



SAN LUIS OBISPO COUNTY CSA 23 – SANTA MARGARITA  
SYSTEM NUMBER CA4010024  
2010 WATERSHED SANITARY SURVEY UPDATE

Prepared by:  
COUNTY OF SAN LUIS OBISPO  
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

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Photo of the Wetland Enhancement in the Santa Margarita Area following the  
Low Impact Development (LID) Project  
(photo taken January, 2010)

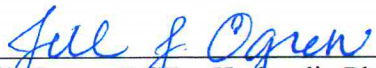
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**CSA 23 – SANTA MARGARITA**  
**WATERSHED SANITARY SURVEY UPDATE**

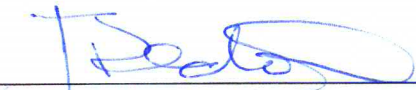
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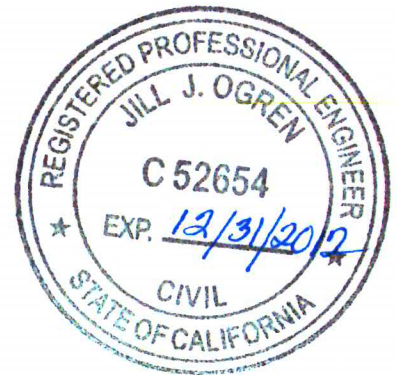
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## Acronyms and Abbreviations

°C	Degrees Centigrade
CDPH	California Department of Public Health
CFU/mL	Colony Forming Units per milliliter
CSA	Community Service Area
CT	Contact Time
E. coli	Escherichia coli
EPA	Environmental Protection Agency
gpm	Gallons per minute
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
MCL	Maximum Contaminant Level
MFL	Million Fibers per Liter
MG	Million Gallons
mg/L	Milligrams per Liter
Mn	Manganese
MSL	Mean Sea Level
pCi/L	pico Curies per Liter
PWD	Public Works Department
SLO	San Luis Obispo
SWTR	Surface Water Treatment Rule
ug/L	Micrograms per Liter
umhos/cm	Micromhos per centimeter

## **1.0 SUMMARY**

The 2010 Sanitary Survey Update, the 2005 Sanitary Survey Update, and the initial 2001 Sanitary Survey for the Santa Margarita watershed encompasses Well 4 (active), and Wells 1 and 2 (standby). These three wells are partially under the influence of surface water. Well 3, although a deep well and not under the influence of surface water, is briefly discussed in all three reports.

### **1.1 Summary and Conclusion of 2001 Initial Survey by Boyle Engineering**

The initial Sanitary Survey for Santa Margarita was conducted in 2001 by Boyle Engineering. The overall conclusion of the report was that Well 4 could continue to produce adequate water quality as long as the disinfection of the water was continuously effective in terms of meeting the contact time (CT) and providing reliable chlorination to the system.

The recommendations made by Boyle Engineering in the initial 2001 Sanitary Survey spoke primarily of analytical evaluations to be made in the event that the Standby Wells (1 and/or 2) were to be activated in an emergency situation. These two wells have not been needed for such an emergency and have not been in service since 1997.

One additional analytical recommendation was made for Well 4. Well 4 should be sampled once for *Giardia* and *Cryptosporidium* cysts. The well was sampled in November, 2005 and found to have less than 0.1 Organisms per Liter.

In addition, the San Luis Obispo County Environmental Health Department has been asked to immediately notify the Santa Margarita Water Systems Operator and Water Quality Manager of any incidences involving septic tank or leach field failures, or hazardous material spills within the Santa Margarita watershed.

### **1.2 Summary and Conclusion of 2005 Survey Update by SLO County**

As in the initial 2001 Survey report, the overall conclusion remained the same in the 2005 Survey update. Specifically, that Well 4 can continue to produce water with acceptable quality as long as the required disinfection CT is continuously achieved and the chlorination system remains reliable. There were no significant changes in the potential contaminants or potential contaminating activities in the watershed since the 2001 watershed survey.

Recommendations in the 2005 Survey and their status are as follows:

- Wells 1 and 2 should remain standby wells, used only in an emergency and with the approval of the CDPH. *These wells have not been used since 1997 when they were changed to “stand by” status.*

- The County should work with landowners in the watershed, providing them with information on potential contaminating activities and the steps they can take to reduce the risk from these activities. *The County's Planning Department has set up a website with information on Land Use, Long Range Planning, and Environmental Impacts within the County.*

*Section "22.104.080 – Santa Margarita Urban Area Standards" defines standards applied to all land use categories inside the Santa Margarita Urban Area.*

*Section "22.10.180 – Water Quality" of the "San Luis Obispo County Code – Title 22, Land Use Ordinance" establishes a procedure for the notification of the California Central Coast Regional Water Quality Control Board when a new land use or modification to an existing use may affect groundwater quality because of proposed methods of disposal, or large volumes of wastewater, or because of the disturbance of natural soil contours.*

- The Public Works Department should continue working with the Planning Department in order to identify potential contaminating activities in the area and assess the impact of these activities on water quality. Both departments should work together in evaluating proposed developments or zoning changes that could impact water quality. *The Public Works Department and Planning Department continue to work together to protect the County's watersheds.*
- Pesticide and herbicide use in the area should be considered when evaluating the watershed monitoring program. *No significant changes were observed in pesticide/herbicide use.*
- The small 2 inch monitoring well adjacent to Well 4 should be routinely inspected to ensure it continues to be properly sealed against surface water intrusion. If the monitoring well is no longer used or needed, it should be properly abandoned. *This monitoring well is routinely inspected by County Water Systems Operators.*

Monthly testing of Well 4 for total coliforms and *Escherichia coli* should continue as scheduled. If an increase in *Escherichia coli* levels are ever noted, periodic testing for *Giardia* and *Cryptosporidium* cysts would be recommended. *In 2008, grandfathered data was submitted to the CDPH in order to comply with the LT2ESWTR. This data consisted of one year of monitoring for Escherichia coli (E. coli) in lieu of analyzing for Cryptosporidium. As part of the County's routine monitoring, Well 4 is currently and will continue to sample once per month for E. coli.*



### **1.3 Summary and Conclusion of 2010 Watershed Sanitary Survey Update by SLO County**

As in the initial 2001 and 2005 survey reports, the overall conclusion remained the same in the 2010 Survey update. Specifically, that Well 4 can continue to produce water with acceptable quality as long as the required disinfection CT is continuously achieved and the chlorination system remains reliable. There were no significant changes in the potential contaminants or potential contaminating activities in the watershed since the 2001 and 2005 watershed surveys.

Several improvements were completed in the town of Santa Margarita and the Santa Margarita watershed area in 2005 to 2010. These included:

- In 2006 - 2008, a Low Impact Development (LID) Project. The project served to enhance the drainage in the community of Santa Margarita by constructing over 6 acres of wetland enhancement and modifying over 2,000 feet of roadside ditches to function as bioswales. The bioswales are connected hydrologically to the enhanced wetland, located about two miles upstream on the southwest side of town. The enhanced wetland provides approximately 22 acre-feet of stormwater runoff storage. The wetland slows stormwater runoff before it flows through town aiding attenuation and reducing pollutant loading and flooding.
- In 2009, upgrades were made to the distribution system water line. In order to increase fire flow capacity and improve circulation and reliability in the system, several lines were upsized and two dead-ends were looped. In addition, 22 wharf head hydrants were replaced with standard fire hydrants and 21 new in-line valves were installed.
- In 2009, the Yerba Buena Storm Drain was constructed in order to redirect large storm flows from El Camino Real into Santa Margarita Creek, thereby reducing the chance of flooding in the neighborhoods along Murphy and F Streets.
- In 2010, construction of a new 500,000 gallon storage tank began. This tank will replace an aging existing 150,000 gallon tank in order to increase storage capacity and fire flow. In addition, a new 12 inch pipeline was constructed to connect the tank to the distribution system.
- In 2010, the County completed a Water Supply Reliability Report. This report addressed the water supply reliability during a significant drought, options for drought reliability improvement, and County and community recommendations.
- Since 2004, the Public Works Department has been working with the community to implement water conservation measures. Signs have been prominently posted to inform residents of the current water status and conservation recommendations.

#### **1.4 2010 Watershed Sanitary Survey Recommendations**

- County staff should update the Santa Margarita watershed maps, utilizing Geographic Information System (GIS) mapping software.
- County staff should proceed with a formal vote of Santa Margarita property owners for support of a drought reliability project to install a State Water connection and obtain a State Water allocation in order to provide a secondary source of water to be used during extended droughts or water quality emergencies.

## **2.0 INTRODUCTION**

### **2.1 Sanitary Survey Requirements**

California Title 22, Code of Regulations requires public water systems utilizing surface water or a surface water influenced source, conduct a sanitary survey of its watershed. The regulations further require the survey be updated every five years. The purpose of the sanitary survey is to evaluate and document the capability of a drinking water system to consistently and reliably deliver an adequate quality and quantity of safe drinking water to the consumer.

An initial watershed sanitary survey was completed in October, 2001, and updated in 2005. This second update covers the period from August, 2005, through December, 2010. In preparing this update, the County of San Luis Obispo reviewed the previous watershed sanitary survey and update, evaluated water quality monitoring data since the last update, and performed field inspections in order to identify existing or potential water quality problems which could result from contaminants in the watershed. The original survey and all updates serve as a foundation for current and future watershed management and watershed planning efforts.

### **2.2 Objectives**

The objective of this update was to identify and evaluate any significant changes in the watershed during the last five years that could have an affect on the source water or treated water quality. Previous survey recommendations were re-evaluated for implementation and success.

### **2.3 Conduct of the Study**

Boyle Engineering Corporation completed the initial watershed sanitary survey for the Santa Margarita wells in October, 2001. The first update was completed by San Luis Obispo (SLO) County Public Works Department staff in December, 2005. This survey update was also prepared by the SLO County Public Works Department staff. The majority of the field surveys were conducted by visual observations from roads. Analytical data from the SLO Water Quality Laboratory database was reviewed. Other sources of information included the SLO County Environmental Health Department, the County Planning Department, and the Agricultural Commission. A Watershed Sanitary Survey Update Checklist can be found in Appendix A.

## **2.4 Drinking Water Source Water Assessment Plan**

The disinfection process currently provided for Wells 1, 2, and 4 was initially evaluated in the *Drinking Water Source Assessment, Santa Margarita Well Nos. 1, 2 and 4* by Boyle Engineering Corporation in September, 2002. After review of the document by Public Works Department staff during the preparation of the 2005 Sanitary Survey Update, it was noted that the protection zones for Well 4 had been reversed with the delineated zones for Wells 1 and 2. For this 2010 update, no significant changes were noted in potential contaminants within the delineated protection zones. The 2005 updated protection zone maps for Wells 1 and 2, and Well 4 are included in Appendix B of this document.

## **2.5 Security**

Wells 1 and 2 are housed in a locked building which in turn is located in a fenced area. Well 4 is not housed, but is located in the same fenced area as Wells 1 and 2. Well 3 is located in a separate fenced location. Both areas are located in highly visible sections of the community and are checked several times weekly by system operators. The system's storage tanks are also fenced and routinely checked by operators. Operators live in County supplied housing, approximately 1 to 2 miles from the wells and tanks. Monitoring instruments at the well sites are alarmed and these alarms would likely be triggered in the case of vandalism. Alarms are monitored by an alarm company 24 hours per day, 365 days per year. The alarm company is supplied with 24 hour contact numbers for system operators. At least one operator is on standby duty at all times. As the well sites are highly visible, vandalism would likely be observed and reported by community residents. Operators monitor the distribution system weekly, performing field analyses and collecting samples for additional analysis in the County's Water Quality Laboratory or sent to a State approved laboratory.

### **3.0 WATERSHED AND WATER SUPPLY SYSTEM**

#### **3.1 Watershed Land Use and Natural Setting**

The community of Santa Margarita is located in central San Luis Obispo County, approximately 12 miles north of San Luis Obispo, ten miles south of Atascadero, and less than one mile east of Highway 101. Santa Margarita is bordered to the west by the Santa Lucia Mountains and to the southeast by the La Panza Range. The town is surrounded by the 14,000-acre privately owned Santa Margarita Ranch.

Santa Margarita is located in the upper watersheds of two small tributaries to the Salinas River. Santa Margarita Creek (the larger of the two streams) drains the extreme western portion of the town while Yerba Buena Creek drains the eastern portion. Both intermittent creeks flow from south to north. Yerba Buena Creek flows into Santa Margarita Creek near the southern boundary of Garden Farms. Another much larger nearby watershed, Trout Creek, is east of the Yerba Buena watershed and outside of the town limits. Santa Margarita and Trout creeks join near the confluence with the Salinas River about three miles north of town.

The local topography in Santa Margarita is relatively flat with land surface elevations ranging from 1,000 to 1,020 feet above mean sea level (MSL). Miller Flat, located upstream and southeast of town and drained by Yerba Buena Creek, has a relatively low and gentle topography, rising to 1,120 feet MSL. The Yerba Buena Creek watershed attains an elevation of 2,228 feet MSL near the headwaters of Sycamore Canyon, while the Santa Margarita Creek watershed reaches an elevation of 2,761 feet MSL at Tassajera Peak. Average annual rainfall is between 25 and 30 inches. (SEIR, 2010)

The Santa Margarita watershed, for the purpose of this report, consists of approximately 6,800 acres and extends from Tassajera Peak in the west to the community of Santa Margarita in the east. The area is roughly bounded by the Santa Lucia range on the south and west, Santa Margarita Creek on the north, and Yerba Buena Creek on the east. The delineation of the watershed can be seen in Appendix B.

The watershed is predominantly open range, with scattered residential homes. More concentrated residential development is found around the well location, within the community of Santa Margarita. The County of San Luis Obispo Planning Department has identified the residential areas within the watershed as being small lot rural, large lot rural, and urban. See Appendix B for a map of Land Use Categories.

