# COMPREHENSIVE WATER QUALITY MONITORING PLAN FOR THE SANTA CLARA RIVER WATERSHED

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# EXECUTIVE SUMMARY

The Santa Clara River, its tributaries and the associated riparian or streamside habitats comprise the largest natural river systems remaining in Southern California. In 1991 it became apparent to agencies regulating the Santa Clara River and the various organizations with interests along the river that a consensus plan was needed to manage the river and its many resources. As a result, all involved parties agreed to work together and formed the Project Steering Committee (PSC) to oversee the planning process. Among the issues of concern identified by the PSC was the need for development of a management plan focused on addressing water quality and quantity in the Santa Clara River. In November 2003, AMEC Earth and Environmental, Inc. (AMEC) was retained by the Ventura County Watershed Protection District (VCWPD), under the direction of the State Water Resources Control Board (SWRCB), to compile and review existing water quality data, determine data gaps, and develop a Comprehensive Monitoring Plan (CMP) for the Santa Clara River. The goals of this plan are to: 1) develop baseline conditions for the watershed; 2) have a mechanism to measure improvements or degradations in the water quality; and 3) provide sufficient information to assist the PSC in making important management decisions regarding the watershed. To develop the CMP, AMEC gathered existing monitoring data for the Santa Clara River, assembled a comprehensive water quality and flow database, identified data gaps, evaluated the constituents monitored and made recommendations regarding modifications to existing monitoring protocol and procedures necessary to ensure development of a comprehensive water quality monitoring program.

In general, the results of the Data Gap Analysis revealed clear data gaps for fecal coliform, total suspended solids (TSS), total dissolved solids (TDS), flow, all metals, nitrite, phosphorus, phosphate, chemical constituents such as polychlorinated biphenyls (PCBs), and toxicity testing. Further, sampling appeared to be the most prevalent in the Upper Santa Clara River watershed compared to all other subwatersheds. Based on these results and the identified need to develop a monitoring program that would establish baseline conditions in the watershed, AMEC has recommended a slightly modified systematic sampling program and selected monitoring locations at regular intervals along the Santa Clara River. The recommended frequency of sampling at all stations is monthly for most chemical and physical parameters and for total and fecal coliform. Sediment sampling and bioassessment monitoring has been recommended on an annual basis at only specific sites on the watershed. Additional measurements can be added at any time to address local or regional environmental issues. Flow, measured as discharge, is one key variable that needs greater attention because it is a keystone for any TMDL calculation. Therefore, monthly flow sampling has been recommended at all monitoring locations. Sites that are currently measuring physical conditions on a real-time, daily, or weekly basis shall remain in operation.

Data quality objectives (DQOs) are described for each type of testing. Methods will be chosen by stakeholders based on their intended use to fulfill monitoring data gaps, while maintaining consistency with past measurements, where appropriate. DQOs such as precision, accuracy, and sensitivity will be considered during method selection. Additionally, funding and implementation for the recommended monitoring plan will be determined by the stakeholders prior to the initiation of any sampling program.

## Acronym List

| | |
|---|---|
| °C | degrees Celsius |
| ALERT | automated local evaluation in real-time |
| AWQC | ambient water quality criteria |
| CaCO3 | calcium carbonate |
| CDFG | California Department of Fish and Game |
| CLWA | Castaic Lake Water Agency |
| cm | centimeter |
| CMP | Comprehensive Monitoring Plan |
| CRWQCB | California Regional Water Quality Control Board |
| DDT | dichlorodiphenyltrichlorethane |
| DO | dissolved oxygen |
| DQOs | data quality objectives |
| GIS | geographic information systems |
| HA | hydrologic area |
| HR | hydrologic region |
| HSA | hydrologic sub-area |
| HU | hydrologic unit |
| L | liter |
| LACDPW | Los Angeles County Department of Public Works |
| LACSD | Los Angeles County Sanitation District |
| LARWQCB | Los Angeles Regional Water Quality Control Board |
| mg | milligram |
| MPN | most probable number |
| NPDES | National Pollutant Discharge Elimination System |
| PAH | polycyclic aromatic hydrocarbons |
| PCB | polychlorinated biphenyl compound |
| POTW | public owned treatment works |
| PSC | Project Steering Committee |
| RBP | Rapid Bioassessment Protocol |
| SAR | sodium adsorption rate |
| SCREMP | Santa Clara River Enhancement and Management Plan |
| s.u. | Standard Units |
| SWRCB | State Water Resources Control Board |
| TAL | Target Analyte List |
| TDS | total dissolved solids |
| TMDL | total maximum daily load |
| TSS | total suspended solids |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UWCD | United Water Conservation District |
| VCWPD | Ventura County Watershed Protection District |
| WRP | water reclamation plants |

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# 1.0 INTRODUCTION

The Santa Clara River, its tributaries and the associated riparian or streamside habitats comprise one of the largest relatively undeveloped river systems remaining in Southern California. From its headwaters in the San Gabriel Mountains southeast of Acton, the Santa Clara River flows for 84 miles through Tie Canyon, Aliso Canyon, Soledad Canyon, the Santa Clarita Valley, the Santa Clara River Valley, and the Oxnard Plain before discharging to the Pacific Ocean near the Ventura Marina, and comprises a watershed area of approximately 1,634 square miles. Approximately 40 percent of the Santa Clara River watershed is located in Los Angeles County while the remaining 60 percent is in Ventura County. In Los Angeles County, the river transits national forest land, large areas of moderately developed private rural lands, the growing City of Santa Clarita and then large tracts of rural farmland extending west to the county line. In Ventura County, the river primarily runs through large agricultural tracts, the cities of Santa Paula, Fillmore, Oxnard and San Buenaventura prior to emptying into the Pacific Ocean. Major tributaries include Castaic Creek and San Francisquito Creek in Los Angeles County, and Sespe Creek, Piru Creek, and Santa Paula Creek in Ventura County.

This river system and its associated riparian habitats provide multiple beneficial uses to the surrounding communities including groundwater recharge, urban and agricultural water supplies, flood conveyance, visual relief, and recreational opportunities. In addition, the riparian habitat along the Santa Clara River is valuable wildlife habitat, in terms of both species diversity and abundance, and provides habitat for some of the state's most threatened and endangered wildlife. This is especially important since it is estimated that as much as 90 percent of California's streamside riparian plant communities have been eliminated by urban and agricultural development within the last 150 years.

In addition to encroaching development, rising population and the spread of invasive species also have an impact on water quality. The Santa Clara River watershed has several known water quality problems that have been identified through the Federal Clean Water Act Section 303(d) process for listing impaired water bodies. Current ongoing efforts related to the development of total maximum daily loads (TMDLs) in the Santa Clara River include assessment of chloride levels and nutrients.

## 1.1 Background and Purpose

In 1991 it became apparent to agencies regulating the Santa Clara River and the various organizations with interests along the river that a consensus plan was needed to manage the river and its many resources. As a result, all involved parties agreed to work together to develop a coordinated management plan known as the Santa Clara River Enhancement and Management Plan (SCREMP) and formed the Project Steering Committee (PSC) to oversee the planning process. The PSC is comprised of 26 members representing private landowners, local government, industry, special districts, interest groups, and state and federal resource and regulatory agencies.

In April 1999 the PSC published a *Summary of Riverwide Issues and Riverwide Recommendations* that was based in part on data contained within the *Water Resources Report on the Santa Clara River* (1996). Among the issues of concern identified by the PSC was the need for development of a management plan focused on addressing water quality and quantity in the Santa Clara River.

Water quality within the Santa Clara River is affected by the storm water runoff from many cities, Publicly Owned Treatment Works (POTW) discharges and inflow tributaries located along the entire 84-mile length. Therefore, the PSC concluded that it is imperative that management decisions regarding the river be made using current, comprehensive and consistent water quality data. The *Water Resources Report on the Santa Clara River* contains data from only 38 of the 67 monitoring locations within the 500-year floodplain. In addition, the most recent data contained in the report is from 1992, with a large majority of the data from the 1980's. Further, monitoring data are inconsistent from location to location with regard to constituents analyzed and there are no data for pesticides, sediment chemistry, or aquatic toxicity.

Without comprehensive water quality data, the PSC has insufficient grounds upon which to make important management decisions. In November 2003, AMEC Earth and Environmental, Inc. (AMEC) was retained by the Ventura County Watershed Protection District (VCWPD), under the direction of the State Water Resources Control Board (SWRCB), to compile and review existing water quality data, determine data gaps, and develop a Comprehensive Monitoring Plan (CMP) for the Santa Clara River. The goals of this plan are to: 1) develop baseline conditions for the watershed; 2) have a mechanism to measure improvements or degradations in the water quality; and 3) provide sufficient information to assist the PSC in making important management decisions regarding the watershed. Thus, the objectives of the CMP are to gather existing monitoring data for the Santa Clara River, assemble a comprehensive data base, identify data gaps, evaluate the constituents monitored and make recommendations regarding modifications to existing monitoring protocol and procedures necessary to ensure development of a comprehensive water quality monitoring program.

The CMP project was initiated by the VCWPD in March, 2004, using grant funding provided by the SWRCB.

## 2.0 WATERSHED OVERVIEW

The Santa Clara River is the largest river system in southern California remaining in a relatively natural state. The Santa Clara River headwater is at Pacifico Mountain in the San Gabriel Mountains about 12 linear miles southeast of the Community of Action (Figure 1). The river flows in a generally westerly direction for approximately 84 miles through Tie Canyon, Aliso Canyon, Soledad Canyon, the Santa Clarita Valley, the Santa Clara River Valley, and the Oxnard Plain before discharging to the Pacific Ocean near the Ventura Marina. The Santa Clara River and tributary system has a watershed area of approximately 1,634 square miles. Major tributaries to the river include Castaic Creek and San Francisquito Creek in Los Angeles County, and the Sespe, Piru and Santa Paula Creeks in Ventura County. Approximately 90 percent of the watershed is to the east and north of the floodplain in the mountainous terrain of the San Gabriel Mountains, the Sierra Pelona, and Topatopa Mountains of the Sespe backcountry to the headwaters near Pine Mountain and Mount Pinos, and to the south of the river including Santa Susana Mountains, Oak Ridge and South Mountain. Much of this area is in the Angeles and Los Padres National Forests. The remaining 10 percent of the watershed is comprised of the relatively flat terrain of the Oxnard Plain, the Santa Clarita Valley, Castaic Valley, the Santa Clara River Valley, and the floors of the larger canyons including the upper

Soledad (Acton area), and lower Sand, Mint, Bouquet, Placerita, San Francisquito, Piru, Santa Paula, and the Sespe Study Area.

## 2.1 Land Use

Agriculture is the primary land use within the 500-yr floodplain of the Santa Clara River (61.9 percent). This land use is primarily located in the lower watershed within Ventura County. The second highest land use is industrial (21.5 percent), which includes areas zoned for mining operations along the river, most of which are inactive. The remaining area within the 500-yr floodplain is divided among residential uses (centered in the City of Santa Clarita in Los Angeles County [7.4 percent]), commercial uses (2.9 percent), open space/recreation areas (4.6 percent), and vacant areas (1.6 percent) (SCREMP 2005) (Figure 2).

## 2.2 Vegetation

General habitat types that exist along the 500-yr floodplain of the Santa Clara River are described in the *Biological Resources Report Volume 1* (1996) and mapped in *Biological Resources Report Volume II* (1996). Thirteen general habitat types are present along the river and include: beach, southern foredune, active channel, alkali marsh, freshwater marsh, alluvial scrub, arrow weed scrub, mulefat scrub, southern willow scrub, great basin sage scrub, southern willow riparian woodland, southern cottonwood/willow riparian woodland, and disturbed habitats. The major riparian habitats that occur along the Santa Clara River in Ventura County include coastal habitats at the mouth of the river (i.e., beach, southern foredune, alkali marsh), riparian scrubs and woodlands (i.e., mule fat scrub, alluvial scrub, southern willow scrub, southern willow riparian woodland), disturbed riparian habitat composed of primarily giant cane (*Arundo donax*), and young successional vegetation growing in the active channel on sand and gravel bars. The major riparian habitats on the Santa Clara River in Los Angeles County fall into three main types: riparian scrubs and woodlands, riparian forests, disturbed riparian habitat composed primarily of giant cane, and young successional vegetation of the active channel.

## 2.3 Wildlife

The Santa Clara River's braided channels and riparian forests provide crucial habitat for many species of wildlife, including herons, egrets, coyotes, and bobcats, as well as many threatened or endangered species such as the southwestern willow flycatcher. Wildlife species typical of the southern riparian forest (i.e., cottonwood/willow riparian forest, willow riparian woodland) and southern riparian scrub (i.e., mule fat scrub, southern willow scrub, alluvial scrub, big sagebrush scrub) habitats include the great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), black-shouldered kite (*Elanus caeruleus*), scrub jay (*Aphelocoma coerulescens*), bushtit (*Psaltriparus minimus*), deer mouse (*Peromyscus maniculatus*), dusky-footed woodrat (*Neotoma fuscipes*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Felis rufus*) and the coast horned lizard (*Phrynosoma coronatum*). Wildlife species typical of the coastal and valley freshwater marsh habitat include the Pacific treefrog (*Hyla regilla*), double-crested cormorant (*Phalacrocorax auritus*), Canada goose (*Branta canadensis*), least sandpiper (*Calidris minutilla*), short-billed dowitcher (*Limnodromus griseus*), western rattlesnake (*Crotalus viridis*), raccoon (*Procyon lotor*), and the western pond turtle (*Clemmys marmorata*). A list of sensitive plant and animal species within the watershed was provided to the *Biological Resources Report Volume I* by the U.S. Fish and

Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) California Natural Diversity Database. These species and their status are displayed in Table 1 of Appendix A.

# 3.0 WATERSHED HYDROLOGY

## 3.1 Hydrologic Basins

For the purposes of this CMP study the watershed has been divided into hydrologic subwatersheds (subbasins). The dataset used for this analysis was the California Watershed Data (CALWATER 2.0) for the Santa Clara River Watershed. This data represents the CDFG CALWATER 2.0 data set of watershed units in California, clipped to the Santa Clara River Watershed. This data was downloaded from the CDFG web site. It was then clipped to the extent of the Santa Clara River Watershed and reprojected to CA State Plane, Zone 5, NAD 83, units feet by REGIS, UC Berkeley for the California Coastal Conservancy Watershed Inventory. The California Watershed Map (CALWATER version 2.0) is a set of standardized watershed boundaries meeting standardized delineation criteria. The hierarchy of watershed designations consists of four levels of increasing specificity: Hydrologic Region (HR), Hydrologic Unit (HU), Hydrologic Area (HA), and Hydrologic Sub-Area (HSA). This shapefile can be downloaded from the California Environmental Information Catalog (http://gis.ca.gov/catalog/BrowseRecord.epl?id=4250). Table 1 displays the tributaries associated with each subwatershed. Table 2 displays the reaches associated with each subwatershed.

**Table 1. Tributaries Within Each SubWatershed**

| Subwatershed Name | Associated Tributaries |
|---|---|
| Oxnard Plain | N/A |
| Santa Paula | Santa Paula Creek |
| Sespe | Sespe Creek, Pole Creek |
| Piru | Piru Creek, Hopper Creek |
| Upper Santa Clara | Castaic Creek, San Francisquito Canyon Creek, Bouquet Canyon Creek, Mint Canyon Creek, South Fork Santa Clara River |

**Table 2. Reaches Associated with each Subwatershed**

| Reach Number | Reach Description (RWQCB Designations) | Subwatershed |
|---|---|---|
| 1 | Between Highway 101 Bridge and Santa Clara River Estuary | Oxnard Plain |
| 2 | Between Freeman Diversion Dam near Saticoy and Highway 101 bridge | Santa Paula/Oxnard Plain |
| 3 | Between A Street, Fillmore and Freeman Diversion Dam near Saticoy | Sespe/Santa Paula |
| 4 | Between Blue Cut gaging station and A Street, Fillmore | Piru/Sespe |
| 5 | Between West Pier Highway 99 and Blue Cut gaging station | Upper Santa Clara/Piru |
| 6 | Between Bouquet Canyon Road bridge and West Pier Highway 99 | Upper Santa Clara |
| 7 | Between Lang gaging station and Bouquet Canyon Road bridge | Upper Santa Clara |
| 8 | Above Lang gaging Station | Upper Santa Clara |
| 9 | Santa Paula Creek above Santa Paula waterworks dam | Santa Paula |
| 10 | Sespe Creek above gaging station, 500' downstream from Little Sespe Creek | Sespe |
| 11 | Piru Creek above gaging station below Santa Felicia dam | Piru |

## 3.2 Watershed Hydraulics

As discussed in the scope of work, the quantity and flow of water in the Santa Clara River will impact the physical integrity of the streambed, the habitat and water supply. Therefore, the adequacy of the number of stream gaging stations and rainfall measurement stations has been evaluated. A description of the existing stream gaging and rainfall measurement stations and the associated analysis is included in the sections below.

### 3.2.1 Distribution of Rainfall Stations

The rain gauge network within the Santa Clara River watershed consists of a variety of gauge types including automatic, standard, and ALERT (Automated Local Evaluation in Real-Time). The locations of these gauges are illustrated in Figure 3.

VCWPD maintains several types of gauge networks. Their official recording gauges provide rain information at 5-minute intervals for use in estimating official rain quantities. They also have standard gauges where the rainfall totals are reported daily through an observer network. In addition, they have a number of storage gauges in the Sespe and Piru watersheds. These storage gauges are measured twice a year and help to provide annual rainfall information at higher elevations. The ALERT gauge network provides real-time rain information for monitoring stream conditions and provides flood warnings during storm events. The ALERT gauge data can be used to estimate rainfall depths, but is labor-intensive to process and verify.

Initial assessment of VCWPD's rain gauge network shows that the official gauges are generally located near developed areas and that these areas have sufficient coverage to characterize rainfall spatial and temporal variability. The ALERT gauges are generally located in less developed areas in the watershed and could improve the spatial coverage in Ventura County if converted to official stations. The portions of the watershed at higher elevations and subject to snow do not have enough gauges to adequately characterize spatial and temporal variations in rainfall for use in water quality and other continuous models. Ventura County only has one precipitation gauge that can measure snowfall and thus snow cannot be adequately represented and simulated in hydrology models, unless temperature is used to estimate the percent of precipitation occurring as snowfall.

Initial assessment of LACDPW's rain gauge network, which consists of both active and standard gauges, shows sufficient coverage of the Los Angeles County portion of the watershed. However, it is understood that there are areas of the watershed with little rain gauge coverage that will be filled in as funding becomes available.

### 3.2.2 Distribution of Stream Flow Gauges

The stream gauge network within the Santa Clara River watershed consists of a variety of gauge types including recording, peak only and ALERT. The locations of these gauges are illustrated in Figure 4.

As with their rain gauges, VCWPD maintains two types of stream gauge networks. Their official recording gauges provide flow information at intervals as small as 5-minutes for use in estimating official flow quantities. Their ALERT gauge network provides real-time stream flow information for monitoring stream conditions and is used to provide flood warnings during storm events. The ALERT gauge data can be used to provide historic flow level information, but is labor-intensive to process and verify.

In general, VCWPD and their cooperative partner, the USGS, have official flow measurement stations on the Santa Clara River and its major tributaries in Ventura County sufficient to characterize flow conditions in the river down to 15-minute intervals. The only major tributary lacking a stream gauge is the Grimes Canyon channel at its confluence with the river at the City of Fillmore. There are also a number of barrancas without gauges in agricultural areas in the vicinity of the Cities of Santa Paula and San Buenaventura; however, these barrancas have relatively small watersheds and do not comprise a significant percentage of the river's peak flow during major storm events.

The Santa Clara River is currently lacking an official stream gauge downstream of the Piru Creek, because the historic gauge at Highway 101 was removed during freeway bridge construction (ongoing in 2005) and the USGS removed the Saticoy gauge at Hwy 118 just upstream of the City of San Buenaventura. Once the bridge is finished, VCWPD has plans to replace the gauge, which will measure flows from portions of the urbanized areas of the Cities of San Buenaventura and Oxnard. There is also the option of converting the ALERT gauge stations at the 12th Street Bridge in Santa Paula or the Freeman Diversion site to official gauge stations.

In LA County, the USGS currently has a gaging station downstream of the City of Santa Clarita. LADPW also operates a number of gauges on the river and its tributaries, including a station near the intersection of Old Road and Interstate 5 and a station on lower Mint Canyon Creek.

## 3.3 Beneficial Uses

Based on the physical descriptions of the watershed outlined in the previous sections, the Los Angeles Regional Water Quality Control Board (LARWQCB) has outlined beneficial uses for the watershed. These uses are described in the *Water Quality Control Plan – Los Angeles Region* (Harris et al. 1994). These beneficial uses form the underlying foundation of water quality protection and water quality plans. A brief excerpt of the text describing these uses is provided below:

> *"Beneficial uses can be designated for a waterbody in a number of ways. Those* beneficial *uses that have been attained for a waterbody on, or after, November 28, 1975, must be designated as "existing" in the Basin Plans. Other uses can be designated, whether or not they have been attained on a waterbody, in order to implement either federal or state mandates and goals (such as fishable and swimmable) for regional waters. Beneficial uses of streams that have intermittent flows, as is typical of many streams in southern California, are designated as intermittent. During dry periods, however, shallow ground water or small pools of water can support some beneficial uses associated with intermittent streams; accordingly, such beneficial uses (e.g., wildlife habitat) must be protected throughout the year and are designated "existing." In addition, beneficial uses can be designated as "potential" for several reasons, including:*
>
> - *implementation of the State Board's policy entitled "Sources of Drinking Water Policy" (State Board Resolution No. 88-63, described in Chapter 5),*
> - *plans to put the water to such future use,*
> - *potential to put the water to such future use,*
> - *designation of a use by the Regional Board as a regional water quality goal, or*
> - *public desire to put the water to such future use.*

Table 3 provides the definition of beneficial uses for the Los Angeles Region and only includes uses that are designated for the 500-year floodplain of the Santa Clara River. The unique uses for each creek within each of the five subwatersheds (Oxnard, Santa Paula, Sespe, Piru and Upper Santa Clara) are also summarized in Table 2-1 of the Water Quality Control Plan and are provided in Appendix A.

## 3.4 Water Quality Standards and Objectives

In addition to the beneficial uses, Water Quality Objectives for the Santa Clara River have also been extensively summarized in the *Water Quality Control Plan – Los Angeles Region* document mentioned in the previous section (Harris et al., 1994). The narrative definitions for each applicable water quality objective/criteria are described within this document and are listed below. For clarity and brevity, the lengthy text addressing the broad overview of the regulatory history, policy, and antidegradation statutes are omitted. The Water Quality Objectives that do not apply to the current Santa Clara River database (e.g., methylene blue active substances, biostimulatory substances, total residual chlorine) are omitted from the excerpted text below. The reader is encouraged to consult that document directly to obtain a more detailed background of the development of water quality objectives for southern California streams and rivers.

> *"Narrative or numerical water quality objectives have been developed for the following parameters (listed alphabetically) and apply to all inland surface waters and enclosed bays and estuaries (including wetlands) in the Region.*

## Table 3. Beneficial Use Definitions

| Symbol | Definition |
|---|---|
| MUN | Municipal and Domestic Supply. Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply. |
| AGR | Agricultural Supply. Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing. |
| PROC | Industrial Process Supply. Uses of water for industrial activities that depend primarily on water quality. |
| IND | Industrial Service Supply. Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization. |
| GWR | Ground water recharge. Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers. |
| FRSH | Freshwater Replenishment. Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity). |
| NAV | Navigation. Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels. |
| REC-1 | Water Contact Recreation. Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs. |
| REC-2 | Non-contact Water Recreation. Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities. |
| COMM | Commercial and Sport Fishing. Uses of water for commercial or recreational collection of fish, shellfish, or other organisms intended for human consumption or bait purposes. |
| WARM | Warm Freshwater Habitat. Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates. |
| COLD | Cold Freshwater Habitat. Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates. |
| EST | Estuarine Habitat. Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds). |
| WET | Wetland Habitat. Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants. |
| MAR | Marine Habitat. Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds). |
| WILD | Wildlife Habitat. Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources. |
| RARE | Rare, Threatened, or Endangered Species. Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered. |
| MIGR | Migration of Aquatic Organisms. Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish. |
| SPWN | Spawning, Reproduction, and/or Early Development. Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. |

Source: Chapter 2 of Harris et al. 1994.

*Ammonia*

*The neutral, un-ionized ammonia species ($NH_3$) is highly toxic to fish and other aquatic life. The ratio of toxic NH3 to total ammonia ($NH_4^- + NH_3$) is primarily a function of pH, but is also affected by temperature and other factors. Additional impacts can also occur as the oxidation of ammonia lowers the dissolved oxygen content of the water, further stressing aquatic organisms. Ammonia also combines with chlorine (often both are present) to form chioramines - persistent toxic compounds that extend the effects of ammonia and chlorine downstream.*

*Bacteria, Coliform*

*Total and fecal coliform bacteria are used to indicate the likelihood of pathogenic bacteria in surface waters. Water quality objectives for total and fecal coliform vary with the beneficial uses of the waterbody.*

*Chemical Constituents*

*Chemical constituents in excessive amounts in drinking water are harmful to human health. Maximum levels of chemical constituents in drinking waters are listed in the California Code of Regulations and the relevant limits are described below.*

*Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.*

*Water designated for use as Domestic or Municipal Supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), and Table 64444-A of Section 64444 (Organic Chemicals). This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect….*

*Mineral Quality*

*Mineral quality in natural waters is largely determined by the mineral assemblage of soils and rocks and faults near the land surface. Point and nonpoint source discharges of poor quality water can degrade the mineral content of natural waters. High levels of dissolved solids renders waters useless for many beneficial uses. Elevated levels of boron affect agricultural use (especially citrus).*

*Nitrogen (Nitrate, Nitrite)*

*High nitrate levels in drinking water can cause health problems in humans. Infants are particularly sensitive and can develop methemoglobinemia (blue-baby* *syndrome). Excess nitrogen in surface waters also leads to excess aquatic growth and can contribute to elevated levels of $NO_3$ in ground water as well.*

Oxygen, Dissolved (DO)

*Adequate dissolved oxygen levels are required to support aquatic life. Depression of dissolved oxygen can lead to anaerobic conditions resulting in odors or, in extreme cases, in fish kills. Dissolved oxygen requirements are dependent on the beneficial uses of the waterbody.*

Pesticides

*Pesticides are used ubiquitously for a variety of purposes; however, their release into the environment presents a hazard to aquatic organisms and plants not targeted for their use. The extent of risk to aquatic life depends on many factors including the physical and chemical properties of the pesticide. Those of greatest concern are those that persist for long periods and accumulate in aquatic life and sediments.*

*No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.*

pH

*The hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. While the pH of "pure" water at 25 C is 7.0, the pH of natural waters is usually slightly basic due to the solubility of carbon dioxide from the atmosphere. Minor changes from natural conditions can harm aquatic life.*

Polychlorinate Biphenyls (PCBs)

*Polychlorinated biphenyls (PCBs) are a highly toxic and persistent group of organic chemicals that have been historically released into the environment. Many historic discharges still exist as sources in the environment.*

Solid, Suspended, or Settleable Materials

*Surface waters carry various amounts of suspended and settleable materials from both natural and human sources. Suspended sediments limit the passage of sunlight into waters, which in turn inhibits the growth of aquatic plants. Excessive deposition of sediments can destroy spawning habitat, blanket benthic (bottom dwelling) organisms, and abrade the gills of larval fish.*

Temperature

*Discharges of wastewaters can cause unnatural and/or rapid changes in the temperature of receiving waters which can adversely affect aquatic life.*

> <u>*Toxicity*</u>
>
> *Toxicity is the adverse response of organisms to chemical or physical agents. When the adverse response is mortality, the result is termed acute toxicity. When the adverse response is not mortality but instead reduced growth in larval organisms or reduced reproduction in adult organisms (or other appropriate measurements), a critical life stage effect (chronic toxicity) has occurred. The use of aquatic bioassays (toxicity tests) is widely accepted as a valid approach to evaluating toxicity of waste and receiving waters."*

Numerical objectives for the constituents of concern within this document are provided in Tables 4 and 5. Values differ for selected creeks so the range of values for each constituent is provided. The minimum objective indicates the lowest objective for each constituent that is designated at some point in the watershed. For instance, above Lang station the objective for chloride is 50 mg/L (minimum) whereas between the Freeman Diversion dam and Saticoy bridge the objective is 150 mg/L (maximum). Where no minimum is indicated the water quality objective remains constant throughout the watershed. Table 5 is provided to show where the objectives for some of the constituents of concern vary within the subwatersheds of the main river.

# 4.0 DATA GAP ANALYSIS

The first step in creating a comprehensive baseline water quality monitoring program was to compile all existing water quality data for the watershed into a single database. This database was then used to analyze spatial and temporal gaps for each constituent of concern and compare existing data to the water quality objectives. The results of this analysis were used to create the Draft Data Gap Analysis document that was distributed to watershed stakeholders August 12, 2005. Comments received during the review period and AMEC responses to comments are provided in Appendix B of this document. The Final Data Gap Analysis is provided below and was used to develop the monitoring recommendations provided in Section 5.0, *Baseline Water Quality Monitoring*.

