SB 610 WATER SUPPLY ASSESSMENT

Sage Ranch Development Project

PREPARED FOR:

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1.0 INTRODUCTION AND BACKGROUND

This Water Supply Assessment (WSA) has been prepared pursuant to the requirements of Senate Bill 610 (Costa; Chapter 643, Stats. 2001) ("SB 610"), which requires public water agencies, parties or purveyors that may supply water to certain proposed development projects to prepare a WSA for use in environmental documentation for such projects, pursuant to the California Environmental Quality Act (CEQA). The City of Tehachapi is conducting an environmental review under the requirements of CEQA for the proposed Sage Ranch Development Project (Project) in the City of Tehachapi, California. See Section 2.0 for a description of the Project.

The WSA will evaluate whether the total Project water supply determined to be available during normal, single dry and multiple dry years will meet the Project water demand associated with the Project, in addition to existing and planned future uses in the City.

This WSA contains information from the Greater Tehachapi Area - 2015 Urban Water Management Plan (UWMP) which was adopted by the Tehachapi-Cummings County Water District (TCCWD) and the City of Tehachapi (City). Other source documents were used to support the analysis and are cited as applicable within this document.

A WSA is required for any "project" that is subject to CEQA and proposes, among other things, a residential development of more than 500 dwelling units. Therefore, since the Sage Ranch Development Project is proposing a development of 1,000 units, a WSA is required.

Water Agencies and Providers

The City of Tehachapi provides water supplies for the City. However, the City is part of a regional group of agencies and providers within the Greater Tehachapi Area as follows:

- Tehachapi-Cummings County Water District (wholesale water supplier)
- Bear Valley Community Services District
- City of Tehachapi
- Golden Hills Community Services District
- Stallion Springs Community Services District

Tehachapi-Cummings County Water District (TCCWD), the wholesale water supplier for the area, provides State Water Project (SWP) water supplies that are used primarily for agriculture with some commercial, industrial, and urban uses. TCCWD also acts as the court-appointed

Watermaster for the three adjudicated basins (Tehachapi Valley, Cummings Valley and Brite Valley) in the Greater Tehachapi Area, from which the retail water purveyors produce most of the water supplies delivered in their service areas.

However, the TCCWD does not supply these agencies with native groundwater. The agencies have rights pursuant to the judgments to exercise their groundwater supplies. TCCWD does provide untreated imported SWP water for groundwater recharge that is then accessed by the retail water purveyors.

Water System and Supply

The Tehachapi Basin (Basin) provides the main source of water supply for the City of Tehachapi and surrounding communities. The TCCWD serves as Watermaster over the Basin. Tehachapi is currently allocated 1,847 acre-feet per year (afy), approximately 90 percent of its average demand of 2,017 afy.[1] The City makes up the shortfall by acquiring water from the exchange pool, in which water rights holders are able to exchange or sell portions of their allocation. Major rights holders in addition to Tehachapi include the Golden Hills Community Services District (CSD), industrial and agricultural users, with agricultural users representing the largest number of participants in the exchange pool.[2] Regionally, TCCWD's water supply (as of 2015 when the RUWMP was prepared), is summarized in Table 1-1 – TCCWD: Water Supplies – Actual (2015).

Table 1-1
TCCWD: Water Supplies – Actual (2015)

Water Supply Source	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Purchased or Imported Water	SWP	5,160	Raw Water
Recycled Water	From CCI	158	Recycled Water
Groundwater	M&I Use	5,510	Drinking Water
Groundwater	Agricultural use	4,543	Raw Water
Total		15,371	
NOTES: From annual summary prepared by the TCCWD.			

[1] Based on the City's 10-year average (communication with Public Works Department Sept. 2019).

[2] Tehachapi General Plan EIR, page 4.14.1-1.

According to the TCCWD, the Basin's safe yield is 5,500 af annually.[3]

The City's water service area covers approximately 4,800 acres and operates six wells serving five pressure zones.[4] The City water service area includes a variety of residential, commercial, governmental, institutional, and industrial water users. Water is distributed via a City-maintained system of 2-inch through 16-inch mainline piping. All of the potable domestic water is currently derived from groundwater wells.

Regional Watershed

The principal drainage courses in the Tehachapi Valley are Tehachapi Creek, which flows west to the San Joaquin Valley, and Cache Creek, which flows east to the Mojave Desert. Proctor Dry Lake also collects surface drainage that flows eastward. The majority of the stream flow coming into Tehachapi Valley percolates through streambeds and does not exit the valley via stream flow. Any stream flow that is lost from the basin is generally through surface water outflow in Tehachapi Creek, through evaporation from Proctor Dry Lake and in very wet years through surface water outflow to Cache Creek.

The Tehachapi basin is divided into two sub-basins: Tehachapi Valley East and Tehachapi Valley West. Immediately to the west is Brite Basin, a natural sink where several small streams that drain the surrounding valley walls disappear into the ground, mostly in the vicinity of Brite Lake. This lake is one of the principal recharge sites for the Tehachapi Groundwater Basin that underlies the Tehachapi Basin and Brite Basin. The other important recharge area is Antelope Reservoir, south of Highline Road. Many smaller stormwater retention basins throughout the City also act as groundwater recharge facilities.[5]

[3] http://tccwd.com/ground-water-managment/, accessed July 2019.

[4] Regional Urban Water Management Plan – 2015, page 4-2.

[5] Tehachapi General Plan EIR, page 4.8-1.

2.0 PROJECT DESCRIPTION

PROJECT LOCATION AND SETTING

The proposed Project is located on approximately 138-acres in the City of Tehachapi, California, and is bounded by Valley Boulevard to the north, Tract 6212 to the west, Pinon Street to the south and Tehachapi High School to the east. The site is comprised of four parcels: 417-012-01, 417-012-24, 417-012-25, and 417-012-28. See Figures 2-1 and 2-2 – Aerial Map and Proposed Site Layout Plan Map, respectively.

The proposed Project site is located in the southeastern area of Tehachapi, southeast of downtown in an area that generally consists of single-family housing, multi-family housing, schools and churches. The site is currently zoned T-4 (General Urban) and is designated by the General Plan as 4B – Southern Neighborhoods. The site is vacant / undeveloped and is generally void of vegetation except for grass/weeds and scrub brush. Land uses and zoning designations of adjacent parcels surrounding the site are as shown in Table 1-1.

Table 1-1 - Surrounding Land Use and Zoning

Location	Existing Land Use	Current Zoning Classification
North	Vacant and residential	T-4 (General Urban)
South	Vacant, residential, church	R-1-8 (Low Density Single Family Residential) and T-4
West	Residential	R-1-8 (Low Density Single Family Residential)
East	High School	RSP (Recreation, School, Public Use)

DESCRIPTION OF PROPOSED PROJECT

The Project Applicant is proposing to subdivide and develop approximately 138-acres of T-4 zoned land into a residential community with a mix of single-family and multi-family housing units. The proposal features eight different types of housing products for a total of 1,000

residential units at buildout. The eight different types of housing features detached products (52%) and attached products (48%). A brief description of housing types is shown in Table 1-2 and the proposed Site Layout Plan is shown in Figure 2.

Table 1-2 - Summary of Proposed Housing Types

Housing Type	Total Acreage	Number of Units
SFD-5: Single-Family Detached (5,000 – 5,500 sq. ft. parcels). Four blocks of this housing type will be located on the outer edge of the Project along the eastern and southern edge of the Project.	20.9	124
SFD-7: Single-Family Detached (4,200 sq. ft. parcels). Two blocks of this housing type will be located within the interior of the Project around the central park.	20.5	139
Patio Homes: Multi-Family Detached. Three locations of his housing type will be near the interior of the Project around the central park, interspersed with the SFD-7 housing.	18.9	165
Court Homes: Multi-Family Detached. Two locations of his housing type will be near the southeastern area of the Project.	11.5	114
Cottage A&B: Multi-Family Attached. Cottage A will be located along the northern edge and Cottage B along at southwestern corner of the Project.	13	A – 72 B – 66
Townhomes: Multi-Family Attached. Townhomes will be located at the northeastern corner of the Project.	8.8	116
Apartments: Multi-Family Attached. Apartments will be located in the southeastern corner of the Project.	11.2	204
Total	**104.8***	**1,000**

**The balance of the total Project acreage consists of parks/open space, roadways, right-of-way and related land.*

Pedestrian Sheds and Civic Space

The Project includes a total of five pedestrian sheds, all civic space, within the Project. A variety of park space is being proposed as follows:

- 3.8 acre Central Park

- 3.4 acre Youth Sports Park / Detention Basin
- 0.6 acre Garden Park
- 0.6 acre Neighborhood Park
- 0.4 acre Organic Garden
- Various pocket parks throughout

Site Circulation and Access

The overall layout of the proposed Project is block form, with shortened roadway lengths in order to create a walkable urban environment. The site has been designed with 12 points of ingress and egress. Five of these points connect at Valley Boulevard along the northern edge of the Project; 3 access points on the western edge; and 4 access points along the southern edge. The Project will be responsible for construction of internal roadways to City standards as well as for potential improvements to surrounding roadways to accommodate the Project.

Infrastructure

The Project will require connection to various City-operated systems. These include sewer, water and storm drain facilities. The Project will be responsible for construction of connection points to the City's existing infrastructure. The Project also includes improvements and landscaping along the frontage roads and within the site itself.

Phasing / Construction Schedule

The Project is proposed to be built out in phases. Although the exact timing of construction and buildout will be determined by the City, it is anticipated that the Project would be built out over a seven year period with approximately 143 units per year on average.

Entitlement Procedures

The Project is proposed to be processed as a Planned Development Zone which is found in Chapter 3.30.160 of the City's Zoning Code. The Planned Development Zone is a mechanism that allows for a flexible regulatory procedure by which the General Plan and Zoning Code may be accomplished and is appropriate for comprehensive site planning of large parcels. Various approvals by the City (Planning Commission and City Council) are required for the Final Master Development Plan which will include the following components:

- Final/complete site plan
- Proposed floor plans / elevations

- Tentative tract map
- CEQA documents and technical studies (including this WSA)
- Associated studies, maps and reports

Upon approval of the Final Master Development Plan by the City Council, the Applicant is required to submit Precise Development Plans for each phase or increment of construction and must provide a level of detail satisfactory to the City Engineer. The Planning Commission considers each Precise Development Plan as they are submitted.