The more urbanized residential area that constitutes the community of Santa Margarita is located east of Highway 101. Highway 101 traverses through the watershed in a north/south direction. The town itself is divided by the Southern Pacific Railroad tracks

and the adjacent El Camino Real (Highway 58). In general, both transportation routes run in an east to west direction. Residential development is located within a grid of 25-foot wide lots, and in larger parcels in a residential suburban zone at the west and east ends of the community. Only the westernmost portion of the community of Santa Margarita is considered to be within the boundaries of the watershed. The remainder of the community is located down stream from Wells 1, 2, and 4, outside the boundaries of the defined watershed.

Outside the community of Santa Margarita, there are scattered residential homes. The majority of these are located along the southern bank of Tassajera Creek, near the Los Padres National Forest boundary. The northern bank of Tassajera is located within the boundaries of the privately owned Spanish Oaks Ranch.

The applicable land use designations within the defined watershed outside of the Santa Margarita urban community, as determined by the County of San Luis Obispo Department of Planning and Building, include:

- Multi-use public land
- Agricultural under conservation contract
- Small lot rural
- Large lot rural
- Agricultural

The land use designations within the Santa Margarita urbanized community include:

- Residential multifamily
- Residential single family
- Industrial
- Recreation
- Residential suburban
- Commercial service
- Commercial retail
- Public facility

In addition, the following areas are classified as “Open Space Resources”:

- The Highway 101 corridor has been identified as a scenic resource, and as a result, any future development within this area strictly regulated with regard to visual impacts.
- The portion of the Los Padres National Forest within the watershed is designated as a public recreational area.
- The north slope of the Cuesta Ridge, which forms the southern boundary of the watershed, has been identified as a geologically sensitive area being susceptible to soil erosion and landslides.

## **3.2 Land Ownership**

### **3.2.1 Public Ownership**

The majority of the public land areas within the watershed are found in the Los Padres National Forest. The Los Padres National Forest accounts for nearly 3,600 acres of the watershed and is actively managed by the U.S. Department of Agriculture through the U.S. Forest Service. The Forest Service, however, is not a land-use permitting agency and can only review projects and recommend conditions of project approval. Land uses within National Forests are set forth in federal statutes. The statutes state that the Forest Service may permit limited land uses that include roads, grazing lands, and communication facilities such as those located on TV Tower Road along the Cuesta Ridge. The Highway 101 corridor is also publicly owned, policed, and maintained by the State of California.

### **3.2.2 Private Ownership**

The remaining 3,200 acres of the watershed are privately owned lands. The major private landowners within the watershed include the Santa Margarita Ranch and the Spanish Oaks Ranch. Aside from these two large ranches, there are scattered rural residential home sites west of Highway 101 within the Tassajera Canyon Planning Area, adjacent to Tassajera Creek. There are also a considerable number of residential homes east of Highway 101, within the community of Santa Margarita.

The Tassajera Canyon area can be accessed from Tassajera Creek Road, which extends westerly from Highway 101. The area is a boxed canyon that is bordered by the Los Padres National Forest on the west and south and by large agricultural parcels on the north. The Tassajera Canyon Planning Area is envisioned as a low-density residential rural area with no anticipated public access to the National Forest from the canyon floor.

### **3.3 Land Use Designations**

#### **3.3.1 Urban**

The portion of the watershed within the community of Santa Margarita comprises the only true urban area within the boundaries of the watershed being evaluated. The remainder of the watershed consists of open space, agricultural, and rural residential areas.

#### **3.3.2 Agricultural**

Agricultural activities within the watershed include livestock grazing and small-acreage “hobby” farms. These farms appear to focus on the cultivation of small vineyards and are concentrated in the rural residential areas within Tassajera Canyon. The cattle grazing operations are located within the confines of the Spanish Oaks Ranch and the Santa Margarita Ranch properties. The Spanish Oaks Ranch is located in the northwestern portion of the watershed, north of Tassajera Creek. A portion of the Santa Margarita Ranch lies within the eastern section of the watershed, with the majority of the cattle grazing taking place north of Santa Margarita Creek.



## 4.0 WATER SUPPLY SYSTEM

Santa Margarita, SLO County Service Area No. 23 (CSA 23), is owned and operated by the County of San Luis Obispo. Since the 1940s, CSA 23 (previously known as County Waterworks District No. 6) has supplied potable water to the town of Santa Margarita. The Santa Margarita Water System currently serves 532 meters serving approximately 1259 people (2010 United States Census) which include residences, businesses, and multi-family units. For the last 5 years, the average annual water usage was 170,000 gallons per day with an annual average water production of 61 MG. Of that amount, approximately 59% was used indoors and 41% was used outdoors. July and August have historically been the peak demand months requiring on average, 7.8 MG/month.

CSA-23 currently operates two wells, Well 3 and Well 4. Wells 1 and 2 are maintained as standby wells. Well 4, located on El Camino Real, is the primary supply well for the community. It draws water from the shallow alluvial aquifer of Santa Margarita Creek. Well 3 is a deeper well in a fractured rock formation that draws from a less productive and poorer quality aquifer than Well 4. Wells 1 and 2 are located adjacent to Well 4 and draw from the same shallow aquifer as Well 4.

### 4.1 Well 3

Well 3 was installed in 1991 and is not considered to be under the influence of surface water. The well was constructed in deep, fractured-rock located in the low yield Santa Margarita Formation near the east end of town to a depth of 730 feet. The depth to the highest perforation is 230 feet. No clay layers are present above the perforations. No sewer lines or sewage disposal facilities are located within 50 or 100 feet respectively. The safe yield for Well 3 is estimated to be less than 90 AFY and its pumping capacity is approximately 100 gpm. Well 3 provides approximately 25% of the community water supply.



**Figure 4-1:** Well 3 Pump House

Well 3 exceeds the secondary standards for iron and requires treatment with potassium permanganate and subsequent filtration.

To help ensure system compliance with the Lead and Copper Rule, Well 3 is treated with a blended polyphosphate for corrosion control. Well 3 treated water complies with all drinking water standards and the distribution system complies with the corrosion control requirements.

Since Well 3 is not under the influence of surface waters, it has been excluded from the initial and updated Watershed Sanitary Surveys.

#### **4.2 Well 4**

Well 4 was constructed in 1996 and is located in the high yield alluvium of Santa Margarita Creek near the west end of town. Well 4 can produce up to 400 gpm and provides approximately 75% of the community's water supply. Well 4 is considered to be partially under the influence of surface water and must comply with the Surface Water Treatment Rule. No sewer lines or private sewage disposal systems are located within 50 or 100 feet from the well, respectively. The 14-inch diameter well was drilled to a depth of 70 feet with a 57-foot steel casing. Blue sandstone and shale were encountered at 49 feet. A coarse-grained sand and gravel aquifer was encountered overlying the shale. The water table in the area is between 10 to 15 feet deep. Well 4 is constructed with 20 feet of stainless steel wirewrap screen from 29 to 49 feet. The well has a 24-foot annular seal and is surface sealed. The well receives some protection from the 24-foot annular seal and a 5-foot thick clay layer at 27-feet. Well 4 is chlorinated and because it is partially under the influence of surface water, the chlorinated water is pumped to a disinfection loop to provide chlorine contact time required for 4-log inactivation of viruses.

To help ensure system compliance with the Lead and Copper Rule, Well 4 is treated with a blended polyphosphate for corrosion control and sodium hydroxide for pH adjustment. The system has maintained compliance with the corrosion control requirements. The well complies with all other drinking water standards.



**Figure 4-2: Well 4 Pump House (left) and Wells 1 & 2 Pump House (right)**

<b>TABLE 4-1: SANTA MARGARITA CSA-23 WELL PRODUCTION 2005 – 2010 (Million Gallons)</b>					
<b>2005</b>	<b>Well 3</b>	<b>Well 4</b>	<b>2006</b>	<b>Well 3</b>	<b>Well 4</b>
JAN	1.641	1.343	JAN	1.610	1.499
FEB	1.495	1.190	FEB	1.010	1.598
MAR	1.757	1.327	MAR	1.513	1.532
APR	1.667	2.405	APR	1.302	1.616
MAY	1.584	3.786	MAY	1.340	3.904
JUN	1.598	5.576	JUN	1.555	6.336
JUL	1.625	7.011	JUL	1.491	6.891
AUG	1.677	6.478	AUG	1.633	5.927
SEP	1.621	4.914	SEP	1.664	5.200
OCT	1.458	3.383	OCT	1.507	3.359
NOV	1.613	2.634	NOV	1.311	2.667
DEC	1.580	1.804	DEC	1.203	2.237
<b>TOTAL</b>	<b>19.316</b>	<b>41.851</b>	<b>TOTAL</b>	<b>17.139</b>	<b>42.766</b>
<b>Percentage</b>	<b>32%</b>	<b>68%</b>	<b>Percentage</b>	<b>29%</b>	<b>71%</b>
<b>SYSTEM TOTAL</b>	<b>61.167</b>		<b>SYSTEM TOTAL</b>	<b>59.905</b>	

<b>2007</b>	<b>Well 3</b>	<b>Well 4</b>
JAN	1.227	2.361
FEB	1.190	1.791
MAR	1.221	2.846
APR	1.210	4.377
MAY	2.102	4.597
JUN	2.498	5.505
JUL	2.333	5.731
AUG	2.578	6.244
SEP	1.978	3.446
OCT	2.263	2.804
NOV	2.005	2.247
DEC	1.615	1.721
<b>TOTAL</b>	<b>22.220</b>	<b>43.670</b>
<b>Percentage</b>	<b>34%</b>	<b>66%</b>
<b>SYSTEM TOTAL</b>	<b>65.890</b>	

<b>2008</b>	<b>Well 3</b>	<b>Well 4</b>
JAN	2.214	0.808
FEB	1.783	1.289
MAR	1.700	2.002
APR	1.698	3.415
MAY	1.753	4.971
JUN	3.037	4.433
JUL	2.439	5.202
AUG	2.898	4.924
SEP	2.876	4.196
OCT	3.160	2.788
NOV	2.664	0.817
DEC	2.458	0.697
<b>TOTAL</b>	<b>28.680</b>	<b>35.542</b>
<b>Percentage</b>	<b>45%</b>	<b>55%</b>
<b>SYSTEM TOTAL</b>	<b>62.008</b>	

<b>2009</b>	<b>Well 3</b>	<b>Well 4</b>
JAN	1.551	1.625
FEB	1.538	1.017
MAR	2.325	0.729
APR	2.884	1.636
MAY	2.985	3.073
JUN	2.849	3.292
JUL	3.045	4.759
AUG	2.865	4.084
SEP	2.978	3.663
OCT	2.808	1.642
NOV	2.787	0.842
DEC	3.145	2.800
<b>TOTAL</b>	<b>31.760</b>	<b>29.162</b>
<b>Percentage</b>	<b>52%</b>	<b>48%</b>
<b>SYSTEM TOTAL</b>	<b>60.922</b>	

<b>2010</b>	<b>Well 3</b>	<b>Well 4</b>
JAN	2.170	0.452
FEB	1.139	1.320
MAR	0.998	2.306
APR	0	3.610
MAY	0.622	3.403
JUN	2.212	4.796
JUL	2.011	4.815
AUG	2.036	5.116
SEP	1.938	4.519
OCT	1.898	2.604
NOV	1.024	2.336
DEC	1.034	2.047
<b>TOTAL</b>	<b>17.082</b>	<b>37.324</b>
<b>Percentage</b>	<b>31%</b>	<b>69%</b>
<b>SYSTEM TOTAL</b>	<b>54.406</b>	

### **4.3 Standby Wells 1 and 2**

Standby Wells 1 and 2 were constructed in 1947 and 1952, respectively. They were drilled to a depth of 49-feet and are approximately 10-feet apart. In 1997, these wells were shut down because they did not meet California Department of Public Health's (CDPH) current well construction standards and were at risk for contamination. Wells 1 and 2 were replaced by Well 4 and designated Standby Wells for emergency purposes only. Well 4 was drilled approximately 40-feet from Wells 1 and 2 following the current standards for construction. No sewer lines are located within 50 feet and no private sewage disposal systems are located within 100 feet from the wells.

During rain events, the wells can experience positive bacteriological results. Both wells are considered to be under the influence of surface water and must comply with Surface Water Treatment Rule (SWTR) requirements. Emergency use of these wells can only be permitted if the water is passed through the disinfection loop to provide a chlorine contact time required for 4-log inactivation of viruses. The California Department of Public Health must be notified prior to placing either well into emergency service. Routine use of the wells is prohibited due the positive coliform levels.

The Standby Wells 1 and 2 were not put in use in the 2005 -2010 time period. In 2005, they were turned on and pumped to waste in order to collect required samples for Inorganics, General Minerals, Gross-alpha, Radium-228, and Physical analyses. The standby wells were also pumped to waste once each year in order to collect required nitrate samples. In addition, the wells were pumped (to waste) twice in 2008 in order to collect perchlorate samples.

### **4.4 Storage Facilities**

The system maintains two reservoirs which provide a total storage capacity of 300,000 gallons (150,000 gallons each). The tanks are located in a rural area west of Santa Margarita. There exists only one pressure zone in this system. Reservoir 01 was constructed in 1966 and Reservoir 02 in 1993. Both tanks are located above ground and are constructed of welded steel. The tanks are equipped with screened vents and overflows. Reservoir 02 was built to current standards and the coatings are in good condition. The original Reservoir 01, has had minimal repair work since its installation and has reached the end of its useful life.

Construction has begun on a new above ground steel reservoir with a capacity of 500,000 gallons. This new reservoir will replace the existing 150,000 gallon storage reservoir (Reservoir 01). The 150,000 gallon Reservoir 02, will be retained for a total storage capacity of 650,000 gallons. These two reservoirs will be large enough to accommodate the total storage volume of 645,000 gallons required for demand, fire and emergency storage. To aid in access to the tanks, a new 12-foot wide paved access road is being constructed from Wilhemina Avenue to the tank site. Completion is anticipated for June, 2011.

See *Section 7.2 New 500,000 gallon Water Storage Tank (2011)* for additional details.



**Figure 4-3: Existing Storage Tanks  
Reservoir 01 (left) and Reservoir 02 (right)**

#### **4.5 New Pipeline Infrastructure Upgrades**

In order to provide the needed water system capability to deliver the State required residential fire flow through town and improve system circulation and operation, the County completed several pipeline infrastructure improvements in 2009. Pipeline upgrades included upsizing of several pipelines, construction of water system loops, replacement of old wharf head fire hydrants with new standard fire hydrants and installation of over 20 new in-line valves.



