

Eastern Fresno County Foothill and Mountain Water Study

Current and Projected Water Demand Analysis Technical Memorandum

County of Fresno

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Section 1

Introduction

This technical memorandum (TM) fulfills the milestones for Tasks 3 and 5 of the Eastern Fresno County Foothill and Mountain Water Study. The purpose of this TM is to describe the methodology used to estimate current and projected groundwater usage within the Shaver Lake, Auberry/Prather, and Squaw Valley areas and to present the results of the evaluation. Available water usage (demands) data are limited, especially in the Auberry/Prather and Squaw Valley areas. The analysis utilized available data along with historical data from comparable geographic settings and water usage estimates based on commonly used engineering and planning standards to develop the water demands. This TM identifies the available data, describes the methodology used to estimate current and projected water demands, and presents the findings.

Section 2

Data Collection

The available groundwater production and usage data included:

- Community service district (CSD) well production and/or annual water usage data in the Shaver Lake area,
- Average monthly mobile home park (MHP) water usage data in the Auberry area.

Data gathered from the County and other agencies utilized in this report included:

- Parcel map information,
- Building permit information by parcel,
- 1990 and 2000 U.S. Census Bureau (Census) population and occupancy data,
- General average historical water usage data throughout the Central Valley and from similar geographic settings obtained from other studies.

The majority of available water production and usage information consists of data within the Shaver Lake area. The Shaver Lake area contains several large CSDs from which data, such as water production (by day, month, year), service connection meter records, and system characteristics (size, number of connections, wells, storage, etc.), were available. Data were also available for two MHPs in the Auberry/Prather area.

The County's parcel map and building permit data in conjunction with available Census data (<http://www.Census.gov/>) were used in estimating the number of households (water users) within the areas and average number of people per household.

Historical water use data for the valley and other foothill communities were considered for benchmarking purposes in the process of estimating water usage in the Auberry/Prather and Squaw Valley areas.

Section 3

Current Water Demand

Current water demand estimates are presented in this section along with a discussion of the calculation methodology employed. Subsections include a discussion of differences between the areas, types of water demands, and estimated current water demand.

3.1 Area Differences

The variability in the quantity and quality of the available data and the significant differences in habitation, climate, and water consumption among the three areas required the use of different water demand calculation methods in order to maximize the effectiveness of the available data. The four different water demand methods are discussed in Section 3.2. The differences in the characteristics of the areas are discussed below.

Occupancy Patterns: The Auberry/Prather and Squaw Valley areas consist primarily of permanent residents, whereas the Shaver Lake area consists of a greater percentage of “seasonal” residents where occupancy patterns tend to reflect vacation and weekend occupancy trends. The 1984 Sewer and Water Master Plan for the Shaver Lake Area (Carollo 1984) estimated that 43 percent of the housing units were permanently occupied by an average of 2.6 persons per dwelling unit, with the remaining 57 percent (nonpermanent) being occupied for various durations. The 2000 Census Bureau data indicated that 16 percent of the households were permanently occupied by an average of 2.65 persons per dwelling unit, but excluded households such as vacation homes and rentals from the permanent occupancy counts.

Climate: Climatic differences are related primarily to the elevation of the three areas. The Shaver Lake area elevation ranges from approximately 2,000 to 6,000 feet above mean sea level (MSL), while elevations in the Auberry/Prather and Squaw Valley areas range from approximately 800 to 4,900 feet above MSL. The lower elevation areas have warmer climates (average temperatures in the mid-90s in the Auberry and Squaw Valley areas versus the mid-80s in the Shaver Lake area during peak water usage season), less precipitation (Auberry/Prather/Squaw Valley areas have an average annual precipitation range of 19 to 26 inches, while average annual precipitation in the Shaver Lake area ranges from 28 to 35 inches), and increased evapotranspiration rates.

Outdoor Water Usage: Historical water usage data for Central Valley communities indicate that outdoor water usage can account for up to 50 percent or more of the total water usage of a household. The Shaver Lake area has a much lower proportion of full-time occupants, and most homes in the Shaver Lake area do not have outdoor landscaping that requires consistent irrigation schedules. Households in the Auberry/Prather and Squaw Valley areas predominantly are occupied on a permanent basis and have more irrigated landscaping than the Shaver Lake area. Therefore, water users in the Auberry/Prather and Squaw Valley areas are likely to use significantly more outdoor water, resulting in greater overall water demand.

3.2 Water Demand Calculation Methods

The estimate of current water demand for each area used four different water demand calculation methods (Figures 3-1 through 3-3): CSD/MHP, household count, area factor, and no demand (Table 3-1). The use of the selected water demand method for various areas was based on land use and available data. Each water demand method is discussed below.

3.2.1 CSD/MHP Demand Method

Some of the CSD and MHPs in the areas have actual well production and/or water usage data available (Table 3-2). In the Shaver Lake area, Districts 37, 40, 41, Sierra Cedars, and Shaver Lake Heights had production data and in the Auberry/Prather area, Sandy Creek Village and Mt. Ararat MHPs had production data. These CSDs/MHPs were assigned water demands based on known well production averages. No CSDs exist in the Auberry/Prather and Squaw Valley areas.

For CSDs without water usage or well production data, average water usage values were estimated based on comparable CSDs with available data. For Shaver Lake area households located at an elevation of approximately 4,800 feet and below, a value of 75,000 gallons per year (gpy), or 0.23 acre-feet per year (AFY) was applied. For Shaver Lake area households located at an elevation above approximately 4,800 feet, a value of 52,400 gpy, or 0.16 AFY was applied. For the Shaver Lake Village area households, a value of 29,300 gpy, or 0.09 AFY was applied. The values of 75,000, 52,400, and 29,300 gpy were based on average well production and the number of service connections for districts with available data (Table 3-2).

3.2.2 Household Count Demand Method

For some of the areas outside of the CSDs, the household count demand method was applied to parcels identified on County digitized maps (GIS shapefiles) as having building permits. Because parcels with building permits may not have a residence built on the parcel, Census data were used to estimate the number of actual households on these parcels. The Census data contained surveys for the Auberry, Shaver Lake, and Squaw Valley areas. Within the Census data, the number of households was available for each Census tract. This number was broken

down into occupied and vacant categories, and the vacant categories were further broken down into types of vacancy (e.g., for rent, for sale only, rented or sold, seasonal or recreational, and other vacant). Our analysis assumed that the “other vacant” category was the only vacant classification that represented no water usage from a counted household. The remaining vacancy types are likely to be occupied and have water usage. The household count method was also applied to areas designated by the County to be rural residential and single family residential in the County’s zoning map.

The total acreage of parcels with building permits and parcels with a residential type designation were calculated within each area. Census data were used to determine the acreage to household (AH) density ratio within each area in the following format:

$$\begin{aligned} \text{AH} &= \text{acres to households ratio} \\ &= (\text{acreage of Census survey area}) / (\# \text{ of households within Census survey boundary}) \end{aligned}$$

The calculated AH ratios for each area were as follows:

- Auberry/Prather = 16 acres per household (one house per 16 acres)
- Squaw Valley = 32 acres per household (one house per 32 acres)
- Shaver Lake = 12 acres per household (one house per 12 acres)

By using the AH ratio and the applicable amount of acres within each area, the number of households within the areas classified as Household Count areas was estimated. An average water demand per household was then applied to the estimated number of households calculated with the AH ratios. The average demand per household was based on a combination of water

usage data in the area, historical water usage in Central Valley cities, and average household size based on the Census data.

To determine the average usage per household in the Auberry/Prather and Squaw Valley areas, the following assumptions were made:

- Average indoor water usage in the Central Valley is comparable to indoor water usage in the Auberry/Prather and Squaw Valley areas (9,000 gallons per month [gal/mo] = 108,000 gpy).
- Average capita per household = 2.65 for the Auberry/Prather and Squaw Valley areas (based on Census data).
- Outdoor water usage in the Auberry/Prather and Squaw Valley areas is approximately 33 percent of outdoor usage in the Central Valley.

Water usage within metered areas of the Central Valley is approximately 200 gallons per capita per day (gpcd) for households with similar per-capita counts. Assuming indoor water usage in the Auberry/Prather and Squaw Valley areas is approximately the same as for Central Valley communities (9,000 gal/mo) and outdoor water usage is approximately 33 percent of that in Central Valley communities, the average water usage per household in the Auberry/Prather and Squaw Valley areas was estimated to be 136,500 gpy (Tables 3-3 and 3-4). As previously estimated in Section 3.2.1, the average household water use in the Shaver Lake area is 29,300 to 75,000 gpy, depending on the location. Table 3-5 summarizes the household water demands by area used in this study.

Second residences within the same parcels were also accounted for by using data provided by the County that illustrated which parcels have obtained building permits for second residences. From a comparison with aerial photography for a sample of the parcels with second residence building permits, an estimated 80 percent of the parcels that have building permits for a second residence actually have built the second household. Therefore, these second households have been counted as a separate household with a separate water demand.

3.2.3 Area Factor Demand Method

Due to the lack of available data for nonresidential type areas such as commercial or industrial lands, the Area Factor Demand Method was applied to nonresidential parcels with building permits outside of CSDs. These nonresidential areas are designated by the County to be some type of agricultural, commercial, or manufacturing/industrial zoning. The Area Factor Demand Method used a water demand factor that was applied to the acreages of each land use type. The water demand factors were based on standard water-use factors typically employed for master planning of water systems throughout Central California, and adjusted to more accurately represent water usage within the eastern Fresno County foothill and mountain areas. The demand factors were multiplied by the respective land use areas to estimate the overall water demand. The demand factors used are presented in Table 3-6.

Using GIS tools, the distribution and acreage of the various land uses within each specific area was calculated, and the corresponding demand factors were applied.

3.2.4 No Demand Areas

Areas that have been designated by the County to be either Resource Conservation areas or Open Conservation areas do not have any identified water usage, and were classified as “No Demand” areas.

3.3 Current Water Demand Estimates

Table 3-7 presents the estimated water demands for each of the three areas (Auberry/Prather, Squaw Valley, and Shaver Lake), and includes a breakdown by demand type and by watersheds within each area. Water demands were estimated on a watershed basis because calculating water balances by watershed (discussed in a future technical memorandum) required groundwater pumpage estimates by watershed.

Figure 3-4 shows the watersheds within each area. Some watersheds extend beyond the area boundaries. Therefore, calculations of water demand are only for the portion of the watersheds included in the study boundaries. Complete tables used to calculate water demands by watershed are provided in the Appendix.

Section 4

Water Demand Projections

Projected water demand estimates for the three study areas were made based on two scenarios: 1) projected population growth of the areas for the next 20 years obtained from Census data, and 2) projected water demand for each area at full buildout of permitted parcels.