Figure 1
Aerial Map

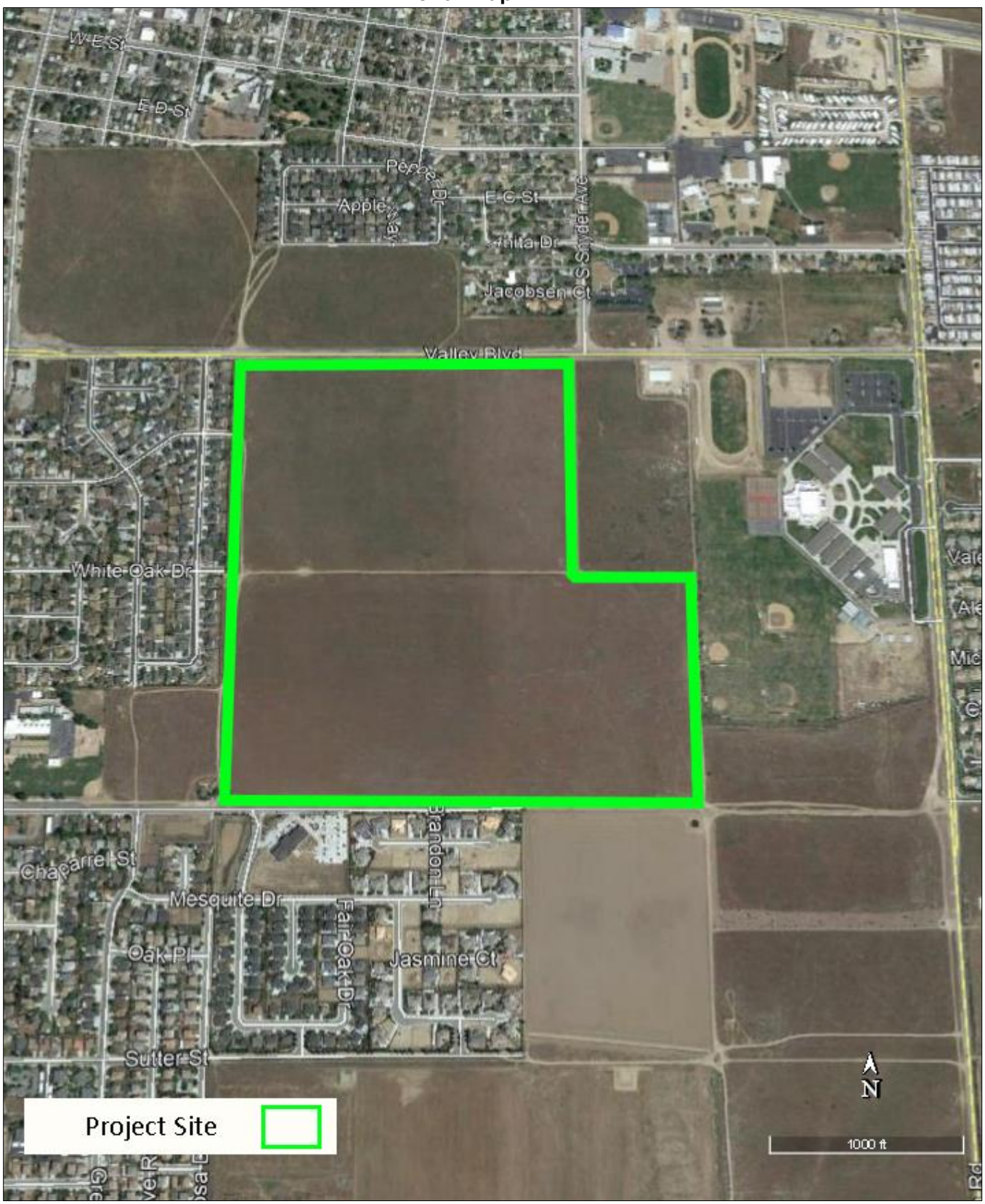


Figure 2
Proposed Site Layout Plan

2.0 PROJECT WATER DEMANDS

ASSUMPTIONS

Project water demand is estimated using information from the City's adopted 2015 Urban Water Management Plan (UWMP), as well as from a more recent water use information from the June 2019 *City of Tehachapi – Water and Sewer Systems Modeling, Planning, and Fee Studies Update* prepared by Michael K. Nunley and Associates. Project water demand is calculated on the following assumptions:

- Residential: The Project is proposing 1,000 residential units (see Table 1-2 for the breakdown of housing types).
- Public Parks: The Project includes approximately 9 acres of park space distributed among five parks throughout the proposed development. To be conservative, it is assumed that the entire park space acreage will be irrigated lawn and will require approximately 5 acre-feet of water per acre per year. This figure is based on existing water use at Warrior Park (located approximately ¼ mile southwest of the Project site) as well as information pertaining to water requirements for large irrigated lawns such as golf courses in the region.
- Per Capita Water Use: The average residential water use in gallons per capita per day (GPCD) for calendar years 2017-2018 in the City of Tehachapi was 118 GPCD per person,[6] which is based on readings from metered residential customers. This figure will be used to calculate projected water demand from the Project. This is inclusive of water used for outdoor landscaping.
- Public Areas / Landscaping: In addition to park space, the outdoor public spaces (excluding backyards) will be maintained by a Homeowners Association (HOA). Although the 118 GPCD estimate includes water used for outdoor landscaping, the Project will not utilize potable water for public outdoor space landscape irrigation (with the exception of private backyards). See *Measures to Reduce Potable Water Use* for more information pertaining to outdoor water use.

[6] City of Tehachapi – *Water and Sewer Systems Modeling, Planning and Fee Studies Update*(Memo #3), MKN (June 2019), Page 9, Table 5-2.

- Household Size: According to the 2018 U.S. Census for Tehachapi, the City averages 2.63 persons per household. Although some of the housing products / floor plans proposed by the Project would likely result in fewer than 2.63 persons per residence, the figure is being used to conservatively estimate Project water demand.

PROJECT WATER DEMANDS

Based on the above assumptions, Project water demand is calculated as follows:

Residential: 1,000 dwelling units X 2.63 persons per dwelling unit = 2,630 persons X 118 GPCD = 310,340 total gallons per day X 365 days per year = 113,274,100 gallons per year (or ~**348 acre/feet/year**)

Parks: 9 acres X 5.0 acre/feet/year = ~**45 acre/feet/year**

Total Water Demand: 348 acre/feet/year for Residential
45 acre/feet/year for Parks
393 acre/feet/year

It is anticipated that the Project would require approximately 393 acre/feet/year of water. The next section identifies measures to reduce the amount of potable water required for the Project.

MEAURES TO REDUCE POTABLE WATER USE

As identified above, the proposed Project would use approximately 393 AFY of water per year. To offset the amount of potable water being utilized by the Project, the City will require the following measures:

1. The ~9 acres of parks / public space, as well as the outdoor spaces maintained by the HOA will be irrigated with non-potable water from TCCWD. TCCWD provides a reasonably reliable water source either from Basin return flows or from SWP. However, since outdoor landscaping is considered non-critical, the water available for outdoor public spaces may be limited during severe drought conditions.
2. Even though the Project will use non-potable water for outdoor irrigation (with the exception of backyard spaces), the Project is designed to use less water per unit for landscaping than a typical single family residential development. As previously mentioned, the 118 GPCD estimate includes water used for outdoor irrigation. In California, particularly non-coastal areas, outdoor irrigation can often exceed 50% of total potable water use in residential developments. However, it is anticipated that the

proposed Project would use significantly less water for outdoor irrigation because of the relatively small lots with minimal outdoor space available for extensive landscaping. Most of the housing products consist of multi-family patio/court homes, townhomes and apartments (737 units), with the remaining 263 units consisting of single family residential houses on small lots ranging from 4,200 to 5,500 square feet. Because of the relatively small lot sizes and the high number of multi-family housing products, there is limited opportunity for extensive landscaping. In addition, the Project is subject to the Model Water Efficient Landscape Ordinance (MWELO) which encourages more efficient irrigation systems, onsite stormwater capture, limiting turf, etc. By incorporating these factors, it is conservatively estimated that the Project would use at least 20% less than the 118 GPCD estimate for potable water use, or 95 GPCD.

PROJECT WATER DEMANDS AFTER REDUCTION MEASURES

As identified previously, the Project would use approximately 393 AFY of potable water unmitigated. The measures identified above would result in the following potable water savings:

- 45 acre/feet/year in potable water savings by using non-potable water for parks (based on an estimated 5 acre/feet/year per acre of park space).
- 68 acre/feet/year in potable water savings by using non-potable water for outdoor public areas (not including backyards). This is based on 1,000 dwelling units X 2.63 persons per dwelling unit = 2,630 persons X 95 GPCD = 249,850 total gallons per day X 365 days per year = 91,195,250 gallons per year (or ~280 acre/feet/year). Unmitigated residential water use is 348 acre/feet/year. Mitigated residential water use is 280 acre/feet/year which results in a net savings of 68 acre/feet/year.

This results in a savings of 113 acre/feet/year in potable water use. Total anticipated potable water use from the Project after implementation of reduction measures is approximately **280 acre/feet/year** (393 – 45 – 68 = 280).

CITY-WIDE FUTURE ESTIMATED WATER USE

The City pumps groundwater from the adjudicated Tehachapi Groundwater Basin and is allowed 1,847 acre-feet of groundwater pumped per year. The City can purchase imported SWP water from TCCWD to meet demands in excess of its groundwater allocation. These supplies are delivered to the City through groundwater recharge. According to the Greater Tehachapi RUWMP (2015), the projected available water supply (shown in five-year increments) for the City is as follows:

Year	Projected Acre-Feet-Year of Available Water Supply[7]
2020	2,242 AFY
2025	2,347 AFY
2030	2,458 AFY
2035	2,575 AFY

More recent information about projected water demand within the City is in the *Water and Sewer Systems Modeling, Planning, and Fee Studies Update*, *Technical Memorandum #3* prepared by Michael K. Nunley and Associates. The Technical Memorandum provides a summary of projected future water demands associated with 10 years of anticipated development within the City. The proposed Project site was evaluated in the study and assumed the site would be built out with 150 single-family units and 350 multi-family units.[8] Based on 2.63 people per unit and 118 GPCD, it was assumed the site would require approximately 174 acre/feet/year. However, as identified herein, the proposed Project would require approximately 280 acre/feet/year of potable water, a difference of 106 acre/feet/year from the projected/estimated water demand for the site. Because the City is restricted in its groundwater extraction, the Applicant will be required to secure some potable water from alternate sources.