## 4.1 Data Management

The data used to conduct the Data Gap Analysis primarily consist of physicochemical measurements made on a wide range of water quality parameters that were submitted (or queried from respective databases) by the following agencies and municipalities:

- Ventura County Watershed Protection District (VCWPD)
- Los Angeles Regional Water Quality Control Board - Surface Water Ambient Monitoring Program (SWAMP)
- Los Angeles County Sanitation District (LACSD)
- Los Angeles County Department of Public Works (LACDPW)
- United States Geological Survey (USGS)
- United Water Conservation District (UWCD)
- Cities of San Buenaventura, Fillmore, and Santa Paula

## Table 4. Water Quality Objectives for the Santa Clara River Watershed

| Constituent/Analyte of Concern | California Water Quality Objectives[1] | |
|---|---|---|
| | Minimum | Maximum |
| **Conventional Water Quality Parameters** | | |
| Chloride (mg/L) | 50 | 150 |
| Sulfate (mg/L) | 100 | 650 |
| Fecal Coliform (MPN/100 ml) | 200 | 2000 |
| Conductivity (umhos/cm) | --- | --- |
| Dissolved Oxygen (mg/L) | 5 | 7 |
| Temperature ($^oC$) | --- | 26.6 |
| pH (s.u.) | 6.5 | 8.5 |
| Hardness (mg/L $CaCO_3$) | --- | --- |
| Total Dissolved Solids (mg/L) | 500 | 1300 |
| **Inorganics/Metals (as Maximum Contaminant Levels)[2]** | | |
| Aluminum (mg/L) | --- | 1.0 |
| Boron (mg/L) | 0.5 | 1.5 |
| Copper (mg/L) | --- | 0.022 |
| Lead (mg/L) | --- | 0.011 |
| Mercury (mg/L) | --- | 0.002 |
| Thallium (mg/L) | --- | 0.002 |
| Zinc (mg/L) | --- | 0.246 |
| Nutrients | | |
| Ammonia (mg/L) | 6.8 | 8 |
| Nitrate (mg/L) | 5 | 10 |
| Nitrite (mg/L) | 5 | 10 |
| Phosphorus (mg/L) | --- | --- |
| **PCBs/PAHs/Pesticides** | | |
| Polycyclic Aromatic Hydrocarbons (mg/L) | --- | 0.0002 |
| Polychlorinated Biphenyls (mg/L) | --- | 0.0005 |
| DDT (mg/L) | --- | --- |
| Aldrin/Dieldrin/Endrin (mg/L) | --- | 0.002 |
| Heptachlor/Heptachlor Epoxide (mg/L) | --- | 0.00001 |
| Endosulfan Isomers (mg/L) | --- | --- |
| Hexachlorocyclohexanes (mg/L) | --- | --- |
| Toxaphene (mg/L) | --- | 0.003 |
| Chlordane (mg/L) | --- | 0.0001 |
| Diethylhexylphthalate (mg/L) | --- | 0.004 |
| **Aquatic Toxicity Tests (as Percent Mortality)** | | |
| Water Flea (*Daphnia* spp.) | 10 | 30 |
| Fathead Minnow (*Pimephales promelas*) | 10 | 30 |
| Algae (*Selanastrum* spp.) | 10 | 30 |

1. For Santa Clara River Watershed. Taken from Chapter 3 of: Harris et al. 1994.
2. For waters designated as MUN. All reaches of the Santa Clara River are designated as potentially MUN with the exception of Hydrologic Unit 403.55 which is an existing MUN designation.

**Table 5. Water Quality Objectives for Constituents Which Vary Within Subwatersheds**

| Reach | TDS (mg/L) | Sulfate (mg/L) | Chloride (mg/L) | Boron (mg/L) | Nitrogen (mg/L) | SAR |
|---|---|---|---|---|---|---|
| **Upper Santa Clara Subwatershed** | | | | | | |
| Above Lang Gaging Station | 500 | 100 | 50 | 0.5 | 5 | 5 |
| Between Lang Gaging station and Bouquet Canyon Road bridge | 800 | 150 | 100 | 1.0 | 5 | 5 |
| Between Bouquet Canyon Road bridge and West Pier Highway 99 | 1000 | 300 | 100 | 1.5 | 10 | 5 |
| **Upper Santa Clara and Piru Subwatersheds** | | | | | | |
| Between West Pier Highway 99 and Blue Cut Gaging Station | 1000 | 400 | 100 | 1.5 | 5 | 10 |
| **Piru and Sespe Subwatersheds** | | | | | | |
| Between Blue Cut Gaging Station and A Street, Fillmore | 1300 | 600 | 100 | 1.5 | 5 | 5 |
| **Sespe and Santa Paula Subwatersheds** | | | | | | |
| Between A Street, Fillmore and Freeman Diversion Dam near Saticoy | 1300 | 650 | 100 | 1.5 | 5 | 5 |
| **Santa Paula and Oxnard Plain Subwatersheds** | | | | | | |
| Between Freeman Diversion Dam near Saticoy and Highway 101 bridge | 1200 | 600 | 150 | 1.5 | NA | NA |
| **Santa Paula Subwatershed** | | | | | | |
| Santa Paula Creek above Santa Paula waterworks dam | 600 | 250 | 45 | 1.0 | 5 | 5 |
| **Sespe Subwatershed** | | | | | | |
| Sespe Creek above gaging station, 500' downstream from Little Sespe Creek | 800 | 320 | 60 | 1.5 | 5 | 5 |
| **Piru Subwatershed** | | | | | | |
| Piru Creek above gaging station below Santa Felicia dam | 800 | 400 | 60 | 1.0 | 5 | 5 |

Source: Chapter 3 of Harris et al. 1994; Basin Plan Amendment, 2002 SAR= sodium adsorption ratio

All of the water quality data received from the above parties were formatted and merged into the Microsoft Access database developed for the project. Because each of the entities listed utilized slightly different data fields and/or recording formats for each class of water quality parameters (or, in some cases, individual chemicals), the data had to be reformatted so that queries would produce consistent output (e.g., no "unique" data qualifiers for individual measurements). Sample data that were collected at locations outside of the Santa Clara watershed were removed from the GIS and Access databases and are not included in this analysis. A summary of the number and types of data that each participating agency contributed to this database is provided in Table 6.

In order to conduct the Data Gap Analysis for the Santa Clara River Watershed the data were plotted on a map by linking the site identifier in the GIS database containing coordinates for each sample monitoring location with the corresponding site identifier in the Access database containing all of the physicochemical data. This relational database was then used to query the sample data and display the selected results on a map. Due to the size of the database (initial entries totaled over 133,432 records); certain assumptions had to be made in order to obtain a representative data set that would:

1) Allow the majority of the data for each individual water quality parameter to be mapped on a single figure;
2) Maintain the integrity of the original data set; and
3) Be amenable to selection criteria used to identify what constitutes a true "Data Gap."

These assumptions included the following actions or data conversions:

- Data older than ten years (pre-1995) were not included in the Data Gap Analysis. Many Federal and State agencies consider data more than ten years old to be invalid due to improvements in the both the accuracy and precision of analytical methods, as well as to long-term changes in the environment (e.g., decrease in concentration of persistent, bioaccumulative or toxic chemicals).
- Sample stations that had fewer than five measurements for any individual water quality parameter were not included in the Data Gap Analysis. Five measurements made over a span of ten years (1995 – 2005) would "average out" to only one sample every two years. This sample frequency was determined to be the absolute minimum "cutoff" criteria for what might constitute a "Data Gap."
- For individual metal measurements in surface water, "dissolved" and "total" data were considered equivalent. This was because the metals data were sparse and dissolved forms are rarely less than 80 to 90 percent of the total metal concentration(s).
- Organic compounds that differed only by congener (e.g., PCBs) or isomer type/configuration (e.g., aldrin, dieldrin, endrin) were considered equivalent.

## 4.2 Data Scoring

The first step of the Data Gap Analysis was to identify and separate chemical constituents, parameters and/or tests into "like" classes:

- conventional parameters (chloride, sulfate, total/fecal coliform, conductivity, dissolved oxygen, temperature, pH, hardness, total dissolved solids, total suspended solids, flow)
- metals (aluminum, boron, copper, lead, mercury, thallium, zinc)
- nutrients (ammonia, nitrate, nitrite, nitrate+nitrite, phosphorus, phosphate)
- organic compounds (polycyclic aromatic hydrocarbons, polychlorinated biphenyls, DDT, aldrin/dieldrin/endrin, heptachlor/heptachlor epoxide, endosulfan isomers, hexachlorocyclohexane, toxaphene, diethylhexylphthalate, chlordane, cyanide, diazinon, mirex, nonachlor)
- aquatic toxicity tests (daphnia, fathead minnow, algae)

## Table 6. Database Summary

| Agency | File Name | # Results in Input File | # Unique Results in Database | Comments |
|---|---|---|---|---|
| Fillmore | Dec Monthly River 2004.xls | 61 | 61 | OK |
| Fillmore | Feb Monthly River 2005.xls | 62 | 62 | OK |
| Fillmore | Jan Monthly River 2005.xls | 62 | 62 | OK |
| Fillmore | Jan Quarterly River 2005.xls | 7 | 7 | OK |
| Fillmore | Jan Semi Annual River 2005.xls | 34 | 34 | OK |
| Fillmore | Oct Monthly River 2004.xls | 59 | 59 | OK |
| Fillmore | Oct Quarterly River 2004.xls | 6 | 6 | OK |
| Fillmore | Oct Semi Annual River 2004.xls | 44 | 44 | OK |
| Fillmore | Fillmore_Monthly River 043005.xls | 569 | 569 | OK |
| Fillmore | Fillmore_Quarterly River 063005.xls | 19 | 19 | OK |
| Fillmore | Fillmore_Semi Annual River.xls | 129 | 129 | OK |
| LACDPW | Appendix B_Santa_Clara_02_03.xls | 930 | 930 | OK |
| LACDPW | Historic_Data_SCR.xls | 3960 | 3898 | OK. 62 records not added because they are duplicated within this file. |
| LACDPW | Appendix B_0304 | 775 | 775 | OK. |
| LACSD | Copper_Diazinon(LACSD).xls | 423 | 404 | OK. 19 records not added because they are duplicated within this file. |
| LACSD | AMEC-datarequest.xls | 4361 | 4346 | 13 records were not added because they are duplicated within this file; 2 were not added because constituent in "#NA." |
| LACSD | AMEC-datarequest_final.xls | 1329 | 0 | OK. These records are primarily NPDES or effluent samples. Only 424 records are Santa Clara River QA monitoring samples, all of which are duplicates of records in AMEC-data request (05272005).xls. |
| LACSD | AMEC-datarequest(05272005).xls | 6134 | 6133 | OK. 1 record is a duplicate of one record in Copper_Diazinon(LACSD).xls (SCR-RA, 3/12/93, copper) |
| Santa Paula<br>Santa Paula | SPTP RIVER 1 TO 2003.xls<br>River Annual 2003.xls (River 1 tab) | 386<br>184 | 398 | OK. There is significant overlap in these files for 2003 sampling dates. All unique records have been entered. |

## Table 6. Database Summary (continued)

| Agency | File Name | # Results in Input File | # Unique Results in Database | Comments |
|---|---|---|---|---|
| Santa Paula<br>Santa Paula | SPTP RIVER 2 TO 2003.xls<br>River Annual 2003.xls (River 2 tab) | 397<br>184 | 410 | OK. There is significant overlap in these files for 2003 sampling dates. All unique records have been entered. |
| Santa Paula<br>Santa Paula | SPTP RIVER 3 TO 2003.xls<br>River Annual 2003.xls (River 3 tab) | 389<br>184 | 403 | OK. There is significant overlap in these files for 2003 sampling dates. All unique records have been entered. |
| Santa Paula | RIVER-1 ANNUAL 2004.xls (and River 1 2004.xls) | 190 | 186 | OK. Six results (two dates each for "EPA8141", "EPA625", "EPA619") not entered; Toxicity data entered both as units of TU and % Survival, as per River 1 2004.xls (resulting in 2 extra Toxicity results than River-1 Annual.xls) |
| Santa Paula | RIVER-2 ANNUAL 2004.xls (and River 2 2004.xls) | 190 | 186 | OK. Six results (two dates each for "EPA8141", "EPA625", "EPA619") not entered; Toxicity data entered both as units of TU and % Survival, as per River 2 2004.xls (resulting in 2 extra Toxicity results than River-2 Annual.xls) |
| Santa Paula | RIVER-3 ANNUAL 2004.xls (and River 3 2004.xls) | 190 | 186 | OK. Six results (two dates each for "EPA8141", "EPA625", "EPA619") not entered; Toxicity data entered both as units of TU and % Survival, as per River 3 2004.xls (resulting in 2 extra Toxicity results than River-3 Annual.xls) |
| SWAMP | bdat_data_1083609298.csv | 1995 | 1229 | OK. 749 records not entered because no result was provided; 17 records were not added because they are duplicated within this file. |
| UWCD | UWCD SW to AMEC 5-04.xls | 27714 | 27668 | OK. 46 records not added because they are duplicated within this file. |
| UWCD | CMP flow records to AMEC.xls | 585 | 541 | OK. 44 records not added because they were duplicates of records already in the database or records in this file. |
| VCWPD | records in database upon receipt | 4316 | 4316 | OK |

### Table 6. Database Summary (continued)

| Agency | File Name | # Results in Input File | # Unique Results in Database | Comments |
|---|---|---|---|---|
| VCWPD | county_waterquality.xls | 2079 | 0 | OK. These data were not added to the database but they are all included in the query that pulled existing records from the original database AMEC received. |
| Ventura | 1998 Data Summary - All Tables (SC Receiving Water only) | 220 | 0 | OK. Data was not added to the db because it was duplicated in Complete Ventura 1998 & Rec H2O tox table. |
| Ventura | 1998 Data Summary - Rec H2O Tox (SC Receiving Water only) | 40 | 40 | OK. |
| Ventura | 1998 Data Summary - Rec H2O Chem (SC Receiving Waters Only) | 180 | 0 | OK. Data was not added to the db because it was duplicated in Complete Ventura 1998. |
| Ventura | 1999 Data Summary - All Tables (SC Receiving Water only) | 220 | 0 | OK. Data was not added to the db because it was duplicated in Complete Ventura 1999 & Rec H2O tox table. |
| Ventura | 1999 Data Summary - Rec H2O Tox (SC Receiving Water only) | 40 | 40 | OK. |
| Ventura | 1999 Data Summary - Rec H2O Chem (SC Receiving Waters Only) | 180 | 0 | OK. Data was not added to the db because it was duplicated in Complete Ventura 1999. |
| Ventura | 2000 Data Summary - All Tables (SC Receiving Water only) | 200 | 0 | OK. Data was not added to the db because it was duplicated in Complete Ventura 2000 & Rec H2O tox table. |
| Ventura | 2000 Data Summary - Rec H2O Tox (SC Receiving Water only) | 20 | 20 | OK. |
| Ventura | 2000 Data Summary - Rec H2O Chem (SC Receiving Waters Only) | 180 | 0 | OK. Data was not added to the db because it was duplicated in Complete Ventura 2000. |
| Ventura | 2001 Data Summary - All Tables (SC Receiving Water only) | 749 | 0 | OK. Data was not added because it was duplicated in Rec H20 Chem or in Complete Ventura 2001. |
| Ventura | 2001 Data Summary - Rec H2O Tox (SC Receiving Water only) | 24 | 24 | OK. |
| Ventura | 2001 Data Summary - Rec H2O Chem (SC Receiving Waters Only) | 715 | 236 | OK. 360 were not added because the data was duplicated in Complete Ventura 2001 and 119 were not of a requested constituent (TKN and chlorophyll). |

**Table 6. Database Summary (continued)**

| Agency | File Name | # Results in Input File | # Unique Results in Database | Comments |
|---|---|---|---|---|
| Ventura | 2002 Data Summary - All Tables (SC Receiving Water only) | 741 | 0 | OK. Data was not added because it was duplicated in Rec H20 Chem or in Complete Ventura 2002. |
| Ventura | 2002 Data Summary - Rec H2O Tox (SC Receiving Water only) | 34 | 34 | OK. |
| Ventura | 2002 Data Summary - Rec H2O Chem (SC Receiving Waters Only) | 705 | 230 | OK. 355 were not added to the db because they are duplicated in Rec H2O Chem or in Complete Ventura 2002 and 120 were not of a requested constituent (TKN, Chlorophyll). |
| Ventura | 2003 Data Summary - All Tables (SC Receiving Water only) | 739 | 0 | OK. Data was not added because it was duplicated in Rec H20 Chem or in Complete Ventura 2003. |
| Ventura | 2003 Data Summary - Rec H2O Tox (SC Receiving Water only) | 20 | 20 | OK. |
| Ventura | 2003 Data Summary - Rec H2O Chem (SC Receiving Waters Only) | 1061 | 235 | OK. 706 were not added because it was duplicated in Red H2O Chem or in Complete Ventura 2003 and 120 were not of a requested constituent (TKN and chlorophyll). |
| Ventura | 2004 Summary Report | | 0 | OK. Duplicate file of Complete Ventura 2004. |
| Ventura | Complete Ventura 1998 | 3410 | 3410 | OK |
| Ventura | Complete Ventura 1999 | 301 | 301 | OK. |
| Ventura | Complete Ventura 2000 | 3131 | 3131 | OK |
| Ventura | Complete Ventura 2001 | 3178 | 3178 | OK. |
| Ventura | Complete Ventura 2002 | 2576 | 2576 | OK |
| Ventura | Complete Ventura 2003 | 3257 | 3257 | OK |
| Ventura | Complete Ventura 2004 | 3125 | 3125 | OK |

After applying data restrictions based on the assumptions listed in the Data Management section, selected data fields within each of these classes were then queried for sampling frequency. They were subsequently plotted as bubble diagrams on a map of the Santa Clara River watershed. These were broken out based on the sample location for each individual compound, parameter or test. Data gaps were then qualitatively scored for each segment of the Santa Clara River within the Oxnard, Santa Paula, Sespe, Piru or Upper Santa Clara subwatersheds. The ranking scheme used to quantify the data is as follows:

| | | |
|---|---|---|
| No Data | = | **-** |
| Data Poor | = | **+** |
| Data Moderate | = | **++** |
| Data Rich | = | **+++** |

The criteria used for selecting the above data ranking schemes for each subwatershed section are as follows:

| | |
|---|---|
| No Data: | no stations and/or no data recorded over the 10 year period |
| Data Poor: | 1-2 stations and/or 5-10 records per station over the 10 year period |
| Data Moderate: | 3-4 stations and/or 11-40 records per station over the 10 year period |
| Data Rich: | >5 stations and/or >40 records per station over the 10 year period |

These scoring criteria were developed using the professional experience and judgment of several AMEC water quality experts. The criteria consider both spatial location and sample frequency, with the latter not taking concentration into consideration (e.g., whether the sample was above or below the instrument detection limit). If a particular subwatershed revealed a "grey area" for any particular parameter, the default rank chosen erred on the side of a data gap. For example, if a subwatershed had between three and four stations but each sample location had less than ten records/station, the "+" rank was selected, rather than the "++" rank. The results for each compound, parameter or test are provided in Section 4.3, *Results.*

## 4.3 Results

### 4.3.1 Conventional Parameters

Conventional parameters are measurements that are recognized by the scientific community as good or reliable indicators of water quality and are more commonly tested. Some, like conductivity and hardness, are not listed as "Water Quality Objectives" but are routinely measured by many different types of facilities and laboratories because they are key variables in controlling water chemistry. The Data Gap Analysis for all of the conventional parameters is presented in Table 7. Maps displaying the frequency and spatial locations for the measurement of chloride, sulfate, total coliform, fecal coliform, conductivity, dissolved oxygen (DO), temperature, pH, hardness, total dissolved solids (TDS), total suspended solids (TSS) and flow can be found, respectively, in Figures 5 through 16.

**Table 7. Data Gap Analysis for Conventional Parameters**

| Constituent of Concern | Map # | Subwatershed | | | | |
|---|---|---|---|---|---|---|
| | | Oxnard Plain | Santa Paula | Sespe | Piru | Upper Santa Clara |
| Chloride | 5 | - | +++ | ++ | ++ | +++[1] |
| Sulfate | 6 | - | +++ | ++ | +++ | +++[1] |
| Total Coliform | 7 | +++[1] | ++ | + | - | ++[1] |
| Fecal Coliform | 8 | - | + | + | - | ++[1] |
| Conductivity | 9 | - | +++[1] | ++ | ++ | +++[1] |
| Dissolved Oxygen | 10 | +++[1] | +++ | + | - | +++[1] |
| Temperature | 22 | +++[1] | +++ | ++ | ++ | +++[1] |
| pH | 23 | - | +++ | ++ | ++ | +++[1] |
| Hardness | 23 | +++[1] | ++[1] | ++ | ++ | +++[1] |
| Total Dissolved Solids | 14 | - | +++ | ++ | ++ | - |
| Total Suspended Solids | 15 | - | ++ | + | - | ++[1] |
| Flow | 16 | - | +++ | ++ | + | - |

← Flow

[1]Stations distributed over lower third of watershed.

Oxnard Plain

This subwatershed has no major tributaries and had No Data reported for chloride, sulfate, fecal coliform, conductivity, pH, TDS, TSS and flow. Total coliform DO, temperature and hardness were scored as Data Rich. However, all four of these measurements appear to be spatially biased as they are located toward the mouth (estuarine portion) of the river.

Santa Paula

This subwatershed was classified as Data Poor for fecal coliform and was Data Moderate for total coliform, hardness and TSS. The spatial distribution appears biased for hardness with most sampling occurring in one general area of this subwatershed. This subwatershed was Data Rich for chloride, sulfate, conductivity, DO, temperature, pH, TDS and flow. Stations measuring conductivity appear to be biased toward the lower third of the subwatershed.

Sespe

The Sespe subwatershed was Data Poor for total and fecal coliform, DO, and TSS. The spatial distribution of the latter appears to be biased towards the upper third of the subwatershed. The data reported for chloride, sulfate, conductivity, temperature, pH, hardness, TDS and flow were classified as Data Moderate. Only the distal portion of Sespe Creek is sampled, as access to the upstream portions of this tributary appears to be limited.

Piru

This subwatershed had No Data for total and fecal coliform, DO, and TSS. There is only one flow station, so this has been categorized as Data Poor. The remaining parameters including chloride, conductivity, temperature, pH, hardness and TDS were reported as Data Moderate. Sulfate was ranked as Data Rich, although the distribution of sample locations leaned toward the canyon tributaries.

Upper Santa Clara

This uppermost portion of the watershed had No Data for TDS and flow. Although the remaining parameters were classified as either Data Moderate (total and fecal coliform, TSS) or Data Rich (chloride, sulfate, conductivity, DO, temperature, pH, hardness), all were qualified as having a spatially biased distribution because only three general areas were sampled in the lower third (downstream) section of this subwatershed.

In summary for the conventional parameters, ten out of twelve parameters had at least one subwatershed with No Data and six out of twelve had two or more ranks at or below the level of Data Poor. With respect to subwatershed regions, the richness of data ranked from highest to lowest appears to be:

1) Santa Paula;
2) Upper Santa Clara;
3) Sespe;
4) Piru;
5) Oxnard Plain.

In most cases, it appears that the station locations of the upper tributaries may be determined simply by the presence or absence of flowing water (e.g., some may only contain water during wet weather events).

### 4.3.2 Metals

Metals can be indicative of non-point source pollution from old mining facilities or point sources from metals-related industries (e.g., alkali production, electroplating). The suite of metals for this database was fairly limited. This may be due to location or region-specific concerns. Boron, while not classified as a metal per se, was included in this classification because it is an elemental analysis. Copper, lead, mercury and zinc are routinely measured in surface waters in or near hazardous waste sites, but thallium and aluminum are rarely included in routine media sampling and analysis protocols. The Data Gap Analysis for all of the above metals is presented in Table 8. Maps displaying the frequency and spatial locations for the measurement of aluminum, boron, copper, lead, mercury, thallium and zinc can be found, respectively, in Figures 17 through 23.

**Table 8. Data Gap Analysis for Inorganics/Metals**

| Constituent of Concern | Map # | SubWatershed | | | | |
|---|---|---|---|---|---|---|
| | | Oxnard Plain | Santa Paula | Sespe | Piru | Upper Santa Clara |
| Aluminum | 17 | - | + | - | - | + |
| Boron | 18 | - | ++ | ++ | ++ | ++[1] |
| Copper | 19 | ++[1] | ++ | ++ | ++ | ++[1] |
| Lead | 20 | ++[1] | ++ | - | - | ++[1] |
| Mercury | 21 | - | + | - | - | +++[1] |
| Thallium | 22 | - | + | - | - | ++[1] |
| Zinc | 23 | ++[1] | ++ | ++ | ++ | ++[1] |

← Flow

[1]Stations distributed over lower third of watershed.

Oxnard Plain

Based on current data management assumptions, there were No Data reported in the Oxnard subwatershed for aluminum, boron, mercury and thallium. The frequency of measurement was Data Moderate for copper, lead and zinc, but the overall spatial distribution was poor for this subwatershed. Samples were concentrated in a limited area towards the mouth of the river.

Santa Paula

This subwatershed was classified as Data Poor for aluminum, mercury and thallium (only one sampling station) and Data Moderate for boron, copper, lead and zinc.

Sespe

This subwatershed of the river had No Data for aluminum, lead, mercury and thallium. Boron, copper and zinc were classified as Data Moderate. Only the distal portion of Sespe Creek is sampled, as access to the upstream portions of this tributary appears to be limited.

Piru

This subwatershed had No Data reported for aluminum, lead, mercury and thallium; boron, copper and zinc received a Data Moderate score. Most of the latter measurements were samples taken from the tributaries (Piru and Hopper Canyon Creeks). There was only one sampling station located on the Santa Clara river portion of the Piru subwatershed.

Upper Santa Clara

Unlike the other four subwatersheds, the westernmost portion of the Santa Clara was scored as Data Rich for mercury and Data Moderate for boron, copper, lead, thallium and zinc. Only one metal (aluminum) received a ranking score of Data Poor (18 measurements at a single station). It should be noted that both the moderate and rich data scores are qualified as having a spatially biased distribution as the samples were located within the lower third of the Upper Santa Clara watershed.

In summary, five out of the seven metals had at least one subwatershed with No Data. With respect to subwatershed region, the richness of data, ranked from highest to lowest, appears to be:

1) Upper Santa Clara;
2) Santa Paula;
3) Sespe;
4) Piru;
5) Oxnard Plain.

It appears that the station locations of the upper tributaries may be determined simply by the presence or absence of flowing water (e.g., some may only contain water during wet weather events).

### 4.3.3 Nutrients

Ammonia, nitrate, nitrite and phosphorus act as nutrients when present in concentrations that exceed the self-purification mechanisms of a natural waterbody. Un-ionized ammonia can also be particularly toxic to freshwater fish and invertebrates. The concentration of un-ionized ammonia is dependent of the pH of the receiving water and the temperature. Nitrate and phosphorus may both play a role determining the amount of eutrophication within a pond, lake or estuary. Phosphate is typically more stimulatory to phytoplankton populations in nitrogen-limited environments.

The Data Gap Analysis for nutrient compounds is presented in Table 9. Maps displaying the frequency and spatial locations for the measurement of ammonia, nitrate, nitrite, nitrate+nitrite, phosphorus and phosphate can be found, respectively, in Figures 24 through 29.

**Table 9. Data Gap Analysis for Nutrients**

| Constituent of Concern | Map # | Subwatershed | | | | |
|---|---|---|---|---|---|---|
| | | Oxnard Plain | Santa Paula | Sespe | Piru | Upper Santa Clara |
| Ammonia | 24 | ++[1] | +++ | + | + | +++[1] |
| Nitrate | 25 | ++[1] | +++ | ++ | +++[1] | +++[1] |
| Nitrite | 26 | ++[1] | +++ | ++ | ++ | +++[1] |
| Nitrate + Nitrite | 27 | - | +++ | ++ | ++ | - |
| Phosphorus | 28 | ++[1] | + | + | - | + |
| Phosphate | 29 | - | ++ | ++ | + | - |

← Flow

[1]Stations distributed over lower third of watershed.

Oxnard Plain

This smaller western section of the Santa Clara River watershed possessed No Data for nitrate+nitrite and phosphate. The remaining parameters (ammonia, nitrate, nitrite and phosphorus) were ranked as Data Moderate, although the spatial distributions of these measurements are all toward the mouth of the river.

Santa Paula

This subwatershed was Data Poor for phosphorus and Data Moderate for phosphate. The remaining nitrogenous parameters (ammonia, nitrate, nitrite and nitrate+nitrite) are classified as Data Rich. It should also be noted that spatial distribution was adequate for the Santa Clara River, but that the main tributaries were rarely sampled in this subwatershed.

Sespe

This subwatershed was Data Poor for ammonia and phosphorus and Data Moderate for the remaining nutrients (nitrate, nitrite, nitrate+nitrite and phosphate). Only the distal portion of Sespe Creek is sampled, as access to the upstream portions of this tributary appears to be limited.

Piru

The Piru portion of the watershed had No Data collected for phosphorus and was Data Poor for ammonia and phosphate. Nitrite and nitrate+nitrite were scored as Data Moderate and nitrate received a score of Data Rich. It should be noted that some nutrients appear to have a biased spatial distribution in that the majority of the samples were taken within the main tributaries of the Piru subwatershed.

Upper Santa Clara

The easternmost subwatershed of the Santa Clara River watershed had No Data for nitrate+nitrite and phosphate and was Data Poor for phosphorus. This subwatershed was Data Rich for the remaining nutrients (ammonia, nitrate and nitrite), although the spatial distribution for these samples was limited to the lower third (downstream) portion of the watershed. None of the main tributaries to the north were sampled.

In summary for nutrients, four out of the six parameters had at least two subwatersheds with ranks at or below the level of Data Poor. With respect to subwatershed region, the richness of data, ranked from highest to lowest, appears to be:

1) Santa Paula;
2) Upper Santa Clara;
3) Sespe;
4) Oxnard Plain;
5) Piru.

It appears that the station locations of the upper tributaries may, in most cases, be determined simply by the presence or absence of flowing water (e.g., some may only contain water during wet weather events).

### 4.3.4 Chemical Constituents – Organic Compounds

Polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyl compounds (PCBs) are routinely measured in naturally occurring surface waters throughout the country. However, chlorinated pesticides are much less commonly requested in routine samples in and are typically sampled near contaminated sites or property.

The Data Gap Analysis for organic compounds is presented in Table 10. Maps displaying the frequency and spatial locations for the measurement of PAHs, PCBs, DDT, aldrin/dieldrin/endrin, heptachlor/heptachlor epoxide, endosulfan isomers, hexachlorocyclohexanes, toxaphene, DEHP, chlorade, and cyanide/diazinon/mirex/nonachlor can be found, respectively, in Figures 30 through 40.

**Table 10. Data Gap Analysis for Chemical Constituents/Organic Compounds**

| Constituent of Concern | Map # | Subwatershed | | | | |
|---|---|---|---|---|---|---|
| | | Oxnard Plain | Santa Paula | Sespe | Piru | Upper Santa Clara |
| Polycyclic Aromatic Hydrocarbons | 30 | - | + | - | - | ++[1] |
| Polychlorinated Biphenyls | 31 | - | + | - | - | ++[1] |
| DDT, Methoxychlor, DDE | 32 | - | + | - | - | +[1] |
| Aldrin/Dieldrin/Endrin | 33 | - | + | + | - | +[1] |
| Heptachlor/Heptachlor Epoxide | 34 | - | + | - | - | +[1] |
| Endosulfan Isomers | 35 | - | + | - | - | +[1] |
| Hexachlorocyclohexanes | 36 | - | + | - | - | ++[1] |
| Toxaphene | 37 | - | + | - | - | + |
| Diethylhexylphthalate (DEHP) | 38 | - | + | + | - | + |
| Chlordane | 39 | - | + | - | - | + |
| Diazinon, Mirex, Nonachlor, Cyanide | 40 | - | + | - | - | + |

**Flow**

[1]Stations distributed over lower third of watershed.