4.1 Water Demand Projections Based On Census Data

Future water demands were estimated by projecting the development trends from the 1990 and 2000 Census data, 20 years into the future. Census data included the number of housing units, which accounts for all houses, apartments, mobile home or trailer park units, a group of rooms, or a single room occupied as a separate living quarter. The projected water demand analysis utilized the average annual percentage increase in housing units from 1990 to 2000 to represent general development trends within each of the areas. All three areas were reasonably represented by two Census Places and one Census Tract within Fresno County. Percentage increases in housing units for the Census Places and Tract from 1990 to 2000 are shown in Table 4-1.

Water demand in the three areas is due primarily to domestic water usage. It is assumed that increased water demand for the three areas will be due primarily to the projected growth in housing units. The projected water demands for the three areas are shown in Table 4-2 and Figure 4-1.

These projections assume that the population characteristics (household densities, occupancy types, etc.) and water usage characteristics (per capita usage) will remain the same in all three areas.

4.2 Water Demand at Full Buildout of Permitted Parcels

Water demands were calculated for the three areas assuming full buildout of the existing permitted parcels. It was assumed that water demand characteristics would remain the same in all three areas. A second scenario for the Shaver Lake area assumed full buildout of permitted parcels and full-time (year-round) occupancy for all households in the Shaver Lake area.

Area factor demands (demands for nonresidential water usage) were also scaled to account for increases from commercial and industrial water uses. The demands were scaled under the assumption that water demand increases for commercial and industrial areas will increase proportionally to residential water demands.

4.2.1 Water Demand at Full Buildout of Permitted Parcels with Same Occupancy Characteristics

For full buildout of permitted parcels with the same occupancy characteristics as currently exist, the estimate of the number of households and water demands for the three areas are shown in Table 4-3. Table 4-4 breaks down the water demands at full buildout by watershed.

4.2.2 Water Demand at Full Buildout of Permitted Parcels and Full-Time Occupancy in Shaver Lake Area

The Shaver Lake area currently demonstrates seasonal occupancy patterns. Therefore, for planning purposes, a second scenario was evaluated to represent the case where Shaver Lake could become a predominantly permanent residence community. To estimate the average water demand per household for full-time occupants in the Shaver Lake area, data for individual water meter records for District 37 were used. The water meter records for District 37 indicated a significant difference in water usage between the 12 highest water users and the remaining 34 water users in the District. Therefore, it is assumed that the top 12, or approximately 26% of

households in District 37 are occupied on a full-time basis. This estimate agrees with the previous full time occupancy rates determined by Census data and Carollo 1984 of 16 and 43 percent, respectively. The average water usage of the top 12 (26 percent) water users was approximately 130,000 gpy. This value was applied to each household in the lower Shaver Lake area for full-time occupancy water demand.

Since it was previously estimated that indoor water demand in Auberry/Prather and Squaw Valley (assumed full-time occupancy areas) was 108,000 gpy, the total household water demand in the upper Shaver Lake area for full-time occupancy should be greater than 108,000 gpy (assumed indoor-only water usage) but less than 130,000 gpy (assumed full-time occupancy water usage in lower Shaver Lake area). Therefore, 120,000 gpy was used for the upper Shaver Lake area households for full-time occupancy.

Table 4-5 presents the Shaver Lake Area projected water demand at full buildout of permitted parcels with current seasonal occupancy characteristics and with full-time occupancy characteristics. Table 4-6 presents the Shaver Lake area water demand based on full buildout of permitted parcels with full-time occupancy characteristics on a watershed basis. The numbers for the Auberry/Prather and Squaw Valley areas do not change but are presented again for comparison purposes.

Section 5

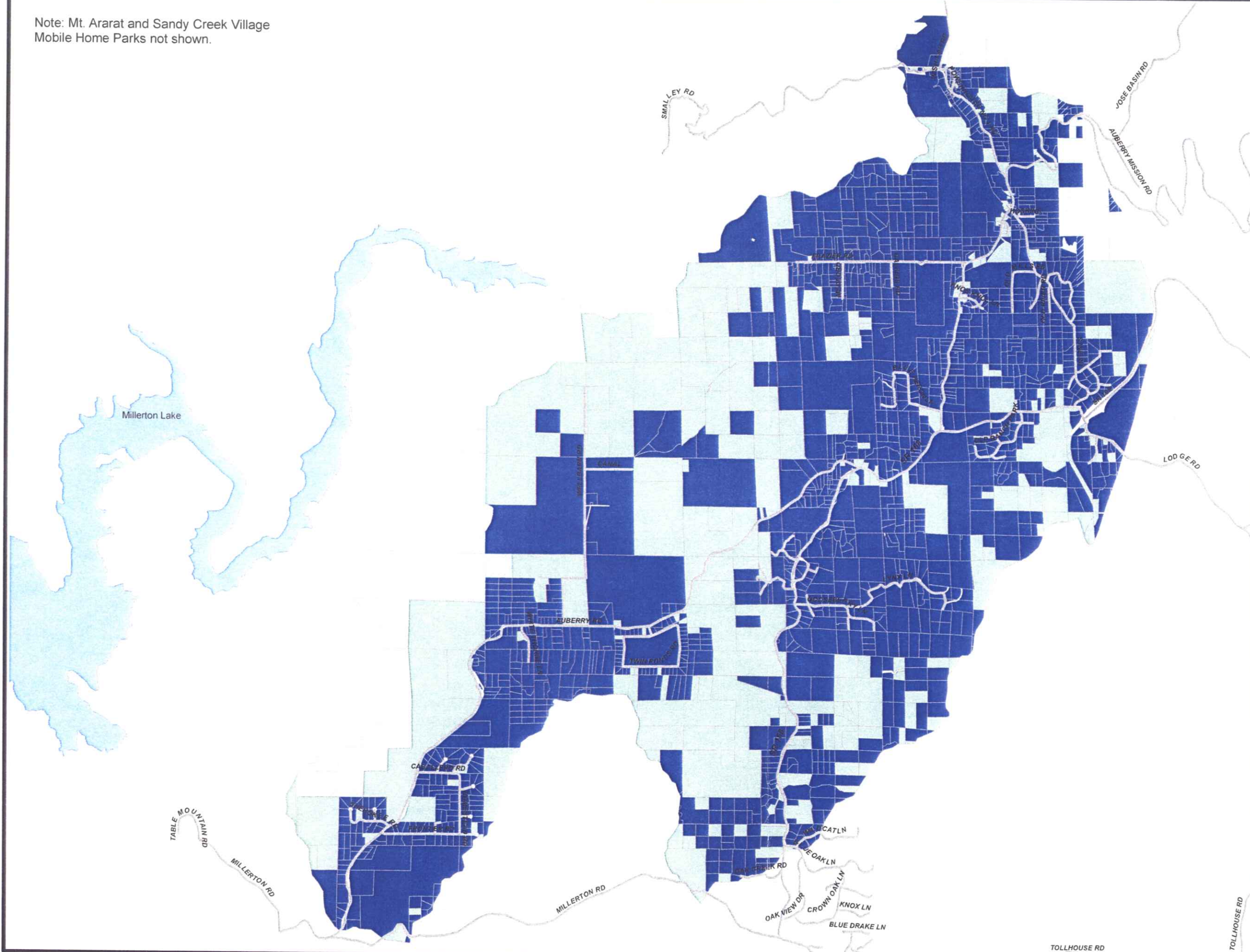
Sewer and Water Master Plan for the Shaver Lake Area

The Sewer and Water Master Plan for the Shaver Lake Area (Master Plan) prepared by Carollo in 1984 and amended by Fresno County in 1985 estimated that the maximum safe groundwater production capacity for the portion of the ultimate service area in Township 10 is 0.51 mgd, or 571 AFY. This portion of the ultimate service area encompasses approximately 3,578 acres and is shown in Figure 5-1. The Master Plan estimated that this quantity of groundwater was sufficient to serve 2,000 equivalent dwelling units (EDUs or households) based on 100 gallons per capita per day (GPCD) and an average per capita household of 2.55 persons, or approximately 93,100 gpy (0.29 AFY) per household.

Currently, there are an estimated 995 households in this area with an average annual demand of 163 AFY (Table 5-1). Assuming similar occupancy characteristics and water demands as currently exists in the area, the projected water demand for 2,000 households would be 325 AFY (Table 5-2). If full-time occupancy were assumed for all 2,000 households the water demand would be approximately 737 AFY (Table 5-3). A further comparison of the water demands for this area will be included in the Water Budget TM and the report.

Figures

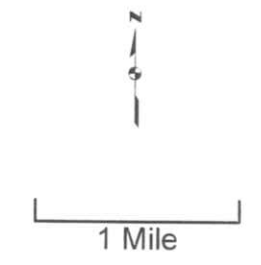
Note: Mt. Ararat and Sandy Creek Village Mobile Home Parks not shown.



