APPENDIX D – MEMORANDUM, SAN LUIS OBISPO COUNTY WATER DEMAND ANALYSIS METHODOLOGY AND RESULTS, ESA, JANUARY 11, 2010

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DRAFT memorandum

date January 11, 2010

to Courtney Howard, San Luis Obispo County; Water Resources Advisory Committee (WRAC)

from Annika Fain, ESA; Eric Zigas, ESA

subject San Luis Obispo County Water Demand Analysis Methodology and Results

Background

San Luis Obispo County (County) has experienced multiple droughts, degradation of groundwater, and limited water supplies. The San Luis Obispo County Flood Control and Water Conservation District (District), with the assistance of the Carollo consulting team (team includes ESA, Wallace Group, Fugro, and Cleath), is preparing an updated County Master Water Plan (MWP). The previous version of the MWP was completed in 1998 (County, 1998). Since then, there have been many changes in the water resources in the County, including the completion of local and regional water management plans, formation of the Integrated Regional Water Management Plan (IRWMP), new water sources, new water users, and new water regulations.

The updated MWP incorporates these changes and provides all entities in the County with information and tools to help effectively and efficiently manage water resources to protect ecosystems, public health and safety, and agriculture. The County, with the assistance of consultants, has compiled and calculated the water supply and water demand. This document presents the methodology and results summary for the water demand analysis. For the water demand analysis, ESA utilized data and information provided by the WRAC and other stakeholders. The description of water resources management, urban water demand, and water supply inventory is presented in an Appendix to the updated MWP.

Total Water Demand

Definition

The total County water demand is divided into three categories: urban, rural, and agricultural. Total demand is defined as the sum of urban, agricultural, and rural demand. Environmental water demand refers to the amount of water needed in an aquatic ecosystem, or released into it, to sustain aquatic habitat. Environmental water demand is not included in the total demand because it needs to be compared to the entire amount of water in the watershed, rather than only the groundwater and surface water available to County users.

Method

The total water demand was calculated for existing and future conditions throughout the County. For calculating the existing water demand ESA utilized the most recent available data. Details about what data were used for the analysis are described in the urban, agricultural, rural, and environmental sections of this document. For future water demand ESA provided projected demand for the foreseeable future. ESA created a geodatabase, which includes all categories of water demand for existing and future conditions, as well as the total water demand, for each of the water planning areas (WPAs). The water demand has been compiled into spreadsheets that are generated by ArcGIS® layers. This allows the County to readily update any of the parameters related to water demand to conduct additional analyses. ESA utilized input from the WRAC, regional, sub-regional, and other stakeholders related to the total water demand methodology. Water purveyors throughout the County were contacted about existing and future conservation. Specific conservation factors were applied to the future urban water demand projections for urban areas where these factors were available.

Assumptions

Calculating the existing total water demand and projecting the future total water demand requires a number of assumptions, as well as review and analysis of existing data for each of the categories. Two general assumptions are outlined below while assumptions specific to each of the individual water demand categories are discussed within the individual category sections:

- Existing demands represent average annual use, in acre-feet per year (AFY). The demand can vary widely on smaller timescales, such as a daily or monthly demand.

- Future water demand is shown as a range whenever possible. For urban areas, the minimum projected future water demand accounts for conservation and the maximum projected future water demand represents a maximum buildout scenario as defined by water management plans and purveyors. The projected demand is not associated with a particular year because the year of maximum buildout is unknown and varies between water planning areas. For agricultural demand, the range represents the difference between using low and high end values for existing and future effective rain and irrigation efficiencies. For rural demand, the future range represents the difference between different development and conservation scenarios.

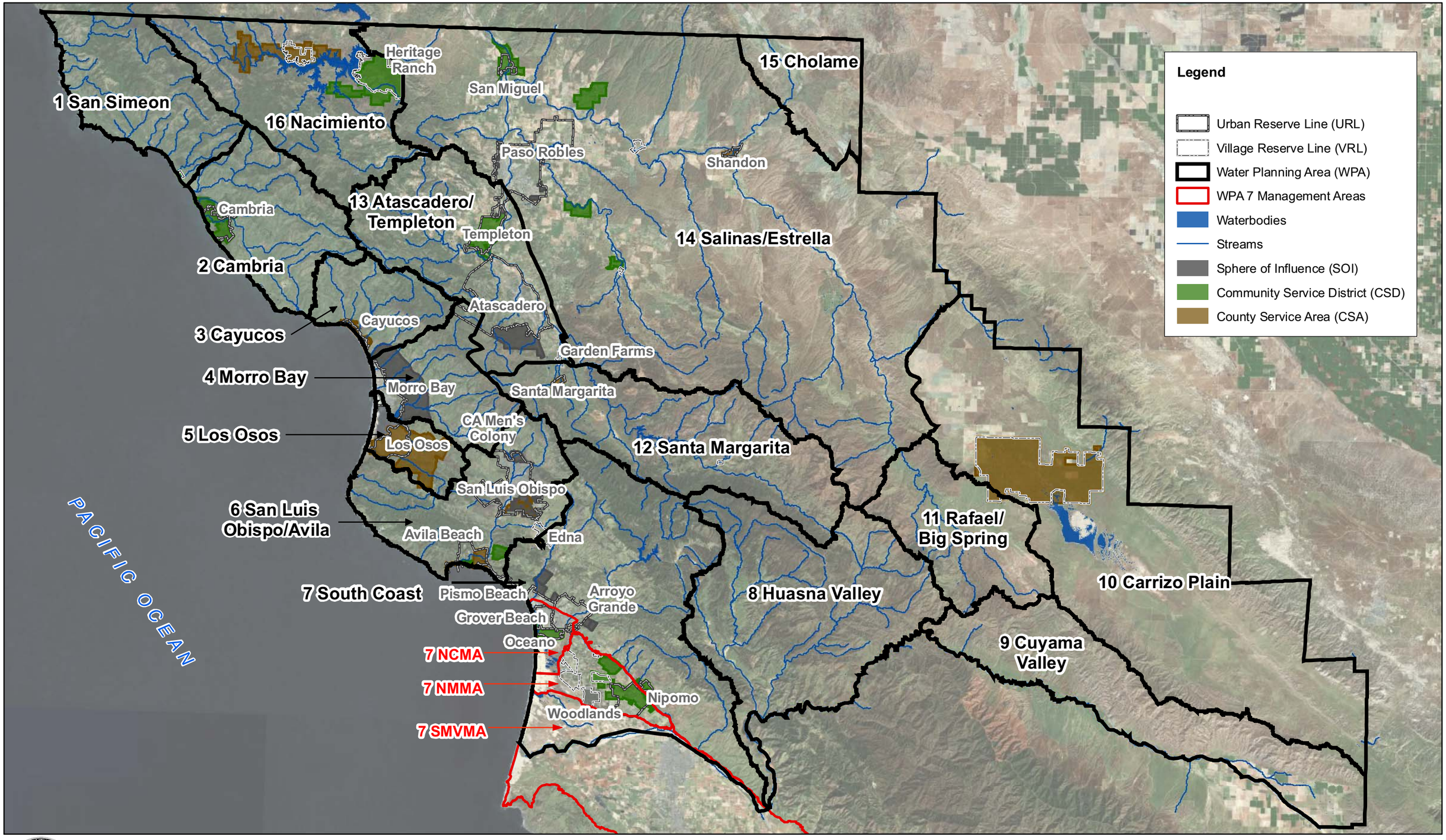
Total Demand by WPA

Table 1 summarizes the total water demand, including urban, agricultural, and rural water demand, as well as the environmental demand, developed for each of the 16 WPA's, **Figure 1** includes all 16 WPA's and the three management areas within WPA 7.

Urban Water Demand

Definition

Urban water demand refers to residential, commercial, industrial, parks, institutional, and golf course water demand within many of the unincorporated communities and incorporated cities in the County. For purposes of the MWP, the urban water demand includes all unincorporated communities and incorporated cities in the County where water purveyors have provided water demand information.



San Luis Obispo County Flood Control and Water Conservation District

MASTER WATER PLAN

San Luis Obispo County

Figure 1 Water Planning Areas in San Luis Obispo County

TABLE 1
EXISTING AND PROJECTED FUTURE WATER DEMAND FOR ALL WATER PLANNING AREAS[a]

WPA	WPA Name/ Category	Existing Demand (AFY)	Projected Demand (AFY)		
1	**San Simeon**				
Demand Category	Urban	108	213	-	224
	Agricultural	70	10	-	60
	Rural	20	50	-	50
	Total	**198**	**273**	**-**	**334**
	Environmental	72,980	72,980		
2	**Cambria**				
Demand Category	Urban	815	987	-	1,009
	Agricultural	640	740	-	1,490
	Rural	100	190	-	220
	Total	**1,555**	**1,917**	**-**	**2,719**
	Environmental	51,460	51,460		
3	**Cayucos**				
Demand Category	Urban	432	609	-	641
	Agricultural	520	430	-	800
	Rural	80	130	-	140
	Total	**1,032**	**1,169**	**-**	**1,581**
	Environmental	26,160	26,160		
4	**Morro Bay**				
Demand Category	Urban	3,112	3,460	-	3,532
	Agricultural	2,060	1,690	-	2,440
	Rural	120	190	-	220
	Total	**5,292**	**5,340**	**-**	**6,192**
	Environmental	27,880	27,880		
5	**Los Osos**				
Demand Category	Urban	2,043	2,727	-	2,870
	Agricultural	3,290	2,750	-	3,770
	Rural	20	20	-	20
	Total	**5,353**	**5,497**	**-**	**6,660**
	Environmental	7,040	7,040		
6	**SLO/Avila**				
Demand Category	Urban	7,871	10,787	-	11,355
	Agricultural	3,610	2,810	-	4,120
	Rural	450	610	-	660
	Total	**11,931**	**14,207**	**-**	**16,135**
	Environmental	33,030	33,030		
7	**South Coast**				
	Urban	410	458	-	482
	Agricultural	19,920	16,610	-	23,830
	Rural	1,480	1,990	-	2,160
Demand Category	NCMA[b]	11,326	13,142		13,854
	NMMA[b]	12,600	17,984		17,984
	SMVMA[b]	25,540	25,540		25,540
	Total	**71,276**	**75,724**	**-**	**83,850**
	Environmental	32,960	32,960		
8	**Huasna Valley**			-	
	Urban	0	0	-	0
Demand Category	Agricultural	1,550	2,060	-	2,820
	Rural	90	360	-	450
	Total	**1,640**	**2,420**	**-**	**3,270**
	Environmental	25,020	25,020		
9	**Cuyama Valley**				
	Urban	0	0	-	0
Demand Category	Agricultural	28,870	25,240	-	32,410
	Rural	10	80	-	100
	Total	**28,880**	**25,320**	**-**	**32,510**
	Environmental	Undetermined	Undetermined		
10	**Carrizo Plain**				
	Urban	0	0	-	0
Demand Category	Agricultural	800	680	-	890
	Rural [c]	210	9,610	-	12,740
	Total	**1,010**	**10,290**	**-**	**13,630**
	Environmental	Undetermined	Undetermined		

TABLE 1 (Continued)
EXISTING AND PROJECTED FUTURE WATER DEMAND FOR ALL WATER PLANNING AREAS

WPA	WPA Name/ Category	Existing Demand (AFY)	Projected Demand (AFY)		
11	**Rafael/Big Spring**				
	Urban	0	0	-	0
	Agricultural	0	0	-	0
Demand Category	Rural	0	470	-	620
	Total	**0**	**470**	**-**	**620**
	Environmental	Undetermined	Undetermined		
12	**Santa Margarita**				
	Urban	1,819	5,881	-	6,190
	Agricultural	1,770	1,720	-	2,680
Demand Category	Rural	240	450	-	520
	Total	**3,829**	**8,051**	**-**	**9,390**
	Environmental	32,850	32,850		
13	**Atascadero/Templeton**			-	
	Urban	8,538	9,359	-	9,852
	Agricultural	10,620	9,740	-	14,600
Demand Category	Rural	1,480	1,810	-	1,930
	Total	**20,638**	**20,909**	**-**	**26,382**
	Environmental	41,010	41,010		
14	**Salinas/Estrella**				
	Urban	8,126	11,634	-	14,543
	Agricultural	67,610	60,740	-	86,820
Demand Category	Rural	3,590	5,570	-	6,230
	Total	**79,326**	**77,944**	**-**	**107,593**
	Environmental	Undetermined	Undetermined		
15	**Cholame Valley**				
	Urban	0	0	-	0
	Agricultural	80	60	-	80
Demand Category	Rural	10	150	-	190
	Total	**90**	**210**	**-**	**270**
	Environmental	Undetermined	Undetermined		
16	**Nacimiento**				
	Urban	619	987	-	1,039
	Agricultural	3,860	4,740	-	7,120
Demand Category	Rural	280	730	-	880
	Total	**4,759**	**6,457**	**-**	**9,039**
	Environmental	108,390	108,390		

NOTES:

a Urban demand: Low projected demand includes conservation factor of 0 to 20 percent, based on conversations with Partners in Water Conservation. Agricultural demand: Affected by a wide range of conditions, including lack of data, weather conditions, changes in commodities and differences in irrigation practices. Future projections may not reflect the actual future water use or need, because of constant changes in farming practices. Projected agricultural demand may be significantly higher if more land is converted from dry to wet farming. Rural demand: Minimum projected rural demand reflects a 75 percent buildout scenario.

b Demand for WPA 7 management areas is from 2008 reports from NCMA (Todd Engineers, 2009), NMMA (NMMA, 2009), and SMVMA (Luhdorff and Scalmanini, 2009). SMVMA is approximated based on the proportion within San Luis Obispo County

c Carrizo Plain rural demand projections are based on existing zoning, which includes the potential for extensive California Valley development. The actual development may be much lower than 75 percent due to limited groundwater and other factors

Sources

Primary sources of data include the water system master plans (WSMP) and urban water management plans (UWMP) prepared by water purveyors, incorporated cities, and unincorporated communities. All of the urban areas have adopted a WSMP or UWMP during the last 10 years. Additionally, the County's *2008 Resource Management System Annual Resource Summary Report* provides existing projected water demand and population for these areas (County, 2008).

Method/Assumptions: Existing Use and Future Water Demand

Existing water use calculations and future water demand projections from WSMP's and UWMP's were used. UWMP's are available for all incorporated cities and include existing and future water demand. WSMP's are available for all of the unincorporated communities within Urban Reserve Lines (URLs) and some of the incorporated communities within the Village Reserve Lines (VRLs), and include existing and future water demand. The urban areas, which include all areas where water usage has been reported, are serviced by cities, Community Services Districts (CSD), County Service Areas (CSA), or other water purveyors. The Carollo consulting team, reviewed the UWMP's and WSMP's prepared by these water purveyors and provided a summary of the available existing and future urban water demand and supply presented in these documents.

The WSMP's and UWMP's describe existing use and future demand in various units such as gpcd (gallons per capita per day), AFY, or average day demand. For purposes of this analysis, the annual urban water demand is presented in AFY. The urban water demand for individual areas in the County are associated with an ArcGIS® layer that includes the existing and future urban demand. The range of future demand represents different development and conservation scenarios.

Urban Water Demand by WPA

Table 2 summarizes the urban water demand for WPAs. WPAs 8, 9, 10, 11, and 15 do not have urban demand because there are no large population centers in these WPAs. The urban water demand is discussed in detail in an Appendix to the MWP.

TABLE 2
URBAN WATER DEMAND BY WATER PLANNING AREA (WPA) [a]

WPA #	WPA Name	Existing (AFY)	Minimum Future (AFY)	Maximum Future (AFY)
1	San Simeon	108	213	224
2	Cambria	815	987	1,009
3	Cayucos	432	609	641
4	Morro Bay	3,112	3,460	3,532
5	Los Osos	2,043	2,727	2,870
6	San Luis Obispo/Avila	7,871	10,787	11,355
7	South Coast	410	458	482
	NCMA	8,702	10,518	11,232
	NMMA	6,600	11,984	11,984
12	Santa Margarita	1,819	5,881	6,190
13	Atascadero/Templeton	8,538	9,359	9,852
14	Salinas/Estrella	8,126	11,634	14,543
16	Nacimiento	619	987	1,039
Total		**49,195**	**69,604**	**74,953**

a WPAs 8,9, 10, 11, and 15, as well as SMVMA in WPA 7, do not have any urban water demand

North Coast Sub-Region

The North Coast Sub-Region includes WPA 1 through 6. The urban demand for WPA 1, San Simeon, includes the San Simeon CSD existing demand of 108 AFY and projected future demand of 213 to 224 AFY. The lower projected future water demand is based on an additional 5 percent reduction due to conservation. The urban demand for WPA 2 , Cambria, includes the Cambria CSD existing water demand of 815 AFY and projected future demand of 987 to 1,009 AFY. Cambria has achieved significant conservation and projects. In the future they could have an additional 2 percent reduction. The urban demand for WPA 3 includes the Cayucos Area Water Organization existing water demand of 432 AFY and projected future demand of 609 to 641 AFY. The lower projected future water demand is based on an additional 5 percent reduction due to conservation. The urban demand for WPA 4, Morro Bay, includes the Chorro Valley Water System and City of Morro Bay. The Chorro Valley Water System includes the California Men's Colony, Camp San Luis Obispo, and Cuesta College. The existing urban demand is 3,112 and the project future demand ranges from 3,460 to 3,532. The lower projected future water demand is based on an additional 2 percent reduction due to conservation. The existing urban demand in WPA 5, Los Osos, is 2,043 AFY and future projected demand ranges from 2,727 to 2,870 AFY. The lower projected future water demand is based on an additional 5 percent reduction due to conservation. The existing urban water demand for WPA 6, San Luis Obispo/Avila, is 7,871 AFY and future water demand ranges from 10,787 to 11,335. The lower projected future water demand is based on an additional 5 percent reduction due to conservation.

South Coast Sub-Region

The South Coast Sub-Region includes WPA 7 through 9. There is no urban water demand in WPA 8 and 9. WPA 7 includes the Northern Cities Management Area (NCMA), Nipomo Mesa Management Area (NMMA), and the northern portion of the Santa Maria Valley Management Area (SMVMA), as well as other outlying areas. The total urban existing demand for the entire water planning area is 15,712 AFY and future project demand ranges from 22,960 to 23,698 AFY. The lower projected future water demand is based on an overall 3 percent reduction due to conservation. The conservation includes 6 percent additional conservation for the NCMA, no additional conservation for the NMMA, and 5 percent additional conservation for the urban areas outside of the management areas within WPA 7. SMVMA within San Luis Obispo County does not include any urban water demand.

Inland Sub-Region

The inland sub-region includes WPA 10 through 16. WPAs 10, 11, and 15 have urban demand. The existing urban water demand for Santa Margarita Water Planning Area, WPA 12, is 1,819 AFY and future ranges from 5,881 to 6,190 AFY. The lower projected future water demand is based on an additional 5 percent reduction due to conservation. The existing urban water demand for WPA 13, Atascadero/Templeton, is 8,538 AFY and projected future demand ranges from 9,359 to 9,852 AFY. The lower projected future water demand is based on an additional 5 percent reduction due to conservation. The existing urban water demand for WPA 14, Salinas/Estrella, is 8,126 AFY and projected future ranges from 11,634 to 14,543. The lower projected future water demand is based on an additional 20 percent reduction due to conservation. The existing urban water demand for WPA 16, Nacimiento, is approximately 619 AFY and projected future ranges from approximately 987 to 1,039 AFY. The lower projected future water demand is based on an additional 5 percent reduction due to conservation.

Agricultural Water Demand

Definitions

Agricultural water demand refers to the annual applied water in all agricultural areas in the County. The following definitions are related to agricultural water demand:

- *Annual crop-specific applied water*: The annual crop-specific applied water represents the quantity of applied irrigation water per year (AF/Ac/Yr). For San Luis Obispo County, the crop-specific applied water is primarily a function of crop evapotranspiration (Etc), effective rainfall (ER), leaching requirement (LR), irrigation efficiency (IE), and frost protection (FP).

- *Eto*: The reference evapotranspiration (Eto) represents the approximate theoretical water use of a well watered, cool-seasoned grass, 4 – 6 inches tall, under full cover. This varies with changing weather conditions throughout the County. The Eto is generally reported in inches/month or inches/year.

- *Kc*: The crop coefficient (Kc) refers to a dimensionless number, specific to a particular crop, which is related to the Eto of grass (1.0). Kc is used to estimate plant water use for a particular plant in a particular region.

- *Etc*: The crop evapotranspiration (Etc) is estimated by multiplying Eto and Kc. Etc is the quantity (depth) of water transpired by plants, retained in plant tissue, and evaporated from adjacent soil surfaces during a specific time. The Etc is generally reported in inches/month or inches/year.

- *ER*: The effective rainfall (ER) is the amount of rain used by crops and is influenced by a variety of factors including frequency, intensity, and total amount of rainfall; percentage of ground cover, rate of evapotranspiration, and rooting depth of the crop; and soil water holding capacity, infiltration rate, and moisture at the time of rainfall. The ER is generally reported in inches/month or inches/year.

- *FP*: Frost protection (FP) refers to the amount of water used to protect plants from frost. The FP is based on the approximate number of nights per year, hours per night, and applied water flow rate for crops which are prone to damage. For this analysis, the crop-specific FP is reported in acre-foot per acre per year. ESA contacted UC Farm Advisors to establish the FP.

- *LR*: Leaching requirement (LR) refers to the amount of extra irrigation water necessary to remove salts from the soils. For this analysis, the LR is reported in percent of irrigated water. ESA contacted UC Farm Advisors to establish the LR.

- *IE*: Irrigation efficiency (IE) represents the percentage of irrigation water beneficially used vs. total irrigation water applied. ESA contacted a CRCD Irrigation Specialist to establish the IE.

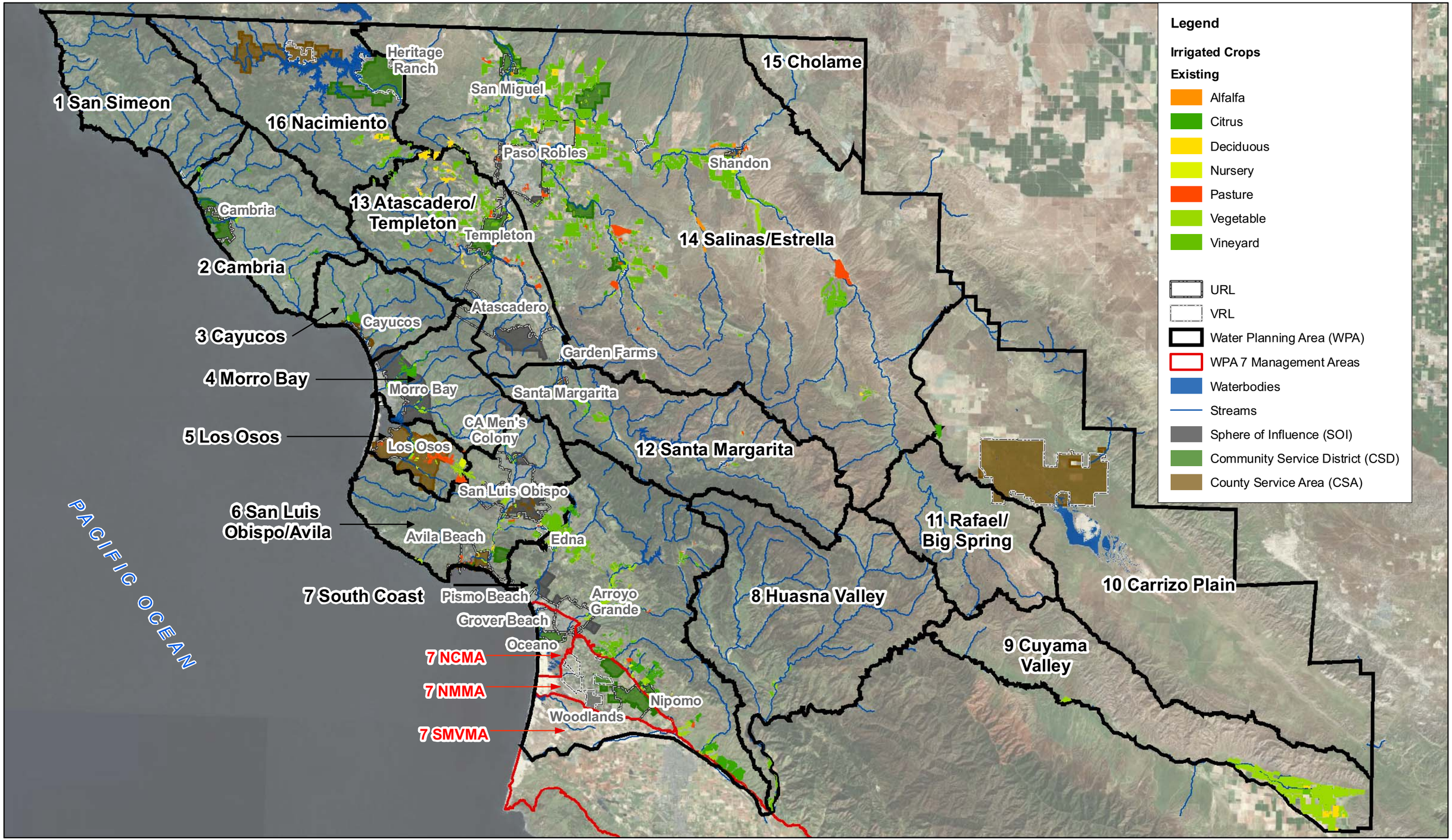
Sources

The Agriculture/Crop ArcGIS® layer for the County from August 2008 was used to determine existing agricultural acreage for each crop group. This layer is updated yearly with information from the pesticide use records obtained by the San Luis Obispo Department of Agriculture. The Agricultural Commissioner, Mike Isensee, has stated that the pesticide use records are forecasts and are approximately 80 percent accurate (Isensee, 2009a). The number of crop rotations varies and is not identified in the Agriculture/Crop ArcGIS® layer. The majority of irrigated vegetables are rotated numerous times throughout the year. Many of the coastal areas with available water may have 2, 3, or 4 crops planted in a particular year (Isensee, 2009c).

The California Irrigation Management Information System (CIMIS) and University of California Cooperative Extension Leaflets 21426 to 21428 data were used as reference evapotranspiration (ETo) and crop coefficients (Kc) for areas where data were available (CIMIS, 2009; Snyder et al., 1987, 1989a, 1989b). The rainfall data utilized is from SLO County gages, SLO County Hydrology Report (County, 2005), and County Flood Control and Water Conservation District maps (County, 2009). ESA contacted two UC Farm Advisors (Mark Battany and Mark Gaskell) in San Luis Obispo County and obtained information on frost protection and leaching requirements. Irrigation efficiency information was obtained from a Cachuma Resource Conservation District (CRCD) Irrigation Specialist (Kevin Peterson), as well as from Ms. Kris O'Connor, the Central Coast Vineyard Team (CCVT) Executive Director. Additionally, ESA used DWR estimates of the quantity of water applied to a specific crop per unit area (DWR, 2009a).

Method/Assumptions: Existing Agricultural Demand

The agricultural crop ArcGIS® layer includes approximately 200 classifications of commodities. This included approximately 86,000 acres of rangeland and 42,000 acres of uncultivated agriculture. For purposes of this analysis, the irrigated commodities were categorized into seven groups (**Table 3**). Avocados and citrus are included in the same crop group to be consistent with DWR crop groups (DWR, 2001) and annual agricultural water use monitoring by Gene Melschau, a Nipomo farmer (Melschau, 2009). Although the groups are based on commodities that may have similar water requirements, the actual water usage will vary based on individual commodities, soil type, and number of rotations on individual parcels. Almonds are not included in the commodity (deciduous) list because they require a small amount of irrigation water (Isensee, 2009b). **Figure 2** includes the location of all irrigated crops identified in the County ArcGIS® layer from August 2008.



San Luis Obispo County Flood Control and Water Conservation District

MASTER WATER PLAN

San Luis Obispo County

Figure 2 Existing Crops in San Luis Obispo County

Copy of document found at www.NoNewWipTax.com

The existing acreage of irrigated crops, as reported by growers, is shown in **Table 4**. The acreage changes on a monthly or annual basis and can be readily updated in ArcGIS® and annual applied water can be recalculated.

TABLE 3
CROP GROUP AND COMMODITIES USED FOR THE AGRICULTURAL DEMAND ANALYSIS

Crop Group	Primary Commodities
Alfalfa	Alfalfa
Nursery	Christmas trees, miscellaneous nursery plants, flowers
Pasture	miscellaneous grasses, mixed pasture, sod/turf, sudangrass
Citrus	avocados, grapefruits, lemons, oranges, olives, kiwis, pomegranates
Deciduous	apples, apricots, berries, peaches, nectarines, plums, figs, pistachios, persimmons, pears, quince, strawberries
Vegetables	artichokes, beans, miscellaneous vegetables, mushrooms, onions, peas, peppers, tomatoes
Vineyard	wine grapes, table grapes

TABLE 4
EXISTING IRRIGATED CROP ACREAGE DETERMINED IN GIS[a]

WPA #	WPA Name	Alfalfa (ac)	Citrus (ac)	Deciduous (ac)	Nursery (ac)	Pasture (ac)	Vegetable (ac)	Vineyard (ac)	Total (ac)
1	San Simeon		19					64	83
2	Cambria		343	26	2		188	45	603
3	Cayucos		345				107	5	456
4	Morro Bay		672		0	35	497	76	1,281
5	Los Osos			4	104	505	903	1	1,515
6	San Luis Obispo/Avila		219	182	40	209	881	538	2,070
7[b]	South Coast		4,018	24	208	530	3,231	3,198	11,210
8	Huasna Valley		19	5			160	472	656
9	Cuyama Valley			642			9,083	211	9,936
10	Carrizo Plain		250						250
12	Santa Margarita	15		7		55		974	1,051
13	Atascadero/Templeton		32	712	80	589	17	3,434	4,864
14	Salinas/Estrella	800	319	655	76	1,446	2,098	27,424	32,818
15	Cholame Valley		26						26
16	Nacimiento		45	780		10		974	1,809
	Total	**815**	**6,307**	**3,037**	**510**	**3,377**	**17,166**	**37,416**	**68,629**

[a] Acreages were determined by aggregating County Crops ArcGIS® (2008) data, which is based on the pesticide use records, and crops identified in the County Land Use ArcGIS® (2009) data. These values are aggregated in a database file exported from ArcGIS® and summarized in a pivot table. The County Crops ArcGIS® data does not include any irrigated crop acreage in WPA 11.

[b] The agricultural acreage determined in GIS for WPA 7 only includes areas outside of the NCMA, NMMA, and SMVMA. The amount of irrigated acreage for these management areas is approximately 1,600 acres for NCMA (Todd Engineers, 2009), 2,600 acres for NMMA (NMMA, 2009), and 10,500 acres for SMVMA (Luhdorff and Scalmanini, 2009). 99.9 percent of strawberries in the County are located in these three areas.

ESA calculated the crop-specific applied water for these crop groups by utilizing information on crop evapotranspiration, contribution from rain or shallow water table, leaching requirements, irrigation efficiency, and frost protection. The following equation was used to calculate the annual crop-specific applied water (AF/Ac/Yr) for each of the water planning areas:

$$\text{Annual Crop - Specific Applied Water (AF/Ac/Yr)} = \frac{\text{ETc} - \text{ER}}{(1 - \text{LR}) \text{ x IE}} + \text{FP}$$

This formula was modified from a general formula for irrigation water requirements, which was established in 1997 (Burt, 1997). A detailed discussion and summary tables of each of the parameters in the above equation is presented in **Appendix A**. The annual crop-specific applied water is multiplied by crop acreage to determine an agricultural water demand for each crop group (AFY).

Reference Crop Evapotranspiration (Eto). Crop evapotranspiration for four CIMIS weather stations in San Luis Obispo County and in Kern County (to the east) was used (CIMIS, 2009). The CIMIS stations in San Luis Obispo County include two in San Luis Obispo, one in Atascadero, and one in Nipomo. Additional Eto monthly averages were obtained from the Reference Eto zone maps (DWR, 1999), University of California Bulletin 1922 (University of California, 1987), and University of California Cooperative Extension Leaflet 21426 (Snyder et al., 1987).

Crop coefficient (Kc). The crops in San Luis Obispo County were assigned crop coefficients based on the crop type and location. These crops include alfalfa, nursery, irrigated pasture, citrus, deciduous, vegetable, and vineyard. ESA has developed spreadsheets and ArcGIS® linkage so these numbers can be easily updated with new crop coefficients and crop evapotranspiration.

Crop Evapotranspiration (Etc). Crop evapotranspiration was calculated by multiplying the Eto by the Kc for each agricultural crop group and WPA.

Effective Rainfall (ER). The effective rainfall was calculated for each area by utilizing historical monthly precipitation in San Luis Obispo County and effective precipitation based on crop group.

Frost Protection (FP). The sprinkler frost protection water requirement was estimated for grapes (throughout the County), strawberries (WPA 7 and 8), and blueberries (WPA 2, 7, and 14). For vineyards, the frost threat occurs from March to April in San Luis Obispo County. For strawberries in San Luis Obispo County, primarily in WPA 7, the frost threat occurs from January to March. Sprinkler frost protection requires a large amount of water, which may be higher than a typical groundwater well can produce (Battany, 2009). Therefore, growers that use sprinkler frost protection will generally have large reservoirs on site or nearby. The frost protection in the County is approximately 0.50 AF/Ac/Yr for vineyards throughout the County (San Luis Obispo County, 1998), because many of the vineyards do not use frost protection ESA has used a value of 0.25 AF/Ac/Yr. The frost protection value used for strawberries and blueberries, classified as deciduous, is 0.4 AF/Ac/Yr (County, 1998). The vast majority of strawberries (99.9 percent) are located in WPA 7 management areas (i.e. NCMA, NMMA, and SMVMA).

Leaching Requirements (LR). Leaching requirements, the amount of over watering necessary to remove salts from the soil, were assumed to be satisfied by rainfall in the coastal areas. ESA assumed that the leaching requirements for inland areas varied from 5 percent to 16 percent for existing conditions and 7 percent to 18 percent for future conditions (Fugro and Cleath, 2002). Mark Gaskell, UC Farm Advisor, stated that strawberries may have a leaching requirement of 10 to 20 percent (Gaskell, 2009). Therefore, ESA used a leaching requirement of 11 percent for existing demand and 13 percent for future demand in WPA 7. Future leaching requirements may be greater, based on a build-up of salts in the soil due to deficient winter rains (Battany, 2008; Gaskell, 2009).

Irrigation Efficiency (IE). Irrigation efficiencies were calculated by utilizing irrigation distribution uniformity and losses provided by the San Luis Obispo County/Santa Barbara County Cachuma Resource Conservation District (CRCD), San Luis Obispo County Coastal Resources Conservation District, vineyard owners, and recent studies. Additionally, ESA incorporated input from a CRCD Irrigation Specialist on existing and future irrigation efficiencies (Peterson, 2009a, 2009b).

Method/Assumptions: Future Agricultural Demand

Similar methods and equations were used to calculate the future irrigation water requirements. The calculation of future agricultural demand is different from existing use due to changes in cropping patterns, weather patterns, and irrigation methods. Over the past 20 years, irrigation efficiencies have improved substantially. Although predicting future agricultural demand is very difficult, according to the Agricultural Commissioner and a CRCD Irrigation Specialist, irrigation efficiencies are likely to continue to improve due to site specific monitoring of soil water availability and crop needs, planting of root stock that is more drought tolerate, or modification of irrigation techniques based upon ongoing research (Isensee, 2009c; Peterson, 2009b) Growers may also face economic pressure due to increased electricity costs if groundwater levels decline, or may have economic incentives for the development of higher water efficiencies (Isensee, 2009c). Therefore, ESA assumed higher irrigation efficiencies for projected future agricultural demand than in existing demand calculations. More details about how the irrigation efficiencies were determined are included in Appendix A.

Based on recent trends in agriculture, much of the additional projected future irrigated land could be converted to vineyards. For purposes of this analysis, ESA assumed that the 6,000 acres of hay and oats identified in the 2008 ArcGIS® crop layer would be converted to vineyards. The County has approximately 70,000 acres of farmland enrolled in the Federal Conservation Reserve Program (CRP) (USDA, 2009). Many of the existing CRP contracts will expire in the next 10 years. If there is sufficient water available, much of this farmland could enter into irrigated production (Isensee, 2009c). ESA has estimated future irrigated crop acreage by adding existing irrigated crop acreage plus inactive irrigated crop acreage and approximately 6,000 acres of future vineyards (converted from existing oat and hay acreage). The total future irrigated crop acreage, including WPA 7 management areas, was 95,038 acres compared to existing crop acreage of 83,329 acres. This analysis does not account for annual rotation from fallow to cultivated land. Projected future irrigated acreage is presented in **Table 5**.

Agricultural Water Demand by WPA

Table 6 includes a summary of the range of existing annual applied water (AFY) by WPA. The range is based on different rainfall and irrigation efficiencies. **Table 7** includes a summary of the projected future annual applied water (AFY) by WPA. All agricultural water demands have been rounded to the 10's.

San Simeon Water Planning Area (WPA 1)

The existing annual applied water for WPA 1 is approximately 70 AFY. The existing crops in this area include citrus and vineyards. The projected future annual applied water for WPA 1 ranges from approximately 10 to 60 AFY. The projected future agricultural demand is less than existing, due to increased irrigation efficiencies and no additional crops in this area.

TABLE 5
PROJECTED FUTURE IRRIGATED CROP ACREAGE DETERMINED IN GIS[a]

WPA #	WPA Name	Alfalfa (ac)	Citrus (ac)	Deciduous (ac)	Nursery (ac)	Pasture (ac)	Vegetable (ac)	Vineyard (ac)	Total (ac)
1	San Simeon		19					64	83
2	Cambria		409	28	2		395	457	1,291
3	Cayucos		477				108	13	598
4	Morro Bay		722		0	35	527	96	1,380
5	Los Osos		21	4	104	505	995	1	1,628
6	San Luis Obispo/Avila		224	182	40	209	920	542	2,117
7[b]	South Coast		4,048	44	209	703	3,378	3,740	12,122
8	Huasna Valley		19	5	4	97	160	670	954
9	Cuyama Valley			642			9,501	211	10,354
10	Carrizo Plain		251	1			3		255
12	Santa Margarita	15	4	9		95		1,284	1,406
13	Atascadero/Templeton		54	778	80	814	47	4,774	6,547
14	Salinas/Estrella	800	381	879	78	1,886	2,121	32,086	38,232
15	Cholame Valley		26						26
16	Nacimiento		48	846		10		2,441	3,345
	Total	**815**	**6,703**	**3,418**	**517**	**4,352**	**18,154**	**46,380**	**80,338**

[a] The agricultural acreages were determined by aggregating County Crops ArcGIS® (2008) data, which is based on the pesticide use records, and crops identified in the County Land Use ArcGIS® (2009) data. These crop acreages are aggregated in a database file exported from ArcGIS® and inputted into spreadsheets. The County Crops ArcGIS® data does not include any irrigated crop acreage in WPA 11.

[b] The agricultural acreage determined in GIS for WPA 7 only includes areas outside of the NCMA, NMMA, and SMVMA. The amount of irrigated acreage for these management areas is approximately 1,600 acres for NCMA (Todd Engineers, 2009), 2,600 acres for NMMA (NMMA, 2009), and 10,500 acres for SMVMA (Luhdorff and Scalmanini, 2009). 99.9 percent of strawberries in the County are located in these three areas.

TABLE 6
EXISTING AGRICULTURAL WATER DEMAND BY WPA (AFY)[a]

Water Planning Area		low demand (AFY)	medium demand (AFY)	high demand (AFY)
1	San Simeon	40	70	90
2	Cambria	440	640	850
3	Cayucos	370	520	670
4	Morro Bay	1,670	2,060	2,440
5	Los Osos	2,750	3,290	3,830
6	San Luis Obispo/Avila	2,900	3,610	4,320
7[b]	South Coast	16,250	19,920	23,580
8	Huasna Valley	1,300	1,550	1,800
9	Cuyama Valley	25,110	28,870	32,630
10	Carrizo Plain	690	800	910
12	Santa Margarita	1,390	1,770	2,160
13	Atascadero/Templeton	8,570	10,620	12,670
14	Salinas/Estrella	55,480	67,610	79,730
15	Cholame Valley	70	80	90
16	Nacimiento	3,120	3,860	4,610
	Total	**120,150**	**145,270**	**170,380**

[a] All agricultural demand values have been rounded to the 10's. The County Crops ArcGIS® data does not include any irrigated crop acreage in WPA 11.

[b] The agricultural demand for WPA 7 in this table only includes areas outside of the NCMA, NMMA, and SMVMA.

TABLE 7
PROJECTED FUTURE AGRICULTURAL WATER DEMAND BY WPA (AFY)[a]

Water Planning Area		low demand (AFY)	medium demand (AFY)	high demand (AFY)
1	San Simeon	10	40	60
2	Cambria	740	1,110	1,490
3	Cayucos	430	620	800
4	Morro Bay	1,690	2,070	2,440
5	Los Osos	2,750	3,260	3,770
6	San Luis Obispo/Avila	2,810	3,470	4,120
7[b]	South Coast	16,610	20,220	23,830
8	Huasna Valley	2,060	2,440	2,820
9	Cuyama Valley	25,240	28,820	32,410
10	Carrizo Plain	680	780	890
12	Santa Margarita	1,720	2,200	2,680
13	Atascadero/Templeton	9,740	12,170	14,600
14	Salinas/Estrella	60,740	73,780	86,820
15	Cholame Valley	60	70	80
16	Nacimiento	4,740	5,930	7,120
	Total	**130,020**	**156,980**	**183,930**

[a] All projected future agricultural demand values have been rounded to the 10's. The County Crops ArcGIS® data does not include any irrigated crop acreage in WPA 11.

[b] The agricultural water demand for WPA 7 only includes areas outside of the NCMA, NMMA, and SMVMA.

Cambria Water Planning Area (WPA 2)

The existing annual applied water for WPA 2 is approximately 640 AFY. The existing crops in this area include citrus, deciduous, vegetable, and vineyards. The projected future annual applied water for WPA 2 ranges from approximately 740 to 1,490 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of all of the existing crop groups, especially vegetables and vineyards.