**Figure 4-4: One of the 17 New Hydrants installed**

## **5.0 POTENTIAL SOURCES OF CONTAMINATION IN THE WATERSHED**

There were several potential sources of contamination identified in the 2001 and 2005 Sanitary Surveys. Each is briefly described below with the current evaluation and/or measures taken to reduce the potential for contamination.

### **5.1 Domestic Wastewater**

The community of Santa Margarita continues to utilize septic tank/leach field systems to treat and dispose of domestic wastewater. Because of the low population density in the effected watershed and the proximity of septic systems relative to creeks and the groundwater wells, the Regional Water Quality Control Board and the County Health Department do not believe the septic systems pose a significant threat to water quality. Wells 3 and 4 consistently meet raw water Bacteriology standards. Methylene blue activated substance (MBAS) have not been detected in the wells.

### **5.2 Urban Runoff**

Urban runoff within the watershed is most significant within the community of Santa Margarita and may pose a water quality threat if flooding occurs in the areas adjacent to Santa Margarita Creek or in close proximity to Wells 1, 2, and 4. Flooding or runoff from nearby horse stables could potentially affect water quality, but the berm supporting the railroad tracks helps separate the stables from the wells. When flooding has occurred in Santa Margarita, the well sites were not affected and all well motors remained above water.

### **5.3 Agriculture Activities**

The cultivation of small vineyards within Tassajera Canyon and the maintenance of small grazing parcels in other areas of the watershed continue to be the two most significant agricultural activities. The total acreage dedicated to the cultivation of crops is very limited and does not appear to pose a threat to the water quality in the watershed. Agriculture activities utilizing fertilizers or producing manure could potentially contribute nitrogen and phosphorus to Santa Margarita Creek.

### **5.4 Cattle Grazing**

Animal grazing does occur within the Santa Margarita watershed, primarily on the Spanish Oaks and the Santa Margarita Ranches. It was observed that cattle have direct access to the northern bank of the Santa Margarita Creek, east of Highway 101. Cattle can potentially introduce bacterial or parasitic cyst contamination to the area. In addition cattle can accelerate creek bank erosion, contributing to creek turbidity. Since the relative density of the cattle within the watershed is low, grazing is not thought to pose a significant threat to the water quality at this time.

## 5.5 Pesticide and Herbicide Use

The threat of contamination from pesticides and herbicides is considered small. Specific chemicals utilized in the Santa Margarita watershed during the last five years were identified from use permits registered with the San Luis Obispo Agriculture Department. A listing of these chemicals and the amount used is found below.

**TABLE 5-1: Registered Pesticide/Herbicide Use 2005 - 2010**

<b>SAN LUIS OBISPO COUNTY CSA 23 – SANTA MARGARITA WATERSHED</b>					
<b>REGISTERED PESTICIDE/HERBICIDE USE in 2005 - 2010</b>					
<b>Permit Owner</b>	<b>Crop</b>	<b>Date Applied</b>	<b>Treated Area (Acres)</b>	<b>Treatment</b>	<b>Quantity Used</b>
Cypress Springs Vineyard	Wine Grapes	5/30/2006	5	Pristine Fungicide	52.5 Gallons
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	Herbicide Activator	2.0 Quarts
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	Rely Herbicide	2.0 Gallons
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	K-90 Knapp Nonionic Adjuvant (Spreader)	30.0 Ounces
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	Quintec	30.0 Ounces
Cypress Springs Vineyard	Wine Grapes	5/9/2007	5	Quintec	25.0 Ounces
Cypress Springs Vineyard	Wine Grapes	5/9/2007	5	JMS Stylet (Oil)	5.0 Gallons

## 5.6 Erosion

Erosion within the watershed is a slight concern due to the presence of highly erodible soils and slopes in the upper elevations of the watershed and the occurrence of tilling activity throughout the watershed. Furthermore, the roads used to access the rural homes within the Tassajera Canyon area are mostly unpaved and may be considered a potential source of soil erosion caused by runoff. The erosion within the watershed may significantly impact the turbidity of the creeks. Since Santa Margarita utilizes groundwater wells as the water source for the community's water system, the impacts of soil erosion and the subsequent fluctuations in turbidity are not a substantial source of concern.

## **5.7 Wild Animals**

Populations of wild turkey, deer, bear, wild pigs, raccoons, skunks, squirrels, and other small mammals are known to be present within the watershed. The presence of wild animals within the watershed can be considered a potential source of viral, bacterial, or protozoan contamination. Due to the relatively small concentrations of wild animals within the watershed, their presence is not viewed as a significant threat to watershed water quality.

## **5.8 Mine Runoff**

There are no active mining operations within the watershed. Several inactive mines are present in the upper elevations of the watershed on the north slope of the Cuesta Ridge. These mines were identified as most likely prospect mines for chromite deposits. The Regional Water Quality Control Board has not identified these mines as being of concern with regard to the Tassajera Creek water quality and they are not viewed as posing a threat to the water quality of the Santa Margarita watershed.

## **5.9 Fueling Locations and Storage**

No new fueling or storage tanks are known to have been installed in the watershed since the 2005 Survey. The Central Coast Water Quality Control Board (CCWQCB) noted and investigated the potential for petroleum hydrocarbons released from an underground storage tank (UST) in April, 2010. The UST is located on Hiway 58 (El Camino Real) approximately four blocks downstream of Wells 1, 2, and 4. Based on underground monitoring and soils investigations, there is no significant threat to groundwater resources from this site.

In general, all petroleum storage facilities and transport pipes should be inspected routinely to verify their integrity. The County Environmental Health Department performs underground fuel storage tank inspections and implements the California Accidental Release Program at the local level. The Environmental Health Department also responds to and tracks hazardous materials spills in the County.

## **5.10 Recreational Use**

Recreational uses within the watershed are primarily restricted to those portions of the watershed that lie with the boundaries of the Los Padres National Forest. The recreational activities known to occur within the watershed include sightseeing, picnicking, hiking, mountain biking, and camping. There are no public restrooms within the watershed area, and recreational activities are not identified as having a significant impact on water quality in the watershed.



### **5.11 Unauthorized Activity**

The County Environmental Health Services Department has no reports of any unauthorized activity or hazardous materials spills that would threaten water quality within the watershed in the last 5 years.

### **5.12 Traffic or Train Accidents or Spills**

Because there is limited traffic in the upper portion of the watershed west of Highway 101, the potential for traffic accidents and vehicle spills impacting water quality in the area is reduced. Highway 101, on the other hand, is a primary north-south transportation corridor along the coast of California. Various chemicals and other liquid wastes routinely pass through the area and could severely impact the surface waters of the lower watershed in the event of a traffic accident causing a major spill.

Also of concern is the active railroad system that runs along Highway 101 and then parallels the main street through the community of Santa Margarita. A side spur of the tracks is located 75 feet from the wells while the main tracks pass within 130 feet of the wells. Trains carrying potential contaminants routinely travel through the area. A spill adjacent to the wells or near Tassajera Creek could potentially impact the surface waters of the watershed and contaminate the well field.

A state wide system is in place which would notify the County Public Works Department if a hazardous materials spill that could affect water quality in the area occurs.

### **5.13 Geologic Hazards**

Natural geologic formations within the watershed can contribute to the degradation of water quality. Areas within the upper reaches of the watershed have been identified as having erodible soils. These areas are vulnerable to earthquake induced landslides and erosion caused by storm waters. Erosion and landslides have the potential for contributing significant quantities of sediments and suspended solids into the tributary streams within the watershed, especially in Tassajera Creek.

### **5.14 Wildfires**

Wildfires within a watershed can contribute large loads of suspended solids and organic matter to surface waters when rain causes runoff before the local vegetation has an opportunity to re-establish itself. The upper elevations of the Santa Margarita Creek watershed are noted by the California Department of Forestry as being “very high” fire hazard areas. The Tassajera Canyon area was devastated by a fire in 1994 and is still considered a very high fire hazard area.

### **5.15 Significance of Potential Contaminant Sources**

The most significant potential contaminant threats are believed to be viral, microbial, and nitrate contamination from nearby septic tanks and leach fields. Wells 1, 2, and 4 are all susceptible to these contaminants. Well 4 was constructed in 1996 and is equipped with an annular seal. By utilizing a continuous chlorine disinfection process and maintaining an approved sample monitoring plan, Well 4 should continue to be a source of safe drinking water for the residents of Santa Margarita. Wells 1 and 2 are more susceptible to these contaminants than Well 4 and have been designated standby wells. They will only be used in an emergency and after notification to the California Department of Public Health.

### **5.16 Impact of the Nacimiento Pipeline**

The Nacimiento pipeline enters Santa Margarita at the north end of El Camino Real and continues following this road as it passes through the town. El Camino Real is the primary traffic route in this area and connects Santa Margarita with both Atascadero and Highway 101. Land use designations of parcels bordering the pipeline route within Santa Margarita are primarily residential single family and commercial retail. The pipeline itself, is not thought to have any potential contaminate contribution to the watershed.

### **5.17 Anticipated Growth and Projected Changes in Sources of Contaminant**

According to the Water Reliability Report 2010 for Santa Margarita, from a land use stand point, Santa Margarita is currently 82% built out. From a population perspective, the town is 96% built out.

Sections of the Santa Margarita Ranch are proposed for residential development. Within the community of Santa Margarita, there are an estimated 120 residential and 15 commercial lots available for development. Although development of these properties would result in increased demands for water, it is not felt that development would contribute significantly to potential contamination to the watershed.

## **6.0 WATERSHED CONTROLAND MANAGEMENT PRACTICES**

### **6.1 Physical Controls**

Physical control of potential contaminants or contaminating activities include:

- The well field (Well 1, 2, and 4) is fenced and secure from public access.
- No sewer lines are located within 50 feet of the well. No sewage disposal facilities are located within 100 feet of the wells.
- The main water supply, Well 4, has a 24-foot-deep annular seal, and the top of the well is surface sealed.
- The elevated railroad provides a berm-like barrier against flood waters south of the wells. The railroad right of way limits development south of the well field.
- The slight elevation of the roadway El Camino Real/Highway 58 adjacent to the wells provides minimal protection against floodwaters north of the wells. The roadway also limits development north of the well field.

### **6.2 Procedural Controls**

Procedural or operational controls include:

- Water produced by Well 4 is disinfected with chlorine in a pipe loop designed to provide the necessary CT for 4 log virus inactivation.
- Continuous monitoring of free chlorine residual, turbidity, and pH is performed on Well 4. Problems with the disinfection system trigger an automatic alarm which will notify the system operator, 24 hours per day.
- A certified operator is assigned to the system and is available 24 hours per day. Additional operators are available and will respond if the assigned operator does not address the alarm condition in a timely manner.
- An inspection of the well site is performed at least three times a week by operational personnel.
- An active water quality monitoring program is in place, based on the vulnerability assessment and the monitoring frequency guidelines established by the CDPH.
- Planning reviews are required for development within the watershed.
- Use permits are required for the application of herbicides/pesticides in the watershed.
- A watershed survey is conducted every five years to identify problems and potential problems thereby preventing contamination of water sources.

## 7.0 SYSTEM IMPROVEMENTS AND PROJECTS

### 7.1 New 500,000 gallon Water Storage Tank (2011)

Construction is underway to install a new above ground steel reservoir with a capacity of 500,000 gallons. As part of this project, a new parallel 12-inch diameter pipeline will be constructed to connect the new tank to the Santa Margarita community (at Wilhelmina Ave.). A 12-foot wide paved road will also be constructed to provide access from Wilhelmina Ave. to the tank site. These needed improvements will provide increased water storage and help meet fire flow requirements

The new tank will replace the existing 150,000 gallon tank constructed in 1966, Reservoir 01. The diameter of the new tank will be 60 feet with a height of 27 feet and a high water level of 1164.6 feet. The location of the new tank will be located on the west side of Reservoir 01 and will occupy a portion of the existing tank's pad which will require the demolition of Reservoir 01. Reservoir 02, will remain in place and provide storage during construction. The construction will be completed in June of 2011.



**Figure 7-1: Site of the new Water Storage Tank and Access Road (with the existing Reservoir 01 visible at the top of the hill)**

## 7.2 Distribution System Water Line Upgrades (2009)

In 2009, several improvements were made to the distribution water lines. The upgrade provided increased fire flow capacity and improved circulation and reliability in the distribution system by upsizing some of the existing pipelines and looping two of the dead-ends.

Existing 2 to 4-inch diameter pipelines were replaced with 6 to 8-inch diameter pipelines within Encina Avenue and K Street. Within F Street east of Pinal Avenue, 6-inch diameter pipeline was replaced with 8-inch diameter pipeline. A 670-foot long, 6-inch diameter water system loop was constructed to join the dead-ends at F Street and Maria Avenue. The upgrade also involved replacing 22 wharf heads with new standard fire hydrants and installing 21 new in-line valves.



**Figure 7-2: Pipeline Upgrade**

## 7.3 Yerba Buena Storm Drain (2009)

The Yerba Buena Storm Drain Project was constructed in 2009. This project involved the construction of a 36-inch storm drain pipe along Yerba Buena Avenue from El Camino Real to the Santa Margarita Ranch property north of town discharging into the Santa Margarita Creek. The outlet is designed with a duck bill flange which keeps drainage from backing up into the storm drains.

This new storm drain diverts the larger storm flows that normally flow east along El Camino Real. Completion of this project has improved the drainage functionality of the downstream wet-swales (bioswales) and has further reduced the frequency of flooding in the Murphy Ave./F Street neighborhood.

**Figure 7-3: Yerba Buena Storm Drain Outlet (2009)**



**Inlet at Highway 58**



**Outlet at Santa Margarita with duck bill flange**

#### **7.4 Low Impact Development Project (2007-2008)**

The Santa Margarita Low Impact Development (LID) Project was completed in order to be a demonstration in the environmentally sensitive management of stormwater. The project included the design and construction of drainage improvements using current LID integrated management practices rather than conventional storm water management practices. The project included wetland enhancement and modification of existing roadside ditches to function as bioswales.