Legend

DEMAND METHOD AREAS

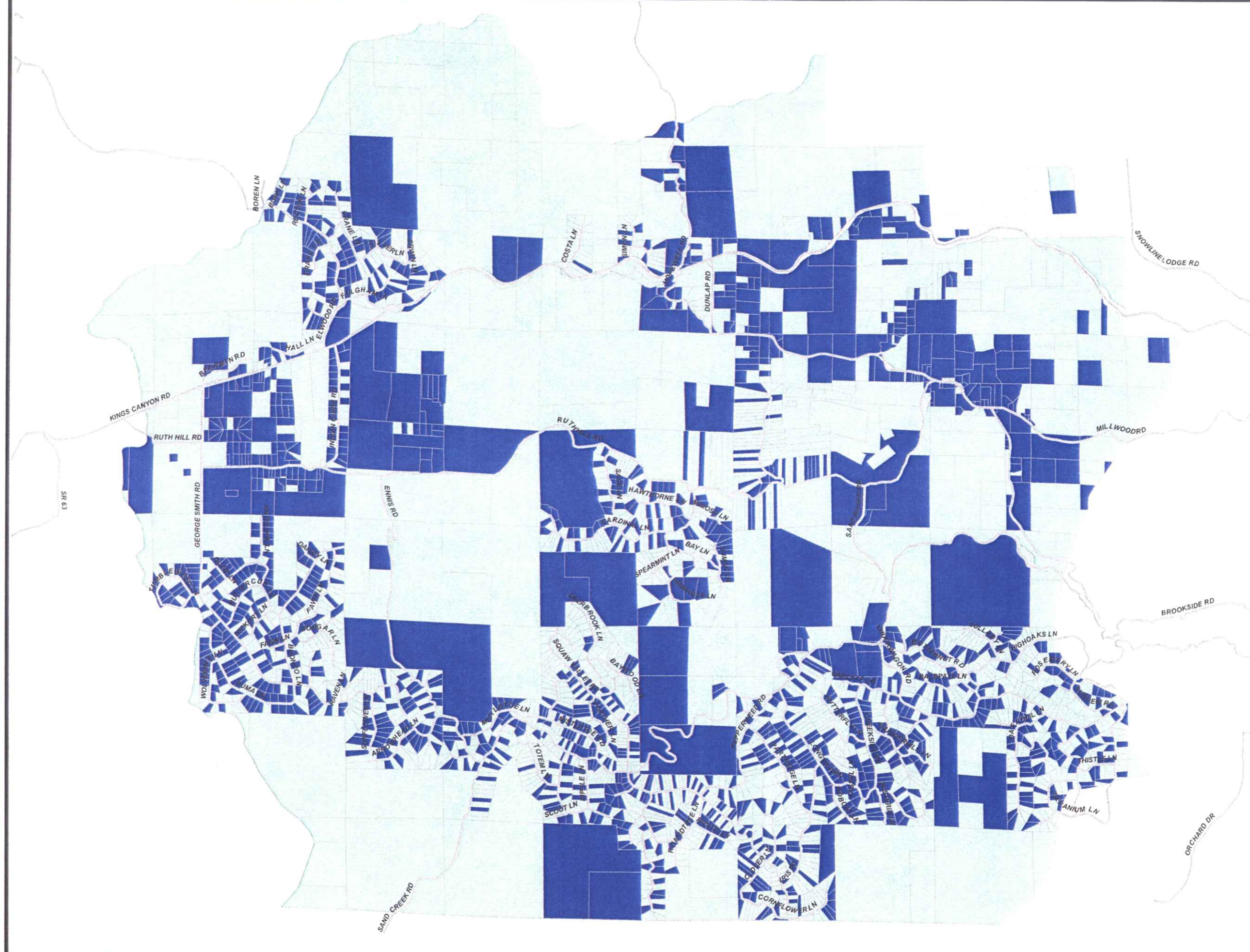
- Household Count
- Area Factor
- No Demand
- MHP



**EASTERN FRESNO COUNTY
FOOTHILL AND MOUNTAIN
WATER STUDY**

AUBERRY/PRATHER AREA
WATER DEMAND METHODS
FIGURE 3-1

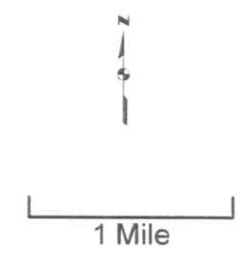




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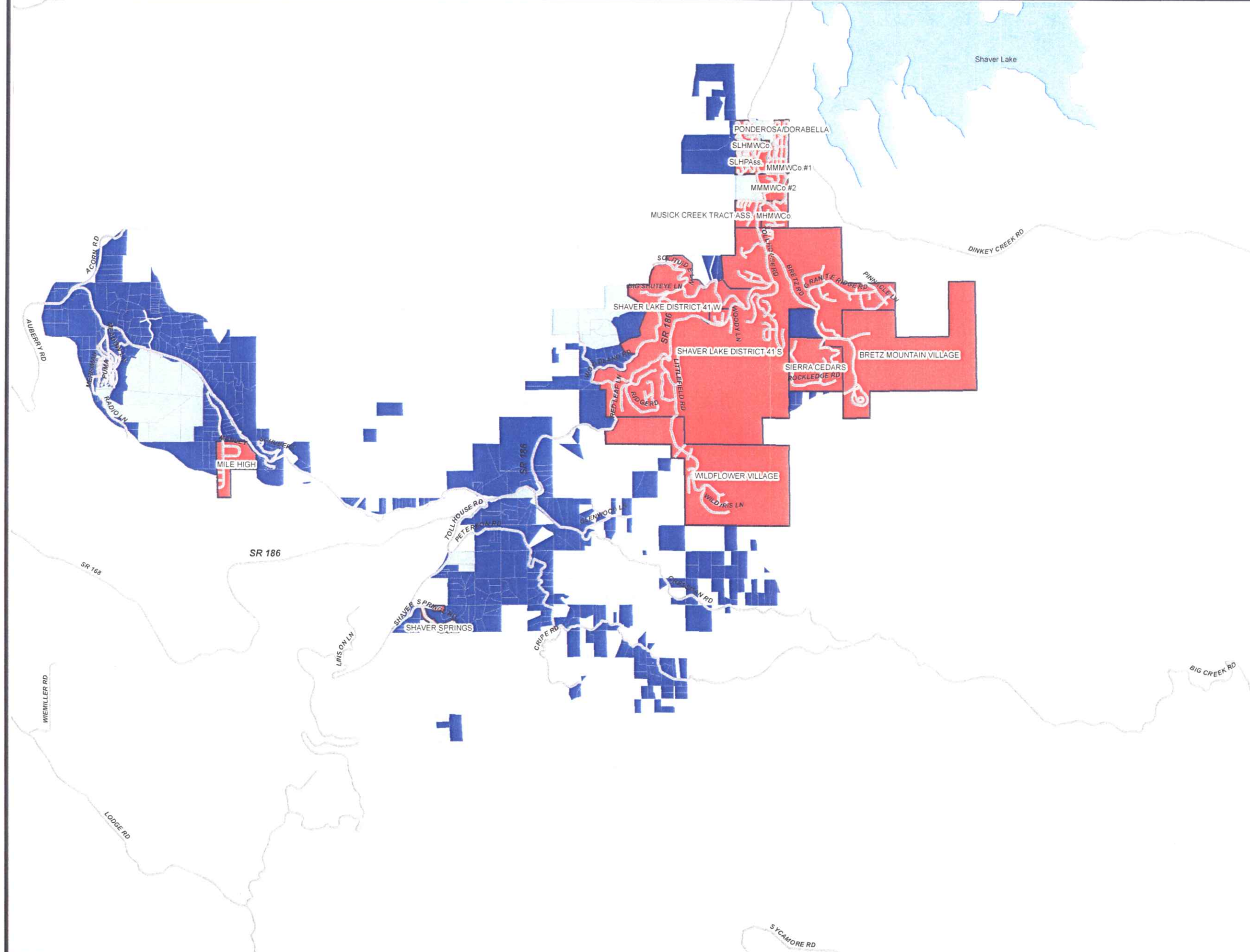
DEMAND METHOD AREAS

- Household Count
- Area Factor
- No Demand
- CSD/MHP



**EASTERN FRESNO COUNTY
FOOTHILL AND MOUNTAIN
WATER STUDY**

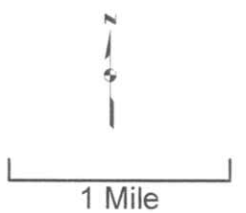
WATER DEMAND METHODS
SQUAW VALLEY AREA
FIGURE 3-2