Cayucos Water Planning Area (WPA 3)

The existing annual applied water for WPA 3 is approximately 520 AFY. The existing crops in this area include citrus, vegetables, and vineyards. The projected future annual applied water for WPA 3 ranges from approximately 430 to 800 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of citrus, vegetables, and vineyards.

Morro Bay Water Planning Area (WPA 4)

The existing annual applied water for WPA 4 is approximately 2,060 AFY. The existing crops in this area include citrus, irrigated pasture, vegetable, and vineyards. The projected future annual applied water for WPA 4 ranges from approximately 1,690 to 2,440 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of citrus, vegetables, and vineyards.

Los Osos Water Planning Area (WPA 5)

The existing annual applied water for WPA 5 is approximately 3,290 AFY. The existing crops in this area include deciduous, nursery, pasture, vegetable, and vineyards. The projected future annual applied water for WPA 5

ranges from approximately 2,750 to 3,770 AFY. The projected future agricultural demand is less than existing, due to increased irrigation efficiencies.

San Luis Obispo/Avila Water Planning Area (WPA 6)

The existing annual applied water for WPA 6 is approximately 3,610 AFY. The existing crops in this area include deciduous, nursery, pasture, vegetable, and vineyards. The projected future annual applied water for WPA 6 ranges from approximately 2,810 to 4,120 AFY. The projected future agricultural demand is less than existing, due to increased irrigation efficiencies.

South Coast Water Planning Area (WPA 7)

Outlying Areas

The existing annual applied water in the tables above includes the demand for the areas in WPA 7 that are located outside of the NMMA, NCMA, and SMVMA boundaries. The existing annual applied water for this part of WPA 7 is approximately 19,920 AFY. The projected future demand ranges from 16,610 to 23,830 AFY.

Northern Cities Management Area (NCMA)

In 2008, the irrigated crops consisted of approximately 4 acres of nursery crops and approximately 1,596 acres of crops such as broccoli, onions, and strawberries. The total existing annual applied water for irrigated crops in the NCMA, part of WPA 7, is approximately 2,590 AFY (Todd Engineers, 2009). The future agricultural water demand in NCMA is not expected to change significantly from existing water usage (Todd Engineers, 2009).

Nipomo Mesa Management Area (NMMA)

In 2008, the irrigated crops in NMMA consisted of 3 acres deciduous, 3 acres pasture, 424 acres vegetable, 264 acres of avocado and lemon, 1,176 acres of strawberries, and 261 acres of nurseries (NMMA, 2009). The total existing annual applied water for irrigated crops in NMMA is approximately 4,300 AFY (NMMA, 2009). The future agricultural water demand in NMMA is not expected to change significantly from existing water usage.

Santa Maria Valley Management Area (SMVMA)

In 2008, the crops within the San Luis Obispo portion of SMVMA consisted of approximately 9,649 acres of vegetables, 798 acres of strawberries, and 63 acres of nurseries. The crop acreage was calculated from the San Luis Obispo County Crops ArcGIS layer. The 2008 SMVMA Annual Report established annual applied crop water duties for these crop groups of 2.50, 1.55, and 2.1 AF/Ac/Yr, respectively (Luhdorff and Scalmanini, 2009). Based on the applied water duties established in the SMVMA 2008 Annual Report and the acreage determined by the County Crops ArcGIS layer, the existing agricultural water demand would be approximately 25,540 AFY. The future agricultural water demand in SMVMA is not expected to change significantly from existing water usage.

Huasna Valley Water Planning Area (WPA 8)

The existing annual applied water for WPA 8 is approximately 1,550 AFY. The existing crops in this area include citrus, deciduous, vegetables, and vineyards. The projected future annual applied water for WPA 8 ranges from approximately 2,060 to 2,820 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of nursery, pasture, and vineyards.

Cuyama Valley Water Planning Area (WPA 9)

The existing annual applied water for WPA 9 is approximately 28,870 AFY. The existing crops in this area include deciduous, vegetables, and vineyards. The projected future annual applied water for WPA 9 ranges from approximately 25,320 to 32,410 AFY. The projected future agricultural demand is less than existing, due to increased irrigation efficiencies.

Carrizo Plain Water Planning Area (WPA 10)

The existing annual applied water for WPA 10 is approximately 800 AFY. The existing crops in this area are primarily citrus crops. The projected future annual applied water for WPA 10 ranges from approximately 680 to 890 AFY. The projected future agricultural demand is less than existing, due to increased irrigation efficiencies.

Santa Margarita Water Planning Area (WPA 12)

The existing annual applied water for WPA 12 is approximately 1,770 AFY. The existing crops in this area include alfalfa, deciduous, pasture, and vineyards. The projected future annual applied water for WPA 12 ranges from approximately 1,720 to 2,680 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of citrus, deciduous, pasture, and vineyards.

Atascadero/Templeton Water Planning Area (WPA 13)

The existing annual applied water for WPA 13 is approximately 10,620 AFY. The existing crops in this area include citrus, deciduous, nursery, pasture, vegetable, and vineyards. The projected future annual applied water for WPA 13 ranges from approximately 9,740 to 14,600 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of all existing crop groups.

Salinas/Estrella Water Planning Area (WPA 14)

The existing annual applied water for WPA 14 is approximately 67,610 AFY. The existing crops in this area include commodities from all crop groups. The projected future annual applied water for WPA 14 ranges from approximately 60,740 to 86,820 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of citrus, deciduous, pasture, vegetables, and vineyards.

Cholame Water Planning Area (WPA 15)

The existing annual applied water for WPA 15 is approximately 80 AFY. The existing crops in this area are primarily citrus crops. The projected future annual applied water for WPA 15 ranges from approximately 60 to 80 AFY. The projected future agricultural demand is approximately equal to the existing agricultural demand in this planning area.

Nacimiento Water Planning Area (WPA 16)

The existing annual applied water for WPA 16 is approximately 3,860 AFY. The existing crops in this area are citrus, deciduous, pasture, and vineyards. The projected future annual applied water for WPA 16 ranges from approximately 4,740 to 7,120 AFY. The projected future agricultural demand is higher than existing due to increases in acreage of citrus, deciduous, and vineyards.

Rural Water Demand

Definitions

Rural water demand refers to water demand in unincorporated areas of the County that are not considered agricultural or urban.

Sources

The County ArcGIS® land use data, including vacant and developed properties and potential subdivisions and units, in the unincorporated areas of the County were used to calculate a rural water demand. Additional sources include information from purveyors, water management plans, and the County's *2008 Resource Management System Annual Summary Report*.

Method/Assumptions: Existing and Future Rural Demand

A water duty factor was applied to the number of dwelling units (DU) of unincorporated areas that are outside of the urban and agricultural areas. The water duty factor associated with rural demand is an estimated average annual volume of water used by a particular rural user and is represented as AFY/DU.

Due to different climates and types of water usage, the water duty factors can vary widely between region and time of year. The water duty factor varies with the number of persons in each DU, the amount of landscaping, and the climate. Coastal areas require less water than inland areas due to greater evapotranspiration in the inland areas and more precipitation in the coastal areas. The water duty factor for each area was determined by utilizing water usage data available through San Luis Obispo County, adjacent counties, and water purveyors. ESA calculated a range for existing and future rural demand in each region based on the amount of development and conservation.

ESA utilized the County Land Use ArcGIS® layer, which includes land use and potential DU per acre for all unincorporated areas of the County. The methods that the County used to prepare the land use data are described in **Appendix B**. A detailed discussion of how ESA utilized the County Land Use ArcGIS® database is included in **Appendix C**. For the rural demand analysis, ESA excluded all areas in the County that were accounted for with urban or agricultural water demand. Existing and projected future nurseries and vineyards present in the Land Use ArcGIS® layer were merged into the agriculture ArcGIS® layer and included in the agricultural demand analysis.

ESA calculated a rural water demand for each area by multiplying the number of dwelling units by a water duty factor. For future rural water demand, the potential residential demand was reduced by 25 percent to account for physical and environmental constraints on development. The 25 percent is based on a future County development of 75 percent of vacant land that is designated by the County as having development potential. In the future, this could be refined for specific planning areas. The County is developing a Countywide Rural Plan that will analyze different rural buildout scenarios. The rural demand for individual areas in the County was associated with a ArcGIS® layer, which includes the number of dwelling units, water duty factor, and calculated rural water demand for all unincorporated areas in the County that are not considered agricultural or urban. ESA utilized input from the WRAC, regional, sub-regional, and other stakeholders to develop the rural water demand methodology.

Rural Water Demand by WPA

Appendix C provides a detailed discussion of the method ESA used to calculate the existing and projected future rural water demand. **Table 8** summarizes an estimate of the existing rural demand and an estimate of the projected future rural demand for all WPAs. The number of existing dwelling units (DU) was multiplied by 0.8 AFY/DU for coastal WPAs (WPA 1-7) and 1.0 AFY/DU for inlands WPA (WPA 8-16) to estimate the existing rural residential water demand for this WPA. Rural residential water demand represents approximately 99.6 percent of the total rural demand. The number of existing rural industrial/commercial parcels, which are not served by existing water purveyors, was multiplied by a factor of 1.5 AFY/DU for all planning areas and for both existing and future industrial/commercial rural water demand. Rural industrial/commercial demand makes up approximately 0.4 percent of total rural water demand. The number of projected future DU was multiplied by 0.6 AFY/DU for coastal WPAs and 0.8 AFY/DU for inland WPAs to determine the projected future rural water demand for this WPA. **Figure 3** shows a summary of residential, commercial/industrial, and vacant parcels throughout San Luis Obispo County. According to existing County land use designations, much of the vacant rural land could be developed in the future if water and other resources were available.

TABLE 8
EXISTING AND FUTURE RURAL WATER DEMAND

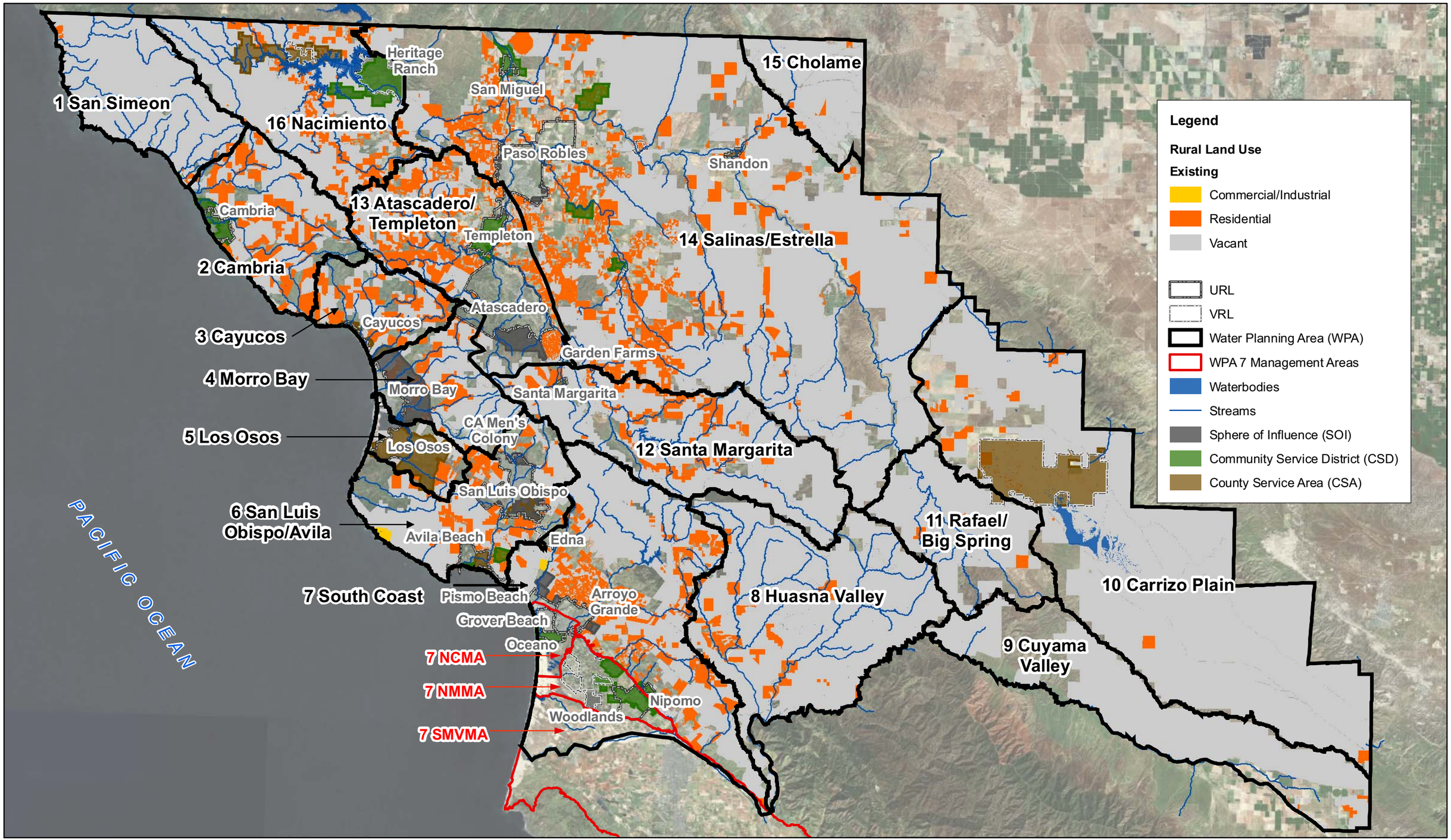
	Water Planning Area	Average Existing Rural Demand (AFY)[a]	Minimum Future Rural Demand (AFY)[b,c]	Maximum Future Rural Demand (AFY)[b]
1	San Simeon	20	50	50
2	Cambria	100	190	220
3	Cayucos	80	130	140
4	Morro Bay	120	190	220
5	Los Osos	20	20	20
6	San Luis Obispo/Avila	450	610	660
7[d]	South Coast	1,480	1,990	2,160
8	Huasna Valley	90	360	450
9	Cuyama Valley	10	80	100
10	Carrizo Plain	210	9,610	12,740
11	Rafael/Big Spring	0	470	620
12	Santa Margarita	240	450	520
13	Atascadero/Templeton	1,480	1,810	1,930
14	Salinas/Estrella	3,590	5,570	6,230
15	Cholame Valley	10	150	190
16	Nacimiento	280	730	880
	Total	**8,180**	**22,410**	**27,130**

[a] Water usage factor used for all existing rural residential units in WPA 1-7 is 0.8 AFY/DU and WPA 8-16 is 1.0 AFY/DU, for commercial/industrial areas was 1.5 AFY/DU.

[b] Water usage factor used for all future residential units in WPA 1-7 is 0.6 AFY/DU and WPA 8-16 is 0.8 AFY/DU, for commercial/industrial areas was 1.5 AFY/DU.

[c] Minimum demand represents 75 percent of potential development

[d] The rural demand for WPA 7 only includes areas outside of the NCMA, NMMA, and SMVMA.



San Luis Obispo County Flood Control and Water Conservation District

MASTER WATER PLAN

San Luis Obispo County

Figure 3 Rural Land Use in San Luis Obispo County

0 2.5 5 10 Miles

North Coast Sub-Region

The existing rural demand for San Simeon Water Planning Area, WPA 1, is approximately 20 AFY and future is approximately 50 AFY. The existing rural demand for Cambria Water Planning Area, WPA 2, is approximately 100 AFY and future is approximately 190 to 220 AFY. The existing rural demand for Cayucos Water Planning Area, WPA 3, is approximately 80 AFY and future range is from approximately 130 to 140 AFY. The existing rural demand for Morro Bay Water Planning Area, WPA 4, is approximately 120 AFY and projected future range is from 200 to 220 AFY. The existing rural demand for Los Osos Water Planning Area, WPA 5, is 20 AFY and projected future demand is approximately the same. The majority of WPA 5 is composed of agricultural and urban areas, so there are only a small number of parcels in WPA 5 where there could be additional rural development. The existing rural demand for San Luis Obispo/Avila Water Planning Area, WPA 6, is 450 AFY and projected future range is 610 to 660 AFY. The majority of existing rural parcels identified in the WPAs within the North Coast Sub-Region are classified as developed rural lands. The majority of vacant parcels in these WPAs that could be converted to rural residential in the future are vacant parcels with rural land use designations.

South Coast Water Planning Area (WPA 7)

Outlying Areas

The existing annual rural water demand in the tables above includes the demand for the areas in WPA 7 that are located outside of the NMMA, NCMA, and SMVMA boundaries. The existing demand for outlying areas in WPA 7 is 1,480 AFY and the projected demand for outlying areas in WPA 7 is 1,990 to 2,160 AFY. The majority of existing rural parcels identified in WPA 7 are classified as developed rural residential, rural suburban, or rural lands. The majority of vacant parcels in WPA 7 that could be converted to rural residential in the future are vacant parcels with rural land use designations

Northern Cities Management Area (NCMA)

In 2008, the NCMA had a rural demand of approximately 36 AFY (Todd Engineers, 2009). The NCMA has minimal rural land that could be developed. In the future, the rural water demand in this area is expected to be similar to the existing demand. Most of the increase in demand in NCMA is projected to be from urban users. The existing rural water demand will be estimated and reported annually in an NCMA report.

Nipomo Mesa Management Area (NMMA)

In 2008, the NMMA had a rural demand of approximately 1,700 AFY (NMMA, 2009). The rural water demand consisted of primarily rural residential and suburban parcels. The rural water demand in the future is expected to be similar to the existing demand. Most of the increase in water demand in NMMA is projected to be from urban users. The rural water demand will be estimated and reported annually in an NMMA report.

Santa Maria Valley Management Area (SMVMA)

The water demand in the San Luis Obispo section of SMVMA is primarily classified as agricultural demand (Luhdorff and Scalmanini, 2009). Based on the County Land Use GIS, the existing rural water demand in SMVMA is approximately 37 AFY and future demand is approximately 110 AFY. Both existing and future rural demand is less than 0.5 percent of the total demand for the SMVMA within San Luis Obispo County.

Huasna Valley Water Planning Area (WPA 8)

For the Huasna Valley Water Planning Area, the existing annual rural water demand is 90 AFY and the range of projected future demand is 360 to 450 AFY. The majority of existing rural parcels identified in WPA 8 are classified as developed rural lands. The majority of vacant parcels in WPA 8 that could be converted to rural residential in the future are vacant parcels with rural land use designations.

Cuyama Valley Water Planning Area (WPA 9)

The existing annual rural water demand is 10 AFY and the range of projected future demand is 80 to 100 AFY. The majority of existing rural parcels identified in WPA 9 are classified as developed rural lands. The majority of vacant parcels in WPA 9 that could be converted to rural residential in the future are vacant parcels with rural land use designations

Inland Sub-Region

The estimated rural demand for the Carrizo Plain, WPA 10, is 210 AFY and future demand ranges from 9,610 to 12,740 AFY. The majority of existing rural parcels identified in WPA 10 are classified as developed rural lands. According to existing zoning, it is possible that Carrizo Plain could have extensive residential development. However, it is unlikely that the number of residential units that are zoned as potential residential will be developed due to limited water availability and other factors.

There is no existing rural demand for WPA 11, Rafael/Big Spring, but in the future, if water is available and development occurs, there could be from approximately 470 to 620 AFY. The existing rural demand for WPA 12 is approximately 240 AFY and future demand ranges from approximately 450 to 520 AFY. The existing rural demand for WPA 13, Atascadero/Templeton, is approximately 1,480 AFY and future demand ranges from 1,810 to 1,930 AFY. The existing rural demand for WPA 14, Salinas/Estrella, is approximately 3,590 AFY and future demand ranges from 5,570 to 6,230 AFY. The existing rural demand for WPA 15, Cholame, is approximately 10 AFY and future demand ranges from 150 to 190 AFY. The existing rural demand for WPA 16 is approximately 280 AFY and future demand ranges from 730 to 880 AFY. The majority of existing rural parcels identified in the Inland Sub-Region are classified as developed rural lands. The majority of vacant parcels in these WPAs that could be converted to rural residential in the future are vacant parcels with rural land use designations

Environmental Water Demand

Definitions

Environmental water demand refers to the amount of water needed in an aquatic ecosystem, or released into it, to sustain aquatic habitat and ecosystem processes.

Sources

There are six active USGS streamflow gages and 68 inactive USGS streamflow gages in San Luis Obispo County (USGS, 2009). Information on location, site details, drainage, and available data was obtained for all United States Geological Survey (USGS) sites and imported into ArcGIS®. ESA obtained similar information from Sylas Cranor in the San Luis Obispo Water Resources Department for all 16 active gages and inactive gages and imported available information into ArcGIS®.

Method/Assumptions: Environmental Demand

A detailed discussion of the methods for determining the environmental demand is included in **Appendix D**. ESA quantified environmental water demands for areas where data were available and unimpaired runoff data could be obtained, calculated, or estimated. ESA utilized USGS and County existing stream gage data and obtained the critical stream flow data. Unimpaired runoff estimates were calculated by developing regional, multiple regression relationships that predict runoff at an ungaged, or partially gaged, location as a function of runoff at a gaged location. Once the estimated unimpaired runoff has been established, ESA used the median annual discharge methodology to calculate an environmental water demand (Hatfield and Bruce, 2000). ESA selected this method for the environmental demand analysis based on target species, data availability, input from the WRAC and other stakeholders, as well as time and budget constraints.

The DWR has identified over 1,000 water rights applications and permits for San Luis Obispo County (DWR, 2009b). For purposes of this analysis, ESA presents the unimpaired mean annual discharge and environmental water demand without including an analysis of the 1,000 diversion rights in the County. However, ESA includes some of the established instream flow requirements. In order to obtain a better understanding of how much surface water is available for aquatic life, the County would need to identify and quantify all diversion rights and instream flow requirements in the watershed.

Environmental Water Demand by WPA

A detailed discussion of the results of the environmental demand analysis is included in Appendix D. The mean annual discharge and environmental water demand estimates are shown in **Table 9**.

San Simeon Water Planning Area (WPA 1)

The total unimpaired mean annual discharge in WPA 1 is approximately 104,490 AFY and environmental water demand is approximately 72,980 AFY. WPA 1 was divided into eight sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for each of these areas. Some of the creeks included in these sub-watersheds include San Carpoforo, Honda Arroyo, Arroyo de la Cruz, Arroyo de la Laguna, Arroyo del Osos, Arroyo del Corral, Arroyo Laguna, and Pico Creek.

TABLE 9
MEAN ANNUAL DISCHARGE AND ENVIRONMENTAL WATER DEMAND ESTIMATES

WPA #[a]	WPA Name	Estimated Unimpaired Mean Annual Discharge (AFY)	Environmental Water Demand (AFY)
1	San Simeon	104,490	72,980
2	Cambria	87,050	51,460
3	Cayucos	33,340	26,160
4	Morro Bay	43,430	27,880
5	Los Osos	8,200	7,040
6	SLO/Avila	45,820	33,030
7	South Coast	49,100	32,960
8	Huasna Valley	34,220	25,020
12	Santa Margarita	46,630	32,850
13	Atascadero/Templeton	74,090	41,010
16	Nacimiento	251,120[b]	108,390[b]

[a] The eastern portion of the County (i.e., WPAs 9, 10, 11, 14, and 15) was ultimately excluded from the environmental water demand analysis due to the lack of data and regional physiographic differences.

[b] Estimates for WPA16 environmental water demand include the watershed area for the Nacimiento River Index-station (162 square miles); though the Index-station is within WPA 16, most of the watershed area is not.

Cambria Water Planning Area (WPA 2)

The total unimpaired mean annual discharge in WPA 2 is approximately 87,050 AFY and environmental water demand is approximately 51,460 AFY. WPA 2 was divided into three sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for each of these areas. Creeks in these sub-watersheds include San Simeon, Santa Rosa, and Villa Creek.

Cayucos Water Planning Area (WPA 3)

For WPA 3, the total unimpaired mean annual discharge is approximately 33,340 AFY and environmental water demand is approximately 26,160 AFY. WPA 3 was divided into three sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for each of these areas. Creeks in these sub-watersheds include Cayucos and Toro Creek.

Morro Bay Water Planning Area (WPA 4)

The unimpaired mean annual discharge for WPA 4 is approximately 43,430 AFY and environmental water demand is approximately 27,880 AFY. WPA 4 was divided into two sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. Creeks in these sub-watersheds include Morro and Chorro Creek.

Los Osos Water Planning Area (WPA 5)

The unimpaired mean annual discharge for WPA 5 is approximately 8,200 AFY and environmental water demand is approximately 7,040 AFY. The analysis for WPA 5 analyzed the area as one watershed that includes Los Osos Creek and an area of approximately 23 square miles.

San Luis Obispo/Avila Water Planning Area (WPA 6)

The unimpaired mean annual discharge for WPA 6 is approximately 45,820 AFY and environmental water demand is approximately 33,030 AFY. WPA 6 was divided into four sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. The largest creek in these sub-watersheds is San Luis Obispo Creek. San Luis Obispo Creek has an instream flow requirement of a minimum daily average of discharge 2.5 cubic feet per second (cfs), which is equivalent to approximately 1,810 AFY (NOAA, 2005).

South Coast Water Planning Area (WPA 7)

The unimpaired mean annual discharge for WPA 7, inclusive of the water management areas, is approximately 49,100 AFY and environmental water demand of 32,960 AFY. WPA 7 was divided into five sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. Creeks in these sub-watersheds include Pismo and Arroyo Grande Creek. The Arroyo Grande Creek below Lopez Dam has instream flow requirements that vary from less than 3 cfs to 20 cfs (2,170 AFY to 14,480) based on time of year and amount of water in the reservoir (Stetson Engineers, 2004)

Huasna Valley Water Planning Area (WPA 8)

The unimpaired mean annual discharge for WPA 8 inclusive of the water management areas is approximately 34,220 AFY and environmental water demand of 25,020 AFY. WPA 8 was divided into three sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. Some of the creeks in these sub-watersheds included Huasna River and Alamo Creek.

Santa Margarita Water Planning Area (WPA 12)

The unimpaired mean annual discharge for WPA 12 inclusive of the water management areas is approximately 46,630 AFY and environmental water demand of 32,850 AFY. WPA 12 was divided into three sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. The Salinas River is the major river in these sub-watersheds.

Atascadero/Templeton Water Planning Area (WPA 13)

The unimpaired mean annual discharge for WPA 13 inclusive of the water management areas is approximately 74,090 AFY and environmental water demand of 41,010 AFY. WPA 13 was divided into two sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. The major water bodies in these sub-watersheds include the Salinas River and Paso Robles Creek.

Nacimiento Water Planning Area (WPA 16)

The unimpaired mean annual discharge for WPA 16 inclusive of the water management areas is approximately 251,124 AFY and environmental water demand of 108,390 AFY. WPA 16 was divided into three sub-watersheds and the unimpaired mean annual discharge and environmental water demand was calculated for these sub-watersheds. The major river in these sub-watersheds is the Nacimiento River.

Appendices

Appendix A, San Luis Obispo County Water Demand Analysis Annual Applied Water Variables, technical memorandum, ESA, prepared December 2009.

Appendix B, San Luis Obispo County ArcGIS® LU Methodology Report, San Luis Obispo County, 2009.

Appendix C, San Luis Obispo County Rural Land Use

Appendix D, SLO County MWP, Environmental Water Demand Estimates, technical memorandum, ESA, November 24, 2009.

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DRAFT memorandum

date January 7, 2010

to Courtney Howard, San Luis Obispo County; Water Resources Advisory Committee (WRAC)

from Annika Fain, ESA; Eric Zigas, ESA

subject San Luis Obispo County Annual Crop-Specific Applied Water Variables (Appendix A)

Agricultural Demand

ESA calculated the crop-specific applied water for these crop groups by utilizing information on crop evapotranspiration, effective rainfall, leaching requirements, irrigation efficiency, and frost protection. The following equation was used to calculate the annual crop-specific applied water (AF/Ac/Yr) for each of the water planning areas:

$$\text{Annual Crop - Specific Applied Water (AF/Ac/Yr)} = \frac{\text{ETc} - \text{ER}}{(1 - \text{LR}) \text{ x IE}} + \text{FP}$$

This formula was modified from a general formula for irrigation water requirements, which was established in 1997 (Burt, 1997). A detailed discussion and summary tables of each of the parameters in the above equation is presented below. **Table A1** presents a range of values for the existing annual crop-specific applied water (AF/Ac/Yr) for all crop groups and water planning area. **Table A2** presents a range of values for the projected future crop-specific applied water (AF/Ac/Yr) for all crop groups and water planning area. The annual crop-specific applied water is multiplied by crop acreage to determine an agricultural water demand (AFY). **Table A3** presents a range of values for the agricultural water demand for all crop groups and water planning area. **Table A4** presents a range of values for the agricultural water demand for all crop groups and water planning area.

Reference Crop Evapotranspiration (Eto). Crop evapotranspiration for CIMIS weather stations in San Luis Obispo County and in Kern County (to the east) was used. The CIMIS stations in San Luis Obispo County include two in San Luis Obispo, one in Atascadero, and one in Nipomo. Additionally, Blackwells Corner, in Kern County was used to estimate Eto in Eastern San Luis Obispo County. The water planning areas were grouped according to the reference crop evapotranspiration climate groups (**Table A5**). Due to substantial variability within WPA 7, ESA used an average crop evapotranspiration of Arroyo Grande and Nipomo for this area. A summary of the estimated reference crop evapotranspiration used for the analysis is shown in **Table A6**.

Crop coefficients (Kc). The crops in San Luis Obispo County were assigned crop coefficients based on the crop type and location. These crops include alfalfa, nursery, irrigated pasture, citrus, deciduous, vegetable, and

vineyard. The spreadsheet and ArcGIS® model is set-up so these numbers can be easily updated with new crop coefficients and crop evapotranspiration. The crop coefficients for this analysis are summarized in **Table A7**.

TABLE A1
EXISTING CROP-SPECIFIC APPLIED WATER (AF/AC/YR) BY CROP GROP AND WATER PLANNING AREA

WPA #	WPA Name	Alfalfa (AF/Ac/Yr)			Citrus (AF/Ac/Yr)			Deciduous (AF/Ac/Yr)			Nursery (AF/Ac/Yr)			Pasture (AF/Ac/Yr)			Vegetable (AF/Ac/Yr)[a]			Vineyard (AF/Ac/Yr)		
		Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med
1	San Simeon	1.4	2.5	2.0	0.5	1.2	0.9	1.3	2.2	1.8	0.6	1.5	1.1	1.6	2.7	2.1	1.2	1.4	1.3	0.5	1.0	0.8
2	Cambria	1.4	2.5	2.0	0.5	1.2	0.9	0.9	1.8	1.4	0.6	1.5	1.1	1.6	2.7	2.1	1.0	1.4	1.2	0.0	0.6	0.4
3	Cayucos	1.6	2.7	2.2	0.6	1.4	1.0	1.1	1.9	1.5	0.7	1.6	1.2	1.7	2.9	2.3	1.0	1.4	1.2	0.1	0.7	0.5
4	Morro Bay	2.2	3.3	2.7	1.1	1.8	1.5	1.6	2.4	2.0	1.2	2.0	1.6	2.3	3.4	2.9	1.2	1.7	1.4	0.5	1.0	0.8
5	Los Osos	2.2	3.3	2.7	1.1	1.8	1.5	1.6	2.4	2.0	1.2	2.0	1.6	2.3	3.4	2.9	1.2	1.7	1.4	0.5	1.0	0.8
6	San Luis Obispo/Avila	2.3	3.5	2.9	1.1	1.9	1.5	1.7	2.6	2.1	1.2	2.1	1.7	2.5	3.7	3.1	1.4	1.8	1.6	0.5	1.1	0.8
7	South Coast	2.7	3.9	3.3	1.5	2.2	1.8	2.7	3.7	3.2	1.6	2.4	2.0	2.9	4.1	3.5	1.5	1.9	1.7	0.7	1.3	1.0
8	Huasna Valley	4.8	6.4	5.6	2.5	3.4	3.0	4.2	5.4	4.8	2.6	3.7	3.1	4.8	6.5	5.7	2.0	2.6	2.3	1.8	2.6	2.2
9	Cuyama Valley	4.8	6.4	5.6	2.5	3.4	3.0	3.8	5.0	4.4	2.6	3.7	3.1	4.8	6.5	5.7	2.0	2.6	2.3	1.8	2.6	2.2
10	Carrizo Plain	5.1	6.7	5.9	2.8	3.6	3.2	4.1	5.3	4.7	2.9	3.9	3.4	5.2	6.8	6.0	2.1	2.7	2.4	2.0	2.7	2.4
11	Rafael/Big Spring	4.8	6.4	5.6	2.5	3.4	3.0	3.8	5.0	4.4	2.6	3.7	3.1	4.8	6.5	5.7	2.0	2.6	2.3	1.8	2.6	2.2
12	Santa Margarita	3.2	4.5	3.9	1.4	2.2	1.8	2.5	3.5	3.0	1.5	2.4	2.0	4.8	6.5	5.7	1.4	1.9	1.6	1.1	1.8	1.4
13	Atascadero/Templeton	3.2	4.5	3.9	1.4	2.2	1.8	2.5	3.5	3.0	1.5	2.4	2.0	4.8	6.5	5.7	1.4	1.9	1.6	1.1	1.8	1.4
14	Salinas/Estrella	3.8	5.2	4.5	1.9	2.7	2.3	3.4	4.5	4.0	2.0	2.9	2.5	5.2	6.8	6.0	1.6	2.2	1.9	1.4	2.1	1.7
15	Cholame Valley	4.9	6.5	5.7	2.5	3.3	2.9	3.9	5.1	4.5	2.6	3.6	3.1	4.8	6.5	5.7	1.9	2.4	2.1	2.0	2.7	2.3
16	Nacimiento	3.2	4.5	3.9	1.4	2.2	1.8	2.5	3.5	3.0	1.5	2.4	2.0	3.3	4.6	3.9	1.4	1.9	1.6	1.1	1.8	1.4

[a] Accounts for multi-cropping (assumes 3 vegetable crops planted per acre per year for WPA 1-7; assumes 2 vegetable crops planted per acre per year for WPA 8-16)

TABLE A2
PROJECT FUTURE CROP-SPECIFIC APPLIED WATER (AF/AC/YR) BY CROP GROP AND WATER PLANNING AREA

WPA #	WPA Name	Alfalfa (AF/Ac/Yr)			Citrus (AF/Ac/Yr)			Deciduous (AF/Ac/Yr)			Nursery (AF/Ac/Yr)			Pasture (AF/Ac/Yr)			Vegetable (AF/Ac/Yr)[a]			Vineyard (AF/Ac/Yr)		
		Low	High	Med	Low	High	Med	Low	Low	High	Med	Low	High	Med	Low	Low	High	Med	Low	High	Med	Low
1	San Simeon	1.3	2.4	1.8	0.5	1.2	0.8	1.3	2.1	1.7	0.6	1.4	1.0	1.5	2.5	2.0	0.9	1.3	1.1	0.0	0.6	0.3
2	Cambria	1.3	2.4	1.8	0.5	1.2	0.8	0.9	1.7	1.3	0.6	1.4	1.0	1.5	2.5	2.0	0.9	1.3	1.1	0.0	0.6	0.3
3	Cayucos	1.5	2.5	2.0	0.6	1.3	0.9	1.0	1.8	1.4	0.7	1.5	1.1	1.6	2.6	2.1	1.0	1.3	1.2	0.2	0.7	0.4
4	Morro Bay	2.1	3.0	2.5	1.1	1.7	1.4	1.5	2.2	1.9	1.1	1.9	1.5	2.2	3.2	2.7	1.2	1.5	1.4	0.5	1.0	0.7
5	Los Osos	2.1	3.0	2.5	1.1	1.7	1.4	1.5	2.2	1.9	1.1	1.9	1.5	2.2	3.2	2.7	1.2	1.5	1.4	0.5	1.0	0.7
6	San Luis Obispo/Avila	2.2	3.2	2.7	1.0	1.7	1.4	1.6	2.4	2.0	1.1	2.0	1.5	2.3	3.4	2.9	1.3	1.7	1.5	0.5	1.0	0.7
7	South Coast	2.6	3.6	3.1	1.4	2.1	1.7	2.6	3.5	3.1	1.5	2.3	1.9	2.7	3.8	3.3	1.4	1.8	1.6	0.7	1.2	0.9
8	Huasna Valley	4.6	6.1	5.3	2.4	3.3	2.8	4.1	5.2	4.6	2.5	3.5	3.0	4.6	6.1	5.4	1.9	2.5	2.2	1.7	2.5	2.1
9	Cuyama Valley	4.6	6.1	5.3	2.4	3.3	2.8	3.7	4.8	4.2	2.5	3.5	3.0	4.6	6.1	5.4	1.9	2.5	2.2	1.7	2.5	2.1
10	Carrizo Plain	4.9	6.3	5.6	2.7	3.5	3.1	4.0	5.0	4.5	2.7	3.7	3.2	4.9	6.4	5.7	2.1	2.6	2.3	2.0	2.6	2.3
11	Rafael/Big Spring	4.6	6.1	5.3	2.4	3.3	2.8	3.7	4.8	4.2	2.5	3.5	3.0	4.6	6.1	5.4	1.9	2.5	2.2	1.7	2.5	2.1
12	Santa Margarita	3.1	4.3	3.7	1.4	2.1	1.7	2.4	3.4	2.9	1.5	2.3	1.9	3.1	4.3	3.7	1.3	1.8	1.6	1.1	1.7	1.4
13	Atascadero/Templeton	3.1	4.3	3.7	1.4	2.1	1.7	2.4	3.4	2.9	1.5	2.3	1.9	3.1	4.3	3.7	1.3	1.8	1.6	1.1	1.7	1.4
14	Salinas/Estrella	3.7	4.9	4.3	1.8	2.6	2.2	3.3	4.3	3.8	1.9	2.8	2.3	3.7	5.0	4.3	1.6	2.1	1.8	1.4	2.0	1.7
15	Cholame Valley	4.7	6.1	5.4	2.4	3.2	2.8	3.8	4.9	4.4	2.5	3.4	2.9	4.8	6.2	5.5	1.8	2.3	2.0	1.9	2.6	2.2
16	Nacimiento	3.1	4.3	3.7	1.4	2.1	1.7	2.4	3.4	2.9	1.5	2.3	1.9	3.1	4.3	3.7	1.3	1.8	1.6	1.1	1.7	1.4

[a] Accounts for multi-cropping (assumes 3 vegetable crops planted per acre per year for WPA 1-7; assumes 2 vegetable crops planted per acre per year for WPA 8-16)

TABLE A3
EXISTING AGRICULTURAL WATER DEMAND (AFY) BY CROP GROP AND WATER PLANNING AREA

WPA #	WPA Name	Alfalfa (AFY)			Citrus (AFY)			Deciduous (AFY)			Nursery (AFY)			Pasture (AFY)			Vegetable (AFY)[a]			Vineyard (AFY)		
		Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med
1	San Simeon	0	0	0	9	24	17	0	0	0	0	0	0	0	0	0	0	0	0	33	65	49
2	Cambria	0	0	0	165	424	295	24	47	36	1	2	2	0	0	0	248	343	295	3	30	17
3	Cayucos	0	0	0	220	471	345	0	0	0	0	0	0	0	0	0	146	198	172	1	4	2
4	Morro Bay	0	0	0	753	1,206	979	0	0	0	0	0	0	82	120	101	796	1,038	917	43	81	62
5	Los Osos	0	0	0	0	0	0	6	8	7	125	209	167	1,176	1,725	1,451	1,444	1,883	1,664	1	1	1
6	San Luis Obispo/Avila	0	0	0	241	408	324	304	466	385	48	85	67	515	773	644	1,512	1,991	1,752	279	594	436
7[b]	South Coast	0	0	0	5,892	8,886	7,389	68	89	78	324	510	417	1,539	2,190	1,864	5,974	7,718	6,846	2,458	4,192	3,325
8	Huasna Valley	0	0	0	48	65	56	18	23	20	0	0	0	0	0	0	392	508	450	845	1,206	1,026
9	Cuyama Valley	0	0	0	0	0	0	2,448	3,236	2,842	0	0	0	0	0	0	22,287	28,861	25,574	377	538	457
10	Carrizo Plain	0	0	0	693	911	802	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Rafael/Big Spring	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Santa Margarita	48	68	58	0	0	0	18	25	21	0	0	0	266	358	312	0	0	0	1,055	1,709	1,382
13	Atascadero/Templeton	0	0	0	46	70	58	1,799	2,516	2,158	123	194	159	2,851	3,827	3,339	28	38	33	3,718	6,026	4,872
14	Salinas/Estrella	3,053	4,182	3,617	607	859	733	1,981	2,672	2,327	151	223	187	7,447	9,770	8,609	4,160	5,463	4,812	38,080	56,562	47,321
15	Cholame Valley	0	0	0	65	87	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Nacimiento	0	0	0	65	99	82	1,970	2,755	2,362	0	0	0	33	46	39	0	0	0	1,054	1,709	1,381
Total		**3,101**	**4,250**	**3,676**	**8,804**	**13,509**	**11,157**	**8,636**	**11,837**	**10,237**	**773**	**1,224**	**998**	**13,908**	**18,808**	**16,358**	**36,988**	**48,043**	**42,515**	**47,946**	**72,716**	**60,331**

[a] Accounts for multi-cropping (assumes 3 vegetable crops planted per acre per year for WPA 1-7; assumes 2 vegetable crops planted per acre per year for WPA 8-16)

[b] The agricultural demand for WPA 7 in this table only includes areas outside of the NCMA, NMMA, and SMVMA.