ACQUISITION OF WATER

The City purchases SWP water from TCCWD to meet its demands in excess of its groundwater allocation and stores at least a 5-year supply. It is anticipated that the City can provide 100% of average supplies in every year.[9] See Section 4.0 for an evaluation of dry-year adequacy.

The Applicant will be required to secure/purchase water rights to serve the Project and/or pay in-lieu fees as determined by the City (for the City to purchase additional water for recharge). As discussed previously, Project water supply will likely occur from a combination of sources including acquisition of non-potable agricultural water (for public space outdoor irrigation), purchase/acquisition of potable water, and payment of City water fees. Each housing unit shall pay the water rights fee in place at the time of permit issuance. Alternatively, at the discretion of the City, the Applicant shall construct an equivalent water savings project that has the effect of

[7] Greater Tehachapi RUWMP (2015), page 4-15, Table 4:6-9.

[8] City of Tehachapi – *Water and Sewer Systems Modeling, Planning and Fee Studies Update* (Memo #3), MKN (June 2019), Page 12, Table 5-5.

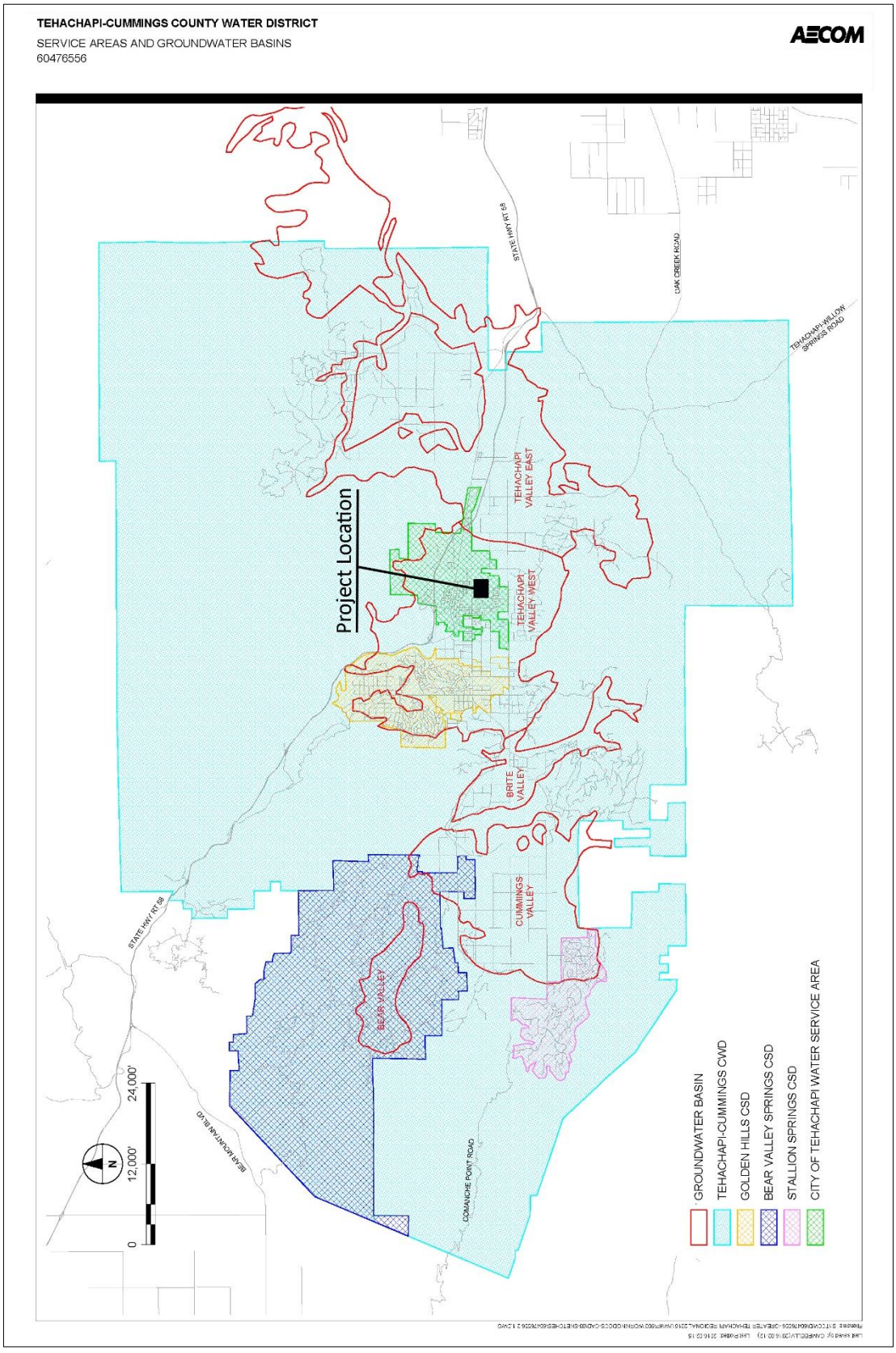
[9] Regional Urban Water Management Plan – 2015, page 4-17.

reducing current potable water demand elsewhere in the City, as an "in-lieu" method of achieving the water demand requirements of the Project. This shall be made a condition of Project approval.

3.0 INCLUSION IN ADOPTED URBAN WATER MANAGEMENT PLAN (Water Code Section 10910(C)(1))

The proposed Sage Ranch Project site is included in the land use / population area covered by the City's 2015 Regional Urban Water Management Plan. Figure 3 shows the location of the Project site in relation to the Water Service Area boundaries covered by the 2015 RUWMP. The adequacy of the water supply for the Project will thus be analyzed on the basis of the analysis of the City's water supply in the adopted Urban Water Management Plan.

Figure 3 – Project Location Within the RUWMP Boundaries



4.0 DRY YEAR WATER SUPPLY ADEQUACY (Water Code Section 10910(C)(4))

The following dry year water supply adequacy is excerpted from the adopted 2015 RUWMP for the City-served area.

The City of Tehachapi relies on groundwater pumping from the adjudicated Tehachapi Basin to meet the demands of its customers. The City has an adjudicated allocation of 1,847 acre-feet/year in addition to the right to recovery of previously recharged SWP supplies purchased from the TCCWD in its Banked Water Reserve Account (BWRA). Based on ongoing monitoring of the Tehachapi Basin, the City anticipates that the safe yield and water quality will remain at close to current conditions for the next twenty years and beyond. With average SWP deliveries at 60% longterm, the City anticipates that sufficient supplies will be reasonably available for purchase from the TCCWD and will have been previously recharged for recovery during the average year, single dry year, and multiple dry years scenarios. As of December 31, 2018, the City's BWRA balance is estimated to be 1,295 acre-feet. The City maintains a storage balance of an estimated five year supply (of banked groundwater in excess of the 1,847 AFY already allocated to the City for pumping).

The reliability of the City's groundwater supplies for the various water year types are summarized in Table 4-1.

Table 4-1 COT: Basis of Water Year Data

Year Type	Base Year	Available Supplies if Year Type Repeats
		% of Average Supply
Average Year	Base Year	100%
Single-Dry Year	2015	100%
Multiple-Dry Years 1st Year	2013	100%
Multiple-Dry Years 2nd Year	2014	100%
Multiple-Dry Years 3rd Year	2015	100%

NOTES: The City pumps groundwater from an adjudicated basin with an annual allocation of 1,847 acre-feet. The City purchases SWP from TCCWD to meet its demands in excess of its groundwater allocation and stores at least a 5-year supply. It is anticipated that the City can provide 100% of average supplies in every year.

The comparison of City's supply and demand projections for the normal year, single dry year, and multiple dry year scenarios are shown in Tables 4-2, 4-3, and 4-4 respectively. The City's purchase and recharge of imported SWP supplies are based on providing a five year supply beyond its adjudicated allocation. The City anticipates having groundwater supplies available to meet demands during the normal, single dry year, and multiple dry year scenarios.

Table 4-2 COT: Normal Year Supply and Demand Comparison				
Description	2020	2025	2030	2035
Supply totals *(from Table 4: 6-9)*	2,242	2,347	2,458	2,575
Demand totals *(from Table 4: 4-3)*	2,242	2,347	2,458	2,575
Difference	0	0	0	0
NOTES:				

Table 4-3 COT: Single Dry Year Supply and Demand Comparison				
Description	2020	2025	2030	2035
Supply totals	2,242	2,347	2,458	2,575
Demand totals	2,242	2,347	2,458	2,575
Difference	0	0	0	0
NOTES:				

Table 4-4 COT: Multiple Dry Years Supply and Demand Comparison					
Description		2020	2025	2030	2035
First year	Supply totals	2,242	2,347	2,458	2,575
	Demand totals	2,242	2,347	2,458	2,575
	Difference	0	0	0	0
Second year	Supply totals	2,242	2,347	2,458	2,575
	Demand totals	2,242	2,347	2,458	2,575
	Difference	0	0	0	0
Third year	Supply totals	2,242	2,347	2,458	2,575
	Demand totals	2,242	2,347	2,458	2,575
	Difference	0	0	0	0
NOTES:					

REGIONAL SUPPLY RELIABILITY

According to the RUWMP, the urban water suppliers in the Greater Tehachapi area have been working together for many years to manage available water supplies on a regional basis. The Water Availability Preservation Committee meets on a regular basis to plan for and manage available water supplies.[10]

[10] Regional Urban Water Management Plan – 2015, page 4-18.

5.0 WATER SUPPLY RIGHTS AND ENTITLEMENTS; HISTORIC WATER USAGE (Water Code Section 10910(A)(1) and 10910(D)(2))

The City of Tehachapi uses primarily groundwater for its potable water, supplemented with surface water that is purchased and recharged into the underlying basin. The following pages are extracted directly from the adopted 2015 RUWMP (Pages 2-2 through 2-20) in satisfaction of these Code sections. This information is applicable to the entire City of Tehachapi municipal water service area, including the Sage Ranch Project site.

Tehachapi Valley Basin:

The Tehachapi Valley Groundwater Basin is described as two basins by the DWR in California's Groundwater Bulletin 118 (2006). The Tehachapi Valley West Groundwater Basin (DWR Basin No. 5-28) encompasses the western half of the Tehachapi Valley, with a surface area of about 14,800 acres. The basin is bounded on the north by the Sierra Nevada and on the south by the Tehachapi Mountains. A low-lying ridge connecting these two ranges forms the western boundary. A similar ridge with a narrow gap separates Brite Valley from Tehachapi Valley. Alluvial deposits are estimated to be 600 feet in depth.