Legend

DEMAND METHOD AREAS

- Household Count
- Area Factor
- No Demand
- CSD



**EASTERN FRESNO COUNTY
FOOTHILL AND MOUNTAIN
WATER STUDY**

SHAVER LAKE STUDY AREA
WATER DEMAND METHODS
FIGURE 3-3

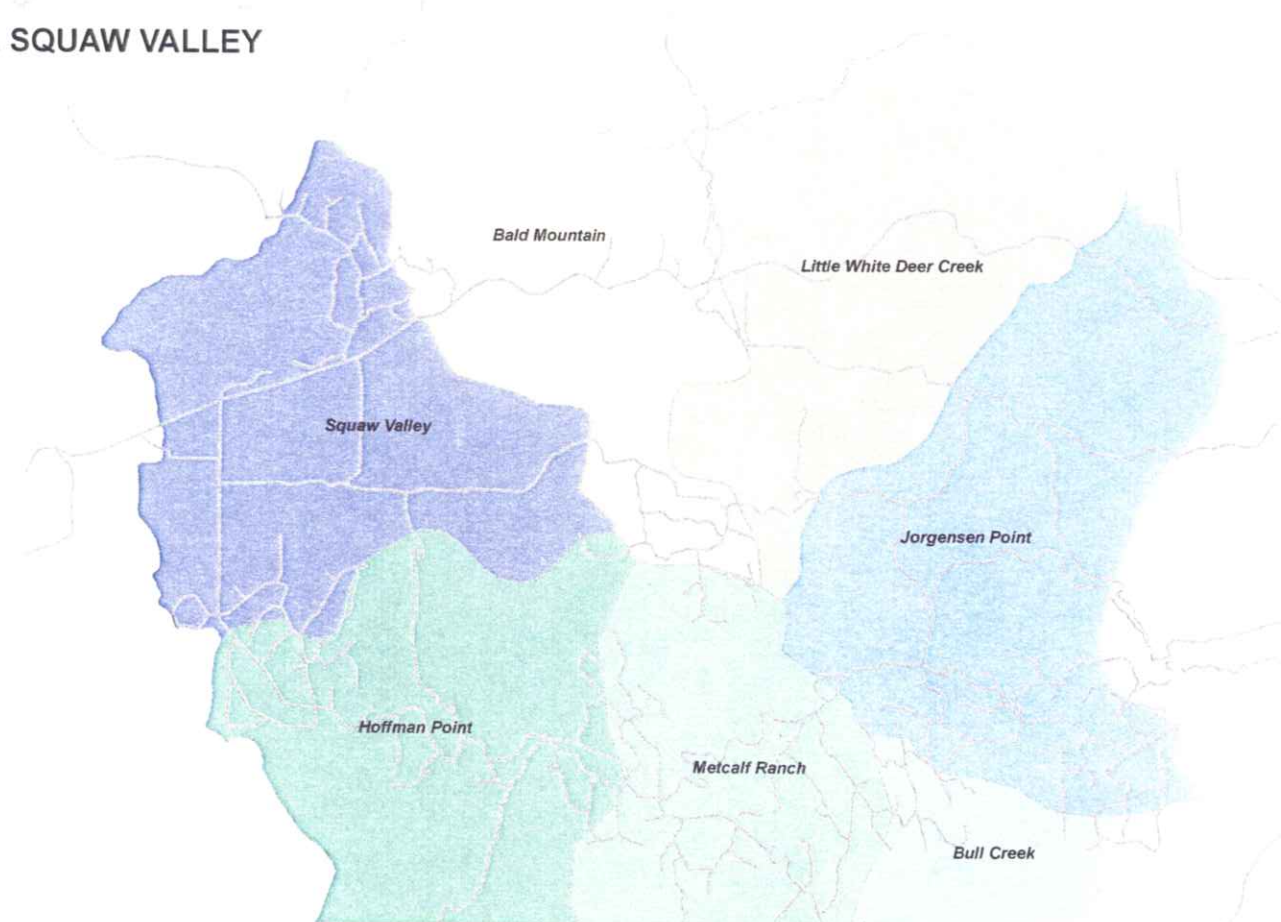
1. AUBERRY/PRATHER



3. SHAVER LAKE



2. SQUAW VALLEY



KEY MAP

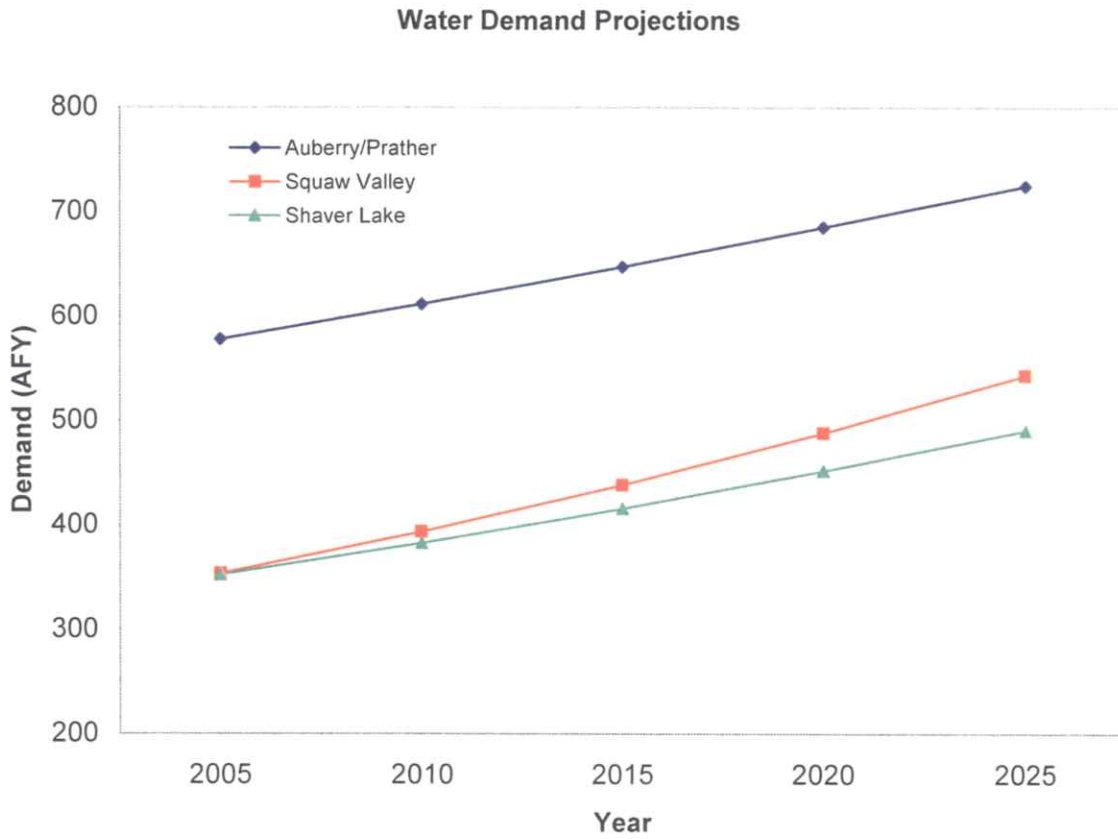


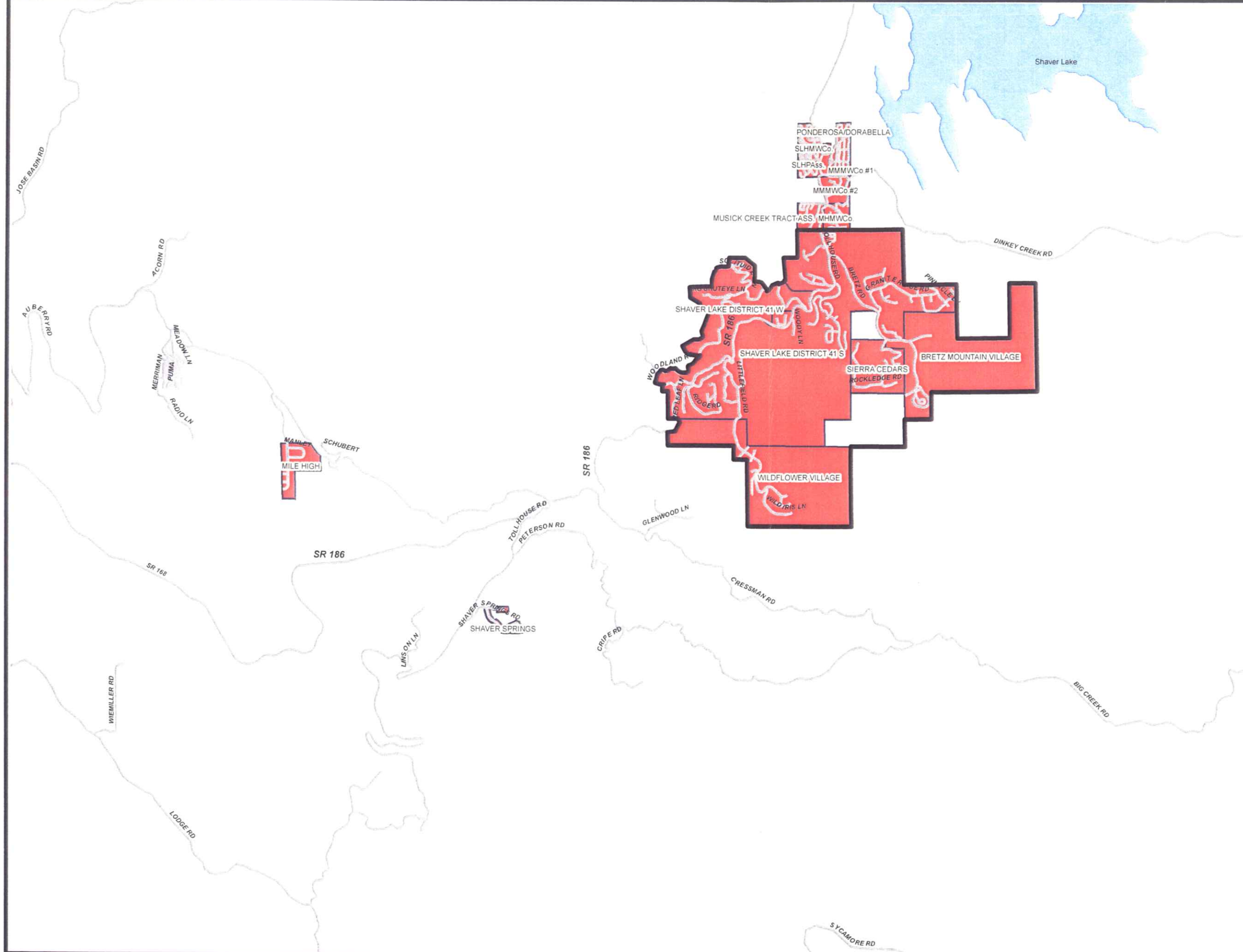
NOTE: All Areas Not To Scale

EASTERN FRESNO COUNTY
FOOTHILL AND MOUNTAIN
WATER STUDY

AREA WATERSHEDS
FIGURE 3-4

Figure 4-1
Eastern Fresno County Foothill and Mountain Water Study
Water Demand Projections





Legend

- Ultimate Service Area In Township 10
- CSD

**EASTERN FRESNO COUNTY
FOOTHILL AND MOUNTAIN
WATER STUDY**

MASTER PLAN ULTIMATE
SERVICE AREA IN TOWNSHIP 10
FIGURE 5-1

Tables

**Table 3-1
Eastern Fresno County Foothill and Mountain Water Study
General Plan Distribution and Demand Calculation Methods**

Zone	Description	Demand Calculation Method			
		CSD/MHP Demand	Household Count	Area Method	No Demand
---	Community Service Districts and Mobile Home Parks	X			
---	Parcels with Building Permits		X		
AE160	Exclusive Agricultural			X	
AE40	Exclusive Agricultural			X	
AE5	Exclusive Agricultural			X	
AL20	Limited Agricultural			X	
AL40	Limited Agricultural			X	
C2	Community Shopping Center			X	
C4	Central Trading			X	
C6	General Commercial			X	
CM	Commercial and Light Manufacturing			X	
M1	Light Manufacturing			X	
M3	Heavy Industrial			X	
O	Open Conservation				X
R1	Single Family Residential			X	
R1A	Single Family Residential (Suburban Lots)		X		
R1B	Single Family Residential (Suburban Setting)		X		
R1C	Single Family Residential (Non-Intensive)		X		
R2	Low Density Multi-Family Residential		X		
RC	Resource Conservation				X
RC160	Resource Conservation				X
RC40	Resource Conservation				X
RCC	Rural Commercial Center		X		
RE	Recreational			X	
RP	Residential/Professional Office		X		
RR	Rural Residential		X		
RR5	Rural Residential		X		
TP	Trailer Park Residential	X			
TPZ	Timberland Preserve				X

Table 3-2
Eastern Fresno County Foothill and Mountain Water Study
CSD/MHP Well Production Data

Community Service Districts and Mobile Home Parks	Current Number of Connections	Cumulative Number of Connections for Period	Total Water Production for Period (gallons)	Water Production Period (years)	Avg. Annual Usage Per Connection for Period (gal/year)	Highest Annual Usage for Period ⁷ (gal/year)
Shaver Lake CSDs (lower)						
District 37 ¹	46	46	3,237,550	1	70,382	70,382
District 40 ²	67	67	5,262,570	1	78,546	78,546
weighted average =					75,000	
Shaver Lake CSDs (upper)						
District 41 ³	768	2,526	141,080,628	4	55,851	58,729
Sierra Cedars ⁴	212	1,060	46,765,000	5	44,118	46,910
weighted average =					52,400	
Shaver Lake Village CSDs						
Shaver Lake Heights ⁵	212	1,049	30,700,000	5	29,266	38,900
weighted average =					29,300	
Auberry/Prather MHPs ⁶						
Mt. Ararat	36	36	1,825,000	1	50,694	50,694
Sandy Creek Village	46	46	2,920,000	1	63,478	63,478

¹ Data based on well production records from March 2004 to March 2005.

² Data based on well production records from the year 2004 to 2005.

³ Data based on well production records from the year 2001 to 2004.

⁴ Data based on well production records from 1995, 1998, 1999, 2001 & 2002.

⁵ Data based on well production records from the year 1997 to 2002.

⁶ Data based on well production averages provided by system operators.