Oxnard Plain

This subwatershed had No Data available for any of these chemical compounds/classes.

Santa Paula

This subwatershed was scored as Data Poor for all of the organic compounds measured in surface water. This was due to the fact that only one station was available for sampling.

Sespe

This subwatershed had No Data for PAHs, PCBs, DDT, heptachlor/heptachlor epoxide, endosulfan isomers, hexachlorocyclohexanes, toxaphene, chlordane, diazinon, mirex and nonachlor. A score of Data Poor was assigned to aldrin/dieldrin/endrin compounds and diethylhexylphthalate. This was due to the fact that only one station was available for sampling throughout the entire Sespe subwatershed area.

Piru

The Piru portion of the Santa Clara River watershed had No Data reported for any of these compounds/classes.

Upper Santa Clara

Again, with the caveat that all data sets for this section of the Santa Clara river watershed appeared to have a spatially biased distribution, the PAHs, PCBs and hexachlorocyclohexanes were scored as Data Moderate. The remaining pesticides (DDT, aldrin/dieldrin/endrin, heptachlor/heptachlor epoxide, endosulfan isomers, toxaphene, iethylhexylphthalate, chlordane, diazinon, mirex, cyanide and nonachlor) were scored as Data Poor because only one station was sampled.

In summary for organic compounds, all of the parameters had at least two subwatersheds (Oxnard Plain and Piru) with No Data and all but the Upper Santa Clara subwatershed had ranks at or below the level of Data Poor. With respect to subwatershed region, the richness of data, ranked from highest to lowest, appears to be:

1) Upper Santa Clara;
2) Santa Paula;
3) Sespe;
4) Oxnard Plain;
5) Piru.

It appears that the station locations of the upper tributaries may, in most cases, be determined simply by the presence or absence of flowing water (e.g., some may only contain water during wet weather events).

### 4.3.5 Chronic Aquatic Toxicity Tests

Chronic aquatic toxicity tests are generally limited to testing the toxicity of effluents before they are released into waters adjacent to industrial or municipal facilities. Occasionally, receiving waters are tested as well. Chronic toxicity tests routinely use organisms that are genetically homogeneous, easy to culture and have a proven track record in laboratories throughout the U.S. and Canada. These tests routinely employ sensitive aquatic invertebrates (e.g., water flea), fish (e.g., fathead minnow) and suspended algae (e.g., *Selanastrum spp.*).

The Data Gap Analysis for all of the above chronic aquatic toxicity tests are presented in Table 11. Maps displaying the frequency and spatial locations for the invertebrate, fish and algae bioassays are presented in Figures 41 through 43.

**Table 11. Data Gap Analysis for Chronic Aquatic Toxicity Tests**

| Aquatic Toxicity Bioassays | Map # | Subwatershed | | | | |
|---|---|---|---|---|---|---|
| | | Oxnard Plain | Santa Paula | Sespe | Piru | Upper Santa Clara |
| Water Flea (*Daphnia* spp.) | 41 | ++[1] | - | - | - | ++[1] |
| Fathead Minnow (*Pimephales promelas*) | 42 | ++[1] | - | - | - | +[1] |
| Algae (*Selanastrum* spp.) | 43 | ++[1] | - | - | - | ++[1] |

← Flow

[1]Stations distributed over lower third of watershed.

Oxnard Plain

The data for this subwatershed was ranked as Data Moderate for all three of these aquatic toxicity tests. As seen with other parameters discussed above, the spatial distribution of these samples was toward the mouth of the Santa Clara River.

Santa Paula

This subwatershed was scored as having No Data for all three of these aquatic toxicity tests.

Sespe

This subwatershed saw No Data for all three aquatic toxicity tests.

Piru

The Piru portion of the Santa Clara River watershed had No Data reported for all three aquatic toxicity tests.

Upper Santa Clara

This subwatershed was ranked as Data Poor for the fathead minnow and Data Moderate for water flea and algae testing, with the caveat that spatial distribution was biased toward the lower downstream segment of this subwatershed.

In summary for chronic aquatic toxicity, all tests had at least three subwatersheds (Santa Paula, Sespe and Piru) with No Data. The Oxnard Plain and the Upper Santa Clara subwatersheds were never ranked above the level of “Data Moderate.” With respect to subwatershed region, the richness of data ranked from highest to lowest appears to be:

1) Oxnard Plain;
2) Upper Santa Clara;
3) Santa Paula;
4) Sespe;
5) Piru.

It appears that the station locations of the upper tributaries may, in most cases, be determined simply by the presence or absence of flowing water (e.g., some may only contain water during wet weather events).

## 4.4 Temporal and Spatial Distribution of Samples

Two sources of data, the USGS and the UWCD, have monitoring records that date back to 1951 and 1925, respectively. However, the monitoring programs within these agencies are not entirely consistent over the long term. For example, the USGS has at times completely eliminated chemical monitoring, principally due to budget constraints or priorities with other key stream variables.

The LACSD and the LACDPW have data records dating back to 1984 and 1988, respectively. The Cities of San Buenaventura, Fillmore and Santa Paula provided electronic data records that date back to 1997, 2004 and 1999, respectively. The LARWQCB (SWAMP) has data from 2001 and 2003. In general, it is not scientifically reasonable to determine a temporal trend in data from any one sampling station or from a set of consecutive stations given the heterogeneous nature of the database.

Although the database was not evaluated in detail for how individual samples were taken through time, it is possible to get a relatively good understanding based on a mapping of the data selected from the last five years of how often samples were taken. For example, it is clear, that the locations at Valencia Water Reclamation Plant (VA001) and the Saugus Water Reclamation Plant (SA001) near the lower third of the Upper Santa Clara watershed are sampled on a fairly regular basis for almost all of the parameters. These two locations are NPDES-permitted water treatment facilities. On the other hand, locations within the upper portion of the Oxnard Plain, as well as both the Sespe and Piru watersheds (and associated creeks) are rarely monitored on a regular basis.

Based on the locations of historical sampling stations in the watershed, the spatial distribution of sample stations along the Santa Clara River appears to be adequate Figure 44). Other historic sampling locations within each main tributary or creek also appear adequate, although the location of many of these may be governed by access limitations. In contrast, the currently active sample locations (those used in the Data Gap Analysis) appear to have inadequate spatial distribution. Based on the locations of Data Gap Analysis sampling stations, the spatial distribution is inadequate, even in areas that have a relatively high frequency of routine sampling (Figure 45). For example, currently sampling occurs frequently at four locations that are concentrated at the mouth of the Santa Clara River, but the remainder of the Oxnard Plain sub-watershed is not sampled. The ten locations that are sampled in the Santa Paula watershed adequately cover the Santa Clara River, although even these ten stations are concentrated in only a few locations. The Santa Paula Creek is only sampled near its confluence with the Santa Clara River whereas historically, stations were located at various points upstream. The Piru and Sespe watersheds, in general, are also poorly represented from the standpoint of a complete or robust data set. Sampling in the Sespe Creek sub-watershed occurs at the downstream portions of the Sespe and Pole Creeks as well as along the Santa Clara River but does not occur in the upstream portions of these tributaries. Historically, the upstream portion of the Sespe Creek was sampled but the upstream portion of Pole Creek was not. The southern portion of the Piru Creek sub-watershed below Lake Piru and along the Santa Clara River has many sampling stations but the upstream portion has none. Historically, USGS and SWAMP stations existed in the upstream section of Piru Creek. Lastly, there are only six stations in the Upper Santa Clara River sub-watershed, all of which are located on the

Santa Clara River between its confluence with Bouquet Canyon Creek and its confluence with Castaic Creek. Stations do not exist on Castaic Creek, San Francisquito Canyon Creek, Bouquet Canyon Creek, Mint Canyon Creek and the eastern portion of the Santa Clara River upstream of Bouquet Canyon Creek. Historically, sampling stations once existed in all of these areas. As a consequence of the above observations, the selection of sampling locations took into account the spatial disparity seen in the Data Gap Analysis, as well as the general observation that selected parameters were identified as a “data gap” for particular subwatershed regions. Generally speaking, sample locations identified in the Data Gap Analysis tended to be spatially clustered. Additionally, the northern reaches and, in some cases the downstream reaches of the tributaries, were not well represented in terms of spatial sampling. The current preliminary sampling stations take these differences into account.

It is readily apparent, as alluded to above, that spatial distribution of many of the monitoring stations may be due to the presence of industrial facilities that may require routine sampling to fulfill permit conditions. Biased sampling locations may also be required in locations that are densely settled (in order to determine non-point stressors).

## 4.5 Comparison of Historical Data to Water Quality Criteria and TMDL Objectives

The current database was developed with information from a wide variety of sources, each of which may have differed in terms of sampling methodology, analytical methodology and quality assurance/quality control protocols. Because of this, one should be cautious in the interpretation of trends, either over time or space. Based on data presented in the *Santa Clara River Enhancement and Management Plan* (SCREMP [released in May 2005, but based on data collected prior to 1995]), the following conclusions were made with regard to Surface Water Quality:

> *<u>Upper Santa Clara River</u>*
>
> *Two trends observed in the water quality data collected in the upper Santa Clara River are indicated in UWCD and CLWA (1996):*
>
> *(1) The increase in concentration of the total dissolved solids (TDS) and sulfate downstream, with the maximum concentrations of TDS and sulfate at the County Line station (the most downstream) about ten times higher than that at Lang station (the most upstream);*
>
> *(2) The general decrease in concentrations of TDS and sulfate at the stations over the periods of record.*
>
> *Unfortunately, these data do not reflect recent changes in the surface water quality conditions that, in turn, would reflect changes in the hydrologic conditions in the watershed.*

*<u>Lower Santa Clara River</u>*

*The water quality data for common dissolved constituents for the lower Santa Clara River are … summarized below. These tables do not include information regarding suspended and settleable solids.*

*(1) A weaker trend of TDS and sulfate concentrations progressively increasing downstream than observed in the upper reaches of the river is observed in the lower reaches. UWCD reported strong correlation between the TDS and sulfate concentrations in the local waters influenced by the presence of marine sediments in the watershed (UWCD, 2001b). Surface waters sampled in the lower Santa Clara River were classified as calcium-sulfate (UWCD and CLWA, 1996).*

*(2) The concentrations of the common dissolved constituents, reflective of the water quality, vary inversely to the rate of flow (discharge). This results in a "flow dilution" trend of higher quality waters associated with higher flow volumes and lower quality waters associated with lower flow volumes.*

*(3) Elevated nitrate concentrations are observed at several stations downstream of developed areas within watershed and correlated with land use practices (septic tanks, agricultural, industrial, reclaimed water). In 2000, UWCD reported high nitrate concentrations at Blue Cut station believed to be originated from ammonia in the effluent from Saugus and Valencia water reclamation plants (WRPs) discharged into the Santa Clara River (UWCD, 2001b). The LARWQCB is currently monitoring and updating nitrate concentration data in support of the Board's Nitrate TMDL.*

*(4) Elevated chloride concentrations displaying trends similar to nitrate. WRPs are the best-documented source of chloride in the area (see Appendix A, Table 36, and Tables 50-55). The larger plants discharge treated effluent directly to the river, and the smaller plants in the watershed usually discharge treated effluent to percolation ponds. In 2000, UWCD reported the chloride concentrations of 148 and 170 mg/L in the effluent from the Saugus and Valencia plants based on LACSD data, respectively, and an effluent concentration of 154 mg/L was reported by the Santa Paula WRP. These concentrations were influenced by chloride from water softeners in the residential homes in the City's water and in water from the State Water Project used by WRPs for their water supply. The LARWQCB is currently monitoring and updating chloride concentration data in support of the Board's Nitrate TMDL.*

*(5) Potential sources of water quality problems in the lower Santa Clara River include natural oil seeps in the Santa Paula area, impact from urbanization, impacts from agriculture and effects of imported and reclaimed water (UWCD and CLWA, 1996). Surface water trend evaluation of the Santa Clara River is difficult due to the complex hydrogeology, with numerous areas of sinking and rising groundwater at the subbasin boundaries, and further complicated by the data gaps in the upper reaches.*

*Santa Clara River Estuary*

*Several water quality issues associated with the Santa Clara River estuary were identified in the 1996 study:*

(1) Water Level Management - As of 1992, the plan allowed for the natural breaching of the sandbar at the lagoon mouth when the water level reached nine feet AMSL.

*(2) Mosquito Abatement.*

*(3) Eutrophication.*

*(4) Coliform - Bacteria levels exceeding recreational standards have been recorded at receiving stations in the estuary and nearby ocean monitoring stations and believed to result from non-point sources (i.e., birds).*

*(5) Pesticides.*

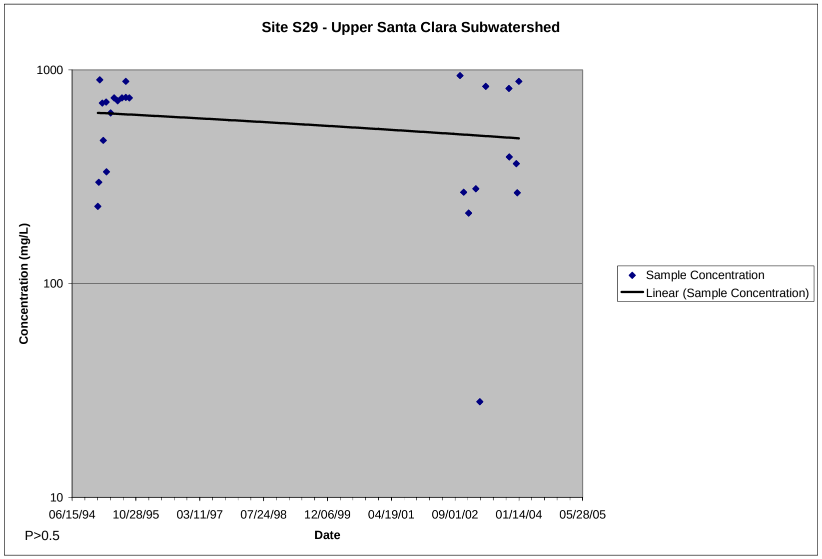
AMEC queried the TDS, sulfate, nitrate, and chloride data included in the Data Gap Analysis to examine the current validity of the conclusions in the SCREMP. Data was queried at one sample location with the greatest number of sample events within each subwatershed for which there was sampling for each particular parameter.

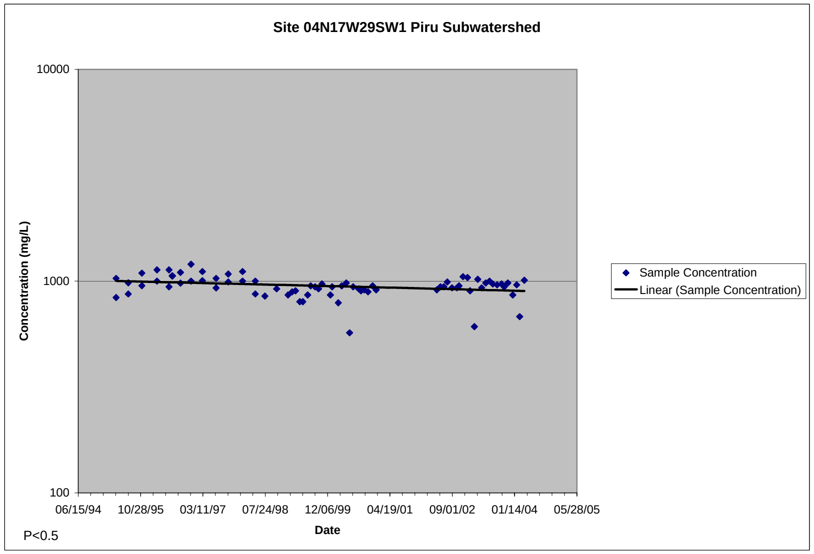
In contrast to observations made in the SCREMP, TDS concentrations do not appear to progressively increase downstream. As displayed in Charts 1 through 4, TDS concentrations remain at relatively constant levels between the subwatersheds. Variability in TDS concentration is the most prominent in the Upper Santa Clara subwatershed, with little variation at all present in the other three subwatersheds. Results for TDS concentration are statistically significant in only the Piru and Santa Paula subwatersheds. Finally, sample concentrations in all four subwatersheds rarely exceeded the water quality objective maximum limit.

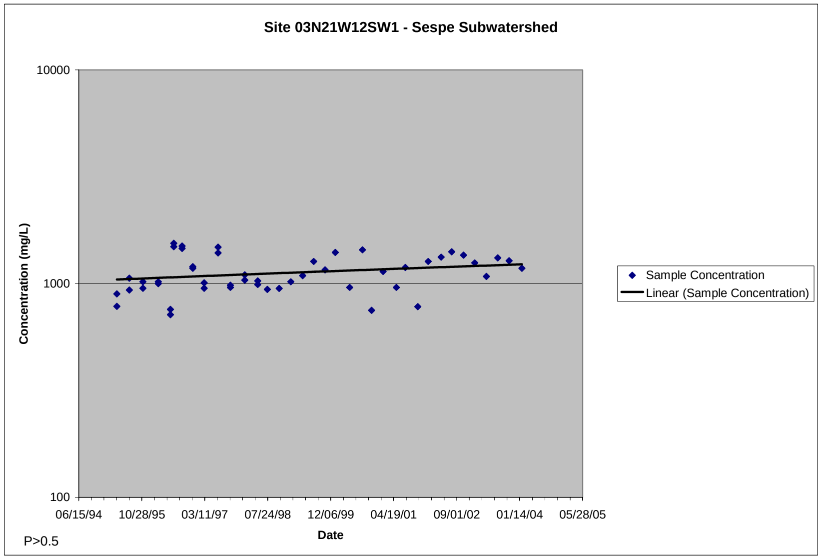
In comparison, sulfate samples displayed much greater variability than TDS samples within all four subwatersheds (Charts 5 through 8). However, sulfate does appear to progressively increase in concentration in the lower subwatersheds as increases in both the Sespe and Santa Paula subwatershed are statistically significant. These results match the observations made in the SCREMP document.

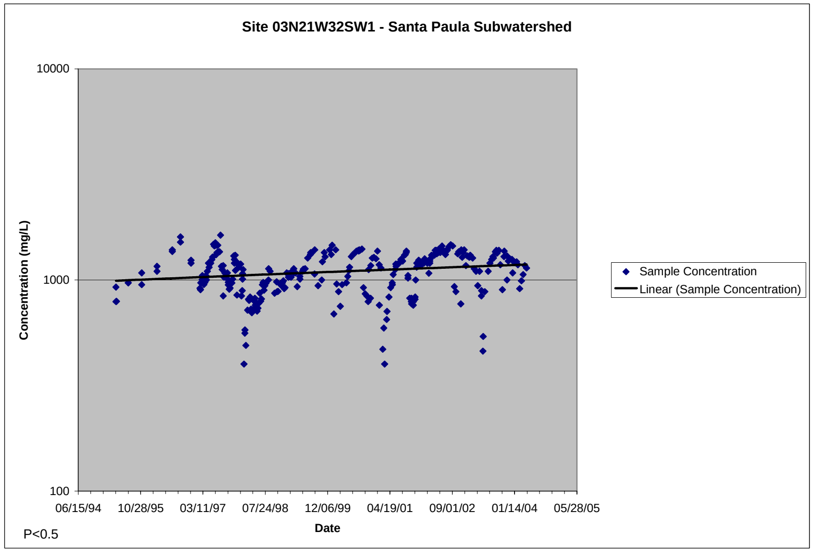
With regard to nitrate, sample concentrations in the Piru subwatershed have been elevated above water quality objective levels over the ten-year sample period, although trends show that levels have been slowly decreasing over the same time period (Charts 9 through 13). This matches observations made in the SCREMP; however, with the exception of the Piru subwatershed trends within each subwatershed are not statistically significant. Within the Santa Paula subwatershed, mean concentrations have remained relatively stable and below water quality objectives while individual sample concentrations display seasonal highs and lows. Concentrations in the Upper Santa Clara, Sespe, and Oxnard subwatersheds range seasonally but are consistently below water quality objective maximum concentration limits.