TABLE A4
PROJECT FUTURE AGRICULTURAL WATER DEMAND (AFY) BY CROP GROP AND WATER PLANNING AREA

WPA #	WPA Name	Alfalfa (AFY)			Citrus (AFY)			Deciduous (AFY)			Nursery (AFY)			Pasture (AFY)			Vegetable (AFY)[a]			Vineyard (AFY)		
		Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low	High	Med
1	San Simeon	0	0	0	9	22	16	0	0	0	0	0	0	0	0	0	0	0	0	5	42	23
2	Cambria	0	0	0	185	472	329	25	47	36	1	2	1	0	0	0	493	672	582	35	298	166
3	Cayucos	0	0	0	288	608	448	0	0	0	0	0	0	0	0	0	139	187	163	3	10	6
4	Morro Bay	0	0	0	764	1,208	986	0	0	0	0	0	0	76	110	93	797	1,027	912	52	96	74
5	Los Osos	0	0	0	22	35	29	5	8	7	117	193	155	1,103	1,592	1,347	1,502	1,937	1,720	1	1	1
6	San Luis Obispo/Avila	0	0	0	233	390	311	287	435	361	45	78	62	483	713	598	1,490	1,939	1,715	272	567	420
7[b]	South Coast	0	0	0	5,606	8,355	6,981	121	155	138	304	471	388	1,914	2,681	2,297	5,899	7,531	6,715	2,767	4,638	3,703
8	Huasna Valley	0	0	0	46	62	54	17	22	20	9	13	11	448	592	520	379	485	432	1,166	1,644	1,405
9	Cuyama Valley	0	0	0	0	0	0	2,366	3,090	2,728	0	0	0	0	0	0	22,506	28,802	25,654	366	516	441
10	Carrizo Plain	0	0	0	672	872	772	4	5	5	0	0	0	0	0	0	7	9	8	0	0	0
11	Rafael/Big Spring	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Santa Margarita	46	64	55	5	8	7	21	29	25	0	0	0	296	410	353	0	0	0	1,356	2,169	1,762
13	Atascadero/Templeton	0	0	0	75	113	94	1,898	2,624	2,261	118	183	151	2,539	3,515	3,027	74	99	87	5,040	8,062	6,551
14	Salinas/Estrella	2,925	3,946	3,436	700	978	839	2,569	3,423	2,996	150	217	183	6,969	9,366	8,167	4,060	5,270	4,665	43,365	63,625	53,495
15	Cholame Valley	0	0	0	63	83	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Nacimiento	0	0	0	66	99	83	2,064	2,853	2,459	0	0	0	31	43	37	0	0	0	2,577	4,122	3,350
Total		**2,972**	**4,011**	**3,491**	**8,733**	**13,306**	**11,020**	**9,376**	**12,690**	**11,033**	**744**	**1,158**	**951**	**13,858**	**19,024**	**16,441**	**37,346**	**47,957**	**42,652**	**57,005**	**85,790**	**71,397**

[a] Accounts for multi-cropping (assumes 3 vegetable crops planted per acre per year for WPA 1-7; assumes 2 vegetable crops planted per acre per year for WPA 8-16)
[b] The agricultural demand for WPA 7 in this table only includes areas outside of the NCMA, NMMA, and SMVMA.

TABLE A5
CLIMATE GROUP FOR CROP EVAPOTRANSPIRATION BY WPA

WPA#	WPA	Assigned Climate Group
1	San Simeon	San Simeon
2	Cambria	San Simeon
3	Cayucos	San Simeon
4	Morro Bay	Morro Bay
5	Los Osos	Morro Bay
6	San Luis Obispo/Avila	San Luis Obispo
7	South Coast	Arroyo Grande/Nipomo
8	Huasna Valley	Cuyama
9	Cuyama Valley	Cuyama
10	Carrizo Plain	Cuyama
11	Rafael/Big Spring	Cuyama
12	Santa Margarita	Atascadero
13	Atascadero/Templeton	Atascadero
14	Salinas/Estrella	Paso Robles
15	Cholame Valley	Blackwells Corner
16	Nacimiento	Atascadero

[a] Climate Groups were determined by looking at available Eto by WPA

TABLE A6
REFERENCE CROP EVAPOTRANSPIRATION (inches/month)[a]

Month	Arroyo Grande	Blackwells Corner	Morro Bay	Paso Robles	San Luis Obispo	San Simeon	Nipomo	Atascadero	Cuyama
January	2.0	1.4	2.0	1.6	2.0	2.0	2.2	1.2	2.1
February	2.2	2.1	2.2	2.0	2.2	2.0	2.5	1.5	2.4
March	3.2	3.8	3.1	3.2	3.2	2.9	3.8	2.8	3.8
April	3.8	5.4	3.5	4.3	4.1	3.5	5.1	3.9	5.4
May	4.3	7	4.3	5.5	4.9	4.2	5.7	4.5	6.9
June	4.7	7.8	4.5	6.3	5.3	4.4	6.2	6	7.9
July	4.3	8.5	4.6	7.3	4.6	4.6	6.4	6.7	8.5
August	4.6	7.7	4.6	6.7	5.5	4.3	6.1	6.2	7.7
September	3.6	5.8	3.8	5.1	4.4	3.5	4.9	5	5.9
October	3.2	3.9	3.5	3.7	3.5	3.1	4.1	3.2	4.5
November	2.4	1.9	2.1	2.1	2.4	2.0	2.9	1.7	2.6
December	1.7	1.2	1.7	1.4	1.7	1.7	2.3	1	2
Total (in/yr)	40.0	56.5	39.9	49.2	43.8	38.2	52.2	43.7	59.7

[a] The ETo values in this table were derived from: CIMIS, 2009; DWR, 1999; University of California, 1987; Snyder et al., 1987

TABLE A7
CROP COEFFICIENTS FOR EACH CROP GROUP

Month	Alfalfa	Citrus	Deciduous	Nursery	Pasture	Vegetables	Vineyard
January	0.00	0.56	0.00	0.50	0.00	0.00	0.00
February	0.00	0.56	0.00	0.50	0.00	0.00	0.00
March	0.90	0.56	0.60	0.50	1.00	0.00	0.00
April	0.90	0.56	0.70	0.50	1.00	0.00	0.00
May	0.90	0.56	0.80	0.50	1.00	0.00	0.60
June	0.90	0.56	0.90	0.50	1.00	0.00	0.70
July	1.00	0.56	1.00	0.50	1.00	0.00	0.60
August	1.00	0.56	1.00	0.50	1.00	1.00	0.50
September	1.10	0.56	0.90	0.50	1.00	1.00	0.30
October	1.00	0.56	0.80	0.50	1.00	1.00	0.10
November	0.00	0.56	0.00	0.50	0.00	1.00	0.00
December	0.00	0.56	0.00	0.50	0.00	1.00	0.00

[a] Adapted from DWR 113-3 (DWR, 1974), UC Leaflet 21427 (Snyder et al., 1989a), UC Leaflet 21428 (Snyder et al., 1989b)

Crop Evapotranspiration (Etc). Crop evapotranspiration was calculated by multiplying the reference evapotranspiration and for each agricultural crop and area. Annual Crop evapotranspiration (AF/Ac/Yr) for each crop group and WPA is summarized in **Table A8**.

TABLE A8
ANNUAL CROP EVAPOTRANSPIRATION [a] (AF/Ac/Yr)
FOR EACH CROP GROUP AND WPA

WPA #	WPA Name	Alfalfa	Citrus	Deciduous	Nursery	Pasture	Vegetable	Vineyard
1	San Simeon	2.4	1.8	2.2	1.6	2.5	1.2	1.0
2	Cambria	2.4	1.8	2.2	1.6	2.5	1.2	1.0
3	Cayucos	2.4	1.8	2.2	1.6	2.5	1.2	1.0
4	Morro Bay	2.6	1.9	2.3	1.7	2.7	1.3	1.0
5	Los Osos	2.6	1.9	2.3	1.7	2.7	1.3	1.0
6	San Luis Obipso/Avila	2.8	2.0	2.5	1.8	3.0	1.5	1.2
7	South Coast	3.0	2.2	2.6	1.9	3.1	1.5	1.2
8	Huasna Valley	4.1	2.8	3.7	2.5	4.2	1.9	1.7
9	Cuyama Valley	4.1	2.8	3.7	2.5	4.2	1.9	1.7
10	Carrizo Plain	4.1	2.8	3.7	2.5	4.2	1.9	1.7
11	Rafael/Big Spring	4.1	2.8	3.7	2.5	4.2	1.9	1.7
12	Santa Margarita	3.1	2.0	2.8	1.8	3.2	1.4	1.3
13	Atascadero/Templeton	3.1	2.0	2.8	1.8	3.2	1.4	1.3
14	Salinas/Estrella	3.4	2.3	3.0	2.1	3.5	1.6	1.4
15	Cholame Valley	4.0	2.6	3.6	2.4	4.2	1.7	1.7
16	Nacimiento	3.1	2.0	2.8	1.8	3.2	1.4	1.3

[a] Crop evapotranspiration is equal to the product of crop coefficients and reference crop evapotranspiration

Effective Rainfall (ER). The effective rainfall was calculated for each area by utilizing historical annual precipitation in San Luis Obispo County and effective precipitation based on crop type and water planning area.

The historical yearly precipitation gages that were used for the water demand analysis are listed in **Table A9**. The rainfall from each of these gages was assigned to a particular water planning area. Due to substantial variability

TABLE A9
SAN LUIS OBISPO COUNTY RAINFALL STATIONS USED FOR ANALYSIS

Rainfall Station	Average (Inches/Yr)	County Gage #	Record
Santa Rosa Creek	27.5	169	1964-2003
Cayucos Creek	24.8	173.1	1965-2003
Baywood Park/Camp SLO	18.2	177/224	1967-2003
CalPoly	22.2	1	1870-2003
Lopez Dam	19.6	178.1	1968-2003
Nipomo	16.6	38	1921-2003
Santa Maria Valley	15.3	23	1910-2003
Paso Robles	15.2	10	1887-2003
AMWC	17.4	34	1916-2003
Santa Margarita	24.3	9a	1972-2003
Carrizo Plain	10.9	151.2	1966-2003
White Ranch	12.3	93	1931-2008
Oceano CSA #13	16.1	157.1	1959-2006

SOURCE: San Luis Obispo County, 2005 & 2009 http://www.slocountywater.org/site/Water%20Resources/Data/maps/data.htm

within WPA 7, ESA used an average precipitation of Nipomo and Lopez Dam gages for this area. **Table A10** lists the range of effective rainfall percentage for each crop group.

TABLE A10
EFFECTIVE RAINFALL PERCENTAGE FOR EACH CROP GROUP[a]

Range	Alfalfa	Citrus	Deciduous	Nursery	Pasture	Vegetable[b]	Vineyard
Low	40%	40%	40%	30%	40%	15%	30%
High	60%	60%	60%	50%	60%	25%	50%

[a] Effective rainfall general ranges from 29% to 59% (Burt et al., 2002)
[b] Accounts for multi-cropping by reducing vegetable effective rainfall in half.

Frost Protection (FP). The sprinkler frost protection water requirement was estimated for grapes (throughout the County), as well as strawberries and blueberries (WPA 1, 7, 8, and 14). For vineyards, the frost threat occurs from March to April in San Luis Obispo County. For strawberries and blueberries in San Luis Obispo County, primarily in WPA 7 and 14, respectively the frost threat occurs from January to March. Sprinkler frost protection requires a large amount of water, which may be higher than a typical groundwater well can produce (Battany, 2009). Therefore, growers that use sprinkler frost protection will generally have large reservoirs on site or nearby. The frost protection values ESA used were 0.25 AF/Ac/Yr for vineyards throughout the County and 0.4 AF/Ac/Yr for strawberries and blueberries in WPA 1, 7, 8, and 14. This was based on information provided by the

UC Farm Advisors and input from the WRAC and other agricultural stakeholders. Details on how the numbers were determined for vineyards and strawberry frost protection are shown below.

Grapes

Sprinkler frost protection on vineyards will only occur where growers have access to a large reservoir onsite or nearby (Battany, 2009). Overhead sprinklers may operate from 4-6 hours per evening for 10-12 nights per year (San Luis Obispo County, 1998). System flow rates generally range from 40 to 50 gallons per minute per acre (gpm/Ac), 0.09 inches per hour (in/hr) and 0.11 in/hr, respectively. **Table A11** shows an example of yearly applied water for frost protection on a vineyard depending on minutes of runtime and a system flow rate of 50 gpm/Ac. To determine the percentage of acreage that uses sprinkler frost protection would require a detailed look at all vineyards on aerial photography and/or discussions with all vineyard owners. The amount of frost protection on vineyards varies from year to year and farm to farm. For purposes of this analysis, ESA has assumed that approximately 50% of the vineyards use frost protection. Therefore, ESA used 0.25 AF/Ac/Yr for frost protection on grapes throughout the County.

TABLE A11
RANGE OF ANNUAL APPLIED WATER FOR FROST PROTECTION ON A TYPICAL VINEYARD (AF/AC/YR)

Hours per night	Nights per year	Annual Applied Water (AF/Ac/Yr)
4	10	0.34
	11	0.38
	12	0.41
5	10	0.43
	11	0.47
	12	0.52
6	10	0.52
	11	0.57
	12	0.62

SOURCE: San Luis Obispo County, 1998

Strawberries and Blueberries

The amount of frost protection on strawberries varies from year to year and farm to farm. Sprinklers typically operate for 6 to 10 hours a night for 8-12 nights per year (San Luis Obispo County, 1998). System flow rates for frost protection of strawberries are approximately 45 gpm/Ac (0.10 in/hr). **Table A12** shows an example of yearly applied water for frost protection on strawberries depending on minutes of runtime and a system flow rate of 45 gpm/Ac. For purposes of the agricultural water demand analysis, strawberries and blueberries are grouped in the deciduous group. To account for the frost protection of strawberries and blueberries on some of the crops, 0.4 AF/Ac/Yr was added to the deciduous crop in WPA 1, 7, 8, and 14.

TABLE A12
RANGE OF ANNUAL APPLIED WATER FOR FROST PROTECTION ON STRAWBERRIES (AF/AC/YR)

Hours per night	Nights per year	Annual Applied Water (AF/Ac/Yr)
6	8	0.48
	10	0.60
	12	0.72
8	8	0.64
	10	0.80
	12	0.96
10	8	0.80
	10	1.00
	12	1.20

SOURCE: San Luis Obispo County, 1998

Leaching Requirements (LR). Leaching requirements, amount of over watering necessary to remove salts from the soil, were assumed to be satisfied by rainfall in the majority of the coastal areas (WPA 1 to WPA 6). Leaching requirements for the Paso Robles Basin were presented by Fugro and Cleath (2002). ESA used these estimates, approximately 5 percent to 16 percent, to identify existing LR for inland areas. **Table A12** includes the leaching requirement percentage used for crop groups located in inland WPAs (WPA 8-16). Mark Gaskell, UC Farm Advisor, stated that strawberries may have a leaching requirement of 10 to 20 percent (Gaskell, 2009). Therefore, ESA used a leaching requirement of 11 percent for existing demand in WPA 7. The future leaching requirements may be greater based on a build-up of salts in the soil (Battany, 2008; Gaskell, 2009). Therefore, the future leaching requirements were assumed to be 1 to 2 percent higher than existing leaching requirements.

TABLE A12
LEACHING REQUIREMENTS FOR INLAND AREAS IN SAN LUIS OBISPO COUNTY

Crop Group	Leaching Requirements (%)	
	Existing	Future
Alfalfa	8%	10%
Nursery	5%	7%
Pasture	8%	10%
Citrus	5%	7%
Deciduous	11%	13%
Vegetable	8%	10%
Vineyard	16%	18%

SOURCE: Existing leaching requirements were adapted from Fugro and Cleath, 2002 (Table 13)

Irrigation Efficiencies (IE). Irrigation efficiencies were calculated by utilizing distribution uniformity and losses provided by the San Luis Obispo County/Santa Barbara County Cachuma Resource Conservation District

(CRCD), San Luis Obispo County Coastal Resources Conservation District, vineyard owners, and recent studies. Additionally, ESA incorporated input from the WRAC and other agricultural stakeholders.

Higher irrigation efficiencies depend primarily on improving system distribution uniformity, decreasing surface losses, and reducing scheduling errors. Irrigation efficiencies are difficult to measure and are often estimated according to the system type, special practices, and distribution uniformities. Micro irrigation systems include micro-sprinklers, drip emitters, and drip tape. Micro systems tend to have higher irrigation efficiencies than sprinkler systems (**Table A13**). Regardless, there is a range between potential and actual performances of irrigation systems.

TABLE A13
ESTIMATED IRRIGATION EFFICIENCY RANGES BASED ON SYSTEM TYPE

	Estimated Irrigation Efficiency (IE) (%)		
Irrigation System Type	**Maximum Potential IE (includes excellent design and excellent management)**	**Average IE (includes excellent design and average management)**	**Low IE (includes average design and below average management)**
Sprinkler	80-85	75	50-60
Micro	90-95	85	60-70

SOURCE: Peterson, 2009a

Local farm advisors were contacted regarding the types of irrigation systems on crop groups. **Table A14** summarizes the type of irrigation systems used on specific crops. In 1998 MWP, the majority of vegetables were irrigated with surface systems. Over the last 10 years, surface irrigation systems have been converted to micro and sprinkler irrigation systems (Peterson, 2009a).

TABLE A14
ESTIMATES OF CURRENT IRRIGATION SYSTEM TYPES BY CROP GROUP

	Percentage of Acreage with Irrigation System Type (%)		
Crop Group	**Surface**	**Sprinkler**	**Micro**
Alfalfa	0	100	0
Citrus (permanent)	0	20	80
Deciduous (permanent)	0	20	80
Nursery	0	50	50
Pasture	0	100	0
Permanent	0	20	80
Vegetable	0	40	60
Vineyard	0	0	100

[a] Acreage was placed in a particular category according to the system they use most of the season.

SOURCE: Peterson, 2009b

Although measuring irrigation efficiency is difficult, a system's distribution uniformity can be quantified and measured in the field. The relationship between distribution uniformity and irrigation efficiency can be expressed as follows:

Irrigation Efficiency=Distribution Uniformity x (1-Losses)

The CRCD conducts irrigation evaluations with the Mobile Irrigation Lab. The CRCD has completed more than 325 evaluations related to irrigation efficiencies throughout San Luis Obispo and Santa Barbara Counties. The irrigation specialists provided estimates presented in Table A9 and Table A10, as well as information on distribution uniformity. Recent evaluations have shown that the distribution uniformity is approximately 75%, which is 5% higher than in 1998 (Peterson, 2009a). This change is primarily due to the change from surface to micro and sprinkler systems.

The sprinkler systems are associated with distribution uniformities of approximately 75% and micro systems are associated with distribution uniformities of 85%. For the purposes of estimating applied water, irrigation efficiencies were assigned to crop group according to the primary irrigation system type. **Table A15** includes existing irrigation efficiencies for crop groups**.** Irrigation efficiencies are likely to continue to improve in the future, due to improvements in equipment, economic pressure (increased electricity costs if groundwater levels decline), or have economic incentives (Isensee, 2009). **Table A16** includes projected future irrigation efficiencies for crop groups.

TABLE A15
EXISTING IRRIGATION EFFICIENCIES FOR CROP GROUPS

	Existing Irrigation Efficiency Range (%)	
Crop Group	**Low**	**High**
Alfalfa	60%	75%
Nursery	60%	75%
Pasture	60%	75%
Citrus & Deciduous	70%	85%
Vegetable	70%	85%
Vineyard	70%	85%

SOURCE: Peterson, 2009a and 2009b

TABLE A16
FUTURE PROJECTED IRRIGATION EFFICIENCIES FOR CROP GROUPS

	Projected Future Irrigation Efficiency Range (%)	
Crop Group	**Low**	**High**
Alfalfa	65%	80%
Nursery	65%	80%
Pasture	65%	80%
Citrus & Deciduous	75%	90%
Vegetable	75%	90%
Vineyard	75%	90%

SOURCE: Peterson, 2009a and 2009b

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Master Water Plan Project
Part 1: Methodology for Determining Vacant and Developed Properties

Intro - The assessor's GIS parcel database consists of 122895 individual APNs. Each APN record is populated with information indicating ownership, an abbreviated legal description (LEGAL), land value (LAND), improvement value (IMPS), home owner's exemption (HOX), land use codes* (PRIM_LUC, LUC_1, LUC_2, LUC_3), etc. A "Status" field was added to the GIS parcel database to designate whether a property is either developed or vacant or within city limits.

Step 1: Select all parcels that are within city limits and designate status as "City" (total APNs = 56594).

Step 2: Select (from the remaining parcels - 66301) all parcels that have a home owner's exemption and designate status as "Developed LUCode – HOX Res" (total APNs = 20879).

Step 3: Select parcels (from the remaining parcels - 45422) that have an improvement value of less than $1000 and designate status as "Vacant <= 1000 IMP" (total APNs = 25519).

Step 4: From the parcels selected above (Vacant <= 1000 IMP) all parcels with a PRIM_LUC indicating: common area, church, government, greenhouse, public trns facility, school, sludge site, utility, winery (121, 580, 636, 637, 802, 810, 820, 850 – 861 or legal field indicates "road") were selected and viewed using aerial photography to determine status. Note: Properties with the PRIM_LUC's indicated above have improvements often not assessed because of tax status. Additional review was required in order to determine whether or not properties were developed or vacant and status designated as "Vacant <= 1000 IMP" or "Developed <= 1000 IMP " and land use code type where applicable or "Military Base" or "Road" or "Lake" (total APNs = 2282).

Step 5: Select parcels (from the remaining parcels - 19903) that have land use codes indicating development types consistent with residential, commercial, industrial, manufacturing, motel, office, retail, etc. (i.e., 110 – 415, 421, 422, 423, 424, 425, 427, 428, 435, 440, 509, 511, 512, 515, 520, 522, 536) and that also have improvement values greater than 20,000. Designate status as "Developed LUCode" and land use code type where applicable (total APNs = 16425).

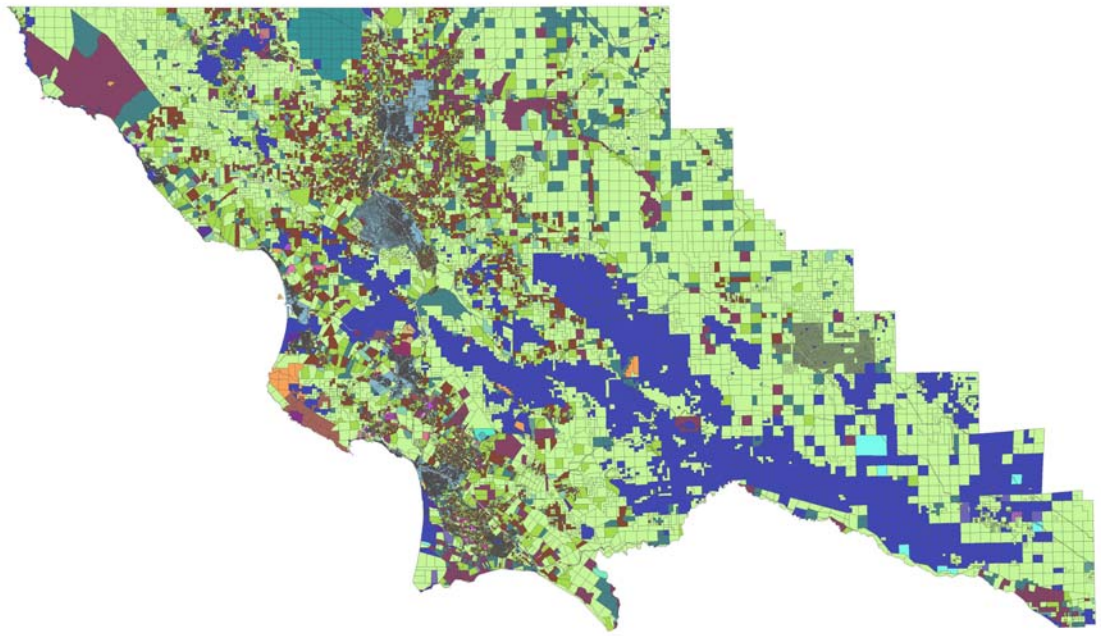
Step 6: Select parcels (from the remaining parcels 3475) that have an improvement value of more than $1000 and less than $20,000 and designate as "Vacant Aerial <= 20000 IMP" or "Developed Aerial <= 20000 IMP" and land use code type where applicable (total APNs = 1965).

Step 7: The remaining parcels (1513) have an improvement value ranging from 20228 – 7903723 and the PRIM_LUC indicates use other than residential. All parcels zoned as RMF, RSF, RS, RR and RL were viewed using aerial photography and determined to be either "Vacant Aerial" or "Developed Aerial" and land use code type where applicable (total APNs = 536).

Step 8: The remaining 977 parcels were sorted by land use category. All parcels zoned AG were viewed using aerial photography and designated status as “Vacant Aerial” or “Developed Aerial” and land use code type where applicable (total APNs = 890).

Step 9: The remaining 87 parcels, which have a zoning other than Residential or Agriculture and have an improvement value greater than $20,000 were viewed individually and status designated as “Vacant Aerial” or “Developed Aerial” and land use code type where applicable.

> * The assessor land use codes have been found to contain inconsistencies, errors and omissions. While it is impractical to view each parcel individually to verify which are developed or vacant, many parcels were viewed individually using the aerial photography to determine status.



Parcels

Status

- City
- Developed <= 1000 IMP - Airport Facility
- Developed <= 1000 IMP - Campground
- Developed <= 1000 IMP - Cemetery
- Developed <= 1000 IMP - Church
- Developed <= 1000 IMP - Dam
- Developed <= 1000 IMP - Drainage
- Developed <= 1000 IMP - Fire Dept
- Developed <= 1000 IMP - Govt Building
- Developed <= 1000 IMP - Greenhouse
- Developed <= 1000 IMP - Library
- Developed <= 1000 IMP - Lighthouse
- Developed <= 1000 IMP - Medical Facility
- Developed <= 1000 IMP - Nuclear Power Plant
- Developed <= 1000 IMP - Park
- Developed <= 1000 IMP - Parking Lot
- Developed <= 1000 IMP - Prison
- Developed <= 1000 IMP - Radar Site
- Developed <= 1000 IMP - Railroad
- Developed <= 1000 IMP - Recreation
- Developed <= 1000 IMP - Res
- Developed <= 1000 IMP - Reservoir
- Developed <= 1000 IMP - Road
- Developed <= 1000 IMP - School
- Developed <= 1000 IMP - Sewer
- Developed <= 1000 IMP - Sludge Site
- Developed <= 1000 IMP - Student Res
- Developed <= 1000 IMP - Utility
- Developed <= 1000 IMP - Water Facility
- Developed <= 1000 IMP - Water Pump
- Developed <= 1000 IMP - Water Tank
- Developed <= 1000 IMP - Well
- Developed <= 1000 IMP - Winery
- Developed Aerial - Campground
- Developed Aerial - Church
- Developed Aerial - Comm/Industrial
- Developed Aerial - Fire Dept
- Developed Aerial - Golf
- Developed Aerial - Government
- Developed Aerial - Govt Building
- Developed Aerial - Greenhouse
- Developed Aerial - Mining
- Developed Aerial - Oil Facility
- Developed Aerial - Parking Lot
- Developed Aerial - Post Office
- Developed Aerial - Recreation
- Developed Aerial - Res
- Developed Aerial - School
- Developed Aerial - Utility
- Developed Aerial - Water Company
- Developed Aerial <= 20000 IMP - Automotive
- Developed Aerial <= 20000 IMP - Campground
- Developed Aerial <= 20000 IMP - Church
- Developed Aerial <= 20000 IMP - Comm/Industrial
- Developed Aerial <= 20000 IMP - Dam
- Developed Aerial <= 20000 IMP - Food Service
- Developed Aerial <= 20000 IMP - Golf
- Developed Aerial <= 20000 IMP - Greenhouse
- Developed Aerial <= 20000 IMP - MH Park
- Developed Aerial <= 20000 IMP - Manufacturing
- Developed Aerial <= 20000 IMP - Meeting Hall
- Developed Aerial <= 20000 IMP - Motel
- Developed Aerial <= 20000 IMP - Office
- Developed Aerial <= 20000 IMP - Oil Facility
- Developed Aerial <= 20000 IMP - Park
- Developed Aerial <= 20000 IMP - Parking Lot
- Developed Aerial <= 20000 IMP - Res
- Developed Aerial <= 20000 IMP - Retail
- Developed Aerial <= 20000 IMP - Road
- Developed Aerial <= 20000 IMP - School
- Developed Aerial <= 20000 IMP - Warehouse
- Developed Aerial <= 20000 IMP - Water Company
- Developed Aerial/LUCode - Govt Building
- Developed Aerial/LUCode - Oil Facility
- Developed Aerial/LUCode - Recreation
- Developed Aerial/LUCode - Res
- Developed Aerial/LUCode - Winery
- Developed LUCode - Apartments
- Developed LUCode - Automotive
- Developed LUCode - Bank
- Developed LUCode - Campground
- Developed LUCode - Cemetery
- Developed LUCode - Church
- Developed LUCode - Comm/Industrial
- Developed LUCode - Common Area
- Developed LUCode - Food Service
- Developed LUCode - Golf
- Developed LUCode - Greenhouse
- Developed LUCode - Grocery Store
- Developed LUCode - HOX Res
- Developed LUCode - Laundromat
- Developed LUCode - MH Park
- Developed LUCode - Manufacturing
- Developed LUCode - Medical Facility
- Developed LUCode - Mini Storage
- Developed LUCode - Mixed Living 5 or more units
- Developed LUCode - Mortuary
- Developed LUCode - Motel
- Developed LUCode - Office
- Developed LUCode - Parking Lot
- Developed LUCode - Recreation
- Developed LUCode - Res
- Developed LUCode - Retail
- Developed LUCode - Shopping Center
- Developed LUCode - Warehouse
- Developed LUCode - Winery
- Lake
- Military Base
- Ocean
- Railroad
- Road
- Vacant <= 1000 IMP
- Vacant <= 1000 IMP - Campground
- Vacant <= 1000 IMP - Church
- Vacant <= 1000 IMP - Common Area
- Vacant <= 1000 IMP - Golf
- Vacant <= 1000 IMP - Government
- Vacant <= 1000 IMP - Marina
- Vacant <= 1000 IMP - Park
- Vacant <= 1000 IMP - Recreation
- Vacant <= 1000 IMP - School
- Vacant <= 1000 IMP - Utility
- Vacant Aerial
- Vacant Aerial - Government
- Vacant Aerial - Recreation
- Vacant Aerial <= 20000 IMP
- Vacant Aerial <= 20000 IMP - Common Area
- Vacant Aerial <= 20000 IMP - Government
- Vacant Aerial <= 20000 IMP - Recreation
- Vacant Aerial <= 20000 IMP - Utility
- Vacant Aerial/LUCode - Common Area
- Vacant Aerial/LUCode - Government

Part 2: Determination of Development Potential – Subdivision and Units.

Urban and Village Area Additional Development Potential Assumptions for County Master Water Plan

Vacant Land

To determine additional development potential on vacant parcels, use the following densities and intensities, except as shown below for particular communities. **Additional residential development potential should be multiplied by 0.9** to account for environmental and physical constraints and the likelihood that not all parcels will be developed to full potential.

RR: 5-acre parcel size; assign 1 dwelling unit per parcel
RS: 1-acre parcel size; assign one dwelling unit per parcel
RSF: 5 units per acre
RMF: 20 units/acre (only on parcels > or = to 6,000 ft.^{2}; otherwise, 1 unit)
O/P,CR: Floor area (ft.^{2}) = .2625 x total parcel area (ft.^{2})
(.2625 = .35 FAR x .75)
CS: Floor area (ft.^{2}) =.1875 x total parcel area (ft.^{2})
(.1875 = (.25 FAR x .75)
IND: Floor area (ft.^{2}) =.15 x total parcel area (ft.^{2})
(.15 = .20 FAR x .75)

Exceptions*:*
Note: RMF densities apply only on parcels > or = to 6,000 ft.^{2}; otherwise, 1 unit

Cayucos: RMF: 10 units per acre (planning area standard)
Cambria: RMF: 15 units per acre
Santa Margarita: RMF: 15 units per acre (due to septic)
Templeton: RSF: 4 units per acre (due to 7,500 ft.^{2} min. parcel size)
Oceano: RMF: 15 units per acre (planning area standard)
Nipomo: RMF: 15 units per acre (some planning area standards reduce density)
Whitley Gardens: RS: 2.5-acre minimum parcel size (planning area standard)

Shandon: SP- 6 Use draft plan buildout as follows:

RS: 88
RSF: 1,334
RMF: 426
AG: 25
Mixed-use: 284 residential, 332,000 ft.^{2} commercial
CS/Res.: 52 residential, 84,000 ft.^{2} commercial

CR: 10 residential, 241,500 ft.^{2} commercial
CS: 1 residential, 730,000 ft.^{2} commercial

Los Ranchos/ Edna Village: SP- 2 Use total buildout of 690 units as follows:
REC: 258
RR: 45
RS: 200
RSF: 187

Black Lake: SP-1 REC: 606

Woodlands: SP- 5 Residential development potential = 1,320 units as follows:

REC: 1,240 single-family, 60 multi-family, 500-unit hotel/resort + commercial on 28 acres
CR: 20 multi-family
CR: 140,000 ft.^{2}
CS: 350,000 ft.^{2}

Heritage Ranch: SP- 3 total development potential per planning area standards (2,900, including RV sites)

Oak Shores: SP- 4 additional potential per planning area standards (1,786 including RV spaces)

Rural Area Build-Out Assumptions for the Master Water Plan[1]

Planning Area	Category								
	AG	RL	RR	RS[2]	CS[4]/ IND[4]	CR[5]	REC	PF[3]	OS[3]
Adelaida	160	80[10]	5	N/A	N/A	N/A	No dev.	-----	-----
El Pomar-Estrella	160	80	5	2.5	N/A	N/A	No dev.	-----	-----
Huasna-Lopez	160	80	N/A	N/A	N/A	N/A	No dev.	-----	-----
Los Padres	160	160	N/A	N/A	N/A	N/A	N/A	-----	-----
Las Pilitas	160	80	10	N/A	N/A	2.5	20	-----	-----
Nacimiento	160	80	10	N/A	N/A	2.5	20	-----	-----
Salinas River	80	80	5	2.5	2.5 (CS)	2.5	No dev.	-----	-----
San Luis Bay	80	80	5	2.5	N/A	N/A	No dev.	-----	-----
San Luis Obispo	80	160	10	2.5	N/A	N/A	No dev.	-----	-----
Shandon-Carrizo	160	160	5[6]	N/A	N/A	N/A	N/A	-----	-----
South County	80	80[7]	5[8]	2.5	2.5 (CS) 10 (IND)	2.5	66 res. units[9]	-----	-----
North Coast	160	80	N/A	N/A	N/A	2.5	No dev.	-----	-----
Estero	160	160[10]	5	5	N/A	N/A	No dev.[11]	-----	-----
San Luis Bay	20 res.	80	N/A	N/A				-----	-----

(coastal)	units[12]								
South County (coastal)	80	No dev.	N/A	N/A	No dev. (IND)	N/A	No dev.	-----	-----

1. Numbers are assumed average minimum parcel sizes for new land divisions, unless otherwise indicated. Residential buildout potential is determined as follows:
   a. Determine the numbers of potential parcels using the minimum parcel sizes in the table, but use actual buildout numbers from the table where indicated
   b. Assign one dwelling unit per existing and potential parcel
   c. For purposes of the Master Water Plan, determine existing numbers of dwelling units by planning area, and then subtract that from the total number of dwelling units from b. above to yield additional residential development potential by planning area
   e. Multiply the additional residential development potential by 0.9 to account for environmental and physical constraints and the likelihood that not all parcels will be developed to full potential.
   f. Add the additional residential development potential from e. above to the number of existing residential units in the planning area to yield total residential buildout for the planning area.
2. Assume that ordinance changes will discourage community water systems in rural areas per COSE; some rural areas have planning area standards for 2.5-acre minimum parcel sizes
3. Assumes no additional development potential in these categories
4. Where parcel sizes are specified, determine development potential ($ft.^2$ of floor area) as follows:
   a. Determine total number of existing and potential parcels
   b. For each existing and potential parcel, development potential ($ft.^2$ of floor area) = parcel area x 0.18 floor area ratio
   c. Multiply the square footage from b. above by .75 to yield total commercial or industrial buildout. This accounts for environmental and physical constraints, possible existing residential development in Commercial and Industrial categories, and the likelihood that not all such parcels will be developed to their full potential (Commercial and Industrial categories are typically not built out to their zoning capacities).
5. Where parcel sizes are specified, determine development potential ($ft.^2$ of floor area) as follows:
   a. Determine total number of existing and potential parcels
   b. For each existing and potential parcel, development potential ($ft.^2$ of floor area) = parcel area x 0.20 floor area ratio
   c. Multiply the square footage from b. above by .75 to yield total commercial buildout; this accounts for environmental and physical constraints, possible existing residential development in Commercial and Industrial categories, and the likelihood that not all such parcels will be developed to their full potential (Commercial categories are typically not built out to their zoning capacities).
6. This area is adjacent to the Shandon URL and is to be included in an expanded URL per the draft Shandon Community Plan; if the buildout for this area is included in the buildout for the Shandon urban area, then do not assign buildout for this area
7. Replace residential buildout for Southland Area adjacent to Nipomo (RL on west side of 101; AG, RS and REC on east side of 101) with buildout for industrial park per planning area standard; use .25 FAR and do not adjust further, as the site is vacant, has minimal constraints, should be included in the Nipomo Urban Reserve Line, and should develop with full urban services. [APNs: 092-152-039 (RL); 092-153-048,032; 090-171-036,008,018,007)

8. Replace residential buildout for Canada Ranch adjacent to Nipomo with buildout for industrial park/retail/residential per planning area standard. This area should be included in the Nipomo Urban Reserve Line and develop with full urban services (APN: 091-301-041).
9. Assign 50 dwelling units in the REC category per Bartleson Ranch planning area standard (APNs: 047-311-008; 075-102-004,003) and 16 units in the REC category per Willow/ Via Concha planning area standard (APNs: 091-181-053,052)
10. No development potential on existing lots in the Morro Strand and Morro Rock View subdivisions
11. No further residential development in the REC category along Hwy. 41 occupied by the mobilehome and RV park and adjacent area (see limitation on use standard)
12. Total residential development potential in Cienega Valley assumes one dwelling per existing parcel--no additional subdivision potential; no residential development along Diablo coast

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DRAFT memorandum

date December 17, 2009

to Courtney Howard, San Luis Obispo County; Water Resources Advisory Committee (WRAC)

from Annika Fain, ESA

subject San Luis Obispo County Rural Water Demand Analysis (Appendix C)

Rural Water Demand

A water duty factor was applied to the number of dwelling units of unincorporated areas outside of land designated as rural or agricultural. The County Land Use ArcGIS® database was used to determine where rural residential land use exists and how many dwelling units (DU) exist. Also, the database was used to determine where the future development may occur and how many DU could be built. The rural water demand analysis in combination with the urban and agricultural demand analysis, confirmed that the existing rural water demand is less than 5 percent of the total water demand (including urban, agricultural, and rural) (ESA, 2009-Table 1) . The analysis confirmed that even if 75 percent or more of the available rural residential land is developed, then the countywide rural water demand would be less than 10 percent of the total water demand (ESA, 2009-Table 1). Prior to the County providing the County Land Use ArcGIS® to ESA, a number of steps were completed to update the countywide database. These are explained in detail in Appendix B (San Luis Obispo County, 2009). We followed a series of seven steps for this analysis.

County Land Use Analysis

The main steps ESA followed after receiving the County Land Use ArcGIS® layer are as follows:

Step 1: Created a rural land use ArcGIS® layer from existing County Land Use ArcGIS® layer.

- Opened the County Land Use file that includes approximately 120,000 parcels.
- Calculated existing acreage for all parcels (Calc_Acrge).
- Subtracted out all parcels that were located in areas where an urban demand has been defined by excluding areas within the URL, VRL, CSD, and CSA boundaries, as well as areas where agricultural demand has been calculated.
- Calculated new acreage for parcels that were partially in an urban or agricultural defined area (New_Acrge).
- Calculated the ratio of new acreage to existing ratio (Acge_Ratio).

- For those parcels where the ratio of new acreage over existing acreage was greater than 50%, an indicator was set to "1" (Acge_Ind). These were used in the rural demand calculations.
- For the parcels where the ratio of new acreage over existing acreage was less than or equal to 50% than the demand was calculated as an urban or agricultural parcel.
- Rural land use was analyzed for the remaining parcels (approximately 30,000 parcels)

Step 2: Grouped the remaining land use categories for further analysis. Many of these categories only had a few parcels associated with them after the urban and agriculture areas had been excluded.