⁷ Highest annual usage during periods with available data. Actual peak water usage may be higher.

Notes:

1. The cumulative number of connections is the sum of the number of connections for each year of the period and does not represent the current number of connections in the CSD except in Districts 37 and 40, which only have a one year period of well production data.
2. Districts 37 and 40 are within the lower elevation region of the Shaver Lake Area.
3. District 41 includes Wildflower Village.

Table 3-3
Eastern Fresno County Foothill and Mountain Water Study
Estimated Central Valley Outdoor Water Demand

Gallons Per Capita Day Water Demand in Central Valley (gpcd)	Per Capita Household in Auberry/Prather & Squaw Valley	Total Water Demand (indoor & outdoor) ¹		Indoor Water Demand ²		Outdoor Water Demand (gpy)
		(gpd)	(gpy)	(gal/mo)	(gpy)	
200	2.65	530	193,450	9,000	108,000	85,450

¹ Total water demand in Central Valley using per capita household in Auberry/Prather and Squaw Valley.

² Based on U.C. Davis study.

Table 3-4 Eastern Fresno County Foothill and Mountain Water Study Auberry/Prather (A/P) and Squaw Valley (SV) Area Household Water Demand				
Indoor Water Demand (gpy) ¹	Outdoor Water Demand			A/P & SV Household Demand (gpy)
	Central Valley (gpd)	A/P & SV as % of Central Valley ²	A/P and SV Demand	
108,000	85,450	33.3%	28,500	136,500

¹ Based on U.C. Davis study.

² Assumes outdoor water use in Auberry/Prather and Squaw Valley is equivalent to 33.3% of outdoor water usage in the Central Valley.

Table 3-5 Eastern Fresno County Foothill and Mountain Water Study Average Annual Household Water Demand		
Area	Average Annual Household Water Demand	
	(gpy)	(AFY)
Auberry/Prather	136,500	0.42
Squaw Valley	136,500	0.42
Shaver Lake:		
below 4,800'	75,000	0.23
above 4,800'	52,400	0.16
Shaver Lake Village	29,300	0.09

Table 3-6
Eastern Fresno County Foothill and Mountain Water Study
Area Factor Demand: Land Use Demand Factors

County Zone Designation	Description	Demand Factor (gpd/acre)
AE40	Exclusive Agricultural	0
AL40	Limited Agricultural	0
C2	Community Shopping Center	1300
C4	Central Trading	1100
C6	General Commercial	1000
CM	Commercial and Light Manufacturing	600
M1	Light Manufacturing	500
M3	Heavy Industrial	750
R	Recreational	0

**Table 3-7
Eastern Fresno County Foothill and Mountain Water Study
Current Water Demand Summary**

Area and Watershed	Water Demand Type			Totals (AFY)
	CSDs or MHPs (AFY)	Household Count (AFY)	Area Factor (AFY)	
<u>Auberry/Prather Area</u>				
Little Sandy Creek	15	150	82	247
Big Sandy Valley	0	63	5	68
Sentinel School	0	105	30	135
Auberry Valley	0	123	5	128
Totals	15	441	122	578
<u>Squaw Valley Area</u>				
Bald Mountain	0	20	8	28
Little White Deer Creek	0	33	40	73
Jorgensen Point	0	53	8	61
Bull Creek	0	8	0	8
Metcalf Ranch	0	52	0	52
Hoffman Point	0	33	0	33
Squaw Valley	0	51	48	99
Totals	0	250	104	354
<u>Shaver Lake Area</u>				
Bald Mill Creek	0	43	0	43
Musick Creek	223	27	13	263
North Fork Sycamore	17	29	0	46
Totals	240	99	13	352

Table 4-1 Eastern Fresno County Foothill and Mountain Water Study Housing Unit Increase from the Census Data			
Area	Census Place or Tract No. ¹	% Increase 1990-2000	Average Annual % Increase
Auberry/Prather	Auberry CDP	12%	1.14%
Squaw Valley	Squaw Valley CDP	24%	2.17%
Shaver Lake ²	64.02	18%	1.67%

¹ Census data were available for the Auberry/Prather and Squaw Valley areas at a Census Place level for both 1990 and 2000, but only Census Tract level data were available for both 1990 and 2000 in the Shaver Lake area.

² Within District 41, the number of housing units from 1995 to 2005 has increased by approximately 75%, which is a 5.8% average annual increase.

**Table 4-2
Eastern Fresno County Foothill and Mountain Water Study
Water Demand Projections**

Area and Watershed	Projections by Year (AFY)				
	2005	2010	2015	2020	2025
<u>Auberry/Prather Area</u>¹					
Little Sandy Creek	247	262	277	293	310
Big Sandy Valley	68	72	76	80	85
Sentinel School	135	143	151	160	169
Auberry Valley	128	136	144	152	161
Totals	578	612	647	685	725
<u>Squaw Valley Area</u>²					
Bald Mountain	28	31	34	38	42
Little White Deer Creek	73	81	90	100	112
Jorgensen Point	61	68	76	85	94
Bull Creek	8	9	10	12	13
Metcalf Ranch	52	58	64	72	80
Hoffman Point	33	37	41	46	51
Squaw Valley	99	110	122	136	152
Totals	354	394	438	488	544
<u>Shaver Lake Area</u>³					
Bald Mill Creek	43	47	51	55	60
Musick Creek	263	286	310	337	366
North Fork Sycamore	46	50	55	60	65
Totals	352	383	416	452	491

¹ Based on assumed annual increase in water demand of 2.01 % (Table 4-1).

² Based on assumed annual increase in water demand of 2.50 % (Table 4-1).

³ Based on assumed annual increase in water demand of 1.67 % (Table 4-1).

Note: Rate of annual water demand increases based on U.S. Census Bureau data

Table 4-3 Eastern Fresno County Foothill and Mountain Water Study Water Demands at Full Buildout of Permitted Parcels				
Area	Current Estimates		Estimate at Full Buildout of Permitted Parcels ¹	
	No. of Households	Water Demand (AFY)	No. of Households	Water Demand (AFY)
Auberry/Prather Area	1,135	578	1,744	908
Squaw Valley Area	593	354	1,697	979
Shaver Lake Area	2,136	352	2,694	475

¹ Accounts for the different types of water demands by demand type and also the water demand differences between the Upper and Lower Shaver Lake areas.

**Table 4-4
Eastern Fresno County Foothill and Mountain Water Study
Water Demand Summary for Full Buildout Conditions by Watershed ¹**

Area and Watershed	Water Demand Type			Totals (AFY)
	CSDs or MHPs (AFY)	Household Count (AFY)	Area Factor (AFY) ²	
<u>Auberry/Prather Area</u> ³				
Little Sandy Creek	15	255	134	404
Big Sandy Valley	0	107	9	116
Sentinel School	0	160	46	206
Auberry Valley	0	173	8	182
Totals	15	696	197	908
<u>Squaw Valley Area</u> ³				
Bald Mountain	0	56	23	80
Little White Deer Creek	0	62	76	139
Jorgensen Point	0	129	19	148
Bull Creek	0	40	0	40
Metcalf Ranch	0	146	0	146
Hoffman Point	0	122	0	122
Squaw Valley	0	156	148	304
Totals	0	712	267	979
<u>Shaver Lake Area</u> ³				
Bald Mill Creek	0	94	0	94
Musick Creek	243	58	13	314
North Fork Sycamore	17	50	0	67
Totals	260	202	13	475

¹ Buildout conditions assumes that all permitted parcels are occupied and have water usage.

² Area Factor Demands were increased the same percentage as Household Count Demands.

³ Assumes same household occupancy characteristics (e.g. permanent vs. seasonal)

**Table 4-5
 Eastern Fresno County Foothill and Mountain Water Study
 Shaver Lake Area Water Demand at Buildout of Permitted Parcels**

Current Water Demand (AFY)	Water Demands at Full Buildout of Permitted Parcels (AFY)	
	Same Occupancy Characteristics	Assumed Full-Time Occupancy of All Households
352	475	1,087

Table 4-6				
Eastern Fresno County Foothill and Mountain Water Study				
Water Demand Summary by Watershed for Buildout Conditions and Full-Time Occupancy ¹				
Area and Watershed	Water Demand Type			Totals (AFY)
	CSDs or MHPs (AFY)	Household Count (AFY)	Area Factor (AFY)	
<u>Auberry/Prather Area</u>				
Little Sandy Creek	15	255	134	404
Big Sandy Valley	0	107	9	116
Sentinel School	0	160	46	206
Auberry Valley	0	173	8	182
Totals	15	696	197	908
<u>Squaw Valley Area</u>				
Bald Mountain	0	56	23	80
Little White Deer Creek	0	62	76	139
Jorgensen Point	0	129	19	148
Bull Creek	0	40	0	40
Metcalf Ranch	0	146	0	146
Hoffman Point	0	122	0	122
Squaw Valley	0	156	148	304
Totals	0	712	267	979
<u>Shaver Lake Area</u>				
Bald Mill Creek	0	162	0	162
Musick Creek	656	112	36	804
North Fork Sycamore	28	93	0	121
Totals	684	367	36	1,087

¹ Assumes all households in the Shaver Lake Area are occupied on a full-time basis. The Auberry/Prather and Squaw Valley area data are repeated from Table 4-4 for comparison purposes.

**Table 5-1
Eastern Fresno County Foothill and Mountain Water Study
Master Plan Ultimate Service Area in Township 10
Current Water Demands**

CSD Name	Estimated Number of Service Connections or Households	Annual Demand (gal/year)	Annual Demand (AF/year)
District 41 (includes Wildflower Village)	768	42,931,200	132
Sierra Cedars	212	9,370,400	29
Bretz Mountain Village ¹	8	419,200	1
Additional 7 permitted parcels outside CSDs ¹	7	366,800	1
TOTALS=	995		163

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area for CSDs or households without well production data.

**Table 5-2
Eastern Fresno County Foothill and Mountain Water Study
Master Plan Ultimate Service Area in Township 10
Projected Water Demand at 2,000 Households (Current Usage Rates)**

CSD Name	Estimated Number of Service Connections or Households	Annual Demand (gal/year)	Annual Demand (AF/year)
District 41 (includes Wildflower Village)	768	42,931,200	132
Sierra Cedars	212	9,370,400	29
Bretz Mountain Village ¹	8	419,200	1
Additional 7 permitted parcels outside CSDs ¹	7	366,800	1
Additional 1,005 households ¹	1,005	52,662,000	162
TOTALS=	2,000		325

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area for CSDs or households without well production data.