## Charts 1 - 4. Concentration of TDS Samples Over Time

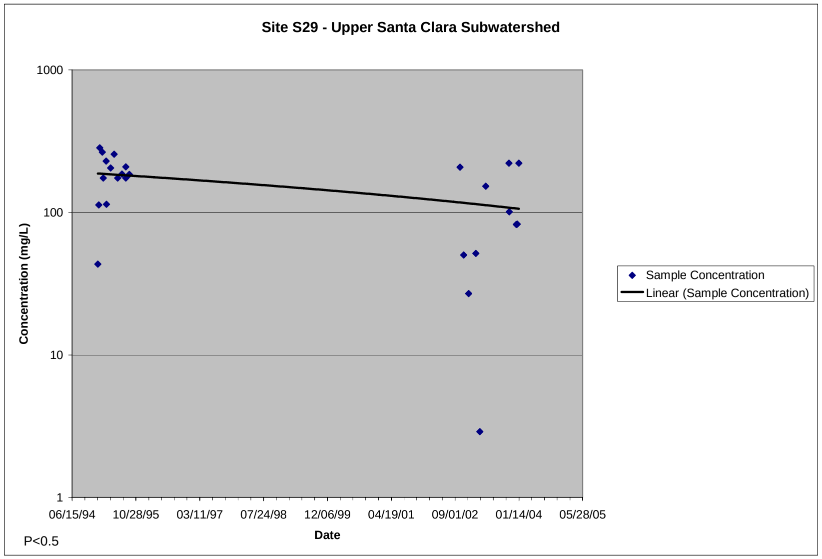


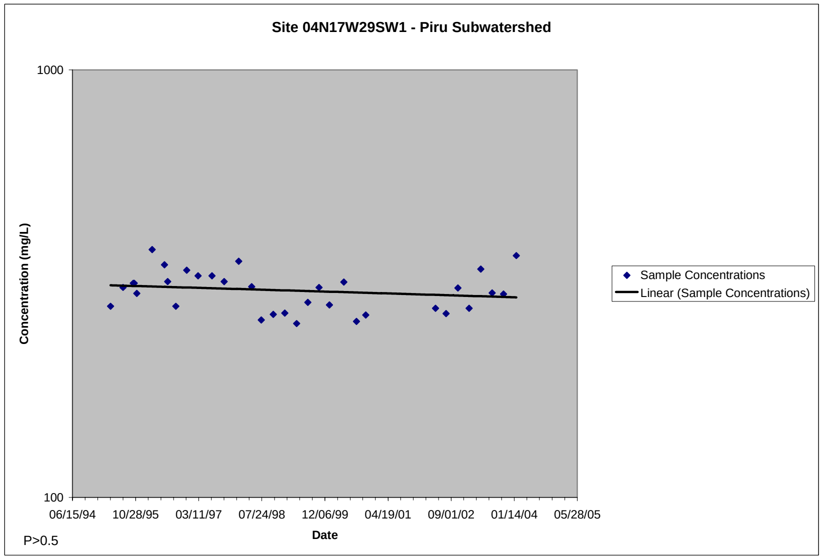



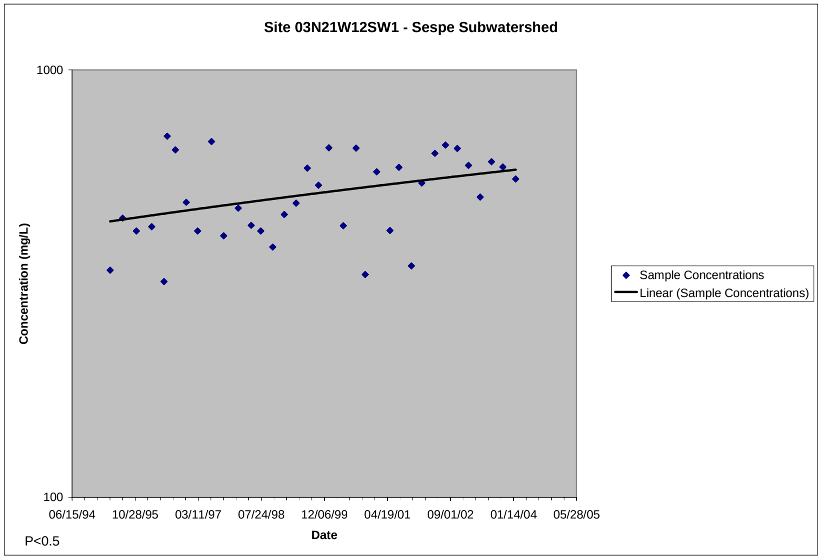



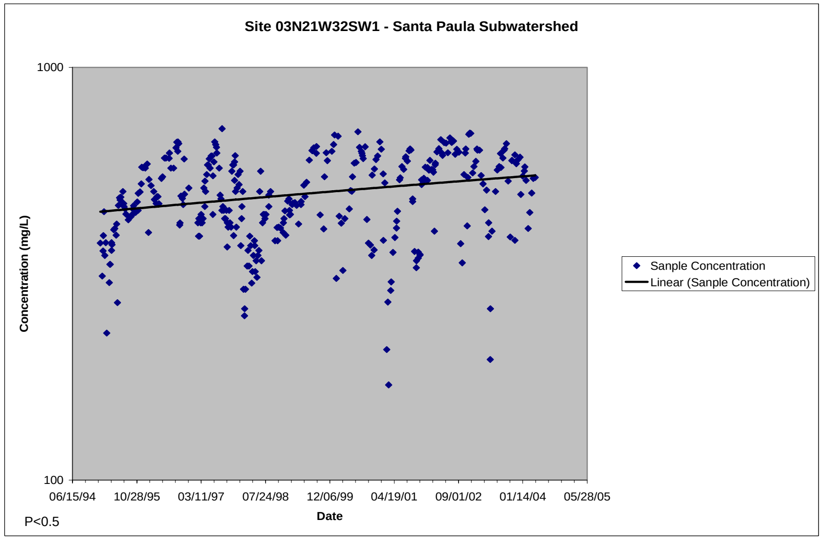



## Charts 5 - 8. Concentrations of Sulfate Samples Over Time

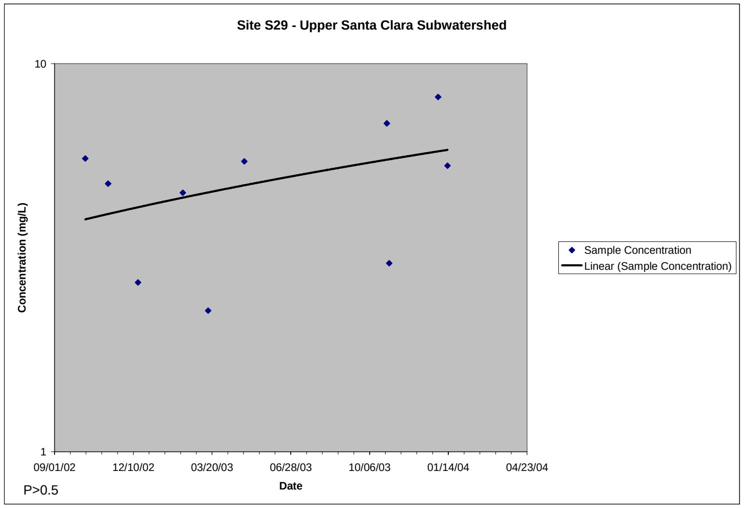


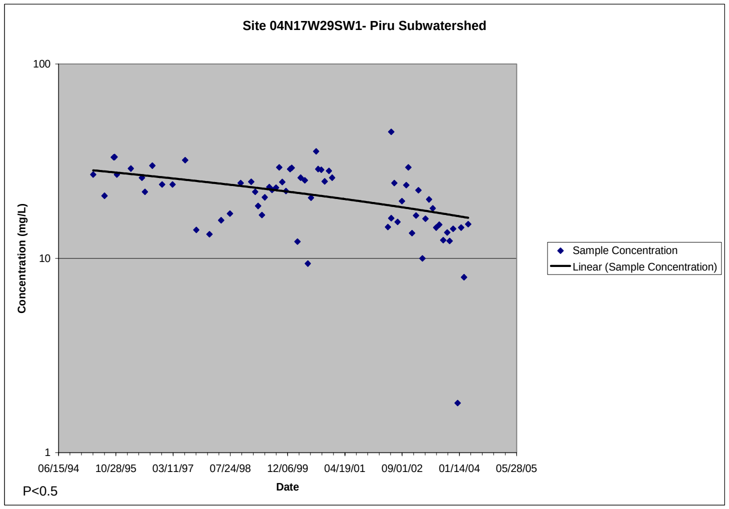



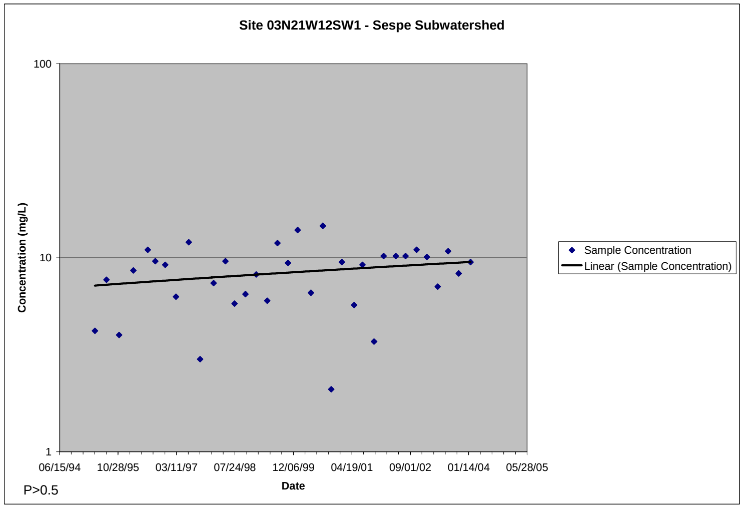



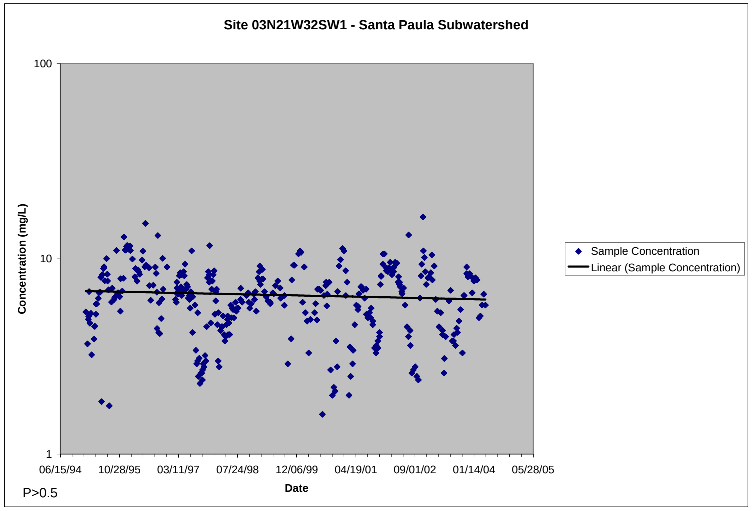



## Charts 9 - 13. Concentration of Nitrate Samples Over Time

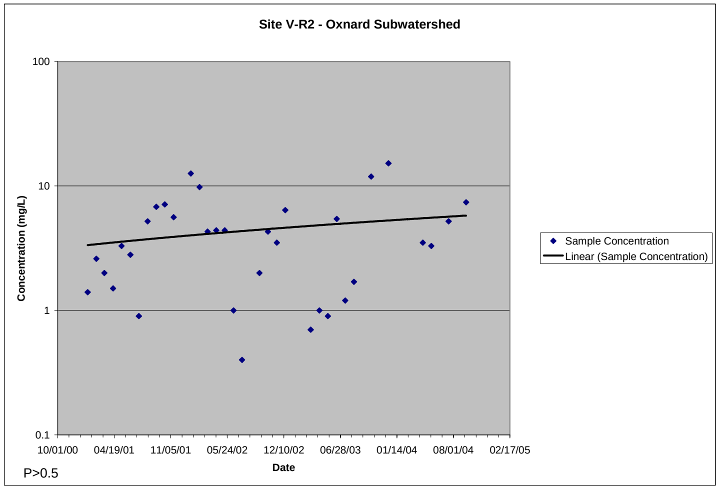


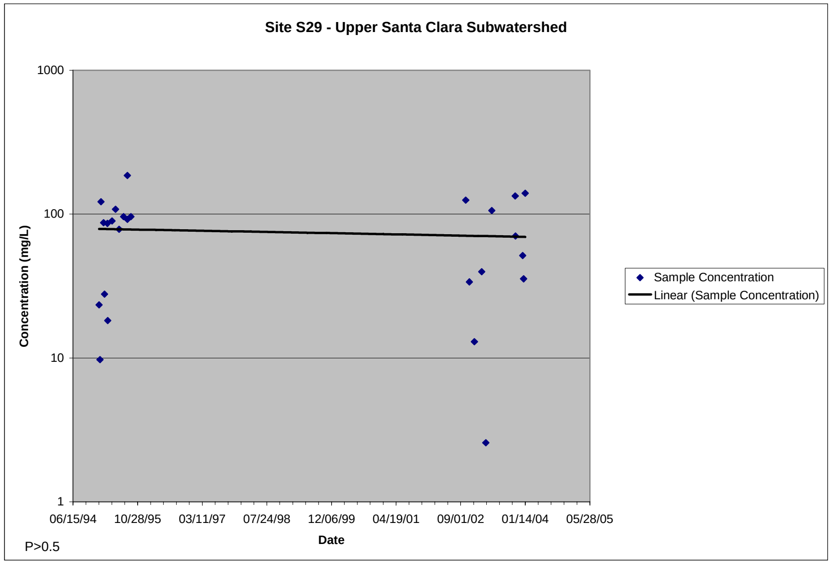



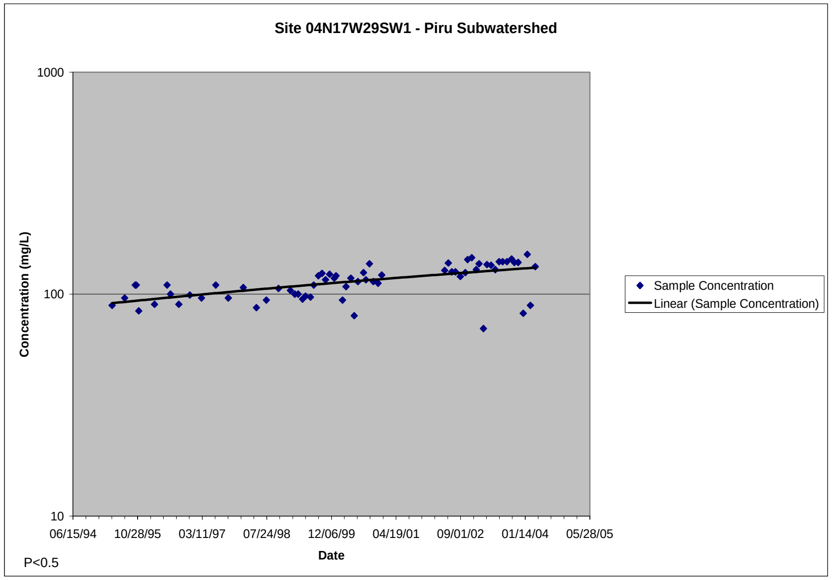



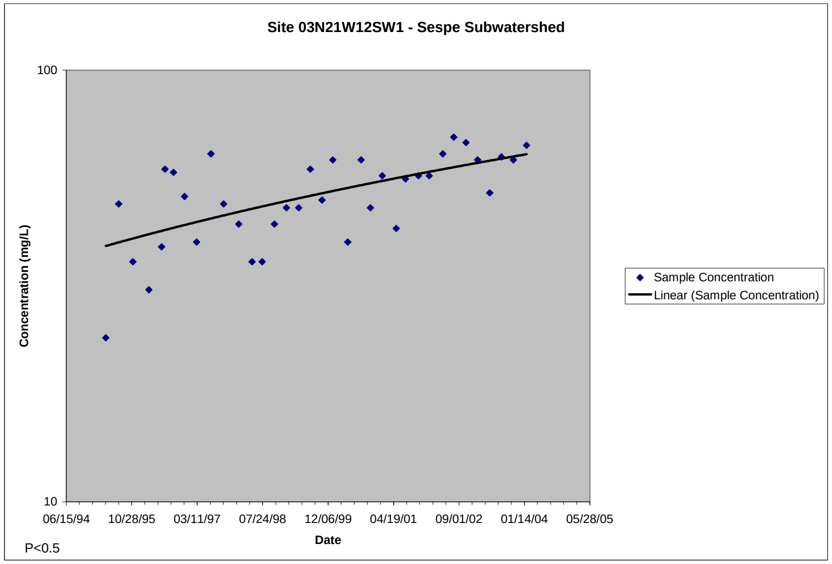
## Charts 9 - 13. Concentration of Nitrate Samples Over Time (continued)

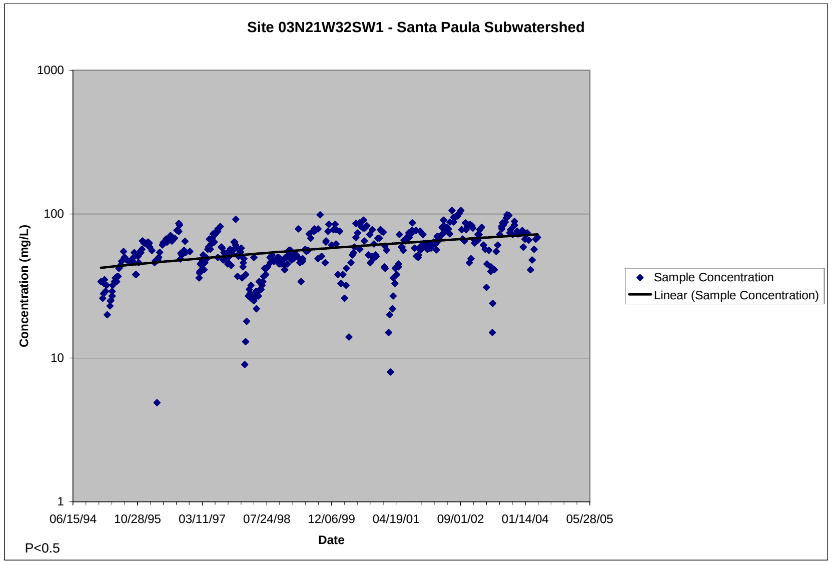


## Charts 14 - 17. Concentration of Chloride Samples Over Time



With regard to chloride, concentrations in the lower watershed increased significantly in samples in all of the lower subwatersheds over the ten year period and corresponded with observations made in the SCREMP (Charts 14 through 17). Further, concentrations in the Piru subwatershed were consistently above the water quality objective for this reach of the watershed (100 mg/L; please see Table 5). In contrast, sample concentrations within the Sespe and Santa Paula subwatersheds were at or below the water quality objectives for the corresponding reach of the river over the ten-year period.

Although the heterogeneous nature of the current database would advise against a detailed data analysis for the Santa Clara River, it is still instructive to compare the distribution for each individual parameter against California's Water Quality Objectives. This exercise may also be important with regard to the development of current or future TMDL programs. These TMDLs will be addressing long standing water quality issues like elevated surface water concentrations of chloride, ammonia, nitrate/nitrite, fecal coliform, and pH.

Table 12 presents Water Quality Objectives for the Santa Clara River compared to the actual data collected on the river. These values were selected from tables presented in Chapter 3 of the *Water Quality Control Plan* (Harris et al, 1994). It is important to note that Water Quality Objectives may differ for different reaches of the Santa Clara River and/or tributaries based on beneficial uses as displayed previously in Table 5. For example, the Water Quality Objectives for chloride is 50 mg/L "above the Lang gaging station" but 150 mg/L "between Freeman Diversion Dam near Saticoy and Highway 101 Bridge." A range of water quality criteria, as a minimum and a maximum, are therefore presented. The percent of values exceeding the Water Quality Objectives are given for both the minimum and the maximum cited water quality criteria.

### 4.5.1 Conventional Parameters

Approximately 69 percent of the chloride values within the current database exceeded the minimum 50 mg/L criteria, while 10 percent exceeded the maximum value of 150 mg/L. For sulfate, 98 percent of the values exceeded the lowest water quality criteria of 100 mg/L, while only 11 percent exceeded the maximum value of 650 mg/L. Fecal coliform exceeded the minimum 200 MPN standard at least 38 percent of the time and exceeded the maximum 2000 MPN standard about 5 percent of the time. Dissolved oxygen was fairly optimal for most locations. It exceeded the minimum required concentration of 5 mg/L for roughly 92 percent of the values, while roughly 75 percent of the values exceeded a dissolved oxygen concentration of 7 mg/L. Temperature deviations also appeared to be somewhat optimal, only exceeding the upper boundary of 26.6 $^{o}$C about 10 percent of the time. Finally, the hydrogen ion concentration, as measured by pH, was above the minimum criteria of 6.5 s.u. for almost every record (99 percent), while the number of values exceeding the maximum allowable value of 8.5 s.u. was only 4 percent of the total number of records.

## Table 12. Percent of Values Exceeding Water Quality Objectives for Each Constituent of Concern

| Constituent/Analyte of Concern | California Water Quality Objectives[1] | | Percent of Values Exceeding Minimum | Percent of Values Exceeding Maximum |
|---|---|---|---|---|
| | Minimum | Maximum | | |
| ***Conventional Water Quality Parameters*** | | | | |
| Chloride (mg/L) | 50 | 150 | 69.1 | 9.7 |
| Sulfate (mg/L) | 100 | 650 | 98.0 | 10.6 |
| Fecal Coliform[3] (MPN/100 ml) | 200 | 2000 | 38.7 | 5.2 |
| Conductivity (umhos/cm) | --- | --- | N/A | N/A |
| Dissolved Oxygen (mg/L) | 5 | 7 | 91.6 | 74.9 |
| Temperature ($^oC$) | --- | 26.6 | --- | 0.1 |
| pH (s.u.) | 6.5 | 8.5 | 98.9 | 3.7 |
| Hardness (mg/L $CaCO_3$) | --- | --- | N/A | N/A |
| Total Dissolved Solids (mg/L) | 500 | 1300 | 94.3 | 23.0 |
| ***Inorganic/Metals (as Maximum Contaminant Levels)*** | | | | |
| Aluminum (mg/L) | --- | 1.0 | N/A | 16.0 |
| Boron (mg/L) | 0.5 | 1.5 | 72.7 | 2.7 |
| Copper (mg/L) | --- | 0.022 | N/A | 4.5 |
| Lead (mg/L) | --- | 0.011 | N/A | 5.3 |
| Mercury (mg/L) | --- | 0.002 | N/A | 0.0 |
| Thallium (mg/L) | --- | 0.002 | N/A | 0.0 |
| Zinc (mg/L) | --- | 0.246 | N/A | 0.9 |
| ***Nutrients*** | | | | |
| Ammonia (mg/L)[2] | 6.8 | 8 | 39.2 | 33.0 |
| Nitrate (mg/L) | 5 | 10 | 31.2 | 11.7 |
| Nitrite (mg/L) | 5 | 10 | 0.0 | 0.0 |
| Phosphorus (mg/L) | --- | --- | N/A | N/A |
| ***PCBs/PAHs/Pesticides*** | | | | |
| Polycyclic Aromatic Hydrocarbons[4] (mg/L) | --- | 0.0002 | 0.0 | 1.1 |
| Polychlorinated Biphenyls (mg/L) | --- | 0.0005 | 0.0 | 0.0 |
| DDT (mg/L) | --- | --- | N/A | N/A |
| Aldrin/Dieldrin/Endrin (mg/L) | --- | 0.002 | 0.0 | 0.0 |
| Heptachlor/Heptachlor Epoxide (mg/L) | --- | 0.00001 | N/A | 0.0 |
| Endosulfan Isomers (mg/L) | --- | --- | N/A | N/A |
| Hexachlorocyclohexanes (mg/L) | --- | --- | N/A | N/A |
| Toxaphene (mg/L) | --- | 0.003 | 0.0 | 0.0 |
| Chlordane (mg/L) | --- | 0.0001 | N/A | 0.0 |
| Diethylhexylphthalate | --- | 0.004 | N/A | 7.7 |
| ***Aquatic Toxicity Tests (as Percent Mortality)*** | | | | |
| Water Flea (*Daphnia* spp.) | 10 | 30 | N/A | N/A |
| Fathead Minnow (*Pimephales promelas*) | 10 | 30 | N/A | N/A |
| Algae (*Selanastrum* spp.) | 10 | 30 | N/A | N/A |

[1]For Santa Clara River Watershed. Taken from Chapter 3 of: Harris et al., 1994. Values differ for selected creeks and rivers, so range of values (min - max) presented.

[2]Assumes a "One Hour" average ammonia concentration for an average watershed pH of 8.0. Applies to waters designated as "cold" water fishery.

[3]Low value cited for beneficial use of water contact recreation, high value cited for beneficial use of non-water contact recreation.

[4]Conservatively assumes all PAH as potent as Benzo(a)pyrene.

### 4.5.2 Inorganics/Metals

For aluminum, 16 percent of the measured values within the database exceeded the Water Quality Objective of 1.0 mg/L. Boron exceeded the minimum criteria value of 0.5 mg/L for 73 percent of the values, but exceeded the maximum cited criteria of 1.5 mg/L only 3 percent of the time.

The water quality criteria for copper, lead and zinc was conservatively calculated using the 10$^{th}$ percentile database hardness value of 270 mg/L (as $CaCO_3$). Only 4.5 percent of the copper values exceeded the water quality criteria value of 0.022 mg/L. For lead, only 5 percent of the database values exceeded the ambient water quality criteria (AWQC) value of 0.011 mg/L. None of the values within the database for mercury exceeded the Water Quality Objective of 0.002 mg/L. None of the samples taken for the measurement of thallium exceeded the Water Quality Objective of 0.002 mg/L. Finally, only 1 percent of the total number of records for zinc exceeded the water quality criteria value of 0.246 mg/L.

### 4.5.3 Nutrients

Ammonia exceeded the minimum Ammonia standard of 6.8 mg/L 39 percent of the time, while exceeding the maximum Ammonia standard at least 33 percent of the time. This may be due to the fact that the pH for these waters runs in the alkaline range.

Nitrate exceeded the minimum (5 mg/L) and maximum (10 mg/L) water quality criteria at least 31 percent and 11 percent of the time, respectively. Nitrite, however, appears to be within normal limits because it did not exceed either the minimum or maximum values cited within the Water Quality Control Plan. There is no Water Quality Objective for phosphorus (or phosphate) and this variable was therefore not evaluated against an available standard.

### 4.5.4 Chemical Constituents

Chemical constituents were sampled less frequently than some of the other key chemical parameters (see Table 10). With the exception of PAHs, none of the concentrations of any of the individual chemical constituents exceeded their respective Water Quality Objectives. PAHs exceeded the respective Water Quality Objective for only 1 percent of the total number of data entries.

### 4.5.5 Aquatic Toxicity Tests

The aquatic endpoints for the database were entered as “Percent Effluent,” which is the relative concentration of effluent (usually as a serial dilution percentage) that may have affected aquatic organisms for that individual facility or treatment plant. The Water Quality Objective is narrated in terms of a percentage of organisms that may be affected by any one test. The database values thus cannot be compared to the Water Quality Objectives for toxicity because the units are not the same.

## 4.6 Data Summary in Relation to Current and Future TMDLs

From the perspective of applying these database values to fulfill the requirements of TMDL regulations, it appears the following conclusions can be made:

- Conventional Parameters: With the exception of the Oxnard Plain, data appears to be adequate for chloride, sulfate and pH. Clear data gaps exist for fecal coliform, TDS, TSS, and flow.
- Inorganics/Metals: With the exception of Oxnard Plain, the amount of data appears to be adequate for boron. For the remaining metals, data gaps exist for every subwatershed except the Upper Santa Clara subwatershed. However, it is important to note that for any individual metal only a small percentage of the recorded values exceeded the applicable Water Quality Objective. Additionally, in relation to the instrument detection limits used at the time of sampling/analysis, these waters appear to be low in aluminum, mercury and thallium.
- Nutrients: Clear data gaps exist for the section of the river that runs through the Oxnard Plain (where there is no information for any nutrient). Data appears to be adequate for ammonia only in the Santa Paula and Upper Santa Clara subwatersheds. The amount of data appears to be adequate for nitrate for all but the Oxnard subwatershed sections. Data gaps exist for nitrite, but all of the records where sampling has occurred appear to be below the existing Water Quality Objectives. Phosphorus and phosphates will require additional sampling for all of the Santa Clara River and associated tributaries.
- Chemical Constituents: In general, chemical constituents, whether PAHs, PCBs, or chlorinated pesticides, show clear data gaps for just about every area of the Santa Clara River and associated subwatersheds. Data sets are the most robust in the Upper Santa Clara subwatershed. As was observed with the metals, concentrations appear to be very low in lieu of the detection limits used at the time of sampling and analysis. Virtually all constituents fell below health-based Water Quality Objectives.
- Aquatic Toxicity Tests: These tests are apparently carried out as a requirement of several NPDES permitted facilities within the Upper Santa Clara subwatershed. The values in the database could not be evaluated against the Water Quality Objectives because the units of measurement were not the same ("percent effluent" for the database versus "percent mortality" for the Water Quality Objectives). If impacts (from chemical constituents) to aquatic life appear to be an issue for the Santa Clara River, then more freshwater aquatic toxicity tests will be required to fill in the existing data gaps identified in this paper.

# 5.0 BASELINE WATER QUALITY MONITORING

As discussed in the scope of work, the main purpose of the CMP is to "develop baseline conditions for the watershed and have a mechanism to measure improvements or degradations in the watershed." The ideal Baseline Water Quality Monitoring Plan maximizes the breadth of the physical, chemical and biological information while minimizing the overall scope of the study design (i.e., optimizing available resources based on anticipated cost and/or effort). The best way to do this is to utilize monitoring stations that already have relatively complete data profiles. This is an important aspect for any baseline monitoring plan because it is rarely advantageous to change either a monitoring location or decrease the number of constituents in a particular analytical suite once the sampling process has begun. Additionally, because the term baseline suggests environmental conditions that might exist during "average" conditions, the collection of stormwater, although mentioned in the scope of work, should be revisited by the stakeholders in terms of obtaining data that is meaningful over the long term.

## 5.1 Monitoring Station Locations

The protection of California's natural water resources has a very long history and, because monitoring of both quality and quantity are an essential part of the security of this precious commodity, a number of State and Federal agencies maintain semi-permanent and/or permanent monitoring stations throughout the Santa Clara River watershed. Figure 44 presents the current universe of monitoring locations identified from various GIS shapefiles made available to AMEC including the USGS, the UWCD, LACSD, VCWPD, and SWAMP. Some of these monitoring locations are temporary (e.g., Kamer and Fairey, 2005; SWAMP) and some are permanent (e.g., active USGS or VCWPD gaging stations). The distribution of Data Gap Analysis sampling stations (Figure 45) is primarily a subset of these historical monitoring locations. It is important to note that many of the location names/identifiers are redundant. It is not uncommon for one location to have two or more "IDs" depending on what agency or stakeholder is sponsoring the station or has historically sponsored the station. For example, a Santa Clara River monitoring station in Hopper Creek near Piru California has a USGS identifier of 11110500, a VCWPD ID of 710, and a UWCD ID of 04N19W25SW1.

The general criterion for developing a sampling plan includes study objectives, cost-effectiveness, patterns of environmental contamination/variability and practical considerations such as site access, equipment security, and political jurisdiction. Once a general sampling plan has been decided upon, the actual selection of monitoring locations can vary from haphazard ("any location will do") to highly structured (e.g., simple or stratified random sampling). Because the scope of work recommended a "baseline" study for the CMP, it was determined that a slightly modified systematic sampling strategy, which typically selects locations that are separated by regular intervals along a waterbody, would be the most effective sampling design (Gilbert, 1987). This strategy also corresponds with the scope of work which states that monitoring points are to be selected based on: 1) downstream points of Santa Clara sub-basins; 2) system morphology; and 3) historical data availability. Further, while land use is an important characteristic of the watershed, rather than selecting locations based on their land use, this systematic approach captures the varied land uses on the watershed through the spacing of sampling stations along the river and tributaries. Other factors mentioned in the scope of work, such as sensitive habitats and potential problem areas, should be discussed at a local level to address individual water quality questions beyond the baseline sampling program described in this document. Currently wetland data for the watershed is available only in the Ventura County portion of the watershed and detailed vegetation mapping is only available for the Los Angeles County portion of the watershed.

It is also important to note the regulatory climate and associated timetables when selecting monitoring locations. For the Santa Clara River, the plan should consider the statutory requirements needed to be fulfilled under the federal 303(d) TMDL regulations. A TMDL is defined as the maximum amount of a pollutant that a water body can receive and still meet water quality standards. This exercise allocates the acceptable pollutant load to both point and nonpoint sources. The TMDL is generally expressed in terms of mass per time or concentration. Since TMDLs are of primary concern with regard to the allocation and use of future data, the siting and/or location of monitoring stations should include locations at or slightly downstream of real-time USGS gaging stations. Thus, pollutant loads from different subwatersheds or tributaries can be evaluated and flow measurements could be easily retrieved from the Internet for any particular day of the year.

### 5.1.1 Spatial Sampling: Selection of Preliminary Sampling Locations

Based on the information above, preliminary sampling locations were selected using the following strategy:

1) For major tributaries to the Santa Clara River (e.g., Mint Canyon, Pole Creek), select a downstream [historical] monitoring location nearest to the junction with the Santa Clara River.
2) For the Santa Clara River, select a historical station that is slightly downstream of the tributary/Santa Clara River fork (beyond the mixing zone).
3) Select any additional locations along the Santa Clara River from historical or active stations (Figures 44 and 45, respectively) that will provide information identified as a data gap in the Data Gap Analysis.

Following this strategy, one monitoring station should be located near the mouth of almost every major tributary that enters the main channel of the Santa Clara River. These downstream monitoring locations are sometimes referred to as integrator locations, because the physical and chemical parameters measured at the furthest downstream location will generally reflect the sum total of upstream contributions and/or processes. Figure 46 presents a map of the recommended monitoring stations. Most of the selected locations include active or real-time USGS or VCWPD gaging/monitoring locations, which will take advantage of existing data on flow, velocity or discharge. Due to the continuity of the data and permanent nature of the gaging stations, it is recommended that all “flow composited” baseline sampling stations be located at active gaging stations. Additional flow-composited stations can be added later to extended reaches, if deemed necessary.

Other non-USGS locations represent existing stations that are currently being monitored by various state or regional agencies. In addition, a few monitoring station locations were added based on the results of the data gap analysis, which indicated spatial gaps in certain reaches within the watershed. In most cases, this is due to the fact that either a tributary is not adequately represented in the current data gap analysis data set or the distance between two stations on a tributary of the main body of the Santa Clara River is too long to adequately characterize water quality variations within a particular reach.

Table 13 presents more detailed information on each of the recommended monitoring stations including the site number, name, a brief description of the location, the agency currently using/sponsoring the monitoring station, and its current monitoring status.

### Table 13. Preliminary Sampling Locations

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 403STCSFO | San Francisquito Creek Water quality data from 10/31/01only from SWAMP sampling. Also velocity measurement from this date. | SWAMP | Upper Santa Clara | San Francisquito Creek | Historic SWAMP water quality station. Added as an integrator station for San Francisquito Creek. |
| New-3 | TBD | TBD | " " " | San Francisquito Creek | Added to fill in spatial gaps in existing monitoring programs in the Upper Santa Clara subwatershed. Located in a residential land use area. |
| 11108000 | SANTA CLARA R NR SAUGUS CA (Currently operated by LACDPW) Water quality sampling from 1974 through 1976. | USGS(LACDPW) | " " " | Santa Clara River | Existing flow station; historic water quality station. Located in an area with a mix of residential and industrial land uses. Sites RD and RC may be substituted for this site if discharge is available. |
| 11107745 | SANTA CLARA R AB RR STATION NR LANG CA (Currently operated by LACDPW) Water quality sampling from 1974 through 1976. | USGS (LACDPW)[1] | " " " | Santa Clara River | Existing flow station; historic water quality; representative of upstream portion of the Upper Santa Clara subwatershed. Located in an undeveloped portion of the watershed. |
| 11107770 | MINT CYN C A SIERRA HWY NR SAUGUS CA (Currently operated by LACDPW) No water quality data available. | USGS (LACDPW) | " " " | Mint Cyn Creek | Existing flow station. Added as an integrator station for Mint Canyon Creek. Located in a residential land use area. |
| 11107860 | BOUQUET C NR SAUGUS CA (Location moved in 2003, currently operated by LACDPW) No water quality data available. | USGS (LACDPW) | " " " | Bouquet Creek | Existing flow station. Added as an integrator station for Bouquet Creek. Located in a residential land use area. |

**Table 13. Preliminary Sampling Locations (continued)**

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 11107922 | SF SANTA CLARA R A SAUGUS CA No water quality data available. | USGS | " " " | Santa Clara River | Active until 1977. Added as an integrator station for the south fork of the Santa Clara River. Located in a residential land use area. |
| 11108075 | CASTAIC C AB FISH C NR CASTAIC CA (USGS until 1993, currently operated by DWR, flow data available by request) No water quality data available. | USGS (DWR) | " " " | Castaic Creek | Existing flow station. Added as an integrator station for Castaic Lake. |
| 11108135 | CASTAIC LAGOON PARSHALL FL NR CASTAIC CA (USGS until 1996, currently operated by DWR, flow data available by request) No water quality data available. | USGS (DWR) | " " " | Castaic Creek | Existing flow station. Added as an integrator station for Castaic Lake releases. |
| 11108145 | CASTAIC C NR SAUGUS CA No water quality data available. | USGS | " " " | Castaic Creek | Active until 1976. Added as an integrator station for Castaic Creek into the Santa Clara River. Located in an area with industrial land uses and undeveloped space. |
| 403STC068 | Random Site 68 – Santa Clara River (Potrero Canyon) Water quality data from 2/25/03 only from SWAMP sampling. Also velocity measurement from this date. | SWAMP | " " " | Santa Clara River | Historic SWAMP water quality station. Added to fill spatial gaps within the Upper Santa Clara subwatershed. Located in an area with industrial land uses and undeveloped space. |
| New-1 | TBD | TBD | " " " | Santa Clara River | Added to fill spatial gaps in sampling within the Santa Clara River headwaters. Located in an undeveloped portion of the watershed. |

## Table 13. Preliminary Sampling Locations (continued)

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| New-2 | TBD | TBD | " " " | Santa Clara River | Added to fill spatial gaps in sampling within the Santa Clara River headwaters. Located in a primarily undeveloped portion of the watershed with some residential land use areas. |
| 04N18W20SW1 | 5 - Piru Creek at Piru Some historic WQ data, quarterly samples since 5/2000. | UWCD | Piru | Piru Creek | Existing water quality station. Serves as an integrator station for Piru Creek. Located in an agricultural land use area. |
| 11108500; 11109000 | Formerly SANTA CLARA RIVER AT L.A.-VENTURA CO. LINE CA (SCR at Blue Cut); moved to current location in 1996 - Santa Clara River near Piru (Newhall Bridge) Annual water quality sample data from 1951 through 1992. | USGS (VCWPD) | " | Santa Clara River | Existing flow and historic water quality station. Fills a spatial gap within the Piru subwatershed. Located in an agricultural land use area. |
| 04N18W30SW1 | 8 - SCR at Torrey Road Data from two water quality samples obtained during late summer/early fall from 1993 through 1995 | USGS (UWCD) | " | Santa Clara River | Existing water quality station. Eliminates the spatial gap within the Piru subwatershed. Located in an agricultural land use area. |
| 11109600 05N18W10SW1 | PIRU CREEK ABOVE LAKE PIRU CA Annual USGS water quality samples from 1965; 1972 through 1975. Historic data by UCWD from 1980, quarterly samples since 1997. | USGS (UWCD) | " | Piru Creek | Existing flow station and water quality station. Serves as an integrator station for discharge into Lake Piru. |
| 11109800 | PIRU C NRCREEK BELOW SANTA FELICIA DAM PIRU CA No water quality data available. | USGS | " | Piru Creek | Existing flow station. Added as an integrator station for Piru Creek. |

## Table 13. Preliminary Sampling Locations (continued)

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 11110500<br>04N19W25SW1 | HOPPER CREEK NEAR PIRU CA Currently VCWPD flow stationat historic USGS station site; quarterly water quality sampling by UWCD since 1997. | USGS/VCWPD/<br>UWCD | " | Hopper Creek | Existing flow and water quality station. Serves as an integrator station for Hopper Creek. Located in an area of mixed agricultural and industrial land uses. |
| 713 | Pole Creek at Sespe Ave. No water quality data available. | VCWPD | Sespe | Pole Creek | Existing flow station. Serves as an integrator station for Pole Creek. |
| 04N19W33SW1 | SCR 1/4 mile downstream of Fillmore Fish Hatchery. Water quality sample data available quarterly since 2/1992. | UWCD | " | Santa Clara River | Existing water quality station. Serves as an integrator station for the upper half of the Santa Clara River watershed and fills spatial gaps between the Sespe and Piru subwatersheds. Located in an agricultural land use area. |
| 04N20W24SW1 | Sespe Creek at USGS Gauging Stn-formerly Sespe Creek at Old Telegraph Road. Some historic water quality data available, sampling done several times per year 1998 through 2001. Currently Station 04N20W12SW1. Moved because streambed is dry during late summer/early fall. | UWCD | " | Sespe Creek | Historic water quality station. Surface water readily percolates to groundwater in this portion of the Sespe Creek fan. Serves as an integrator station for lower Sespe Creek discharge into the Santa Clara River. Located in a residential land use area. |

