should be updated by the General Manager and/or staff at regular and special board meetings. During cases of extreme drought, updates may occur more often by e-mail or by phone, consistent with the requirements of the Ralph M. Brown Open Meetings Act.

The DRT should meet periodically during normal water supply conditions to discuss updates and other important ongoing considerations. The group would meet more often as drought events occur and worsen, perhaps once per week or even once per day in extreme cases. A DRT meeting may be requested by any member, but should be facilitated and convened jointly by the Customer Services and Water Operations Managers or as designated by the General Manager.

Another important component of the DRT function during the early stages of drought is to make preparations for subsequent stages, including an examination of staff levels, financial resources, water waste enforcement staff resources, and areas of collaboration among other agencies in the region. It is also important for the DRT to recognize that some of the activities recommended by this Plan may not be possible at current staffing levels and with current financial resources.

2.3 Drought Monitoring and Modeling

While County-wide strategies and mechanisms can be discussed in regional, multi-agency drought committees, monitoring of individual water supplies and drought conditions are the responsibility of each water purveyor. Within EID, drought monitoring will be the combined task of engineering and operations. It is important that staff use the sources of information and drought tools available to them to ensure adequate monitoring. Because drought is the leading hazard of economic loss in the United States each year, monitoring regional and long-term trends within the United States will enable EID to be better prepared for drought. Local drought conditions can change very quickly, but if staff frequently monitors the climatic conditions that cause hydrologic drought, EID will be better equipped to manage District-wide concerns.

2.4 Annual Water Supply and Demand Assessment Procedures

Beginning July 1, 2022, EID is required to prepare an annual water supply and demand assessment and submit an Annual Water Shortage Assessment Report to DWR. The Annual Water Shortage Assessment Report will be due by July 1 of every year, as required by Water Code Section 10632.1. Procedures for EID's annual Water Supply and Demand Assessment are presented below. This assessment is conducted annually to help inform water resources management decisions for the current year. The analysis incorporates numerous data sources used as evaluation criteria to forecast water reliability (water supply vs. demand) for the current year and one subsequent dry year. Data sources and operational factors to consider in preparing the assessment include:

- Projected weather conditions
    - Northern Sierra 8-Station Precipitation Index compared to historical
    - Snow Water Content data – Central Region compared to historical
    - Bulletin 120 Projections for Water Year Type
    - Snow surveys - Caples Lake, Silver Lake and Carson Pass, others
    - NOAA Precipitation Outlooks
    - Seasonal Drought Outlook (Drought Monitor)
- Projected Unconstrained Customer Demand
    - Historical Water Diversion Reports
    - Historical Water Consumption Reports
    - Urban Water Management Plan demand forecasts
    - New customer connections
    - Recycled Water Demand

  Projected Supply Availability
    - Project 184 Reservoir Storage (Aloha, Echo, Caples and Silver Lake Levels)
    - Project 184 pre-1914 water rights
    - Jenkinson Lake Storage
    - Folsom Lake Levels and USBR CVP allocations
    - Water Right Permit 21112
    - Ditch/Weber Reservoir water rights
    - Recycled Water production
- Regulatory Conditions
    - FERC license conditions for in-stream flows and target lake levels
    - Water right conditions for lake levels and minimum releases
    - State-mandated conservation or curtailment orders
- Infrastructure Constraints
    - El Dorado Canal planned maintenance schedule

- Planned or unplanned major water infrastructure upgrades and repairs that constrain normal capacity
- Others as identified

The general procedure for preparing the annual Water Supply and Demand Assessment is listed below. EID may modify this process based on available data, significant events, operational restrictions, or other external factors that may impact the assessment. The following procedures will be undertaken beginning each winter season and continue through late spring until the current year water supply conditions are known. The final product will result in a written water supply assessment per the requirements of Water Code Section 10632.1 to be submitted by July 1 of each year.

1. Compile existing weather data to characterize current year water supply conditions. District staff typically will provide regular Board informational updates on developing water supply conditions during the winter and spring months as needed, and discuss any potential water supply reliability concerns.
2. Estimate current year and subsequent dry year unconstrained demands based on representative customer use data. Sources to estimate demands primarily include annual water diversion and consumption reports. Dry year demand projections developed in the Urban Water Management Plan updates may also be used. Development of unconstrained demand should incorporate any additional demand considerations resulting from new customer connections or unique demand trends.
3. Determine current year available supply for each primary supply region (Jenkinson Lake, Project 184 - Forebay, and Folsom Lake). Estimate subsequent dry year water supply for each supply region. The UWMP data may be used to estimate the subsequent dry year water supply availability for each source.
4. Identify and incorporate any applicable constraints (infrastructure, regulatory, etc.) regarding accessibility of supply in the current year and subsequent year.
5. Compare water supply availability to demand for the current year and one subsequent dry year, which will summarize the results of the annual water supply assessment. Consider if any current year supply targets and operational modifications are appropriate to prepare for a subsequent dry year. For example, consideration may be given in the current year to maximize utilization of available Project 184 supplies to supplement and/or reduce the demand from Jenkinson Lake in order to preserve Jenkinson Lake storage in the event of a subsequent dry year. Identify any projected current year supply shortfall to meet the unconstrained demand, cross referencing the condition to one of the water shortage levels identified in this Plan. If current year supply will meet demand, but the projections for the subsequent dry year show a supply reliability concern, consider whether it is appropriate to take any operational actions, water resource management strategies, or demand management measures in the current year to prepare in the event of a subsequent dry year.
6. Prepare the annual Water Supply and Demand Assessment pursuant to subdivision (a) of Section 10632. Assessment will include information as applicable on any anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions, consistent with the Drought Action Plan (Water Shortage Contingency Plan).
7. Present the annual Water Supply and Demand Assessment to the Board of Directors for approval as necessary and appropriately trigger any recommendations for specific shortage response actions resulting from the assessment. Staff may modify/update the assessment per direction from the Board.