- The "Residential" category included developed residential and other parcels that may have rural water demand associated with them. This makes up approximately 99% of the developed parcels.
  - The following four "Status" categories made up approximately 99% of the developed land use parcels: Developed Aerial – Res, Developed Aerial <= 20000 IMP – Res, Developed LUCode - HOX Res, and Developed LUCode – Res.
  - The other categories that are included in residential made up less than 1% of the total developed land use parcels: Developed Aerial – School, Developed Aerial <= 20000 IMP – Campground, Developed Aerial <= 20000 IMP - MH Park, Developed Aerial/LUCode - Govt Building, Developed LUCode – Apartments, Developed LUCode – Campground, Developed LUCode - Food Service, Developed LUCode - Medical Facility, Developed LUCode - MH Park, Developed LUCode - Mixed Living 5 or more units, Developed LUCode – Motel, Developed <= 1000 IMP – School, and Developed LUCode - Office
- The "Commercial/Industrial" category included developed commercial/industrial parcels that may have rural water demand associated with them. The total number of parcels in this category makes up less than 1% of the developed parcels. The following "Status" designations made up the commercial/industrial category.
  - Status = 'Developed <= 1000 IMP - Nuclear Power Plant' OR "Status" = 'Developed Aerial - Comm/Industrial' OR "Status" = 'Developed Aerial - Mining' OR "Status" = 'Developed Aerial - Oil Facility' OR "Status" = 'Developed Aerial <= 20000 IMP - Comm/Industrial' OR "Status" = 'Developed Aerial <= 20000 IMP - Manufacturing' OR "Status" = 'Developed Aerial <= 20000 IMP - Oil Facility' OR "Status" = 'Developed LUCode - Comm/Industrial' OR "Status" = 'Developed LUCode - Manufacturing'
- The "Other" category included areas where there was little or no rural water demand associated with the parcels. This category makes up less than 1% of the developed parcels remaining after subtracting agricultural and urban areas. The following "Status" designations were included in the category:
  - "Status" = 'Developed <= 1000 IMP - Cemetery' OR "Status" = 'Developed <= 1000 IMP - Dam' OR "Status" = 'Developed <= 1000 IMP - Lighthouse' OR "Status" = 'Developed <= 1000 IMP - Radar Site' OR "Status" = 'Developed <= 1000 IMP - Railroad' OR "Status" = 'Developed <= 1000 IMP - Recreation' OR "Status" = 'Developed <= 1000 IMP - Reservoir' OR "Status" = 'Developed <= 1000 IMP - Road' OR "Status" = 'Developed <= 1000 IMP - Sewer' OR "Status" = 'Developed <= 1000 IMP - Sludge Site' OR "Status" = 'Developed <= 1000 IMP - Utility' OR "Status" = 'Developed <= 1000 IMP - Water Facility' OR "Status" = 'Developed <= 1000 IMP - Water Pump' OR "Status" = 'Developed <= 1000 IMP - Water Tank' OR "Status" = 'Developed <= 1000 IMP - Well' OR "Status" = 'Developed Aerial - Recreation' OR "Status" = 'Developed

Aerial <= 20000 IMP - Dam' OR "Status" = 'Developed Aerial/LUCode - Recreation' OR "Status" = 'Developed LUCode - Automotive' OR "Status" = 'Developed LUCode - Church' OR "Status" = 'Developed LUCode - Grocery Store' OR "Status" = 'Developed LUCode - Mini Storage' OR "Status" = 'Developed LUCode - Recreation' OR "Status" = 'Developed LUCode - Warehouse' OR "Status" = 'Lake' OR "Status" = 'Railroad' OR "Status" = 'Road'

- The "Vacant" category included the followed Status designations established by the County. The majority of vacant parcels were classified by the County as 'Vacant <= 1000 IMP' and designated as parcels that could be developed. A summary of the vacant categories are as follows:

  – Residential Vacant: Status = 'Vacant <= 1000 IMP' OR "Status" = 'Vacant <= 1000 IMP - Campground' OR "Status" = 'Vacant <= 1000 IMP - School' OR "Status" = 'Vacant Aerial' OR "Status" = 'Vacant Aerial - Government' OR "Status" = 'Vacant Aerial <= 20000 IMP' OR "Status" = 'Vacant Aerial <= 20000 IMP - Government' OR "Status" = 'Vacant Aerial/LUCode - Government' OR "Status" = 'Vacant <= 1000 IMP - Government'

  – Other Vacant: Status = 'Vacant <= 1000 IMP - Common Area' OR "Status" = 'Vacant <= 1000 IMP - Marina' OR "Status" = 'Vacant <= 1000 IMP - Recreation' OR "Status" = 'Vacant Aerial <= 20000 IMP - Common Area' OR "Status" = 'Vacant Aerial/LUCode - Common Area'

Step 3: Divided the parcels by WPAs and assigned parcels. Some parcels were located in multiple WPAs.

- Recalculate acreages (Acge_Ind) for each parcel, including divided parcels.
- For those parcels where the ratio of new acreage over existing acreage was greater than 50%, an indicator was set to "1" (Acge_Ind).
- The divided parcels were assigned to the WPA where the majority of the parcel was located.

Step 4: Assigned a number of dwelling units for each residential and commercial/industrial category. The "Specific_P" and "Units" were defined by the County based on planning designations:

- For all existing developed parcels we assigned the following number of dwelling units (Exist_DU)

  – All "developed" = 1 (DU)
  – All "vacant" = 0 (DU)
  – Other = 0 (DU)

- For all future developed parcels we assigned the following number of dwelling units (Future_DU)

  – For "Specific_P" = FAR (Floor Area Ratio) & "Specific_P"= Note7-FAR, then Future_DU = 1 (DU). Since FAR numbers of units are not defined by a parcel, we have assumed that each FAR parcel will have 1 DU associated. This may result in an underestimate of future FAR units, but the total number of FAR units

  – All other "Specific_P":

    ▪ For "Units" > 0, then Future_DU="Units" [e.g. 2, 3]
    ▪ For "Units" = 0 AND "Exist_DU=0, then Future_DU=0

        - For "Units" = 0 AND "Exist_DU=1, then Future_DU=1

Step 5: Assigned a water duty factor (AF/DU) for each of the designated categories:

- Existing water duty factors were assigned (Ex_AF_DU):
  - Residential-Existing
    - 0.8 AFY/DU for planning area 1-7
    - 1.0 AFY/DU for planning area 8-16
  - Commercial Industrial
    - 1.5 AFY/DU for all planning areas
- Future water duty factors were assigned (Fut_AF_DU):
  - Residential-Future
    - 0.6 AFY/DU for planning area 1-7
    - 0.8 AFY/DU for planning area 8-16
  - Commercial Industrial
    - 1.5 AFY/DU for all planning areas

Step 6: Calculated the rural water demand for each WPA:

- Existing rural demand (Exist _AFY)
  - Multiply Exist_DU and Ex_AF_DU
- Future rural demand (Future _AFY)
  - Multiply Future_DU and Fut_AF_DU

Step 7: Summarized the rural water demand for each WPA:

- Created summary pivot tables from rural land use ArcGIS® layer
- Linked the pivot table to the rural demand summary excel file, as well as the total demand excel file.

References

Environmental Science Associates (ESA), San Luis Obispo County Water Demand Analysis Methodology and Results, December 2009.

San Luis Obispo County, San Luis Obispo County ArcGIS® Land Use Methodology Report, San Luis Obispo County, 2009.

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DRAFT memorandum

date December 17, 2009

to Jose Gutierrez, Carollo; Lou Carella, Carollo

from Justin Gragg, ESA; Annika Fain, ESA

subject SLO County MWP, Environmental Water Demand Estimates (Appendix D)

Purpose and Scope

San Luis Obispo County (County) has experienced multiple droughts, degradation of groundwater, and is faced with increasingly limited water supplies. The County is preparing an updated County Master Water Plan (MWP). The previous version of the MWP was completed in 1998. Since then, there have been many changes to the water resources within the County, including the completion of local and regional water management plans, formation of the Integrated Regional Water Management Plan (IRWMP), new water sources, new water users, and new water regulations. The updated MWP will incorporate these changes and provide all entities in the County with information to help effectively and efficiently manage water resources to protect ecosystems, public health and safety, and agriculture.

The updated MWP will include water supply and demand estimates for the entire County for existing and future conditions. Water demand estimates will be divided into the following categories: Agricultural, Urban, Rural, and Environmental. The following presents the approach, methodology, and results of the Environmental Water Demand (EWD) analysis for the County Watershed Planning Areas (WPAs) (as applicable).

Approach

For the purposes of the MWP, the term “Environmental Water Demand” is herein defined as the amount of water needed in an aquatic ecosystem, or released into it, to sustain aquatic habitat and ecosystem processes. Of course, natural riverine ecosystems are highly complex and often very dynamic, being controlled by a number of physical processes, containing a variety of distinct habitat types, and supporting a wide variety of aquatic species. Thus, it is often necessary to identify a target species, or group of species, whose habitat requirements are well-enough defined to allow for the development of a reasonable estimation of the amount of water needed to support these species. Furthermore, the target species, or group of species, should be widely recognized as an indicator species (i.e., a species whose habitat requirements are sensitive enough to allow for successful identification of environmental problems, yet broad enough to adequately represent a wide array of aquatic species). For the purposes of the EWD analysis, the federally threatened south-central California coast steelhead (*Oncorhynchus mykiss*) was used as the primary indicator species. Although numerous other listed and non-listed native aquatic

species occur throughout the County, a large proportion of these species typically thrive in water bodies known to support steelhead. Furthermore, the threatened status of steelhead requires careful consideration of potential impacts to the species from future projects, including water development projects.

EWD is most commonly described and quantified in terms of instream flow requirements (i.e., the amount of water that must remain in the creek or river to support the various life stages of the target or indicator species). Numerous methodologies have been developed over recent decades for the purposes of quantifying instream flow requirements for steelhead and other salmonid species. These range from very simplistic estimations, such as the "Montana Method" (Tennant, 1976), to very site-specific and data-intensive assessments, such as the widely applied Instream Flow Incremental Methodology (IFIM) and its component Physical Habitat Simulation Model (PHABSIM), developed in the 1970's by the U.S. Fish and Wildlife Service (USFWS). The advantages and disadvantages of the various methodologies have been discussed extensively in the scientific literature and technical publications. We evaluated the relative merits and shortcomings of a number of available methodologies to determine the most appropriate approach to use for estimating EWD. Based on a number of selection criteria, including regional applicability, scientific support and justification, scale of the assessment (i.e., county-wide), and the feasibility and efficiency of the overall approach, we chose to apply a peer-reviewed methodology developed by Hatfield and Bruce (2000), *Predicting Salmonid Habitat-Flow Relationships for Streams from Western North America*.

The Hatfield and Bruce (2000) methodology is based on the authors' review of over 1,500 habitat-flow relationship curves developed during 127 site-specific PHABSIM studies from throughout the western United States. The authors developed predictions regarding the flow requirements for salmonids in this region and tested whether habitat-flow relationships for salmonids were related to watershed characteristics and geographic location. Their research found that mean annual discharge (MAD) was the best predictor for optimum flow, and that improvements in the predictive power of the regression model was sometimes possible with the addition of longitude and latitude coordinates (Hatfield and Bruce, 2000). As is the case in many regression-derived predictive models, a number of statistical uncertainties are inherent in this approach, and the authors provide a thorough discussion of the applicability of their methodology, including explicit cautions that site-specific follow-up assessments would be warranted in many situations. However, the largely planning-level focus of the Hatfield and Bruce (2000) approach appears to lend itself particularly well to the development of EWD estimates on a regional scale, recognizing that more detailed assessment will likely be required in support of future site-specific water development projects.

Implementation

During PHABSIM assessments, optimum flow ranges are typically developed for different life stages of the target species. Since their methodology is based on a review of numerous PHABSIM studies, Hatfield and Bruce (2000) also present optimum flow relationship equations for four distinct life stages of steelhead (i.e., fry, juvenile, adult, and spawning). Distinguishing between the flow needs of different life stages provides fisheries managers with the tools necessary to maximize suitable flow conditions according to life stage. However, this approach presents a minor difficulty for a broad-scale EWD assessment. For example, one life stage of steelhead, juveniles, is present year-round, and all four life stages may be present simultaneously during the spring. This raises the question of which optimal flow is in fact "optimal" at any given time of the year. In other words, which life stage equation should be used to determine yearly EWD? We elected to use two representative life stages in the assessment of EWD. If flow conditions are suitable for the adult life stage during the winter and early spring, then spawning can occur even though the physical spawning capacity of the water course in question may not be maximized. Similarly, if summer and fall flow conditions are suitable for juvenile steelhead, then the slower,

shallower channel margin habitat preferred by fry is typically also present. Therefore, we chose to use Hatfield and Bruce's (2000) adult equation to determine EWD during the adult/spawning season of December through April, and the juvenile equation to determine EWD during the May through November rearing period.

As discussed, we have selected steelhead as our target/indicator species, and have selected the adult and juvenile flow prediction equations to represent EWD on an annual basis. However, the County contains numerous minor, seasonal drainages, as well as larger watersheds (particularly within the eastern half of the County), that do not support steelhead and are unlikely to have supported the species historically. Although fish use of seasonal drainages is limited, these streams nevertheless serve an important ecological function for a number of other aquatic species, including amphibians, reptiles, and invertebrates. Moreover, many of these streams ultimately flow into larger drainages that do support fisheries resources, including steelhead. The same can be said for some of the larger watersheds not known to support (presently or historically) steelhead. A consistent, comparable, and broadly-applicable methodology for assessing EWD in relation to another species or habitat characteristic, for areas where steelhead may not have existed historically, was not available. However, it would not be reasonable to exclude such areas from the EWD estimate, which has a broad ecological connotation, based solely on whether or not steelhead are currently or were historically present. Further, relatively simple adjustments can be made to the values derived from the Hatfield and Bruce (2000) methodology to better account for the seasonality of flow within particular watersheds of WPAs. Therefore, it is assumed that, in general, the Hatfield and Bruce (2000) approach leads to a reasonable estimate of EWD (i.e., the amount of water required for optimum ecological function), regardless of whether or not the watershed of interest has historically supported steelhead.

Methods

The Hatfield and Bruce (2000) methodology requires MAD estimates for each watershed of interest. In order to reflect an accurate estimate of EWD, the MAD discharge should represent unimpaired (or natural) flow conditions and should be reflective of a relatively long time period (i.e., longer than 30 years). Mean daily flow values from stream gaging stations representative of long-term, unimpaired flow conditions were used to derive MAD estimates within the different WPAs. The overall methodology for the calculation and extrapolation of unimpaired MAD estimates generally follows the approaches presented by Ries and Friesz (2000) and Mann et al. (2004).

Selection of Index and Study Stations

Following the approach presented by Mann et al. (2004), candidate Index and Study-stations were identified from a list of existing and historic stream gaging locations within the County and adjacent counties. An Index-station is defined as a stream gage that is representative of long-term, unimpaired flows conditions (i.e., the mean daily flow record does not need to be adjusted or extended); a Study-station is defined as a stream gage that has a period of record shorter than desired but is representative of unimpaired flow conditions. As such, the record of mean daily flow values for the Study-station could be extended, or adjusted, to a period concurrent with that of an Index-station if a reliable and reasonable relationship exists. Thus, the differences between records would be due to differences in climatic or drainage basin characteristics and not to the fact that different periods of time are being represented. Most of the stations used in the analysis were those of the U.S. Geological Survey (USGS) and the remainder were installed or taken-over by the San Luis Obispo County Flood Control and Water Conservation District (District).

Index-stations were selected based upon having a period of record longer than 30 years, being representative of unimpaired flow conditions, and not exhibiting any long-term trends in the mean daily flow data. To determine

whether or not flow conditions could reasonably be considered unimpaired, the USGS Annual Water Data Report (WDR) was consulted for each gage location of interest for the last, or most recent, year of operation. If the USGS WDR indicated that there was no upstream regulation or diversion, the gage location was considered to be representative of unimpaired flow conditions. If the USGS WDR indicated that there was no upstream regulation but there were small diversions (e.g., small domestic diversion, stock ponds, etc.), or if the gage was one managed by the District (e.g., information equivalent to that found in the USGS WDR was not available), then the face-value amount of the upstream water rights (i.e., diversions) was determined through searching the State Water Resources Control Board's (SWRCB) Water Right Information Management System (WRIMS) (SWRCB, 2009). If the total face-value of the upstream permitted or licensed (or otherwise recognized by the SWRCB) diversions was less than one percent of the MAD of the gage of interest, then that location was considered to be representative of unimpaired flow conditions. Otherwise, the gage location was eliminated from further consideration in the analysis.[1]

Study-stations were selected based upon having a common (i.e., with the eventual study period) period of record longer than 8 years and being representative of unimpaired flow conditions. Determination of whether or not the Study-station mean daily flow record could reasonably be considered representative of unimpaired flow conditions followed the same methodology as described above for the Index-stations.

In order to adjust Study-station flows using the long-term Index-station records, tests for trends in the Index-station flow data were carried out. Improper regression or correlation can result if trends are evident in the long-term record for the region or for individual Index-stations (e.g., if trends are evident in the long-term Index-station records, then using these stations to adjust and extend short-term records may lead to substantially more error in the estimates). Trend tests involved first plotting mean annual flow versus year for each potential Index-station for qualitative detection of trends in the data. Kendall τ correlation tests (at the 0.05 significance level; Helsel and Hirsch, 2002) were then run on each Index-station's mean annual flows to quantitatively determine if any long-term trends were evident. No regional or individual station long-term trends were detected.

Based upon the criteria described above, two Index-stations were selected from the study area (i.e., the County and areas immediately adjacent): Lopez Creek near Arroyo Grande (Index-station 1; USGS 11141280) and the Nacimiento River below Sapaque Creek near Bryson (Index-station 2; USGS 11148900) (**Table D1; Figure D1**). The study period (i.e., the period for which the existing, average annual EWD estimates were made), based upon the Index-stations' common period of record, was selected as water year (WY) 1972-2008.[2] These two stations are at opposite extremes with respect to the overall flow regime (**Figure D2**): Lopez Creek is a relatively small, perennial stream and the Nacimiento River is a relatively large and ephemeral stream. Six Study-stations were ultimately selected from the study area: the Sisquoc River near Sisquoc (Study-station 1; USGS 11138500), Arroyo Grande above Phoenix Creek near Arroyo Grande (Study-station 2; USGS 11141150), Los Berros Creek near Nipomo (Study-station 3; USGS 11141600), Arroyo de la Cruz near San Simeon (Study-station 4; USGS 11142500), the Salinas River near Pozo (Study-station 5; USGS 11143500), and Salsipuedes Creek near Pozo (Study-station 6; USGS 11144200) (**Table D1; Figure D1**). For each Index and Study-station, information

[1] If there were many (i.e., more than 10) water rights upstream of a given station location, then that station was eliminated based solely upon the number of recorded water rights and, due to scope and budget limitations, the face-value of the water rights was not determined; nor was it determined whether or not the time period of the water right was concurrent with that of the station location of interest.

[2] A water year (WY) begins on October 1 of the previous year and ends on September 30 of the designated WY. For example, WY 2004 comprises the period of October 1, 2003 through September 30, 2004.

related to the USGS WDR and/or water rights is presented in **Attachment 1**. The results of the Kendall τ correlation tests on the mean annual flow values for Index-stations 1 and 2 are presented in **Attachment 2**.

TABLE D1
INDEX AND STUDY STATIONS

Station	Site Name	Site ID/no.	Drainage Area (sq. miles)	Flow Regime	Period of Record (Water Years)
Index Station 1 (Ind1)	Lopez Creek	USGS 11141280	20.9	Perennial	1968-2008
Index Station 2 (Ind2)	Nacimiento River	USGS 11148900	162.0	Ephemeral	1972-2008
Study Station 1 (Std1)	Sisquoc River	USGS 11138500	281.0	Perennial	1944-1999
Study Station 2 (Std2)	Arroyo Grande	USGS 11141150	13.5	Perennial	1968-1992
Study Station 3 (Std3)	Los Berros Creek	USGS 11141600	15.0	Perennial	1969-1978[a]
Study Station 4 (Std4)	Arroyo de la Cruz	USGS 11142500	41.2	Ephemeral	1951-1979
Study Station 5 (Std5)	Salinas River	USGS 11143500	70.3	Perennial	1943-1983
Study Station 6 (Std6)	Salsipuedes Creek	USGS 11144200	5.9	Ephemeral	1970-1983

[a] Based on data from the USGS for these water years

Regression Analysis and Mean Annual Discharge

Regression analysis was used to extend the mean daily flow record of each Study-station to cover the entire study period, WY 1972-2008. Study-station-Index-station pairings were based primarily on proximity of the stations to one another. In cases where the regression relationship was not strong or clear, both Index-stations were used in order to determine which one, if any, provided the most reliable relationship with respect to mean daily flow values.

Similar to the approach described by Ries and Friesz (2000), the relationship between Index-station and Study-station mean daily flow values were evaluated over a concurrent period (i.e., the period of overlap in the mean daily flow record of each station). First, the log-transformed (base 10), concurrent mean daily flow values at a Study-station were plotted versus the log-transformed mean daily flow values at the selected Index-station. A mathematical (i.e., ordinary least squares) correlation method was used when the subsequent relationship appeared linear, and a graphical method was used when the relationship illustrated curvature or otherwise appeared non-linear. Both methods assume that the relation between the mean daily flow at the Study-station and the Index-station remains constant with time (this is why trend testing of the Index-stations is important), and thus the relation between the concurrent period mean daily flows can be used to estimate flow statistics that represent long-term conditions. Once a reliable mathematical or graphical relationship was established, the statistic of interest (e.g., long-term MAD) for the Index-stations was used to compute the statistic of interest for each Study-station.

For the mathematical correlation between the log-transformed data, the regression coefficient of determination (R^2) for Index-station daily mean flows versus Study-station daily mean flows was required to be greater than 0.8 for concurrent flow data. The Index-station MAD (or statistic of interest) was then log-transformed, entered into the ordinary-least-squares regression equation, and the equation was subsequently solved for the Study-station value (e.g., MAD for WY 1972-2008).

For the graphical correlation, the method was applied by plotting the original (non-log) values of concurrent mean daily flows on log-log paper and drawing a smooth curve through the plotted points that appears to best fit the data (Ries and Friesz, 2000). Next, the MAD (or statistic of interest) for the Index-station was entered into the

curve of relation and the corresponding value for the Study-station was read from the graph. In this approach, the relationship between the two stations was most important for the range of flows near the MAD value for the Index-station. As such, if the relationship was not strong below this range (i.e., at the low end of the relation, as is often the case with log-log plots), the Study-station was not necessarily automatically discarded. Further, if an ordinary-least-squares regression line appeared to best describe the relationship of the data (i.e., if the ordinary-least-squares regression line was essentially the same as that which was drawn in by hand), then the subsequent regression equation was used to predict the MAD (or statistic of interest) value for the Study-station. If a reliable relationship (mathematical or graphical) did not exist the Study-station was discarded from further analysis. The Index-station-Study-station relations used in this analysis are included in **Attachment 3**.

Weighted Mean Annual Discharge

If the period of record for a Study-station comprised one-half or more of the study period, then a weighted MAD was calculated. In this case, the MAD was calculated from the Study-station mean daily flow values over the period of record, and the MAD for the remainder of the study period was calculated using the regression relation. The final MAD was calculated as a weighted average of the two values. For two Study-stations, the Sisquoc River (Study-station 1) and Arroyo Grande (Study-station 2), a weighted MAD was calculated (**Attachment 4**).

Extrapolation of Mean Annual Discharge Values

Once the unimpaired MAD estimates were calculated for the Index- and Study-stations, these values were then used to estimate the MAD for other watersheds and WPAs through extrapolation. To do this, the WPAs were further subdivided into individual sub-watershed areas (**Figure D3**). The delineation of sub-watersheds within the WPAs was done using ArcGIS® and was based upon the watershed delineation data provided by the District (San Luis Obispo County, 2000). The area (in square miles) and coordinates (longitude and latitude of the watershed mid-point) of each sub-watershed were also calculated within ArcGIS®. Sub-watershed areas were generally delineated (and aggregated) for the point at which the particular river or stream exited the WPA. As a result, the sub-watersheds draining east (to the Salinas River valley) are generally much larger than the coastal sub-watersheds. In some cases these larger sub-watershed areas were further sub-divided based upon a particular feature (e.g., lake or reservoir) or a particularly large tributary (e.g., Paso Robles Creek). It is important to note (as explained in more detail below, *Assumptions and Sources of Uncertainty*) that the unit optimal flow values derived from Hatfield and Bruce (2000), and ultimately the EWD estimates, are in part dependent upon the size of the drainage area (i.e., larger drainage areas have smaller unit optimal flow values, and vice versa).

Once the sub-watershed areas were delineated, the unit MAD (cubic feet per second [cfs] per square mile) was calculated for each of the Index- and Study-stations. The unit MAD values were then applied to each of the sub-watersheds in order to derive a MAD estimate for the entire sub-watershed based on its area. The extrapolation of Index- and Study-station unit MAD values to other sub-watershed areas was done qualitatively based upon proximity as well as similarities in mean annual rainfall (PRISM, 2007) and overall topography. In some cases, more than one unit MAD value was used for a given sub-watershed, in which case the unit MAD value ultimately used represented an average. Unit MAD values for the Index- and Study-stations, as well as for each of the sub-watersheds (including a list of which Index- and Study-station unit MAD values were used in the derivation of the unit MAD for each of the sub-watersheds), are listed in the tables comprising **Attachment 5**.

The eastern portion of the County (i.e., WPAs 9, 10, 11, 14, and 15) was ultimately excluded from the EWD analysis due to the lack of data and regional physiographic differences. No unimpaired flow data were available for WPAs 9, 10, 11, 14, and 15. All of the available unimpaired flow data were for stations in the western portion

of the County. Substantial differences in mean annual rainfall, topography, and geology precluded a reliable extrapolation of the Index- and Study-station unit MAD values to these eastern areas of the County.

Environmental Water Demand

Once the MAD was calculated for each sub-watershed, the equations presented by Hatfield and Bruce (2000) were used to derive the EWD estimate (as described above). An EWD flow value was calculated for the period December through April (i.e., adult demand) and for the period May through November (i.e., juvenile demand). The following are the relevant equations as presented by Hatfield and Bruce (2000):

$$\log_e(optimum\_juvenile\_flow) = -8.482 + 0.593 \cdot \log_e(MAD) + 2.555 \cdot \log_e(latitude)$$

$$\log_e(optimum\_adult\_flow) = 1.105 + 0.737 \cdot \log_e(MAD)$$

Where optimum flow and MAD are in cfs and latitude is in decimal degrees.

For each period the flow value was converted to a total volume (i.e., acre-feet) based upon the average number of days within the period, and the two volumes were then summed to derive a total annual EWD estimate for each sub-watershed. For the juvenile period (May through November) an additional adjustment was made to better account for the generally ephemeral nature of the study area (i.e., assuming that all days in the May through November period would normally have flow under natural, or unimpaired, conditions is not reflective of the regional hydrologic regime). At the scale of the sub-watersheds used in this analysis (i.e., relatively large), most (if not all) of the coastal watersheds, as well as the larger watersheds to the east, are naturally ephemeral. Those reaches that are perennial tend to be in the small, headwater-type watersheds (though there are exceptions within the study area, such as the Sisquoc River – though the Sisquoc River is not within the County). Based upon the mean daily flow data for the Nacimiento River Index-station, which indicate that the river is dry approximately 30 percent of the time, a regional adjustment was made to the annual EWD estimates: it was assumed that all of the sub-watersheds were dry for 30 percent of the time (i.e., for approximately 110 days). The optimum flow values and EWD estimates for each sub-watershed and WPA are presented in the tables of Attachment 5; the annual EWD estimates for each WPA are also summarized below in **Table D2**.

TABLE D2
MEAN ANNUAL DISCHARGE AND ENVIRONMENTAL WATER DEMAND ESTIMATES

WPA (#)[a]	WPA Name	Estimated Unimpaired Mean Annual Discharge (MAD) (AFY)	Environmental Water Demand (EWD) (AFY)
1	San Simeon	104,491	72,975
2	Cambria	87,049	51,463
3	Cayucos	33,340	26,162
4	Morro Bay	43,433	27,878
5	Los Osos	8,199	7,045
6	SLO/Avila	45,816	33,034
7	South Coast	49,103	32,956
8	Huasna Valley	34,217	25,019
12	Santa Margarita	46,633	32,850
13	Atascadero/Templeton	74,088	41,006
16	Nacimiento	251,124[b]	108,390 [b]

[a] The eastern portion of the County (i.e., WPAs 9, 10, 11, 14, and 15) was ultimately excluded from the EWD analysis due to the lack of data and regional physiographic differences. No unimpaired flow data were available for WPAs 9, 10, 11, 14, and 15.

[b] Estimates include the watershed area for the Nacimiento River Index-station (162 square miles); though the Index-station is within WPA 16, most of the watershed area is not.

Assumptions and Sources of Uncertainty

The following list summarizes some key assumptions and sources of uncertainty for the presented estimates of EWD:

- The EWD estimates presented here are based upon the habitat requirements of steelhead (*Oncorhynchus mykiss*), and this approach and methodology therefore assumes that the steelhead is an appropriate target species for the study area;

- For the Nacimiento River Index-station and most of the Study-stations, the coefficient of variation (CV)[3] for the mean daily flows was beyond the range (i.e., higher than) reported by Hatfield and Bruce (2000) for their study sites. This reflects the fact that the flow regime in our study area (i.e., the County and surrounding areas) is generally more ephemeral and variable than that of the collective region analyzed by Hatfield and Bruce (2000) Therefore, extrapolation using the MAD at these stations may lead to overestimates of the optimal flow value (and, subsequently, the EWD) for the sub-watershed areas. This is because the MAD value at these stations is disproportionately influenced by large flows and these watersheds are predominantly ephemeral;

- A few of the sub-watershed areas had estimated MAD values below the range reported by Hatfield and Bruce (2000) for their study sites (i.e., below 4.1 cfs). The reliability of the Hatfield and Bruce (2000) methodology in this low range of MAD values is unclear and has not been tested. In fact, the optimal flow values calculated for the very small sub-watershed areas in our study area (i.e., those with estimated MAD values less than approximately 10 cfs) were often greater than the estimated MAD values, in which case the annual EWD was assumed to equal the MAD.

- The prediction intervals for the Hatfield and Bruce (2000) equations are relatively large, primarily reflecting statistical uncertainty and other sources of error;

- Regional variation in rainfall is not quantitatively accounted for in extrapolating the mean annual discharge estimates for the Index and Study-stations to other areas;

- As stated in the scope of work, the estimates of EWD presented here do not include "geomorphic" flows. In other words, in calculating an annual EWD for a given watershed, consideration was not given to the particular range of flows typically responsible for the maintenance of channel form and, ultimately, function over time;

- The unit EWD (i.e., demand per unit area, such as acre-feet per square mile) is, in part, dependent upon the drainage area to the point of interest, and the relationship between unit EWD and drainage area is generally not linear. In some cases the unit EWD is inversely related to drainage area (i.e., the EWD volume per unit area *increases* as drainage area *decreases*). As a result, dividing large watershed areas (e.g., WPA 12 or 13) into smaller sub-watersheds, and subsequently summing the EWD estimates from the smaller sub-watersheds, would likely lead to a higher total EWD estimate for the overall watershed area of interest. It is assumed that the delineation of sub-watersheds employed here is reasonable for the purpose of estimating EWD.

- Planning-level assessments such as this one do not take the complexity of natural systems into consideration. While our results provide a reasonable and scientifically supported estimation of Environmental Water Demand for the purposes of water planning, site- and project-specific instream flow requirements should be completed for all future water development projects.

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[3] The coefficient of variation (CV) is a statistical measure of variability and is calculated as the standard deviation divided by the mean.

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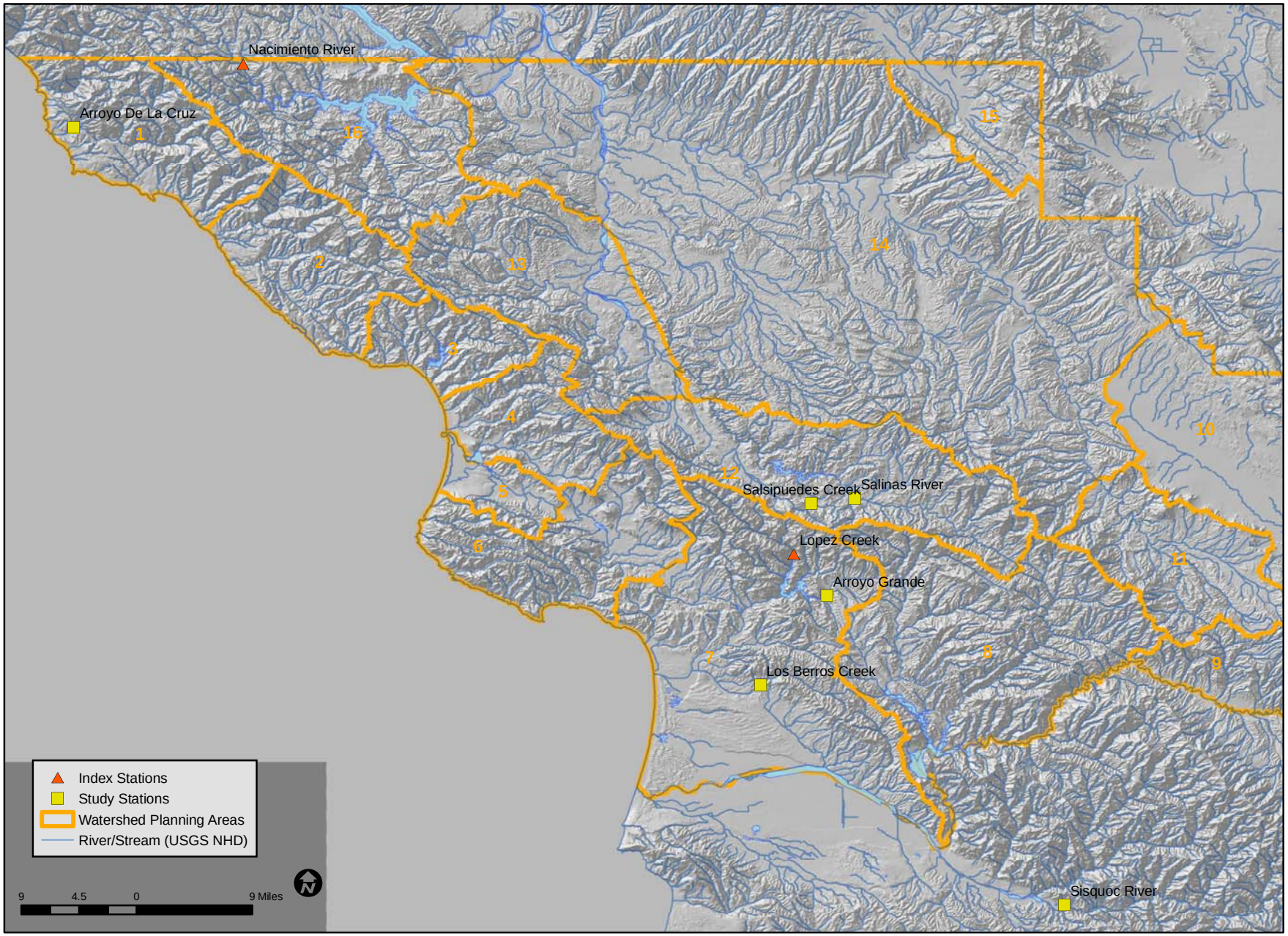
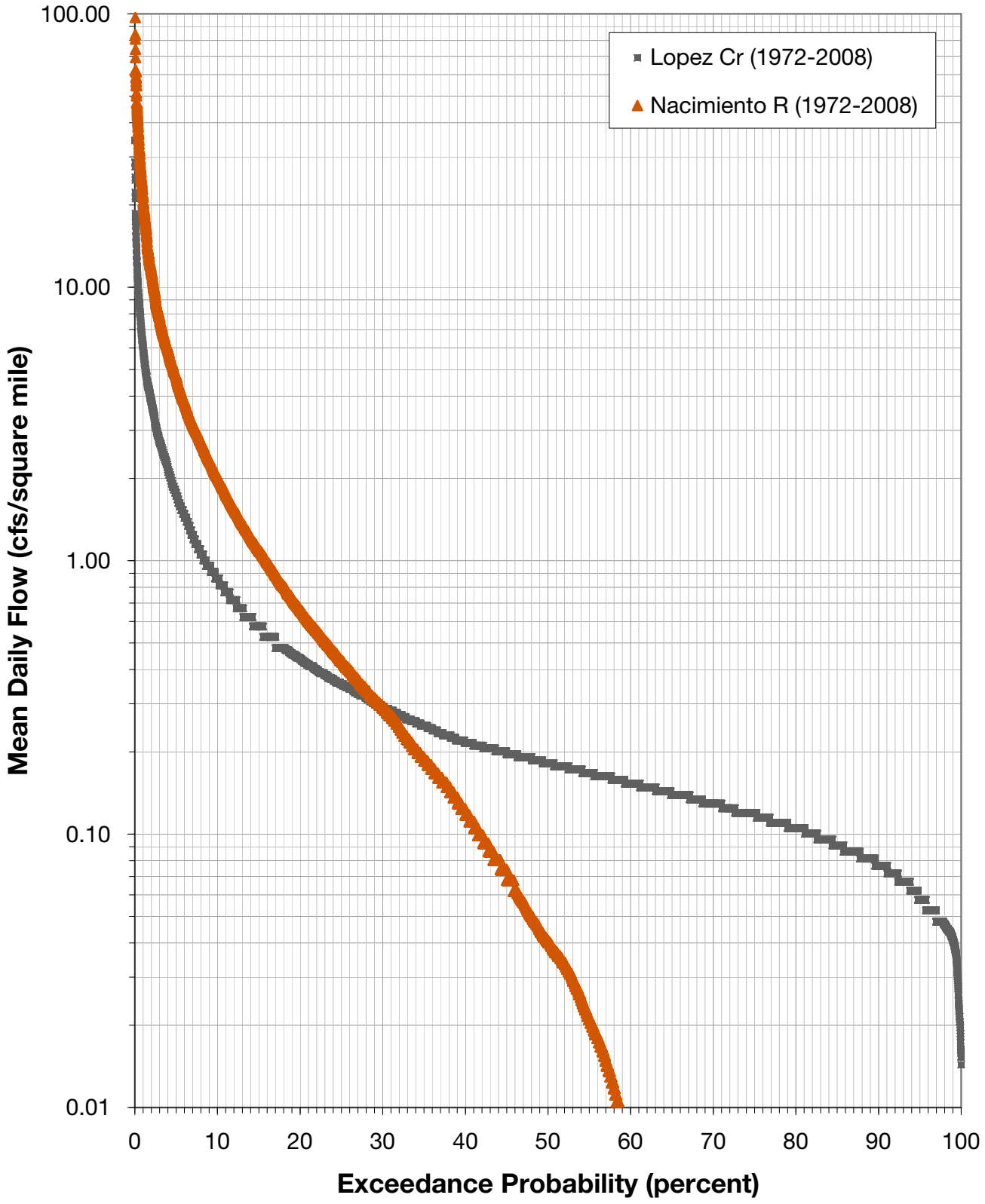


SOURCE: USGS, 2009; ESA, 2009; USEPA, 2005; San Obispo County, 2000 & 2009

San Luis Obispo Master Water Plan . 208691

Figure D1

Index and Study Stream Gage Stations



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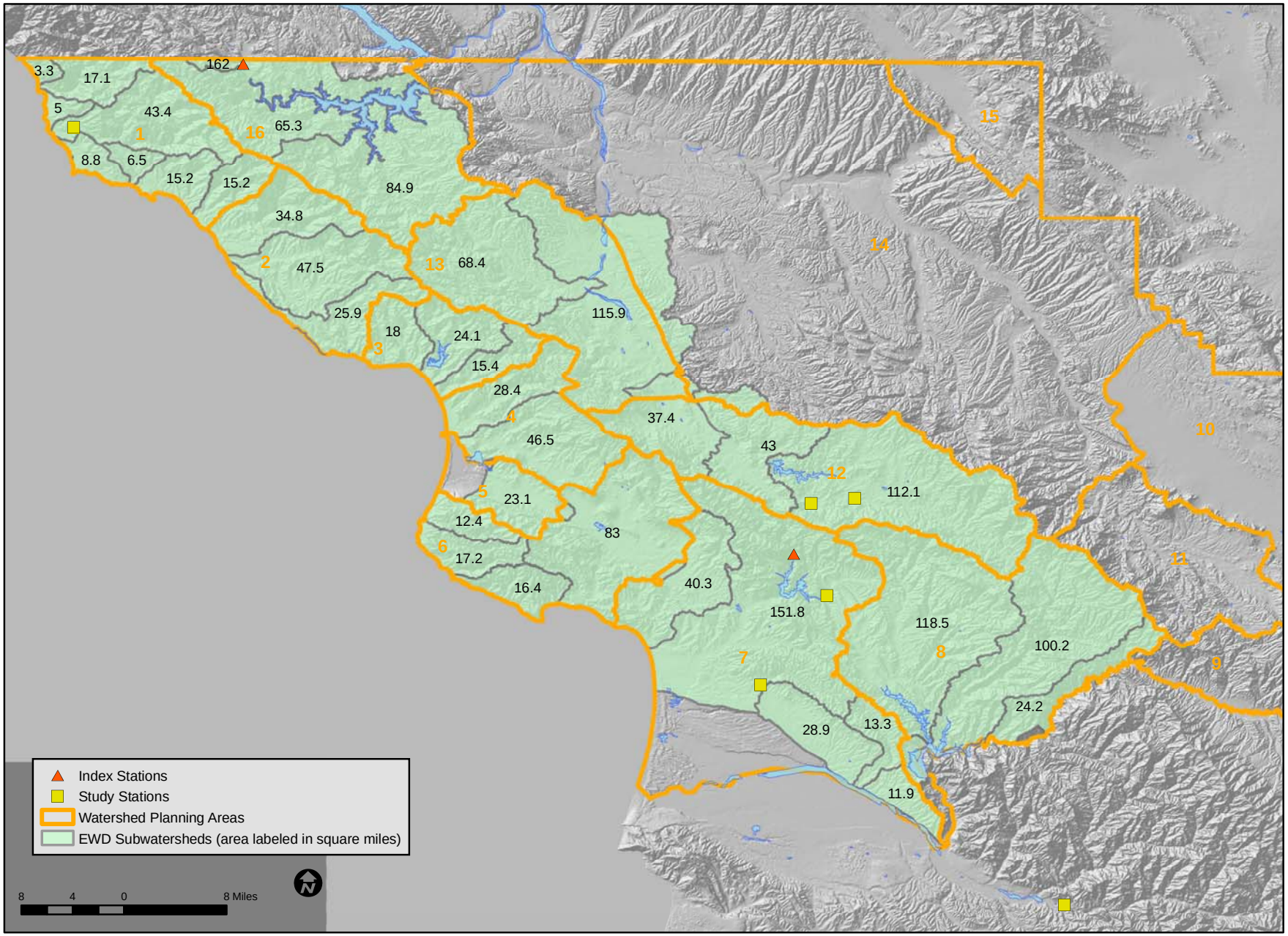
SOURCE: USGS, 2009; ESA, 2009