## Table 13. Preliminary Sampling Locations (continued)

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 04N20W35SW1 | 12 - SCR near Bardsdale. Data from two water quality samples obtained during late summer/early fall from 1993 through 1994 | USGS (UWCD) | " | Santa Clara River | Existing water quality station. Replaces F-D & F-R2. Serves as a representative of the Sespe subwatershed. Located in an area with both agricultural and residential land uses. |
| 111115000 | SESPE CREEK NEAR WHEELER SPRINGS CA. No water quality data available. | USGS | " | Sespe Creek | Existing flow station. Added as an integrator station for the headwaters of upper Sespe Creek. Located in an agricultural land use area. |
| 737 | Sespe Creek above Bear Creek A650 ALERT station: flow not rated below 860 cfs, theoretical rating for peaks- used for flood warning only – no water quality data available from this location. No water quality data available. | VCWPD | " | Sespe Creek | Existing ALERTstation for flood warning. Added as an integrator station for the upper half of Sespe Creek. |
| 11113000<br>04N20W12SW1 | SESPE C NR FILLMORE USGS flow station and quarterly water quality sampling by UWCD since 2001. | USGS (UWCD) | " | Sespe Creek | Existing flow and water quality station. Added as an integrator station for the lower portion of Sespe Creek. |
| 11113300 | SANTA CLARA R NR SANTA PAULA CA One 1996 flow measurement only- no water quality data available from this site | USGS | " | Santa Clara River | One flow measurement from 1996 (collected peak-flow only). Added an an integrator station for Sespe Creek. Located in an area with a mix of agricultural and industrial land uses. |

## Table 13. Preliminary Sampling Locations (continued)

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 02N22W01SW3 | SCR, approx 200' downstream of confluence with Ellsworth Barranca. Several water quality samples obtained in 2001 providing electric conductivity and TDS. | UWCD | Santa Paula | Santa Clara River | Historic water quality station. Reflects conditions for most of the Santa Clara River watershed. Located in an agricultural land use area. |
| 03N21W11SW2 | 17 - Santa Paula Creek at Hwy 126. Data from two water quality samples obtained during late summer/early fall from 1993 through 1994 | USGS (UWCD) | " " | Santa Paula Creek | Historic water quality and existing flow station. Added as an integrator station for all of Santa Paula Creek. Located in an area with a mix of residential and agricultural land uses. |
| 03N21W28SW1 | 21 - SCR near Haines Data from several water quality samples obtained from 1993 through 1995. | USGS (UWCD) | " " | Santa Clara River | Existing water quality and flow station. Chosen to reduce clusting of monitoring locations currently located in the Santa Paula subwatershed. Located in an agricultural land use area. |
| 03N21W30SW1 | Todd Barranca near Todd Road Jail Data from one water quality sample in 1995, quarterly samples from 1997 to 2004 | UWCD | " " | Santa Clara River | Existing water quality station. Serves as a midway sampling point in the Santa Paula subwatershed. Located in an agricultural land use area. |
| 11113500 | SANTA PAULA C NR SANTA PAULA No water quality data available. | USGS (VCWPD) | " " | Santa Paula Creek | Existing flow station. Added as an integrator site for the upper portion of the Santa Paula creek. |

## Table 13. Preliminary Sampling Locations (continued)

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 11113920 | SANTA CLARA R A SATICOY CA No water quality data available. | USGS | " " | Santa Clara River | Active flow station until 1999. Added as an integrator station for all waters upstream of the northwest border of the Oxnard Plain subwatershed. Located in an agricultural land use area. |
| 720 | Santa Clara River at 12th Street ALERT gauge for flood warning purposes only. Low flow rating curve may not be developed for official record. No water quality data are available from this location. | VCWPD | " " | Santa Clara River | Existing ALERT flow station started in WY2005. Added as an integrator station for Santa Paula Creek discharge into the Santa Clara River. Located in a residential land use area. |
| 03N21W32SW1 | SCR at Freeman Diversion; VCWPD also has ALERT flow gauge at this location for flood warning purposes only. Low flow rating curve may not be reliable due to weir and effects of diversion gate on flow record. UWCD samples water quality every two weeks, historical data beginning 1925. | UWCD; VCWPD | " " | Santa Clara River | Existing water quality station. Serves as an ongoing sampling location for several agencies within the Santa Paula subwatershed. Located in an agricultural land use area. |
| V-L-5 | V-L-5 Data from monthly water quality samples beginning 1997. | Ventura | Oxnard Plain | Santa Clara River | Existing water quality station. Serves as an integrator station for the mouth of the Santa Clara River and the estuarine portion of the Oxnard Plain subwatershed. Located in a designated open space and recreation land use area. |

## Table 13. Preliminary Sampling Locations (continued)

| Site Number | Site Name | Agency | Subwatershed | Tributary | Comment/Status |
|---|---|---|---|---|---|
| 11114000 | SANTA CLARA RIVER AT MONTALVO CA (Represents several different locations, including Hwy101 bridge [Until 1992, Freeman Diversion, and Hwy 118 bridge in Saticoy [until 2004]. Official record may be extended by VCWPD ALERT gauge data from Freeman Diversion after 2004). No water quality data are available from the Hwys 101 and 118 locations. | USGS (VCWPD) | " " | Santa Clara River | Active until 2004. Could be an active flow station upon completion of freeway construction. Serves as a mid-subwatershed sampling point in the Oxnard Plain subwatershed. Located in an area with a mix of agricultural, industrial and residential land uses. |

Note: TBD = to be determined.

[1]Agencies in parentheses have taken over monitoring at the USGS stations but results continue to be published on USGS website.

### 5.1.2 Temporal Sampling: Recommended Schedule

The overall recommended sample frequency for any particular parameter would be monthly. Monthly samples represent a trade-off between too frequent (daily or weekly) and too infrequent (quarterly) sampling regimens. Daily or weekly sampling is often too expensive and provides redundant data, and quarterly sampling will miss seasonal variations that may be caused by changes in patterns of precipitation. Additionally, samples collected will be flow-composites, single grab, or wet weather. Table 14 presents a preliminary study design for the baseline monitoring of chemical, physical or biological parameters. Sediment quality and Rapid Bioassessment Protocols (RBP) (USEPA, 1999) are also recommended for selected stations. Existing USGS gaging stations can be used as a platform to set up semi-permanent flow composite stations.

Chemical, physical and biological parameters (detailed below) will be measured at most stations along the Santa Clara River, as well as most of the furthest downstream stations for each major tributary within each subwatershed. The recommended frequency of sampling for chemical, physical and some biological (total coliform and fecal coliform) parameters is on a monthly basis. As noted previously, monthly sampling represents a good compromise between too frequent (daily or weekly) and too infrequent (quarterly or biannually) sampling events. Because sediment chemistry and the structure of biological communities do not change as often as water quality, these parameters can be assessed on a more infrequent basis. The recommended frequency of sediment and bioassessment sampling is annually.

## 5.2 Water Quality

Water quality is directly affected by the combined impacts of human or ecological vectors on chemical, physical or biological parameters. For example, flocks of geese inhabiting a lake can produce enough waste (chemical) to stimulate the production of algae (biological). This may result in a severe depletion of dissolved oxygen (physical) that affects selected fish populations (biological) and overall productivity. This section of the document addresses existing or new water quality measurements that will give water resource managers a better understanding of baseline conditions within the Santa Clara River watershed.

### 5.2.1 Chemical Parameters

The selection of chemical parameters is strongly dependent on the need to resolve current environmental concerns, including compliance with short or long-term regulations (e.g., TMDLs), within each state, regional or local water resources agency. It is clear from the data gap analysis that different regulatory agencies and/or water resource boards have markedly different water quality concerns. These concerns may sometimes overlap, but there is often significant disparity between adjacent reaches of the Santa Clara River.

Ideally, chemical parameters would have the same analyses conducted at each monitoring station and the same laboratory would conduct the analyses. Based on our analysis of historical data, the following chemical parameters are recommended for sampling and analysis at each monitoring station:

### Table 14. Preliminary Sampling Design

| Site Number | Site Name | Agency | Subwatershed | Flow Data See Table 8 | Type of Sample[1] | Tentative Analytical Suite[2] |
|---|---|---|---|---|---|---|
| New-2 | TBD | TBD | Upper Santa Clara | N | G, WW | C, P |
| New-3 | TBD | TBD | " " " | N | G | C, P, B, S |
| New-1 | TBD | TBD | " " " | N | G, WW | C, P |
| 11107745 | SANTA CLARA R AB RR STATION NR LANG CA | USGS (LACDPW) | " " " | Y | FC | C, P, B, S |
| 11107770 | MINT CYN C A SIERRA HWY NR SAUGUS CA | USGS (LACDPW) | " " " | Y | G, WW | C, P |
| 11107860 | BOUQUET C NR SAUGUS CA | USGS (LACDPW) | " " " | Y | G, WW | C, P, B |
| 403STCSFO | San Francisquito Creek | SWAMP | " " " | N | G | C, P |
| 11107922 | SF SANTA CLARA R A SAUGUS CA | USGS | " " " | Y | G, WW | C, P, B |
| 11108000 | SANTA CLARA R NR SAUGUS CA | USGS | " " " | Y | FC | C, P, B, S |
| 11108075 | CASTAIC C AB FISH C NR CASTAIC CA | USGS (DWR) | " " " | Y | G | C, P, B |
| 11108135 | CASTAIC LAGOON PARSHALL FL NR CASTAIC CA | USGS (DWR) | “ “ “ | Y | G | C, P |
| 11108145 | CASTAIC C NR SAUGUS CA | USGS (DWR) | “ “ “ | Y | FC | C, P, B |
| 403STC068 | Random Site 68 – Santa Clara River (Potrero Canyon) | SWAMP | “ “ “ | Y | G | C, P, B |
| 11109000 | Santa Clara River near Piru | USGS (VCWPD) | Piru | Y | FC | C, P, B, S |
| 11109600 | PIRU CREEK ABOVE LAKE PIRU CA | USGS | " | Y | G | C, P |
| 11119800 | PIRU C NR CREEK BELOW SANTA FELICIA DAM PIRU CA | USGS | " | Y | G | C, P |
| 04N18W20SW1 | 5 - Piru Creek at Piru | UWCD | " | N | G | C, P, B |
| 04N18W30SW1 | 8 - SCR at Torrey Road | USGS (UWCD) | " | N | FC | C, P, B, S |
| 11110500 | HOPPER CREEK NEAR PIRU CA | USGS | " | Y | G, WW | C, P, B |
| 11108500 | SANTA CLARA RIVER AT l.A. – VENTURA CO. LINE CA (SCR at Blue Cut) | USGS | “ | N | G | C, P, S |
| 713 | Pole Creek at Sespe Ave. | VCWPD | Sespe | Y | G, WW | C, P |
| 04N19W33SW1 | SCR 1/4 mile downstream of Fillmore Fish Hatchery | UWCD | " | Y | FC | C, P, B, S |

## Table 14. Preliminary Sampling Design (continued)

| Site Number | Site Name _ | Agency- | Subwatershed | Flow Measurements See Table 8 | Type of Sample[1] | Tentative Analytical Suite[2] |
|---|---|---|---|---|---|---|
| 04N20W35SW1 | 12 - SCR near Bardsdale | USGS (UWCD) | " | N | FC | C, P, B, S |
| 111115000 | SESPE CREEK NEAR WHEELER SPRINGS CA | USGS | " | Y | G | C, P |
| 737 | Sespe Creek above Bear Creek A650 | VCWPD | " | Y | G | C, P |
| 11113000 | SESPE C NR FILLMORE | USGS | " | Y | G | C, P |
| 04N20W12SW1 | Sespe Creek at USGS Gauging Station | USGS/UWCD | " | N | G, WW | C, P, B |
| 11113300 | SANTA CLARA R NR SANTA PAULA CA | USGS | " | Y | G | C, P, B, S |
| 720 | Santa Clara River at 12th Street | VCWPD | Santa Paula | Y | G, WW | C, P |
| 11113500 | SANTA PAULA C NR SANTA PAULA | USGS | “ “ | Y | FC | C, P, B |
| 03N21W11SW2 | 17 - Santa Paula Creek at Hwy 126 | USGS (UWCD) | " " | N | G, WW | C, P |
| 03N21W28SW1 | 21 - SCR near Haines | USGS (UWCD) | " " | N | G | C, P, B, S |
| 03N21W30SW1 | Todd Barranca near Todd Road Jail | UWCD | " " | N | G, WW | C, P |
| 03N21W32SW1 | SCR at Freeman Diversion | UWCD | " " | Y | G | C, P |
| 02N22W01SW3 | SCR, approx 200' downstream of confluence with Ell | UWCD | " " | N | G, WW | C, P, B, S |
| 11113920 | SANTA CLARA R A SATICOY CA | USGS | " " | Y | FC | C, P, B, S |
| 11114000 | SANTA CLARA RIVER AT MONTALVO CA | USGS | Oxnard Plain | Y | FC | C, P, B, S |
| V-L-5 | V-L-5 | Ventura | " " | N | FC | C, P, B, S |

[1] FC = flow composite sample; G = grab sample; WW = wet weather sample.
[2] C = chemical suite; P = physical measurements; B = biological measurements (Barbour et al, 1999); S = sediment quality

Inorganic Parameters

- Ammonia
- Nitrate and nitrite
- Total (unfiltered) and ortho (filtered) phosphate
- Chloride
- Sulfate
- Hardness
- Total (unfiltered) and dissolved (filtered) metals

In addition to those metals identified by stakeholders for the Data Gap Analysis, AMEC recommends sampling for additional metals included on the USEPA 6010B target analyte list. This suite of metals includes potentially toxic metals not targeted in the Data Gap Analysis, as well as other metals that can be used as a check on water chemistry (e.g., calcium vs. hardness, sodium vs. conductivity). Selection of this "suite" of metals is also more cost-effective than selecting individual metals because the cost of running the TAL analysis is same regardless of the number of metals tested at most laboratories. If the first round of data results shows low levels of metals throughout the watershed, then those particular metals may be eliminated from future sampling events.

Organic Parameters

- Polycyclic aromatic hydrocarbons (PAHs)
- Polychlorinated biphenyl compounds (PCBs)
- Chlorinated pesticides (e.g., aldrin, BHCs, dachtal, dieldrin, endosulfans, heptachlor(s), hexachlorocyclohexanes, DDT/ methoxychlor, mirex, cyanide, nonachlor, chlordane, toxaphene)

Table 12 indicates that measurements of PAHs, PCBs and chlorinated pesticides are rarely observed above the detection limits for these compounds. Some, like toxaphene, are listed as a constituent of concern on the 303(d) inventory. Others, like phthalate esters, are ubiquitous, both as environmental constituents and as laboratory contaminants. These compounds should therefore be evaluated on a case-by-case basis. More advanced investigative techniques such as High Volume Sampling, Semi-Permeable Membrane Devices, Solid Phase Microextraction and Mussel Biomonitoring programs are often used by various state or federal agencies to determine if these constituents may present an issue within a particular watershed or receiving water. There are advantages and disadvantages associated with each of these technologies, therefore monitoring agencies are encouraged to seek additional information from supporting laboratories before employing these advanced techniques.

It is recommended that chemical parameters be measured at all downstream tributary stations, as well as every available station along the Santa Clara River. In addition, extraneous chemical parameters which are not included on the list of constituents identified by stakeholders for the Data Gap Analysis such as individual organic compounds (e.g., VOCs, SVOCs, phthalate esters, estrogens, pharmaceuticals, organometallics) or total organic or inorganic carbon, could be added at the discretion of the party performing the sampling as these constituents may have importance to individual stakeholders and to public health. The recommended sampling frequency for these parameters is once per month.

Suggested monitoring locations for wet weather sampling locations are presented in Table 14. Because this is a "baseline" monitoring plan, wet weather sampling is not considered a priority item. This type of sampling is generally conducted as an information gathering step in conjunction with stormwater permits. AMEC therefore recommends that decisions made addressing location and/or frequency of wet weather sampling events be adjusted according to local or regional (e.g., individual reach) concerns.

### 5.2.2 Physical Parameters

Physical parameters strongly affect surface water chemistry and therefore water quality. There did not appear to be significant data gaps for conventional parameters (temperature, pH, dissolved oxygen, specific conductivity). With the exception of the Santa Paula and Sespe subwatersheds, flow data is clearly a data gap identified within the database developed for the Draft CMP. This is a key variable for the TMDL calculation and thus should be considered as a primary measurement parameter at each and every monitoring station within the Santa Clara River watershed. As noted previously, flow is routinely measured at most existing USGS gaging stations and there is historical data available for phased out stations. It is recommended that some type of discharge measurements[1] be added to existing stations that may not have monitored it in the past, as well as at newly selected stations that have been added to enhance the spatial distribution of monitoring activities within the CMP.

The routine monitoring of the following physical parameters are recommended to assist with compliance with anticipated regulatory criteria that may arise with regard to future watershed issues:

- Flow (cfs)
- Temperature ($^{o}$F)
- Dissolved oxygen (mg/L)
- pH (standard units)
- Specific conductivity (umhos/cm)
- TDS (mg/L)
- TSS (mg/L)

It is recommended that conventional physical parameters (pH, D.O., temperature, conductivity) be measured at all tributary stations, as well as every station along the Santa Clara River. Extraneous physical parameters, such as turbidity (NTU) or chemical oxygen demand (COD, mg/L) could be added at the discretion of the party performing the sampling events.

The recommended sampling frequency is once per month. Some parameters, such as discharge or temperature, may already be measured on a real-time (e.g., hourly or daily) basis and it is recommended that these measurements continue. Suggested monitoring locations for wet weather sampling locations are presented in Table 14. Because this is a "baseline" monitoring plan, wet weather sampling is not considered a priority item. This type of sampling is generally conducted as an information-gathering step in conjunction with stormwater permits.

[1] Depending on the profile of the river bottom at any individual monitoring location, it may be easier to simply measure discharge using manual techniques (e.g., a flow meter to measure velocity and a measuring tape to integrate the cross-sectional area of the stream). Continuous flow monitoring is difficult to implement if a viable infrastructure is not in place (e.g., a preexisting rating curve based on the presence of a historical gaging station).

AMEC therefore recommends that decisions made addressing location and/or frequency of wet weather sampling events be adjusted according to local or regional (e.g., individual reach) concerns.

### 5.2.3 Biological Parameters

The only biological parameters that met the database selection criteria (i.e., no older than 1995 and >5 records per station) were total and fecal coliform. Data gaps appear to exist for both parameters within the Piru and Sespe watersheds. Due to the prevalence of large wastewater treatment plants on the Santa Clara River and the potential hazard presented by pathogenic bacteria from non-point sources, it is recommended that routine (weekly) sampling for the following parameters be performed at most stations along the main channel of the Santa Clara River:

- Total coliform (cfu/100 ml)
- Fecal coliform (cfu/100 ml)

In addition, although bioassessments are sometimes included as part of other watershed assessments or water quality studies, the results from such assessments, generally being qualitative in nature, are rarely entered into a regional database. This information would be useful to have in determining the biological integrity at selected stations within the Santa Clara River watershed. Accordingly, the USEPA RBPs (Barbour et al, 1999) present well structured forms and guidelines that will allow for the evaluation of both aquatic habitat and the structure and function of benthic macroinvertebrates. In streams and rivers, populations of macroinvertebrates and the fish that feed upon them, change very slowly in terms of time (years to decades). Because changes in biological communities occur slowly, these labor intensive measurements should be done on an annual basis to determine if there may be a trend in water quality, as reflected by the biological sustainability of the aquatic community. Sampling more than this recommended rate would yield redundant information and therefore waste resources. The sampling strategy should follow the macroinvertebrate and/or the fish protocols presented in the USEPA’s RBP guidelines (Barbour et al, 1999). The minimum design criteria would include for a qualitative evaluation of macroinvertebrates and fish. The decision on which protocol is chosen needs to consider availability of labor and the level of expertise of the biologist.

It is recommended that these parameters be measured at all downstream tributary stations and at selected locations along the Santa Clara River, especially those locations that are closest to wastewater treatment facilities and locations of high recreational use.. The upstream areas may not be as affected by human development, so annual sampling should be adequate. At a minimum, a baseline survey should be conducted at most stations during the initial water quality survey in order to establish baseline conditions. In some studies, reference locations, which are chosen to represent non-impacted sites that have a similar habitat structure (e.g., similar benthic substrate), are assessed so that a comparison of biological indices can be made. However, the purpose of the CMP is to determine “baseline” conditions against which future assessments can be compared. Therefore, the use of “reference” sites does not need to be considered in the selection of bioassessment protocols. Further, the Technical Advisory Committee suggests, “specialized laboratory studies to link toxicological effects with physical, chemical and biological parameters.” However, the database records reviewed for the Data

Gap Analysis showed that virtually all discharges to the Santa Clara River, as well as the respective receiving water samples, had little to no effect on aquatic invertebrates in the laboratory. It is therefore recommended that specialized toxicity bioassays, which are generally employed during more advanced tiers of watershed assessments to determine whether a chemical or physical agent is responsible for a particular impact (e.g., Toxicity Identification Evaluations), be reserved for the identification of more localized issues.

### 5.2.4 Sediment Quality

Sediment contamination is becoming more of a concern in waters where historical siltation may be evident. This generally includes areas that are immediately upstream of dams or impoundments or adjacent to heavy industrial activity (e.g., ports and harbors). Rivers that periodically experience flood waters, such as the Santa Clara River and its tributaries, may have sections that are depleted of depositional sediment due to frequent scouring events (during or after heavy rain storms). Contaminants typically associated with sediment contamination issues include environmentally persistent compounds, such as DDT, PCBs, PAHs, and chlorinated pesticides.

It is therefore recommended that before a sediment sampling plan is put into place, a reconnaissance survey first be conducted at or near sediment monitoring stations to determine if significant deposits of sediments exist on the river bottom. This will be especially important around quiescent areas where sediment deposition would normally be expected. Following this survey, a full-scale sediment survey can be conducted. Recommended measurements for constituents of concern would include inorganics (e.g., TAL metals) and persistent bioaccumulative or toxic organic compounds (e.g., PAHs, PCBs, chlorinated pesticides). Concentrations of these constituents of concern would then be compared to Federal, State or Regional Sediment Quality Values (e.g., MacDonald et al., 2000). Should any monitoring station reveal significant contamination, then sediment bioassays may be performed. The rationale for adding or deleting constituents discussed in the Data Gap Analysis is presented in Section 6.2.1, *Chemical Parameters*. Alterations in sediment contamination profiles occur through the slow deposition of suspended particulate matter. Since the banning of the vast majority of persistent chlorinated pesticides, the trend in most sediment contamination profiles throughout the U.S. has been toward less contaminated upper layers. It is therefore recommended that a baseline survey of sediment contamination only be performed once at selected sites. If comparison to available Sediment Quality Criteria indicates a potential issue for any type of persistent compound, then a more focused study can be developed for that particular area or region.

## 5.3 Trend Analysis

The analysis of spatial and/or temporal trends is a critical aspect of any medium- or long-term baseline monitoring plan. The use of a combination of existing USGS gaging station locations, existing agency and/or countywide monitoring stations, and the addition of several new sampling locations will ensure that future trends can be established for any physical, chemical or biological parameter. This is particularly true for the main body of the Santa Clara River, as the distance between each monitoring station is relatively uniform from the headwaters in the Upper Santa Clara subwatershed to the mouth of the river at the coastline (Oxnard Plain).

Additionally, the vast majority of the existing stations have historical data associated with them, which can easily be retrieved from the current amalgamated database that was developed for the Data Gap Analysis.

# 6.0 DATA QUALITY OBJECTIVES

The data quality objectives (DQO) process is a systematic approach that: 1) clarifies the study objectives, 2) defines the most appropriate type of data to collect, 3) determines the most appropriate conditions from which to collect the data, and 4) specifies tolerable limits on decision errors so that an appropriate quantity and quality of data is attained to support the project decision goals (USEPA 2005). The DQOs identify when and where to collect samples, the number of samples to be collected, the analysis method, the analytical performance criteria, how the results will be interpreted relative to the project objectives, the practical constraints for collecting the samples, and the acceptable level of uncertainty for data usability.

Many of the sampling and process design DQOs have been discussed in Section 5.0 (*Baseline Water Quality Monitoring*) of this report. Analytical DQOs include selection of analysis method that are established, reliable, and meet the project measurement performance objectives. Historical data for this project has been attained by various agencies and methodologies. Future samples will be collected and analyzed using established sampling procedures and analytical methods (i.e., EPA and/or state approved). Methods will be chosen by stakeholders based on their intended use to fulfill monitoring data gaps, while maintaining consistency with past measurements, where appropriate. DQOs such as precision, accuracy, and sensitivity will be considered during method selection. Analytical measurement performance criteria shall meet method requirements when specified or laboratory acceptance criteria (when not specifically stated in the method). If sampling or analytical anomalies are encountered, their impact and effect on data usability will be assessed and appropriate actions will be taken regarding data interpretation. Stakeholder agencies will also consider participating in a laboratory intercalibration study to set common performance standards for stormwater chemical analyses in the watershed.

# 7.0 DATABASE MANAGEMENT AND QUALITY CONTROL

All water quality data collected as part of this CMP project has been submitted by the VCWPD to the U.S. Environmental Protection Agency's STORET database. Future management of the database created for this project will be determined by the stakeholders in order to continue acquiring water quality data for the Santa Clara River watershed into one primary public database. It is recommended that stakeholders and agencies conducting water quality sampling in accordance with the recommendations in this report discuss and agree on a data sheet and reporting format prior to implementation of the CMP. Methods of quality control for the database should also be agreed upon prior to implementation of the CMP to prevent duplicate or inaccurate entries. The CMP database may be updated during calendar year 2007 or 2008 as part of the Santa Clara River Watershed Feasibility Study.

# 8.0 FUNDING AND IMPLEMENTATION

Funding assistance for the implementation of this program may be in part or entirely provided by the LARWQCB SWAMP monitoring program. Currently, approximately $250,000 is available for monitoring in the Santa Clara River and Calleguas Creek watersheds for FY 2007. Funding is provided on a five-year rotating schedule, therefore future implementation funding may need to be provided from other sources.

The LARWQCB may also be able to provide implementation assistance to participating agencies by integrating various monitoring efforts (i.e., NPDES, TMDL, stormwater, SWAMP, and volunteer) into the CMP. Current monitoring programs for LARWQCB permittees may be modified to implement the new plan so long as the level of monitoring does not decrease. Stakeholders should continue to meet on a regular basis to finalize the CMP sampling design according to the group's objectives and goals. Details of the implementation strategy will be included in this report by stakeholder agencies following finalization of the CMP sampling design. Stakeholders can also identify an agency willing to gather the water quality data from current sampling and incorporating it into the water quality database developed through this study.

In addition to organizations contacted during this study, there is a study by the Friends of the Santa Clara River (FSCR). FSCR is performing monthly sampling at the following six sites along the river (in order from downstream to upstream): the Victoria Avenue Bridge, 12th Street Bridge in Santa Paula, Hwy 23 Bridge in Fillmore, Torrey Road Bridge, Old Road Bridge, and River End Trailer Park. The sampling constituents are flow, temperature, dissolved oxygen, pH, conductivity, TDS, turbidity, odor and visual observations, ammonia (as N), nitrate (as N), total dissolved nitrogen, ortho-phosphate, and total dissolved phosphorus. They started a three year program of monthly sampling beginning December, 2005, and are funded by the US EPA through the SWRCB. There may be opportunities to team with this study and other new sampling efforts in the watershed to implement the CMP as outlined in this document.