8. The general proposed annual timeline for the assessment is as follows:
    - Monitor conditions and prepare assessment: January-May
    - Present assessment to Board: May/June
    - Submit annually to DWR per CWC Section 10632.1: July 1

2.5 Interagency Coordination

A County-wide Drought Coordination Committee (DCC) may be formed to include regional partners and water purveyors. The team would meet monthly during a drought to discuss the issues of water supply and demand, conjunctive use, and environmental needs. EID staff should attend these coordination meetings, as designated by the General Manager.

MONITORING – Communication among agencies of their drought indicator status would allow each agency to understand the current conditions of the other water purveyors.

PUBLIC OUTREACH – Development of drought education tools, plus collaboration on public education and outreach, provides efficiency and consistency within the region.

RESOURCE SHARING – Collaboration resources, including: staff, grant funding, monitoring tools, infrastructure, water, and educational outreach tools would allow agencies to support each other efforts in the community.

2.6 Drought Guidelines and Definitions

There are a number of circumstances during a drought in which the District would be required to make and implement decisions that are not solely based upon water supply availability, such as how long to stay in a drought stage, and how demand reductions should be quantified. The new annual assessment procedure will define the base unconstrained demand for which a proxy demand for each user category can be developed and compared against actual conservation performance.

Overall Guidelines

Below is a list of drought guidelines developed to assist staff in managing the drought event.

1) The District will strive to stay within each stage of drought for at least 2 months for consistency in messaging and effective public outreach.
2) Drought stage demand reductions will be quantified by output at the water treatment plants during all stages; however, in Stages 3 and 4 meter reads may also be necessary to determine compliance with individual allocations and reduction targets.
3) This Drought Action Plan should be reviewed and updated every 5 years (or as needed) due to changes in water supplies, operations, expected water demands or other relevant factors.

Early Actions

1.1.1 CROSS TRAINING – It is important that ongoing staff training be conducted before a drought occurs, as staffing may be necessary for the enforcement of water waste prohibition, enforcement of mandatory or prohibited conservation measures, and answering questions

related to recycled water use. Staff ordinarily responsible for other duties may be temporarily reassigned to implement these drought-response activities.

1.1.2 BOARD UPDATES – The Board should be kept apprised of all drought monitoring and predicted water shortages. It is the responsibility of the General Manager to decide the best method for these updates.

1.1.3 PUBLIC OUTREACH TO ID 97 OWNERS – Pursuant to paragraph 10 of the Interim Agreement to Amend the Terms and Conditions of El Dorado Irrigation District Improvement District No. 97, the District will reduce aesthetic flows in Clear Creek from Jenkinson Lake during declared water shortages. The district will provide 30 days written notice to all ID 97 property owners.

- Background. The *4-Stage Water Supply Matrix and Water Shortage Response Measures* – a copy of which can be found in Appendix D of the 2008 Drought Preparedness Plan – was in effect when the ID 97 Interim Agreement was adopted by the Board of Directors in 2005. Pursuant to this agreement, the flow rate in Clear Creek is reduced as the drought stages progress, from a maximum of 3 cubic-feet per second (cfs) down to a minimum of 1 cfs. When drought is imminent, notifications are to be sent to the ID 97 property owners that Clear Creek flows may be reduced with the drought stages.

2.7 Enforcement and Appeals

Water conservation enforcement measures for all stages, including Normal Water Supply, are outlined in AR 1041.5 (Penalties for Violation of the District's Water Waste Regulation) and AR 5011. AR 5011.1 states, "a prohibition of water waste will be in effect during both normal and restricted water supply conditions." The sequence of notification, discontinuance of service, and progressive reconnect fees are outlined in AR 1041.5.

3.0 Ongoing Activities

This Drought Action Plan addresses water management and customer service activities that would be modified during drought conditions. In this section, ***Ongoing Actions*** are defined as activities that are performed on a regular basis, even in non-drought conditions, that might change in the face of a drought being declared. Throughout the District, there are a number of ongoing activities related to drought management. It will be the responsibility of the DRT members to ensure that these activities continue to occur in their respective areas during non-drought conditions, in order to be ready for a declaration of drought. The following sub-sections refer to staff functions rather than departments, and include a brief description of these functions and their ongoing actions as they pertain to a drought.

3.1 Engineering and Operations

The primary responsibility of engineering and operations staff is to ensure the continued integrity of infrastructure throughout the District's service area, in addition to actively monitoring and modeling potential drought conditions. Operations staff must also stay abreast of changes during drought conditions, such as lower pressures, increased sewer pipeline blockages, lower reservoir levels, changes in demand patterns, and other potential impacts. The environmental staff contributions to the District's drought preparedness occur mostly prior to a drought event while conducting environmental reviews and permit preparation for proposed projects, but may also include outreach to recycled water customers during the course of their work relating to recycled water compliance.