The DWR notes that an alluvial high (surface drainage divide) forms the boundary between this basin and the adjacent Tehachapi Valley East Basin. However, this surface drainage divide does not create a boundary within the groundwater basin. The Tehachapi Valley East Basin (DWR Basin No. 6-45) encompasses a surface area of about 24,000 acres. The basin is bounded on the east by the Tehachapi Mountains.

Groundwater in the western portion of the Tehachapi Valley Basin is recharged primarily through percolating stream flows from Antelope, China and Brite Creeks, as well as artificial recharge of imported SWP supplies at Antelope Dam and China Hill. Blackburn and Mendiburu Creeks are the primary sources of recharge in the eastern portion of the basin.

Groundwater adjudication proceedings were initiated in 1966 in response to the decline in groundwater levels that had been experienced in the Tehachapi Valley Basin since 1950. The Tehachapi Basin adjudication judgment was filed in 1971, with an amended judgment filed in 1973 (Superior Court Case No. 97210). The adjudicated Tehachapi Basin includes portions of both the Tehachapi Valley West and East Basins. The physical solution in the judgment created "allowed pumping allocations" for each party which restricted total annual extractions within the Tehachapi Basin to the safe yield of 5,500 acre-feet. Exports from the groundwater basin are not allowed. Allowed pumping allocations per the judgment are as follows:

- City of Tehachapi – 1,847 Acre-feet
- Golden Hills CSD – 874 Acre-feet
- Other pumpers – 2,828 Acre-feet.

The following pages are extracted directly from the adopted 2015 RUWMP (Pages 2-2 through 2-20) in satisfaction of Water Code Sections 10910(A)(1) and 10910(D)(2)).

supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (10631(j)).

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan (10621(b)).

TCCWD provides a supplemental imported water supply from the State Water Project (SWP) to retail water suppliers in the GTA. The TCCWD provides untreated water for groundwater recharge that is then accessed by the retail water purveyors.

Table 2:2-4 lists the water suppliers that were informed of SWP water supply projections as a part of the RUWMP development process. TCCWD provides wholesale imported water supplies to these agencies.

Table 2:2-4 Wholesale: Water Supplier Information Exchange

Supplier has informed the following water suppliers of water supplies available in accordance with CWC 10631.
Water Supplier Name
Bear Valley Community Services District
City of Tehachapi
Golden Hills Community Services District
Stallion Springs Community Services Districts
NOTES: Agencies are participants in this RUWMP.

In addition to the water suppliers listed in **Table 2:2-4**, the Kern County Planning Department was provided notice that an update to the RUWMP was being prepared and notice of the public hearing on the Plan. Further information on coordination of the Plan and public involvement is included in **Section 2.09**. Copies of notices are included in **Appendix A**.

2.02 System Description

2.02.1 General Description

Law

Describe the service area of the supplier (10631(a)).

The TCCWD is located within the Tehachapi mountain range east of Bakersfield in southeastern Kern County, and encompasses approximately 266,000 acres. The TCCWD provides imported water supplies (SWP), water resources management, and flood protection within several improvement districts in the Tehachapi Basin. The TCCWD serves as watermaster for three adjudicated groundwater basins: Brite Valley, Cummings Valley, and Tehachapi Valley. TCCWD sells imported SWP supplies to agricultural lands, the California Department of Corrections and Rehabilitation's Correctional Institution in Tehachapi (CCI), and to retail water agencies within TCCWD through conjunctive use. The service area boundaries for TCCWD

and the four retail water suppliers covered by this RUWMP Update, along with the boundaries of the groundwater basins, are shown in **Figure 2-1**.

The TCCWD Imported Water Project takes delivery of water supplies from the California Aqueduct upstream of the Edmonston Pumping Plant (Reach 16A). Water is pumped from the Aqueduct to the Cummings Basin, where it is used for agriculture and the conjunctive use program for retail water purveyors. The TCCWD main pipeline is 31 miles in length and ranges from 18 to 30 inches in diameter. The nominal operating capacity of the line is 9,400 gallons per minute (21 cfs). The TCCWD system includes four pumping stations serving three pressure zones, and Jacobsen Reservoir (Brite Lake) which serves as a both a storage facility and recreational lake.

There are a number of entities within the TCCWD service area that use local groundwater but are not a party to the RUWMP. These include agricultural users, rural homes, mutual water companies, industrial facilities, and the CCI. These entities pump from the three adjudicated basins and from outside of these basins. Estimated groundwater usage by these entities has been included as necessary to understand the regional groundwater conditions.

2.02.2 Service Area Climate

Law

Describe the climate of the supplier (10631(a)).

The GTA is located in the mountains with elevations ranging from about 3,900 feet to almost 8,000 feet. Precipitation mainly occurs during the months of November through April, with occasional thunderstorms during the summer months. The area typically receives about 15-20 inches of snow annually. **Table 2:3-0** presents the average rates of evapo-transpiration (Eto), temperature, and precipitation of the service area.

Table 2:3-0: Climate

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Monthly Eto[(a)]	1.55	2.24	3.72	5.10	6.82	7.80	8.68	7.75	5.70	4.03	2.10	1.24	56.73
Average Precipitation (inches)[(b)]	2.01	1.77	1.96	0.92	0.40	0.09	0.08	0.27	0.24	0.38	1.23	1.62	10.97
Average Max Temperature (Fahrenheit)[(b)]	51.3	54.0	56.0	62.6	70.6	79.7	87.1	86.3	80.4	70.8	56.6	52.3	67.6
Average Min Temperature (Fahrenheit)[(b)]	29.6	31.6	33.5	37.5	43.8	51.5	57.2	54.9	48.1	40.7	34.4	30.4	41.1

Sources:
[(a)] CIMIS Reference Evapotranspiration Zones, November 2005. Standard Monthly Average Eto is for Zone 14, Mid-Central Valley, Southern Sierra Nevada, Tehachapi and High Desert Mountains.
[(b)] Western Regional Climate Center, Tehachapi Station (048826), Period of Record General Climate Summary.

2.02.3 Service Area Population

Law

(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . . (10631(a)).

. . . (population projections) shall be in five-year increments to 20 years or as far as data is available (10631(a)).

Describe . . . other demographic factors affecting the supplier's water management planning (10631(a)).

The State of California Department of Finance (DOF) prepares reports with population estimates for Cities and Counties on an annual basis. These estimates were used for the City of Tehachapi and the CCI for 2015. The 2015 population estimates for the participating CSDs were developed based on 2010 Census data and the population per connection method (using 2010 Census data for the Bear Valley Springs CDP, Golden Hills CDP, and the Stallion Springs CDP). The population for the remainder of the TCCWD was calculated based on the 2010 Census data and the percentage increase in population for the City of Tehachapi from 2010 to 2015. The population within the TCCWD service area was estimated to be about 35,700 in 2015 as shown in **Table 2:3-1.**

Population projections for the participating agencies for the years 2020 through 2035 were based on population projections for the City of Tehachapi (1.1% growth per year), and the unincorporated areas (1% growth per year) from the Kern COG 2014 Regional Transportation Plan. No change in population is anticipated for the CCI. By the year 2035 the population within the TCCWD service area is projected to be approximately 42,847.

Table 2:3-1 TCCWD: Population - Current and Projected

Population Served	2015[1]	2020[2]	2025[2]	2030[2]	2035[2]
Bear Valley CSD	5,314	5,585	5,870	6,169	6,484
City of Tehachapi	8,815	9,311	9,834	10,387	10,971
Golden Hills CSD	8,787	9,235	9,706	10,201	10,721
Stallion Springs CSD	2,782	2,924	3,073	3,230	3,395
CCI (TCCWD)	4,213	4,213	4,213	4,213	4,213
Remaining TCCWD	5,789	6,084	6,394	6,720	7,063
Total TCCWD	**35,700**	**37,352**	**39,090**	**40,920**	**42,847**

NOTES:
1. 2015 population for the City of Tehachapi and CCI from California DOF Population Estimate Report E-5. 2015 population for the participating CSDs were developed using the population per connection method. The remainder of TCCWD was estimated based on 2010 Census data and the percentage increase in population for the City from 2010 to 2015.
2. Population projections for 2020 through 2035 based on population projections of 1.1% per year for the City of Tehachapi and 1% for the unincorporated area from Kern COG (Regional Transportation Plan June 2014), except no change in population is assumed for the CCI.

2.03 System Water Use

2.03.1 Water Use

Law

> *Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural (10631(e)(1) and (2)).*
>
> *The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).*

TCCWD makes water deliveries of imported SWP water supplies which may be used as follows:

- Direct delivery to agricultural, commercial, and industrial customers overlying the Cummings Valley, Tehachapi Valley, and Brite Valley groundwater basins.
- Groundwater recharge delivery in the Cummings Valley Basin for ultimate use by M&I customers: BVCSD, SSCSD, and CCI. Evaporation losses from this recharge are estimated at 6 percent (Tehachapi-Cummings, 2010).
- Groundwater recharge delivery in the Tehachapi Valley Basin for ultimate use by M&I customers: City of Tehachapi and GHCSD. Evaporation losses from this recharge are estimated at 6 percent (Tehachapi-Cummings, 2010).
- Storage in Jacobsen Reservoir (Brite Lake).

In addition, TCCWD receives ownership of return flow water from agricultural application of SWP supplies, which are calculated as 15 percent of all metered imported water applied for agricultural use. These supplies can be delivered anywhere in the TCCWD for agricultural and M&I customers.

Water use data within the TCCWD for 2015 is summarized in **Table 2:4-1**. 2015 was an extremely dry year, so reduced SWP supplies were available to TCCWD for groundwater recharge. TCCWD makes no deliveries of water for saline intrusion barriers. The deliveries by the participating agencies for retail water usage are included in their respective sections of the Plan.

