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Technical Memorandum

Date: July 29, 2009

From: Spencer Harris

To: ISJ Group

SUBJECT: Water Use Estimates for Private Domestic Wells

This memorandum documents results of the private domestic water use survey. The purpose of the survey was to update estimates of current private domestic well production in the basin. The scope of work was performed in accordance with sub-task 1 of the ISJ consulting agreement dated December 17, 2008.

Prior Estimate

Private domestic well production was estimated in the 2008 technical memorandum prepared for the Los Osos Wastewater Project (Cleath & Associates, *Basin hydrologic budget with simulated ground water elevation contour maps*, August 7, 2008). Under current conditions, basin well production included 150 acre-feet per year of private domestic well production, of which 70 acre-feet per year was in the creek valley, and 80 acre-feet per year in the urban area.

Rural Residential Parcel Survey

The parcel survey consisted of determining the number of existing residences on rural residential parcels outside of water system boundaries, and classifying developed parcel irrigation demand into three categories of water use: low, medium, or high. The initial survey was completed using aerial photography from July 2007. Field reconnaissance was performed in February 2009 to check for any significant changes and to inspect areas that were not clear in the aerial photos. The typical lot size is one acre.

The parcels were initially classified as low, medium, or high water use lots based on comparing the turf areas. Low water use parcels have less than 1,000 square feet of turf. Medium water use parcels have 1,000 to 3,000 square feet of turf. High water use parcels have over 3,000 square feet of turf. Low and medium water use parcels with additional major irrigated landscaping features such as orchards, vegetable gardens, or greenhouses were moved up one classification.

A few non-residential parcels (churches) have been included in the survey. Commercial greenhouse operations are not shown in the parcel survey, but water use for these businesses has been added to the total. Results of the survey are presented in Figures 1-3 (attached) and summarized in Table 1 below.

Table 1
Rural Residential Parcel Survey

Basin Area	Total Parcels	Total Vacant	Residences	Outdoor Water Use Classification		
				Low	Medium	High
East Side	131	14	138	26	45	46
Creek Valley	68	1	76	13	16	38
Total	199	15	214	39	61	84

Water System Data

Data provided by GSWC were used to estimate the water demand for residences and for each outdoor water use classification. The data consisted of bi-monthly demand figures over four years (2005-2008) for three one-acre parcels adjacent to the study area. Most of the rural residential parcels in the study area are approximately one-acre in size. GSWC staff reviewed their system data and selected the three parcels as representative of the low, medium, and high residential water demands for the area.

Each data set was analyzed to separate the indoor and outdoor use components. The indoor components were averaged into a single indoor water use factor, while the outdoor use components were kept separate to use with the parcel survey data.

The estimated indoor use averaged 0.33 acre-feet per year. This is consistent with indoor use estimates for GSWC and LOCSD from the 2002 LOCSD Water Master Plan, assuming four persons per residence. Outdoor use was estimated at 1.05 acre-feet per year for high-use parcels, 0.44 acre-feet per year for medium-use parcels, and 0.23 acre-feet per year for low-use parcels.

Private Domestic Water Use

Data from the parcel classification survey and the water system were combined to estimate the gross water use for current private domestic wells. Table 2 presents these results.

Table 2
Water Use Estimates
Private Domestic Wells

Component	Units	Water Use Factor (AFY)	Estimated Water Use (AFY)
Residences	214	0.33	71
Low-use	39	0.23	9
Medium-use	61	0.44	27
High-use	84	1.05	88
Total			195

There are a total of 184 developed rural residential parcels. The average water use is estimated at 195 acre-feet per year, or 1.06 acre-feet per year per parcel.

Greenhouses

Combined greenhouse operations on the east side are assigned a nominal 5 acre-feet per year total water use, based on conversations with growers in 2006 (Ripley Pacific Team, Technical memorandum #5, Recycled Water Reuse Potential, July 5, 2006). For practical purposes, the water use for these operations have been added to the private domestic well production, bringing the total estimated water use to 200 acre-feet per year.

Basin Model Production

There are close to 240 pumping wells in the basin model, including purveyor wells, agricultural irrigation wells, and private domestic wells. The distribution of private wells in the basin model is based on historical records (well logs), with additional pumping sites placed to fill data gaps. Domestic wells in the basin model pump a nominal 1 acre-foot per year each. The combined production of domestic wells in the basin model has been set at 200 acre-feet per year, of which 75 acre-feet per year is in the creek valley, and 125 acre-feet per year is in the urban area.

ATTACHMENTS:

Figure 1
Figure 2
Figure 3
Water Use Calculations

Key:

# is number of residences
L = low outdoor water use
M = medium outdoor water use
H = high outdoor water use

2M = two residences with medium outdoor water use

Private Domestic Water Use
Survey Sheet 1
Los Osos ISJ Group

Cleath-Harris Geologists, Inc.

Key:

# is number of residences
L = low outdoor water use
M = medium outdoor water use
H = high outdoor water use

2M = two residences with medium outdoor water use

Private Domestic Water Use
Survey Sheet 2
Los Osos ISJ Group

Cleath-Harris Geologists, Inc.

Key:

# is number of residences
L = low outdoor water use
M = medium outdoor water use
H = high outdoor water use

2M = two residences with medium outdoor water use

Private Domestic Water Use
Survey Sheet 3
Los Osos ISJ Group

Cleath-Harris Geologists, Inc.

Rural Residential Water Use Survey
Los Osos East Side and Creek Valley

Factors (AFY):

Indoor	0.33
Outdoor (L)	0.23
Outdoor (M)	0.44
Outdoor (H)	1.05

Block	Parcels	residences	Water Use Category Low	Med	High	Vacant	Indoor Use	Outdoor Use Low	Med	High	Total	Sheet Total
							----------Acre-Feet per Year (AFY)----------					
Survey Sheet 1 (East Side)												
North of Nipomo	54	56	9	17	22	6						
South of Nipomo	47	49	6	18	17	6						
Subtotal	101	105	15	35	39	12	34.65	3.45	15.4	40.95	59.8	94.45
Survey Sheet 2 (East Side)												
Scenic Way	8	10	1	4	2	1						
South Bay Blvd.	22	23	10	6	5	1						
Subtotal	30	33	11	10	7	2	10.89	2.53	4.4	7.35	14.28	25.17
Survey Sheet 3 (Creek Valley)												
North of L.O.V.R.	49	53	12	8	28	1						
South L.O.V.R.	19	23	1	8	10	0						
Subtotal	68	76	13	16	38	1	25.08	2.99	7.04	39.9	49.93	75.01
Total	199	214	39	61	84	15	70.62	8.97	26.84	88.2	124.01	**195**

Developed Parcels	184	
Total water use	195	AFY
Average water use	1.06	AFY per parcel