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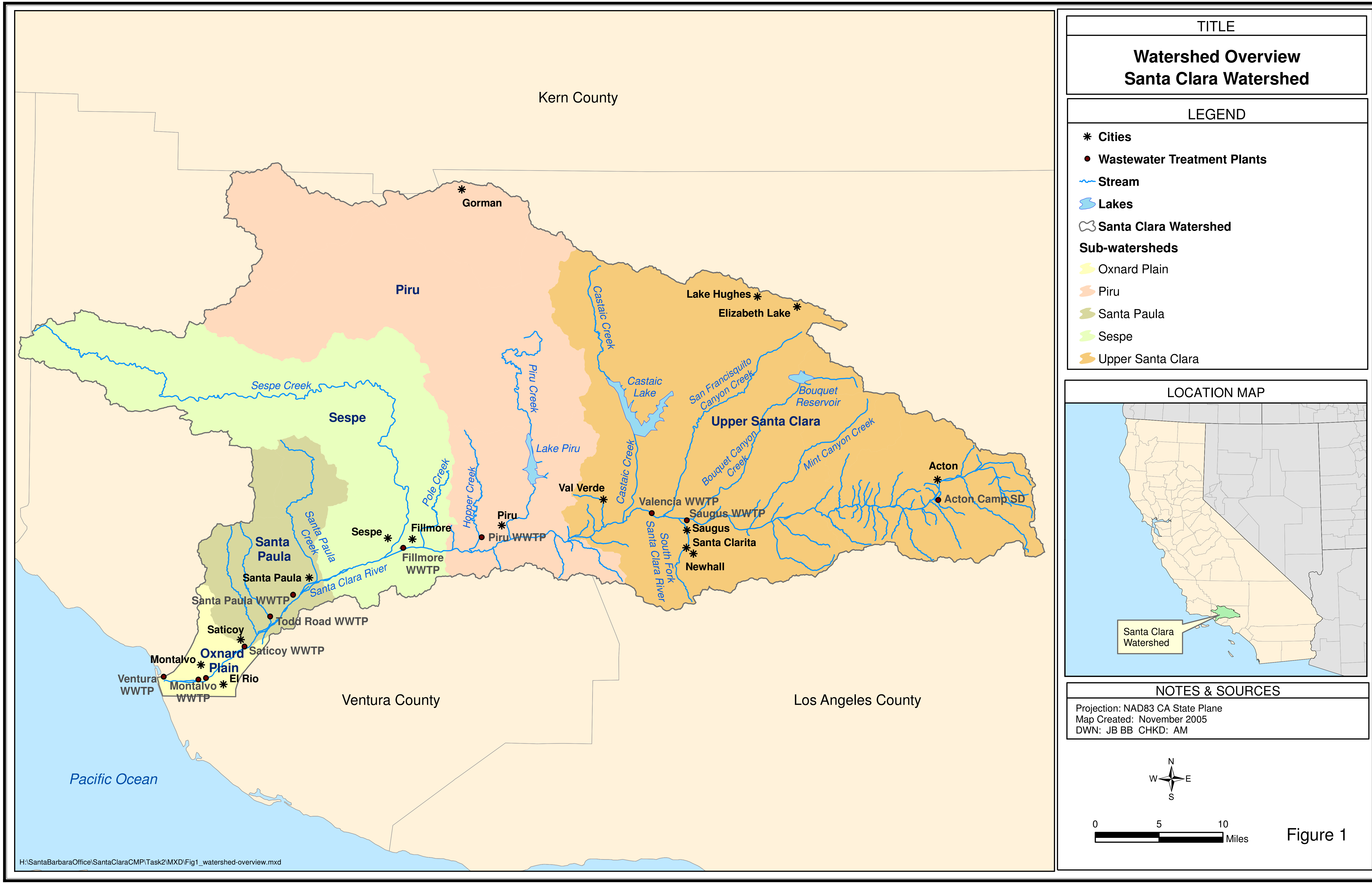
TITLE
Watershed Overview
Santa Clara Watershed
LEGEND
Cities
Wastewater Treatment Plants
Stream
Lakes
Santa Clara Watershed
Sub-watersheds
Oxnard Plain
Piru
Santa Paula
Sespe
Upper Santa Clara
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: November 2005
DWN: JB BB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 1
Kern County
Ventura County
Los Angeles County
Pacific Ocean
Gorman
Piru
Sespe
Santa Paula
Oxnard Plain
Upper Santa Clara
Sespe Creek
Santa Paula Creek
Pole Creek
Hopper Creek
Piru Creek
Lake Piru
Castaic Creek
Castaic Lake
San Francisquito Canyon Creek
Bouquet Reservoir
Bouquet Canyon Creek
Mint Canyon Creek
Santa Clara River
South Fork Santa Clara River
Lake Hughes
Elizabeth Lake
Acton
Acton Camp SD
Val Verde
Valencia WWTP
Saugus WWTP
Saugus
Santa Clarita
Newhall
Piru WWTP
Fillmore
Fillmore WWTP
Sespe
Santa Paula
Santa Paula WWTP
Todd Road WWTP
Saticoy
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El Rio
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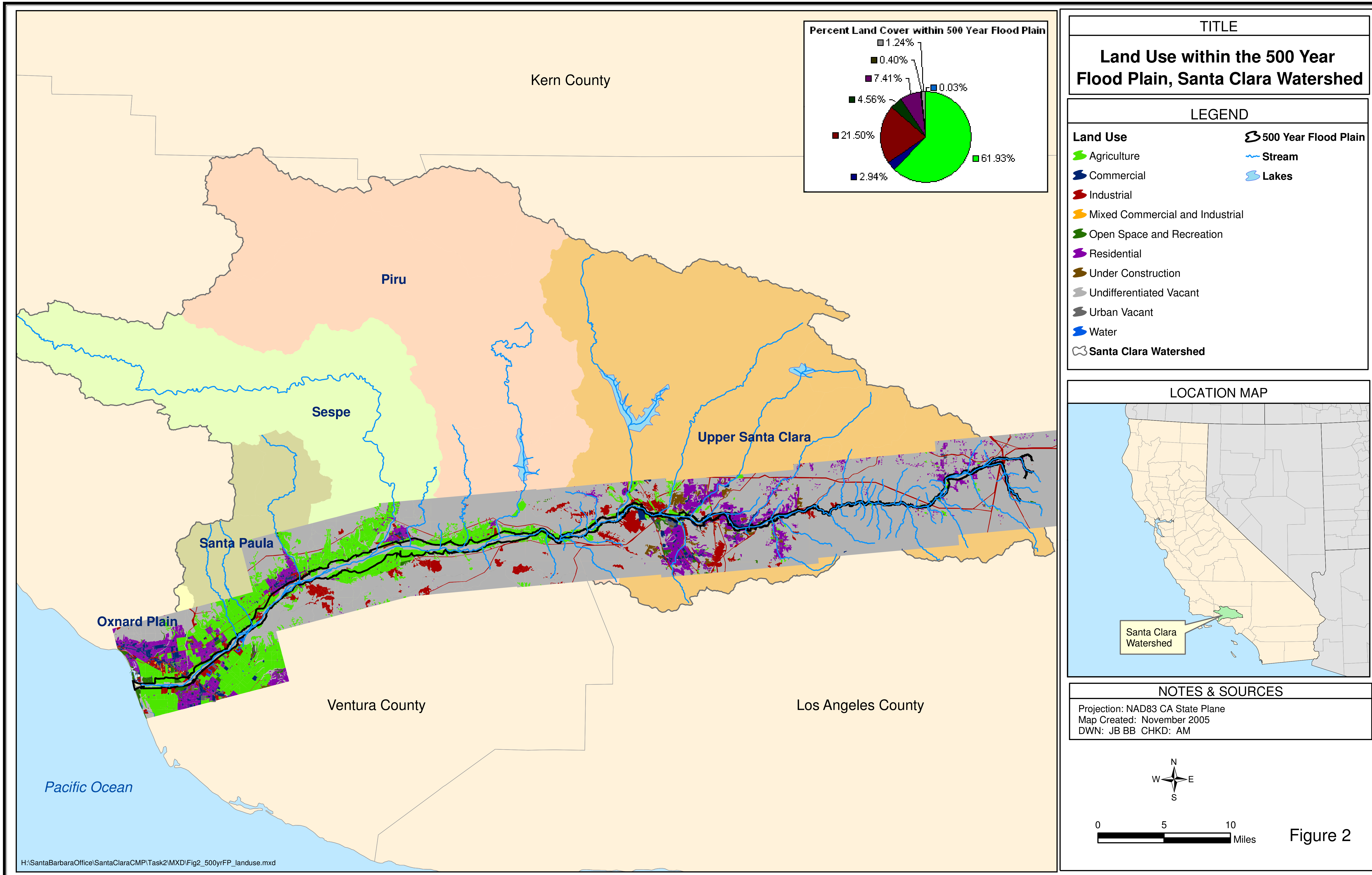

TITLE
Land Use within the 500 Year Flood Plain, Santa Clara Watershed
LEGEND
Land Use
Agriculture
Commercial
Industrial
Mixed Commercial and Industrial
Open Space and Recreation
Residential
Under Construction
Undifferentiated Vacant
Urban Vacant
Water
Santa Clara Watershed
500 Year Flood Plain
Stream
Lakes
Percent Land Cover within 500 Year Flood Plain
1.24%
0.40%
7.41%
0.03%
4.56%
21.50%
61.93%
2.94%
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: November 2005
DWN: JB BB CHKD: AM
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5
10
Miles
Figure 2
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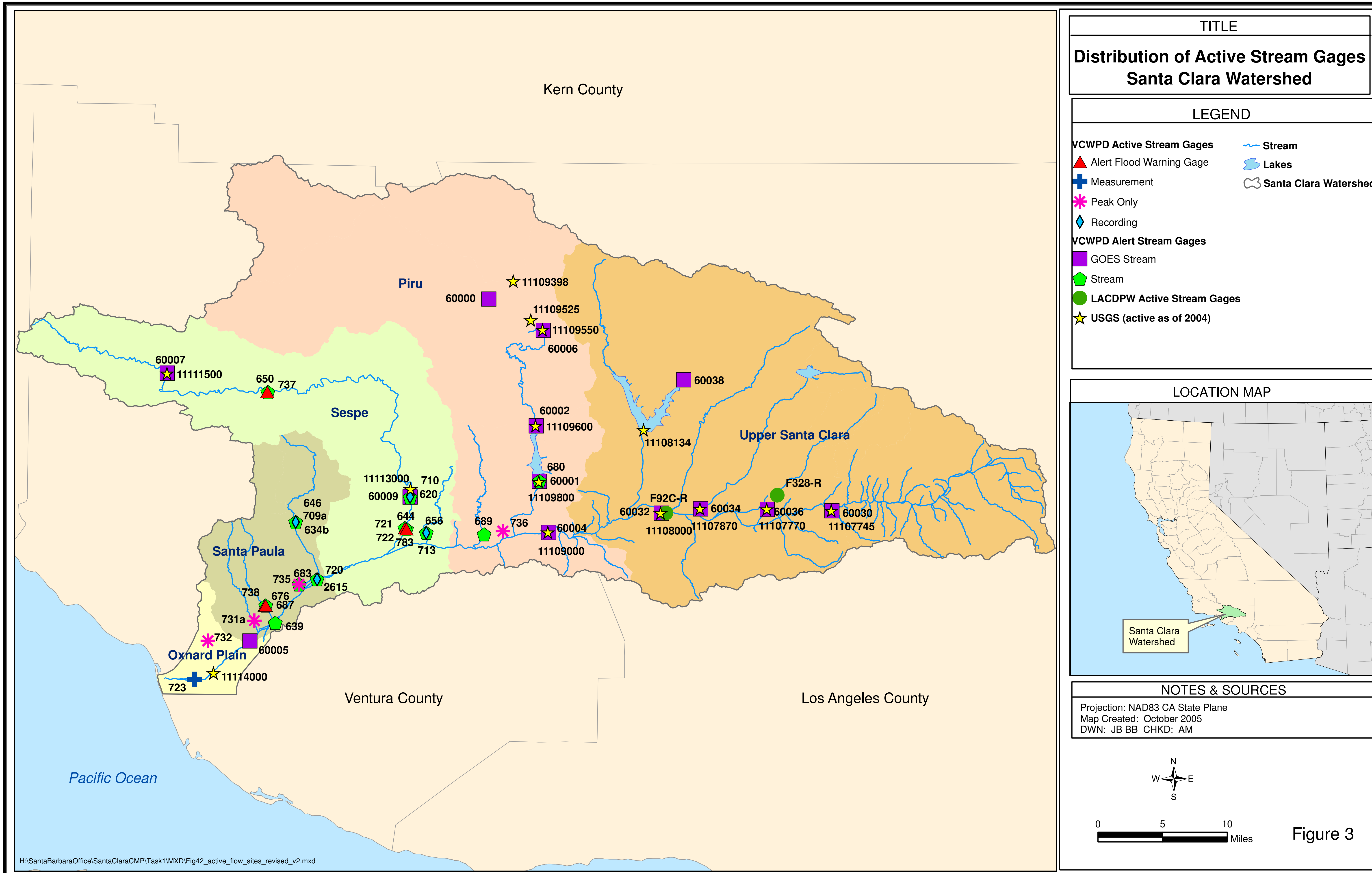
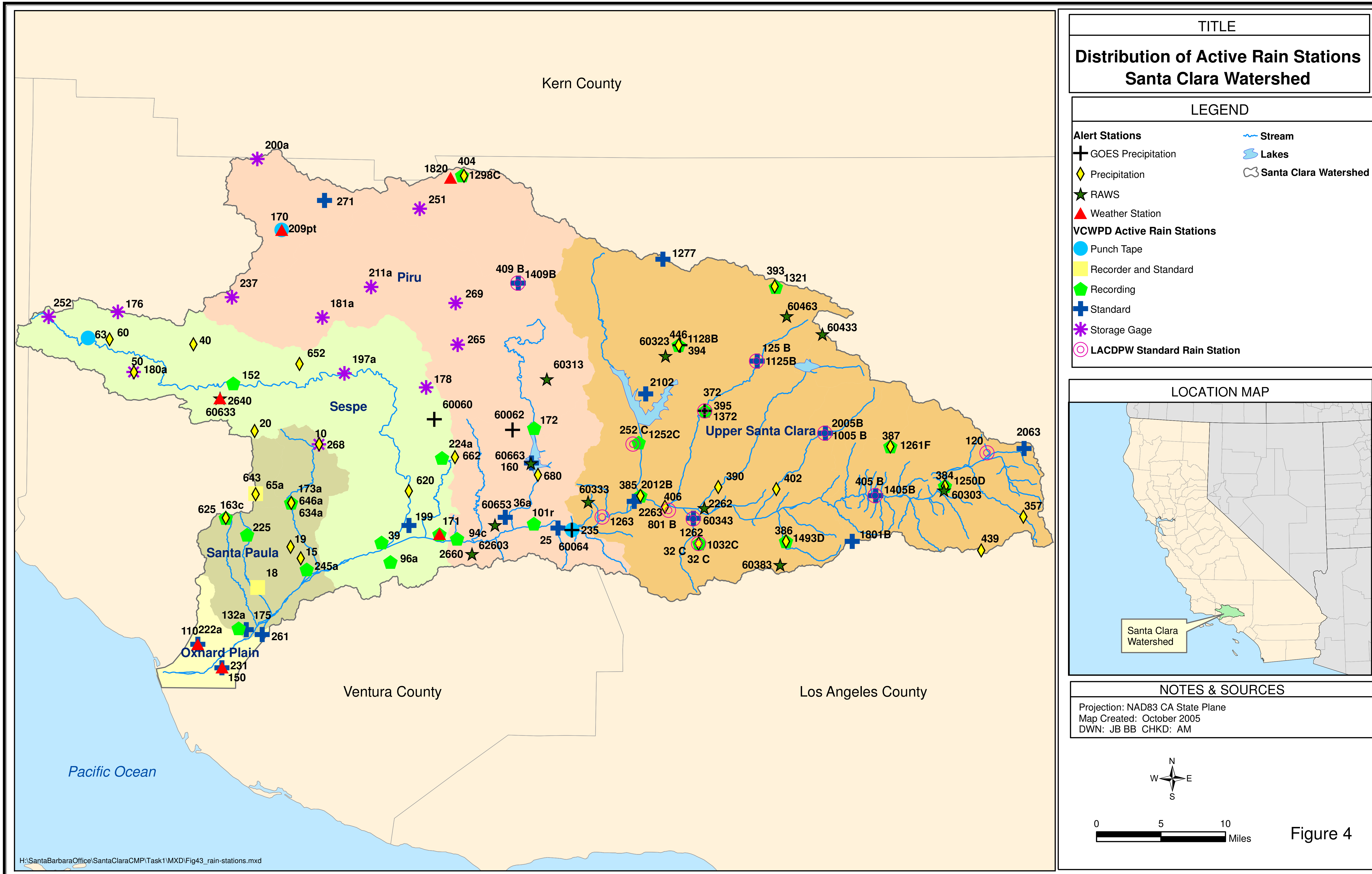
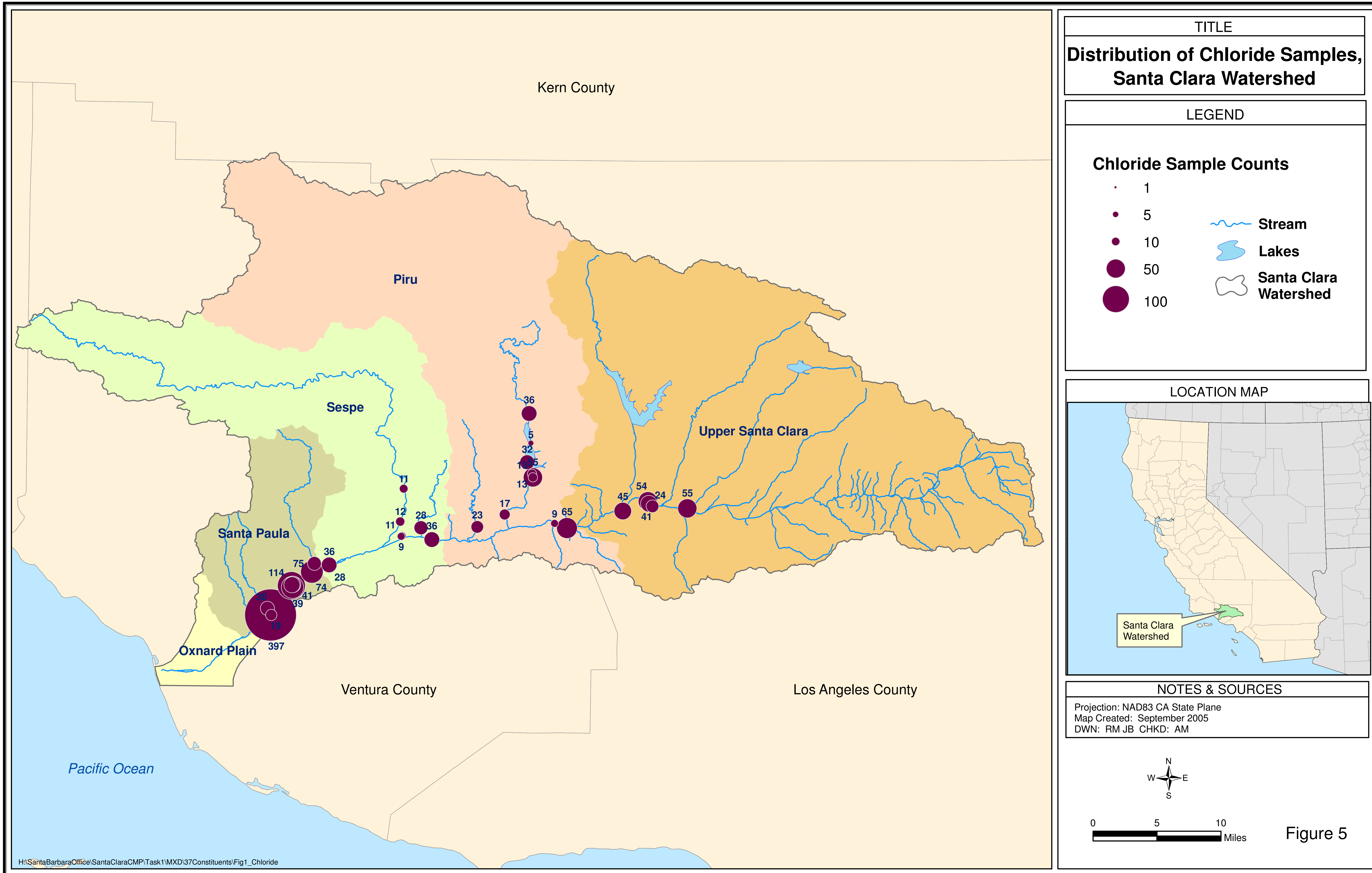
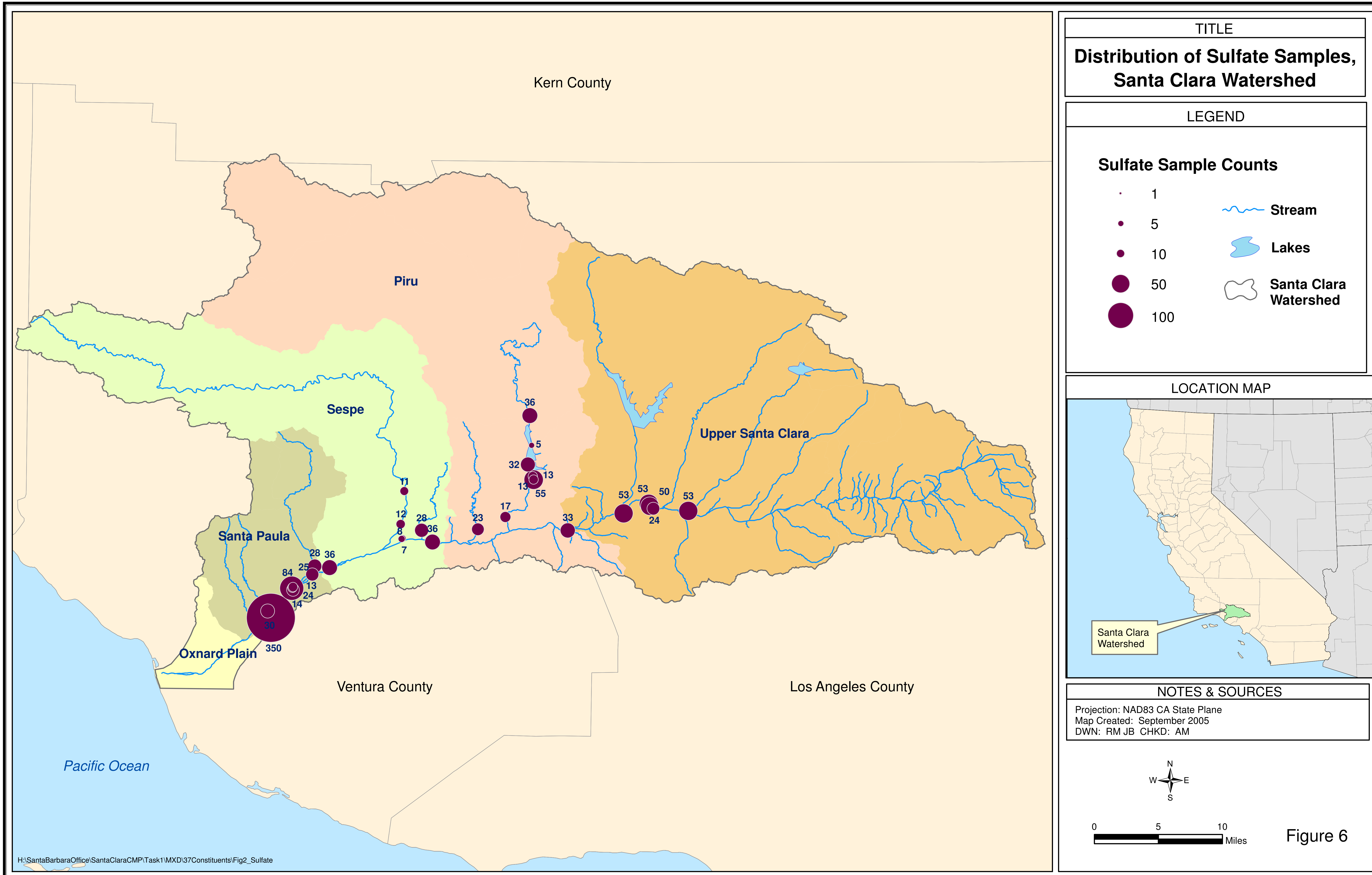


TITLE
Distribution of Active Stream Gages
Santa Clara Watershed
LEGEND
VCWPD Active Stream Gages
Alert Flood Warning Gage
Measurement
Peak Only
Recording
VCWPD Alert Stream Gages
GOES Stream
Stream
LACDPW Active Stream Gages
USGS (active as of 2004)
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: October 2005
DWN: JB BB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Ventura County
Los Angeles County
Pacific Ocean
Piru
Sespe
Santa Paula
Oxnard Plain
Upper Santa Clara
60000
11109398
11109525
11109550
60006
60007
11111500
650
737
60038
60002
11109600
11108134
680
60001
11109800
11113000
710
60009
620
646
709a
634b
644
721
722
783
656
713
689
736
60004
11109000
F92C-R
60032
11108000
60034
11107870
F328-R
60036
11107770
60030
11107745
683
735
720
2615
738
676
687
731a
639
732
60005
723
11114000
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\Fig42_active_flow_sites_revised_v2.mxd


Figure 3


TITLE
Distribution of Active Rain Stations
Santa Clara Watershed
LEGEND
Alert Stations
GOES Precipitation
Precipitation
RAWS
Weather Station
VCWPD Active Rain Stations
Punch Tape
Recorder and Standard
Recording
Standard
Storage Gage
LACDPW Standard Rain Station
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: October 2005
DWN: JB BB CHKD: AM
N
S
W
E
0
5
10
Miles
Figure 4
Kern County
Ventura County
Los Angeles County
Pacific Ocean
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\Fig43_rain-stations.mxd


TITLE
Distribution of Chloride Samples, Santa Clara Watershed
LEGEND
Chloride Sample Counts
1
5
10
50
100
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 5
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
36
5
32
13
17
23
11
12
28
36
11
9
36
75
28
114
74
41
39
30
19
397
9
65
45
54
24
41
55
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig1_Chloride


TITLE
Distribution of Sulfate Samples, Santa Clara Watershed
LEGEND
Sulfate Sample Counts
1
5
10
50
100
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 6
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
36
5
32
13
13
55
11
12
8
7
28
36
23
17
33
53
53
50
24
53
28
36
25
84
13
24
14
30
350
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig2_Sulfate