Ongoing Actions

1) Manage water supplies and conservation levels to achieve approximately 25,000 acre-feet of carry-over storage in Jenkinson Lake to guard against multiple year drought conditions including importing Project 184 supplies through the Hazel Creek tunnel.
2) Track regional weather predictions and monitor reservoir levels in conjunction with the dashboard drought risk assessment.
3) Gather information on drought management from other agencies.
4) Incorporate the results of various drought supply analyses and modeling when analyzing the environmental effects of proposed projects.
5) Enforce the water waste prohibition regulation – *with legal, water efficiency, and customer services.*
6) Examine the District's infrastructure for leakage, and reduce losses where cost-effective.
7) Assist community members whose wells have gone dry due to drought conditions, to access drinking water through bulk water stations and key cards – *with public outreach.*
8) Investigate all dry-year water supply options such as water transfers, conjunctive use, and groundwater banking – *with legal.*
9) Develop drought impact avoidance projects, if needed.
10) Investigate potential reservoir re-operation, and consider long-term adjustments to reservoir release rules.
11) Consider the environmental effects of long-term draw-down of reservoirs, such as air quality, soil/sedimentation, water quality, temperature, and other conditions that may affect the District's ability to provide treated water.
12) Work with the El Dorado Water Agency to facilitate additional water supply projects, if needed.

13) Collaborate with regional water management groups, including but not limited to the Regional Water Authority (RWA), Mountain Counties Water Resources Association (MCWRA), and the Cosumnes, American, Bear, and Yuba Rivers group (CABY).

14) Maintain interagency coordination, primarily through a DCC, but also through participation in federal, state, and/or regional drought task forces.

3.2 Finance and Customer Services

The primary responsibility of finance staff is to keep the District solvent when faced with the increased costs and potential for reduced revenues associated with a drought condition in the watershed and enforcement of excessive residential water use as described in the District's Water Waste Prohibition. Along with other District employees, staff must be able to look into the future to assess possible staffing needs and potential sources of cost to the District. On the other side, finance staff must also be able to identify possible sources of income, or at the very least, a method of financing the additional efforts associated with managing drought.

Ongoing Actions

1) Enforce the water waste prohibition regulation – *with legal, operations, and water efficiency.*

2) Educate customers on how to read their water meters in order to determine their own monthly usage during times of demand restrictions – *with public outreach.*

3) Provide prompt notice to a customer whenever the District obtains information that indicates that a leak may exist within the end-user's exclusive control.

3.3 Legal

The primary responsibility of administration and legal staff is to ensure that EID's actions are legal and defensible. It is important that the administration and legal staff be apprised of policy and planning activities with regard to water supply, regional activities, and inter-agency planning.

Ongoing Actions

1) Ensure the District follows applicable state law when declaring drought conditions, and include citations to pertinent legal authority in drought-related Board actions.

2) Continue to enforce the water waste prohibition regulation – *with water efficiency, operations, and customer services.*

3) Examine possible legal implications of dry reservoirs and canals during drought conditions, and associated liability at recreational lakes – *with recreation and property.*

4) Examine the District's Board Policies and Administrative Regulations for potential changes and/or additions for better drought management.

5) Track legislation and regulation relating to drought, especially as they pertain to curtailing water rights, prescribing or prohibiting actions by water suppliers, financing drought management, water transfers, and ground-water banking.

6) Urge county and city planners to consider the drought stages when implementing development and future planning scenarios.

7) Collaborate with regional water management groups, such as RWA, MCWRA, and CABY - *with engineering and operations.*

3.4 Public Outreach

The efforts of public outreach staff are integral to the implementation a successful Plan and management of a drought event. Public education is the most important activity when a drought occurs, because demand management will not be successful if customers are not adequately informed regarding the water situation and the requirements of the purveyor. The most important time for public outreach and education is at the beginning of Stage 1.

Ongoing Actions

1) Educate customers regarding water saving devices and practices – *with water efficiency*.
2) Educate customers regarding the overall challenges of providing a reliable water supply in a semi-arid climate.
3) Educate customers regarding drought stages through bill inserts or a printed message on the bill, an article in the bi-monthly newsletter, e-mail messages, social media, drought website, automated telephone messages, direct mail post cards, government and community organization meetings, newspaper advertisements, and other means – *with water efficiency*.
4) Develop a webpage for "Drought Stage" information, including an easy-to-understand explanation of when a drought is called and when a drought has ended – *with water efficiency*.
5) Educate customers on how to read their water meters in order to determine their own monthly usage during times of demand restrictions – *with finance and customer services*.
6) Work with the DCC to educate community members, whose wells have gone dry due to drought conditions, about the availability of drinking water through bulk water stations with key card access – *with customer services*.
7) Collaborate with the Regional Water Authority, ACWA, Mountain Counties and other regional groups to ensure consistent messaging.

3.5 Recreation

The challenges and responsibilities of recreation and property staff in the face of a drought are quite different from those of other EID functions. The primary concerns with recreation and property are the liabilities associated with water attractions in low water level conditions. These can vary from exposed rocks in reservoirs to increased danger of fires resulting from recreational use in campgrounds and day use areas.