Table 2:4-1 TCCWD: Demands for Potable and Raw Water - Actual			
Use Type	2015 Actual		
	Additional Description	Level of Treatment When Delivered	Volume[1]
Sales to other agencies	Imported water sales	Raw Water	262
Sales to other agencies	Conjunctive use sales	Raw Water	1,048
Sales to other agencies	Wheeled water sales	Raw Water	60
Sales to other agencies	Recycled water sales	Raw Water	158
Agricultural irrigation		Raw Water	8,892
Groundwater recharge		Raw Water	37
Other	Estimated Other M&I[2]	Drinking Water	4,914
TOTAL			**15,371**

NOTES:
1. Demands shown are for entire TCCWD service area. From TCCWD water demand summary.
2. Estimated Other M&I use is met through groundwater pumping by retail water suppliers or other overlying landowners.

Table 2:4-2 includes projections of TCCWD's water demands for the years 2020 through 2035 in five year increments. For retail water suppliers, projections for future water use are based on historic deliveries and projected growth rates. Descriptions of water usage projections for each of the participating agencies are included in their respective sections of the Plan. Projections of low income housing water use needs for single-family and multifamily residential housing will be addressed by the retail water suppliers in their Plan sections.

Agricultural water deliveries are anticipated to have minimal growth in the next ten to fifteen years with a possible decrease over the next twenty to thirty years. The water delivery projections in **Table 2:4-2** show consistent quantities through 2035. It is projected that in the long-term more agricultural land will convert to urban uses.

Table 2:4-2 TCCWD: Demands for Potable and Raw Water - Projected					
Use Type	Additional Description	Projected Water Use			
		2020	2025	2030	2035
Sales to other agencies	Imported water sales[1]	570	570	570	570
Sales to other agencies	Conjunctive use sales[1]	2,100	2,100	1,600	1,600
Sales to other agencies	Wheeled water sales	80	80	80	80
Sales to other agencies	Recycled water sales	800	800	800	800
Agricultural irrigation		9,500	9,500	9,500	9,500
Other	Estimated Other M&I[2]	5,172	5,493	6,331	6,687
TOTAL		**18,222**	**18,543**	**18,881**	**19,237**

NOTES:
1. For M&I use. Deliveries are made to retail suppliers in most years so that adequate storage (5 year average SWP demand) is in place for recovery in dry years.
2. Estimated Other M&I demands are for retail water suppliers or other overlying landowners to be met by groundwater pumping. Demands are for the entire TCCWD.

Table 2:4-3 summarizes TCCWD's total water demands from **Tables 2:4-1 and 2:4-2**.

Table 2:4-3 TCCWD: Total Water Demands					
Description	2015	2020	2025	2030	2035
Potable and Raw Water *From Tables 2:4-1 and 2:4-2*	15,371	18,222	18,543	18,881	19,237
Recycled Water Demand *From Table 2:6-4*	158	800	800	800	800
TOTAL WATER DEMAND	**15,529**	**19,022**	**19,343**	**19,681**	**20,037**
NOTES:					

2.03.2 Distribution System Water Losses

Law

> *Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:. . . (J) Distribution system water loss. (10631(e)(1) and (2)).*
>
> *For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.*
>
> *The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association (10631(e)(3)).*

TCCWD's historical water loss rate (2002 – 2014) is 12.3 percent, and over the last five years is 10.9 percent. Losses are due primarily to evaporation losses and seepage from its storage reservoir (Jacobsen Reservoir), which also functions as the regional recreational lake (Brite Lake). While these losses cannot be fully mitigated due to the nature and use of open-air reservoirs, TCCWD continues to manage the reservoir to reduce evaporative losses as much as possible. In 2011, a bi-directional meter was installed to isolate the reservoir from the rest of the transmission system so as to identify how much of the overall loss is truly attributed to the reservoir evaporation. A detailed accounting of reservoir management in 2012 indicated that evaporation/seepage accounted for 30.1% of total system losses. Every 2 to 3 years, the shoreline is compacted while the water level is low to minimize seepage losses.

Prior to 2015, TCCWD had repaired only about 8 leaks throughout the pipeline's 40 year history. However, in 2015, five leaks were repaired in one year. Four of them occurred in the lower section of pipeline between the SWP aqueduct turnout and Pumping Plant 1. Additionally, system performance degradation occurred in 2015 that was speculated to be due to trapped air in that section of pipe. Leak detection was performed on the lower 7.2 miles of pipe by Pure Technologies using a SmartBall® in November 2015. One small leak was found (less than two gallons per minute) as well as five sections of pipe with entrained air. TCCWD is moving ahead with leak repair and exploring options to reduce trapped air to minimize future leaks.

TCCWD's goal is to reduce overall losses to no more than 12 percent of SWP imports and losses other than those due to the reservoir to no more than 7 percent.

Table 2:4-4 summarizes the results of TCCWD's water loss audit for 2015 using the AWWA water audit reporting worksheet. As a wholesaler delivering water for agricultural and groundwater recharge uses, many of the inputs on the standard AWWA water loss audit reporting worksheet are not applicable. A copy of the TCCWD's water audit reporting worksheet for its importation system is included in **Appendix H**.

Table 2:4-4 TCCWD: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss
01/2015	769.6
NOTES: TCCWD Importation System water loss from AWWA water audit worksheet. See Appendix H.	

2.03.3 Climate Change

A Climate Change Vulnerability Assessment was completed as a part of the Tulare Lake Basin Portion of Kern County Integrated Regional Water Management Plan (Kern IRWMP) and is included in **Appendix C**. Climate change adaptation and mitigation was included as a part of prioritization of projects in the IRWMP. Discussion of the potential climate change impacts to water supplies is included in **Section 2.05.1, Section 2.05.10,** and **Section 2.07.2**.

2.04 Baselines and Targets

The TCCWD does not need to adopt baselines and targets as a wholesale supplier. However, baselines and targets for the Regional Alliance were adopted as a part of the 2010 RUWMP. The update of the calculations of baselines and targets for the Regional Alliance is included in this section. Measures and policies adopted by the TCCWD that help the retail water suppliers in its wholesale service area achieve their SB X7-7 targets are described in **Section 2.08**.

2.04.1 Updating Calculations from 2010 UWMP

Law

> *An urban retail water supplier shall include in its urban water management plan due in 2010 . . .the baseline daily per capita water use . . . along with the bases for determining those estimates, including references to supporting data (10608.20(e)).*
>
> *An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan (10608.20(g)).*

The same target method is proposed for use in this RUWMP Update that was used for the 2010 Plan. The Regional Alliance targets have been calculated based on Option 2 (RA2). The SB X7-7 verification form tables for the Regional Alliance (RA2) and the participating retail water suppliers are included in **Appendix G.** As with the 2010 RUWMP, targets have been calculated for the Regional Alliance and for each of the

participating agencies. This is to permit the participating agencies to show compliance with their individual targets should the regional alliance targets not be met.

2.04.2 Baseline Periods

Law

"Base daily per capita water use" means any of the following:

1) *The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*
2) *For an urban retail supplier that meets at least 10 percent of its measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*
3) *For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year reporting period ending no earlier than December 31, 2007, and no later than December 31, 2010 (10608.12(b)).*

The Regional Alliance will utilize the same baseline period (2000 – 2009) as used in the 2010 RUWMP (see **SB X7-7 RA2 Table 1**).

2.04.3 Service Area Population

Law

When calculating per capita values for the purposes of this chapter, an urban water retailer shall determine population using federal, state, and local population reports and projections (10608.20(f)).

The City population estimates were taken from State DOF Table E-8 and population estimates for the CSDs were developed based on the persons per connection method and U.S. Census data for 2000 and 2010 for each Census Designated Place (see descriptions in each agency's respective section of the Plan). The Regional Alliance population estimate is the sum of the data for the four participating retail urban water suppliers (see **SB X7-7 RA2 Table 5**).

2.04.4 Gross Water Use

Law

"Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

1) *Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier*
2) *The net volume of water that the urban retail water supplier places into long term storage*

3) *The volume of water the urban retail water supplier conveys for use by another urban water supplier*
4) *The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24 (10608.12(g)).*

The gross water use for the Regional Alliance is the total gross water use of the four participating retail urban water suppliers as described in their respective sections of the Plan (see **SB X7-7 RA2 Table 5**).

2.04.5 Baseline Daily Per Capita Water Use

The baseline daily per capita water use for the Regional Alliance (calculated by dividing the gross water use by the service area population) is shown for each of the baseline years in **SB X7-7 RA2 Table 5**.

2.04.6 2015 and 2020 Targets

The 2020 Target for the Regional Alliance was calculated using Target Method 3 (95% of the Regional Target from the 20 x 2020 Water Convention Plan, State of California Agency Team, 2010) as shown in **SB X7-7 RA2 Table 7E**. The calculated target of 179 gpcd is the same as determined for the Regional Alliance in the 2010 RUWMP. The confirmation of the 2020 Target is shown in **SB X7-7 RA2 Table 7F**. The baseline and target information for the Regional Alliance is summarized in **Table 2:5-1**. Targets for the participating retail urban water suppliers are included in their respective sections of the Plan.

Table 2:5-1 Baselines and Targets Summary
Regional Alliance

Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target*	Confirmed 2020 Target*
10-15 year	*2000*	*2009*	*190*	*185*	*179*
5 Year	*2003*	*2007*	*190*		

*All values are in Gallons per Capita per Day (GPCD)

NOTES: See SB X7-7 RA2 tables in Appendix G.

2.04.7 2015 Compliance Daily per Capita Water Use (GPCD)

Law

"Compliance daily per capita water use" means the gross water use during the final year of the reporting period (10608.12(e)).

Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015 (10608.24(a)

The actual 2015 daily per capita water use for the Regional Alliance was 134 gpcd. The Regional Alliance is in overall compliance with the Regional Alliance 2015 Interim Target of 185 gpcd as shown in **Table 2:5-2.** The Alliance was also able to achieve compliance with the 2020 Target of 179 gcpd. The 2015 daily per

capita water use (134 gpcd) for the Regional Alliance is a reduction of approximately 30% from the 2000 to 2009 baseline period, and is 25% lower than the 2020 Target of 179 gpcd.

Table 2:5-2: 2015 Compliance *Regional Alliance**		
Actual 2015 GPCD	2015 Interim Target GPCD	Did Supplier Achieve Targeted Reduction for 2015? Y/N
134	185	Yes
**All values are in Gallons per Capita per Day (GPCD)*		
NOTES See SB X7-7 RA2 tables in Appendix G:		

2.05 System Supplies

2.05.1 Purchased or Imported Water

TCCWD purchases imported water from the SWP through contracts with the Kern County Water Agency (KCWA). Currently, TCCWD has two contracts with the KCWA for SWP entitlement (Table A), one for 4,300 acre-feet/year of agricultural water and the other for 15,000 acre-feet/year of M&I water. TCCWD is also able to purchase additional SWP supplies from the KCWA (such as Article 21 and turnback pool water) when available. Deliveries of imported SWP water for 2015 are included in **Table 2:6-8** in **Section 2.05.9**.