Figure D2

Mean Daily Flow at Index Station Stream Gages



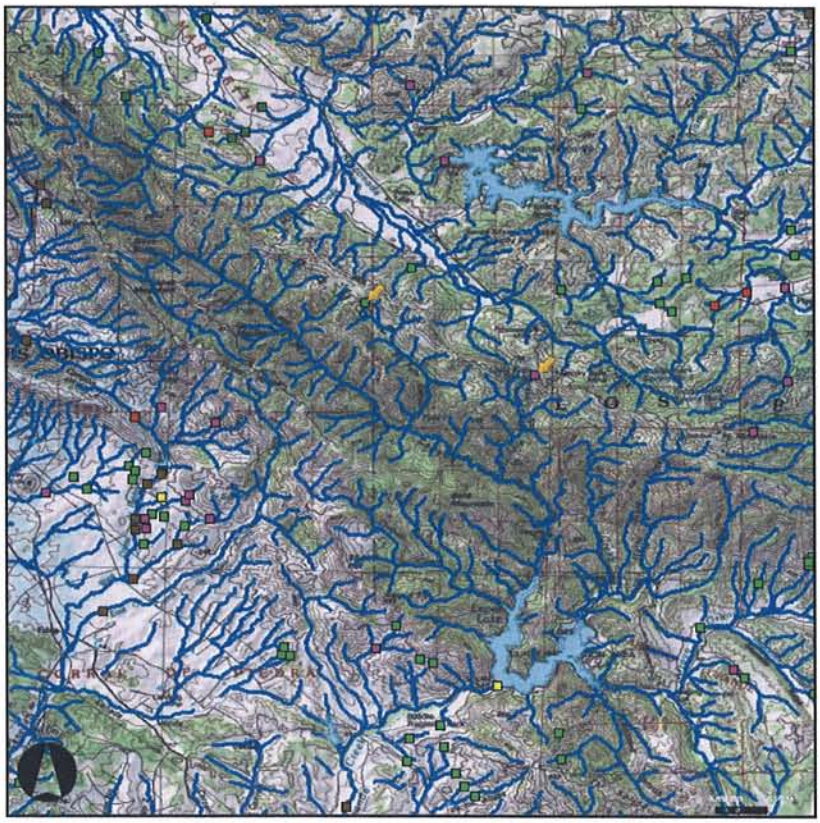
SOURCE: USGS, 2009; ESA, 2009; San Obispo County, 2000 & 2009

Figure D3

Subwatersheds Used for Environmental Water Demand Analysis

Attachment 1

USGS Water Data Reports and SWRCB Water Rights Information



water rights upstream of
USGS 11141280
Lopez Cr

Points of Diversion (1)

Points of Diversion (1)

Points of Diversion
- Adjudicated
- Cancelled
- Certified
- Claimed
- Claimed - Local Oversight
- Inactive
- Licensed

Points of Diversion (continued)
- Pending
- Permitted
- Registered
- Revoked
- State Filing
- Temporary

Lakes (1:24K)

Rivers (1:24K)

NGS USA Topographic Maps

Select POD Results

Points of Diversion (1)

POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTER
894	A021268	01	A021268_01	30	S	14	E	28		SE	SE

Select POD Results

Points of Diversion (1)

POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTER
22513	C005030	01	C005030_01	30	S	13	E	24		NW	NW

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	A021268
Appliation Rec'd Date	
Application Acceptance Date	5/1/1963
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	U S LOS PADRES NATL FOREST
Primary Owner Entity Type	Federal Government
Water Right Type	Appropriative
Face Value Amount	1.1
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	1000
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0
Max Use Ann	1.1
Year First Use	0
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Federal Government
Last Name	U S LOS PADRES NATL FOREST
Middle Name	
First Name	
Mailing Street Number	
Mailing Street Name	6755 HOLLISTER AVE STE 150
Mailing Address Line2	
Mailing City	GOLETA
Mailing State	CA
Mailing Zip	93117
Mailing Country	USA
Mailing Foreign Code	
Billing Street Number	
Billing Street Name	6755 HOLLISTER AVE STE 150
Billing Address Line2	
Billing City	GOLETA
Billing State	CA
Billing Zip	93117

	Billing Country	USA
	Billing Foreign Code	
	Phone	8059686640
Status		
	Current Status	Licensed
Uses		
	Use Code	Domestic
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Jan
	Direct Div Season End Date	31-Dec
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Fire Protection
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Jan
	Direct Div Season End Date	31-Dec
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0

Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	0

Use Seasons

Direct Div Season Begin Date	1-Jan
Direct Div Season End Date	31-Dec
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	
Storage Season End Date	
Season Storage Amount (AFA)	0
Collection Season Status (New)	Migrated from old WRIMS data

Uses

Use Code	Fish and Wildlife Protection and/or Enhancement
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	0

Use Seasons

Direct Div Season Begin Date	1-Jan
Direct Div Season End Date	31-Dec
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	
Storage Season End Date	
Season Storage Amount (AFA)	0
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	1000
Direct Div Ac Ft	0
Amount Storage	0
POD Max Dd	1000
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A021268
Object ID	177519
Pod Number	1
Has Opod	N
Appl Pod	A021268_01
podId	894

	County	San Luis Obispo
	Parcel Number	
	Sp Zone	5
	North Coord	2295832
	East Coord	5822486
	Quarter Quarter	SE
	Quarter	SE
	Section Classifier	
	Section Number	28
	Township Number	30
	Township Direction	S
	Range Number	14
	Range Direction	E
	Meridian	21
	Location Method	DD_NE
	Source Name	LITTLE FALLS SPRING
	TribDesc	
	Watershed	ESTERO BAY
	Quad Map Name	SANTA MARGARITA LAKE
Permit		
	Permit ID	14230
	Water Right Description	Migrated data from old WRIMS system.
	Issue Date	1/3/1964
	Construction Completed by	
	Planned Project Completion Date	12/1/1966
License		
	License ID	8823
	Issue Date	1/3/1969
	Licensee Reporting Cycle	
	First Licensee Report Year	
License Terms		
	Term ID	
	Version Number	1
	Term Short Description	
	DWR Specific Clauses	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C005030
Appliation Rec'd Date	12/31/1997
Application Acceptance Date	12/31/1997
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	L CARL GRIEB
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	1
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	1
Max Use Ann	1
Year First Use	1969
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	1/5/1999
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	GRIEB
Middle Name	CARL
First Name	L

Parties

Name Type	Non-Primary Owner
Effective From Date	1/5/1999
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	GRIEB
	Middle Name	L
	First Name	BARBARA
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	120
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	1
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Jan
	Storage Season End Date	31-Dec
	Season Storage Amount (AFA)	1
	Collection Season Status (New)	Migrated from old WRIMS data
POD		
	POD Number	1
	POD Unit	Gallons per Day
	POD Status	Active
	Direct Div Amount	0
	Direct Div Ac Ft	0
	Amount Storage	1
	POD Max Dd	0
	Source Max Dd Unit	Gallons per Day
	POD Max Storage	1
	Source Max Storage Unit	Gallons per Day
	Diversion Code	Diversion point
	Diversion Type	Storage
	Storage Type	Diversion point
POD GIS Maintained Data		
	Appl ID	C005030
	Object ID	177563

Pod Number	1
Has Opod	Y
Appl Pod	C005030_01
podId	22513
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2303733
East Coord	5808086
Quarter Quarter	NW
Quarter	NW
Section Classifier	
Section Number	24
Township Number	30
Township Direction	S
Range Number	13
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	ARROYO GRANDE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	5030
Issue Date	7/24/2000
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002567
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.1
Max Use Ann	0
Year First Use	1968
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MANKINS
Middle Name	B
First Name	LESTER

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	W
	First Name	ANDREW
Parties		
	Name Type	Non-Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.1
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.1
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.1
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002567
Object ID	177366
Pod Number	1
Has Opod	N
Appl Pod	C002567_01
podId	32416
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2262231
East Coord	5845386
Quarter Quarter	SW
Quarter	NW
Section Classifier	
Section Number	32
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2567
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002568
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.7
Max Use Ann	0
Year First Use	1965
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MCREYNOLDS
Middle Name	W
First Name	ANDREW

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Non-Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.7
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.7
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.7
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002568
Object ID	177377
Pod Number	1
Has Opod	N
Appl Pod	C002568_01
podId	19077
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2263931
East Coord	5839486
Quarter Quarter	NW
Quarter	NW
Section Classifier	
Section Number	31
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2568
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002569
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.1
Max Use Ann	0
Year First Use	1962
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MANKINS
Middle Name	B
First Name	LESTER

Parties

Name Type	Non-Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Parties		
	Name Type	Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	W
	First Name	ANDREW
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.1
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.1
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.1
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002569
Object ID	177426
Pod Number	1
Has Opod	N
Appl Pod	C002569_01
podId	26526
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2273732
East Coord	5840986
Quarter Quarter	SE
Quarter	NW
Section Classifier	
Section Number	19
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2569
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002570
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.2
Max Use Ann	0
Year First Use	1962
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MCREYNOLDS
Middle Name	W
First Name	ANDREW

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Non-Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.2
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.2
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.2
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002570
Object ID	177445
Pod Number	1
Has Opod	N
Appl Pod	C002570_01
podId	13496
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2275931
East Coord	5845386
Quarter Quarter	SW
Quarter	SW
Section Classifier	
Section Number	17
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2570
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002571
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.2
Max Use Ann	0
Year First Use	1962
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MANKINS
Middle Name	B
First Name	LESTER

Parties

Name Type	Non-Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	W
	First Name	ANDREW
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.2
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.2
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.2
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002571
Object ID	177451
Pod Number	1
Has Opod	N
Appl Pod	C002571_01
podId	32417
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2276431
East Coord	5845686
Quarter Quarter	SW
Quarter	SW
Section Classifier	
Section Number	17
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2571
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002572
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	CHRISTA M MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.1
Max Use Ann	0
Year First Use	1962
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MCREYNOLDS
Middle Name	M
First Name	CHRISTA

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Non-Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	W
	First Name	ANDREW
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.1
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.1
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.1
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002572
Object ID	177442
Pod Number	1
Has Opod	N
Appl Pod	C002572_01
podId	13497
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2275531
East Coord	5845386
Quarter Quarter	SW
Quarter	SW
Section Classifier	
Section Number	17
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2572
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002573
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.4
Max Use Ann	0
Year First Use	1962
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Agent
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MANKINS
Middle Name	B
First Name	LESTER

Parties

Name Type	Non-Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	W
	First Name	ANDREW
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.4
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.4
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.4
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002573
Object ID	177420
Pod Number	1
Has Opod	N
Appl Pod	C002573_01
podId	3761
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2271331
East Coord	5849686
Quarter Quarter	SE
Quarter	SE
Section Classifier	
Section Number	20
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2573
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002574
Appliation Rec'd Date	
Application Acceptance Date	1/3/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	LESTER B MANKINS
Agent Entity Type	Individual
Primary Owner	ANDREW W MCREYNOLDS
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.9
Max Use Ann	0
Year First Use	1965
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	MCREYNOLDS
Middle Name	W
First Name	ANDREW

Parties

Name Type	Non-Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	MCREYNOLDS
	Middle Name	M
	First Name	CHRISTA
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	MANKINS
	Middle Name	B
	First Name	LESTER
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.9
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May

Season Storage Amount (AFA)	0.9
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0.9
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C002574
Object ID	177408
Pod Number	1
Has Opod	N
Appl Pod	C002574_01
podId	7769
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2269232
East Coord	5835886
Quarter Quarter	NE
Quarter	NW
Section Classifier	P
Section Number	25
Township Number	31
Township Direction	S
Range Number	14
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	ARROYO GRANDE CREEK
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2574
Issue Date	5/18/1979
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002682
Appliation Rec'd Date	
Application Acceptance Date	1/5/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	BOB LANGSTON
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.1
Max Use Ann	0
Year First Use	1962
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Non-Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	LANGSTON
Middle Name	
First Name	MOLLY

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	LANGSTON
	Middle Name	
	First Name	BOB
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.1
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May
	Season Storage Amount (AFA)	0.1
	Collection Season Status (New)	Migrated from old WRIMS data
POD		
	POD Number	1
	POD Unit	Gallons per Day
	POD Status	Active
	Direct Div Amount	0
	Direct Div Ac Ft	0
	Amount Storage	0.1
	POD Max Dd	0
	Source Max Dd Unit	Gallons per Day
	POD Max Storage	0
	Source Max Storage Unit	Gallons per Day
	Diversion Code	Diversion point
	Diversion Type	Direct Diversion
	Storage Type	Diversion point
POD GIS Maintained Data		
	Appl ID	C002682
	Object ID	177405

Pod Number	1
Has Opod	N
Appl Pod	C002682_01
podId	15254
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2268331
East Coord	5851186
Quarter Quarter	SE
Quarter	NW
Section Classifier	
Section Number	28
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2682
Issue Date	5/14/1980
Licensee Reporting Cycle	
First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C002683
Appliation Rec'd Date	
Application Acceptance Date	1/5/1978
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	BOB LANGSTON
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	0.1
Max Use Ann	0
Year First Use	1954
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	LANGSTON
Middle Name	
First Name	BOB

Parties

Name Type	Non-Primary Owner
Effective From Date	9/15/1994
Effective To Date	

	Salutation	
	Entity Type	Individual
	Last Name	LANGSTON
	Middle Name	
	First Name	MOLLY
Status		
	Current Status	Certified
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0.1
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	1-May
	Season Storage Amount (AFA)	0.1
	Collection Season Status (New)	Migrated from old WRIMS data
POD		
	POD Number	1
	POD Unit	Gallons per Day
	POD Status	Active
	Direct Div Amount	0
	Direct Div Ac Ft	0
	Amount Storage	0.1
	POD Max Dd	0
	Source Max Dd Unit	Gallons per Day
	POD Max Storage	0
	Source Max Storage Unit	Gallons per Day
	Diversion Code	Diversion point
	Diversion Type	Direct Diversion
	Storage Type	Diversion point
POD GIS Maintained Data		
	Appl ID	C002683
	Object ID	177407

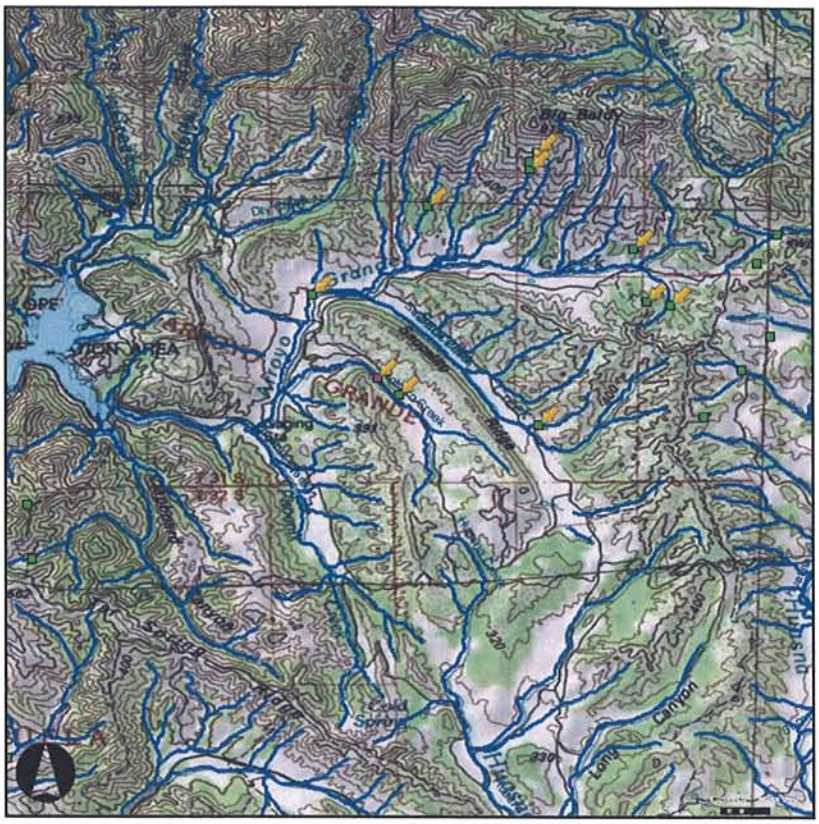
Pod Number	1
Has Opod	N
Appl Pod	C002683_01
podId	19086
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2268531
East Coord	5850186
Quarter Quarter	SW
Quarter	NW
Section Classifier	
Section Number	28
Township Number	31
Township Direction	S
Range Number	15
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNST
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	TAR SPRING RIDGE

Permit

Permit ID	
Water Right Description	
Issue Date	
Construction Completed by	
Planned Project Completion Date	

License

License ID	2683
Issue Date	5/14/1980
Licensee Reporting Cycle	
First Licensee Report Year	



water rights upstream of
USGS 11141150
Arroyo Grande AB Phoenix Cr

Points of Diversion (11)

Points of Diversion
- Adjudicated
- Cancelled
- Certified
- Claimed
- Claimed - Local Oversight
- Inactive
- Licensed
- Pending

Points of Diversion (continued)
- Permitted
- Registered
- Revoked
- State Filing
- Temporary

Lakes (1:24K)

Rivers (1:24K)

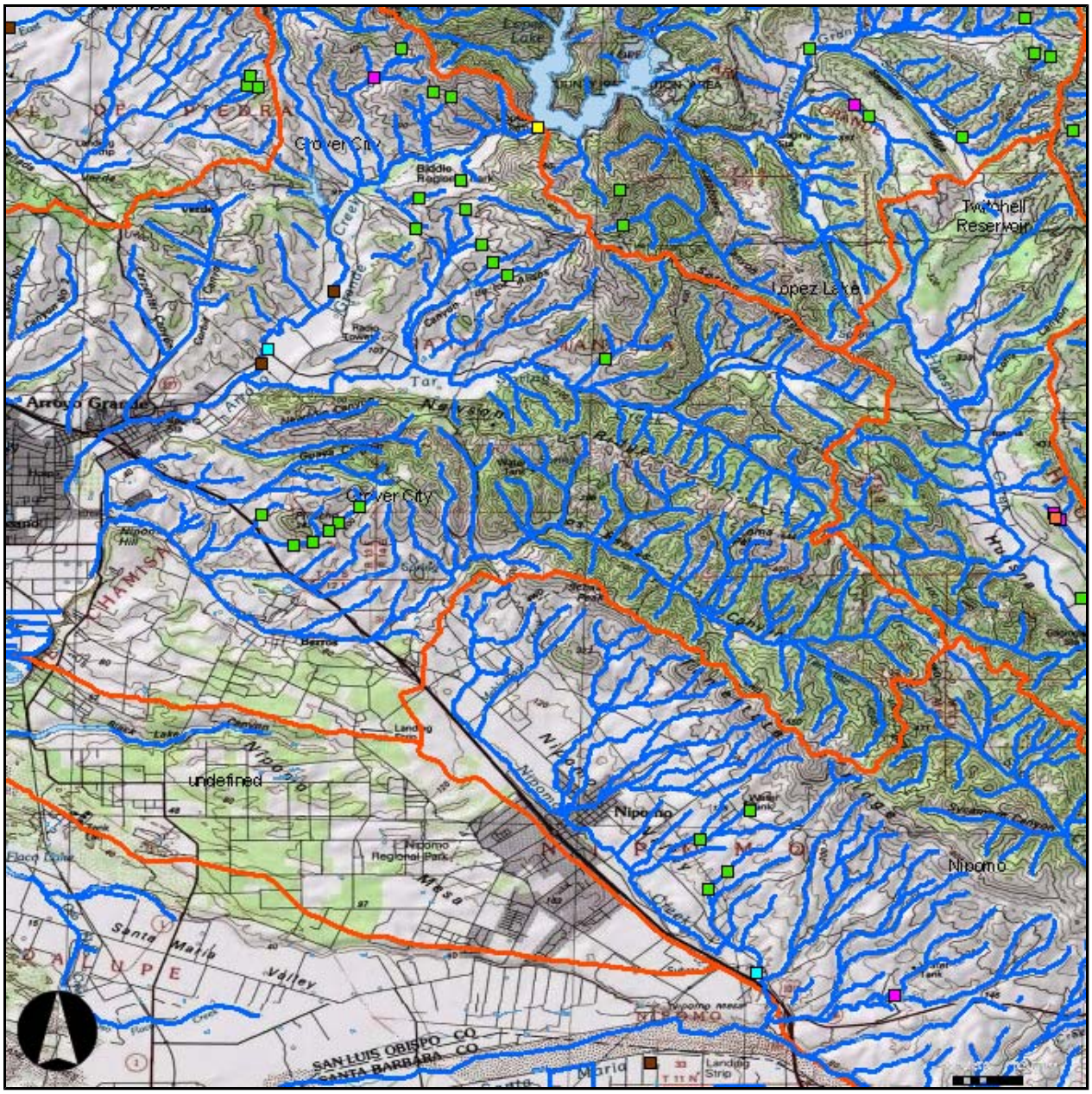
NGS USA Topographic Maps

Select POD Results

Points of Diversion (11)

POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTER
32623	A025698	01	A025698_01	31	S	14	E	25	P	SE	SE
32416	C002567	01	C002567_01	31	S	15	E	32		NW	SW
19077	C002568	01	C002568_01	31	S	15	E	31		NW	NW
26526	C002569	01	C002569_01	31	S	15	E	19		NW	SE
13496	C002570	01	C002570_01	31	S	15	E	17		SW	SW
32417	C002571	01	C002571_01	31	S	15	E	17		SW	SW
13497	C002572	01	C002572_01	31	S	15	E	17		SW	SW
3761	C002573	01	C002573_01	31	S	15	E	20		SE	SE
7769	C002574	01	C002574_01	31	S	14	E	25	P	NW	NE

15254	C002682	01	C002682_01	31	S	15	E	28		NW	SE
19086	C002683	01	C002683_01	31	S	15	E	28		NW	SW



Points of Diversion
- Adjudicated
- Cancelled
- Certified
- Claimed
- Claimed - Local Oversight
- Inactive
- Licensed
- Pending
- Permitted
- Registered

Points of Diversion (continued)
- Revoked
- State Filing
- Temporary

Lakes (1:24K)

Rivers (1:24K)

Super Planning Watersheds

NGS USA Topographic Maps

water rights upstream of
USGS 11141600/SLO 05
Los Berros Cr
(no identified upstream rights)

ewWipTax.com

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	A019108
Appliation Rec'd Date	
Application Acceptance Date	11/24/1959
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	STATE WATER RESOURCES CONTROL BOARD
Primary Owner Entity Type	Government (State/Municipal)
Water Right Type	Appropriative
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	0
Appl Fee Amt Recd	0
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	80000
Max Use Ann	0
Year First Use	0
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Government (State/Municipal)
Last Name	STATE WATER RESOURCES CONTROL BOARD
Middle Name	
First Name	
Mailing Street Number	
Mailing Street Name	PO BOX 2000
Mailing Address Line2	
Mailing City	SACRAMENTO
Mailing State	CA
Mailing Zip	95812
Mailing Country	USA
Mailing Foreign Code	
Billing Street Number	
Billing Street Name	PO BOX 2000
Billing Address Line2	
Billing City	SACRAMENTO
Billing State	CA
Billing Zip	95812
Billing Country	USA
Billing Foreign Code	

	Phone	
Status		
	Current Status	State Filing
Uses		
	Use Code	Irrigation
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	70940
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Municipal
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Uses		
	Use Code	Recreational
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Uses		
	Use Code	Domestic
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Uses		
	Use Code	Industrial

Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	0

Uses

Use Code	Stockwatering
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	0

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	80000
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	80000
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A019108
Object ID	179182
Pod Number	1
Has Opod	N
Appl Pod	A019108_01
podId	34643
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2463437
East Coord	5586781
Quarter Quarter	NE
Quarter	NE
Section Classifier	
Section Number	35
Township Number	25
Township Direction	S
Range Number	6
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	ARROYO DE LA CRUZ
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PIEDRAS BLANCAS

Permit

Permit ID
Water Right Description
Issue Date
Construction Completed by
Planned Project Completion Date

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text		10/14/2009
Application			
	Application ID	A020026A	
	Appliation Rec'd Date		3/9/1961
	Application Acceptance Date		3/9/1961
	Notice Date		
	Protest		
	Number of Protests		0
	Agent Name	MARTIN CEPKAUSKAS	
	Agent Entity Type	Individual	
	Primary Owner	HEARST HOLDINGS INC	
	Primary Owner Entity Type	Government (State/Municipal)	
	Water Right Type	Appropriative	
	Face Value Amount		70
	Face Value Units	Acre-feet per Year	
	Appl Fee Amount		0
	Appl Fee Amt Recd		0
	Max DD Appl		0.27
	Max DD Units	Cubic Feet per Second	
	Max DD Ann		70
	Max Storage		0
	Max Use Ann		70
	Year First Use		0
	Billing Determination	Not Determined	
	Power Discount %		0
	FERC #		
	FERC Facility		
	Initial 401 Certification Start		
	Initial 401 Certification End		
	Renewed 401 Certification Start		
	Renewed 401 Certification End		
	Kilowatts Face Plate		0
Parties			
	Name Type	Agent	
	Effective From Date		12/13/2001
	Effective To Date		
	Salutation		
	Entity Type	Individual	
	Last Name	CEPKAUSKAS	
	Middle Name		
	First Name	MARTIN	
Parties			
	Name Type	Primary Owner	
	Effective From Date		6/26/1997
	Effective To Date		
	Salutation		
	Entity Type	Government (State/Municipal)	
	Last Name	HEARST HOLDINGS INC	
	Middle Name		

	First Name		
	Mailing Street Number		
	Mailing Street Name	5 THIRD ST STE 200	
	Mailing Address Line2		
	Mailing City	SAN FRANCISCO	
	Mailing State	CA	
	Mailing Zip		94103
	Mailing Country	USA	
	Mailing Foreign Code		
	Billing Street Number		
	Billing Street Name	5 3RD ST STE 200	
	Billing Address Line2		
	Billing City	SAN FRANCISCO	
	Billing State	CA	
	Billing Zip		94103
	Billing Country	USA	
	Billing Foreign Code		
	Phone		4157778196
Status			
	Current Status	Licensed	
Uses			
	Use Code	Irrigation	
	Use Status (New)	Migrated from old WRIMS data	
	Use Population		0
	Use Net Acreage		27
	Use Gross Acreage		0
	Use Direct Diversion Annual Amount (AFA)		70
	Use Direct Diversion Rate (New)		0
	Use Direct Diversion Rate Units		
	Use Storage Amount (New) (AFA)		0
Use Seasons			
	Direct Div Season Begin Date		1-Apr
	Direct Div Season End Date		31-Oct
	Season Direct Div Rate (New)		0
	Season Direct Div Rate Units		
	Season Direct Div Annual Amount (New) (AFA)		0
	Direct Div Season Status (New)	Migrated from old WRIMS data	
	Storage Season Begin Date		
	Storage Season End Date		
	Season Storage Amount (AFA)		0
	Collection Season Status (New)	Migrated from old WRIMS data	
Uses			
	Use Code	Domestic	
	Use Status (New)	Migrated from old WRIMS data	
	Use Population		0
	Use Net Acreage		0
	Use Gross Acreage		0
	Use Direct Diversion Annual Amount (AFA)		70
	Use Direct Diversion Rate (New)		0
	Use Direct Diversion Rate Units		
	Use Storage Amount (New) (AFA)		0
Use Seasons			

	Direct Div Season Begin Date		1-Jan
	Direct Div Season End Date		31-Dec
	Season Direct Div Rate (New)		0
	Season Direct Div Rate Units		
	Season Direct Div Annual Amount (New) (AFA)		0
	Direct Div Season Status (New)	Migrated from old WRIMS data	
	Storage Season Begin Date		
	Storage Season End Date		
	Season Storage Amount (AFA)		0
	Collection Season Status (New)	Migrated from old WRIMS data	
Uses			
	Use Code	Stockwatering	
	Use Status (New)	Migrated from old WRIMS data	
	Use Population		0
	Use Net Acreage		0
	Use Gross Acreage		0
	Use Direct Diversion Annual Amount (AFA)		70
	Use Direct Diversion Rate (New)		0
	Use Direct Diversion Rate Units		
	Use Storage Amount (New) (AFA)		0
Use Seasons			
	Direct Div Season Begin Date		1-Jan
	Direct Div Season End Date		31-Dec
	Season Direct Div Rate (New)		0
	Season Direct Div Rate Units		
	Season Direct Div Annual Amount (New) (AFA)		0
	Direct Div Season Status (New)	Migrated from old WRIMS data	
	Storage Season Begin Date		
	Storage Season End Date		
	Season Storage Amount (AFA)		0
	Collection Season Status (New)	Migrated from old WRIMS data	
Uses			
	Use Code	Irrigation	
	Use Status (New)	Migrated from old WRIMS data	
	Use Population		0
	Use Net Acreage		0
	Use Gross Acreage		0
	Use Direct Diversion Annual Amount (AFA)		0
	Use Direct Diversion Rate (New)		0
	Use Direct Diversion Rate Units		
	Use Storage Amount (New) (AFA)		0
POD			
	POD Number		1
	POD Unit	Cubic Feet per Second	
	POD Status	Active	
	Direct Div Amount		0.27
	Direct Div Ac Ft		70
	Amount Storage		0
	POD Max Dd		0.27
	Source Max Dd Unit	Cubic Feet per Second	
	POD Max Storage		0
	Source Max Storage Unit	Cubic Feet per Second	
	Diversion Code	Diversion point	

	Diversion Type	Storage
	Storage Type	Diversion point

POD GIS Maintained Data

POD

	POD Number	1
	POD Unit	Cubic Feet per Second
	POD Status	Active
	Direct Div Amount	0.27
	Direct Div Ac Ft	70
	Amount Storage	0
	POD Max Dd	0.27
	Source Max Dd Unit	Cubic Feet per Second
	POD Max Storage	0
	Source Max Storage Unit	Cubic Feet per Second
	Diversion Code	Diversion point
	Diversion Type	Storage
	Storage Type	Diversion point

POD GIS Maintained Data

Permit

	Permit ID	14902
	Water Right Description	Migrated data from old WRIMS system.
	Issue Date	10/28/1965
	Construction Completed by	
	Planned Project Completion Date	

License

	License ID	010924A
	Issue Date	6/26/1997
	Licensee Reporting Cycle	
	First Licensee Report Year	

License Terms

	Term ID	5
	Version Number	1
	Term Short Description	
	DWR Specific Clauses	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	A020026B
Appliation Rec'd Date	3/9/1961
Application Acceptance Date	3/9/1961
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	CALIF DEPT OF PARKS & RECREATION
Primary Owner Entity Type	Government (State/Municipal)
Water Right Type	Appropriative
Face Value Amount	60
Face Value Units	Acre-feet per Year
Appl Fee Amount	0
Appl Fee Amt Recd	0
Max DD Appl	0.14
Max DD Units	Cubic Feet per Second
Max DD Ann	60
Max Storage	0
Max Use Ann	60
Year First Use	0
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	6/26/1997
Effective To Date	
Salutation	
Entity Type	Government (State/Municipal)
Last Name	CALIF DEPT OF PARKS & RECREATION
Middle Name	
First Name	
Mailing Street Number	
Mailing Street Name	PO BOX 942896
Mailing Address Line2	
Mailing City	SACRAMENTO
Mailing State	CA
Mailing Zip	94296
Mailing Country	USA
Mailing Foreign Code	
Billing Street Number	
Billing Street Name	PO BOX 942896
Billing Address Line2	
Billing City	SACRAMENTO

	Billing State	CA
	Billing Zip	94296
	Billing Country	USA
	Billing Foreign Code	
	Phone	
Status		
	Current Status	Licensed
Uses		
	Use Code	Irrigation
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	19
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	55.2
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Apr
	Direct Div Season End Date	31-Dec
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Domestic
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	7.2
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Jan
	Direct Div Season End Date	31-Dec
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Irrigation
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0

Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	0

POD

POD Number	1
POD Unit	Cubic Feet per Second
POD Status	Active
Direct Div Amount	0.14
Direct Div Ac Ft	60
Amount Storage	0
POD Max Dd	0.14
Source Max Dd Unit	Cubic Feet per Second
POD Max Storage	0
Source Max Storage Unit	Cubic Feet per Second
Diversion Code	Diversion point
Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A020026B
Object ID	179063
Pod Number	1
Has Opod	N
Appl Pod	A020026B_01
podId	11447
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2451536
East Coord	5641183
Quarter Quarter	SE
Quarter	NE
Section Classifier	
Section Number	10
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP (AKA PHELAN SPRING)
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

POD

POD Number	1
POD Unit	Cubic Feet per Second
POD Status	Active
Direct Div Amount	0.14
Direct Div Ac Ft	60
Amount Storage	0
POD Max Dd	0.14
Source Max Dd Unit	Cubic Feet per Second

POD Max Storage	0
Source Max Storage Unit	Cubic Feet per Second
Diversion Code	Diversion point
Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A020026B
Object ID	179109
Pod Number	1
Has Opod	Y
Appl Pod	A020026B_01
podId	40134
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2454336
East Coord	5639783
Quarter Quarter	SW
Quarter	SW
Section Classifier	
Section Number	4
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP (AKA CHISHOLM SPRING)
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

Permit

Permit ID	14902
Water Right Description	Migrated data from old WRIMS system.
Issue Date	10/28/1965
Construction Completed by	
Planned Project Completion Date	

License

License ID	010924B
Issue Date	6/26/1997
Licensee Reporting Cycle	
First Licensee Report Year	

License Terms

Term ID	5
Version Number	1
Term Short Description	
DWR Specific Clauses	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009
Application		
	Application ID	A025881
	Appliation Rec'd Date	
	Application Acceptance Date	12/6/1978
	Notice Date	
	Protest	
	Number of Protests	0
	Agent Name	MARTIN CEPKAUSKAS
	Agent Entity Type	Individual
	Primary Owner	HEARST HOLDINGS INC
	Primary Owner Entity Type	Government (State/Municipal)
	Water Right Type	Appropriative
	Face Value Amount	1607
	Face Value Units	Acre-feet per Year
	Appl Fee Amount	24
	Appl Fee Amt Recd	24
	Max DD Appl	5.06
	Max DD Units	Cubic Feet per Second
	Max DD Ann	1607
	Max Storage	0
	Max Use Ann	1607
	Year First Use	0
	Billing Determination	Not Determined
	Power Discount %	0
	FERC #	
	FERC Facility	
	Initial 401 Certification Start	
	Initial 401 Certification End	
	Renewed 401 Certification Start	
	Renewed 401 Certification End	
	Kilowatts Face Plate	0
Parties		
	Name Type	Agent
	Effective From Date	12/13/2001
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	CEPKAUSKAS
	Middle Name	
	First Name	MARTIN
Parties		
	Name Type	Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Government (State/Municipal)
	Last Name	HEARST HOLDINGS INC
	Middle Name	
	First Name	
	Mailing Street Number	
	Mailing Street Name	5 THIRD ST STE 200
	Mailing Address Line2	
	Mailing City	SAN FRANCISCO
	Mailing State	CA
	Mailing Zip	94103
	Mailing Country	USA
	Mailing Foreign Code	
	Billing Street Number	
	Billing Street Name	5 3RD ST STE 200
	Billing Address Line2	
	Billing City	SAN FRANCISCO
	Billing State	CA
	Billing Zip	94103
	Billing Country	USA
	Billing Foreign Code	
	Phone	4157778196
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	12/12/2001
	Salutation	
	Entity Type	Individual
	Last Name	BATTAGLIA
	Middle Name	M
	First Name	PHILLIP
Status		
	Current Status	Permitted
Uses		
	Use Code	Irrigation
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	300
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	1607
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Jan

	Direct Div Season End Date	31-Dec
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Municipal
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	1607
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Jan
	Direct Div Season End Date	31-Dec
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
POD		
	POD Number	1
	POD Unit	Cubic Feet per Second
	POD Status	Active
	Direct Div Amount	5.06
	Direct Div Ac Ft	1607
	Amount Storage	0
	POD Max Dd	5.06
	Source Max Dd Unit	Cubic Feet per Second
	POD Max Storage	0
	Source Max Storage Unit	Cubic Feet per Second
	Diversion Code	Diversion point
	Diversion Type	Storage
	Storage Type	Diversion point
POD GIS Maintained Data		
	Appl ID	A025881
	Object ID	179178
	Pod Number	1
	Has Opod	N
	Appl Pod	A025881_01
	podId	9745
	County	San Luis Obispo
	Parcel Number	
	Sp Zone	5
	North Coord	2462937
	East Coord	5589681
	Quarter Quarter	SW
	Quarter	NE
	Section Classifier	P
	Section Number	36
	Township Number	25
	Township Direction	S
	Range Number	6
	Range Direction	E
	Meridian	21
	Location Method	DD_NE
	Source Name	ARROYO DE LA CRUZ UNDERFLOW
	TribDesc	
	Watershed	ESTERO BAY
	Quad Map Name	PIEDRAS BLANCAS
Permit		
	Permit ID	19247
	Water Right Description	Migrated data from old WRIMS system.
	Issue Date	5/29/1984
	Construction Completed by	
	Planned Project Completion Date	12/31/1906
Permit Terms		
	Term ID	140500
	Version Number	1
	Term Short Description	Monitoring Plans
	DWR Specific Clauses	
Permit Terms		
	Term ID	999
	Version Number	1
	Term Short Description	
	DWR Specific Clauses	
Permit Terms		
	Term ID	60999
	Version Number	1
	Term Short Description	
	DWR Specific Clauses	
Permit Terms		
	Term ID	29

	Version Number	1
	Term Short Description	Permit Term 29 - Water Management/Water Conservation, Irrigation System Evaluation (Note - Not carried over into license)
	DWR Specific Clauses	

Permit Terms

	Term ID	400500
	Version Number	1
	Term Short Description	Invasive Species
	DWR Specific Clauses	

Permit Terms

	Term ID	290101
	Version Number	1
	Term Short Description	
	DWR Specific Clauses	

Permit Terms

	Term ID	600
	Version Number	1
	Term Short Description	
	DWR Specific Clauses	

SWRCB	Division of Water Rights - e-WRIMS	10/14/2009
	1) Select Columns A, B, and C)	
	2) Format / Column / Autofit Selection	
	3) Left Justify Column Text	
Application		
	Application ID	A027126
	Appliation Rec'd Date	
	Application Acceptance Date	11/25/1981
	Notice Date	
	Protest	
	Number of Protests	0
	Agent Name	MARTIN CEPKAUSKAS
	Agent Entity Type	Individual
	Primary Owner	HEARST HOLDINGS INC
	Primary Owner Entity Type	Government (State/Municipal)
	Water Right Type	Appropriative
	Face Value Amount	72
	Face Value Units	Acre-feet per Year
	Appl Fee Amount	10
	Appl Fee Amt Recd	10
	Max DD Appl	0
	Max DD Units	Gallons per Day
	Max DD Ann	0
	Max Storage	72
	Max Use Ann	72
	Year First Use	0
	Billing Determination	Not Determined
	Power Discount %	0
	FERC #	
	FERC Facility	
	Initial 401 Certification Start	
	Initial 401 Certification End	
	Renewed 401 Certification Start	
	Renewed 401 Certification End	
	Kilowatts Face Plate	0
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	3/29/1995
	Salutation	
	Entity Type	Individual
	Last Name	BATTAGLIA
	Middle Name	M
	First Name	PHILLIP
Parties		
	Name Type	Agent
	Effective From Date	12/13/2001
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	CEPKAUSKAS
	Middle Name	
	First Name	MARTIN
Parties		
	Name Type	Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Government (State/Municipal)
	Last Name	HEARST HOLDINGS INC
	Middle Name	

First Name	
Mailing Street Number	
Mailing Street Name	5 THIRD ST STE 200
Mailing Address Line2	
Mailing City	SAN FRANCISCO
Mailing State	CA
Mailing Zip	94103
Mailing Country	USA
Mailing Foreign Code	
Billing Street Number	
Billing Street Name	5 3RD ST STE 200
Billing Address Line2	
Billing City	SAN FRANCISCO
Billing State	CA
Billing Zip	94103
Billing Country	USA
Billing Foreign Code	
Phone	4157778196

Parties

Name Type	Agent
Effective From Date	3/30/1995
Effective To Date	12/12/2001
Salutation	
Entity Type	Individual
Last Name	COOKE
Middle Name	J
First Name	A

Status

Current Status	Permitted

Uses

Use Code	Stockwatering
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	72

Use Seasons

Direct Div Season Begin Date	
Direct Div Season End Date	
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	1-Nov
Storage Season End Date	31-Mar
Season Storage Amount (AFA)	72
Collection Season Status (New)	Migrated from old WRIMS data

Uses

Use Code	Domestic
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	72

Use Seasons

Direct Div Season Begin Date	
Direct Div Season End Date	
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	1-Nov
Storage Season End Date	31-Mar
Season Storage Amount (AFA)	72
Collection Season Status (New)	Migrated from old WRIMS data

Uses

Use Code	Irrigation
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	35
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	72

Use Seasons

Direct Div Season Begin Date	
Direct Div Season End Date	
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	1-Nov
Storage Season End Date	31-Mar
Season Storage Amount (AFA)	72
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	72
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	72
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A027126
Object ID	179062
Pod Number	1
Has Opod	N
Appl Pod	A027126_01
podId	4164
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2451536
East Coord	5641183
Quarter Quarter	SE
Quarter	NW
Section Classifier	P
Section Number	10
Township Number	26
Township Direction	S

Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP (AKA PHELAN SPRING)
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	72
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	72
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A027126
Object ID	179106
Pod Number	1
Has Opod	Y
Appl Pod	A027126_01
podId	39440
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2454336
East Coord	5639573
Quarter Quarter	SW
Quarter	SW
Section Classifier	P
Section Number	4
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP (AKA CHISOLM SPRING)
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

Permit

Permit ID	20775
Water Right Description	Migrated data from old WRIMS system.
Issue Date	2/23/1995
Construction Completed by	
Planned Project Completion Date	

Permit Terms

Term ID	22	
Version Number	1	
Term Short Description	Term 22	Right of Access

DWR Specific Clauses

Permit Terms

Term ID	000005J
Version Number	1
Term Short Description	
DWR Specific Clauses	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	A027212
Appliation Rec'd Date	
Application Acceptance Date	2/17/1982
Notice Date	
Protest	
Number of Protests	0
Agent Name	MARTIN CEPKAUSKAS
Agent Entity Type	Individual
Primary Owner	HEARST HOLDINGS INC
Primary Owner Entity Type	Government (State/Municipal)
Water Right Type	Appropriative
Face Value Amount	65
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0.41
Max DD Units	Cubic Feet per Second
Max DD Ann	65
Max Storage	0
Max Use Ann	65
Year First Use	0
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Government (State/Municipal)
Last Name	HEARST HOLDINGS INC
Middle Name	
First Name	
Mailing Street Number	
Mailing Street Name	5 THIRD ST STE 200
Mailing Address Line2	
Mailing City	SAN FRANCISCO
Mailing State	CA
Mailing Zip	94103
Mailing Country	USA
Mailing Foreign Code	
Billing Street Number	
Billing Street Name	5 3RD ST STE 200