Ongoing Actions

1) Consider alternative recreational strategies/opportunities for dry years.
2) Identify sensitive areas and outline management plans for these areas in dry years.
3) Examine possible legal implications of dry reservoirs and canals during drought conditions, and associated liability at recreational lakes – *with legal*.
4) Ensure adequate protection against catastrophic fires through vegetation management and homeowner education (adjacent to District facilities).
5) Inform customers of the mooring facility policy during drought, and any curtailments of water supplies at recreational facilities.
6) Work with regional partners to identify areas of greatest fire risk.

3.6 Water Efficiency

Water efficiency staff should work closely with public outreach staff, as the activities required to meet water supply constraints are usually through the implementation of water efficiency practices or devices. Because there are ongoing mandated activities, a drought event will increase the number of tasks for which water efficiency staff are responsible. The Drought Preparedness Plan stipulated a number of water conservation actions, some of which are activities *required* of customers, such as not filling swimming pools; while some are simply *guidelines* for customers to help them save water.

Agricultural demands are an important consideration during drought events. The District's Irrigation Management Service (IMS) program is not required for agricultural customers, but staff should encourage participation in the IMS program prior to a drought, including the education of landowners with regard to individual drought planning. A total of 2,000 acre-feet of water is estimated to be saved each year by the IMS program, as verified by the State Water Resources Control Board in 1986.[1]

Ongoing Actions

1) Identify and pursue drought assistance grants available for water efficiency programs.
2) Enforce the water waste prohibition regulation – *with legal, operations, and customer services.*
3) Offer water efficiency rebate programs and complimentary water surveys as staff, budget, and grant funding allows.
4) Continue to implement the California Urban Water Conservation Council's Best Management Practices, as applicable and as required by the U. S. Bureau of Reclamation.
5) Maintain the IMS program for commercial agriculture customers.
6) Educate customers regarding drought stages through bill inserts or a printed message on the bill, an article in the bi-monthly newsletter, e-mail messages, and newspaper advertisements – *with public outreach.*
7) Develop a webpage for "Drought Stage" information, including an easy-to-understand explanation of when a drought is called and when a drought has ended – *with public outreach.*

[1] Source: EID's Water Supply Master Plan, Administrative Draft, December 2001, Pages 3-36 and 3-38. As part of the South Fork American River (SOFAR) water rights permitting process, the 2,000 acre-feet of IMS program water savings was verified in 1986 by the SWRCB; and later acknowledged in an SWRCB letter dated January 1989.

4.0 Stage 1 – Water Alert

A drought Stage 1 is considered a water alert, where water supplies are only slightly restricted. The response actions are intended to initiate public awareness of a possible water shortage in the near future, and to encourage water efficiency practices. Stage 1 actions target up to a **15 percent demand reduction** through the implementation of voluntary measures. The following ***New Actions*** outlined in this section are activities that must be performed during this stage of a drought declaration.

At the beginning of a dry period there is no certainty as to whether the conditions will persist into a more significant drought. Accordingly, the initial phase of conservation is voluntary on the part of the customer, and the use of recycled water continues as normal. Staff should implement an outreach program to educate customers regarding the status of District water supplies, and the predicted water shortage; however, the education should be done without alarming customers as there is not yet a true emergency. This outreach can be complemented by the actions of the Department of Water Resources and RWA. To avoid confusion though, it is important to educate our customers that due to the District's multiple water sources and integrated infrastructure, the rest of the region and the state might be worse off than the District. Raising public awareness therefore represents one of the most important components of this Plan.

4.1 Engineering and Operations

New Actions

1) Monitor reservoir levels on a monthly basis.
2) Manage water supplies and conservation levels to achieve approximately 25,000 acre-feet of carry-over storage in Jenkinson Lake to guard against multiple year drought conditions including importing Project 184 supplies through the Hazel Creek tunnel.
3) Alert ditch customers of potential cutbacks, reminding them of Item No. A-8 of their ditch application for service, and reduce potable water releases from valve blow-offs, if possible – *with customer services*.
4) Alert the Improvement District No. 97 property owners listed on the current County assessment roll of the water alert declaration, reminding them of paragraph 10 of the 2005 Interim Agreement for ID 97 and possible accommodations to decrease the releases to Clear Creek should the drought conditions continue – *with legal*.
5) Monitor water demands weekly at the water treatment plants to assess the amount of water savings accomplished and forecast end-of-year carryover storage needs.
6) Identify areas of low pressure, both present and projected, and communicate this to local fire protection agencies.
7) Increase monitoring for water theft.
8) Refer to the draft ditch operations guidelines in Appendix E of the Drought Preparedness Plan for further information on ditch management during a drought.
9) Alert regulatory agencies to the possibility of decreased stream flow.
10) Examine Deer Creek discharge requirements; and assess the need to work with stakeholders and the State Water Resources Control Board to temporarily reduce flows to conserve potable water – *with legal*.

4.2 Finance and Customer Services

New Actions

1) Implement a project code or charge number for use by all employees to track time and expenses for all drought-related activities.
2) Alert ditch customers of potential cutbacks and remind them of Item No. A-8 of their ditch application for service – *with engineering and operations*.
3) Identify target levels of water usage per user class – *with water efficiency*.
4) Request assistance in programming and obtaining database information appropriate to the drought stage, customer requests, and cutback priorities.
5) Provide prompt notice to a customer whenever the District obtains information that indicates that a leak may exist within the end-user's exclusive control.