Conventional storm water management increases impervious surface area in watersheds. Increased impervious surface area disrupts the natural hydrology of watersheds and increases stormwater runoff, pollutant loads, erosion and sedimentation, flooding, and aquatic habitat degradation. LID implementation reduces pollutant sources by minimizing or eliminating excess urban stormwater runoff and is used to maintain and restore the natural hydrology of watersheds and protect and improve water quality

The LID project required work in two geographically independent sites; however, both are linked by hydrology:

The first project was completed in 2007 and involved the construction of bioswales in the existing roadside ditches on Murphy Avenue and two blocks of F Street. The bioswales were intended to behave similarly to a linear wetland and provide stormwater treatment. As stormwater runoff flows through the wetland, pollutant removal is intended to be achieved through settling and biological uptake. The project included the installation of over 2000 feet of bioswales. Bioswale plant and ground cover area exceeded 20,500 square feet with more than 90% of the bioswales ground area being covered with plants



or ground cover. Post-construction visual inspections during storm events verified that the bioswales were capturing sediment, trash, and other visual pollutants.

The second project was completed in 2008 and involved the construction of an enhanced wetland that also attenuates peak storm flows to slow down stormwater runoff into the urban area. This project reduced the peak flow rate of storm water that discharges into the swales on Murphy Avenue by 30-50% for certain storm events, helping to mitigate flooding around the Murphy Ave./F Street neighborhood. Approximately 6.0 acres of wetland enhancement was constructed resulting in the creation of 2.7 acres of new wetland.

The combined project mitigates flooding in Santa Margarita by reducing peak flows during storm events and providing better drainage functionality. The projects also resulted in improved water quality by slowing down storm water to aid infiltration, settling, and biological uptake of pollutants.

**Figure 7-4: LID Wetland Basin (2006)**



**Before**



**During**



**After**

**Figure 7-5: Bio Swales (2007)**



**Before**

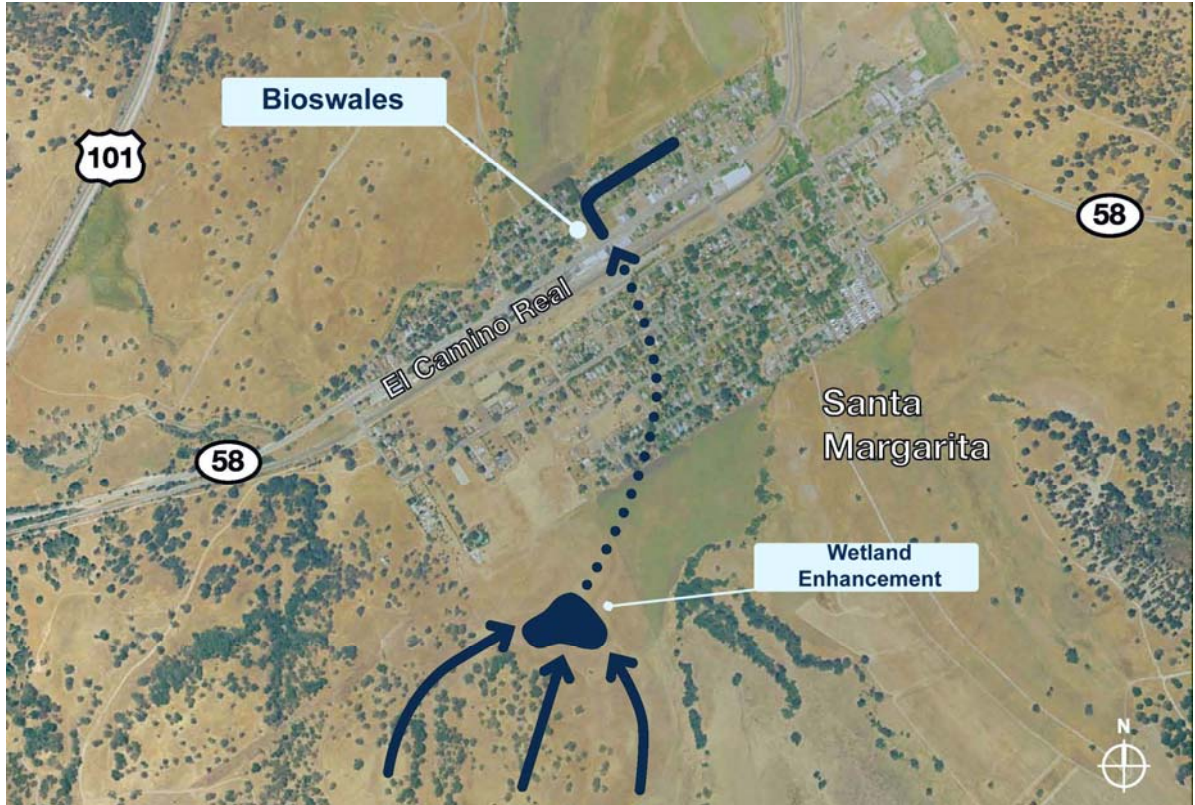


**During**



**After**

**Figure 7-6:**  
**LID Demonstration Project Schematic of the hydrologic connection between wetland and bioswales**



## 7.5 Water Reliability Program

In 2010, the County of San Luis Obispo completed a Water Supply Reliability Report for Santa Margarita. Santa Margarita, like many communities throughout California and the western United States, faces challenges associated with its water supply and water system infrastructure. These challenges are not new, and while some have recently been solved, others continue. The report reflected approximately twenty years of evaluations and studies. The specific topic of focus for the Reliability report was *water supply reliability during a significant drought*. Efforts to pursue reliable water have continued because the Santa Margarita water supply system does not comply with California Department of Health Services requirements for back-up water supplies.

The United States Department of Agriculture (USDA) has approved a loan and grant program to improve water reliability during droughts by funding a connection to an alternative supply. This is the same program that was used and approved by the community in 2008 to fund the recent water system improvements and the new tank discussed previously. The funding for the water lines and tank improvements was funded



through a community approved water rate increase. Funding for the drought reliability project could be through a special property tax assessment that would have to be approved by a majority vote of the property owners. The requirements of the USDA program have deadlines so that they can re-allocate the funding to other communities if Santa Margarita decides not to connect to a back up supply at this time. Consequently, the need for a community decision in 2010 exists.

Santa Margarita's water supply system historically has not complied with the California Department of Health Services Title 22; Section 64554 which states:

*(a) At all times a public water system's water sources shall have the capacity to meet the system's maximum day demand;*

*(b) Community water systems using only groundwater shall have a minimum of two approved sources. The system shall be capable of meeting the maximum day demand with the highest capacity source off line.*

Non-compliance with CDPH standards exists because in the event that the main well (Well 4) shuts down due to low water levels, water quality issues or mechanical issues, the back-up well (Well 3) does not have sufficient capability to meet community demands during its highest use period in the summer. Consequently, alternative solutions have been evaluated and a community-based decision on how to improve water supply reliability is important.

There were three main alternatives identified to improve drought reliability for the community of Santa Margarita. They were:

1. State Water Tie-in with an exchange/banking agreement
2. Tie-in with the Nacimientto Water Pipeline with an exchange agreement with the Santa Margarita Ranch
3. Local Ground Water Resource Development – New Well
  - a. New Deep Well near Well 3
  - b. New Deep Well near the Elementary School Well (currently used for landscape irrigation only)
  - c. Rely solely on Existing Wells with strict water conservation

Each alternative has costs and benefits. Tie-in with the State Water or Nacimientto Pipeline are currently eligible for USDA funding and could require voters approval of a Proposition 218 vote to impose a special property tax. Development of a new well would require an alternative source of funding and may prove difficult in locating a reliable water source.

Both the SLO County Public Works Department (PWD) and the CSA 23 Advisory Group recommend connecting to the State Water Project. The PWD believes that the financial

impacts of the State Water Project connection is the least costly to the community and would provide the greatest ability to diversify water supply options during a significant drought.

## 7.6 Conservation Measures

All three alternatives for water reliability would benefit from a Water Conservation Plan. Although each alternative would provide a back-up supply of water during a drought, conservation remains important to the Water Reliability Plan. Since 2004, the following signs have been posted to alert residents of the current water status and the requested water conservation measures.

**Figure 7-7: Water Status Signs**



**Posted sign of Water Status**



This sign will be posted when the average rainfall and groundwater levels are at or near normal levels. Residents would be entitled to all the water they can put to reasonable and beneficial use.



This sign will be posted to request all residents and business owners in Santa Margarita to voluntarily conserve use so the water supply can remain adequate for everyone.



This sign will be posted when the groundwater drops significantly below normal levels and the supply appears at risk. Mandatory conservation measures would also be implemented.

## **8.0 WATER QUALITY**

### **8.1 Drinking Water Regulations**

Chemical and bacteriological monitoring is required of all public water systems. The Santa Margarita wells are routinely sampled under a CDPH approved monitoring plan. The system fully complies with all sampling, analysis, and reporting regulations. Water quality data from January, 2005, through December, 2010 was compiled, tabulated, and reviewed as described in the remainder of this chapter.

### **8.2 Bacteriological Water Quality**

Raw water samples from Well 4 were collected from the wellhead, before chlorination. The raw water showed the presence of total coliform bacteria in three separate occasions. These events occurred in January and August of 2006, and November of 2009. *Escherichia coli* was not detected in any of these events. All raw water Heterotrophic plate counts were less than 50 CFU/mL during this 5-year period. All treated water from Well 4 was absent for total coliform and *Escherichia coli* from 2005 through 2010. Raw water bacteriological data for Well 4 is tabulated in Appendix D. Treated water bacteriological data is summarized in Appendix E.

As required by the Groundwater Rule, triggered bacteriological source water monitoring of the wells will occur if coliforms are detected in the distribution system.

### **8.3 General Physical Water Quality**

Raw water from Well 4 was sampled twice per month for physical analysis. The standby wells, Wells 1 and 2, were sampled once during this update in May of 2005. Physical analysis samples were collected from wellheads, before chlorination.

The standby wells did show elevated turbidity levels compared to Well 4, most likely due to well inactivity. Well 4 produced water with very low turbidities, color, and odor, meeting all the CDPH general physical MCL requirements. The general physical water quality summary data for Wells 1, 2, and 4 can be found in Appendix F.

#### **8.4 General Mineral Water Quality**

Well 4 meets the CDPH general mineral MCL requirements. The sampling frequency for general minerals is presently scheduled for every odd year. The general mineral water quality data for Wells 1, 2, and 4 is summarized in Appendix G.

Nitrate results, though generally low, occasionally show spiked levels. Although these spikes are still well below the nitrate MCL, the frequency of monitoring for nitrate was increased to monthly for the year 2006 in order to better identify any potential trends. No trends were identified. Nitrate data is tabulated in Appendix H.

#### **8.5 Inorganic Chemical Water Quality**

Wells 1, 2, and 4 meet the CDPH inorganic chemical MCL requirements. The sampling frequency for inorganic chemicals is presently scheduled for every two years. Perchlorate was added to the Inorganics monitoring list in 2008. Initial perchlorate sampling consisted of two samples collected from each well (samples were collected 6 months apart). All results were below the required detection limit of 4.0 ug/L. Appendix I contains the inorganic water quality summaries for Wells 1, 2, and 4.

#### **8.6 Asbestos**

All active groundwater sources that are under the influence of surface water must be analyzed for asbestos. Well 4 was sampled for asbestos in January, 2008 and found to have <0.20 MFL asbestos fibers. The next sampling event is scheduled for 2017. Results can be found in Appendix I, Inorganics.

#### **8.7 Organic Water Quality**

Samples for Synthetic Organic Chemicals (SOCs) were collected from Well 4 in September, 2005. None of the SOCs analyzed were detected. Organic Chemical data can be found in Appendix J. SOCs are required every nine years for both active and standby wells. SOCs will be collected in September, 2014 from Well 4 and in September, 2012 for Wells 1 and 2.

Volatile Organics (VOCs) are required every six years for Well 4 and every 9 years for the standby Wells 1 and 2. Well 4 VOCs are due in August, 2016. The standby wells are due in September, 2011.

A list of pesticides and herbicides applied in the Santa Margarita watershed during 2005 through 2010 was compiled from use permits provided by the San Luis Obispo County Agricultural Department and can be seen in Appendix K. The permits also indicate the commodity or crop treated and the amount used.

## **8.8 Radiological Water Quality**

The initial required sampling for gross alpha and radium 228 for Wells 1, 2, and 4 was completed in 2004 (Well 4) and 2005 (Wells 1 and 2) and reported in the 2005 Watershed Sanitary Survey Update. The average of the first two quarters of gross alpha for all three wells was less than 3 pCi/L. The next sampling event for gross alpha is scheduled for 2013. All radium 228 results were less than 1 pCi/L. Radium 228 was a one time sampling event and no additional monitoring is required.

## **8.9 Long Term 2 Enhanced Surface Water Treatment Rule**

The EPA published the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) on January 5, 2006. The LT2ESWTR was created in order to reduce disease incidence associated with *Cryptosporidium*, *Giardia* and other pathogenic microorganisms in drinking water. The LT2ESWTR supplements existing regulations by targeting additional *Cryptosporidium* treatment requirements to higher risk systems. This regulation also contains provisions to mitigate risks from uncovered finished water storage facilities and to ensure that systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts (DBPs).

### **8.9.1 *Cryptosporidium* and *Giardia***

Pathogens such as *Cryptosporidium* and *Giardia* are often found in surface waters and can cause acute gastrointestinal illness. Health effects in sensitive subpopulations (e.g., infants, AIDS patients, the elderly) may be severe, including the risk of death. *Cryptosporidium* is a significant concern in drinking water because it contaminates surface waters used as drinking water sources, it is resistant to disinfectants like chlorine and it has been associated with waterborne disease outbreaks. Current drinking water regulations require public water systems that use surface water sources to provide filtration to achieve at least a 99 percent (2-log) removal of *Cryptosporidium*.