	Billing Address Line2	
	Billing City	SAN FRANCISCO
	Billing State	CA
	Billing Zip	94103
	Billing Country	USA
	Billing Foreign Code	
	Phone	4157778196
Parties		
	Name Type	Agent
	Effective From Date	9/15/1994
	Effective To Date	12/12/2001
	Salutation	
	Entity Type	Individual
	Last Name	BATTAGLIA
	Middle Name	M
	First Name	PHILLIP
Parties		
	Name Type	Agent
	Effective From Date	12/13/2001
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	CEPKAUSKAS
	Middle Name	
	First Name	MARTIN
Status		
	Current Status	Permitted
Uses		
	Use Code	Irrigation
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	46
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	65
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Dec
	Direct Div Season End Date	30-Apr
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		

	Use Code	Domestic
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	65
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Dec
	Direct Div Season End Date	30-Apr
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
Uses		
	Use Code	Stockwatering
	Use Status (New)	Migrated from old WRIMS data
	Use Population	0
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	65
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	0
Use Seasons		
	Direct Div Season Begin Date	1-Dec
	Direct Div Season End Date	30-Apr
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	
	Storage Season End Date	
	Season Storage Amount (AFA)	0
	Collection Season Status (New)	Migrated from old WRIMS data
POD		
	POD Number	1
	POD Unit	Cubic Feet per Second
	POD Status	Active
	Direct Div Amount	0.41
	Direct Div Ac Ft	0
	Amount Storage	0
	POD Max Dd	0.41
	Source Max Dd Unit	Cubic Feet per Second
	POD Max Storage	0
	Source Max Storage Unit	Cubic Feet per Second
	Diversion Code	Diversion point

Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A027212
Object ID	179108
Pod Number	1
Has Opod	Y
Appl Pod	A027212_01
podId	6678
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2454336
East Coord	5639783
Quarter Quarter	SW
Quarter	SW
Section Classifier	
Section Number	4
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP (AKA CHISOLM SPRING)
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

POD

POD Number	1
POD Unit	Cubic Feet per Second
POD Status	Active
Direct Div Amount	0.41
Direct Div Ac Ft	0
Amount Storage	0
POD Max Dd	0.41
Source Max Dd Unit	Cubic Feet per Second
POD Max Storage	0
Source Max Storage Unit	Cubic Feet per Second
Diversion Code	Diversion point
Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A027212
Object ID	179065
Pod Number	1
Has Opod	N
Appl Pod	A027212_01
podId	38644
County	San Luis Obispo
Parcel Number	
Sp Zone	5

North Coord	2451536
East Coord	5641183
Quarter Quarter	SE
Quarter	NW
Section Classifier	
Section Number	10
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP (AKA PHELAN SPRING)
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

Permit

Permit ID	20906
Water Right Description	Migrated data from old WRIMS system.
Issue Date	3/18/1997
Construction Completed by	
Planned Project Completion Date	

Permit Terms

Term ID	5
Version Number	1
Term Short Description	
DWR Specific Clauses	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	A029851
Appliation Rec'd Date	
Application Acceptance Date	11/1/1990
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	CALIF DEPT OF PARKS & RECREATION
Primary Owner Entity Type	Government (State/Municipal)
Water Right Type	Appropriative
Face Value Amount	2.8
Face Value Units	Acre-feet per Year
Appl Fee Amount	100
Appl Fee Amt Recd	100
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	2.8
Max Use Ann	2.8
Year First Use	0
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Government (State/Municipal)
Last Name	CALIF DEPT OF PARKS & RECREATION
Middle Name	
First Name	
Mailing Street Number	
Mailing Street Name	PO BOX 942896
Mailing Address Line2	
Mailing City	SACRAMENTO
Mailing State	CA
Mailing Zip	94296
Mailing Country	USA
Mailing Foreign Code	
Billing Street Number	
Billing Street Name	PO BOX 942896
Billing Address Line2	
Billing City	SACRAMENTO

	Billing State	CA
	Billing Zip	94296
	Billing Country	USA
	Billing Foreign Code	
	Phone	9163221948

Status

	Current Status	Permitted

Uses

	Use Code	Domestic
	Use Status (New)	Migrated from old WRIMS data
	Use Population	6000
	Use Net Acreage	0
	Use Gross Acreage	0
	Use Direct Diversion Annual Amount (AFA)	0
	Use Direct Diversion Rate (New)	0
	Use Direct Diversion Rate Units	
	Use Storage Amount (New) (AFA)	2.8

Use Seasons

	Direct Div Season Begin Date	
	Direct Div Season End Date	
	Season Direct Div Rate (New)	0
	Season Direct Div Rate Units	
	Season Direct Div Annual Amount (New) (AFA)	0
	Direct Div Season Status (New)	Migrated from old WRIMS data
	Storage Season Begin Date	1-Nov
	Storage Season End Date	31-Mar
	Season Storage Amount (AFA)	2.8
	Collection Season Status (New)	Migrated from old WRIMS data

POD

	POD Number	1
	POD Unit	Gallons per Day
	POD Status	Active
	Direct Div Amount	0
	Direct Div Ac Ft	0
	Amount Storage	2.8
	POD Max Dd	0
	Source Max Dd Unit	Gallons per Day
	POD Max Storage	2.8
	Source Max Storage Unit	Gallons per Day
	Diversion Code	Diversion point
	Diversion Type	Storage
	Storage Type	Diversion point

POD GIS Maintained Data

	Appl ID	A029851
	Object ID	179110
	Pod Number	1
	Has Opod	Y
	Appl Pod	A029851_01
	podId	933
	County	San Luis Obispo
	Parcel Number	
	Sp Zone	5
	North Coord	2454386

East Coord	5639758
Quarter Quarter	SW
Quarter	SW
Section Classifier	
Section Number	4
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	0
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	2.8
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Storage
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	A029851
Object ID	179060
Pod Number	1
Has Opod	N
Appl Pod	A029851_01
podId	29525
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2451486
East Coord	5640983
Quarter Quarter	SE
Quarter	NW
Section Classifier	
Section Number	10
Township Number	26
Township Direction	S
Range Number	8
Range Direction	E
Meridian	21
Location Method	DD_NE
Source Name	UNSP
TribDesc	
Watershed	ESTERO BAY
Quad Map Name	PEBBLESTONE SHUT-IN

Permit

Permit ID	20924
Water Right Description	Migrated data from old WRIMS system.
Issue Date	6/19/1997
Construction Completed by	
Planned Project Completion Date	12/31/2002

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009
Application		
	Application ID	C000612
	Appliation Rec'd Date	
	Application Acceptance Date	12/30/1976
	Notice Date	
	Protest	
	Number of Protests	0
	Agent Name	
	Agent Entity Type	
	Primary Owner	WALTER M WARREN
	Primary Owner Entity Type	Individual
	Water Right Type	Stockpond
	Face Value Amount	0
	Face Value Units	Acre-feet per Year
	Appl Fee Amount	10
	Appl Fee Amt Recd	10
	Max DD Appl	0
	Max DD Units	Gallons per Day
	Max DD Ann	0
	Max Storage	2.5
	Max Use Ann	0
	Year First Use	1958
	Billing Determination	Not Determined
	Power Discount %	0
	FERC #	
	FERC Facility	
	Initial 401 Certification Start	
	Initial 401 Certification End	
	Renewed 401 Certification Start	
	Renewed 401 Certification End	
	Kilowatts Face Plate	0
Parties		
	Name Type	Primary Owner
	Effective From Date	9/15/1994
	Effective To Date	
	Salutation	
	Entity Type	Individual
	Last Name	WARREN
	Middle Name	M
	First Name	WALTER
Status		
	Current Status	Certified
Uses		

Use Code	Stockwatering
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	2.5

Use Seasons

Direct Div Season Begin Date	
Direct Div Season End Date	
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	1-Nov
Storage Season End Date	1-May
Season Storage Amount (AFA)	2.5
Collection Season Status (New)	Migrated from old WRIMS data

POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	2.5
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C000612
Object ID	179058
Pod Number	1
Has Opod	Y
Appl Pod	C000612_01
podId	2016
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2451486
East Coord	5640983
Quarter Quarter	NW
Quarter	NW

	Section Classifier	
	Section Number	10
	Township Number	26
	Township Direction	S
	Range Number	8
	Range Direction	E
	Meridian	21
	Location Method	DD_NE
	Source Name	UNST
	TribDesc	
	Watershed	ESTERO BAY
	Quad Map Name	PEBBLESTONE SHUT-IN
Permit		
	Permit ID	
	Water Right Description	
	Issue Date	
	Construction Completed by	
	Planned Project Completion Date	
License		
	License ID	612
	Issue Date	4/14/1978
	Licensee Reporting Cycle	
	First Licensee Report Year	

SWRCB	Division of Water Rights - e-WRIMS 1) Select Columns A, B, and C) 2) Format / Column / Autofit Selection 3) Left Justify Column Text	10/14/2009

Application

Application ID	C000613
Appliation Rec'd Date	
Application Acceptance Date	12/30/1976
Notice Date	
Protest	
Number of Protests	0
Agent Name	
Agent Entity Type	
Primary Owner	WALTER M WARREN
Primary Owner Entity Type	Individual
Water Right Type	Stockpond
Face Value Amount	0
Face Value Units	Acre-feet per Year
Appl Fee Amount	10
Appl Fee Amt Recd	10
Max DD Appl	0
Max DD Units	Gallons per Day
Max DD Ann	0
Max Storage	1
Max Use Ann	0
Year First Use	1950
Billing Determination	Not Determined
Power Discount %	0
FERC #	
FERC Facility	
Initial 401 Certification Start	
Initial 401 Certification End	
Renewed 401 Certification Start	
Renewed 401 Certification End	
Kilowatts Face Plate	0

Parties

Name Type	Primary Owner
Effective From Date	9/15/1994
Effective To Date	
Salutation	
Entity Type	Individual
Last Name	WARREN
Middle Name	M
First Name	WALTER

Status

Current Status	Certified

Uses

Use Code	Stockwatering
Use Status (New)	Migrated from old WRIMS data
Use Population	0
Use Net Acreage	0
Use Gross Acreage	0
Use Direct Diversion Annual Amount (AFA)	0
Use Direct Diversion Rate (New)	0
Use Direct Diversion Rate Units	
Use Storage Amount (New) (AFA)	1

Use Seasons

Direct Div Season Begin Date	
Direct Div Season End Date	
Season Direct Div Rate (New)	0
Season Direct Div Rate Units	
Season Direct Div Annual Amount (New) (AFA)	0
Direct Div Season Status (New)	Migrated from old WRIMS data
Storage Season Begin Date	1-Nov
Storage Season End Date	1-May
Season Storage Amount (AFA)	1
Collection Season Status (New)	Migrated from old WRIMS data

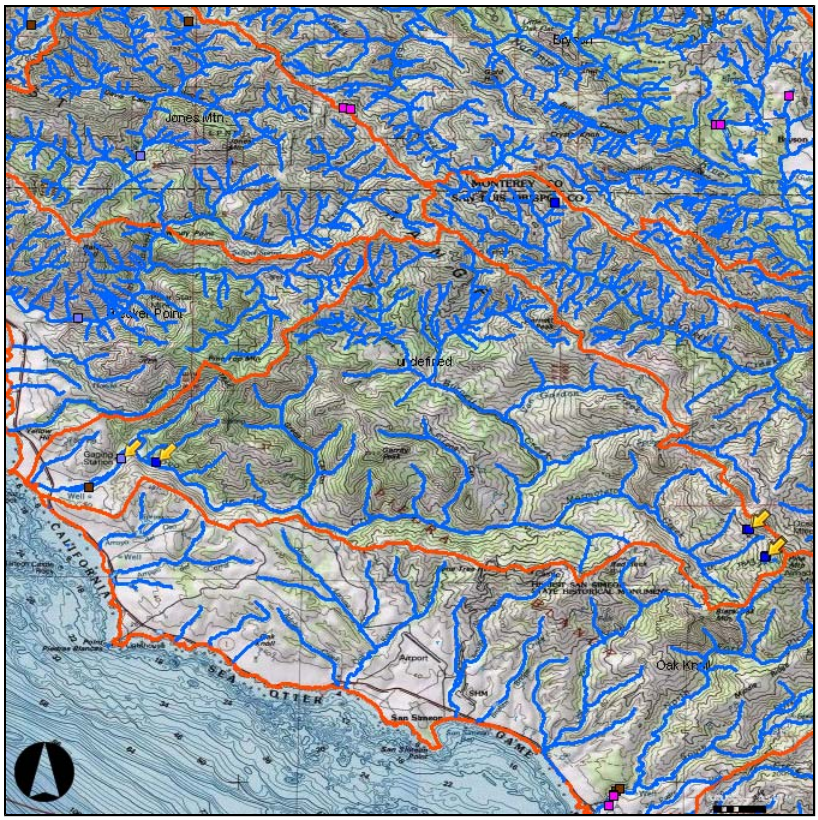
POD

POD Number	1
POD Unit	Gallons per Day
POD Status	Active
Direct Div Amount	0
Direct Div Ac Ft	0
Amount Storage	1
POD Max Dd	0
Source Max Dd Unit	Gallons per Day
POD Max Storage	0
Source Max Storage Unit	Gallons per Day
Diversion Code	Diversion point
Diversion Type	Direct Diversion
Storage Type	Diversion point

POD GIS Maintained Data

Appl ID	C000613
Object ID	179059
Pod Number	1
Has Opod	Y
Appl Pod	C000613_01
podId	13524
County	San Luis Obispo
Parcel Number	
Sp Zone	5
North Coord	2451486
East Coord	5640983
Quarter Quarter	NW
Quarter	SE

	Section Classifier	
	Section Number	10
	Township Number	26
	Township Direction	S
	Range Number	8
	Range Direction	E
	Meridian	21
	Location Method	DD_NE
	Source Name	UNST
	TribDesc	
	Watershed	ESTERO BAY
	Quad Map Name	PEBBLESTONE SHUT-IN
Permit		
	Permit ID	
	Water Right Description	
	Issue Date	
	Construction Completed by	
	Planned Project Completion Date	
License		
	License ID	613
	Issue Date	4/14/1978
	Licensee Reporting Cycle	
	First Licensee Report Year	



water rights upstream of
USGS 11142500
Arroyo De La Cruz NR San Simeon

Points of Diversion (12)

Points of Diversion (2)

Points of Diversion
- Adjudicated
- Cancelled
- Certified
- Claimed
- Claimed - Local Oversight
- Inactive
- Licensed
- Pending

Points of Diversion (continued)
- Permitted
- Registered
- Revoked
- State Filing
- Temporary

Lakes (1:24K)

Rivers (1:24K)

Super Planning Watersheds

NGS USA Topographic Maps

Select POD Results

Points of Diversion (2)

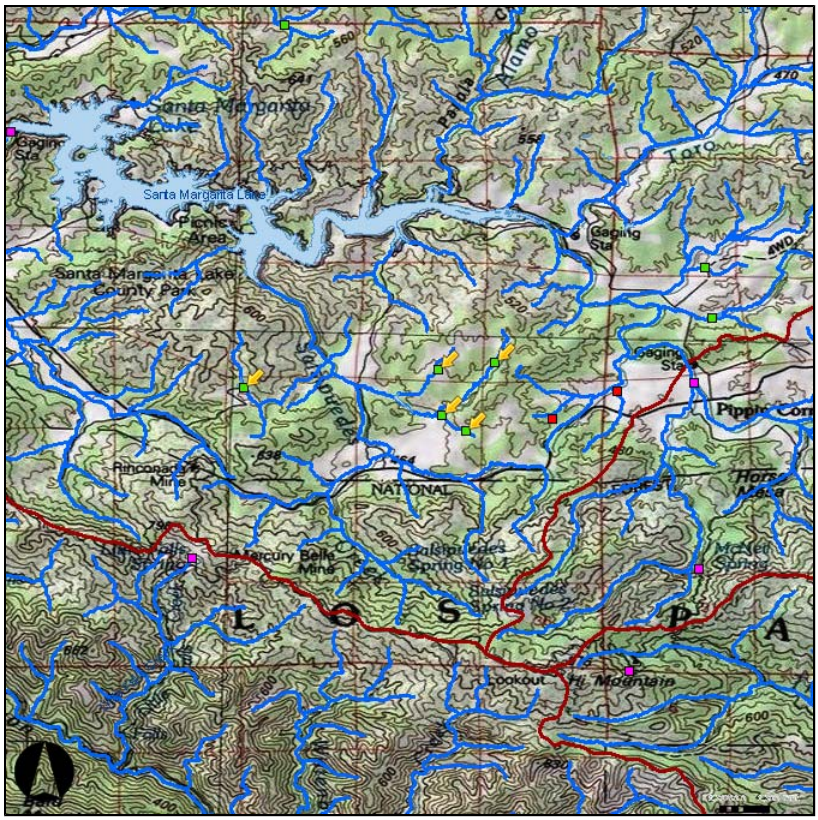
POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTER
34643	A019108	01	A019108_01	25	S	6	E	35		NE	NE
9745	A025881	01	A025881_01	25	S	6	E	36	P	NE	SW

Select POD Results

Points of Diversion (12)

POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTE
7099	A020026	01	A020026_01	26	S	8	E	10		NW	SE
3121	A020026	01	A020026_01	26	S	8	E	4		SW	SW
40134	A020026B	01	A020026B_01	26	S	8	E	4		SW	SW
11447	A020026B	01	A020026B_01	26	S	8	E	10		NE	SE
4164	A027126	01	A027126_01	26	S	8	E	10	P	NW	SE

39440	A027126	01	A027126_01	26	S	8	E	4	P	SW	SW
38644	A027212	01	A027212_01	26	S	8	E	10		NW	SE
6678	A027212	01	A027212_01	26	S	8	E	4		SW	SW
933	A029851	01	A029851_01	26	S	8	E	4		SW	SW
29525	A029851	01	A029851_01	26	S	8	E	10		NW	SE
2016	C000612	01	C000612_01	26	S	8	E	10		NW	NW
13524	C000613	01	C000613_01	26	S	8	E	10		SE	NW



Points of Diversion (1)

Points of Diversion (4)

Points of Diversion
- Adjudicated
- Cancelled
- Certified
- Claimed
- Claimed - Local Oversight
- Inactive
- Licensed
- Pending

Points of Diversion (continued)
- Permitted
- Registered
- Revoked
- State Filing
- Temporary

Lakes (1:24K)

Rivers (1:24K)

Super Planning Watersheds

NGS USA Topographic Maps

Select POD Results

Points of Diversion (4)

POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTER
45387	C004801	01	C004801_01	30	S	14	E	23		NE	SW
39550	C004802	01	C004802_01	30	S	14	E	14		SE	SW
22131	C004803	01	C004803_01	30	S	14	E	13		SW	SW
39551	C005409	01	C005409_01	30	S	14	E	23		SE	NE

Select POD Results

Points of Diversion (1)

POD_ID	APPL_ID	POD_NUM	APPL_POD	TOWNSHIP_NUMBER	TOWNSHIP_DIRECTION	RANGE_NUMBER	RANGE_DIRECTION	SECTION_NUMBER	SECTION_CLASSIFIER	QUARTER	QUARTER
32606	C003486	01	C003486_01	30	S	14	E	22		NW	NW

Water Resources Data for California

Water Year 1977

Volume 1. Colorado River Basin, Southern Great Basin from Mexican Border to Mono Lake Basin, and Pacific Slope Basins from Tijuana River to Santa Maria River

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT CA-77-1

Prepared in cooperation with the California Department of Water Resources and with other agencies

11137400 ALAMO CREEK NEAR NIPOMO, CA

LOCATION.--Lat 35°02'55", long 120°18'05", in Huasna Grant, San Luis Obispo County, on right bank 3.2 mi (5.1 km) upstream from mouth, and 10 mi (16 km) east of Nipomo.

DRAINAGE AREA.--83.3 mi^2 (215.7 km^2).

PERIOD OF RECORD.--March 1959 to current year.

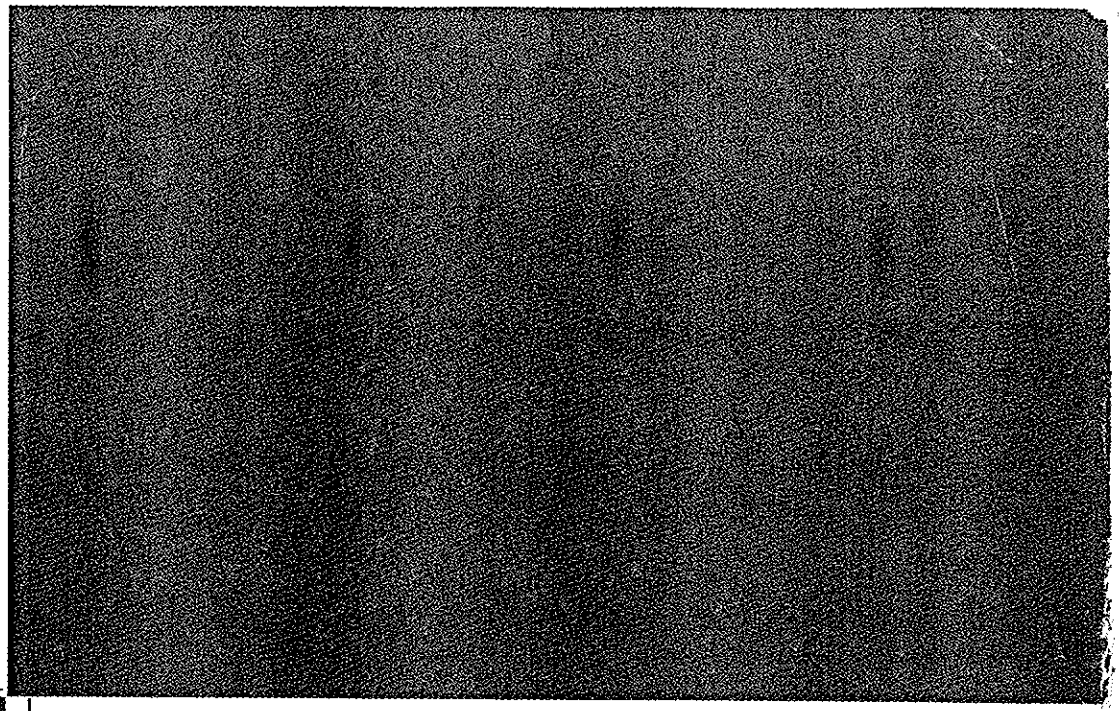
GAGE.--Water-stage recorder. Altitude of gage is 650 ft (198 m), from topographic map. Prior to Oct. 1, 1966, at datum 2.00 ft (0.610 m) higher.

REMARKS.--No flow since Mar. 22, 1975. No regulation or diversion above station.

AVERAGE DISCHARGE.--18 years, 7.14 ft^3/s (0.202 m^3/s), 5,170 acre-ft/yr (6.37 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,020 ft^3/s (255 m^3/s) Jan. 25, 1969, gage height, 10.51 ft (3.203 m), from rating curve extended above 3,100 ft^3/s (87.8 m^3/s) on basis of slope-area measurement at gage height 10.30 ft (3.139 m); no flow for all or part of each year.

EXTREMES FOR CURRENT YEAR.--No flow during year.



Water Resources Data for California

Volume 2. Pacific Slope Basins from Arroyo Grande to Oregon State Line except Central Valley

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT CA-78-2

WATER YEAR 1978

Prepared in cooperation with the California Department of Water Resources and with other agencies

11141600 LOS BERROS CREEK NEAR NIPOMO, CA

LOCATION.--Lat 35°05'17", long 120°30'32", in Nipomo Grant (on boundary), San Luis Obispo County, Hydrologic Unit 18060006, on left bank at upstream side of bridge, 0.8 mi (1.3 km) downstream from Adobe Creek, and 3.7 mi (6.0 km) northwest of Nipomo.

DRAINAGE AREA.--15.0 mi^2 (38.8 km^2).

PERIOD OF RECORD.--August 1968 to September 1978 (discontinued).

GAGE.--Water-stage recorder and broad-crested weir. Altitude of gage is 312 ft (95 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, Apr. 10 to May 16, which are fair. No regulation or diversion above station.

AVERAGE DISCHARGE.--10 years, 2.20 ft^3/s (0.062 m^3/s), 1,590 acre-ft/yr (1.96 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 599 ft^3/s (17.0 m^3/s) Jan. 25, 1969, gage height, 5.43 ft (1.655 m), from rating curve extended above 230 ft^3/s (6.51 m^3/s) on basis of slope-area measurement of maximum flow; no flow Oct. 6 to Dec. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 20 ft^3/s (0.6 m^3/s), revised, and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Jan. 16	1345	259	7.33	3.67	1.119	Mar. 4	1115	*402	11.4	4.41	1.344
Feb. 10	0715	368	10.4	4.23	1.289	Mar. 11	1245	31	.88	2.04	.622
Feb. 13	1130	159	4.50	3.11	.948	Apr. 17	0430	46	1.30	2.20	.671

Minimum daily discharge, no flow Oct. 6 to Dec. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01		0	.15	1.3	6.0	6.2	4.7	1.9	.84	.46	.46
2	.01		0	.15	1.2	6.4	6.0	4.4	2.0	.85	.46	.64
3	.01		0	.16	1.1	11	5.5	4.0	1.8	.78	.45	.56
4	.01		0	.16	.99	197	5.4	3.4	1.7	.84	.39	.50
5	.01		0	.31	1.3	70	4.3	3.2	1.7	.71	.38	.52
6	0		0	2.6	1.6	37	6.3	3.3	1.7	.72	.36	.42
7	0		0	1.7	8.3	22	7.6	3.4	1.6	.74	.36	.41
8	0		0	1.3	25	17	7.0	3.6	1.6	.77	.36	.39
9	0		0	2.3	145	15	6.1	3.3	1.6	.90	.34	.36
10	0		0	5.0	231	13	5.1	3.2	1.4	.89	.31	.37
11	0		0	3.7	65	12	6.2	3.1	1.3	.77	.31	.37
12	0		0	2.7	46	10	5.1	3.1	1.3	.74	.33	.36
13	0		0	2.1	75	8.8	4.7	3.0	1.3	.71	.28	.36
14	0		0	6.9	49	8.3	4.1	2.8	1.3	.55	.39	.36
15	0		0	30	29	7.7	9.6	2.6	1.4	.68	.41	.37
16	0		0	76	18	7.2	17	2.4	1.4	.77	.41	.30
17	0		0	57	13	6.6	13	2.3	1.2	.74	.41	.34
18	0		0	18	9.9	6.5	9.4	2.3	1.1	.74	.41	.30
19	0		0	18	8.6	6.3	7.5	2.3	1.1	.73	.49	.38
20	0		0	16	7.4	6.8	6.2	2.2	1.1	.66	.56	.39
21	0		0	8.8	6.8	6.2	5.8	2.2	1.2	.64	.48	.44
22	0		0	6.0	6.2	7.2	5.6	2.2	1.1	.59	.41	.36
23	0		0	3.3	5.7	7.8	5.2	2.2	1.1	.55	.44	.29
24	0		0	1.9	5.3	6.9	5.8	2.3	1.0	.56	.40	.27
25	0		0	2.8	5.2	6.3	9.2	2.2	.96	.52	.41	.26
26	0		0	2.3	5.1	5.4	6.6	2.1	1.0	.48	.33	.22
27	0		1.0	2.0	5.2	5.0	6.0	2.0	1.1	.45	.40	.22
28	0		1.1	1.8	6.3	4.6	5.4	1.9	1.2	.48	.50	.26
29	0		.21	1.7	---	4.7	5.0	1.8	1.3	.46	.51	.24
30	0		.16	1.5	---	5.4	4.8	1.8	1.1	.46	.49	.24
31	0	---	.15	1.4	---	7.1	---	1.9	---	.46	.49	---
TOTAL	.05	0	2.62	277.73	783.49	541.2	201.7	85.2	40.56	20.78	12.73	10.96
MEAN	.002	0	.085	8.96	28.0	17.5	6.72	2.75	1.35	.67	.41	.37
MAX	.01	0	1.1	76	231	197	17	4.7	2.0	.90	.56	.64
MIN	0	0	0	.15	.99	4.6	4.1	1.8	.96	.45	.28	.22
AC-FT	.10	0	5.2	551	1550	1070	400	169	80	41	25	22

CAL YR 1977 TOTAL 73.84 MEAN .20 MAX 1.1 MIN 0 AC-FT 146
WTR YR 1978 TOTAL 1977.02 MEAN 5.42 MAX 231 MIN 0 AC-FT 3920

11142080 MORRO CREEK AT MORRO BAY, CA

LOCATION.--Lat 35°22'42", long 120°51'12", in Moro Y Cayucos Grant, San Luis Obispo County, Hydrologic Unit 18060006, on left bank at upstream side of frontage road bridge in town of Morro Bay, and 700 ft (213 m) downstream from Little Morro Creek.

DRAINAGE AREA.--24.0 mi^2 (62.2 km^2).

PERIOD OF RECORD.--October 1970 to September 1978 (discontinued).

GAGE.--Water-stage recorder. Concrete control since Nov. 7, 1971. Altitude of gage is 20 ft (6.1 m), from topographic map.

REMARKS.--Records good including those for period of no gage-height record, July 25 to Sept. 30. No regulation; small diversion above station for individual use.

AVERAGE DISCHARGE.--8 years, 8.87 ft^3/s (0.251 m^3/s), 6,430 acre-ft/yr (7.93 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,960 ft^3/s (55.5 m^3/s) Jan. 18, 1973, gage height, 10.38 ft (3.164 m), from rating curve extended above 440 ft^3/s (12.5 m^3/s) on basis of slope-area measurement of maximum flow; no flow for long periods in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 60 ft^3/s (1.7 m^3/s) and maximum (*) from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 27	1615	407	11.5	5.11	1.558	Feb. 10	0330	858	24.3	6.85	2.088
Jan. 5	2400	166	4.70	4.01	1.222	Feb. 12	1730	*1120	31.7	7.75	2.362
Jan. 9	1030	360	10.2	4.90	1.494	Mar. 4	0815	813	23.0	6.69	2.039
Jan. 16	1400	780	22.1	6.57	2.003	Apr. 15	1600	336	9.52	4.78	1.457

Minimum daily discharge, no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			0	11	9.8	33	22	20	8.2	4.5	2.6	1.1
2			0	12	9.4	45	20	19	7.8	3.9	2.7	1.1
3			0	11	8.5	92	20	18	7.3	3.7	2.6	1.1
4			0	8.6	7.9	411	29	18	7.4	3.8	2.6	1.3
5			0	22	13	199	22	17	7.0	3.8	2.6	2.1
6			0	65	15	119	28	16	6.9	3.6	2.5	1.8
7			0	30	114	88	30	15	6.8	3.5	2.4	1.6
8			0	21	167	69	26	15	6.8	3.7	2.4	1.4
9			0	98	486	73	25	15	6.2	3.6	2.5	1.3
10			0	89	451	56	24	14	5.5	3.5	2.4	1.4
11			0	42	165	53	23	14	5.7	3.6	2.2	1.4
12			0	29	337	42	22	13	5.3	3.4	2.1	1.4
13			0	21	295	36	22	13	4.9	3.1	2.1	1.3
14			0	99	153	34	21	12	4.7	3.0	2.0	1.4
15			0	177	103	32	86	12	4.7	3.0	2.0	1.5
16			0	266	83	31	73	12	4.7	2.9	1.9	1.6
17			0	148	65	29	43	11	4.7	2.9	1.9	1.5
18			0	71	52	28	36	11	4.3	2.9	1.8	1.4
19			0	61	44	27	33	10	4.7	2.8	1.7	1.3
20			0	52	39	26	30	10	4.9	2.9	1.7	1.2
21			0	41	35	25	28	10	5.0	2.9	1.7	1.1
22			0	33	34	34	26	10	4.7	2.8	1.7	.90
23			.91	28	32	25	24	9.8	4.5	2.8	1.7	.78
24			0	24	30	24	23	9.8	4.2	2.8	1.6	.74
25			0	21	28	23	32	9.5	4.1	2.7	1.5	.75
26			.01	18	27	23	35	9.0	4.3	2.7	1.4	.76
27			122	17	26	22	24	8.7	4.4	2.7	1.3	.78
28			161	15	35	22	22	8.0	4.1	2.6	1.3	.79
29			37	14	---	22	21	7.8	4.0	2.5	1.2	.78
30			23	13	---	23	20	7.8	4.1	2.5	1.2	.75
31		---	16	11	---	26	---	7.9	---	2.5	1.1	---
TOTAL	0	0	359.92	1568.6	2864.6	1792	890	383.3	161.9	97.6	60.4	36.33
MEAN	0	0	11.6	50.6	102	57.8	29.7	12.4	5.40	3.15	1.95	1.21
MAX	0	0	161	266	486	411	86	20	8.2	4.5	2.7	2.1
MIN	0	0	0	8.6	7.9	22	20	7.8	4.0	2.5	1.1	.74
AC-FT	0	0	714	3110	5680	3550	1770	760	321	194	120	72

CAL YR 1977 TOTAL 394.77 MEAN 1.08 MAX 161 MIN 0 AC-FT 783
WTR YR 1978 TOTAL 8214.65 MEAN 22.5 MAX 486 MIN 0 AC-FT 16290

11142100 TORO CREEK NEAR MORRO BAY, CA

LOCATION.--Lat 35°25'31", long 120°51'33", in Moro Y Cayucos Grant, San Luis Obispo County, Hydrologic Unit 18060006, on left bank at downstream side of county road bridge, 0.3 mi (0.5 km) downstream from small right-bank tributary, and 2.3 mi (3.7 km) north of town of Morro Bay.

DRAINAGE AREA.--14.0 mi^2 (36.3 km^2).

PERIOD OF RECORD.--October 1970 to September 1978 (discontinued).

GAGE.--Water-stage recorder. Concrete control since Aug. 2, 1972. Altitude of gage is 40 ft (12 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, Apr. 16 to May 17, which are fair. No regulation; small diversion above station for individual use.

AVERAGE DISCHARGE.--8 years, 5.74 ft^3/s (0.163 m^3/s), 4,160 acre-ft/yr (5.13 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,600 ft^3/s (130 m^3/s) Jan. 18, 1973, gage height, 9.65 ft (2.941 m), from rating curve extended above 140 ft^3/s (3.96 m^3/s) on basis of slope-area measurement of maximum flow; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 40 ft^3/s (1.1 m^3/s) and maximum (*) from rating curve extended as explained above:

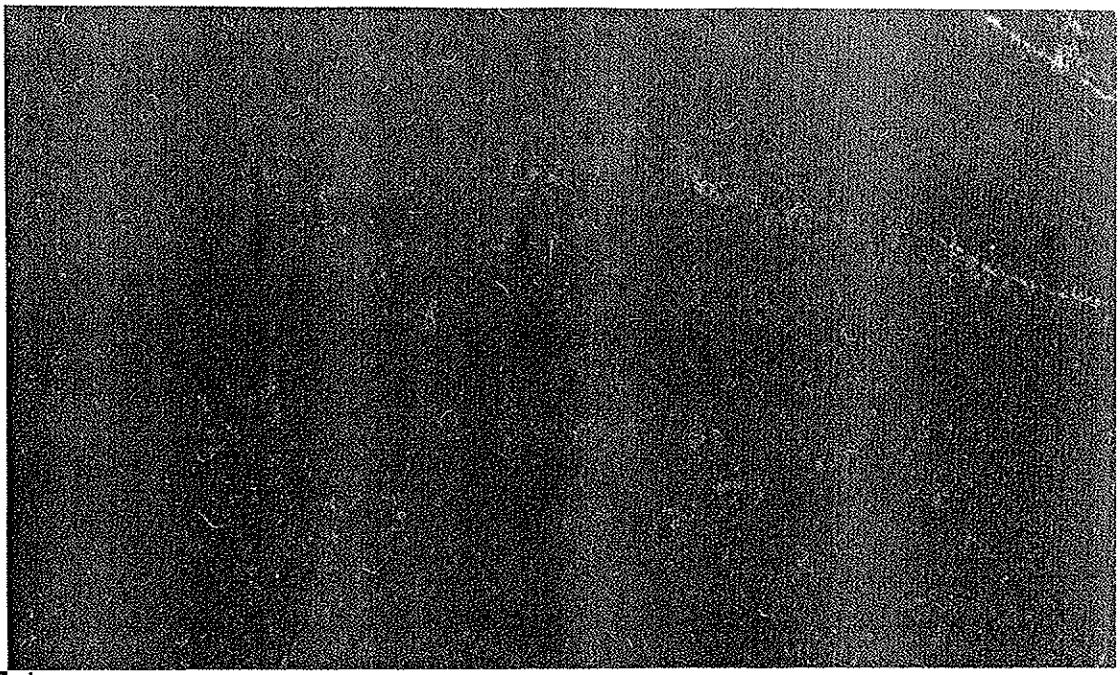
Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 27	1530	264	7.48	2.87	.875	Feb. 28	2200	142	4.02	2.35	.716
Jan. 5	2330	463	13.1	3.51	1.070	Mar. 4	0815	264	7.48	2.87	.875
Jan. 9	1000	254	7.19	2.83	.863	Mar. 9	1400	100	2.83	2.13	.649
Jan. 14	2115	752	21.3	4.26	1.298	Mar. 22	0245	54	1.53	1.84	.561
Jan. 19	0230	182	5.15	2.53	.771	Apr. 4	0515	87	2.46	2.05	.625
Feb. 8	1930	597	16.9	3.88	1.183	Apr. 15	1400	616	17.4	3.93	1.198
Feb. 12	1615	*801	22.7	4.37	1.332						

Minimum daily discharge, no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			0	3.5	6.0	19	13	12	4.7	2.3	1.8	.79
2			0	5.1	5.6	36	12	12	4.5	2.1	1.8	.83
3			0	3.8	5.2	58	12	11	4.6	2.1	1.8	.84
4			0	3.4	5.0	163	25	11	4.7	2.1	1.8	1.2
5			0	19	6.2	110	16	11	4.7	2.2	1.7	1.5
6			0	65	5.9	76	25	10	4.7	2.3	1.7	1.2
7			0	22	67	60	25	9.4	4.0	2.3	1.6	1.1
8			0	13	124	51	21	9.1	3.8	2.4	1.7	.99
9			0	53	235	54	19	8.9	3.5	2.4	1.6	.95
10			0	56	189	43	19	8.7	3.3	2.3	1.4	1.0
11			0	30	93	39	18	8.5	3.4	2.3	1.4	1.0
12			0	18	165	35	17	7.9	3.2	2.4	1.4	.90
13			0	12	132	32	16	7.6	3.0	2.3	1.4	.87
14			0	70	79	29	15	7.3	3.0	2.3	1.3	.96
15			0	104	55	27	91	7.2	3.1	2.1	1.3	1.0
16			0	144	46	26	50	7.0	3.2	2.2	1.3	1.1
17			.65	87	36	24	35	6.5	3.3	2.2	1.2	1.1
18			.13	56	30	22	28	6.1	3.0	2.1	1.1	1.0
19			0	68	26	20	25	5.9	2.9	2.1	1.1	.90
20			0	41	25	19	21	5.7	2.9	2.1	1.1	.81
21			0	32	24	19	19	5.7	2.9	1.9	1.2	.75
22			0	28	20	28	18	5.7	2.9	1.7	1.2	.65
23			.49	22	18	20	17	5.7	2.9	1.7	1.1	.52
24			0	17	16	17	16	5.5	2.8	1.7	1.1	.50
25			0	14	15	16	22	5.3	2.7	1.7	1.0	.47
26			0	12	14	15	24	5.3	2.8	1.7	.98	.41
27			52	9.9	14	14	16	5.2	2.8	1.7	.89	.45
28			79	8.9	23	13	14	5.0	2.6	1.6	.78	.56
29			20	7.7	---	13	14	4.6	2.5	1.6	.81	.53
30			8.9	6.9	---	13	13	4.5	2.5	1.6	.77	.62
31		---	5.1	6.4	---	17	---	4.6	---	1.8	.73	---
TOTAL	0	0	166.27	1038.6	1479.9	1128	676	229.9	100.9	63.3	40.06	25.50
MEAN	0	0	5.36	33.5	52.9	36.4	22.5	7.42	3.36	2.04	1.29	.85
MAX	0	0	79	144	235	163	91	12	4.7	2.4	1.8	1.5
MIN	0	0	0	3.4	5.0	13	12	4.5	2.5	1.6	.73	.41
AC-FT	0	0	330	2060	2940	2240	1340	456	200	126	79	51

CAL YR 1977 TOTAL 189.52 MEAN .52 MAX 79 MIN 0 AC-FT 376
WTR YR 1978 TOTAL 4948.43 MEAN 13.6 MAX 235 MIN 0 AC-FT 9820



Water Resources Data for California

Volume 2. Pacific Slope Basins from Arroyo Grande to Oregon State Line except Central Valley

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT CA-79-2

WATER YEAR 1979

Prepared in cooperation with the California Department of Water Resources and with other agencies

11142500 ARROYO DE LA CRUZ NEAR SAN SIMEON, CA

LOCATION.--Lat 35°43'02", long 121°17'02", in Piedra Blanca Grant, San Luis Obispo County, Hydrologic Unit 18060006, on right bank 1.7 mi (2.7 km) upstream from mouth, and 7 mi (11 km) northwest of San Simeon.

DRAINAGE AREA.--41.2 mi^2 (106.7 km^2).

PERIOD OF RECORD.--October 1950 to September 1979 (discontinued).

REVISED RECORDS.--WSP 1245: 1951. WSP 1929: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 22 ft (6.7 m), from topographic map.