4.3 Legal

New Actions

1) When determined appropriate by the DRT, prepare materials for the declaration of a water alert for approval by the Board of Directors, consistent with applicable state law – *with engineering and operations*.
2) Alert the Improvement District No. 97 property owners listed on the current County assessment roll of the water alert declaration, reminding them of paragraph 10 of the 2005 Interim Agreement for ID 97 and possible accommodations to decrease the releases to Clear Creek should the drought conditions continue – *with engineering and operations*.
3) Track legislation and regulation relating to drought, especially as they pertain to curtailing water rights, prescribing or prohibiting actions by water suppliers, the management of water transfers/ground-water banking, and financing drought management.

4.4 Public Outreach

New Actions

1) Create educational information regarding the stage of drought, what is expected from customers, and the consequences if demand reduction goals are not met.
2) Ensure that customers are aware that drought conditions may worsen quickly, causing rapid progression through the drought stages.
3) Educate recycled water users and community leaders regarding the importance of conserving recycled water and the consequences of reducing or suspending potable water supplementation during a Stage 2 drought.
4) Ensure that the public is aware of the water waste regulation and all associated penalties – *with water efficiency*.
5) Work with local and regional newspapers to secure op-ed space as-needed for public information and water supply/drought education.
6) Maintain drought information on website, and update throughout the drought.
7) Strongly encourage local restaurants to post "serve if requested" messages via poster, table tent signage, in menus, or other means in their establishment – *with water efficiency*.

4.5 Recreation and Property

New Actions

1) Implement new mooring facility policy when warranted by low lake levels.

4.6 Water Efficiency

New Actions

1) Investigate water waste reports, and enforce Administrative Regulation (AR) 1041, Water Waste Prohibition, as currently amended and incorporated by reference.
2) Increase educational efforts regarding water efficiency practices – *with public outreach*.
3) Identify target levels of water usage per user class – *with customer services*.
4) Strongly encourage local restaurants to post "serve if requested" messages via poster, table tent signage, in menus, or other means in their establishment – *with public outreach*.
5) Voluntary: Request customer compliance with these water saving guidelines.
    a) Apply irrigation water during evening and early morning hours only (7 PM to 10 AM);
    b) Inspect irrigation system for leaks and then repair or replace;
    c) Adjust sprinkler run times to avoid runoff; and
    d) Do not refill a swimming pool that has been drained.

5.0 Stage 2 – Water Warning

Drought Stage 2 action items are intended to increase public understanding of worsening water supply conditions, encourage community-oriented voluntary conservation measures, enforce some conservation measures and implement mandatory water use reduction measures to **decrease "normal" demand by up to 30 percent**. Stage 2 activities include a continuation of activities described under Stage 1 and new actions. The achievement of the water use reduction goal is measured by overall performance of the entire customer population, based on EID production meters at the three main potable water treatment plants. It is important to note that user category demand reduction goals are not by individual customer, but are the goal for the customer category.

At the point of calling a Stage 2 Drought, customers are asked to contribute to a system-wide demand reduction of up to 30 percent. The major emphasis by public outreach and customer service is to elevate customer awareness of the supply situation and encourage continued savings to achieve the 30 percent demand reduction goal.

5.1 Engineering and Operations

New Actions

1) Assess the need for a temporary change in the point of diversion for water taken from Folsom Reservoir to further upstream on the South Fork of the American River, possibly to supplement Sly Park's Jenkinson Lake through the Hazel Creek Tunnel – *with legal*.
2) Examine the risk of solids loading, line blocks, water-quality exceedances, and other low-flow hazards, and then take appropriate action.
3) Provide 30-days written notice to all Improvement District No. 97 property owners listed on the current County assessment roll, notifying them of the water warning declaration and the planned decrease of releases into Clear Creek; and take to the Board for approval or ratification at the first available regular Board meeting – *with legal*.
    a) After the 30-day notification period, decrease releases into Clear Creek to no more than 2.0 cfs.
4) Begin examination of source water quality for increasingly concentrated pollutants and higher temperatures.
5) Refrain from releasing water from valve blow-offs unless necessary to maintain compliance with water quality regulatory standards.
6) Review all regulatory requirements relating to water quality and stream flow; and investigate how the District might be affected by these regulations in case of extreme drought.
7) Monitor source and system water quality for increasingly concentrated pollutants and contaminants as a result of drought conditions. Take necessary operational actions to remain in compliance with the Safe Drinking Water Act.
8) Consider reducing or suspending potable supplementation to the recycled water system.

5.2 Finance and Customer Services

New Actions

1) Continue actions listed in Stage 1.

2) Assess the fiscal consequences and present need for a larger drought management staff, particularly of temporary workers.
3) Consider adding customer service representatives to help with answering phones, assisting in customer questions regarding drought restrictions, and possibly extending hours later into the evening.
4) Provide prompt notice to a customer whenever the District obtains information that indicates that a leak may exist within the end-user's exclusive control.