Projections for future deliveries of SWP water are estimated based on DWR's 2015 update of the State Water Project Delivery Capability Report (DCR), a biennial report to assist SWP contractors and local planners in assessing the near and long-term availability of supplies from the SWP. In the 2015 update, DWR provides SWP supply estimates for SWP contractors to use in their planning efforts, including for use in their 2015 UWMPs. The 2015 DCR includes DWR's estimates of SWP water supply availability under both current and future conditions.

DWR's estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and Central Valley Project systems. Key assumptions and inputs to the model include the facilities included in the system, hydrologic inflows to the system, regulatory and operational constraints on system operations, and projected contractor demands for SWP water. For example, the 2015 DCR uses the following assumptions to model current conditions: existing facilities, hydrologic inflows to the model based on 82 years of historical inflows (1922 through 2003), current regulatory and operational constraints, and contractor demands at maximum Table A amounts.

To evaluate SWP supply availability under future conditions, the 2015 DCR included four model studies. The first of the future-conditions studies, the Early Long Term (ELT) scenario, used all of the same model assumptions for current conditions, but reflected changes expected to occur from climate change, specifically, a 2025 emission level and a 15 cm sea level rise. The other three future-conditions include varying model assumptions related to the Bay Delta Conservation Plan/California Water Fix ("BDCP"), such as changes to facilities and/or regulatory and operational constraints.

In spring 2015, DWR announced that BDCP would move from a Section 10 permit to a Section 7 permit process under the Federal Endangered Species Act. As a practical matter, this split the project into two distinct parts known as Cal WaterFix (Alternative 4A), the conveyance portion, and Cal EcoRestore, the restoration portion. Cal WaterFix is Alternative 4A in the recirculated environmental document, and the preferred alternative. Alternative 4A is different than any of the future scenarios modeled by DWR in the

DCR. While there is widespread support for the BDCP/Cal WaterFix project, it would be speculative at this time to assume they will move forward. While there is significant support for BDCP, plans are currently in flux- environmental review is ongoing and is not anticipated to be final until at least 2016, and several regulatory and legal requirements must be met prior to construction.

This RUWMP uses the ELT scenario analyzed in DWR's 2015 DCR as deemed to be the most conservative and appropriate study to use for long term planning estimates of future SWP supply availability. The ELT scenario is based on existing facilities, current operations, and regulatory constraints, with hydrology adjusted for the expected effects of climate change. This scenario is consistent with the studies DWR has used in its previous SWP Delivery Reliability Reports for supply availability under future conditions. Tables C.15 and C.16 from the 2015 DCR show the results of the ELT scenario for the KCWA's Ag and M&I Table A supplies and have been included as **Appendix D**.

The average annual percentage of Table A entitlement as shown in Tables C.15 and C.16 of the 2015 DCR is 60%. This results in an average entitlement allocation of about 11,580 acre-feet per year for TCCWD. Projections of future SWP deliveries are included in **Table 2:6-9** in **Section 2.05.9**.

2.05.2 Groundwater

Law

> *If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the Plan:*
>
> *A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management (10631(b)(1)).*
>
> *A description of any groundwater basin or basins from which the urban water supplier pumps groundwater (10631(b)(2)).*
>
> *For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board (10631(b)(2)).*
>
> *A description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree (10631(b)(2)).*
>
> *For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition (10631(b)(2)).*
>
> *A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(3)).*

TCCWD serves as the court-appointed watermaster for the three adjudicated basins (the Cummings Valley, Brite Valley, and Tehachapi Valley groundwater basins as shown on **Figure 2-1**) from which the participating retail water purveyors produce most of the water supplies delivered in their service areas. However, the TCCWD does not supply these agencies with native groundwater. The agencies have rights pursuant to the

judgments to exercise their groundwater supplies. TCCWD does provide untreated water for groundwater recharge that is then accessed by the retail water purveyors.

The Tehachapi Water Availability Preservation Committee (Committee) is made up of representatives from the five participating urban water suppliers and meets on a regular basis to plan for and manage available water supplies in the Greater Tehachapi area. The Committee adopted an update to the Tehachapi Source Water Protection Plan (SWPP) in April 2013. The purpose of the SWPP is to identify possible contaminating activities and provide specific recommendations to manage these potential threats in order to maintain the quality of water in the groundwater basins that are the source of drinking water for the Greater Tehachapi Area.

The descriptions of the groundwater basins and the pumping rights outlined in the various adjudications are included in this section. The overall pumping for all groundwater users is summarized in this section as well. The amount of pumping by each of the participating retail agencies is included in their individual sections of the Plan. The adjudication judgment documents are included in **Appendix E**.

Tehachapi Valley Basin:

The Tehachapi Valley Groundwater Basin is described as two basins by the DWR in California's Groundwater Bulletin 118 (2006). The Tehachapi Valley West Groundwater Basin (DWR Basin No. 5-28) encompasses the western half of the Tehachapi Valley, with a surface area of about 14,800 acres. The basin is bounded on the north by the Sierra Nevada and on the south by the Tehachapi Mountains. A low-lying ridge connecting these two ranges forms the western boundary. A similar ridge with a narrow gap separates Brite Valley from Tehachapi Valley. Alluvial deposits are estimated to be 600 feet in depth.

The DWR notes that an alluvial high (surface drainage divide) forms the boundary between this basin and the adjacent Tehachapi Valley East Basin. However, this surface drainage divide does not create a boundary within the groundwater basin. The Tehachapi Valley East Basin (DWR Basin No. 6-45) encompasses a surface area of about 24,000 acres. The basin is bounded on the east by the Tehachapi Mountains.

Groundwater in the western portion of the Tehachapi Valley Basin is recharged primarily through percolating stream flows from Antelope, China and Brite Creeks, as well as artificial recharge of imported SWP supplies at Antelope Dam and China Hill. Blackburn and Mendiburu Creeks are the primary sources of recharge in the eastern portion of the basin.

Groundwater adjudication proceedings were initiated in 1966 in response to the decline in groundwater levels that had been experienced in the Tehachapi Valley Basin since 1950. The Tehachapi Basin adjudication judgment was filed in 1971, with an amended judgment filed in 1973 (Superior Court Case No. 97210). The adjudicated Tehachapi Basin includes portions of both the Tehachapi Valley West and East Basins. The physical solution in the judgment created "allowed pumping allocations" for each party which restricted total annual extractions within the Tehachapi Basin to the safe yield of 5,500 acre-feet. Exports from the groundwater basin are not allowed. Allowed pumping allocations per the judgment are as follows:

- City of Tehachapi – 1,822 Acre-feet
- Golden Hills CSD – 874 Acre-feet
- Other pumpers – 2,828 Acre-feet.

Groundwater in the Tehachapi Basin has an average electrical conductivity (EC) of 520 µmhos/cm and an average TDS of 315 milligrams/liter (DWR Bulletin 118, 2006). Some areas have experienced high levels of nitrogen, with some of the City's wells removed from service due to high nitrogen levels. Measures have been undertaken to attempt to reduce nitrogen concentration levels, including pumping wells with high nitrogen concentrations for agricultural use and improvements to the City's Wastewater Treatment Facility.

As noted in the 2010 RUWMP, a groundwater nitrogen (nitrate) level monitoring program has been proposed for the Tehachapi Basin.

A groundwater modeling study of the Tehachapi Basin was completed by Fugro West, Inc. in 2009 to provide a better understanding of the hydrogeology of the basin. The study found the safe yield of the basin to be about 5,317 acre-feet per year, with annual extractions averaging about 3,591 acre-feet. The TCCWD monitors selected wells seasonally for groundwater levels. Groundwater levels have increased since the adjudication and are now close to 1950 levels. The basin is not considered to be in overdraft.

Cummings Valley Basin:

The Cummings Valley Groundwater Basin (DWR Basin No. 5-27) is an alluvial basin bounded by the Tehachapi Mountains to the south and the Sierra Nevada to the north with low lying ridges connecting the two ranges on the east and west. Alluvium in the valley was deposited by Cummings Creek to the south, Chanac Creek to the east, and intermittent streams to the north. Coarser materials (gravels and cobbles) are found at the edges of the valley and finer grained materials (clay and sandy clay) are found near the center of the valley. The thickness of the alluvium increases from approximately 50 feet in the southern part of the valley to 450 feet in the northeast. The surface area of the Cummings Basin is about 10,000 acres (DWR Bulletin 118, 2006).

The Cummings Basin adjudication judgment was filed in 1972 (Superior Court Case No. 97209). Since groundwater pumping at the time of the judgment was less than the designated safe yield of the basin, the judgment did not include restrictions on pumping for overlying use within the basin. Exports of groundwater from the basin are not allowed. The judgment established a safe yield of 4,090 acre-feet per year.

The CCI, Fairview Ranch MWC, various private entities, agricultural interests, and residences pump from the basin for overlying use. Stallion Springs CSD and Bear Valley CSD purchase surface water from TCCWD that is recharged within the basin. These agencies then recover this water from wells within the basin for delivery to portions of their service area located outside of the basin. The CCI also purchases imported supplies from the TCCWD through conjunctive use of groundwater recharge.

Groundwater in the Cummings Basin has an average electrical conductivity (EC) of 530 µmhos/cm and an average TDS of 344 milligrams/liter (DWR Bulletin 118, 2006). Some areas have experienced high levels of nitrates. Active monitoring and mitigation programs for MTBE and perchlorate in surface soils are in place to avoid potential future water quality impacts.

The Cummings Basin has been in overdraft since 2002. As watermaster, the TCCWD is developing mitigation measures to correct this overdraft. A Groundwater Model Update, Cummings Groundwater Basin was completed in March 2015 by Fugro Consultants, Inc. The results of this model report indicate a perennial yield of 3,750 AF/year and a native safe yield of 2,990 AF/year. The native safe yield will be used as the safe yield of the Cummings Basin in this RUWMP. The watermaster submits annual reports to the Court on a calendar year basis.