TITLE

**Distribution of Total Coliform Samples, Santa Clara Watershed**

LEGEND

**Total Coliform Sample Counts**

10
25
50
75
100

**Lakes**
**Stream**
**Santa Clara Watershed**

LOCATION MAP

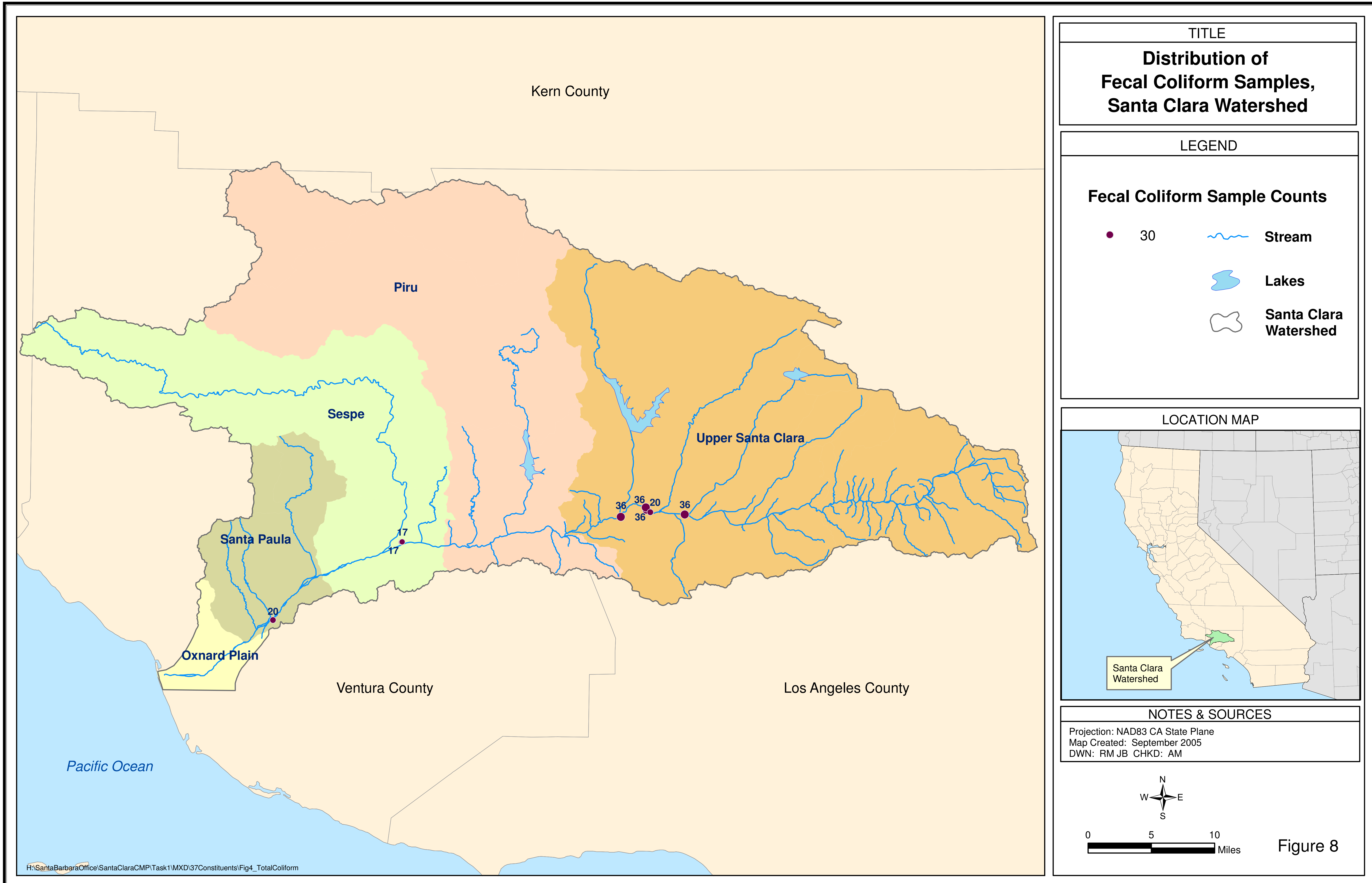

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

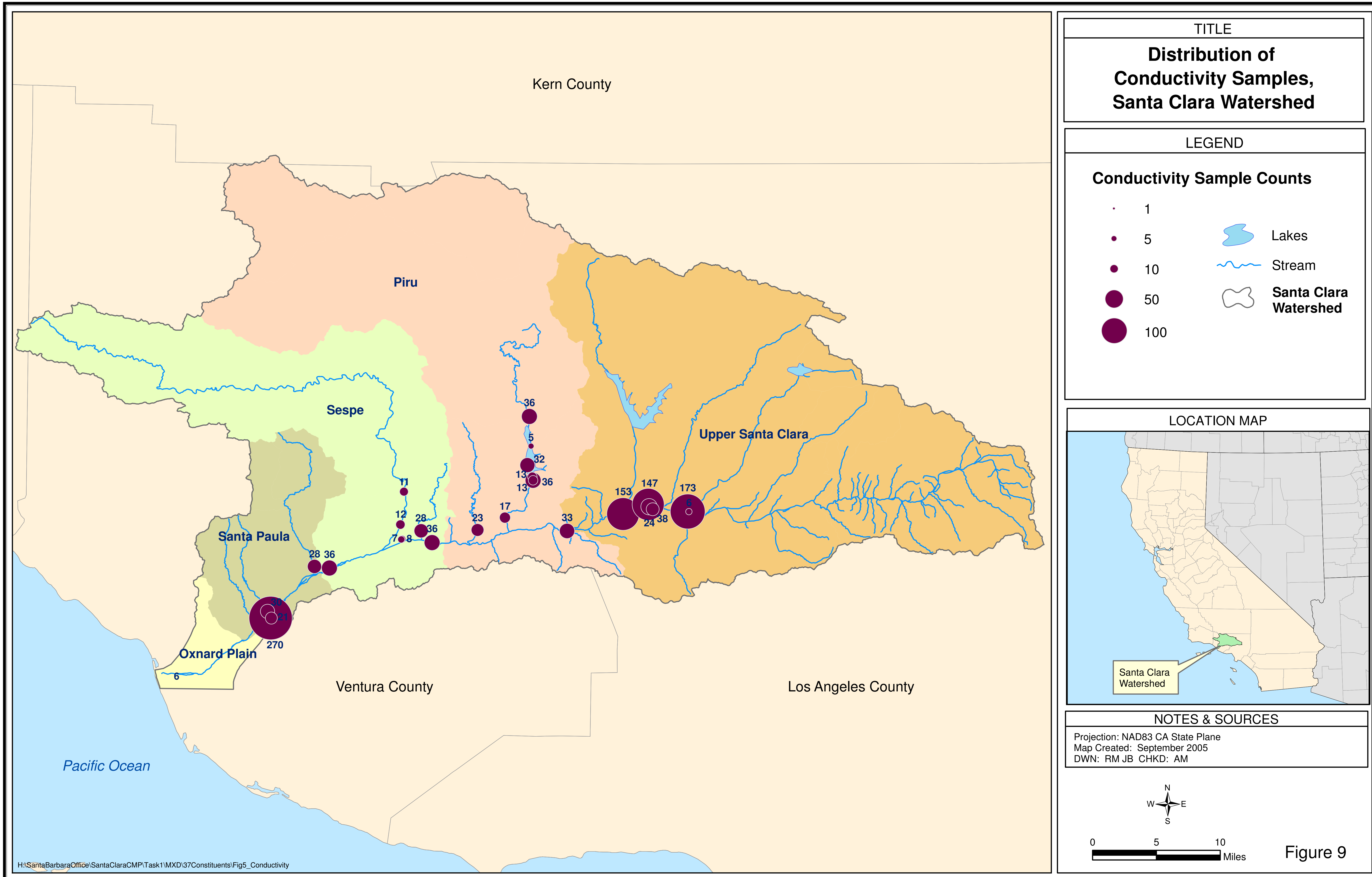
0 5 10 Miles

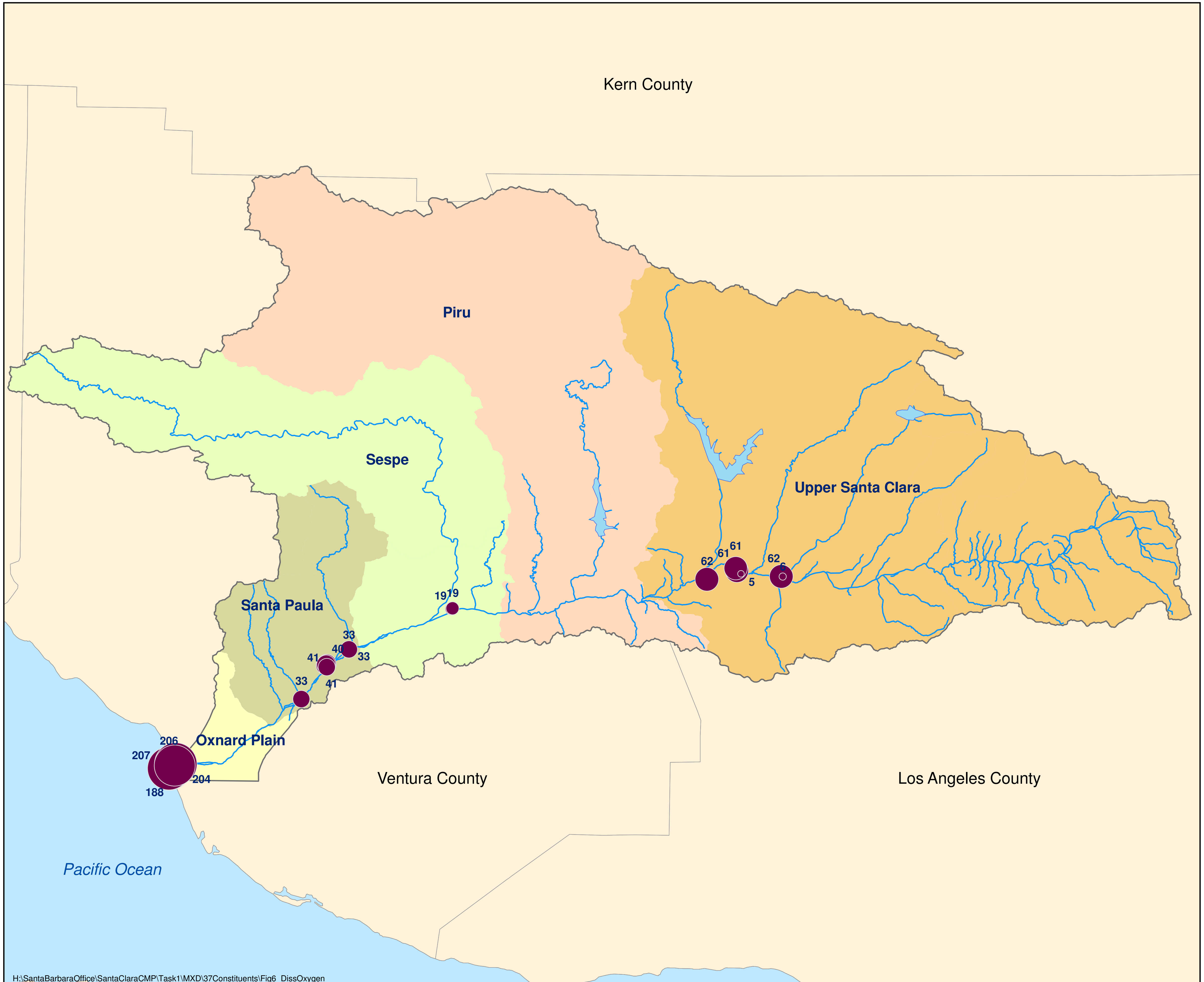
Figure 7



Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
36
36
20
36
36
17
17
20
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig4_TotalColiform
TITLE
Distribution of
Fecal Coliform Samples,
Santa Clara Watershed
LEGEND
Fecal Coliform Sample Counts
30
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles


Figure 8


TITLE
Distribution of Conductivity Samples, Santa Clara Watershed
LEGEND
Conductivity Sample Counts
1
5
10
50
100
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 9
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
36
5
32
13
13
36
11
12
28
36
7
8
23
17
33
153
147
24
38
173
6
28
36
270
6
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig5_Conductivity




TITLE

# Distribution of Dissolved Oxygen Samples, Santa Clara Watershed

LEGEND

**Dissolved Oxygen Sample Counts**

- 1
- 5
- 10
- 50
- 100

Lakes

Stream

**Santa Clara Watershed**

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

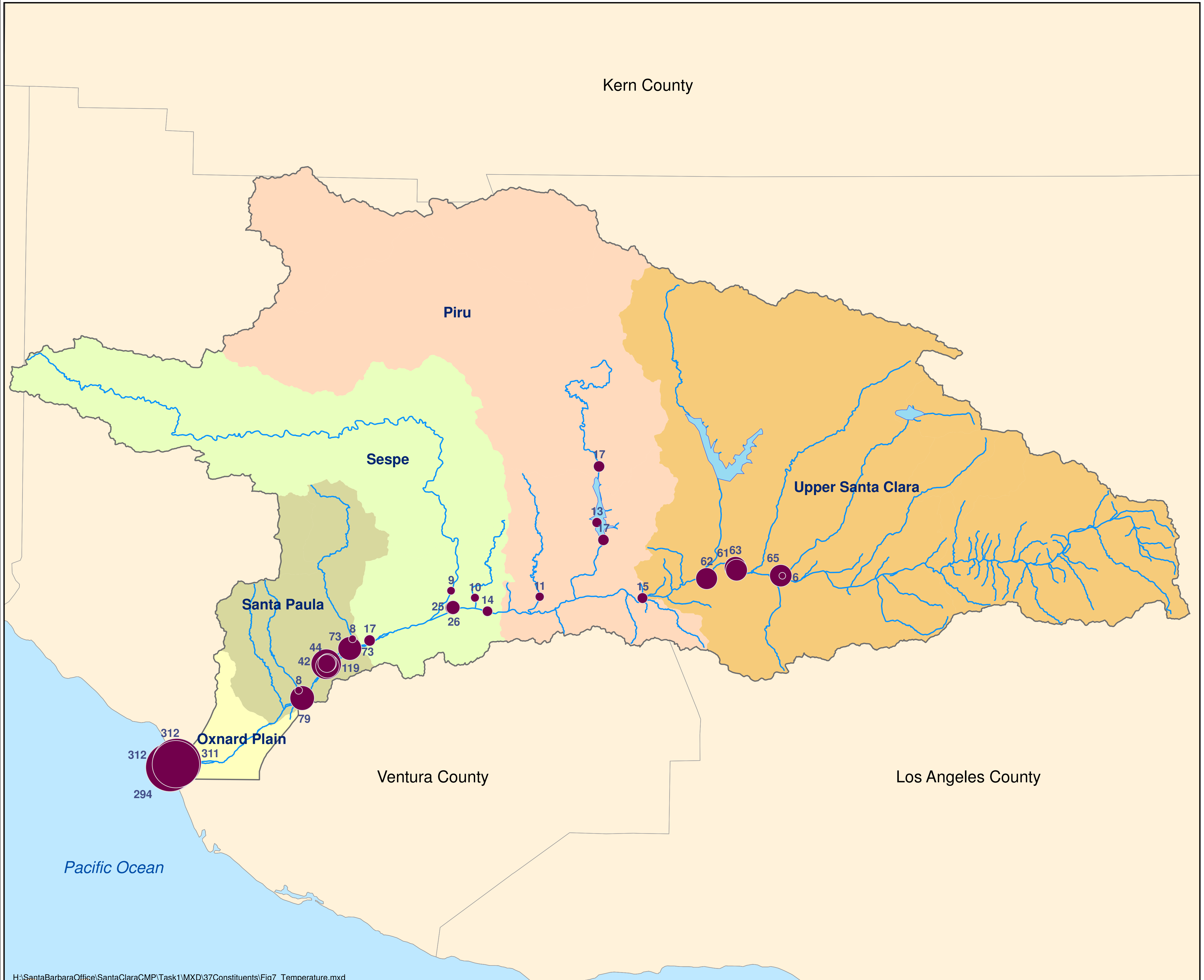
N W E S

0 5 10 Miles

Figure 10

TITLE

**Distribution of Temperature Samples, Santa Clara Watershed**




LEGEND

**Temperature Sample Counts**

10
25
50
75
100

Lakes
Stream
**Santa Clara Watershed**

LOCATION MAP

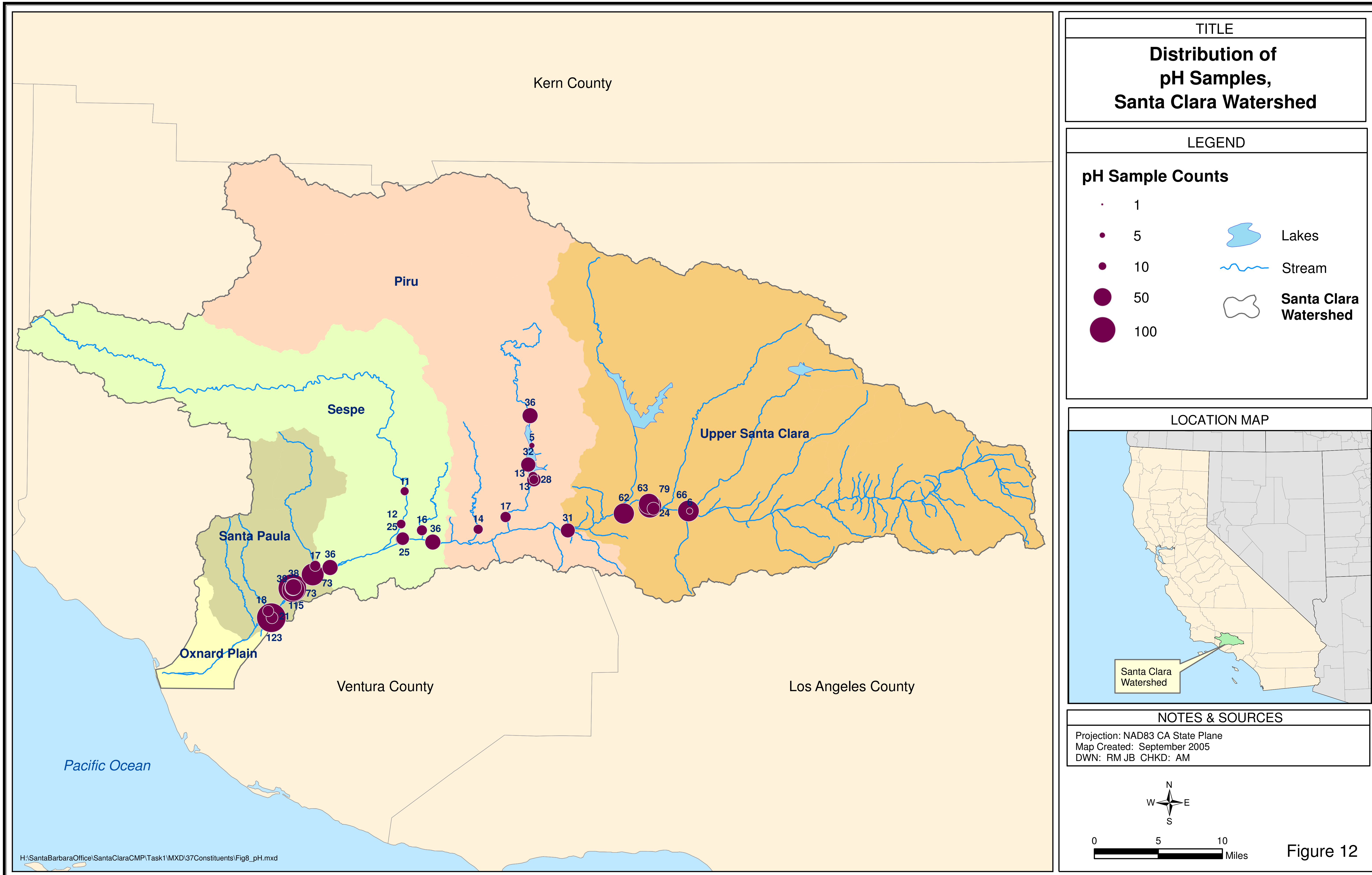

NOTES & SOURCES

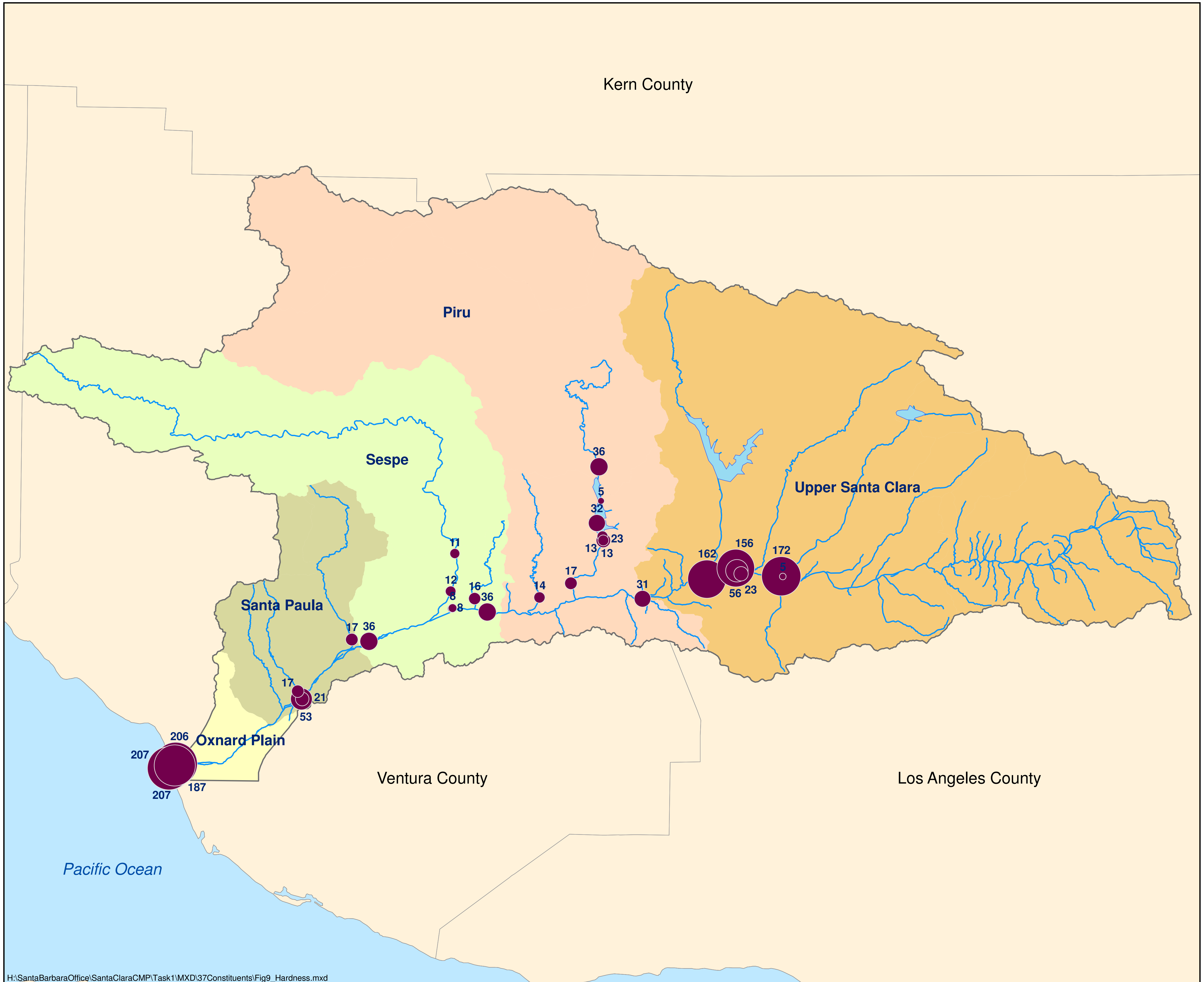
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N
W E
S

0 5 10
Miles

Figure 11


TITLE
Distribution of pH Samples, Santa Clara Watershed
LEGEND
pH Sample Counts
1
5
10
50
100
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig8_pH.mxd
Figure 12




TITLE

**Distribution of Hardness (as CaCO3) Samples, Santa Clara Watershed**

LEGEND

**Hardness (as CaCO3) Sample Counts**

- 1
- 5
- 10
- 50
- 100

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP

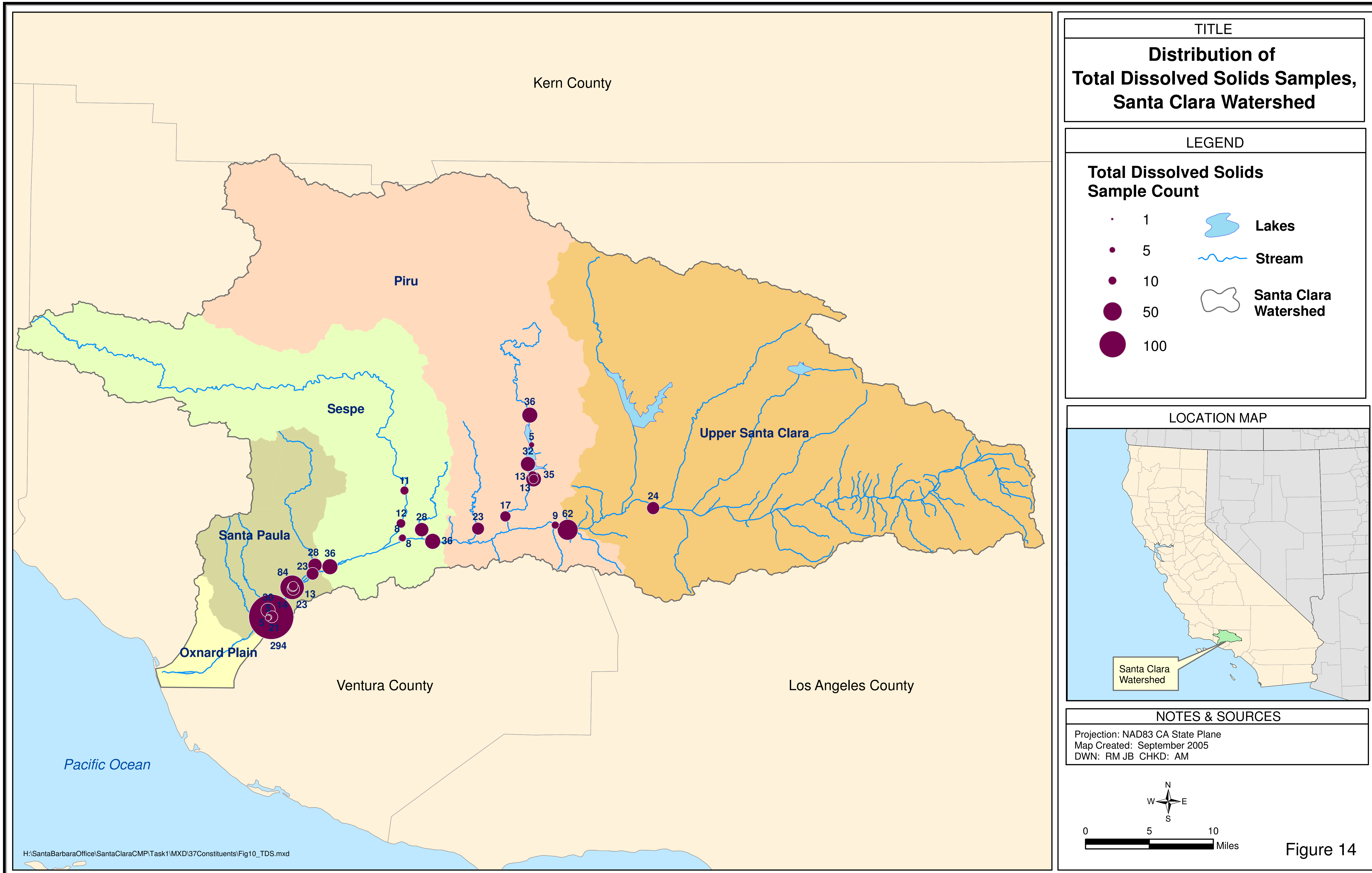

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 13



TITLE
Distribution of Total Dissolved Solids Samples, Santa Clara Watershed
LEGEND
Total Dissolved Solids Sample Count
1
5
10
50
100
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 14
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
36
5
32
13
35
13
11
12
28
8
8
36
23
17
9
62
24
28
36
23
84
13
23
294
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig10_TDS.mxd