5.3 Legal

New Actions

1) When determined appropriate by the DRT, prepare materials for the declaration of a water warning for approval by the Board of Directors, consistent with applicable state law – *with engineering and operations*.
2) Assess the need for a temporary change in the point of diversion for water taken from Folsom Reservoir to further upstream on the South Fork of the American River, possibly to supplement Sly Park's Jenkinson Lake through the Hazel Creek Tunnel – *with engineering and operations*.
3) Provide 30 days written notice to all Improvement District No. 97 property owners listed on the current County assessment roll, notifying them of the water warning declaration and the planned decrease of releases into Clear Creek; and take to the Board for approval or ratification at the first available regular Board meeting – *with engineering and operations*.
4) Review options for Area-of-Origin water rights and exceptions to water-right curtailments.
5) Seek public health and safety adjustments to U. S. Bureau of Reclamation contract shortage criteria, if needed.

5.4 Public Outreach

New Actions

1) Send regular notification postcards to all customers, and email messages to those customers providing email addresses, informing them of mandatory watering restrictions and other conservation requirements in effect.
2) Launch a monthly automated telephone message informing customers of mandatory watering restrictions and other conservation requirements in effect.
3) Work with regional partners to spread the word about drought and fire danger.
4) Secure an op-ed space in local and regional newspapers for an essay on water supply and use restriction in El Dorado County.
5) Continue to update the Drought Stage website link, including weekly updates on community demand response.
6) Assist the City of Placerville with water use reduction targets – *with water efficiency*.

5.5 Recreation and Property

New Actions

1) Urge caution and educate visitors within the District's recreational areas due to elevated fire danger.

5.6 Water Efficiency

New Actions

1) Coordinate with the Sacramento region through RWA membership, especially water purveyors with a common border, in order to coordinate educational efforts to better reach customers.
2) Identify the top 10 percent of residential and CII[2] users, and target these customers with water efficiency outreach – *with customer services*.
3) Voluntary: Ask customers to refrain from: - *with public outreach*.
    a) Planting new or replacement turf.
    b) Pursuing new agricultural plantings.
    c) Pursuing construction of new swimming pools or rehabilitation that would require filling with potable water.
4) Offer assistance to the City of Placerville to help meet their water use reduction targets - *with engineering and operations*.
5) Mandatory: Watering restrictions are in place as shown below. All outside irrigation, potable and recycled—including garden, lawn, landscape, pasture, parks, golf courses, school grounds, and public grounds—shall ONLY occur according to the following schedule:
    a) Outdoor irrigation is limited to the hours of 7:00 PM to 10:00 AM.
    b) Watering days are based on street addresses.
    c) Once-a-week watering is allowed from November 16 to April 15 on Sundays for customers with addresses ending in even numbers (0, 2, 4, 6, 8) and on Saturdays for customers with addresses ending in odd numbers (1, 3, 5, 7, 9).
    d) Twice-a-week watering is allowed from April 16 to May 31 and October 1 to November 15 on Wednesdays and Sundays for customers with addresses ending in even numbers and Tuesdays and Saturdays for customers with addresses ending in odd numbers.
    e) Three days per week watering is allowed from June 1 to September 30 on Wednesdays, Fridays and Sundays for customers with addresses ending in even numbers; and Tuesdays, Thursdays and Saturdays for customers with addresses ending in odd numbers.
    f) Exemptions to watering restrictions are allowed for non-residential customers if a detailed conservation plan is submitted to the District that demonstrates a minimum 30 percent water savings over customer's baseline usage.
6) Mandatory: Outside irrigation for newly constructed homes and buildings is prohibited unless watered using drip or microspray systems.

[2] CII is defined as all commercial, industrial, and institutional customers; which includes businesses, schools, community service districts, owner associations, churches, and public buildings and grounds.

7) Mandatory: Agricultural metered irrigation customers who do not participate in the Irrigation Management Services program must submit a detailed conservation plan to the District that demonstrates minimum 30% water savings over customer's baseline usage.

8) Mandatory: Do not serve drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased.

9) Mandatory: Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each bathroom using clear and easily understood language.

10) Mandatory: Filling or re-filling ponds, lakes, and other non-irrigation water features with District-supplied potable water is prohibited.

6.0 Stage 3 – Water Crisis

The objective of Drought Stage 3 actions are to **reduce District-wide water demand by up to 50 percent** through effective and consistent public outreach, enforce extensive restrictions of water use, and implement water rationing. Protection of water supply for public health and safety purposes is the primary objective during Stage 3 drought conditions. This stage of drought will require much more staff time for policy enforcement with the public, and much greater inter-agency coordination. Because of the mandatory restrictions, emergency management agency notification is required, and public outreach and education will be key in achieving the water savings goal in Stage 3.

6.1 Engineering and Operations

New Actions

1) If needed, implement a temporary change in the point of diversion for water taken from Folsom Reservoir to further upstream on the South Fork of the American River, possibly to supplement Sly Park's Jenkinson Lake through the Hazel Creek Tunnel – *with legal*.
2) As needed, implement and monitor emergency water distribution.
3) EID's General Manager is responsible for notifying the El Dorado County Emergency Management Agency (EMA) of any mandatory requirements for water use reduction.
    a) Staff should consider the escalation of emergency management at the beginning of this stage.
4) Contact the County's EMA regarding fire protection directives that are being implemented within the county.
5) Provide 30-days written notice to all Improvement District No. 97 property owners listed on the current County assessment roll, notifying them of the water crisis declaration, and of the planned decrease of releases into Clear Creek; and take to the Board for approval or ratification at the first available regular Board meeting – *with legal*.
    a) After the 30-day notification period, decrease releases into Clear Creek to no more than 1.5 cfs.
6) Prohibited: Use of EID potable water for construction use.