**Table 5-3
Eastern Fresno County Foothill and Mountain Water Study
Master Plan Ultimate Service Area in Township 10
Projected Water Demand at 2,000 Households (Full-Time Occupancy Usage Rates)**

CSD Name	Estimated Number of Service Connections or Households	Annual Demand (gal/year) ¹	Annual Demand (AF/year)
District 41 (includes Wildflower Village)	768	92,160,000	283
Sierra Cedars	212	25,440,000	78
Bretz Mountain Village	8	960,000	3
Additional 7 permitted parcels outside CSDs	7	840,000	3
Additional 1,005 households	1,005	120,600,000	370
TOTALS=	2,000		737

¹ Assumes water demand per connection is 120,000 gpy (0.37 AFY) in the upper Shaver Lake Area for full-time occupancy.

Appendix

- Current Water Demand Summary
- Current Water Demand Calculations by Demand Type and Watershed
 - Auberry/Prather Area
 - Squaw Valley Area
 - Shaver Lake Area
- Water Demand Summary for Full Buildout Condition
- Buildout Water Demands by Demand Type and Watershed
 - Auberry/Prather Area
 - Squaw Valley Area
 - Shaver Lake Area
 - Shaver Lake Area Full-Time Occupancy

Current Water Demand Summary

**Eastern Fresno County Foothill and Mountain Water Study
Current Water Demand Summary**

Area and Watershed	Water Demand Type			Totals (AFY)
	CSDs or MHPs (AFY)	Household Count (AFY)	Area Factor (AFY)	
<u>Auberry/Prather Area</u>				
Little Sandy Creek	15	150	82	247
Big Sandy Valley	0	63	5	68
Sentinel School	0	105	30	135
Auberry Valley	0	123	5	128
Totals	15	441	122	578
<u>Squaw Valley Area</u>				
Bald Mountain	0	20	8	28
Little White Deer Creek	0	33	40	73
Jorgensen Point	0	53	8	61
Bull Creek	0	8	0	8
Metcalf Ranch	0	52	0	52
Hoffman Point	0	33	0	33
Squaw Valley	0	51	48	99
Totals	0	250	104	354
<u>Shaver Lake Area</u>				
Bald Mill Creek	0	43	0	43
Musick Creek	223	27	13	263
North Fork Sycamore	17	29	0	46
Totals	240	99	13	352

**Auberry/Prather Area
Current Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study Little Sandy Creek Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
MHPs	All mobile home park demands	15
Household Count Method Areas	Residentially Permitted Parcels by County	105
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	27
	Second Residences Within the Same Parcels	18
Area Method	All applicable zones	82
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		247

Eastern Fresno County Foothill and Mountain Water Study
 Little Sandy Creek Watershed - Mobile Home Park Water Demands

CSD Name	Estimated Number of Service Connections	Annual Demand (gallons/year)	Annual Demand (AF/year)
Auberry/Prather Mobile Home Parks ¹			
Mt. Ararat	36	1,825,000	6
Sandy Creek Village	46	2,920,000	9
TOTAL CSD & MHP WATER DEMAND =			15

¹ Known water usage data provided by operator.

**Eastern Fresno County Foothill and Mountain Water Study
Little Sandy Creek Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	4,009	16	251	136,500	34,261,500	105
Areas Classified as "Household Count Method Parcels" Based on County Zoning	1,012	16	64	136,500	8,736,000	27
Second Residences ³	---	---	44	136,500	6,006,000	18
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						150

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Little Sandy Creek Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	1,578	0	0	0	0
AL40	Limited Agricultural ²	40	141	0	0	0	0
C2	Community Shopping Center ³	2	12	1300	16,000	5,840,000	18
C4	Central Trading ⁴	4	5	1100	6,000	2,190,000	7
C6	General Commercial ⁵	6	16	1000	16,000	5,840,000	18
CM	Commercial and Light Manufacturing ⁶	---	10	600	6,000	2,190,000	7
M1	Light Manufacturing	0.2	3	500	2,000	730,000	3
M3	Heavy Industrial	0.2	33	750	25,000	9,125,000	29
RE	Recreational	---	38	0	0	0	0
TOTAL (AFY) =							82

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Farms and other non-intensive agricultural uses

³ Provide for larger shopping centers serving multiple communities/neighborhoods

⁴ Provide for commercial properties within "downtown areas" of unincorporated communities, mainly serving individual communities

⁵ Non shopping center type commercial areas found along major thoroughfares

⁶ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

Eastern Fresno County Foothill and Mountain Water Study Big Sandy Valley Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	52
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	5
	Second Residences Within the Same Parcels	5
Area Method	All applicable zones	5
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		68

**Eastern Fresno County Foothill and Mountain Water Study
Big Sandy Valley Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gallons/year) ²	Annual Demand (gallons/year)	Annual Demand (AF/year)
Permitted Parcels by County	1,991	16	125	136,500	17,062,500	52
Areas Classified as "Household Count Method Parcels" Based on County Zoning	205	16	13	136,500	1,774,500	5
Second Residences ³	---	---	12	136,500	1,638,000	5
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						63

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Big Sandy Valley - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	783	0	0	0	0
C6	General Commercial ²	6	4	1000	4,000	1,460,000	5
RE	Recreational	---	3	0	0	0	0
TOTAL (AFY) =							5

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Non shopping center type commercial areas found along major thoroughfares

Eastern Fresno County Foothill and Mountain Water Study Sentinel School Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	81
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	13
	Second Residences Within the Same Parcels	10
Area Method	All applicable zones	30
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		135

**Eastern Fresno County Foothill and Mountain Water Study
Sentinel School Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	3,094	16	194	136,500	26,481,000	81
Areas Classified as "Household Count Method Parcels" Based on County Zoning	494	16	31	136,500	4,231,500	13
Second Residences ³	---	---	25	136,500	3,412,500	10
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						105

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Sentinel School Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	1,975	0	0	0	0
AL40	Limited Agricultural ²	40	243	0	0	0	0
C4	Central Trading ³	4	13	1100	15,000	5,475,000	17
C6	General Commercial ⁴	6	11	1000	11,000	4,015,000	13
TOTAL (AFY) =							30

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Farms and other non-intensive agricultural uses

³ Provide for commercial properties within "downtown areas" of unincorporated communities, mainly serving individual communities.

⁴ Non shopping center type commercial areas found along major thoroughfares

Eastern Fresno County Foothill and Mountain Water Study Auberry Valley Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	103
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	13
	Second Residences Within the Same Parcels	8
Area Method	All applicable zones	5
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		128

**Eastern Fresno County Foothill and Mountain Water Study
Auberry Valley Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	3,910	16	245	136,500	33,442,500	103
Areas Classified as "Household Count Method Parcels" Based on County Zoning	479	16	30	136,500	4,095,000	13
Second Residences ³	---	---	19	136,500	2,593,500	8
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						123

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Auberry Valley Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/ac)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	2,698	0	0	0	0
AL40	Limited Agricultural ²	40	710	0	0	0	0
CM	Commercial and Light Manufacturing ³	---	6	600	4,000	1,460,000	5
TOTAL (AFY) =							5

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Farms and other non-intensive agricultural uses

³ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

**Squaw Valley Area
Current Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study Bald Mountain Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	18
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	1
	Second Residences Within the Same Parcels	1
Area Method	All applicable zones	8
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		28

**Eastern Fresno County Foothill and Mountain Water Study
Bald Mountain Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	1,320	32	42	136,500	5,733,000	18
Areas Classified as "Household Count Method Parcels" Based on County Zoning	1	32	1	136,500	136,500	1
Second Residences ³	---	---	1	136,500	136,500	1
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						20

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Bald Mountain Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	5,663	0	0	0	0
AE5	Exclusive Agricultural ¹	5	458	0	0	0	0
C6	General Commercial ²	6	5	1000	5,000	1,825,000	6
CM	Commercial and Light Manufacturing ³	---	1	600	1,000	365,000	2
RE	Recreational	---	12	0	0	0	0
TOTAL (AFY) =							8

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Non shopping center type commercial areas found along major thoroughfares

³ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

Eastern Fresno County Foothill and Mountain Water Study Little White Deer Creek Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	30
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	0
	Second Residences Within the Same Parcels	2
Area Method	All applicable zones	40
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		73

Eastern Fresno County Foothill and Mountain Water Study
Little White Deer Creek Watershed - Household Count Method Water Demands

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	2,282	32	72	136,500	9,828,000	30
Areas Classified as "Household Count Method Parcels" Based on County Zoning	19	32	1	136,500	136,500	0
Second Residences ³	---	---	5	136,500	682,500	2
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						33

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Little White Deer Creek Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	3,229	0	0	0	0
AE5	Exclusive Agricultural ¹	5	575	0	0	0	0
C6	General Commercial ²	6	27	1000	27,000	9,855,000	31
CM	Commercial and Light Manufacturing ³	---	12	600	8,000	2,920,000	9
RE	Recreational	---	106	0	0	0	0
TOTAL (AFY) =							40

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Non shopping center type commercial areas found along major thoroughfares

³ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

Eastern Fresno County Foothill and Mountain Water Study Jorgensen Point Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	49
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	1
	Second Residences Within the Same Parcels	3
Area Method	All applicable zones	8
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		61

**Eastern Fresno County Foothill and Mountain Water Study
Jorgensen Point Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	3,756	32	118	136,500	16,107,000	49
Areas Classified as "Household Count Method Parcels" Based on County Zoning	80	32	3	136,500	409,500	1
Second Residences ³	---	---	6	136,500	819,000	3
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						53

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Jorgensen Point Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	4,048	0	0	0	0
AE5	Exclusive Agricultural ¹	5	1,158	0	0	0	0
C2	Community Shopping Center ²	2	3	1300	4,000	1,460,000	5
CM	Commercial and Light Manufacturing ³	---	3	600	2,000	730,000	3
RE	Recreational	---	22	0	0	0	0
TOTAL (AFY) =							8

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Provide for larger shopping centers serving multiple communities/neighborhoods

³ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

Eastern Fresno County Foothill and Mountain Water Study Bull Creek Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	8
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	0
	Second Residences Within the Same Parcels	0
Area Method	All applicable zones	0
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		8

Eastern Fresno County Foothill and Mountain Water Study
Bull Creek Watershed - Household Count Method Water Demands

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	635	32	20	136,500	2,730,000	8
Areas Classified as "Household Count Method Parcels" Based on County Zoning	0	32	0	136,500	0	0
Second Residences ³	---	---	0	136,500	0	0
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						8

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Bull Creek Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	13,557	0	0	0	0
AE5	Exclusive Agricultural ¹	5	350	0	0	0	0
TOTAL (AFY) =							0

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

Eastern Fresno County Foothill and Mountain Water Study Metcalf Ranch Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	35
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	13
	Second Residences Within the Same Parcels	3
Area Method	All applicable zones	0
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		52