In 2008, grandfathered data was submitted to the CDPH in order to comply with the LT2ESWTR. This data consisted of one year of monitoring for *Escherichia coli* (*E. coli*) in lieu of analyzing for *Cryptosporidium*. In addition to the *E. coli* monitoring, a sample was analyzed for *Cryptosporidium* and *Giardia* in November, 2005. No *Cryptosporidium* or *Giardia* cysts were detected. The report can be found in Appendix C. A second round of *E. coli* monitoring must be analyzed starting October 1, 2017. As part of the County's routine monitoring, Well 4 is currently and will continue to sample once per month for *E. coli*.

### **8.9.2 Evaluation of Ability to Meet Surface Water Treatment and Disinfection Byproducts Rules**

The Santa Margarita system, complied with both the Long Term 1 and Long Term 2 Enhanced Surface Water Treatment Rules and met disinfection and updated watershed monitoring requirements. Because disinfectant byproduct formation is well below maximum contaminant limits, the CDPH has approved a reduction in disinfection byproduct monitoring to one sample every three years. Samples were collected in 2007 and in 2010 for Trihalomethanes and Haloacetic acids. Results were well below the maximum contaminant levels. See Appendix L for Trihalomethanes and Haloacetic acids results.

### **8.10 Lead and Copper Corrosion Control Monitoring**

On June 7, 1991, the US Environmental Protection Agency published final national primary drinking water regulations for lead and copper. This rule replaced the previous maximum contaminant level for lead and copper with a treatment technique requirement. The water from the wells in Santa Margarita were unable to meet the copper action level of 1.3 mg/L copper in the 90<sup>th</sup> percentile at consumer's taps. This required the County to implement treatment techniques. Current treatment involves feeding potassium ortho-phosphate as a corrosion inhibitor and caustic soda for pH adjustment. In order to demonstrate compliance, ortho-phosphate and pH are monitored weekly at both Wells 3 and 4 and at five sites in the distribution system. Compliance is demonstrated by maintaining the optimal levels of 1.5 to 2.2 mg/L reactive phosphate and 7.4 to 8.0 for pH. Twelve-week moving graphs of distribution averages for reactive phosphate and pH are generated and submitted to the CDPH monthly. Because phosphate can contribute to bacterial growth, heterotrophic plate counts are monitored in the system weekly. The system is fully compliant with the Lead and Copper Rule requirements. A summary of phosphate analyses for Well 4 and a sample of a 12-week moving graph are included in Appendix M.

### **8.11 Recommended Water Quality Monitoring Program**

The existing water quality monitoring program for the Santa Margarita Wells Watershed focuses on analyses obtained from Well 4. Wells 1 and 2 remain in a standby condition. The present water quality monitoring program, along with quarterly inspections of the watershed, should help ensure safe drinking water.

The monitoring program is routinely reviewed and updated by staff as needed.

## 9.0 References

2003 Water System Master Plan for CSA 23, Santa Margarita, California  
San Luis Obispo County Public Works Department, January 29, 2004

2006 Resource Management System – Annual Resource Summary Report  
San Luis Obispo County Department of Planning and Building

Draft EIR for the Santa Margarita Ranch Agricultural Residential Cluster Subdivision  
Project and Future Development Program  
Rincon Consultants, Inc. January 9, 2007

Drinking Water Source Assessment, Santa Margarita Well Nos. 1, 2 and 4  
Boyle Engineering Corporation, September 2001  
Preliminary Hydrogeological Study for Santa Margarita Ranch Agricultural Residential  
Cluster Subdivision  
Hopkins, 2006

San Luis Obispo County Code – Title 22, Land Use Ordinance  
San Luis Obispo County, September 2010

Santa Margarita Drainage and Flood Control Study, Final Report  
Raines, Melton, and Carella, Inc., February 2004

Santa Margarita Low Impact Development Demonstration Project  
Wetland Enhancement and Wet Swale Construction  
San Luis Obispo County Public Works Department, April 2010

Santa Margarita Wells Watershed Sanitary Survey  
Boyle Engineering, October 2001

Santa Margarita Watershed Sanitary Survey Update  
San Luis Obispo County Public Works Department, December 2005

SEIR Report  
Supplemental Environmental Impact Report for the Santa Margarita Drought Reliability  
Project  
San Luis Obispo County Public Works Department, September 22, 2010

Todd Engineer Report: Groundwater Resources of CSA 23 – Santa Margarita  
October 27, 2004

Water Supply Reliability Report 2010 for Santa Margarita California,  
San Luis Obispo County Public Works Department, 2010



## Appendix A: Watershed Sanitary Survey Update Checklist Form

## SANTA MARGARITA WELLS SANITARY SURVEY UPDATE

### WATERSHED SANITARY SURVEY UPDATE CHECKLIST

#### SYSTEM INFORMATION:

**DHS System No.:** 4010024

**System Name:** County of San Luis Obispo CSA-23 Santa Margarita

**Survey Due Date:** December 31, 2010

#### PREPARER INFORMATION:

**Name of Agency and Address:** County of San Luis Obispo, County Government Center,  
Room 207, San Luis Obispo, CA 93408

**Contact Person, Position/Title,**  
**And Telephone Number:** John Beaton, Water Quality Manager, 805-781-5109

**DHS Approval, Signature,**  
**and Date:**

---

#### SURVEY DESCRIPTION:

**Name of Watershed:** Santa Margarita  
Wells 1, 2, and 4 (Under the Influence of Surface Water)

**Total Watershed Size in acres:** 6,800

**Location (list counties in which watershed is**  
**Located or attach map):** San Luis Obispo County

**Name(s) of water treatment plant using the watershed as a source:**

Wells 1, 2, and 4

Appendix A

**CHECKLIST FORM**

General Conditions	Significant	Not Significant	Unknown	Comments
<b>I. GENERAL CONDITIONS</b>				
A. Changes in available water quantity?		X		
B. Construction of water diversion or reservoir projects		X		
C. Relocation of intakes		X		
<b>II. CONTAMINANT SOURCES</b>				
A. Wastewater Treatment				
1. Treatment plant effluent discharges		X		
2. Storage, transport, treatment, disposal to land		X		
3. Residential septic systems		X		Present but low population density
4. Commercial/industrial septic systems		X		
B. Reclaimed Water		X		Present but low population density
C. Urban Areas		X		
D. Agricultural Crop Land Use		X		
E. Pesticide/Herbicide Use		X		
F. Grazing Animals		X		Present but low population density
G. Concentrated Animal Facilities (feedlots, etc)		X		
H. Wild Animal Populations		X		
I. Mines				
1. Active		X		
2. Inactive		X		
J. Disposal Facilities				
1. Solid waste		X		
2. Hazardous waste		X		
K. Logging		X		
L. Recreation		X		
1. Reservoir body contact		X		
2. Reservoir non-body contact		X		
M. Unauthorized Activity				
1. Illegal dumping		X		
2. Underground storage tank leaks		X		
3. Other		X		
N. Traffic Accidents/Spills				
1. Transportation corridors	X			Highway and Rail Road Tracks
2. History of accidents/spills		X		
O. Groundwater Discharges				
1. Natural discharge		X		
2. Gas, oil, geothermal wells		X		
P. Seawater Intrusion		X		
Q. Geologic Hazards				
1. Landslides	X			
2. Earthquakes		X		
3. Floods		X		
4. Other				
R. Fires	X			
<b>III. GROWTH</b>				
A. Population/General Urban Area Increase		X		
B. Land Use Changes		X		
C. Industrial Use Increase		X		
<b>IV. WATER QUALITY</b>				
A. Changes in Raw Water Quality		X		
B. Difficulty meeting drinking water standards		X		