6.2 Finance and Customer Services

New Actions

1) Continue actions listed in Stage 2.

6.3 Legal

New Actions

1) When determined appropriate by the DRT, prepare materials for the declaration of a water crisis for approval by the Board of Directors, consistent with applicable state law – *with engineering and operations*.
2) If needed, implement a temporary change in the point of diversion for water taken from Folsom Reservoir to further upstream on the South Fork of the American River, possibly to

supplement Sly Park's Jenkinson Lake through the Hazel Creek Tunnel – *with engineering and operations.*

3) Provide 30-days written notice to all Improvement District No. 97 property owners listed on the current County assessment roll, notifying them of the water crisis declaration, and of the planned decrease of releases into Clear Creek; and take to the Board for approval or ratification at the first available regular Board meeting – *with engineering and operations.*

6.4 Public Outreach

New Actions

1) Secure an op-ed and/or advertising space in local and regional newspapers to publicize mandatory water restrictions within the service area of the District.

6.5 Recreation and Property

New Actions

1) Remain alert to fire danger and water pressure considerations at outlying facilities; coordinate with other agencies to ensure a consistent public message.
2) Protect identified sensitive areas from overuse in extreme dry periods.
3) Limit or restrict filming within the District's recreational areas due to severe fire danger.

6.6 Water Efficiency

New Actions

In addition to Stage 2 actions, inform customers of these **mandatory** conservation measures in Stage 3 – *with public outreach.*

1) Prohibited: Filling empty and/or new swimming pools with District-supplied potable water.
2) Prohibited: Washing of vehicles (automobiles, recreational vehicles, trailers, etc.) and boats with District-supplied potable water.
3) Mandatory: Watering restrictions are in place as shown below, however additional restrictions should be evaluated to achieve a higher level of conservation required in Stage 3. All outside irrigation, potable and recycled—including garden, lawn, landscape, pasture, parks, golf courses, school grounds, and public grounds—shall ONLY occur according to the following schedule:
    a. Outdoor irrigation is limited to the hours of 7:00 PM to 10:00 AM.
    b. Watering days are based on street addresses.
    c. Once-a-week watering is allowed from November 16 to April 15 on Sundays for customers with addresses ending in even numbers (0, 2, 4, 6, 8) and on Saturdays for customers with addresses ending in odd numbers (1, 3, 5, 7, 9).
    d. Twice-a-week watering is allowed from April 16 to November 15 on Wednesdays and Sundays for customers with addresses ending in even numbers and Tuesdays and Saturdays for customers with addresses ending in odd numbers.
    e. Exemptions to watering restrictions are allowed for non-residential customers if a detailed conservation plan is submitted to the District that demonstrates a minimum 50% water savings over customer's baseline usage.

4) Prohibited: Use of EID potable water for construction use.
5) Prohibited: IMS customers are not to use more water than recommended by the IMS program schedule.
6) Mandatory: Agricultural metered irrigation customers who do not participate in the Irrigation Management Services program must submit a detailed conservation plan to the District that demonstrates minimum 50 percent water savings over customer's baseline usage.
7) Prohibited: Mist systems.
8) Enforce the water waste prohibition regulation with the help of City and County law enforcement, if needed; and coordinate operational safety with HR-Safety/Security staff.

7.0 Stage 4 – Water Emergency

The objective of Drought Stage 4 actions are to **further reduce water demands in order to achieve a greater than 50 percent reduction**, which may be accomplished through effective and consistent public outreach, enforcement of extensive restrictions on water use, and the implementation of water rationing. Protection of the remaining water supply for public health and safety purposes is the District's primary objective during Stage 4 drought conditions. This stage of drought will require considerable staff time for enforcement, and much greater inter-agency coordination. Because of the mandatory restrictions, public outreach and education are key to meeting the water savings goals.

7.1 Engineering and Operations

New Actions

1) Provide 30-days written notice to all Improvement District No. 97 property owners listed on the current County assessment roll, notifying them of the water emergency declaration, and of the planned decrease of releases into Clear Creek; and take to the Board for approval or ratification at the first available regular Board meeting – *with legal.*
    a) Decrease releases into Clear Creek to no more than 1.0 cfs.

7.2 Finance and Customer Services

New Actions

1) Continue actions listed in Stage 2.

7.3 Legal

New Actions

1) Advise customer services staff on enforcement of AR 1041.5 to ensure compliance with mandatory conservation requirements.
    a) Seek relief from SWRCB as necessary to ensure adequate supply.

7.4 Public Outreach

New Actions

1) Use authorized email addresses and an automated telephone message through the mass notification system as necessary to advise customers of water use restrictions or other drought alerts.

7.5 Recreation and Property

New Actions

1) Restrict filming within the District's recreational areas due to extreme fire danger.