**Eastern Fresno County Foothill and Mountain Water Study
Metcalf Ranch Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	2,681	32	84	136,500	11,466,000	35
Areas Classified as "Household Count Method Parcels" Based on County Zoning	1,012	32	32	136,500	4,368,000	13
Second Residences ³	---	---	8	136,500	1,092,000	3
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						52

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Metcalf Ranch Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	874	0	0	0	0
AE40	Exclusive Agricultural ¹	40	60	0	0	0	0
AE5	Exclusive Agricultural ¹	5	1,841	0	0	0	0
TOTAL (AFY) =							0

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

Eastern Fresno County Foothill and Mountain Water Study Hoffman Point Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	28
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	0
	Second Residences Within the Same Parcels	5
Area Method	All applicable zones	0
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		33

**Eastern Fresno County Foothill and Mountain Water Study
Hoffman Point Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	2,082	32	66	136,500	9,009,000	28
Areas Classified as "Household Count Method Parcels" Based on County Zoning	4	32	1	136,500	136,500	0
Second Residences ³	---	---	12	136,500	1,638,000	5
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						33

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Hoffman Point Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	3,977	0	0	0	0
AE5	Exclusive Agricultural ¹	5	1,501	0	0	0	0
TOTAL (AFY) =							0

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

Eastern Fresno County Foothill and Mountain Water Study Squaw Valley Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	42
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	1
	Second Residences Within the Same Parcels	8
Area Method	All applicable zones	48
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		99

**Eastern Fresno County Foothill and Mountain Water Study
Squaw Valley Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	3,185	32	100	136,500	13,650,000	42
Areas Classified as "Household Count Method Parcels" Based on County Zoning	49	32	2	136,500	273,000	1
Second Residences ³	---	---	19	136,500	2,593,500	8
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						51

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Squaw Valley Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE160	Exclusive Agricultural ¹	160	4,159	0	0	0	0
AE5	Exclusive Agricultural ¹	5	676	0	0	0	0
C4	Central Trading ²	4	3	1100	4,000	1,460,000	5
C6	General Commercial ³	6	32	1000	32,000	11,680,000	36
CM	Commercial & Light Manufacturing ⁴	---	3	600	2,000	730,000	3
M3	Heavy Industrial	0.2	4	750	3,000	1,095,000	4
TOTAL (AFY) =							48

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Provide for commercial properties within "downtown areas" of unincorporated communities, mainly serving individual communities.

³ Non shopping center type commercial areas found along major thoroughfares

⁴ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

**Shaver Lake Area
Current Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study Bald Mill Creek Watersehd - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	0
Household Count Method Areas	Residentially Permitted Parcels by County	36
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	5
	Second Residences Within the Same Parcels	1
Area Method	All applicable zones	0
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		43

**Eastern Fresno County Foothill and Mountain Water Study
Bald Mill Creek Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	1,890	12	158	75,000	11,850,000	36
Areas Classified as "Household Count Method Parcels" Based on County Zoning	267	12	23	75,000	1,725,000	5
Second Residences ³	---	---	6	75,000	450,000	1
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						43

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison

Eastern Fresno County Foothill and Mountain Water Study
 Bald Mill Creek Watershed - Area Factor Method Demands

County Zone Designation	Description	Minimum Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	342	0	0	0	0
TOTAL (AFY) =							0

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

Eastern Fresno County Foothill and Mountain Water Study Musick Creek Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	223
Household Count Method Areas	Residentially Permitted Parcels by County	16
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	6
	Second Residences Within the Same Parcels	5
Area Method	All applicable zones	13
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		263

Eastern Fresno County Foothill and Mountain Water Study
Musick Creek Watershed - CSD Demands

CSD Name	Estimated Number of Service Connections ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Shaver Lake - Known Well Production Data Districts			
District 41 (includes Wildflower Village)	768	42,931,200	132
District 37	46	3,238,400	10
Sierra Cedars	212	9,370,400	29
Shaver Lake Heights Water Co.	212	6,211,600	19
Shaver Lake - Assumed Average Demand/Connection Districts ²			
Bretz Mountain Village	8	393,000	1
Shaver Lake Village - Assumed Average Demand/Connection Districts ²			
Shaver Lake Heights Property Association	129	3,779,700	12
Musick Meadows Mountain Water Co. 1 & 2	112	3,274,275	10
Musick Heights Mutual Water Co.	49	1,428,375	4
Old Musick Tract, Musick Creek Tract Assessment	44	1,296,525	4
Ponderosa Trailer Park and Dorabella Mountain Water Co.	22	637,275	2
TOTAL CSD WATER DEMAND =			223

¹ For CSDs where the number of service connections was not provided, 75% of potential residences was assumed to have water service connections based on the percentages of connection rates within District 41 and 40.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

Notes:

1. For CSDs with known well production data, the current annual demand was estimated by multiplying the known number of service connections by the average annual usage per connection. The annual demands for CSDs without known well production data were estimated by using average data from similar CSDs.

**Eastern Fresno County Foothill and Mountain Water Study
Musick Creek Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County (Upper Shaver)	615	12	52	52,400	2,724,800	9
Permitted Parcels by County (Lower Shaver)	346	12	29	75,000	2,175,000	7
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Upper Shaver)	96	12	9	52,400	471,600	2
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Lower Shaver)	160	12	14	75,000	1,050,000	4
Second Residences (Upper Shaver) ³	---	---	2	52,400	104,800	1
Second Residences (Lower Shaver) ³	---	---	16	75,000	1,200,000	4
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						27

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Musick Creek Watershed - Area Factor Method Demands

County Zone Designation	Description	Min. Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	12	0	0	0	0
AE5	Exclusive Agricultural ¹	5	1	0	0	0	0
AL20	Limited Agricultural ²	20	209	0	0	0	0
C4	Central Trading ³	4	8	1100	9,000	3,285,000	11
CM	Commercial and Light Manufacturing ⁴	---	1	600	1,000	365,000	2
TOTAL (AFY) =							13

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Farms and other non-intensive agricultural uses

³ Provide for commercial properties within "downtown areas" of unincorporated communities, mainly serving individual communities

⁴ Mixed between commercial and light manufacturing, such as warehousing or wholesaling

Eastern Fresno County Foothill and Mountain Water Study North Fork Sycamore Watershed - Total Annual System Demand Summary		
Demand Type	Description	Demand (AFY)
CSDs	All community service district demands	17
Household Count Method Areas	Residentially Permitted Parcels by County	21
	Areas Classified as "Household Count Method Parcels" Based on County Zoning	5
	Second Residences Within the Same Parcels	3
Area Method	All applicable zones	0
List Demands	All list demands	0
TOTAL ANNUAL WATER DEMAND (AFY)=		46

Eastern Fresno County Foothill and Mountain Water Study
North Fork Sycamore Watershed - CSD Demands

CSD Name	Estimated Number of Service Connections	Annual Demand (gallons/year)	Annual Demand (AF/year)
Shaver Lake - Known Well Production Data Districts			
District 40 (Shaver Springs)	67	5,266,200	17
TOTAL CSD WATER DEMAND =			17

Note:

1. Wildflower Village is served by District 41 and its water demand is included in the Musick Creek watershed tables.

**Eastern Fresno County Foothill and Mountain Water Study
North Fork Sycamore Watershed - Household Count Method Water Demands**

Study Area	Applicable Area (acres)	AH Ratio ¹	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ²	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County (Upper Shaver)	492	12	42	52,400	2,200,800	7
Permitted Parcels by County (Lower Shaver)	764	12	64	75,000	4,800,000	15
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Upper Shaver)	15	12	2	52,400	104,800	0
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Lower Shaver)	261	12	22	75,000	1,650,000	5
Second Residences (Upper Shaver) ³	---	---	3	52,400	157,200	0
Second Residences (Lower Shaver) ³	---	---	9	75,000	675,000	2
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =						29

¹ Acres to number of household ratio is based on the US Census Bureau Data for the year 2000.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

³ Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
North Fork Sycamore Watershed - Area Factor Method Demands

County Zone Designation	Description	Minimum Lot Size (acres)	Acreage	Demand Factor (gpd/acre)	Total Demand (gpd)	Total Demand (gal/year)	Total Demand (AFY)
AE40	Exclusive Agricultural ¹	40	33	0	0	0	0
AL20	Limited Agricultural ²	20	1	0	0	0	0
TOTAL (AFY) =							0

¹ Farming, livestock, processing of agricultural products, and other miscellaneous agricultural business

² Farms and other non-intensive agricultural uses

Water Demands for Buildout Conditions

**Eastern Fresno County Foothill and Mountain Water Study
Water Demand Summary for Full Buildout Conditions by Watershed**

Area and Watershed	Water Demand Type			Totals (AFY)
	CSDs or MHPs (AFY)	Household Count (AFY)	Area Factor (AFY)	
<u>Auberry/Prather Area</u>				
Little Sandy Creek	15	255	134	404
Big Sandy Valley	0	107	9	116
Sentinel School	0	160	46	206
Auberry Valley	0	173	8	182
Totals	15	696	197	908
<u>Squaw Valley Area</u>				
Bald Mountain	0	56	23	80
Little White Deer Creek	0	62	76	139
Jorgensen Point	0	129	19	148
Bull Creek	0	40	0	40
Metcalf Ranch	0	146	0	146
Hoffman Point	0	122	0	122
Squaw Valley	0	156	148	304
Totals	0	712	266	979
<u>Shaver Lake Area</u>				
Bald Mill Creek	0	94	0	94
Musick Creek	243	58	13	314
North Fork Sycamore	17	50	0	67
Totals	260	202	18	475

**Auberry/Prather Area
Buildout Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study
 Little Sandy Creek Watershed - Mobile Home Park Water Demands at Buildout

CSD Name	Estimated Number of Service Connections	Annual Demand (gallons/year)	Annual Demand (AF/year)
Auberry/Prather Mobile Home Parks ¹			
Mt. Ararat	36	1,825,000	6
Sandy Creek Village	46	2,920,000	9
TOTAL CSD & MHP WATER DEMAND =			15

¹ Known water usage data provided by operator.