Appendix B: Santa Margarita Community  
and Watershed Boundary Maps



APPENDIX B  
Santa Margarita Watershed

Santa Margarita Watershed  
Boundary Line

A

Yerba Buena Creek

Santa Margarita Creek

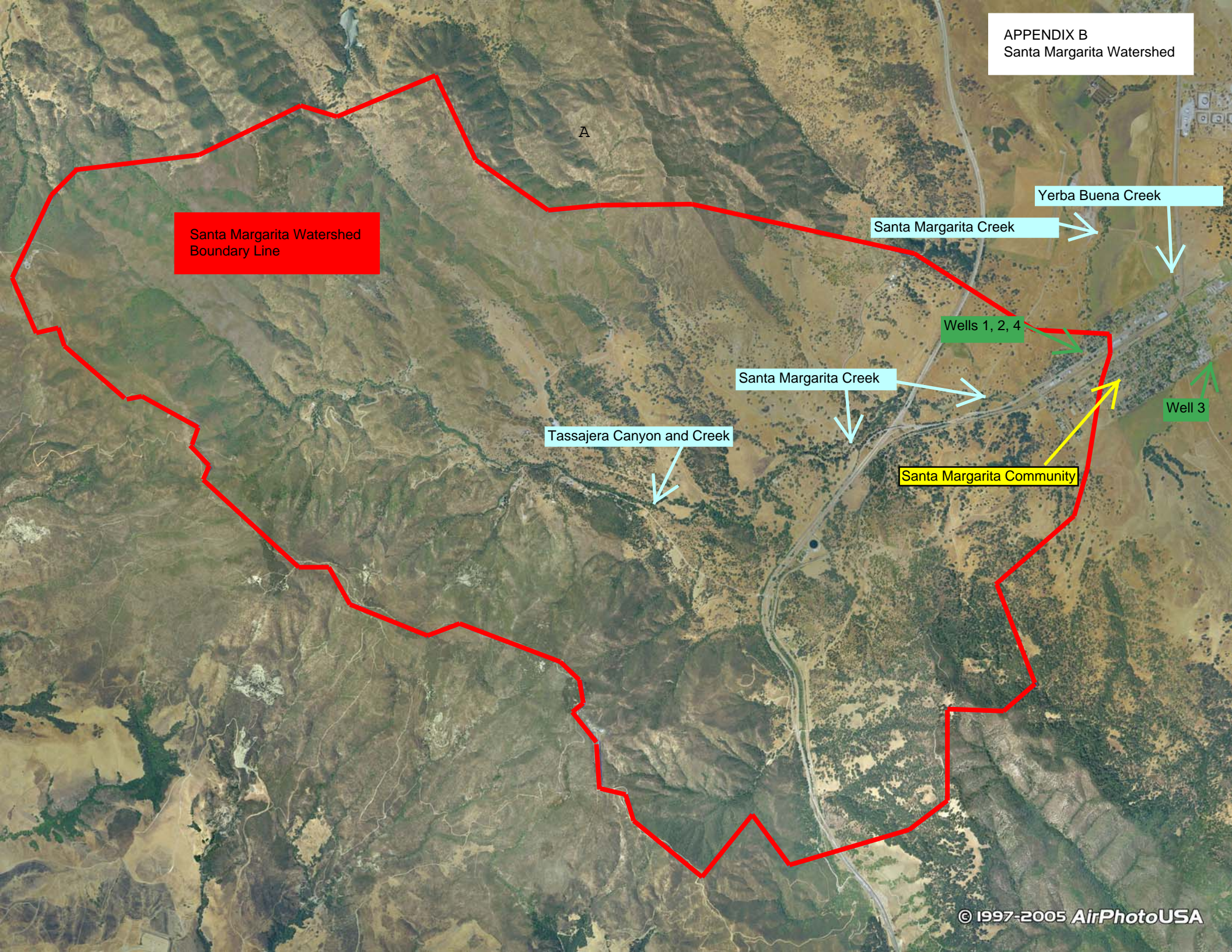
Wells 1, 2, 4

Santa Margarita Creek

Tassajera Canyon and Creek

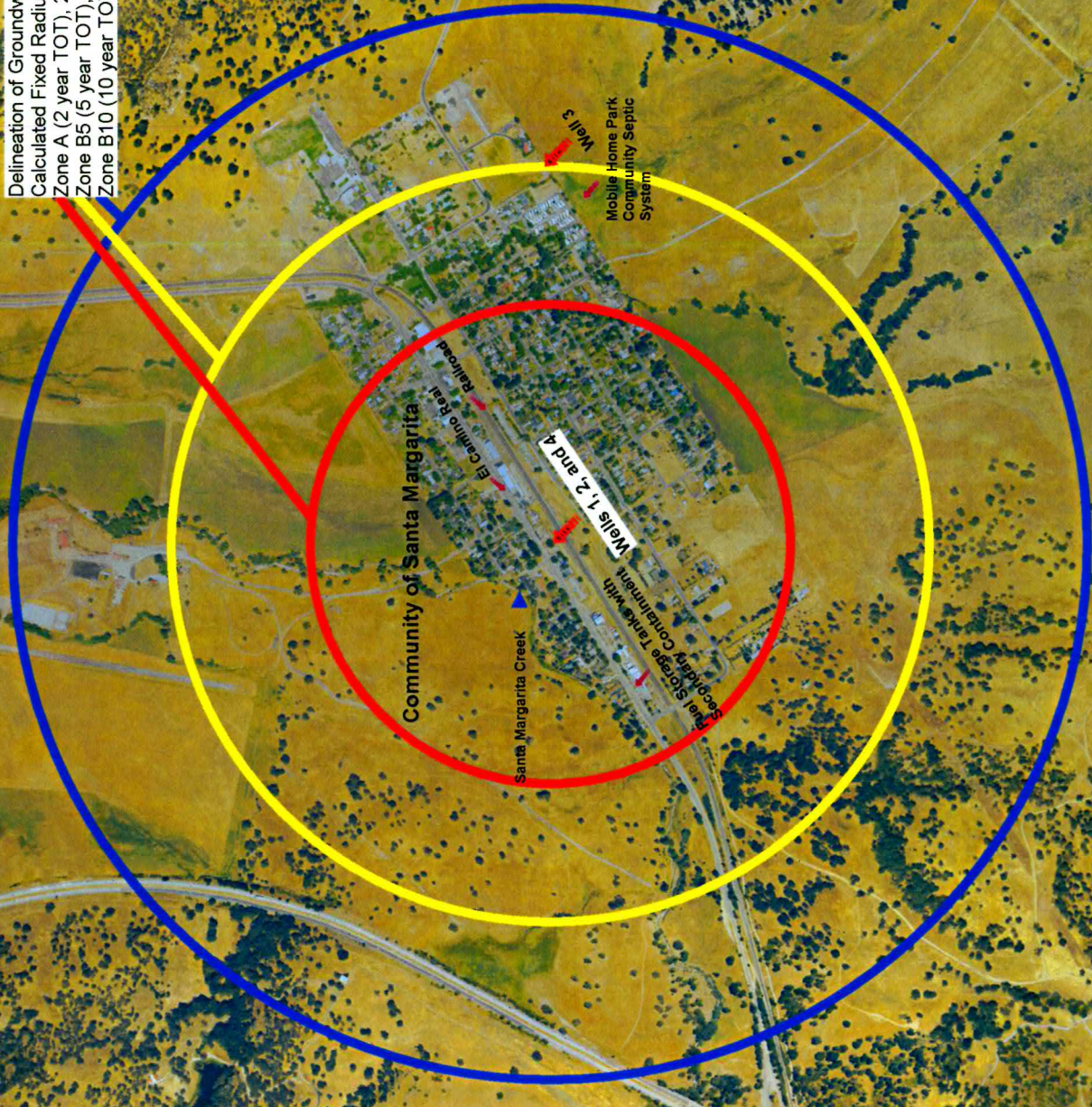
Santa Margarita Community

Well 3



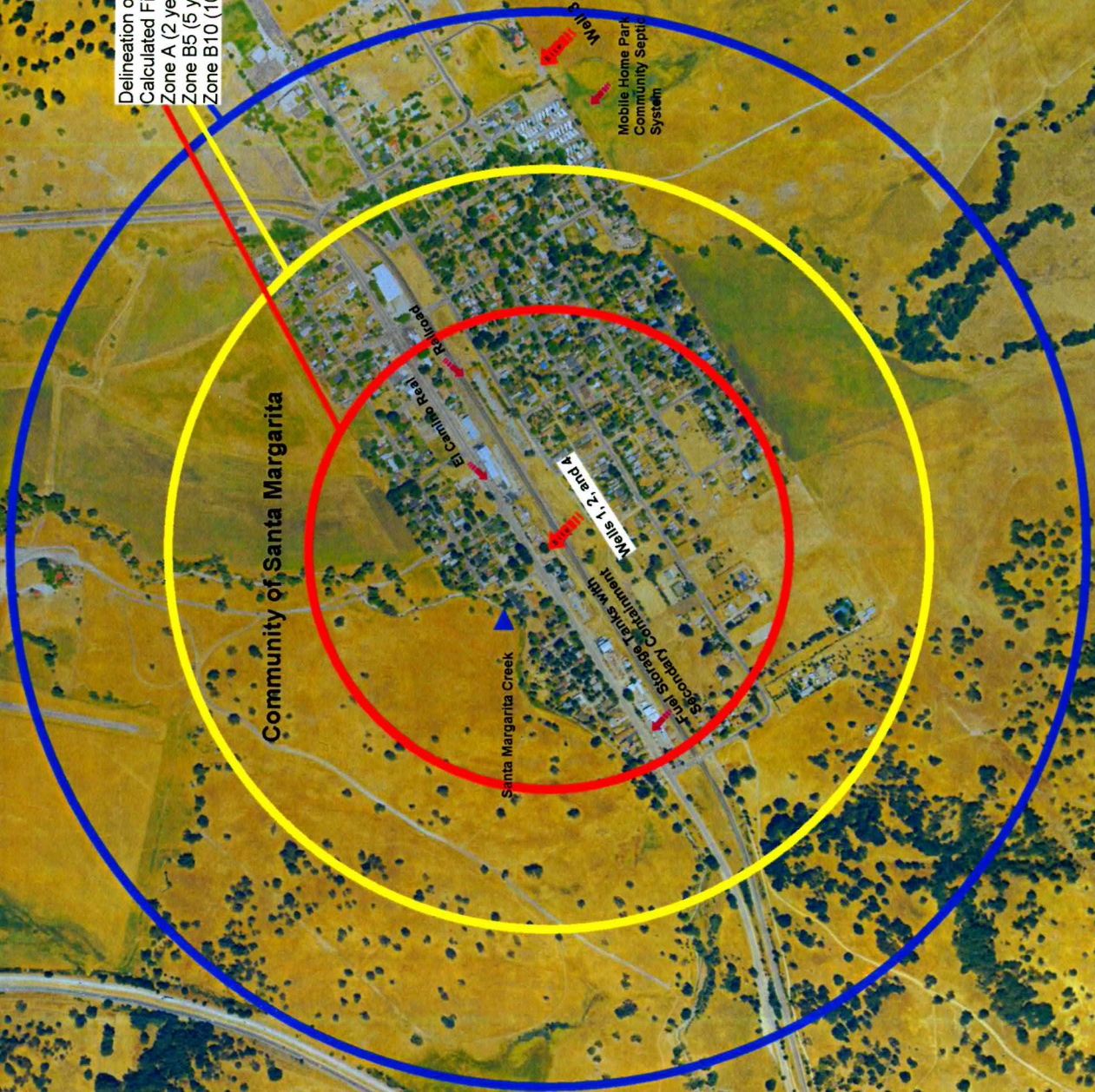


Delineation of Groundwater Protection Zones - Well 4  
Calculated Fixed Radius Delineation Method  
Zone A (2 year TOT), 2115 ft.  
Zone B5 (5 year TOT), 3334 ft.  
Zone B10 (10 year TOT), 4729 ft.





Delineation of Groundwater Protection Zones - Wells 1 and 2  
Calculated Fixed Radius Delineation Method  
Zone A (2 year TOT), 1654 ft.  
Zone B5 (5 year TOT), 2616 ft.  
Zone B10 (10 year TOT), 3699 ft.



Community of Santa Margarita

Santa Margarita Creek

El Cerrillo Real Railroad

Wells 1, 2 and 4

Fuel Storage Tanks with Secondary Containment

Wells 3 and 5

Mobile Home Park Community Septic System



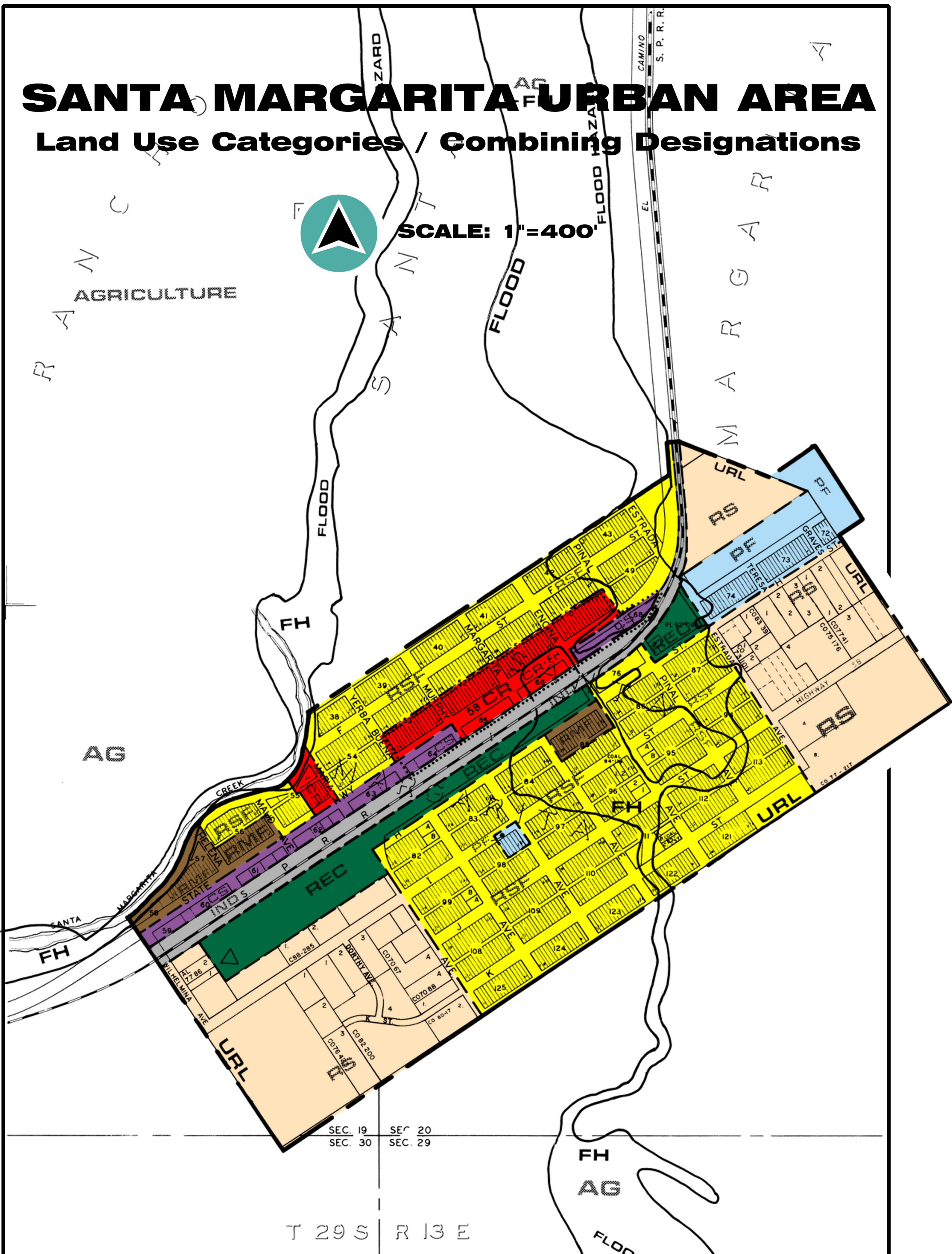
# SANTA MARGARITA URBAN AREA

## Land Use Categories / Combining Designations



SCALE: 1"=400'

AGRICULTURE



LEGEND	
<b>LAND USE CATEGORIES</b>	<b>COMBINING DESIGNATIONS</b>
<b>AG</b> Agriculture	<b>FH</b> Flood Hazard
<b>CR</b> Commercial Retail	<b>AR</b> Airport Review Area
<b>CS</b> Commercial Services	<b>SRA</b> Sensitive Resource Area
<b>IND</b> Industrial	<b>GSA</b> Geologic Study Area
<b>OP</b> Office & Professional	<b>EX</b> Energy & Extractive Area
<b>OS</b> Open Space	<b>V</b> Visitor Serving Area
<b>PF</b> Public Facility	<b>H</b> Historic
<b>REC</b> Recreation	<b>AS</b> Archaeologically Sensitive Area
<b>RMP</b> Residential Multi Family	<b>COASTAL DESIGNATIONS</b>
<b>RSF</b> Residential Single Family	<b>MH</b> Marine Habitat
<b>RS</b> Residential Suburban	<b>CCRV</b> Coastal Creeks / Riparian Vegetation
<b>RR</b> Residential Rural	<b>W</b> Wetlands
<b>RL</b> Rural Lands	<b>TH</b> Terrestrial Habitat
	<b>BOUNDARIES</b>
	<b>URL</b> Urban Reserve Line (URL)
	<b>USL</b> Urban Services Line (USL)
	<b>VRL</b> Village Reserve Line (VRL)
	<b>CBD</b> Central Business District (CBD)
	<b>LCP</b> Local Coastal Plan (LCP)
	<b>PA</b> Planning Area



SAN LUIS OBISPO COUNTY  
DEPARTMENT OF PLANNING & BUILDING  
Mapping & Graphics Section  
*Geographic Information System*

December 2000



Appendix C: *Giardia* and *Cryptosporidium*  
Analysis Reports



BioVir Laboratories, Inc.

NELAC #05234CA  
EPA ID #01401, CA-ELAP # 1795

685 Stone Road, Unit 6 • Benicia, CA 94510 • (707) 747-5906 • 1-800-GIARDIA • FAX (707) 747-1751 • WEB: www.biovir.com

**REPORT OF SAMPLE EVALUATION**

REPORT NO.: 052049-1  
 PAGE NO.: 1 of 1  
 CLIENT ADDRESS: County of San Luis Obispo  
 County Courthouse  
 Public Works and Transportation  
 San Luis Obispo, CA 93408  
 CLIENT NO.: SAN034

**SAMPLE INFORMATION:**

Name of Sampler:	Charles Berna	Sample Date:	11/15/05
Sample Source:	San Luis Obispo CSA23 Santa Margarita	Sample Time:	07:20
Sample Location:	Well 04	Turbidity (NTU):	0.17
Sample Volume:	10 Liters, Grab	Water Temperature:	15.0 C
P.O. #:	33296	pH:	6.81
		Comments:	Raw Drinking Water

**ASSAY RESULTS:**

1. Giardia and Cryptosporidium; June 2003 Version of EPA Method 1623

Amount Assayed: 10.0 Liters Check-in Temp: 4.8 C Date/Time Received: 11/16/05 09:00 Elution Date: 11/16/05

**RESULTS - NUMBER OF SLIDES EXAMINED: ONE**

Report Parameter	Organisms / Liter	
	Giardia Species Cysts	Cryptosporidium Oocysts
Fluorescence Antibody	<0.1	<0.1

**ADDITIONAL INFORMATION**

DAPI		
Negative	<0.1	<0.1
Positive (Internal Staining)	<0.1	<0.1
Positive (Stained Nuclei)	<0.1	<0.1
DIC		
Empty	<0.1	<0.1
Amorphous Structure	<0.1	<0.1
Internal Structure (One)	<0.1	<0.1
Internal Structure (>One)	<0.1	<0.1
DAPI & DIC Positive	<0.1	<0.1

"Less than" results represent the lower detection limit for this assay.

**SAMPLE EVALUATION PERFORMANCE CRITERIA:** The precise rates of recovery of organisms from environmental samples cannot be determined. BioVir Laboratories has analyzed your sample(s) in accordance with the method described with each analyte above, however, due to inherent limitations of these methods organisms may avoid detection. For additional information regarding the limitations of the method(s) referred to above please call us at 1-800-GIARDIA.

**COMPANY IS NOT AN INSURER:** BioVir Laboratories is not an insurer or guarantor of the quality and/or purity of water, wastewater, biosolid or other material from which the sample was taken. BioVir offers no express or implied warranties whatsoever concerning the quality or purity of any water, wastewater, biosolid or other material which is ultimately consumed, distributed, applied or otherwise disposed.