7.6 Water Efficiency

New Actions

1) Prohibited: Automatic sprinklers for the irrigation of existing turf, ornamental plants, garden or landscaped areas.
    a) Watering may ONLY occur by hand-held hose with shut-off nozzle or by a drip irrigation system.
2) Mandatory: Single-family and multi-family residential meters are limited to 50 gallons per person per day **allotment** per bimonthly billing cycle for "health and safety" purposes
    a) Allotments can be increased for special health-related issues.
3) Mandatory: Recreational Turf, non-IMS Ag, and Small Farm customers must **reduce their usage** by 65 percent, based upon their usage during the same billing cycle in the base period.
4) Mandatory: IMS agricultural customers must **reduce their usage** by 40 percent, based upon their usage during the same billing cycle in the base period. IMS customers have already restricted use through weekly soil moisture data sampling and comply with irrigation schedule.
5) Allowed: Vital healthcare and public safety uses are exempt.
6) Mandatory: Commercial, Industrial & Institutional (CII): Reduce by 65 percent.

8.0 Post-Drought Actions

8.1 The End of a Drought

Coming out of a drought can occur quickly or slowly, depending on the weather and the storage accumulated with any precipitation. It is very important to make clear to the public that one good storm will not reverse weeks or months of dry weather. The conditions that end a drought require the filling of reservoirs, which usually occurs over time. Precipitation that occurs during the deepest of droughts can potentially put the District in a less severe stage of drought. If this occurs, and the DRT determines the present situation and probable future indicate a lessening of the drought, staff may recommend reducing the drought stage to the previous stage.

In the event that the drought severity lessens, it must be made explicitly clear to the public which stage the District has moved to, why the change was made, and what the measurements are based upon. Effective public education will minimize conflicts with regard to fines for mandatory cutbacks, and for health and safety concerns. In addition, a lessening of drought severity must be communicated clearly to all staff, especially those with regular public interaction.

- There are several scenarios that would lead the District to either declare the end of a drought or announce a less severe drought stage, including but not limited to, the following three cases.

    1) **Significant rainfall and snowpack** – While it is highly unlikely for one storm to end drought conditions, it is possible that a series of storms over a several-week period could fill Jenkinson Lake and replenish snowpack that could fill the Project 184 reservoirs in the spring. This scenario would assure staff that the drought has ended, and that a return to "normal" conditions is a responsible decision.

    2) **Significant rainfall but no snow** – It is also possible that Jenkinson Lake could fill from a series of storms, but little snowpack accumulates due to warm temperatures. In this scenario, there would be little snowpack to keep Jenkinson Lake full into the summer, and the Project 184 reservoirs may not fill. In this case, the water supply is not secure for the next year, and staff may recommend a less severe drought stage rather than a return to "normal" conditions.

    3) **Average rainfall and snowpack** – Another scenario could be the occurrence of a "normal" water year, with average precipitation and snowpack, following weeks or months of drought. These conditions may not fill the reservoirs adequately to assure staff that ending a drought declaration is the appropriate action. In this case, the drought stage may be lessened or stay the same, as it is important to remember that a year of average precipitation may not immediately result in "normal" conditions.

In any case, declaring the end of a drought depends in large part upon the judgment of staff. While this Drought Action Plan serves as a blueprint for actions in each stage of drought, it is not a rigid prescription for when and how to call a drought, or what actions to take in response. Those decisions must be made by informed and experienced staff, based upon the situation at the time, and approved by the Board of Directors.

8.2 Lessons Learned

When a drought is completely over, and District operations are back to normal, it is important to review what worked, what did not work, and how the overall drought response can be improved. The first step must be an examination of the stages, objectives, and response actions. Did the ongoing and new actions in this Plan work? Was there public confusion? If so, why? Did the mandatory actions cause problems due to uncertainty in implementation or ambiguity in

description? A discussion among all DRT members and implementing staff is imperative to get a complete picture on these questions. Likewise, it may be important to repeat the same process with the County's Drought Coordination Committee, and to involve the Board and customers in the dialogue as well.

8.3 Financial Analysis

The District will analyze the financial considerations following a drought, which is an important way to gauge the success of drought management activities. A detailed financial assessment of the costs incurred during a drought are important.

- Below are two scenarios of drought finances, along with their impacts on the District.
  1) **Costs to the District** – When the drought Stage 1 was declared, a charge number should have been established for all new drought activities, including: permanent staff time, temporary worker time, special materials, and other costs associated with drought management. All costs associated with the drought must be charged to this number in order to completely account for the additional costs incurred during drought.
  2) **Revenues for the District** –Finance staff should analyze how the decreased revenue from the drought impacted District finances and reserve funds and make recommendations for financial stability in future droughts.

The District is aware of the expected decreased revenues and increased costs associated with supply shortage conditions. Approximately 50 percent of the District's revenues are derived from volumetric charges. Assuming a reduction in sales commensurate with the particular Plan stage declaration, a decrease in water rate revenues in the range of 5-15 percent (or higher) may be expected.

EID maintains financial reserves that can be utilized to buffer potential revenue impacts of reduced sales during a stage declaration, should it be prudent to do so. These reserves are a tool that can be used by the District to maintain financial stability during times of imbalanced revenues and expenses that may be caused by reduced volumetric sales during dry periods. In addition to utilizing financial reserves, the District may enact a range of financial management actions depending on the specific situation.

8.4 Report to the Board

The concluding task in any drought management effort is the final report to the Board, especially summarizing the costs and revenues described above. Because the Board reports directly to the customers served by the District, it is important for the Board members to be able to convey to their constituents the successes and lessons learned of the District's drought management efforts. This report may also be released to all District customers, as successful drought management is not possible without customer involvement, cooperation, and support.