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--29 years, 54.4 ft^3/s (1.541 m^3/s), 39,410 acre-ft (48.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,200 ft^3/s (997 m^3/s) Dec. 6, 1966, gage height, 15.27 ft (4.654 m), from rating curve extended above 7,600 ft^3/s (215 m^3/s) on basis of slope-area measurements at gage heights 12.40 ft (3.780 m) and 15.27 ft (4.654 m); no flow for long periods in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft^3/s (71 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Jan. 15	0115	*7600	215	9.42	2.871
Feb. 20	1930	4130	117	7.68	2.341

Minimum daily discharge, no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
MEAN VALUES

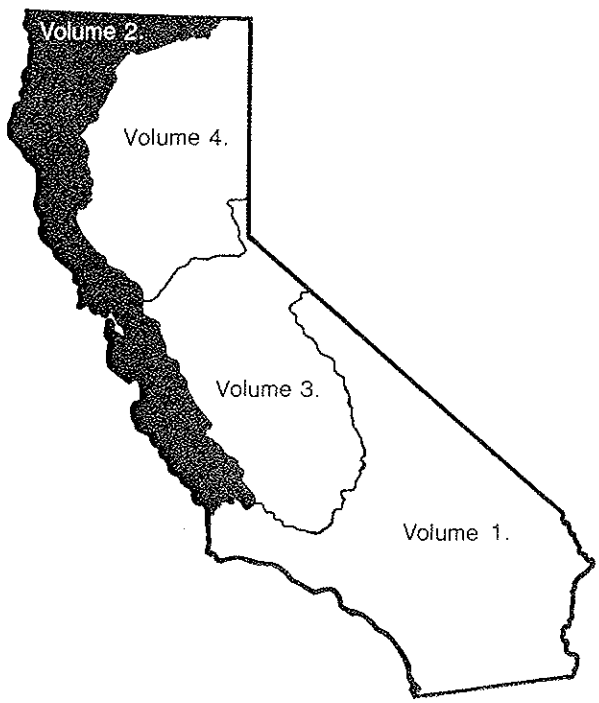
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	7.4	1.1	545	212	168	17	8.1	1.4		
2		0	6.0	.98	392	167	138	17	7.2	1.2		
3		0	4.3	.93	274	148	118	16	6.6	1.1		
4		0	3.5	.93	194	136	103	15	6.0	1.0		
5		0	3.0	.92	145	125	92	14	5.6	.90		
6		0	2.2	.84	108	116	82	14	5.2	.89		
7		0	1.6	.80	79	110	74	13	4.9	.86		
8		0	1.2	163	55	104	66	13	4.5	.84		
9		0	1.1	212	38	99	58	12	4.0	.80		
10		0	1.1	56	35	94	55	11	3.5	.78		
11		0	1.0	33	33	90	54	11	3.1	.76		
12		0	.93	47	32	87	51	10	2.9	.71		
13		0	.92	25	502	83	48	10	2.7	.63		
14		0	.80	398	797	79	45	10	2.6	.26		
15		0	.80	1950	334	81	42	10	2.8	.11		
16		0	.80	577	402	107	39	11	2.8	.04		
17		0	.85	125	265	210	37	11	2.7	.01		
18		0	.99	180	213	114	35	10	2.5	0		
19		0	16	125	189	99	32	11	2.4	0		
20		0	17	91	758	93	30	11	2.4	0		
21		793	11	66	851	86	28	11	2.4	0		
22		261	7.2	50	536	81	27	12	2.3	0		
23		112	4.8	44	482	77	27	12	2.2	0		
24		58	3.4	41	328	73	25	12	2.2	0		
25		36	2.7	38	264	69	24	12	2.2	0		
26		23	2.1	34	231	207	25	11	2.1	0		
27		17	1.7	30	199	1040	32	10	1.9	0		
28		13	1.6	27	180	966	23	9.5	1.6	0		
29		10	1.5	26	---	609	20	9.3	1.5	0		
30		8.3	1.3	45	---	321	18	9.3	1.4	0		
31		---	1.1	783	---	222	---	8.8	---	0		---
TOTAL	0	1331.3	109.89	5172.50	8461	6105	1616	363.9	102.3	12.29	0	0
MEAN	0	44.4	3.54	167	302	197	53.9	11.7	3.41	.40	0	0
MAX	0	793	17	1950	851	1040	168	17	8.1	1.4	0	0
MIN	0	0	.80	.80	32	69	18	8.8	1.4	0	0	0
AC-FT	0	2640	218	10260	16780	12110	3210	722	203	24	0	0

CAL YR 1978 TOTAL 36152.44 MEAN 99.0 MAX 3180 MIN 0 AC-FT 71710
WTR YR 1979 TOTAL 23274.18 MEAN 63.8 MAX 1950 MIN 0 AC-FT 46160

Water Resources Data California

Water Year 1983

Volume 2. Pacific Slope Basins from Arroyo Grande to Oregon State Line except Central Valley



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT CA-83-2
Prepared in cooperation with the California Department of Water Resources and with other agencies

11143500 SALINAS RIVER NEAR POZO, CA

LOCATION.--Lat 35°17'55", long 120°24'10", in NE 1/4 sec.19, T.30 S., R.15 E., San Luis Obispo County, Hydrologic Unit 18060005, on right bank at downstream side of county road bridge, 1.0 mi downstream from Pozo Creek, 1.6 mi west of Pozo, and 7.4 mi upstream from Salinas Dam.

DRAINAGE AREA.--70.3 mi^2.

PERIOD OF RECORD.--July 1942 to September 1983 (discontinued).

REVISED RECORDS.--WSP 1565: 1943(M). WSP 2129: 1952, 1953(P), 1954(M), 1958(M), 1960(M). WDR CA-74-1: 1973.

GAGE.--Water-stage recorder. Datum of gage is 1,347.78 ft National Geodetic Vertical Datum of 1929. Prior to May 13, 1969, water-stage recorder at site 0.4 mi downstream at same datum.

REMARKS.--Records poor. No regulation or diversion above station. Water is stored in Santa Margarita Lake below station.

AVERAGE DISCHARGE.--41 years, 19.5 ft^3/s, 14,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,600 ft^3/s Jan. 25, 1969, gage height, 13.90 ft in gage well, 15.5 ft site then in use, from floodmarks, from rating curve extended above 7,100 ft^3/s on basis of slope-area measurement of maximum flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft^3/s and maximum (*) from rating curve extended above 620 ft^3/s on basis of slope-area measurement of peak flow:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 30	0815	2,770	16.84	Feb. 8	0200	1,790	15.34
Dec. 22	1800	*5,270	19.59	Feb. 12	0515	431	12.04
Jan. 24	0915	2,880	16.98	Mar. 1	0345	3,850	18.13
Jan. 27	0500	3,560	17.81				

Minimum daily, 0.93 ft^3/s Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.5	60	12	118	1570	50	141	7.6	5.0	3.1	2.3
2	.97	1.4	8.0	10	103	1140	46	108	7.0	4.9	3.0	2.3
3	.97	1.4	7.0	8.6	91	681	43	81	7.6	4.8	2.9	2.3
4	1.0	1.3	6.0	7.4	75	435	41	65	8.3	4.4	2.9	2.2
5	1.0	1.4	5.1	6.5	67	308	38	56	10	4.0	2.8	2.2
6	1.1	1.4	4.9	5.9	88	242	36	45	9.8	4.1	2.7	2.3
7	1.1	1.4	5.3	5.2	289	196	34	40	9.1	3.7	2.7	2.3
8	1.1	1.4	4.7	4.7	862	160	33	35	9.2	3.8	2.7	2.2
9	1.1	3.7	4.5	4.3	305	130	31	33	9.3	3.8	2.7	2.1
10	1.1	2.9	4.4	3.8	192	110	30	29	10	3.9	2.7	2.1
11	1.1	2.0	4.5	3.4	146	97	29	27	10	4.0	2.7	2.0
12	1.1	1.8	4.6	3.2	173	80	28	26	10	3.8	2.6	1.8
13	1.0	1.8	4.3	2.9	285	110	27	25	11	3.7	2.4	1.8
14	.93	1.8	4.4	2.7	160	87	24	24	12	3.6	2.5	1.5
15	.98	1.8	4.4	2.7	118	65	22	22	9.2	3.5	2.4	1.4
16	.95	1.8	4.4	2.7	99	110	21	21	4.0	3.5	2.3	1.3
17	1.0	1.8	4.1	2.5	84	135	20	19	5.0	3.5	2.3	1.3
18	1.0	3.5	4.1	10	77	220	68	18	5.8	3.4	2.7	1.2
19	.98	3.3	4.1	29	65	150	79	17	6.0	3.3	3.3	1.1
20	1.0	2.3	4.1	14	56	130	70	15	6.4	3.2	2.8	1.2
21	1.1	2.1	4.5	9.6	49	165	87	14	6.8	3.1	2.8	1.3
22	1.2	2.2	1570	897	44	130	58	12	6.7	3.1	2.7	1.4
23	1.2	2.2	445	594	40	150	51	11	6.6	3.2	2.7	1.4
24	1.3	2.1	101	1190	37	240	91	9.7	6.4	3.3	2.6	1.4
25	1.5	2.1	55	321	66	160	66	10	6.3	3.2	2.5	1.5
26	2.4	2.1	37	165	177	120	52	10	5.7	3.2	2.6	1.4
27	1.5	2.0	26	1860	805	90	42	9.8	5.4	3.1	2.4	1.4
28	1.3	2.0	22	541	502	82	48	9.8	5.3	3.0	2.4	1.4
29	1.2	7.7	22	476	---	70	57	9.7	5.1	3.1	2.3	1.6
30	1.8	718	18	218	---	60	157	9.3	5.0	3.1	2.6	1.8
31	1.7	---	15	147	---	53	---	8.7	---	3.0	2.4	---
TOTAL	36.68	782.2	2468.4	6560.1	5173	7476	1479	961.0	226.6	112.3	82.2	51.5
MEAN	1.18	26.1	79.6	212	185	241	49.3	31.0	7.55	3.62	2.65	1.72
MAX	2.4	718	1570	1860	862	1570	157	141	12	5.0	3.3	2.3
MIN	.93	1.3	4.1	2.5	37	53	20	8.7	4.0	3.0	2.3	1.1
AC-FT	73	1550	4900	13010	10260	14830	2930	1910	449	223	163	102

CAL YR 1982 TOTAL 12439.3 MEAN 34.2 MAX 1900 MIN .78 AC-FT 24670
WTR YR 1983 TOTAL 25408.98 MEAN 69.8 MAX 1860 MIN .93 AC-FT 50400

11144200 SALSIPUEDES CREEK NEAR POZO, CA

LOCATION.--Lat 35°17'34", long 120°27'07", in NW 1/4 SW 1/4 sec.23, T.30 S., R.14 E., San Luis Obispo County, Hydrologic Unit 18060005, on left bank 1.9 mi upstream from mouth, and 4.4 mi west of Pozo.

DRAINAGE AREA.--5.91 mi^2.

PERIOD OF RECORD.--October 1969 to September 1983 (discontinued).

REVISED RECORDS.--WDR CA-72-1: 1971(P).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,480 ft, from topographic map.

REMARKS.--Records fair except for period of faulty or no gage-height record, Feb. 19 to July 16, which is poor. No regulation or diversion above station.

AVERAGE DISCHARGE.--14 years, 2.64 ft^3/s, 1,920 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft^3/s Feb. 21, 1980, gage height, 6.12 ft, from rating curve extended above 67 ft^3/s on basis of slope-area measurements at gage heights 4.58 ft and 5.88 ft; no flow for long periods in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s, and maximum (*) from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 30	Unknown	976	4.94	Jan. 26	2315	313	3.05
Dec. 22	1530	1,250	5.64	Feb. 7	2200	495	3.65
Jan. 24	0545	*1,260	5.66	Mar. 1	0045	1,130	5.34

Minimum, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983
MEAN VALUES

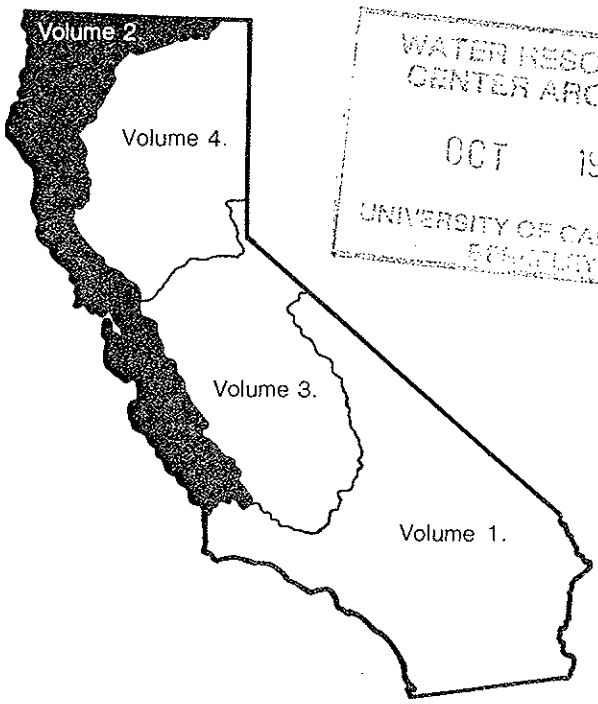
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	4.0	1.9	11	276	6.2	10	.63	.04	0	.01
2		0	2.0	1.7	14	150	5.5	8.0	.57	.03	0	.01
3		0	1.0	1.6	11	90	5.2	6.8	.52	.03	0	.01
4		0	.65	1.5	8.8	65	4.7	6.0	.48	.03	0	.01
5		0	.48	1.4	9.3	48	4.4	5.4	.43	.02	0	.01
6		0	.35	1.2	21	38	4.2	4.9	.39	.02	0	.01
7		0	.29	1.1	68	31	4.0	4.5	.37	.02	0	.01
8		0	.23	1.1	63	26	3.9	4.2	.33	.02	0	.02
9		.14	.20	1.0	25	23	3.7	3.8	.30	.02	0	.02
10		.03	.18	.92	16	17	3.6	3.5	.28	.01	0	.02
11		0	.17	.89	12	15	3.4	3.3	.25	.01	0	.01
12		0	.16	.89	50	12	3.3	3.1	.23	.01	0	.01
13		0	.16	.79	43	15	3.1	2.9	.21	.01	0	.01
14		0	.15	.79	26	12	2.9	2.8	.19	.01	0	0
15		0	.16	.79	22	9.3	2.8	2.7	.17	.01	0	0
16		0	.15	.79	19	17	2.6	2.5	.16	.01	0	0
17		0	.13	.73	18	18	2.4	2.3	.14	0	0	0
18		0	.13	5.1	20	30	18	2.2	.13	0	0	0
19		.54	.13	6.1	19	18	12	2.0	.12	0	0	0
20		.30	.11	2.4	17	19	13	1.8	.11	0	0	0
21		.12	.43	2.1	14	23	15	1.7	.10	0	0	0
22		.06	296	141	13	18	14	1.6	.09	0	0	0
23		.07	31	39	12	22	9.0	1.5	.08	0	.01	0
24		.05	11	134	13	33	12	1.4	.07	0	0	0
25		.05	6.5	27	25	25	9.0	1.2	.07	0	0	0
26		.05	4.6	38	20	18	6.3	1.1	.06	0	0	0
27		.05	3.6	107	75	12	5.4	1.0	.06	0	0	0
28		.06	3.0	32	70	10	7.5	.92	.05	0	0	0
29		1.0	2.7	26	---	8.0	6.5	.85	.05	0	0	0
30		28	2.5	16	---	7.4	14	.75	.04	0	0	0
31		---	2.2	13	---	6.5	---	.70	---	0	0	---
TOTAL	0	30.52	374.36	607.79	735.1	1112.2	207.6	95.42	6.68	0.30	0.01	0.16
MEAN	0	1.02	12.1	19.6	26.3	35.9	6.92	3.08	.22	.010	.000	.005
MAX	0	28	296	141	75	276	18	10	.63	.04	.01	.02
MIN	0	0	.11	.73	8.8	6.5	2.4	.70	.04	0	0	0
AC-FT	0	61	743	1210	1460	2210	412	189	13	.6	.02	.3

CAL YR 1982 TOTAL 1395.23 MEAN 3.82 MAX 296 MIN 0 AC-FT 2770
WTR YR 1983 TOTAL 3170.14 MEAN 8.69 MAX 296 MIN 0 AC-FT 6290

Water Resources Data California

Water Year 1989

Volume 2. Pacific Slope Basins from Arroyo Grande to Oregon State Line except Central Valley



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT CA-89-2
Prepared in cooperation with the California Department of Water Resources and with other agencies

11142300 SAN SIMEON CREEK NEAR CAMBRIA, CA

LOCATION.--Lat 35°35'59", long 121°06'47", in San Simeon Grant, San Luis Obispo County, Hydrologic Unit 18060006, on right bank, 0.7 mi upstream of Highway 1 bridge and 3.0 mi northwest of Cambria.

DRAINAGE AREA.--26.3 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1987 to July 1989 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 12.13 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. No regulation or diversion upstream from station.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 24	0930	*4,880	*15.05				

No flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	18	2.4	2.4	8.8	1.2	.00	.00	---	---
2	.00	.00	.00	11	2.1	48	7.8	1.1	.00	.00	---	---
3	.00	.00	.00	8.9	2.2	23	7.0	.89	.00	.00	---	---
4	.00	.00	.00	7.5	13	11	6.1	.37	.00	.00	---	---
5	.00	.00	.00	141	9.4	8.2	5.4	.18	.00	.00	---	---
6	.00	.00	.00	e43	5.5	7.2	4.7	.05	.00	.00	---	---
7	.00	.00	.00	24	4.4	6.7	4.1	.00	.00	.00	---	---
8	.00	.00	.00	17	4.5	6.0	3.7	.00	.00	.00	---	---
9	.00	.00	.00	14	36	5.4	3.1	.00	.00	.00	---	---
10	.00	.00	.00	12	17	5.1	3.1	.00	.00	.00	---	---
11	.00	.00	.00	10	11	11	3.0	.00	.00	.00	---	---
12	.00	.00	.00	8.2	8.9	9.4	2.8	.00	.00	---	---	---
13	.00	.00	.00	7.2	7.8	6.7	2.5	.00	.00	---	---	---
14	.00	.00	.00	6.8	6.7	6.0	2.6	.00	.00	---	---	---
15	.00	.00	.00	6.2	5.9	5.7	2.2	.00	.00	---	---	---
16	.00	.00	.00	5.7	5.5	11	2.1	.00	.00	---	---	---
17	.00	.00	.00	5.1	5.0	12	2.1	.00	.00	---	---	---
18	.00	.00	.00	4.7	4.8	8.3	2.3	.00	.00	---	---	---
19	.00	.00	.00	4.5	4.7	7.2	2.4	.00	.00	---	---	---
20	.00	.00	.00	4.0	4.3	6.6	2.3	.00	.00	---	---	---
21	.00	.00	.51	3.4	3.9	5.8	2.1	.00	.00	---	---	---
22	.00	.00	124	2.7	3.7	5.4	1.9	.00	.00	---	---	---
23	.00	.00	38	5.5	3.4	5.2	1.8	.00	.00	---	---	---
24	.00	.00	784	6.5	3.3	58	2.0	.00	.00	---	---	---
25	.00	.00	76	4.2	3.2	104	3.1	.00	.00	---	---	---
26	.00	.00	30	3.7	2.9	48	2.5	.00	.00	---	---	---
27	.00	.00	19	3.2	2.9	24	2.0	.00	.00	---	---	---
28	.00	.00	16	2.9	2.7	18	1.7	.00	.00	---	---	---
29	.00	.00	12	2.8	---	14	1.3	.00	.00	---	---	---
30	.00	.00	11	2.6	---	12	1.2	.00	.00	---	---	---
31	.00	---	26	2.5	---	10	---	.00	---	---	---	---
TOTAL	0.00	0.00	1136.51	398.8	187.1	511.3	97.7	3.79	0.00	---	---	---
MEAN	.00	.00	36.7	12.9	6.68	16.5	3.26	.12	.00	---	---	---
MAX	.00	.00	784	141	36	104	8.8	1.2	.00	---	---	---
MIN	.00	.00	.00	2.5	2.1	2.4	1.2	.00	.00	---	---	---
AC-FT	.0	.0	2250	791	371	1010	194	7.5	.0	---	---	---

CAL YR 1988 TOTAL 2591.50 MEAN 7.08 MAX 784 MIN .00 AC-FT 5140

e Estimated.

11142300 SAN SIMEON CREEK NEAR CAMBRIA, CA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--
CHEMICAL DATA: Water year 1988 to February 1989 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
JAN									
31...	1210	2.7	519	--	12.0	--	--	--	--
FEB									
23...	1325	3.6	495	8.20	17.0	240	44	31	16

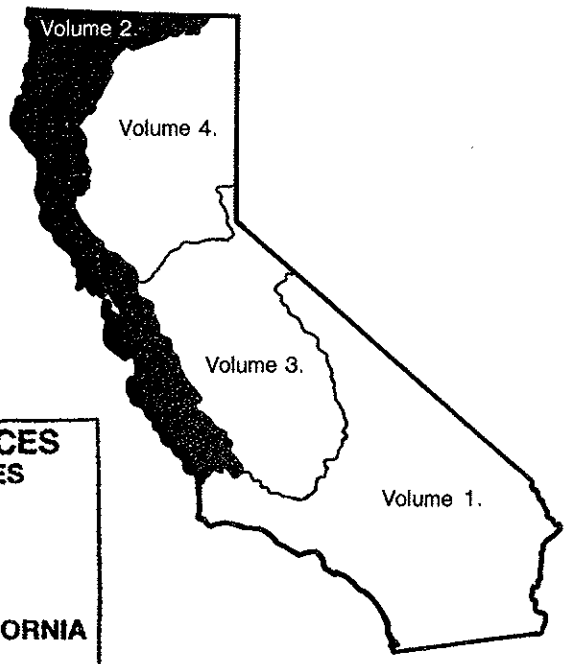
DATE	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	BROMIDE DIS-SOLVED (MG/L AS BR)
JAN								
31...	--	--	--	--	--	--	--	--
FEB								
23...	13	0.5	1.1	216	44	13	0.10	<0.010

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	BORON, DIS-SOLVED (UG/L AS B)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
JAN								
31...	--	--	--	--	--	--	--	--
FEB								
23...	14	292	294	<0.010	0.206	180	5	3

< Actual value is known to be less than the value shown.

Water Resources Data California Water Year 1992

Volume 2. Pacific Slope Basins from Arroyo Grande to Oregon State Line except Central Valley



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT CA-92-2
Prepared in cooperation with the California Department of Water Resources and with other agencies

ARROYO GRANDE BASIN

11141150 ARROYO GRANDE ABOVE PHOENIX CREEK, NEAR ARROYO GRANDE, CA

LOCATION.--Lat 35°11'19", long 120°26'03", in Arroyo Grande Grant, San Luis Obispo County, Hydrologic Unit 18060006, on right bank 0.4 mi upstream from county road bridge, 0.45 mi upstream from Phoenix Creek, and 9.2 mi northeast of Arroyo Grande.

DRAINAGE AREA.--13.4 mi^2.

PERIOD OF RECORD.--June 1967 to September 1992 (discontinued).
CHEMICAL DATA: Water year 1977.
WATER TEMPERATURE: Water years 1968-73.
SEDIMENT DATA: Water years 1967-73, June 1990.

REVISED RECORDS.--WDR CA-70-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 560 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to May 24, 1984, at site 0.4 mi downstream at different datum.

REMARKS.--Records poor. No regulation or diversion upstream from station except for small stock ponds.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,270 ft^3/s, Jan. 25, 1969, gage height, 6.83 ft, in gage well, 6.57 ft from floodmarks, site and datum then in use, from rating curve extended above 350 ft^3/s on basis of slope-area measurement of peak flow; maximum gage height, 8.29 ft, Apr. 4, 1978, from floodmark, site and datum then in use; minimum daily discharge, 0.12 ft^3/s, Sept. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	e0630	e*225	unknown	Feb. 15	e0445	e200	unknown

Minimum daily, 0.28 ft^3/s, Sept. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.30	e.45	e.62	e1.3	e.82	e1.6	e1.3	1.1	.84	.79	.49	.55
2	e.30	e.42	e.62	e.83	e.82	e1.6	e1.3	1.1	.79	.76	.53	.42
3	e.30	e.41	e.62	e.80	e.82	e1.5	e1.3	1.1	.80	.66	.48	.38
4	e.31	e.40	e.62	e.90	e.81	e1.5	e1.3	1.2	.87	.67	.50	.39
5	e.31	e.40	e.62	e10	e.81	e1.6	e1.3	1.3	.99	.58	.40	.41
6	e.31	e.40	e.62	e7.0	e.81	e4.0	e1.3	1.3	1.1	.44	.43	.43
7	e.31	e.40	e.64	e7.4	e.80	e3.5	e1.3	1.4	1.1	.40	.41	.33
8	e.31	e.40	e.70	e3.8	e.80	e2.6	e1.3	1.5	1.1	.44	.38	.33
9	e.32	e.41	e.69	e2.0	e.80	e2.0	e1.3	1.5	1.1	.45	.41	.33
10	e.32	e.70	e.67	e1.5	e17	e1.8	1.3	1.5	1.3	.47	.43	.39
11	e.32	e.67	e.66	e1.3	e28	e1.7	1.2	1.5	1.4	.53	.46	.37
12	e.32	e.60	e.66	e1.1	e56	e1.6	1.2	1.5	1.4	.64	.38	.39
13	e.32	e.53	e.66	e1.0	e45	e1.6	1.3	1.3	1.5	.70	.39	.41
14	e.33	e.50	e.66	e.97	e35	e1.5	1.4	1.3	1.6	.71	.42	.37
15	e.33	e.48	e.66	e.94	e60	e1.5	1.3	1.3	1.7	.73	.41	.38
16	e.33	e.46	e.66	e.94	e35	e1.5	1.3	1.2	1.0	.64	.41	.41
17	e.33	e.50	e.66	e.91	e18	e1.5	1.3	1.1	1.2	.62	.41	.39
18	e.33	e1.0	e.66	e.90	e9.0	e1.5	1.3	1.1	1.4	.63	.39	.39
19	e.34	e.96	e.66	e.88	e4.8	e1.4	1.5	1.1	1.5	.54	.42	.39
20	e.34	e.81	e.66	e.87	e3.3	e1.4	1.5	1.0	1.5	.55	.39	.38
21	e.34	e.73	e.66	e.86	e2.8	e1.4	1.6	1.0	1.4	.55	.40	.29
22	e.34	e.68	e.66	e.86	e2.5	e2.0	1.5	1.0	1.3	.51	.43	.28
23	e.35	e.67	e.66	e.86	e2.3	e1.9	1.5	1.0	1.2	.47	.44	.31
24	e.35	e.66	e.66	e.85	e2.1	e1.7	1.5	1.0	1.1	.52	.45	.33
25	e.35	e.65	e.66	e.85	e2.0	e1.6	1.4	1.0	.96	.52	.44	.38
26	e.80	e.64	e.66	e.84	e1.9	e1.5	1.4	.99	.95	.54	.42	.37
27	e.77	e.63	e.66	e.84	e1.8	e1.5	1.3	.94	.93	.58	.33	.40
28	e.64	e.63	e3.5	e.84	e1.7	e1.5	1.3	.90	.79	.49	.40	.42
29	e.57	e.63	e6.0	e.84	e1.7	e1.4	1.2	.93	.75	.54	.45	.42
30	e.51	e.62	e6.4	e.83	---	e1.4	1.2	.91	.83	.57	.51	.41
31	e.48	---	e2.5	e.83	---	e1.4	---	.86	---	.46	.51	---
TOTAL	11.88	17.44	36.04	54.64	337.19	54.2	40.2	35.93	34.40	17.70	13.32	11.45
MEAN	.38	.58	1.16	1.76	11.6	1.75	1.34	1.16	1.15	.57	.43	.38
MAX	.80	1.0	6.4	10	60	4.0	1.6	1.5	1.7	.79	.53	.55
MIN	.30	.40	.62	.80	.80	1.4	1.2	.86	.75	.40	.33	.28
AC-FT	24	35	71	108	669	108	80	71	68	35	26	23

e Estimated.

ARROYO GRANDE BASIN

11141150 ARROYO GRANDE ABOVE PHOENIX CREEK, NEAR ARROYO GRANDE, CA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1992, BY WATER YEAR (WY)

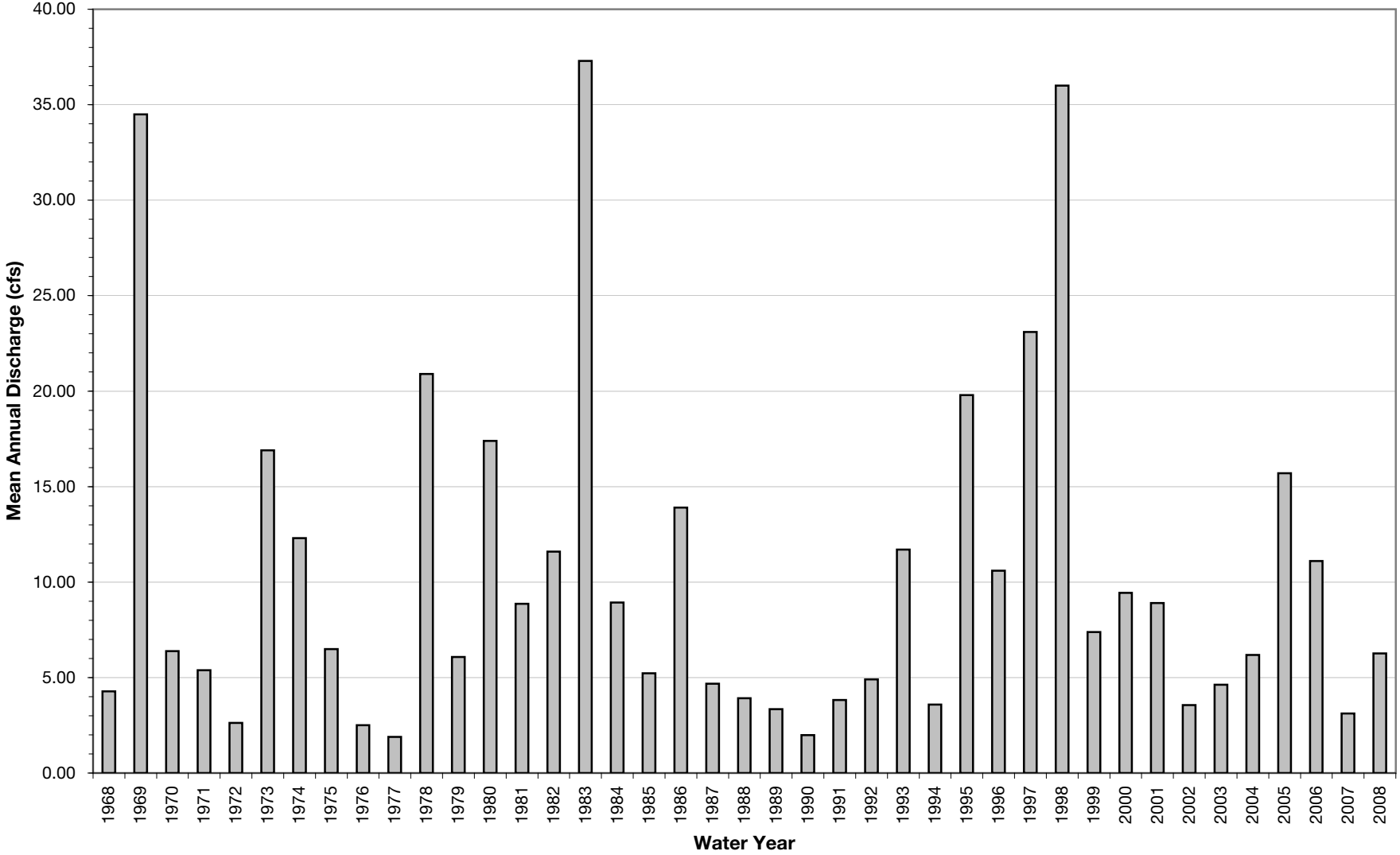
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	.96	1.38	1.90	4.93	7.42	6.67	3.36	1.84	1.47	1.07	.83	.76
MAX	1.95	4.75	6.75	47.8	42.3	32.2	16.0	5.90	4.23	2.84	2.07	1.50
(WY)	1984	1983	1983	1969	1969	1986	1982	1983	1983	1983	1983	1986
MIN	.32	.40	.41	.52	.66	.80	.57	.43	.28	.18	.20	.26
(WY)	1991	1991	1991	1991	1991	1990	1990	1990	1990	1990	1990	1990

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1967 - 1992	
ANNUAL TOTAL	288.75		664.39			
ANNUAL MEAN	.79		1.82		2.68	
HIGHEST ANNUAL MEAN					10.8	1969
LOWEST ANNUAL MEAN					.50	1990
HIGHEST DAILY MEAN	8.6	Mar 20	60	Feb 15	391	Jan 25 1969
LOWEST DAILY MEAN	.30	Sep 29	.28	Sep 22	.12	Sep 7 1977
ANNUAL SEVEN-DAY MINIMUM	.30	Sep 27	.31	Oct 1	.16	Aug 5 1990
INSTANTANEOUS PEAK FLOW			225	Feb 12	1270	Jan 25 1969
INSTANTANEOUS PEAK STAGE			.00	Feb 12	8.29	Apr 4 1978
ANNUAL RUNOFF (AC-FT)	573		1320		1940	
10 PERCENT EXCEEDS	.99		1.7		3.6	
50 PERCENT EXCEEDS	.62		.80		1.2	
90 PERCENT EXCEEDS	.34		.38		.43	

Attachment 2

Mean Annual Discharge and Kendall's Tau Correlation Tests (Lopez Creek and Nacimiento River)

USGS 11141280 Lopez Creek - Index Station 1



11141280_LopezCr_maq.xls : CHT

USGS 11141280 LOPEZ C NR ARROYO GRANDE CA

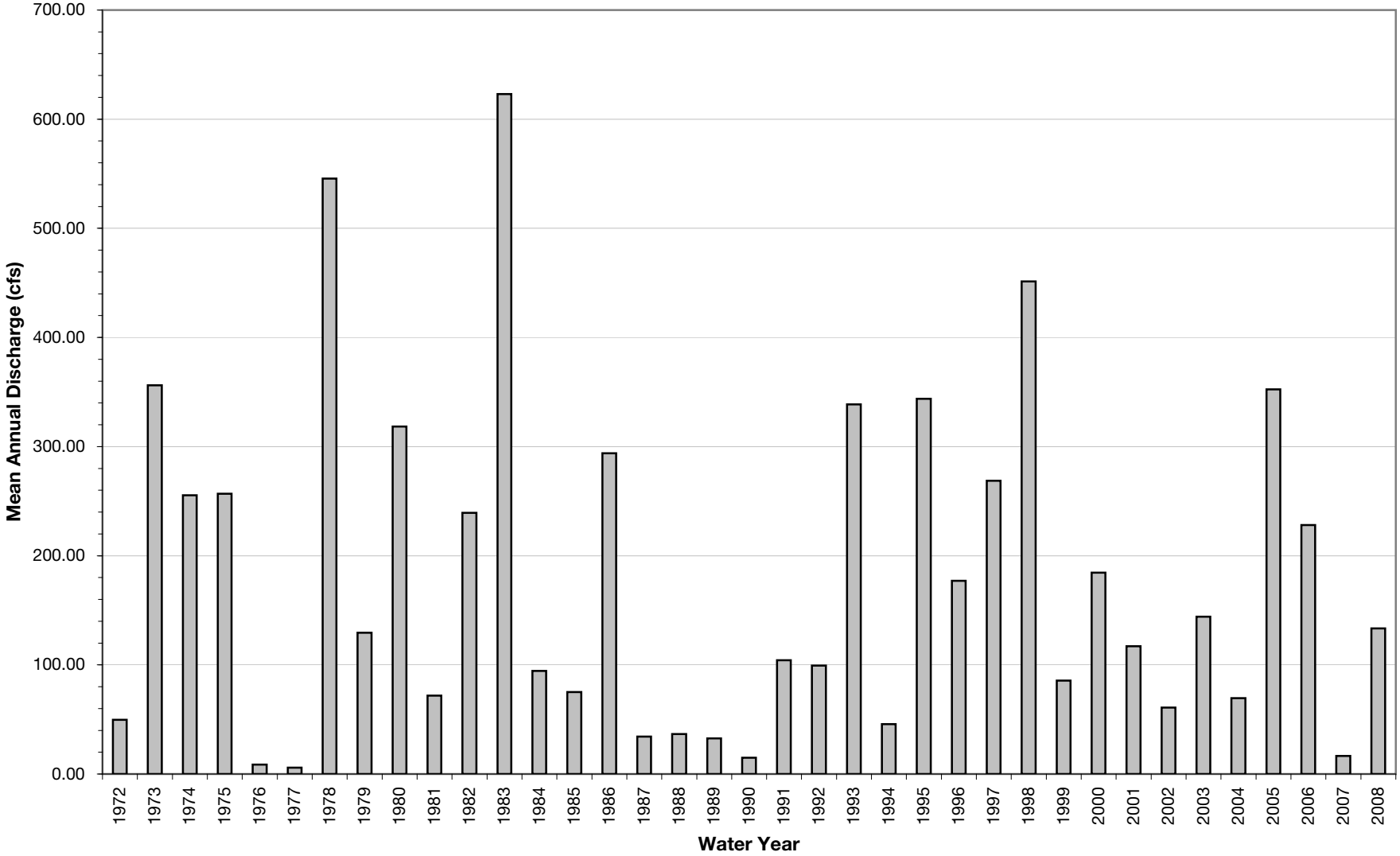
Agency	Gage No.	Water Year	Mean Annual Flow (cfs)
USGS	11141280	1968	4.28
USGS	11141280	1969	34.50
USGS	11141280	1970	6.38
USGS	11141280	1971	5.38
USGS	11141280	1972	2.63
USGS	11141280	1973	16.90
USGS	11141280	1974	12.30
USGS	11141280	1975	6.49
USGS	11141280	1976	2.50
USGS	11141280	1977	1.89
USGS	11141280	1978	20.90
USGS	11141280	1979	6.08
USGS	11141280	1980	17.40
USGS	11141280	1981	8.87
USGS	11141280	1982	11.60
USGS	11141280	1983	37.30
USGS	11141280	1984	8.93
USGS	11141280	1985	5.22
USGS	11141280	1986	13.90
USGS	11141280	1987	4.68
USGS	11141280	1988	3.92
USGS	11141280	1989	3.35
USGS	11141280	1990	1.99
USGS	11141280	1991	3.82
USGS	11141280	1992	4.90
USGS	11141280	1993	11.70
USGS	11141280	1994	3.59
USGS	11141280	1995	19.80
USGS	11141280	1996	10.60
USGS	11141280	1997	23.10
USGS	11141280	1998	36.00
USGS	11141280	1999	7.39
USGS	11141280	2000	9.44
USGS	11141280	2001	8.90
USGS	11141280	2002	3.56
USGS	11141280	2003	4.63
USGS	11141280	2004	6.18
USGS	11141280	2005	15.70
USGS	11141280	2006	11.10
USGS	11141280	2007	3.12
USGS	11141280	2008	6.26

Kendall Rank Correlation for Column 1, Column 2

Score	-14.000
Tau	-.017
Z-Value	-.157
P-Value	.8751
Tau corrected for ties	-.017
Tied Z-Value	-.157
Tied P-Value	.8751
# Ties, Column 1	0
# Ties, Column 2	0

9 cases were omitted due to missing values.