Brite Valley Basin:

The Brite Valley Groundwater Basin (DWR Basin No. 5-80) is a small (3,170 acres of surface area) alluvial basin bounded by the Tehachapi Mountains to the south and the Sierra Nevada to the north with low lying ridges connecting the two ranges on the east and west. Alluvium in the valley was deposited by Brite Creek in the south and east portions of the basin and intermittent streams in the north and west. Coarser materials (gravels and cobbles) are found at the edges of the valley and finer grained materials (clay and sandy clay) are found near the center of the valley. Average thickness of alluvium is estimated to be 119 feet with a maximum of 500 feet on the northeast side of the basin (DWR Bulletin 118, 2006).

The Brite Basin adjudication judgment was filed in 1970 (Superior Court Case No. 97211). The adjudication determined the "natural safe yield" of the basin to be 500 acre-feet per year and the "base rights of pumpers" to be 631 acre-feet annually. Current pumping in the Brite Basin averages about 328 acre-feet per year. Groundwater levels are stable and no restrictions on groundwater production have been established.

SWP water is distributed from the Jacobsen Reservoir (Brite Lake) which is located within the Brite Basin. The use of groundwater in the Brite Basin is primarily by several agricultural and small M&I pumpers. There are no reported issues with groundwater quality.

Bear Valley Basin:

The Bear Valley Basin is located entirely within the boundary of the Bear Valley CSD. Bear Valley CSD's Groundwater Management Plan (also included in **Appendix E**) estimates their safe yield to be 600 acre-feet per year (200 acre-feet per year for their alluvial wells and 400 acre-feet per year for their bedrock wells). This water is the Bear Valley CSD's least expensive supply and is pumped preferentially. More information about the Bear Valley Basin is included in **Section 3.05.2**.

Summary of Groundwater Pumping

Table 2:6-1 summarizes the total groundwater pumping for the various groundwater basins within the TCCWD for 2015. This pumping includes both recovery of conjunctive use water and native groundwater. Details about each participating agency's groundwater pumping are included in their respective sections of the Plan.

Table 2:6-1 TCCWD: Groundwater Volume Pumped

Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Tehachapi Basin	5,089	4,704	5,931	5,705	5,681
Alluvial Basin	Cummings Basin	3,955	3,849	4,732	4,403	4,537
Alluvial Basin	Brite Basin	346	347	347	347	347
Alluvial Basin	Bear Valley Basin	187	158	153	162	167
Fractured Rock	Bear Valley Basin	404	353	377	323	378
TOTAL		**9,981**	**9,411**	**11,540**	**10,940**	**11,110**

NOTES: This is a summary of all estimated groundwater pumping in the TCCWD and does not represent pumping by the TCCWD.

2.05.3 Surface Water

TCCWD does not utilize sources of surface supply other than imported SWP supplies.

2.05.4 Stormwater

While the TCCWD does provide flood control in certain improvement districts and the recharge of stormwater

supplies contributes to groundwater storage within the TCCWD, the TCCWD does not intentionally divert stormwater directly for beneficial use. Stormwater and other native surface waters that recharge the groundwater basin contribute to the safe yield of the groundwater basins, and become part of the area's groundwater supplies as described in **Section 2.05.2**.

2.05.5 Wastewater and Recycled Water

Law

> *The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area. (16033)*

TCCWD does not collect or treat wastewater. It does have a contract with the CCI to purchase Tertiary Treated (Title 22) recycled water. The contract calls for delivery of between 1,000 and 1,200 acre-feet of recycled water to be made available to the TCCWD annually. Problems with the CCI wastewater facility, including a catastrophic failure during 2015, have reduced the quantities of recycled water available to the TCCWD. Projections of future recycled water supplies from the CCI are 800 AF/year. Other agencies within TCCWD do collect, treat, and distribute recycled water, and the use of recycled water is expected to increase. Listed below are agencies within the TCCWD that collect and treat wastewater. The existing and planned recycled water usage of these retail agencies is discussed in their individual sections of the Plan.

- Bear Valley CSD
- City of Tehachapi
- Golden Hills Sanitation Company
- Stallion Springs CSD

TCCWD's current and projected use of recycled water is summarized in **Table 2:6-4**. The comparison of 2015 actual recycled water use to that projected in the 2010 RUWMP is included in **Table 2:6-5**. As noted above, there was a catastrophic failure at the CCI wastewater treatment plant which greatly reduced the quantity of recycled water available to the TCCWD in 2015.

Table 2:6-4 TCCWD: Current and Projected Retailers Provided Recycled Water Within Service Area

Direct Use	Level of Treatment	2015	2020	2025	2030	2035
Golf course and agricultural irrigation	Tertiary	158	800	800	800	800
Total		**158**	**800**	**800**	**800**	**800**

NOTES: Delivered under contract with the CCI. 2015 recycled water usage was reduced due to a catastrophic failure of the CCI Wastewater Treatment Plant.

Table 2:6-5 TCCWD: 2010 RUWMP Recycled Water Use Projection Compared to 2015 Actual		
Direct Use	2010 Projection for 2015	2015 actual use[1]
Golf course and agricultural irrigation	900	158
Total	**900**	**158**
NOTES: 2015 recycled water usage was reduced due to a catastrophic failure of the CCI Wastewater Treatment Plant.		

2.05.6 Desalinated Water Opportunities

Law

Describe the opportunities for development of desalinated water, including but not limited to ocean water, brackish water, and groundwater, as a long-term supply. (10631(h))

TCCWD has no plans for the development of desalinated water supplies within the planning horizon of this RUWMP. TCCWD has determined that desalination is not a cost-effective solution for its water supply needs due to the water resource opportunities that are available at a much lower cost.

2.05.7 Exchanges and Transfers

Law

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis. (10631(d))

The TCCWD has entered into short term banking/exchange programs with its excess SWP supplies in years with SWP allocations greater than the needs of the TCCWD. In 2011, 6,131 AF were placed in storage in the Kern Water Bank on a second-priority basis. Recovery capacity is available to the TCCWD once the needs of the primary banking participants have been met. As of the end of 2015, 2,520 AF of TCCWD banked water remains in storage in the KWB.

An additional 6,750 AF were placed in storage during 2011 in the West Kern Water District's banking project under a 2-for-1 exchange agreement. Under this agreement, one-half of the water became the property of the West Kern Water District and one-half of the water was banked for recovery by the TCCWD in future years. The water banked for the TCCWD was all recovered over a two year period. The TCCWD will investigate banking and exchange programs in future years when supplies are available in excess of the TCCWD's demands.

2.05.8 Future Water Projects

Law

(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify

specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program (10631(g)).

The TCCWD is installing new natural gas engines to power its pumps that will allow it to import as much as 13,000 acre-feet per year of its annual SWP entitlement. The TCCWD is pursuing expansion of groundwater recharge areas in both the Cummings Valley and Tehachapi Basins in order to import the maximum possible amount of SWP water available annually for in-basin recharge and storage. Other future water projects include potential exchanges as described in **Section 2.05.7,** the joint Snyder Well Project with the City (see **Section 4.05.8**), and the Indirect Potable Reuse project under investigation by the City (see **Section 4.05.5**). The TCCWD will participate in the Cal WaterFix project if the KCWA participates.

2.05.9 Summary of Existing and Planned Sources of Water

Law

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a) (10631(b)).

(Provide) a detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(4)).

TCCWD's existing and planned sources of water are summarized in **Tables 2:6-8 and 2:6-9**. Projected supplies include 60% of the TCCWD's SWP Table A allocation, recycled water from the CCI, and the safe yield of all groundwater basins. Recovery of stored groundwater is not included.

Table 2:6-8 TCCWD: Water Supplies — Actual

Water Supply Source	Additional Detail on Water Supply	2015	
		Actual Volume	Water Quality
Purchased or Imported Water	SWP	5,160	Raw Water
Recycled Water	From CCI	158	Recycled Water
Groundwater	M&I Use	5,510	Drinking Water
Groundwater	Agricultural use	4,543	Raw Water
Total		15,371	

NOTES: From annual summary prepared by the TCCWD.

Table 2:6-9 TCCWD: Water Supplies — Projected					
Water Supply Source	Additional Detail on Water Supply	Projected Water Supply *Reasonably Available Volume*			
		2020	2025	2030	2035
Purchased or Imported Water	SWP	11,580	11,580	11,580	11,580
Recycled Water	From CCI	800	800	800	800
Groundwater	Safe Yield - All Basins	9,614	9,614	9,614	9,614
Total		21,994	21,994	21,994	21,994
NOTES: Does not include recovery of stored groundwater.					

2.05.10 Climate Change Impacts to Supply

The potential climate change impacts to the Kern Region's water supplies are described in the Climate Vulnerability Assessment prepared as a part of the Kern IRWMP (see **Appendix C**). These are summarized as follows:

- Groundwater:
  - Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term.
  - Decreased inflow from runoff, increased evaporative losses, warmer and shorter winter seasons can alter natural recharge of groundwater, as well as conjunctive use operations.
  - If more precipitation occurs as rain, short-term high flows could result, and will require the Region to adapt to the faster runoff which will impact the timing of conjunctive uses.
  - Additional reductions in the imported water imposed by climate change would lead to more reliance on local groundwater.
- Imported Water:
  - Potential impacts on SWP water availability resulting from climate change will directly affect the amount of imported water supply delivered to the Greater Tehachapi Area.

Potential climate change impacts to SWP supplies are discussed in **Section 2.05.1** and **Section 2.07.2**.

2.06 Water Supply Reliability Assessment

2.06.1 Constraints on Water Sources

Law

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable (10631(c)(2)).

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability (10634).

The TCCWD anticipates that its sources of supplies will be available at a consistent level of use during the planning horizon of this Plan. The TCCWD is projected to have the capacity to meet normal year demands based on the average water delivery forecast of 60% of Table A amounts. Groundwater supplies for the GTA are from adjudicated basins, which should stabilize the availability of groundwater for the participating agencies throughout the Plan period. Future groundwater banking of excess SWP supplies would provide additional water supplies in years of SWP shortages.

2.06.2 Reliability by Type of Year

Law

Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) an average water year, (B) a single dry water year, (C) multiple dry water years (10631(c)(1)).