**MAINTENANCE OF RECORDS:** BioVir Laboratories, Inc. shall maintain records pertaining to the historical reconstruction of client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that date unless a written client's request for records transfer is received by BioVir which requests otherwise. Records transfer or storage charges may apply after the 5 year period.

11-17-2005  
COMPLETION DATE

Richard E. Daniel  
SIGNATURE/DATE

11-22-2005

Appendix D: Well 4 Raw Water  
Bacteriological Data

**BACTERIOLOGICAL SUMMARY**  
**Santa Margarita Well 04 - Before Chlorination 2005-2010**

Sample Site	Collected Date	Total Coliform	<i>E. coli</i>	Total Coliform (MPN/100mL)	<i>E. coli</i> (MPN/100mL)	Heterotrophic Plate Count (CFU/1mL)	Cryptosporidium (Cysts/L)	Giardia (Cysts/L)
WELL 04	1/3/2005	Absent	Absent			1		
WELL 04	2/7/2005	Absent	Absent			1		
WELL 04	3/7/2005	Absent	Absent			5		
WELL 04	4/4/2005	Absent	Absent			3		
WELL 04	5/2/2005	Absent	Absent			4		
WELL 04	6/6/2005	Absent	Absent			7		
WELL 04	7/5/2005	Absent	Absent			4		
WELL 04	8/1/2005	Absent	Absent			9		
WELL 04	9/6/2005	Absent	Absent			3		
WELL 04	10/3/2005	Absent	Absent			12		
WELL 04	11/7/2005	Absent	Absent			1		
WELL 04	11/15/2005						<0.1	<0.1
WELL 04	12/5/2005	Absent	Absent			8		
WELL 04	1/3/2006	Present	Absent			17		
WELL 04	1/4/2006			58	<1			
WELL 04	1/5/2006			6	<1	18		
WELL 04 @ 1 min	1/6/2006			<1	<1	1		
WELL 04 @ 15 min	1/6/2006			<1	<1	1		
WELL 04 @ 30 min	1/6/2006			<1	<1	1		
WELL 04 @ 30 sec	1/6/2006			<1	<1	<1		
WELL 04 @ 5 min	1/6/2006			<1	<1	<1		
WELL 04	2/6/2006			<1	<1	<1		
WELL 04	3/6/2006			<1	<1	12		
WELL 04	4/5/2006			<1	<1	4		
WELL 04	5/1/2006			<1	<1	2		
WELL 04	6/5/2006			<1	<1	1		
WELL 04	7/3/2006			<1	<1	3		
WELL 04	8/7/2006			1	<1	2		
WELL 04	8/9/2006			<1	<1	<1		
WELL 04	8/14/2006			<1	<1	<1		
WELL 04	9/5/2006			<1	<1	<1		
WELL 04	10/2/2006			<1	<1	1		
WELL 04	11/6/2006			<1	<1	8		
WELL 04	12/4/2006			<1	<1	<1		
WELL 04	1/8/2007			<1	<1	2		
WELL 04	2/5/2007			<1	<1	< 1		
WELL 04	3/5/2007			<1	<1	2		
WELL 04	4/2/2007			<1	<1	4		
WELL 04	5/7/2007			<1	<1	<1		
WELL 04	6/4/2007			<1	<1	5		
WELL 04	7/2/2007			<1	<1	<1		
WELL 04	8/6/2007			<1	<1	12		
WELL 04	9/4/2007			<1	<1	6		

**BACTERIOLOGICAL SUMMARY**  
**Santa Margarita Well 04 - Before Chlorination 2005-2010**

WELL 04	10/1/2007			<1	<1	<1		
WELL 04	11/5/2007			<1	<1	18		
WELL 04	12/3/2007			<1	<1	3		
WELL 04	1/7/2008			<1	<1	<1		
WELL 04	2/4/2008			<1	<1	<1		
WELL 04	3/3/2008			<1	<1	<1		
WELL 04	4/7/2008			<1	<1	4		
WELL 04	5/5/2008			<1	<1	4		
WELL 04	6/2/2008			<1	<1	280		
WELL 04	7/8/2008			<1	<1	<1		
WELL 04	8/4/2008			<1	<1	17		
WELL 04	9/2/2008			<1	<1	<1		
WELL 04	10/6/2008			<1	<1	<1		
WELL 04	11/3/2008			<1	<1	<1		
WELL 04	12/1/2008			<1	<1	6		
WELL 04	1/5/2009			<1	<1	2		
WELL 04	2/2/2009			<1	<1	10		
WELL 04	3/2/2009			<1	<1	1		
WELL 04	4/6/2009			<1	<1	12		
WELL 04	5/4/2009			<1	<1	3		
WELL 04	6/1/2009			<1	<1	4		
WELL 04	7/6/2009			<1	<1	<1		
WELL 04	8/3/2009			<1	<1	24		
WELL 04	9/8/2009			<1	<1	<1		
WELL 04	10/5/2009			<1	<1	19		
WELL 04	11/2/2009			1	<1	1		
WELL 04	11/4/2009			<1	<1			
WELL 04	12/8/2009			<1	<1	1		
WELL 04	1/4/2010			<1	<1	3		
WELL 04	2/1/2010			<1	<1	1		
WELL 04	3/1/2010			<1	<1	1		
WELL 04	4/5/2010			<1	<1	9		
WELL 04	5/3/2010			<1	<1	6		
WELL 04	6/1/2010			<1	<1	8		
WELL 04	7/6/2010			<1	<1	5		
WELL 04	8/2/2010			<1	<1	1		
WELL 04	9/7/2010			<1	<1	3		
WELL 04	10/4/2010			<1	<1	5		
WELL 04	11/1/2010			<1	<1	3		
WELL 04	12/6/2010			<1	<1	2		
	Minimum			<1	<1	<1		
	Maximum			58	<1	280		
	Average			<1	<1	8	<0.1	<0.1
	# of Samples	13	13	69	69	81	1	1

Appendix E: Well 4 Treated Water  
Bacteriological Data

**BACTERIOLOGICAL SUMMARY for Santa Margarita Well 04 After Chlorination 2005-2010**

Year Collected		Residual Chlorine (mg/L)	Total Coliform	<i>E. coli</i>	Total Coliform (MPN/100mL)	<i>E. coli</i> (MPN/100 mL)	Heterotrophic Plate Count (CFU/1mL)
2005	Minimum	1.45	Absent	Absent			<1
	Maximum	2.04	Absent	Absent			25
	Average	1.71	Absent	Absent			2
	# of Samples	52	24	24			52
2006	Minimum	1.50	Absent	Absent			<1
	Maximum	1.80	Absent	Absent			11
	Average	1.64	Absent	Absent	<1	<1	1
	# of Samples	54	26	26	1	1	54
2007	Minimum	1.35	Absent	Absent			<1
	Maximum	1.82	Absent	Absent			22
	Average	1.60	Absent	Absent			2
	# of Samples	53	24	24			53
2008	Minimum	1.40	Absent	Absent			<1
	Maximum	1.84	Absent	Absent			28
	Average	1.69	Absent	Absent			1
	# of Samples	52	24	24			52
2009	Minimum	1.50	Absent	Absent			<1
	Maximum	2.35	Absent	Absent			13
	Average	1.85	Absent	Absent			2
	# of Samples	52	23	23			52
2010	Minimum	1.40	Absent	Absent			<1
	Maximum	1.89	Absent	Absent			16
	Average	1.56	Absent	Absent			2
	# of Samples	52	24	24			52

## Appendix F: Physical Data



**PHYSICAL SUMMARY for Santa Margarita Well 04 2005 - 2010**

Year Collected	Units	WELL 04					WELL 04 AFTER CHLORINATION	
		Temp °C	pH	Odor TON	Turb NTU	True Color CU	Temp °C	pH
2005	Maximum	22	7.46	1.2	0.33	<1	20	7.96
	Minimum	14	6.81	1.0	0.05	<1	13	7.29
	Average	16	7.05	1.1	0.11	<1	16	7.52
	# of Samples	25	53	13	13	13	50	52
2006	Maximum	18	7.52	1.7	0.60	1	19	8.00
	Minimum	14	6.94	1.0	0.03	<1	13	7.38
	Average	16	7.14	1.3	0.12	<1	16	7.67
	# of Samples	23	52	12	12	12	52	52
2007	Maximum	19	7.37	2.0	0.12	<1	21	7.89
	Minimum	15	6.88	1.0	0.04	<1	14	7.37
	Average	17	7.04	1.3	0.06	<1	17	7.66
	# of Samples	24	53	12	12	12	53	53
2008	Maximum	17	7.69	1.7	0.18	1	21	8.10
	Minimum	13	6.78	1.0	0.04	<1	13	7.44
	Average	16	7.04	1.3	0.07	<1	16	7.63
	# of Samples	24	51	13	13	13	52	52
2009	Maximum	22	7.34	1.6	0.08	<1	20	7.68
	Minimum	11	7.02	1.0	0.04	<1	13	7.39
	Average	15	7.16	1.1	0.06	<1	16	7.57
	# of Samples	24	52	12	12	12	52	52
2010	Maximum	18	7.50	1.5	0.08	<1	20	8.0
	Minimum	14	7.08	1.0	0.04	1	13	7.3
	Average	16	7.22	1.2	0.05	<1	16	7.6
	# of Samples	24	52	12	12	12	52	52

**PHYSICAL SUMMARY for Santa Margarita Well 01 and Well 02 2005 - 2010**

Location	Collected Date	Odor (TON)	Turbidity (NTU)	Apparent Color (CU)	True Color (CU)
Well 01	5/2/2005	1.2	0.81	1	1
Well 02	5/2/2005	1.2	1.9	1	1

## Appendix G: General Mineral Data

Appendix G

**GENERAL MINERAL SUMMARY for Santa Margarita Wells 2005 - 2010**

Sample Site	Collected Date	Aggressive Index	Langelier Index	Total Alkalinity as CaCO <sub>3</sub> , mg/L	Bicarbonate as CaCO <sub>3</sub> , mg/L	Carbonate as CaCO <sub>3</sub> , mg/L	Hydroxide Alkalinity, mg/L	Total Hardness as CaCO <sub>3</sub> , mg/L	Calcium, mg/L	Magnesium, mg/L	Chloride, mg/L	Sodium, mg/L	Sulfate, mg/L	Electrical Conductivity, umhos/cm	Total Dissolved Solids, mg/L	Methylene Blue Activated Substances, mg/L
WELL 04	5/2/2005	11.7	-0.4	270	270	0	0	330	61	48	28	27	84	700	460	ND
WELL 04	5/1/2006															
WELL 04	5/5/2008	11.8	-0.2	250	250	0	0	290	50	40	20	26	71	650	390	ND
WELL 04	5/11/2009															
WELL 04 AFTER CHLORINATION	8/11/2008			250					47					680		
STANDBY WELLS																
WELL 01	5/2/2005	11.9	-0.2	250	250	0	0	420	83	59	48	30	160	880	600	ND
WELL 02	5/2/2005	11.8	-0.02	260	260	0	0	390	73	55	43	29	130	830	540	ND

ND = Not Detected

## Appendix H: Nitrate Data

**NUTRIENT SUMMARY for Santa Margarita Well 04 2005 - 2010**

		Nitrite as N, ug/L	Nitrate as N, ug/L
Detection Limit for Reporting	DLR	400	450
Maximum Contaminant Level	MCL	1000	10000
Sample Site	Collected Date		
WELL 04	5/2/2005	<100	4600
WELL 04	11/28/2005		230
WELL 04	12/5/2005		210
WELL 04	1/3/2006		170
WELL 04	2/6/2006		290
WELL 04	3/6/2006		290
WELL 04	4/5/2006		1000
WELL 04	5/8/2006		2700
WELL 04	6/5/2006		2500
WELL 04	7/3/2006		1800
WELL 04	8/7/2006		1000
WELL 04	9/5/2006		540
WELL 04	10/2/2006		490
WELL 04	5/7/2007		250
WELL 04	5/5/2008	<100	1700
WELL 04	5/11/2009		321
WELL 04	5/3/2010		2710
	Minimum	<100	170
	Maximum	<100	4600
	Average	<100	1220
	# of Samples	2	17

## Appendix I: Inorganic Chemical Data

**INORGANICS SUMMARY for Santa Margarita Wells 2005 - 2010**

		Aluminum, ug/L	Antimony, ug/L	Arsenic, ug/L	Asbestos, MFL	Barium, ug/L	Beryllium, ug/L	Cadmium, ug/L	Chromium, ug/L	Copper, ug/L	Fluoride, mg/L	Iron, ug/L	Lead, ug/L	Manganese, ug/L	Mercury, ug/L	Perchlorate, ug/L	Nickel, ug/L	Selenium, ug/L	Silver, ug/L	Thallium, ug/L	Zinc, ug/L
Detection Limit for Reporting	DLR	50	6	2	0.2	100	1	1	10	50	0.1	100	5	20	1	4	10	5	10	1	50
Maximum Contaminant Level	MCL	1000	6	10	7	1000	4	5	50	1000	0.5	300	15	50	2	6	100	50	100	2	5000
<b>ACTIVE WELLS</b>	<b>Collected Date</b>																				
WELL 04	5/2/2005									ND		ND		ND							ND
WELL 04	5/1/2006	ND	ND	ND		ND	ND	ND	ND		0.17		ND		ND		ND	ND	ND	ND	
WELL 04	11/13/2007															ND					
WELL 04	1/7/2008				ND																
WELL 04	5/5/2008									ND		ND		ND							ND
WELL 04	5/19/2008															ND					
WELL 04	5/4/2009	ND	ND	ND		ND	ND	ND	ND				ND				ND	ND	ND	ND	
WELL 04	5/11/2009										0.19				ND						
WELL 04 AFTER CHLORINATION	8/11/2008									ND			ND								
<b>STANDBY WELLS</b>																					
WELL 01	5/2/2005	ND	ND	ND		140	ND	ND	ND	ND	0.12	180	ND	ND	ND		ND	ND	ND	ND	ND
WELL 01	6/23/2008															ND					
WELL 01	12/1/2008															ND					
WELL 02	5/2/2005	ND	ND	ND		130	ND	ND	ND	ND	0.14	570	ND	ND	ND		12	ND	ND	ND	ND
WELL 02	6/23/2008															ND					
WELL 02	12/1/2008															ND					
MFL = Million Fibers per Liter																					
mg/L = milligrams per Liter																					
ND = Not Detected																					
ug/L = micrograms per Liter																					

## Appendix J: Organic Chemical Data



**San Luis Obispo County  
Public Works and  
Transportation Department  
Water Quality Laboratory**

Agency/Project: **SAN LUIS OBISPO CSA 23 - SANTA MARGARITA**

Reason: **REQUIRED**

Sample Site: **WELL 04**

Sample Type: **Grab**

Lab: **MW**

Collected Date/Time: **9/26/2005 10:00:00 AM**

Received Date/Time: **9/26/2005 1:55:28 PM**

Sampler: **Berna**

Analysis Number: **20050926033**

Analysis	Result	Units	Method	Analyst	Completed Date
Simazine (Princep)	< 0.05	ug/L	EPA 525.1	MW	10/10/2005
Ethylene Dibromide	< 0.01	ug/L	EPA 504	MW	9/30/2005
Dibromochloropropane	< 0.01	ug/L	EPA 504	MW	9/30/2005
Atrazine (AAtrex)	< 0.05	ug/L	EPA 525.1	MW	10/10/2005

Comments: Analyze for the following: Atrazine, Dibromochloropropane, Ethylene Dibromide, Simazine.