USGS 11148900 Nacimiento River - Index Station 2



USGS 11148900 NACIMIENTO R BL SAPAQUE C NR BRYSON CA

Agency	Gage No.	Water Year	Mean Annual Flow (cfs)
USGS	11148900	1972	49.60
USGS	11148900	1973	356.10
USGS	11148900	1974	255.40
USGS	11148900	1975	256.80
USGS	11148900	1976	8.62
USGS	11148900	1977	5.74
USGS	11148900	1978	545.70
USGS	11148900	1979	129.40
USGS	11148900	1980	318.30
USGS	11148900	1981	71.80
USGS	11148900	1982	239.30
USGS	11148900	1983	623.00
USGS	11148900	1984	94.50
USGS	11148900	1985	75.20
USGS	11148900	1986	293.90
USGS	11148900	1987	34.30
USGS	11148900	1988	36.60
USGS	11148900	1989	32.60
USGS	11148900	1990	14.90
USGS	11148900	1991	104.30
USGS	11148900	1992	99.30
USGS	11148900	1993	338.70
USGS	11148900	1994	45.70
USGS	11148900	1995	343.90
USGS	11148900	1996	177.00
USGS	11148900	1997	268.60
USGS	11148900	1998	451.30
USGS	11148900	1999	85.60
USGS	11148900	2000	184.40
USGS	11148900	2001	117.00
USGS	11148900	2002	60.90
USGS	11148900	2003	144.20
USGS	11148900	2004	69.40
USGS	11148900	2005	352.40
USGS	11148900	2006	228.10
USGS	11148900	2007	16.50
USGS	11148900	2008	133.50

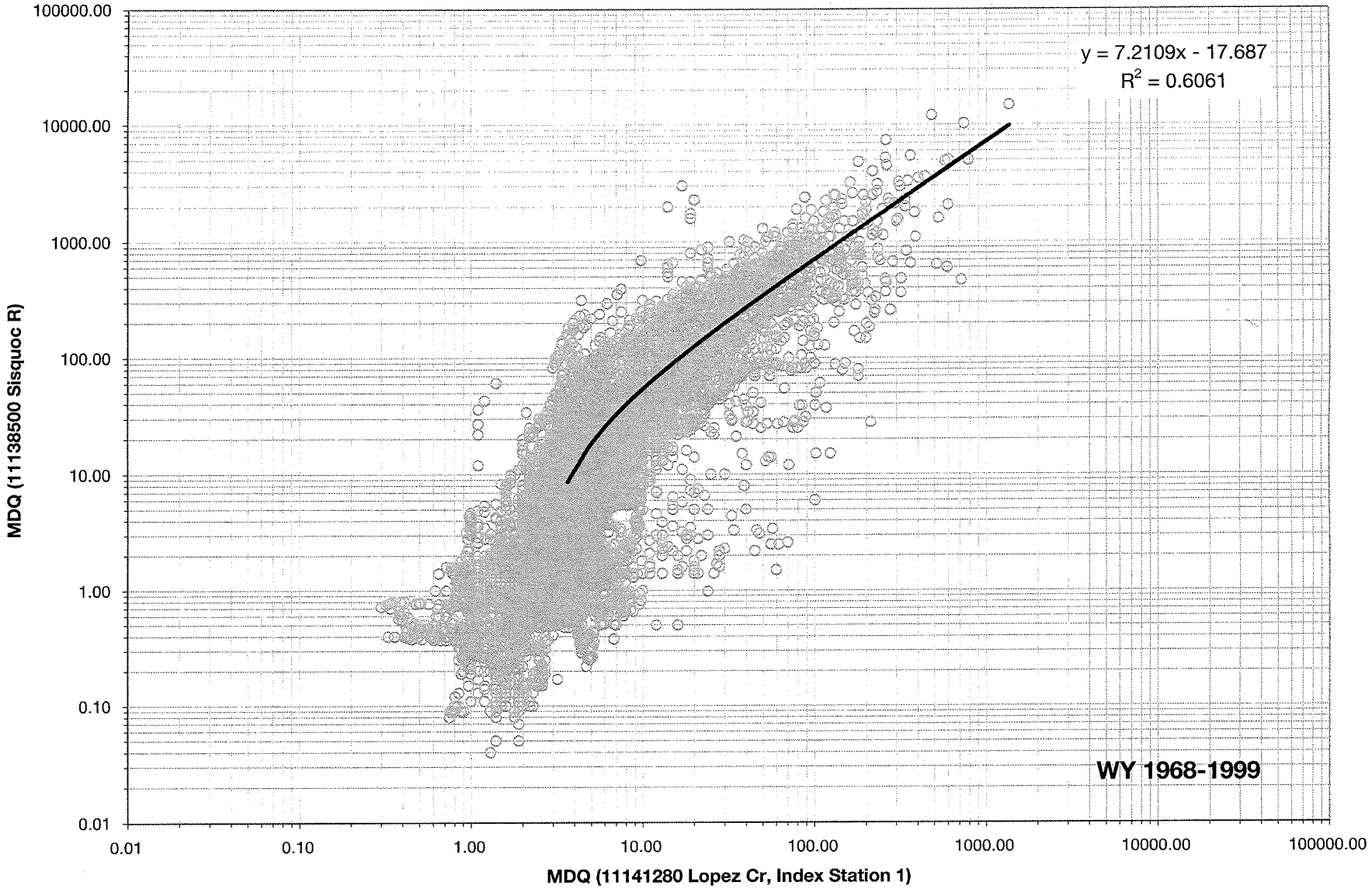
Kendall Rank Correlation for Column 1, Column 2

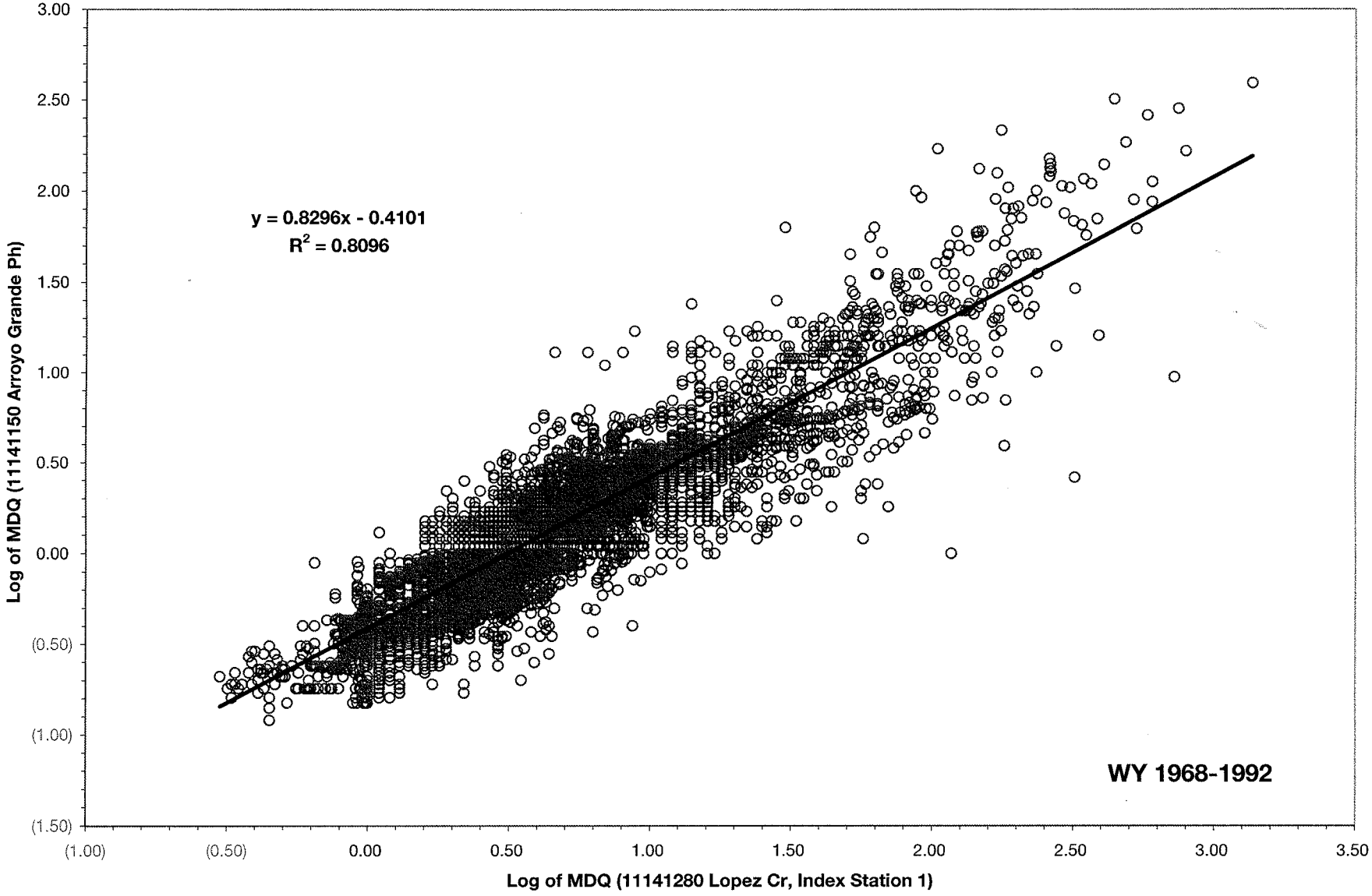
Score	-4.000
Tau	-.006
Z-Value	-.052
P-Value	.9583
Tau corrected for ties	-.006
Tied Z-Value	-.052
Tied P-Value	.9583
# Ties, Column 1	0
# Ties, Column 2	0

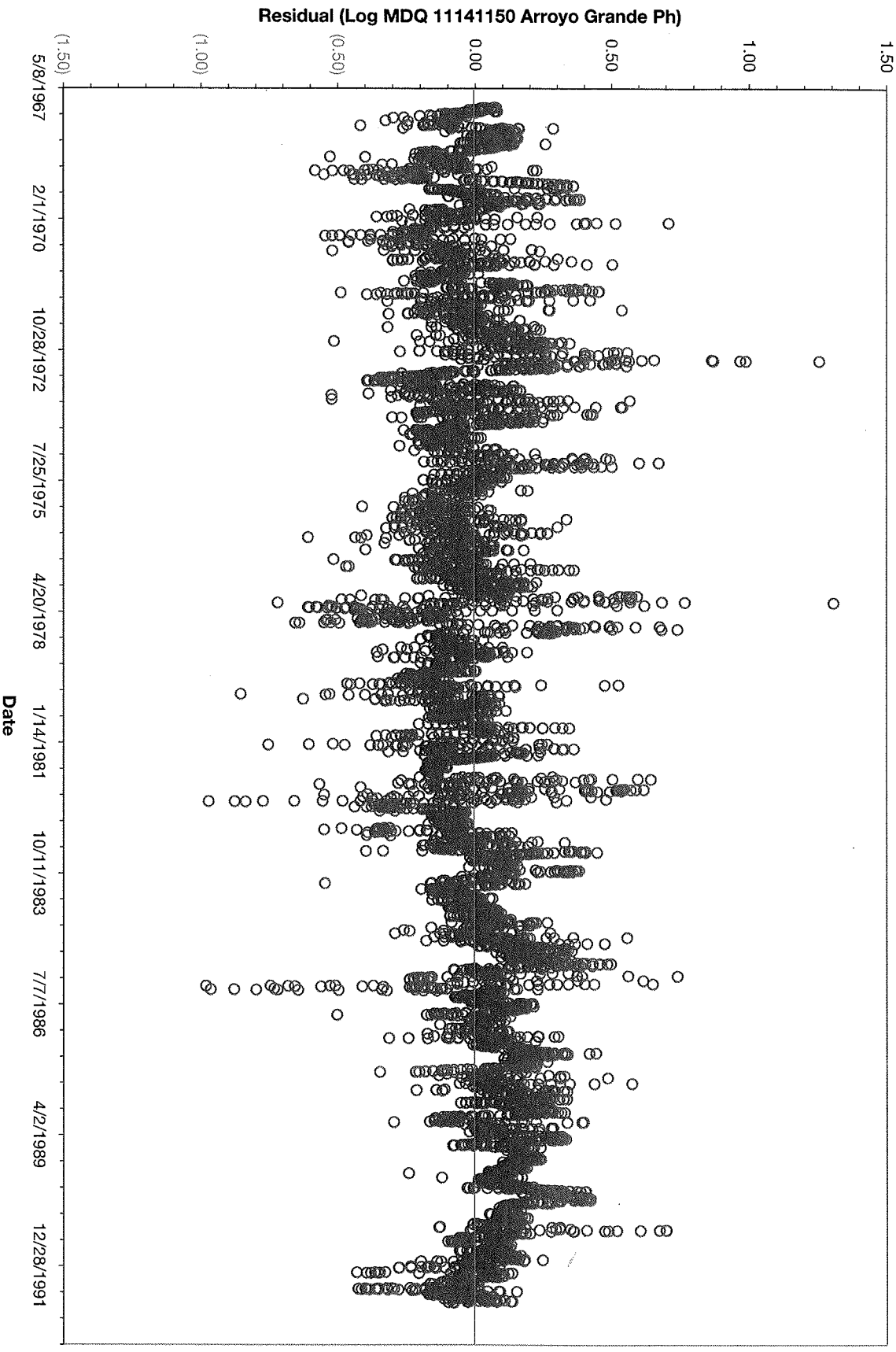
13 cases were omitted due to missing values.

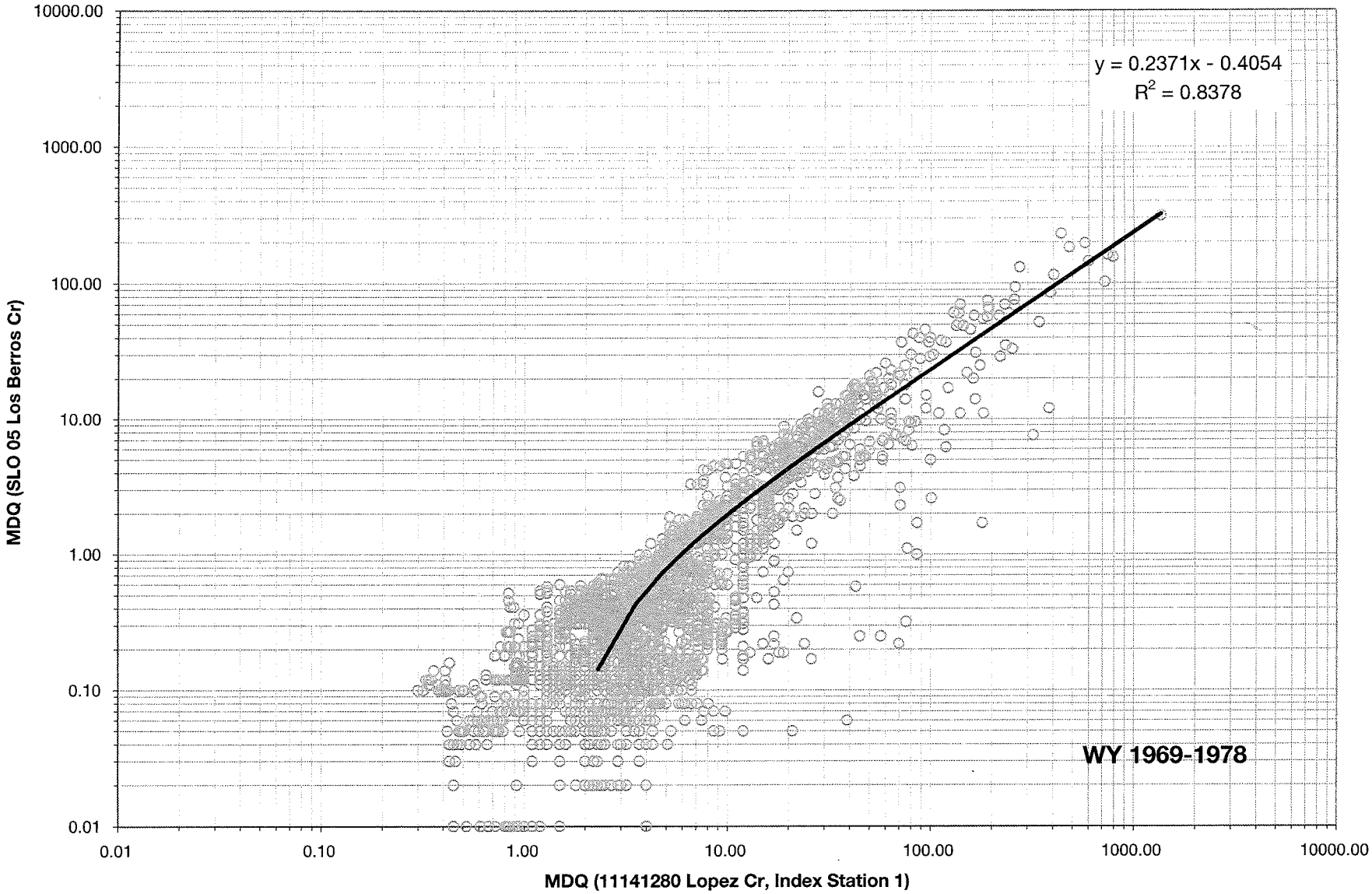
Attachment 3

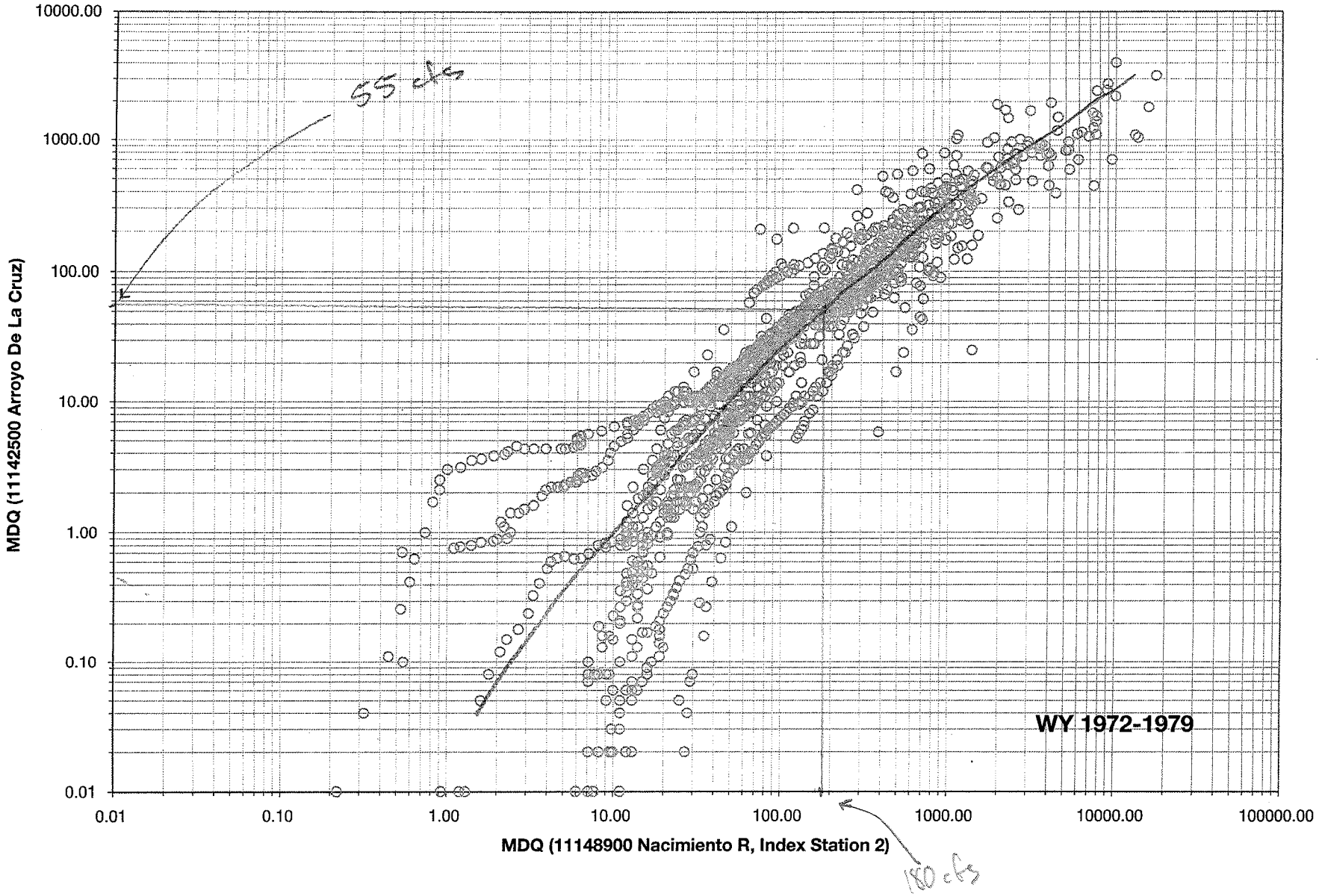
Index and Study Station Regression Analysis

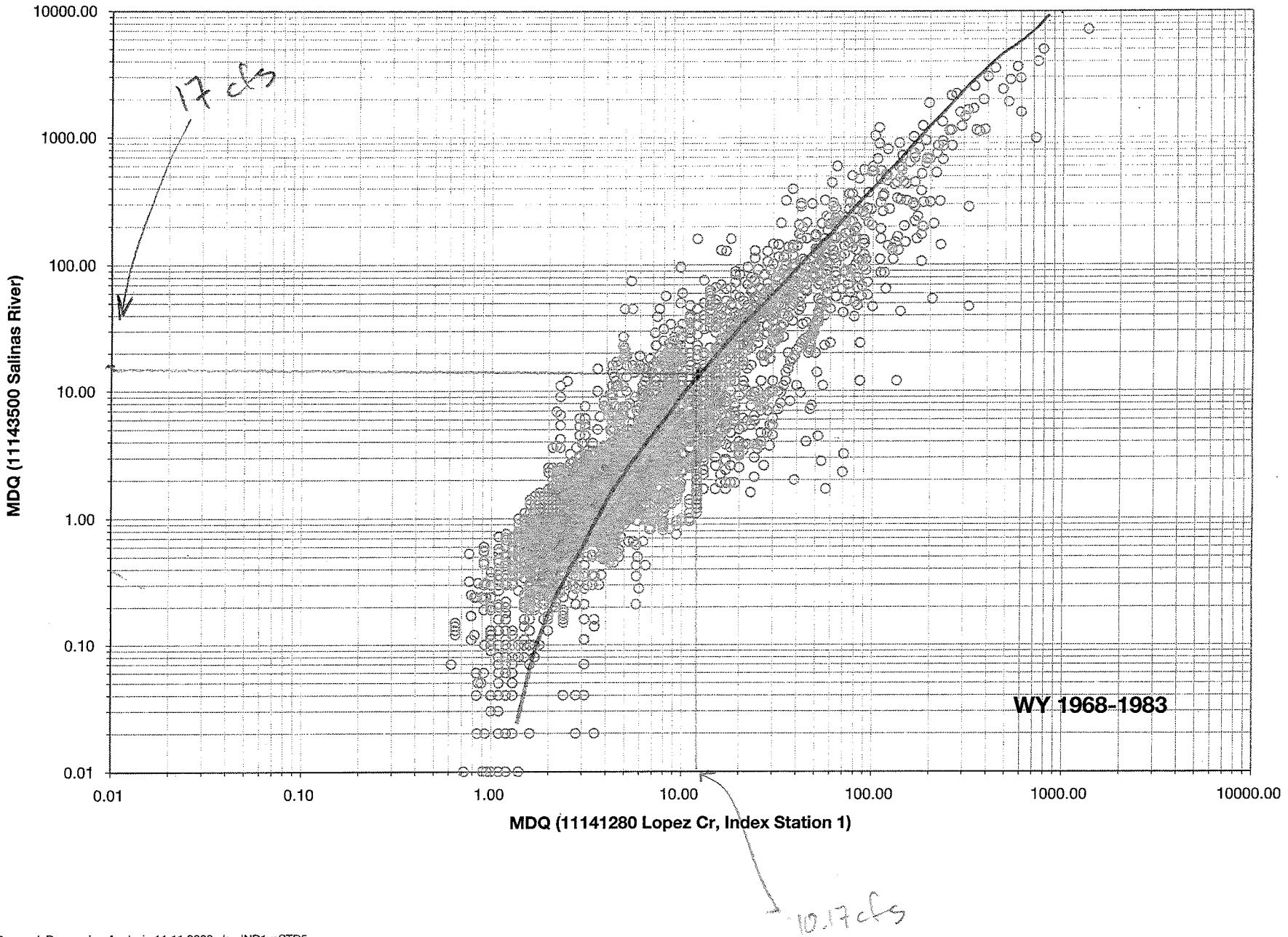


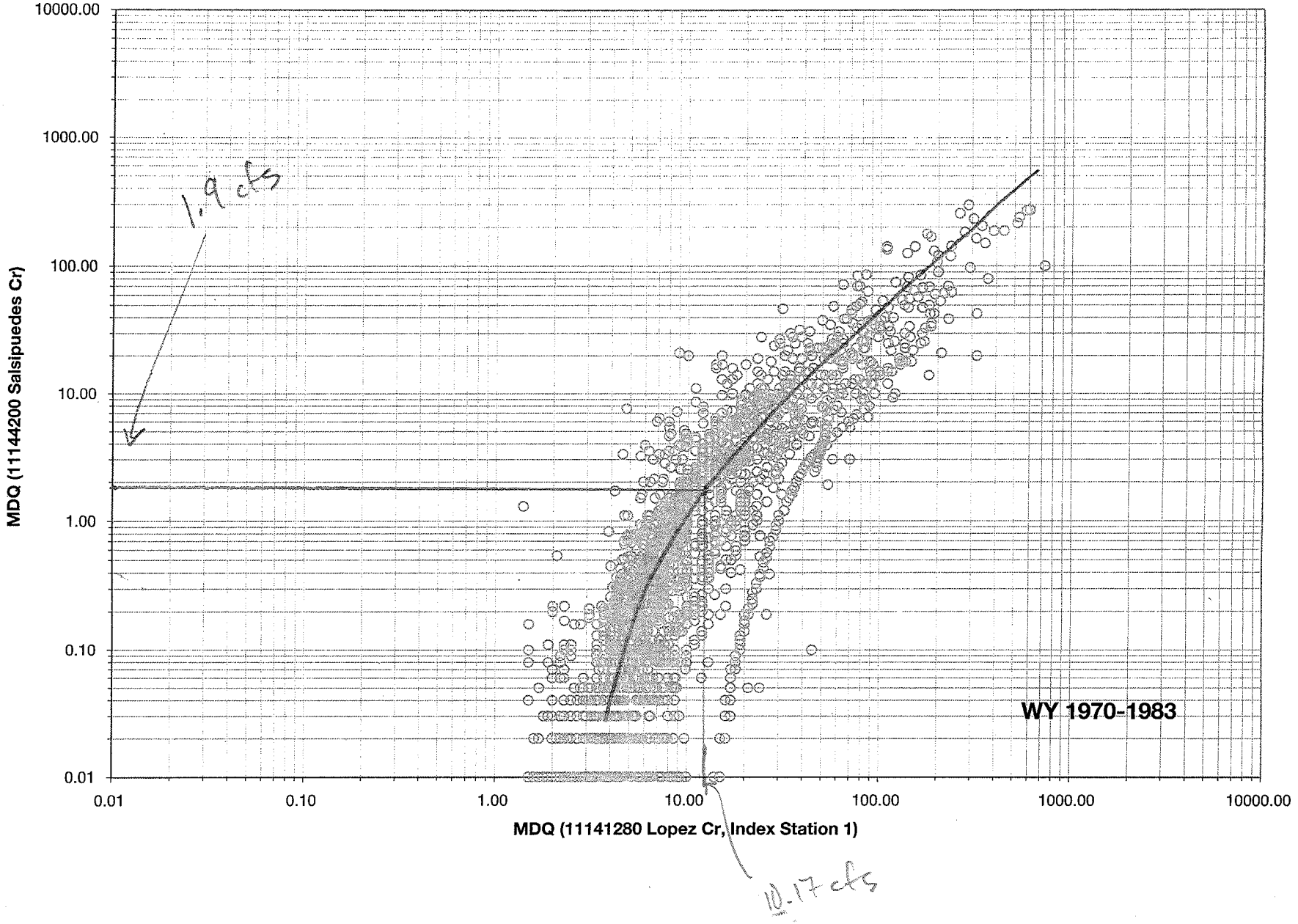












Attachment 4

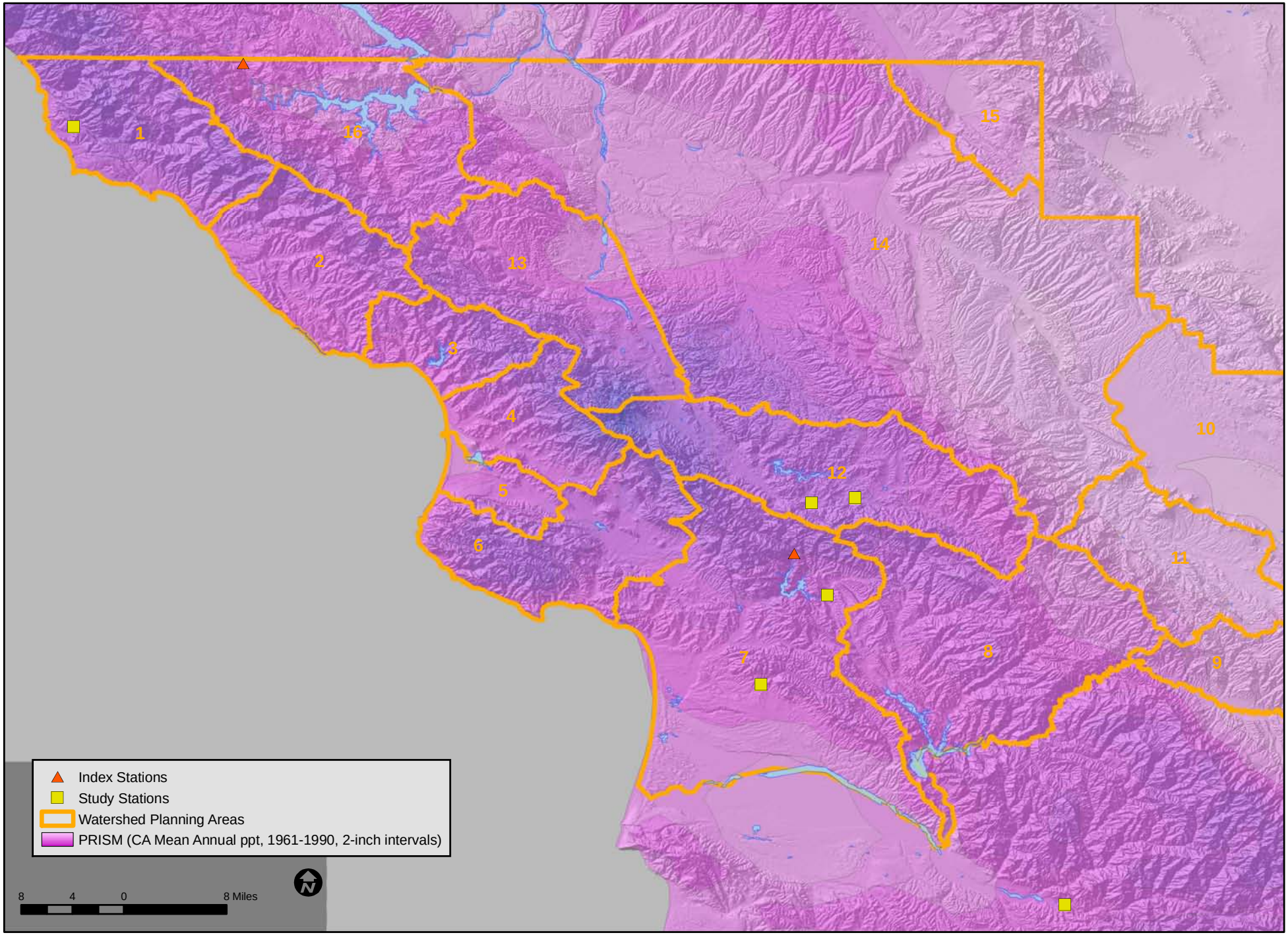
Weighted Mean Annual Discharge (Arroyo Grande and Sisquoc River)

Weighted Mean Annual Discharge (MAD) Calculation

	11141150 Arroyo Grande Ph				11138500 Sisquoc R			
	MAD (cfs)	water year range	years	count (days)	MAD (cfs)	water year range	years	count (days)
MAD (cfs):								
range1 (from gage data)	2.44	1972-1992	21	7670	56.93	1972-1999	28	10227
range2 (from regression)	2.91	1993-2008	16	5844	37.48	2000-2008	9	3287
Weighted MAD (1972-2008) (cfs)	**2.64**				**52.20**			

Attachment 5

Unit Mean Annual Discharge for Index and Study Stations



Mean Annual Discharge - Index/Study Stations
(WY 1972-2008)

WPA #	7	16	S. of 8	7	7	1	12	12
WPA Name	South Coast	Nacimiento	Huasna Valley	South Coast	South Coast	San Simeon	Santa Margarita	Santa Margarita
Station Name	Lopez Creek	Nacimiento River	Sisquoc River	Arroyo Grande Ph	Los Berros Creek	Arroyo DeLa Cruz	Salinas River	Salsipuedes Creek
Station No.	11141280	11148900	11138500	11141150	11141600	11142500	11143500	11144200
Station ID	Index 1	Index 2	Study Sta 1	Study Sta 2	Study Sta 3	Study Sta 4	Study Sta 5	Study Sta 6
Latitude	35.235530	35.788579	34.839722	35.188586	35.088032	35.717190	35.298585	35.292752
DA (mi^2)	20.9	162.0	281.0	13.5	15.0	41.2	70.3	5.9
General Regime	Perennial	Ephemeral	Perennial	Perennial	Perennial [1]	Ephemeral	Perennial	Ephemeral
MAD (cfs)	10.17	180.02	52.20	2.64	2.01	55.00	17.00	1.90
Unit MAD (cfs/mi^2)	0.49	1.11	0.19	0.20	0.13	1.33	0.24	0.32
MAD (acre-feet)	7,370	130,453	37,827	1,913	1,457	39,856	12,319	1,377

Notes:
1 Based on water years 1969-1978 (i.e., the USGS data only)

EWD - SUMMARY
(WY 1972-2008)

WPA #	**1**							
WPA Name	**San Simeon**							
Station Name				Arroyo de la Cruz				Pico Cr
Station No.								
Station ID	11	12	13	14	15	16	17	18
Latitude	35.782313	35.772307	35.738701	35.724013	35.680381	35.680016	35.660101	35.650794
DA (mi^2)	3.3	17.1	5.0	43.4	8.8	6.5	15.2	15.2
Unit MAD derived from:	Ind2, Std4	Ind2, Std4	Ind2, Std4	Std4	Ind2, Std4	Ind2, Std4	Ind2, Std4	Ind2, Std4
Unit MAD (cfs/mi^2)	1.22	1.22	1.22	1.33	1.22	1.22	1.22	1.22
MAD (cfs)	3.98	20.83	6.09	57.71	10.70	7.88	18.51	18.51
MAD (acre-feet)	2,882	15,091	4,412	41,819	7,753	5,711	13,411	13,411
Adult Demand (Dec-Apr):								
(cfs)	8.35	28.29	11.43	59.97	17.32	13.83	25.94	25.94
(cfs/mi^2)	2.56	1.66	2.29	1.38	1.97	2.14	1.71	1.71
(acre-feet)	2,506	8,491	3,430	17,996	5,197	4,149	7,783	7,783
Juvenile Demand (May-Nov):								
(cfs)	4.38	11.68	5.62	21.31	7.82	6.52	10.81	10.80
(cfs/mi^2)	1.34	0.68	1.13	0.49	0.89	1.01	0.71	0.71
Annual 0 flow days (%)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
(acre-feet)[1]	907	2,420	1,164	4,415	1,620	1,351	2,239	2,237
Annual EWD (acre-feet) [2]	**2,882**	**10,911**	**4,412**	**22,410**	**6,817**	**5,500**	**10,022**	**10,021**
Annual EWD ($acre-feet/mi^2$)	**884.1**	**639.2**	**884.1**	**516.5**	**777.3**	**851.4**	**660.7**	**660.6**
Unimpaired MAD for WPA (acre-ft)								**104,491**
Annual EWD for WPA (acre-ft)								**72,975**
EWD/MAD (%)								**69.8%**

Notes:
1 Excludes estimated no. of days with no flow
2 If the calculated EWD is greater than the calculated MAD, then EWD is assumed to be equal to the MAD.

EWD - SUMMARY
(WY 1972-2008)

WPA #	**2**			**3**		
WPA Name	**Cambria**			**Cayucos**		
Station Name	San Simeon Cr	Santa Rosa Cr	Villa Cr	Cayucos Cr		Toro Cr
Station No.						
Station ID	21	22	23	31	32	33
Latitude	35.617505	35.558596	35.507583	35.482575	35.481812	35.453110
DA (mi^2)	34.8	47.5	25.9	18.0	24.1	15.4
Unit MAD derived from:	Ind2	Ind2	Ind2	Ind1, Ind2	Ind1, Ind2	Ind1, Ind2
Unit MAD (cfs/mi^2)	1.11	1.11	1.11	0.80	0.80	0.80
MAD (cfs)	38.62	52.73	28.78	14.41	19.30	12.30
MAD (acre-feet)	27,984	38,207	20,857	10,441	13,983	8,916
Adult Demand (Dec-Apr):						
(cfs)	44.60	56.11	35.91	21.57	26.75	19.20
(cfs/mi^2)	1.28	1.18	1.39	1.20	1.11	1.25
(acre-feet)	13,384	16,837	10,777	6,472	8,026	5,761
Juvenile Demand (May-Nov):						
(cfs)	16.66	19.96	13.89	9.20	10.94	8.36
(cfs/mi^2)	0.48	0.42	0.54	0.51	0.45	0.54
Annual 0 flow days (%)	30.0	30.0	30.0	30.0	30.0	30.0
(acre-feet)[1]	3,452	4,135	2,877	1,905	2,266	1,732
Annual EWD (acre-feet) [2]	**16,836**	**20,972**	**13,655**	**8,377**	**10,292**	**7,492**
Annual EWD ($acre-feet/mi^2$)	**483.9**	**441.5**	**526.6**	**465.1**	**426.7**	**487.2**
Unimpaired MAD for WPA (acre-ft)			**87,049**			**33,340**
Annual EWD for WPA (acre-ft)			**51,463**			**26,162**
EWD/MAD (%)			**59.1%**			**78.5%**

Notes:
1 Excludes estimated no. of days with no flow
2 If the calculated EWD is greater than the calculated M

EWD - SUMMARY
(WY 1972-2008)

WPA #	**4**		**5**	**6**			
WPA Name	**Morro Bay**		**Los Osos**	**SLO/Avila**			
Station Name	Morro Cr	Chorro Cr	Los Osos Cr				SLO Cr
Station No.							
Station ID	41	42	51	61	62	63	64
Latitude	35.419954	35.360460	35.297121	35.272507	35.238282	35.198003	35.259129
DA (mi^2)	28.4	46.5	23.1	12.4	17.2	16.4	83.0
Unit MAD derived from:	Ind1, Ind2	Ind1, Ind2	Ind1	Ind1	Ind1	Ind1	Ind1
Unit MAD (cfs/mi^2)	0.80	0.80	0.49	0.49	0.49	0.49	0.49
MAD (cfs)	22.72	37.22	11.31	6.07	8.44	8.06	40.66
MAD (acre-feet)	16,464	26,969	8,199	4,396	6,118	5,838	29,465
Adult Demand (Dec-Apr):							
(cfs)	30.17	43.40	18.05	11.40	14.54	14.05	46.33
(cfs/mi^2)	1.06	0.93	0.78	0.92	0.84	0.85	0.56
(acre-feet)	9,053	13,024	5,416	3,421	4,365	4,216	13,902
Juvenile Demand (May-Nov):							
(cfs)	11.99	16.00	7.86	5.42	6.58	6.38	16.74
(cfs/mi^2)	0.42	0.34	0.34	0.44	0.38	0.39	0.20
Annual 0 flow days (%)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
(acre-feet)[1]	2,485	3,316	1,629	1,124	1,364	1,322	3,469
Annual EWD (acre-feet) [2]	**11,538**	**16,340**	**7,045**	**4,396**	**5,728**	**5,539**	**17,371**
Annual EWD ($acre-feet/mi^2$)	**406.3**	**351.2**	**305.1**	**355.1**	**332.5**	**336.9**	**209.3**
Unimpaired MAD for WPA (acre-ft)		**43,433**	**8,199**				**45,816**
Annual EWD for WPA (acre-ft)		**27,878**	**7,045**				**33,034**
EWD/MAD (%)		**64.2%**	**85.9%**				**72.1%**

Notes:
1 Excludes estimated no. of days with no flow
2 If the calculated EWD is greater than the calculated M

EWD - SUMMARY
(WY 1972-2008)

WPA #	**7**					**8**		
WPA Name	**South Coast**					**Huasna Valley**		
Station Name	Pismo Cr	Arroyo Grande				Huasna R	Alamo Cr/Huasna R	
Station No.								
Station ID	71	72	73	74	75	81	82	83
Latitude	35.202812	35.170851	35.036416	35.029204	34.959284	35.157884	35.132654	35.087447
DA (mi^2)	40.3	151.8	28.9	13.3	11.9	118.5	100.2	24.2
Unit MAD derived from:	Ind1	Ind1, Std2, Std3	Std3	Std3	Std3	Std2, Std3, Std6	Std1, Std2, Std3	Std1, Std2, Std3
Unit MAD (cfs/mi^2)	0.49	0.27	0.13	0.13	0.13	0.22	0.17	0.17
MAD (cfs)	19.75	40.99	3.75	1.73	1.55	26.07	17.03	4.11
MAD (acre-feet)	14,310	29,701	2,719	1,252	1,122	18,892	12,344	2,981
Adult Demand (Dec-Apr):								
(cfs)	27.21	46.60	8.00	4.52	4.17	33.39	24.40	8.56
(cfs/mi^2)	0.68	0.31	0.28	0.34	0.35	0.28	0.24	0.35
(acre-feet)	8,164	13,984	2,401	1,356	1,250	10,019	7,322	2,569
Juvenile Demand (May-Nov):								
(cfs)	10.87	16.71	4.01	2.53	2.36	12.77	9.90	4.25
(cfs/mi^2)	0.27	0.11	0.14	0.19	0.20	0.11	0.10	0.18
Annual 0 flow days (%)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
(acre-feet)[1]	2,251	3,463	831	524	489	2,646	2,052	881
Annual EWD (acre-feet) [2]	**10,415**	**17,447**	**2,719**	**1,252**	**1,122**	**12,665**	**9,373**	**2,981**
Annual EWD ($acre-feet/mi^2$)	**258.4**	**114.9**	**94.2**	**94.2**	**94.2**	**106.9**	**93.5**	**123.2**
Unimpaired MAD for WPA (acre-ft)					**49,103**			**34,217**
Annual EWD for WPA (acre-ft)					**32,956**			**25,019**
EWD/MAD (%)					**67.1%**			**73.1%**

Notes:
1 Excludes estimated no. of days with no flow
2 If the calculated EWD is greater than the calculated M

EWD - SUMMARY
(WY 1972-2008)

WPA #	**12**			**13**		**16**		
WPA Name	**Santa Margarita**			**Atascadero/Templeton**		**Nacimiento**		
Station Name	Salinas R ab	Salinas R bl		Salinas R	Paso Robles Cr	Nacimiento Gage	Nacimiento N	Nacimiento S
Station No.								
Station ID	121	122	123	131	132	161 (Ind2)	162	163
Latitude	35.305700	35.358765	35.381551	35.524672	35.564448	35.788579	35.748751	35.670447
DA (mi^2)	112.1	43.0	37.4	115.9	68.4	162.0	65.3	84.9
Unit MAD derived from:	Std5, Std6	Ind1, Std6	Ind1, Std6	Ind1, Std6	Ind1, Ind2	Ind2	Ind2	Ind2
Unit MAD (cfs/mi^2)	0.28	0.41	0.41	0.41	0.80	--	1.11	1.11
MAD (cfs)	31.39	17.63	15.33	47.52	54.72	180.02	72.48	94.24
MAD (acre-feet)	22,746	12,776	11,112	34,435	39,653	130,453	52,525	68,291
Adult Demand (Dec-Apr):								
(cfs)	38.28	25.03	22.58	51.97	57.66	138.70	70.94	86.08
(cfs/mi^2)	0.34	0.58	0.60	0.45	0.84	0.86	1.09	1.01
(acre-feet)	11,488	7,510	6,776	15,595	17,304	41,620	21,288	25,831
Juvenile Demand (May-Nov):								
(cfs)	14.41	10.27	9.47	18.72	20.41	42.03	24.44	28.39
(cfs/mi^2)	0.13	0.24	0.25	0.16	0.30	0.26	0.37	0.33
Annual 0 flow days (%)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
(acre-feet)[1]	2,985	2,129	1,963	3,878	4,229	8,707	5,062	5,882
Annual EWD (acre-feet) [2]	**14,473**	**9,638**	**8,739**	**19,473**	**21,533**	**50,327**	**26,350**	**31,713**
Annual EWD ($acre-feet/mi^2$)	**129.1**	**224.1**	**233.7**	**168.0**	**314.8**	**310.7**	**403.5**	**373.5**
Unimpaired MAD for WPA (acre-ft)			**46,633**		**74,088**			**251,269**
Annual EWD for WPA (acre-ft)			**32,850**		**41,006**			**108,390**
EWD/MAD (%)			**70.4%**		**55.3%**			**43.1%**

Notes:
1 Excludes estimated no. of days with no flow
2 If the calculated EWD is greater than the calculated M