An ongoing planning effort to increase long-term supply reliability for both the SWP and Central Valley Project (CVP) is taking place through the BDCP process. The co-equal goals of the BDCP are to improve water supply reliability and restore the Delta ecosystem. The BDCP is being prepared through a collaboration of state, federal, and local water agencies, state and federal fish agencies, environmental organizations, and other interested parties. Several "isolated conveyance system" alternatives are being considered in the plan that would divert water from the north Delta to the south Delta where water is pumped into the south-of-Delta stretches of the SWP and CVP. The new conveyance facilities would allow for greater flexibility in balancing the needs of the estuary with the reliability of water supplies. The plan would also provide other benefits, such as reducing the risk of long outages from Delta levee failures.

The BDCP has been in development since 2006 and is currently undergoing extensive environmental review. The Draft BDCP and its associated Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) were released for public review in December 2013. In response to public comments, the BDCP was reevaluated, and in April 2015 the lead agencies announced a modified alternative which effectively split the project into two parts: the conveyance portion (known as Cal WaterFix), and the restoration portion (known as EcoRestore). The Cal WaterFix alternative is evaluated in a partially recirculated draft environmental document (Recirculated Draft EIR/Supplemental Draft EIS) that was released for public review in July 2015. That environmental document is anticipated to be finalized during 2016.

While there is widespread support for the BCDP/Cal WaterFix project, plans are currently in flux and environmental review is ongoing. Additionally, several regulatory and legal requirements must be met prior to any construction. Because of this uncertainty, any improvements in SWP reliability or other benefits that could result from this proposed project are not included in this Plan.

Tables C.15 and C.16 from the 2015 SWP Delivery Capacity Report (DCR) show the KCWA's forecasted Ag and M&I supplies, respectively, for the ELT scenario and are included in **Appendix D**. For reliability of the TCCWD's SWP supplies, the average water delivery forecast of 60% of Table A amounts for the ELT scenario was used for the average water year. Selection of the single dry water year and multiple dry water years is described below.

6.0 CONTINGENCY ANALYSIS APPLICABILITY (Government Code Section 66473.7 (2)(b)

The City's adopted 2015 Regional Urban Water Management Plan provides a full spectrum of Water Shortage Contingency Plan measures (pages 2-24 through 2-28). These water supply contingency measures, applicable to the entire City of Tehachapi municipal water service area, are fully applicable to the Project and protective of the adequacy of the Project's water supply.

The following pages are extracted directly from the adopted 2015 RUWMP (Pages 2-24 through 2-28) in satisfaction of Government Code Section 66473.7 (2)(b).

2.06.4 Regional Water Supply Reliability

Law

> *An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions (10620(f)).*

The urban water suppliers in the Greater Tehachapi area have been working together for many years to manage available water supplies on a regional basis. The agencies have formed the Tehachapi Water Availability Preservation Committee which meets on a regular basis to plan for and manage available water supplies in the Greater Tehachapi area. More details regarding these efforts are included in other sections of the Plan.

2.07 Water Shortage Contingency Planning

2.07.1 Stages of Action

Law

> *The plans shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:*
>
> *Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50% reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage (10631(a)(1))*

The TCCWD is a wholesale supplier providing a supplemental, imported water supply for the GTA. Deliveries for urban use are made through groundwater recharge and conjunctive use. The retail urban water suppliers rely on groundwater pumping for their water supplies.

The TCCWD's Board of Directors imposes Rules and Regulations regarding the delivery of imported water and recycled water, and use of its facilities. Part L of TCCWD's rules and regulations for water service states:

> *"SHORTAGES. District retains the right and power to later provide, consistent with any then applicable provisions of law, for priorities, restrictions, prohibitions and exclusions in the event of shortage or other emergency, including cessation or interruption of sale of water to particular users."*

The Board considers an emergency water shortage ordinance on an annual basis, if necessary. The TCCWD adopted a water shortage ordinance in 2015 (Ordinance 2015-1) which outlines the priorities for the sale and use of its available imported SWP supplies. Copies of the TCCWD's Rules and Regulations and its Ordinance 2015-1 are included in **Appendix F**.

Stages of action are not directly applicable to the TCCWD's water shortage policies. The TCCWD's water shortage contingency planning is summarized in **Table 2:8-1**. Water shortage contingency planning for the retail urban water suppliers are covered in their respective sections of the Plan.

Table 2:8-1 TCCWD Stages of Water Storage Contingency Plan		
Stage	Percent Supply Reduction[1]	Water Supply Condition
1	50%	*Reduction in SWP Allocation Below Current Demand. See notes.*
[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		
NOTES: TCCWD's Rules and Regulations outline their policies regarding water shortages. TCCWD supplies are supplemental to the retail urban water suppliers, who rely on groundwater pumping for their water supplies. A water shortage ordinance (Ordinance 2015-1) outlines the TCCWD's priorities for the sale and use of SWP supplies for 2015. Copies of TCCWD's Rules and Regulations and its Ordinance 2015-1 are included in Appendix F.		

2.07.2 Consumption Reduction Measures

Law

Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply (10632(a)(5)).

TCCWD has adopted a number of consumption reduction measures to help retail water suppliers reduce water usage. These are described in **Section 2.08: Demand Management Measures**.

2.07.3 Determining Water Shortage Reductions

Law

A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis 10632(a)(9).

TCCWD deliveries are entirely metered. The meter readings will be used to monitor the actual reductions in water usage in accordance with the water shortage contingency plan.

2.07.4 Revenue and Expenditure Impacts

Law

An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments (10632(7)).

with state, federal and local emergency response agencies. DWR, in conjunction with local agencies, the Corps and Cal OES, regularly conduct simulated and field exercises to test and revise the plan under real time conditions.

DWR and the Corps provide vital Delta region response to flood and earthquake emergencies, complementary to an overall Cal OES structure. Cal OES is preparing its Northern California Catastrophic Flood Response Plan that incorporates the DWR Delta Flood Emergency Management Plan. These agencies utilize a unified command structure and response and recovery framework. DWR and the Corps, through a Draft Delta Emergency Operations Integration Plan (April 2015), would integrate personnel and resources during emergency operations.

The DWR Delta Levees Subvention Program has prioritized, funded, and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta region. These efforts have been complementary to the DWR Delta Flood Emergency Management Plan, which along with use of pre-positioned emergency flood fight materials in the Delta, relies on pathway and other levees providing reasonable seismic performance to facilitate restoration of the freshwater pathway after a severe earthquake. Together, these two DWR programs have been successful in implementing a coordinated strategy of emergency preparedness for the benefit of SWP and CVP export systems.

Significant improvements to the central and south Delta levee systems along Old and Middle Rivers began in 2010 and are continuing to the present time at Holland Island, Bacon Island, Upper and Lower Jones Tracts, Palm Tract and Orwood Tract. This complements substantially improved levees at Mandeville and McDonald Islands and portions of Victoria and Union Islands. Together, levee improvements along the pathway and Old River levees consisting of crest raising, crest widening, landside slope fill and toe berms, meet the needs of local reclamation districts and substantially improve seismic stability to reduce levee slumping and create a more robust flood-fighting platform.

2.07.7 Minimum Supply Next Three Years

Law

> *An estimate of the minimum water supply available during each of the next three water years based on the driest three year historic sequence for the agency's water supply (10632(a)(2))*.

An estimate of the minimum supplies available to the TCCWD in each of the next three years is given in **Table 2:8-4.** The estimated minimum supply includes the estimated SWP supply for the driest three year period from Table 7-1, and recycled water supply and safe yield of all groundwater basins from Table 6-9. In addition, the TCCWD currently has 13,082 acre-feet banked in groundwater storage. It is assumed that 1/5 of the total groundwater storage would be reasonably available for each of the next three years.

The minimum available supplies for each participating retail agency are discussed and presented in their respective Plan sections.

Table 2:8-4 TCCWD: Minimum Supply Next Three Years			
Available Water Supply	2016	2017	2018
	15,730	16,120	17,660

NOTES:
Includes the following:
1. Estimated Multiple Dry Year SWP supply from Table 2:7-1
2. Recycled water supply and safe yield of all groundwater basins from Table 2:6-9
3. 1/5 of TCCWD current groundwater storage of 13,082 AF

2.08 Demand Management Measures

Law

Provide a description of the (wholesale) water supplier's water demand management measures. This description will include all of the following (10631(f)):

The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures: (ii) metering. (iv) public education and outreach. (vi) water conservation program coordination and staffing support. (vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented (10631(f)(1)(B)).

(Provide) a narrative description of that addresses the nature and extent of each water demand management measure implemented over the past five years (10631(f)(1)(A)).

For an urban wholesale water supplier, as defined in Section 10608.12, (provide) a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs (10631(f)(2)).

The agencies as a region realize the importance of demand management. The agencies are committed to implementing water conservation strategies and water recycling programs to maximize sustainability in meeting future water needs for their respective customers. As the need for more robust water conservation programs became apparent, an unofficial agreement among the agencies identified TCCWD to take the lead in expanding a regional water conservation program. TCCWD applied for and obtained a grant from DWR to implement toilet replacement programs, and also hired a Water Conservation Coordinator. On December 9, 2015, TCCWD was ratified as a new member of CUWCC.

TCCWD is a wholesale water agency importing water to the GTA, but does provide direct deliveries to industrial and commercial users such as Cal-Portland Cement Plant, a cemetery, high school athletic fields and for temporary construction uses. There are several Demand Management Measures (DMM)s that are not applicable to TCCWD as a wholesale agency, but are implemented by TCCWD on behalf of the retail agencies.

2.08.1 Metering

This DMM requires water meters for all new construction and billings by volume of use, as well as establishing a program for retrofitting any existing unmetered connections. TCCWD has metered all

7.0 ASSESSMENT FINDINGS

It is concluded that the City of Tehachapi water system has sufficient capacity to supply the Sage Ranch Development Project and other projected demands within the City's service area through the year 2040. The Applicant will be required to secure/purchase water rights to serve the Project and/or pay in-lieu fees as determined by the City (for the City to purchase additional potable water). As discussed previously, Project water supply will likely occur from a combination of sources including acquisition of non-potable agricultural water (for public space outdoor irrigation), purchase/acquisition of potable water, and payment of City water fees. Each housing unit shall pay the water rights fee in place at the time of permit issuance. Alternatively, at the discretion of the City, the Applicant shall construct an equivalent water savings project that has the effect of reducing current potable water demand elsewhere in the City, as an "in-lieu" method of achieving the water demand requirements of the Project. This shall be made a condition of Project approval.

Therefore, it is recommended that the City of Tehachapi approve this assessment for inclusion in the CEQA documentation for the proposed Sage Ranch Development Project.