Eastern Fresno County Foothill and Mountain Water Study Little Sandy Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	490	136,500	66,885,000	205
Areas Classified as "Household Count Method Parcels" Based on County Zoning	64	136,500	8,736,000	27
Second Residences ²	55	136,500	7,507,500	23
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				255

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Big Sandy Valley Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gallons/year) ¹	Annual Demand (gallons/year)	Annual Demand (AF/year)
Permitted Parcels by County	228	136,500	31,122,000	96
Areas Classified as "Household Count Method Parcels" Based on County Zoning	13	136,500	1,774,500	5
Second Residences ²	15	136,500	2,047,500	6
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				107

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison)

Eastern Fresno County Foothill and Mountain Water Study Sentinel School Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	321	136,500	43,816,500	134
Areas Classified as "Household Count Method Parcels" Based on County Zoning	31	136,500	4,231,500	13
Second Residences ²	31	136,500	4,231,500	13
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				160

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Auberry Valley Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	361	136,500	49,276,500	151
Areas Classified as "Household Count Method Parcels" Based on County Zoning	30	136,500	4,095,000	13
Second Residences ²	23	136,500	3,139,500	10
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				173

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

**Squaw Valley Area
Buildout Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study Bald Mountain Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	130	136,500	17,745,000	54
Areas Classified as "Household Count Method Parcels" Based on County Zoning	1	136,500	136,500	1
Second Residences ²	1	136,500	136,500	1
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				56

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Little White Deer Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	142	136,500	19,383,000	59
Areas Classified as "Household Count Method Parcels" Based on County Zoning	1	136,500	136,500	0
Second Residences ²	6	136,500	819,000	3
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				62

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Jorgensen Point Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	298	136,500	40,677,000	125
Areas Classified as "Household Count Method Parcels" Based on County Zoning	3	136,500	409,500	1
Second Residences ²	7	136,500	955,500	3
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				129

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Bull Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	95	136,500	12,967,500	40
Areas Classified as "Household Count Method Parcels" Based on County Zoning	0	136,500	0	0
Second Residences ²	0	136,500	0	0
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				40

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison)

Eastern Fresno County Foothill and Mountain Water Study Metcalf Ranch Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	308	136,500	42,042,000	129
Areas Classified as "Household Count Method Parcels" Based on County Zoning	32	136,500	4,368,000	13
Second Residences ²	9	136,500	1,228,500	4
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				146

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Hoffman Point Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	277	136,500	37,810,500	116
Areas Classified as "Household Count Method Parcels" Based on County Zoning	1	136,500	136,500	0
Second Residences ²	14	136,500	1,911,000	6
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				122

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study Squaw Valley Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	317	136,500	43,270,500	133
Areas Classified as "Household Count Method Parcels" Based on County Zoning	32	136,500	4,368,000	13
Second Residences ²	23	136,500	3,139,500	10
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				156

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

**Shaver Lake Area
Buildout Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study Bald Mill Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	377	75,000	28,275,000	87
Areas Classified as "Household Count Method Parcels" Based on County Zoning	23	75,000	1,725,000	5
Second Residences ²	7	75,000	525,000	2
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				94

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household

Eastern Fresno County Foothill and Mountain Water Study Musick Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County (Upper Shaver)	147	52,400	7,702,800	24
Permitted Parcels by County (Lower Shaver)	95	75,000	7,125,000	22
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Upper Shaver)	9	52,400	471,600	2
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Lower Shaver)	14	75,000	1,050,000	4
Second Residences (Upper Shaver) ²	2	52,400	104,800	1
Second Residences (Lower Shaver) ²	19	75,000	1,425,000	5
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				58

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
Musick Creek Watershed - CSD Demands at Buildout

CSD Name	Estimated Number of Service Connections ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Shaver Lake - Known Well Production Data Districts			
District 41 (includes Wildflower Village)	801	44,775,900	137
District 37	46	3,238,400	10
Sierra Cedars	222	9,812,400	30
Shaver Lake Heights Water Co.	236	6,914,800	21
Shaver Lake - Assumed Average Demand/Connection Districts ²			
Bretz Mountain Village	27	1,414,800	4
Shaver Lake Village - Assumed Average Demand/Connection Districts ²			
Shaver Lake Heights Property Association	142	4,160,600	13
Musick Meadows Mountain Water Co. 1 & 2	133	3,896,900	12
Musick Heights Mutual Water Co.	88	2,578,400	8
Old Musick Tract, Musick Creek Tract Assessment	50	1,465,000	4
Ponderosa Trailer Park and Dorabella Mountain Water Co.	22	644,600	2
TOTAL CSD WATER DEMAND =			243

¹ For CSDs where the number of service connections was not provided, 75% of potential residences was assumed to have water service connections based on the percentages of connection rates within District 41 and 40.

² Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

Notes:

1. For CSDs with known well production data, the current annual demand was estimated by multiplying the known number of service connections by the average annual usage per connection. The annual demands for CSDs without known well production data were estimated by using average data from similar CSDs.

Eastern Fresno County Foothill and Mountain Water Study
 North Fork Sycamore Watershed - CSD Demands at Buildout

CSD Name	Estimated Number of Permitted Parcels	Demand Per Service Connection (gal/year) ¹	Annual Demand (gallons/year)	Annual Demand (AF/year)
Shaver Lake - Known Well Production Data Districts				
District 40 (Shaver Springs)	68	78,500	5,338,000	17
TOTAL CSD WATER DEMAND =				17

¹ Based on the average annual water usage per connection from 2004-2005 data.

Note:

1. Wildflower Village is served by District 41 and its water demand is included in the Musick Creek watershed tables.

**Eastern Fresno County Foothill and Mountain Water Study
North Fork Sycamore Watershed - Household Count Method Water Demands at Buildout**

Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County (Upper Shaver)	64	52,400	3,353,600	10
Permitted Parcels by County (Lower Shaver)	136	75,000	10,200,000	31
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Upper Shaver)	2	52,400	104,800	0
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Lower Shaver)	22	75,000	1,650,000	5
Second Residences (Upper Shaver)	3	52,400	157,200	0
Second Residences (Lower Shaver)	11	75,000	825,000	3
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				50

¹ Assumes water demand per connection is 52,400 gpy (0.16 AFY) in the upper Shaver Lake Area, 29,300 gpy (0.09 AFY) in the Shaver Lake Village area, 75,000 gal per year (0.23 AFY) in the lower Shaver Area, and 136,500 gal per year (0.42 AFY) in the Auberry/Prather and Squaw Valley Areas.

**Shaver Lake Area at Full-Time Occupancy
Buildout Water Demand by Demand Type and Watershed**

Eastern Fresno County Foothill and Mountain Water Study Bald Mill Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County	377	130,000	49,010,000	150
Areas Classified as "Household Count Method Parcels" Based on County Zoning	23	130,000	2,990,000	9
Second Residences	7	130,000	910,000	3
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				162

¹ Assumes water demand per connection = 130,000 gallons/year in the lower Shaver Lake Area and 120,000 for the upper Shaver Lake Area for full-time occupancy based on average annual water usage of the top 25% water users in District 37 and 40.

Eastern Fresno County Foothill and Mountain Water Study
Musick Creek Watershed - CSD Demands at Buildout of Permitted Parcels

CSD Name	Estimated Number of Permitted Parcels	Demand Per Service Connection (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Shaver Lake - Known Well Production Data Districts				
District 41 (includes Wildflower Village)	801	120,000	96,120,000	295
District 37 ²	46	130,000	5,980,000	18
Sierra Cedars	222	120,000	26,640,000	82
Shaver Lake Heights Water Co.	236	120,000	28,320,000	87
Shaver Lake - Assumed Average Demand/Connection Districts				
Bretz Mountain Village	27	120,000	3,240,000	10
Shaver Lake Village- Assumed Average Demand/Connection Districts				
Shaver Lake Heights Property Association	142	120,000	17,040,000	52
Musick Meadows Mountain Water Co. 1 & 2	133	120,000	15,960,000	49
Musick Heights Mutual Water Co.	88	120,000	10,560,000	32
Old Musick Tract/Musick Creek Tract Assessment	50	120,000	6,000,000	18
Ponderosa MHP & Dorabella Mountain Water Co.	32	120,000	3,840,000	12
TOTAL CSD WATER DEMAND =				656

¹ Assumes water demand per connection = 130,000 gallons/year in the lower Shaver Lake Area and 120,000 for the upper Shaver Lake Area for full-time occupancy based on average annual water usage of the top 25% water users in District 37 and 40, and the entire Shaver Lake Area (including the Shaver Lake Village) is not limited by groundwater yield conditions.

Eastern Fresno County Foothill and Mountain Water Study Musick Creek Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County (Upper Shaver)	147	120,000	17,640,000	55
Permitted Parcels by County (Lower Shaver)	95	130,000	12,350,000	38
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Upper Shaver)	9	120,000	1,080,000	4
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Lower Shaver)	14	130,000	1,820,000	6
Second Residences (Upper Shaver) ²	2	120,000	240,000	1
Second Residences (Lower Shaver) ²	19	130,000	2,470,000	8
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				112

¹ Assumes water demand per connection = 130,000 gallons/year in the lower Shaver Lake Area and 120,000 for the upper Shaver Lake Area for full-time occupancy based on average annual water usage of the top 25% water users in District 37 and 40.

² Assumes approximately 80% of the parcels permitted for second residences actually have a second household (based on comparison with aerial photography).

Eastern Fresno County Foothill and Mountain Water Study
North Fork Sycamore Watershed - CSD Demands at Buildout

CSD Name	Estimated Number of Permitted Parcels	Demand Per Service Connection (gal/year) ¹	Annual Demand (gallons/year)	Annual Demand (AF/year)
Shaver Lake - Known Well Production Data Districts				
District 40 (Shaver Springs)	68	130,000	8,840,000	28
TOTAL CSD WATER DEMAND =				28

¹ Assumes water demand per connection = 130,000 gallons/year in the lower Shaver Lake Area and 120,000 for the upper Shaver Lake Area for full-time occupancy based on average annual water usage of the top 25% water users in District 37 and 40.

Note:

1. Wildflower Village is served by District 41 and its water demand is included in the Musick Creek watershed tables.

Eastern Fresno County Foothill and Mountain Water Study North Fork Sycamore Watershed - Household Count Method Water Demands at Buildout				
Study Area	Estimated Number of Households	Average Annual Demand Per Household (gal/year) ¹	Annual Demand (gal/year)	Annual Demand (AF/year)
Permitted Parcels by County (Upper Shaver)	64	120,000	7,680,000	24
Permitted Parcels by County (Lower Shaver)	136	130,000	17,680,000	54
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Upper Shaver)	2	120,000	240,000	1
Areas Classified as "Household Count Method Parcels" Based on County Zoning (Lower Shaver)	22	130,000	2,860,000	9
Second Residences (Upper Shaver)	3	120,000	360,000	1
Second Residences (Lower Shaver)	11	130,000	1,430,000	4
TOTAL HOUSEHOLD COUNT AREAS WATER DEMAND =				93

¹ Assumes water demand per connection = 130,000 gallons/year in the lower Shaver Lake Area and 120,000 for the upper Shaver Lake Area for full-time occupancy based on average annual water usage of the top 25% water users in District 37 and 40.