Reported By: \_\_\_\_\_ 03-Feb-11

Original report was routed to: SHD:  No  
 EDT:  Yes  
 CHD:  No  
 RWQCB:  No  
 And also sent to:

**Note: Analyses with a reason listed as "Operational" may or may not be suitable for regulatory reporting purposes. Please check with lab signatory personnel for clarification. Phone (805) 781-5111.**

## Appendix K: Pesticide and Herbicide Use

Appendix K  
 SAN LUIS OBISPO COUNTY CSA 23 - SANTA MARGARITA WATERSHED  
 REGISTERED PESTICIDE/HERBICIDE USE 2005 - 2010

Permittee	Crop	Date Applied	Treated Area (Acres)	Treatment	Quantity Used	Units
Cypress Springs Vineyard	Wine Grapes	5/30/2006	5	Pristine Fugicide	52.50	Ounce
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	Herbicide Activator	2.00	Quart
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	Rely Herbicide	2.00	Gallon
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	K-90 Knapp Nonionic Adjuvant - Spreader	30.00	Ounce
Cypress Springs Vineyard	Wine Grapes	7/22/2006	5	Quintec	30.00	Ounce
Cypress Springs Vineyard	Wine Grapes	5/9/2007	5	Quintec	25.00	Ounce
Cypress Springs Vineyard	Wine Grapes	5/9/2007	5	JMS Stylet - Oil	5.00	Gallon

## Appendix L: Trihalomethane and Haloacetic acids Data

**San Luis Obispo County**  
**Public Works and**  
**Transportation Department**  
**Water Quality Laboratory**

Agency/Project: **SAN LUIS OBISPO CSA 23 - SANTA MARGARITA**  
 Sample Site: **9627 MARGARITA**  
 Sample Type: GRAB  
 Collected Date/Time: 9/10/2007 10:45:00 AM  
 Sampler: Berna

Reason: REQUIRED  
 Lab: MWH  
 Received Date/Time: 9/10/2007 3:30:02 PM  
 Analysis Number: **20070910047**

Analysis	Result	Units	Method	Analyst	Completed Date
Chloroform - Certified	< 0.5	ug/L	EPA 551	MWH	9/22/2007
Temperature	22	° C			
Free Chlorine Residual (measured in the field)	1.30	mg/L	Hach test = SM4500-CI G		
Total Haloacetic Acids - 5 Compounds	< 1.0	ug/L	EPA 552.2	MWH	9/20/2007
Bromochloroacetic Acid	< 1.0	ug/L	EPA 552.2	MWH	9/20/2007
Dibromoacetic Acid	< 1.0	ug/L	EPA 552.2	MWH	9/20/2007
Trichloroacetic Acid	< 1.0	ug/L	EPA 552.2	MWH	9/20/2007
Dichloroacetic Acid	< 1.0	ug/L	EPA 552.2	MWH	9/20/2007
Monobromoacetic Acid	< 1.0	ug/L	EPA 552.2	MWH	9/20/2007
Monochloroacetic Acid	< 2.0	ug/L	EPA 552.2	MWH	9/20/2007
Total Trihalomethanes - Certified	3.3	ug/L	EPA 551	MWH	9/22/2007
Bromoform - Certified	0.9	ug/L	EPA 551	MWH	9/22/2007
Dibromochloromethane - Certified	1.4	ug/L	EPA 551	MWH	9/22/2007
Bromodichloromethane - Certified	1.0	ug/L	EPA 551	MWH	9/22/2007

# Clinical Laboratory of San Bernardino, Inc.


**San Luis Obispo County**

 Water Quality Lab / County Gov Center Rm 207  
 San Luis Obispo CA, 93401

Project: San Luis Obispo CSA 23 - Santa Margarita

Sub Project:

Project Manager: John Beaton

Work Order: 10I0816

Received: 09/10/10 09:00

Reported: 09/23/10

**9627 Margarita**
**10I0816-01 (Water)**
**Sample Date:** 09/07/10 9:30

**Sampler:** Mann/Johnson

Analyte	Method	Result	Units	Rep. Limit	MCL	Prepared	Analyzed	Batch	Qualifier
<b><u>Trihalomethanes Analyses</u></b>									
<b>Bromodichloromethane</b>	EPA 524.2	<b>2.4</b>	ug/L	1.0		09/11/10	09/11/10	1037133	
<b>Bromoform</b>	EPA 524.2	<b>1.2</b>	ug/L	1.0		09/11/10	09/11/10	1037133	
<b>Chloroform (Trichloromethane)</b>	EPA 524.2	<b>1.2</b>	ug/L	1.0		09/11/10	09/11/10	1037133	
<b>Dibromochloromethane</b>	EPA 524.2	<b>3.1</b>	ug/L	1.0		09/11/10	09/11/10	1037133	
<b>Total Trihalomethanes (TTHM)</b>	EPA 524.2	<b>7.9</b>	ug/L	1.0	80	09/11/10	09/11/10	1037133	
<i>Surrogate: Bromofluorobenzene</i>	<i>EPA 524.2</i>	<i>103 %</i>				<i>09/11/10</i>	<i>09/11/10</i>	<i>1037133</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>EPA 524.2</i>	<i>104 %</i>				<i>09/11/10</i>	<i>09/11/10</i>	<i>1037133</i>	
<b><u>Haloacetic Acids Analyses</u></b>									
<b>Dibromoacetic Acid</b>	EPA 552.2	<b>1.1</b>	ug/L	1.0		09/14/10	09/14/10	1038064	
Dichloroacetic Acid	EPA 552.2	ND	ug/L	1.0		09/14/10	09/14/10	1038064	
Monobromoacetic Acid	EPA 552.2	ND	ug/L	1.0		09/14/10	09/14/10	1038064	
Monochloroacetic Acid	EPA 552.2	ND	ug/L	2.0		09/14/10	09/14/10	1038064	
Trichloroacetic Acid	EPA 552.2	ND	ug/L	1.0		09/14/10	09/14/10	1038064	
<b>Total Haloacetic Acids (HAA5)</b>	EPA 552.2	<b>1.1</b>	ug/L	1.0	60	09/14/10	09/14/10	1038064	
<i>Surrogate: 2,3-Dibromopropionic Acid</i>	<i>EPA 552.2</i>	<i>77 %</i>				<i>09/14/10</i>	<i>09/14/10</i>	<i>1038064</i>	

ND Analyte NOT DETECTED at or above the reporting limit

 Stu Styles  
 Client Services Manager

Appendix M: Phosphate Data Summary  
and 12-Week Moving Graph of Phosphate and pH Data

**PHOSPHATE DATA SUMMARY for Santa Margarita Well 04 After Chlorination 2005 - 2010**

Year Collected		Reactive Phosphate as PO <sub>4</sub> , mg/L
2005	Minimum	1.25
	Maximum	2.15
	Average	1.90
	# of Samples	52
2006	Minimum	1.18
	Maximum	2.25
	Average	1.87
	# of Samples	52
2007	Minimum	1.20
	Maximum	2.94
	Average	1.76
	# of Samples	54
2008	Minimum	1.58
	Maximum	2.48
	Average	2.03
	# of Samples	52
2009	Minimum	1.88
	Maximum	2.19
	Average	2.02
	# of Samples	52
2010	Minimum	1.53
	Maximum	2.16
	Average	1.98
	# of Samples	52



System #4010024, San Luis Obispo CSA23 - Santa Margarita, Corrosion Control Water Quality Parameters

Week of	Well 03 Eff					Well 04 After Chlorination					2111 I Street (Home)					2290 I Street					2400 F Street					9206 Murphy					F Street (2100 block)					Distribution Summary					
	Residual Cl2	HPC	pH	Reactive PO4	Temperature	Residual Cl2	HPC	pH	Reactive PO4	Temperature	Residual Cl2	HPC	pH	Reactive PO4	Temperature	Residual Cl2	HPC	pH	Reactive PO4	Temperature	Residual Cl2	HPC	pH	Reactive PO4	Temperature	Residual Cl2	HPC	pH	Reactive PO4	Temperature	Residual Cl2	HPC	pH	Reactive PO4	Temperature	High pH	Low pH	Avg pH	High RPO4	Low RPO4	Avg RPO4
	mg/L	CFU		mg/L	°C	mg/L	CFU		mg/L	°C	mg/L	CFU		mg/L	°C	mg/L	CFU		mg/L	°C	mg/L	CFU		mg/L	°C	mg/L	CFU		mg/L	°C	mg/L	CFU		mg/L	°C				mg/L	mg/L	mg/L
11/9/2009	1.71	<1	7.52	2.04	22	1.83	<1	7.63	2.12	16	1.33	<1	7.64	1.98	16	1.26	<1	7.62	1.91	20	1.36	40	7.62	2.02	19	1.39	1	7.63	1.96	20	1.03	5	7.58	1.84	19	7.64	7.58	7.62	2.02	1.84	1.94
11/16/2009	1.67	<1	7.58	1.92	22	1.62	2	7.58	2.07	15	1.41	<1	7.62	1.95	17	1.46	<1	7.59	2.03	19	1.58	2	7.62	1.97	16	1.42	1	7.61	1.91	18	1.31	<1	7.57	1.91	16	7.62	7.57	7.60	2.03	1.91	1.95
11/23/2009	1.68	2	7.65	1.98	22	1.81	1	7.59	2.06	15	1.31	1	7.63	1.81	14	1.43	1	7.66	1.90	16	1.62	<1	7.59	2.03	15	1.46	6	7.61	2.02	16	1.38	<1	7.63	1.89	15	7.66	7.59	7.62	2.03	1.81	1.93
11/30/2009	1.71	<1	7.62	1.94	22	1.79	2	7.60	2.06	16	0.62	1	7.63	2.01	16	1.40	<1	7.63	1.95	19	1.11	5	7.62	1.97	16	1.34	<1	7.64	2.05	19	0.78	2	7.65	1.92	14	7.65	7.62	7.63	2.05	1.92	1.98
12/6/2009	1.85	<1	7.50	1.83	22	1.84	1	7.61	2.06	14	1.28	1	7.65	1.88	13	1.53	1	7.64	1.96	16	1.62	1	7.62	1.91	15	1.58	3	7.62	1.89	15	1.27	2	7.63	1.89	14	7.65	7.62	7.63	1.96	1.88	1.91
12/14/2009	2.09	7	7.57	2.03	22	1.54	6	7.63	2.04	14	1.65	6	7.70	1.99	17	1.85	2	7.64	1.95	17	1.68	5	7.67	1.91	17	1.74	2	7.63	1.99	18	0.85	1	7.72	2.08	15	7.72	7.63	7.67	2.08	1.91	1.98
12/21/2009	1.80	2	7.61	2.06	22	1.51	1	7.63	2.01	14	1.43	1	7.67	1.93	10	1.52	3	7.63	2.02	14	1.51	17	7.72	1.96	9	1.56	<1	7.66	2.07	13	1.26	1	7.74	1.93	6	7.74	7.63	7.68	2.07	1.93	1.98
12/28/2009	1.58	<1	7.66	2.03	22	1.54	2	7.62	1.98	15	1.06	<1	7.70	2.05	7	1.25	<1	7.64	2.07	14	1.21	6	7.63	1.88	9	1.31	<1	7.66	1.93	11	1.17	<1	7.67	1.82	6	7.70	7.63	7.66	2.07	1.82	1.95
1/4/2010	1.57	<1	7.63	2.06	22	1.56	<1	7.57	2.03	14	1.18	<1	7.72	1.98	9	1.31	<1	7.68	2.04	11	1.03	15	7.72	1.85	8	1.21	<1	7.61	2.03	12	1.07	1	7.64	1.99	6	7.72	7.61	7.67	2.04	1.85	1.98
1/11/2010	1.58	2	7.63	2.08	22	1.53	<1	7.57	1.97	15	1.03	1	7.66	2.02	10	1.20	<1	7.64	1.96	11	1.45	7	7.59	2.01	9	0.95	<1	7.62	2.10	11	1.03	<1	7.60	1.97	6	7.66	7.59	7.62	2.10	1.96	2.01
1/19/2010	1.70	2	7.63	1.96	22	1.55	<1	7.58	1.94	14	1.33	3	7.64	1.92	7	1.35	<1	7.64	1.89	12	1.38	16	7.64	1.96	9	1.30	<1	7.63	1.96	10	1.08	<1	7.66	2.01	7	7.66	7.63	7.64	2.01	1.89	1.95
1/25/2010	1.52	<1	7.66	2.03	22	1.55	1	7.56	1.98	14	1.26	1	7.67	2.02	9	1.31	3	7.64	1.98	13	1.36	1	7.68	2.06	9	1.28	<1	7.63	2.01	11	1.38	<1	7.67	2.02	6	7.68	7.63	7.66	2.06	1.98	2.02

San Luis Obispo CSA23 - Santa Margarita Corrosion Control Monitoring  
12 Week Moving Graph of Distribution Averages