TITLE

**Distribution of Total Suspended Solids Samples, Santa Clara Watershed**

LEGEND

**Total Suspended Solids Sample Counts**

• 20

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 15

TITLE

# Distribution of Flow Sampling Excluding Active Stream Gauging Stations


LEGEND

**Flow Sampling Counts**

10

50

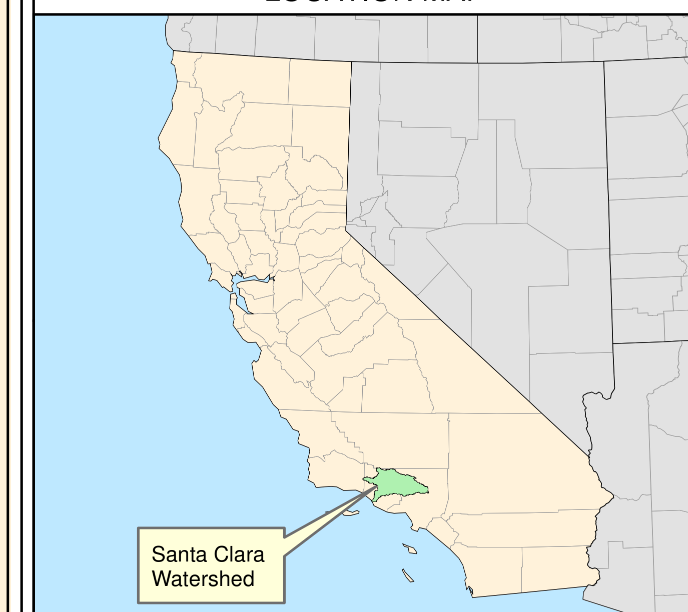
100

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 16

TITLE

# Distribution of Aluminum Sampling, Santa Clara Watershed


LEGEND

**Aluminum Sample Counts**

- 10

- **Lakes**
- **Stream**
- **Santa Clara Watershed**

LOCATION MAP

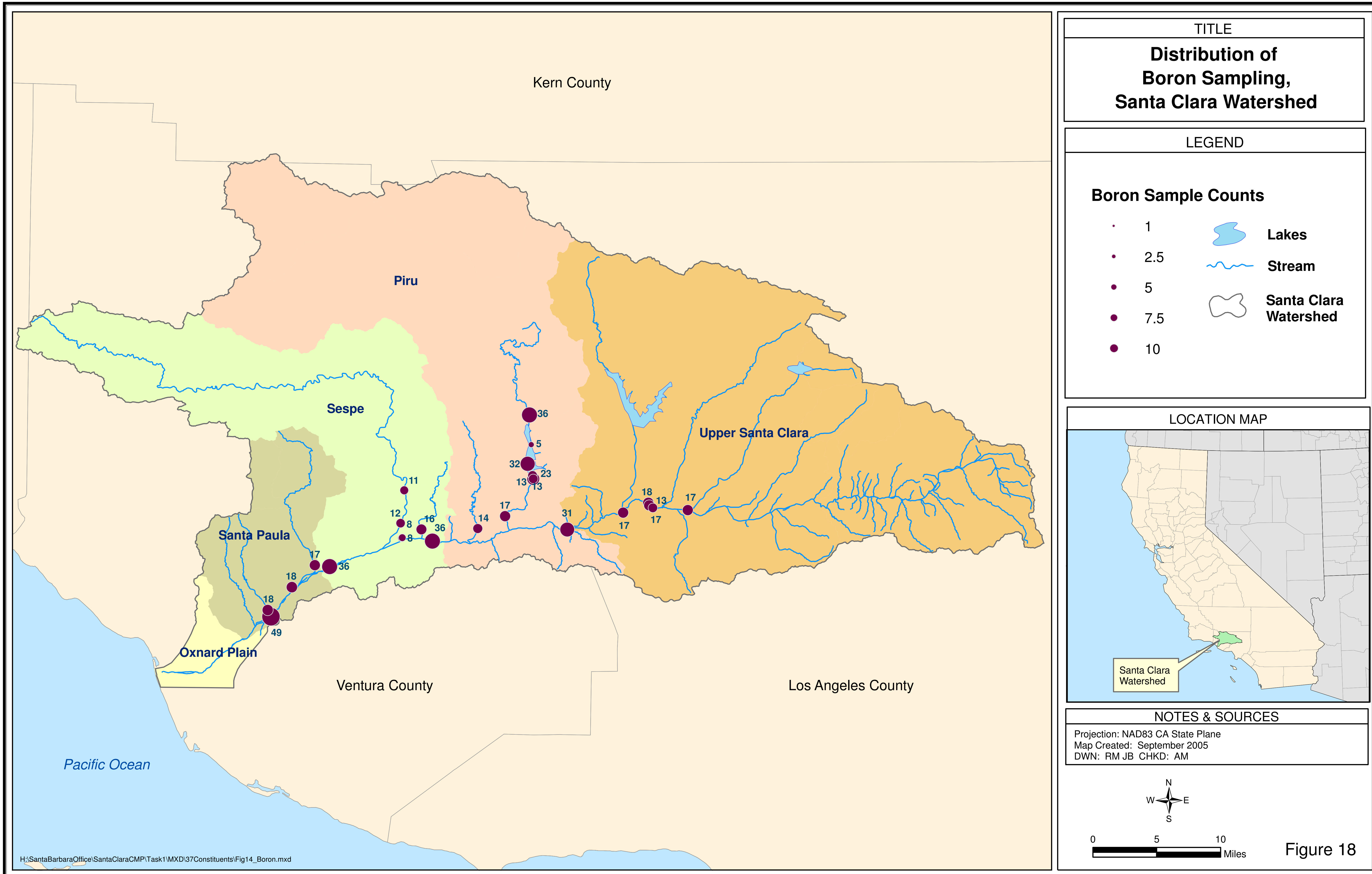

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

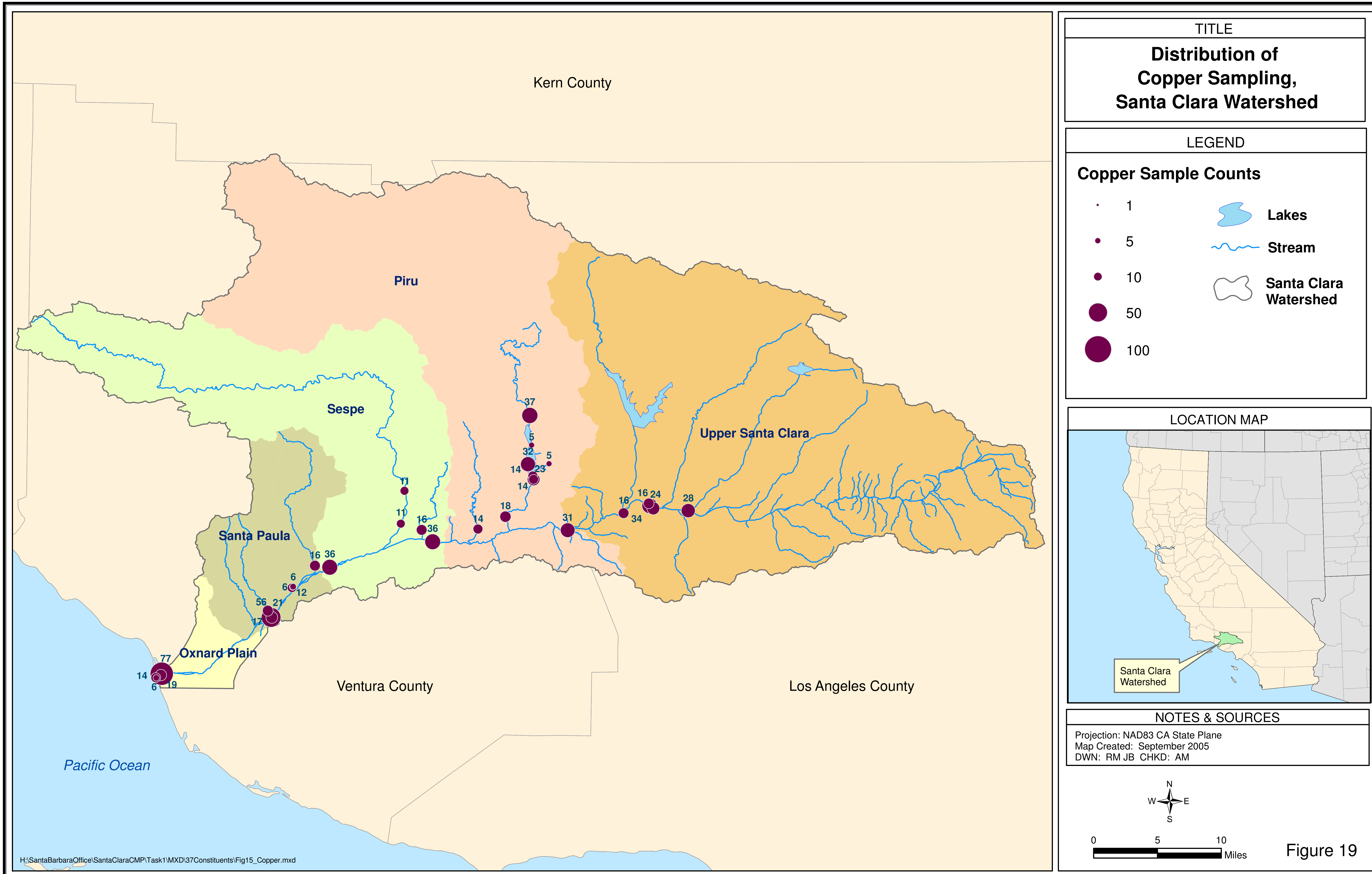
N W E S

0 5 10 Miles

Figure 17

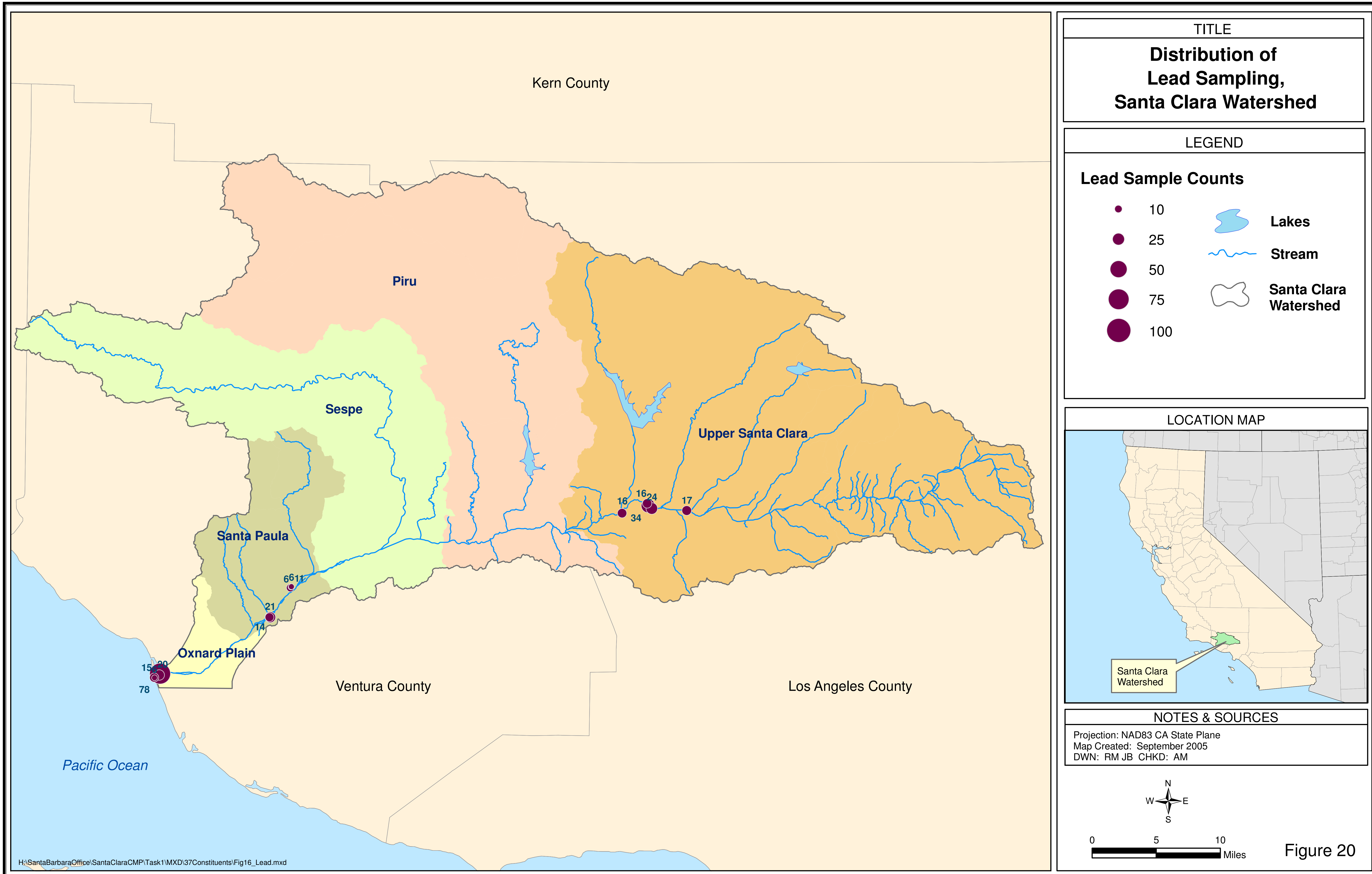


TITLE
Distribution of Boron Sampling, Santa Clara Watershed
LEGEND
Boron Sample Counts
1
2.5
5
7.5
10
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 18
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
36
5
32
23
13
13
11
12
8
8
16
36
14
17
31
18
13
17
17
17
17
36
18
18
49
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig14_Boron.mxd



Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
37
5
32
5
14
23
14
11
11
16
36
14
18
31
16
16
24
34
28
16
36
6
6
12
56
21
17
77
14
6
19
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig15_Copper.mxd
TITLE
Distribution of Copper Sampling, Santa Clara Watershed
LEGEND
Copper Sample Counts
1
5
10
50
100
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles


Figure 19


TITLE
Distribution of Lead Sampling, Santa Clara Watershed
LEGEND
Lead Sample Counts
10
25
50
75
100
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 20
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
16
16
24
34
17
66
11
21
14
15
20
78
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig16_Lead.mxd

TITLE

# Distribution of Mercury Sampling, Santa Clara Watershed


LEGEND

**Mercury Sample Counts**

30

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

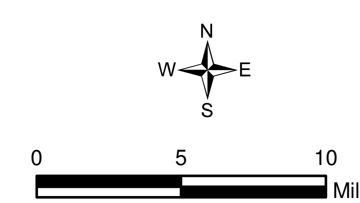



Figure 21


TITLE

# Distribution of Thallium Sampling, Santa Clara Watershed

LEGEND

**Thallium Sample Counts**

- 1
- 5
- 10

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N
W E
S

0 5 10
Miles

Figure 22

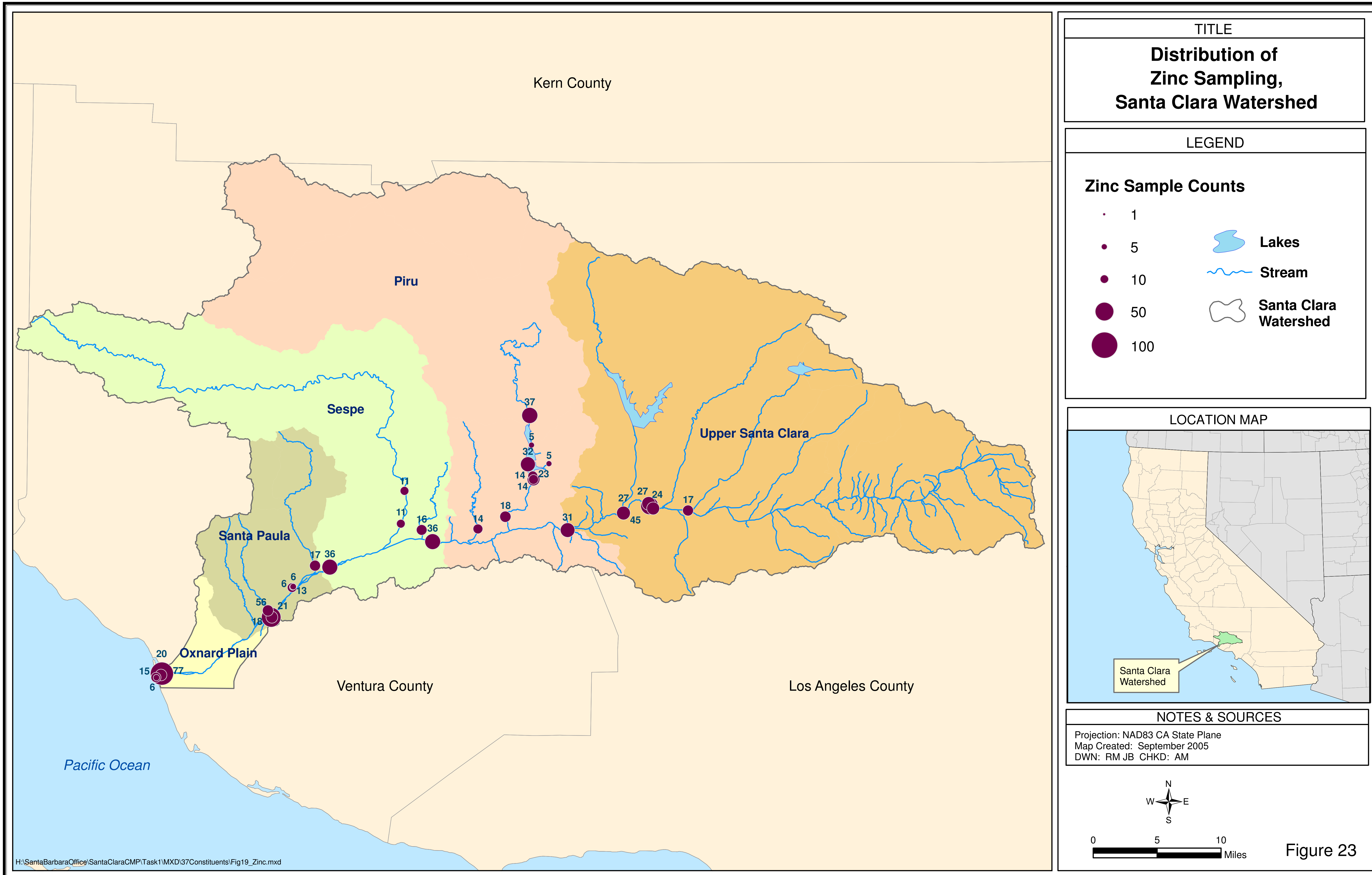
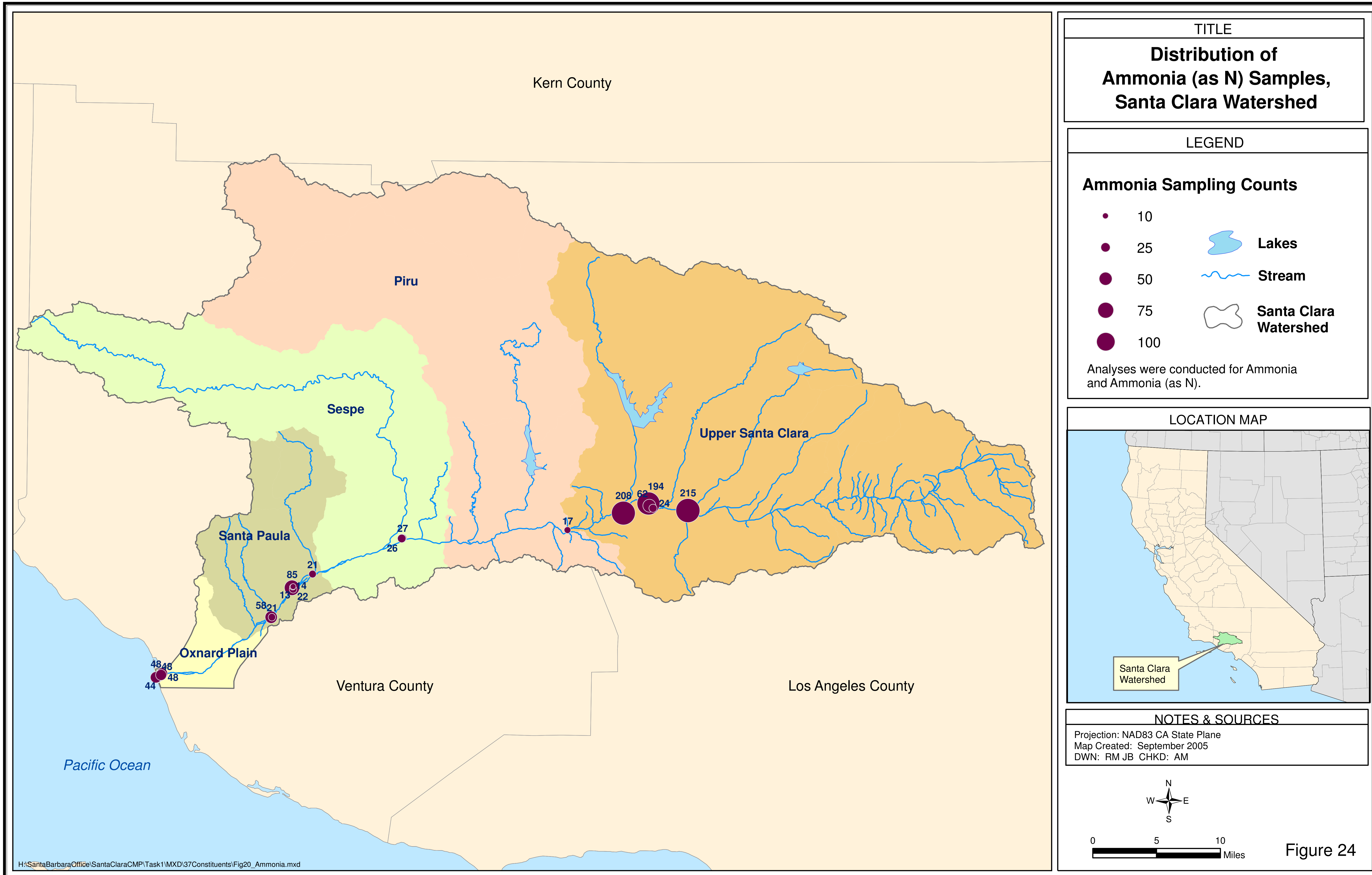
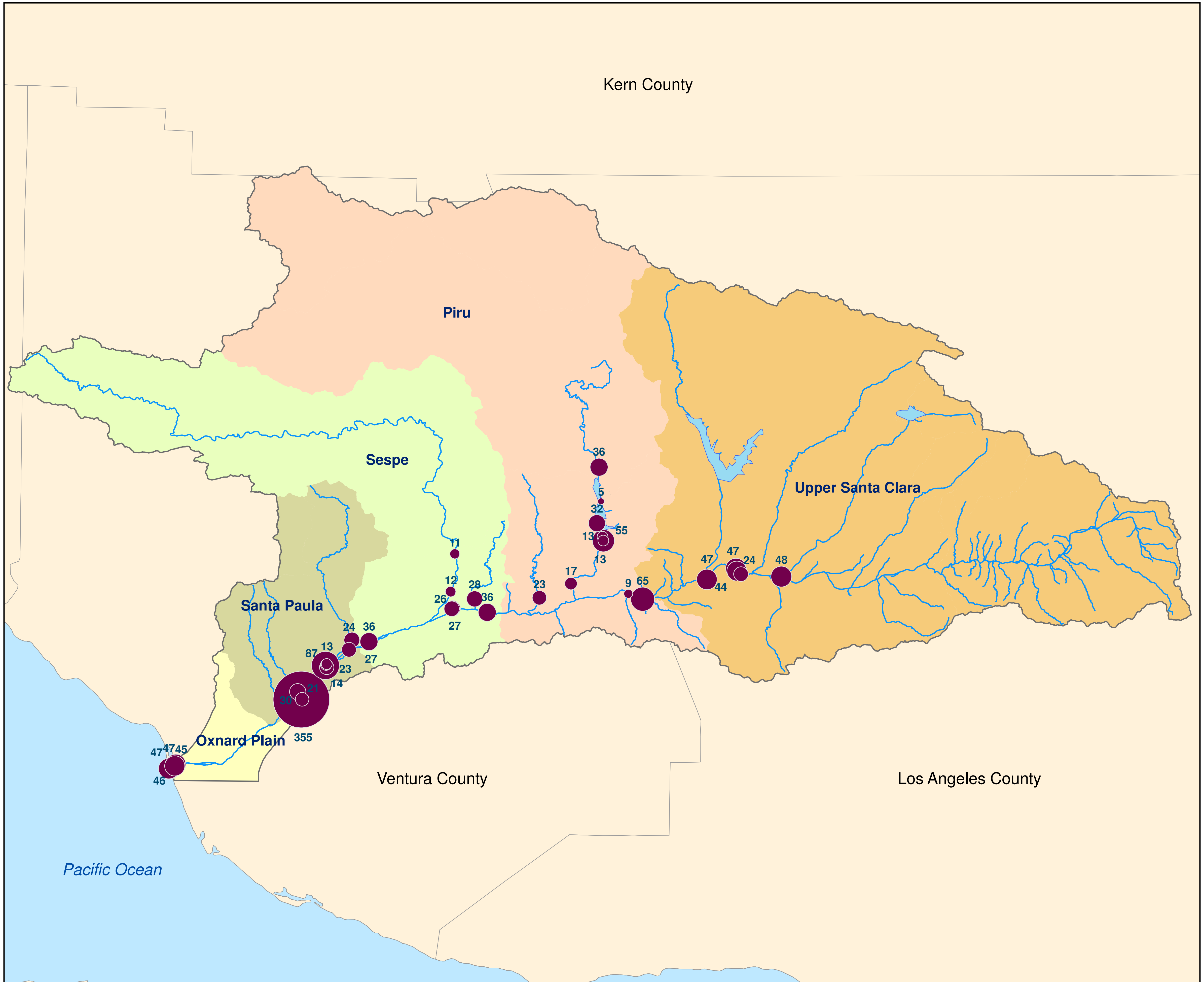

TITLE
Distribution of Zinc Sampling, Santa Clara Watershed
LEGEND
Zinc Sample Counts
1
5
10
50
100
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig19_Zinc.mxd

Figure 23


TITLE
Distribution of Ammonia (as N) Samples, Santa Clara Watershed
LEGEND
Ammonia Sampling Counts
10
25
50
75
100
Lakes
Stream
Santa Clara Watershed
Analyses were conducted for Ammonia and Ammonia (as N).
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
208
194
62
24
215
17
27
26
21
85
4
13
22
58
21
48
48
48
44
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig20_Ammonia.mxd
Figure 24

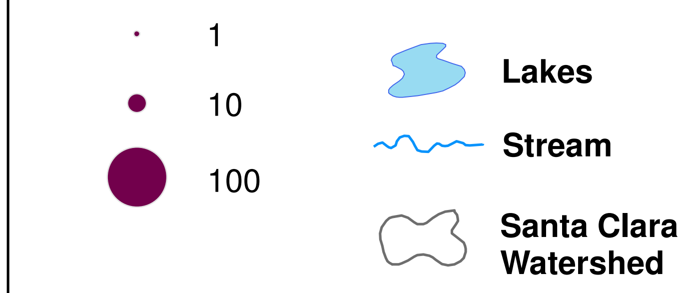
TITLE

**Distribution of Nitrate Samples, Santa Clara Watershed**

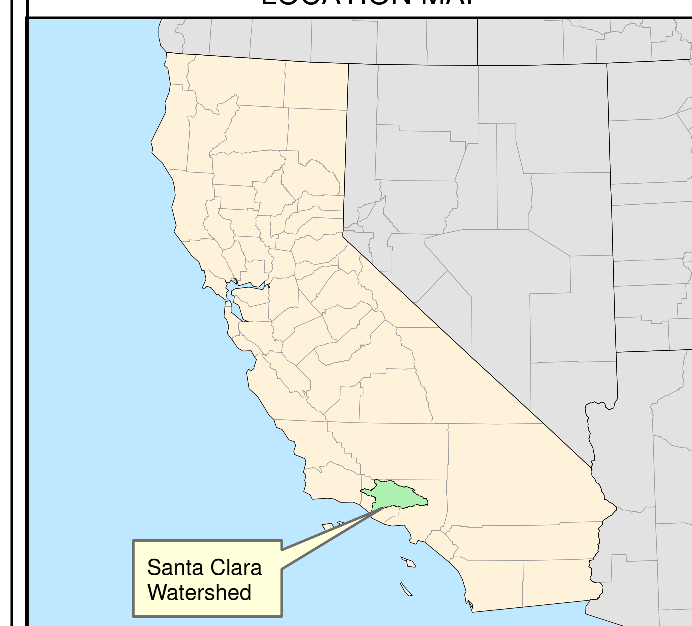



LEGEND

**Nitrate Sample Counts**




LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

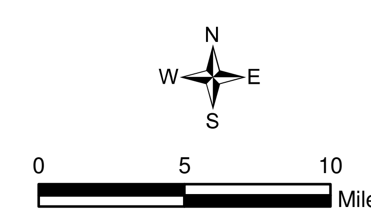



Figure 25


TITLE

**Distribution of Nitrite (as N) Samples, Santa Clara Watershed**

LEGEND

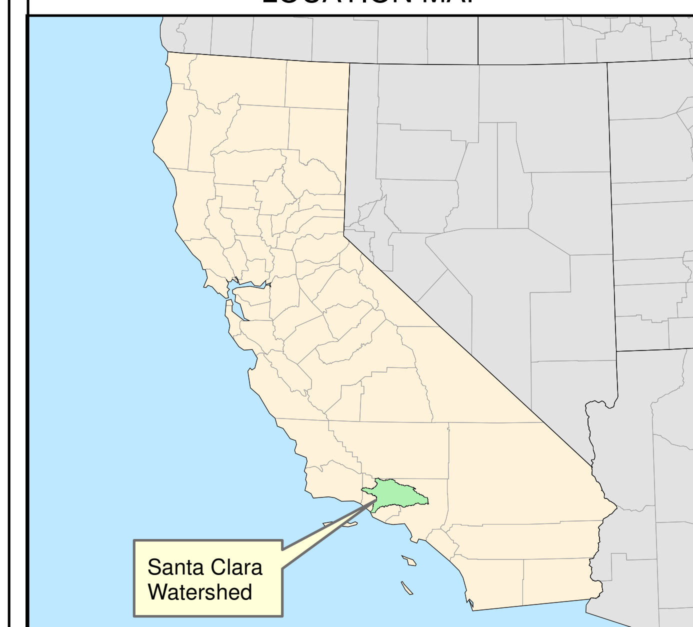
**Nitrite (as N) Sample Counts**

10
25
50
75
100

**Lakes**
**Stream**
**Santa Clara Watershed**

Analyses were conducted for Nitrite and Nitrite (as N)

LOCATION MAP



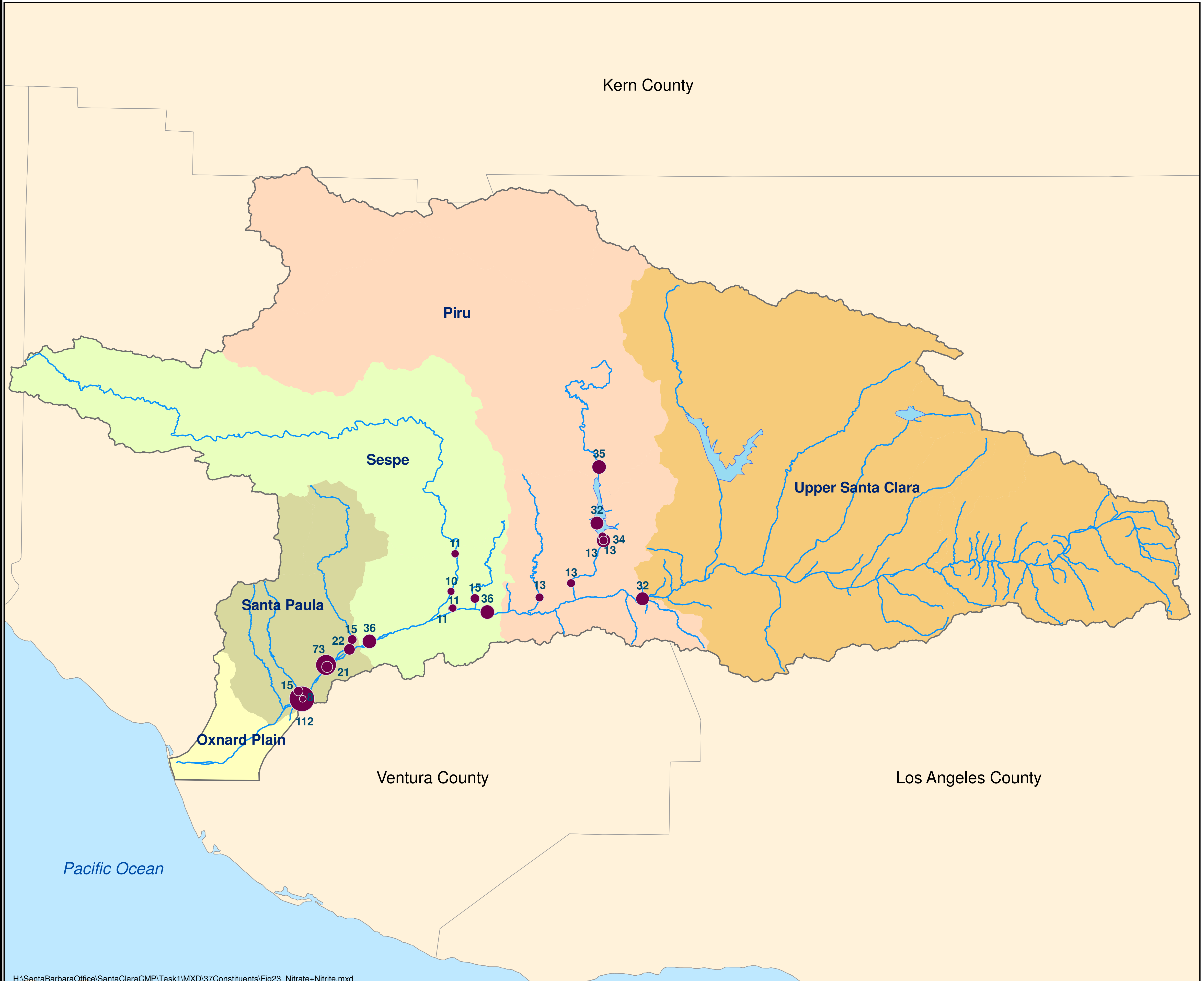

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 26




TITLE

**Distribution of Nitrate + Nitrite Samples, Santa Clara Watershed**

LEGEND

**Nitrate & Nitrite Sample Counts**

10
25
50
75
100

**Lakes**
**Stream**
**Santa Clara Watershed**

LOCATION MAP

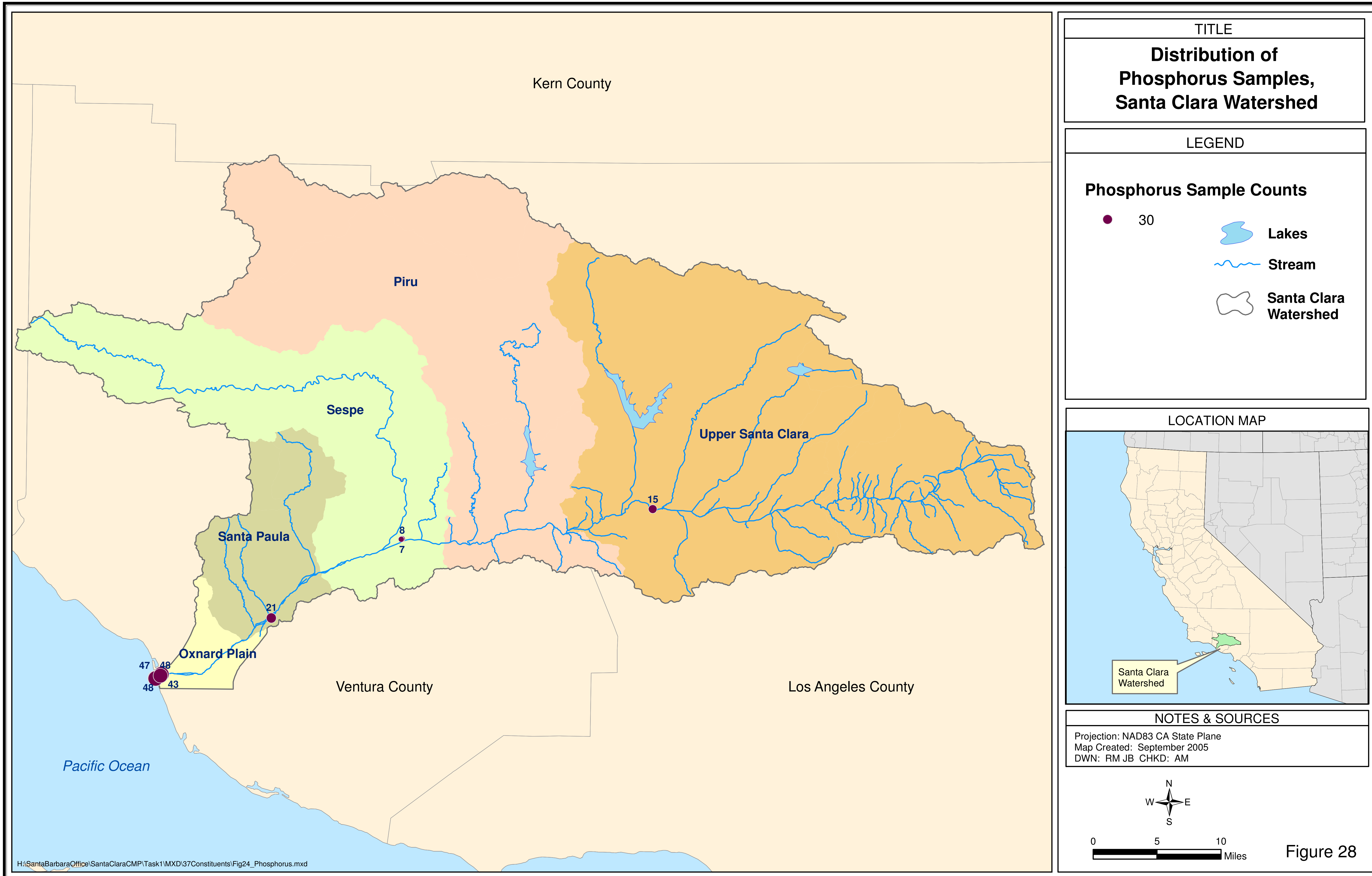

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N
W E
S

0 5 10
Miles

Figure 27



TITLE
Distribution of Phosphorus Samples, Santa Clara Watershed
LEGEND
Phosphorus Sample Counts
30
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
15
8
7
21
47
48
43
48
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig24_Phosphorus.mxd

Figure 28

TITLE

# Distribution of Phosphate Samples, Santa Clara Watershed


LEGEND

**Phosphate Sample Counts**

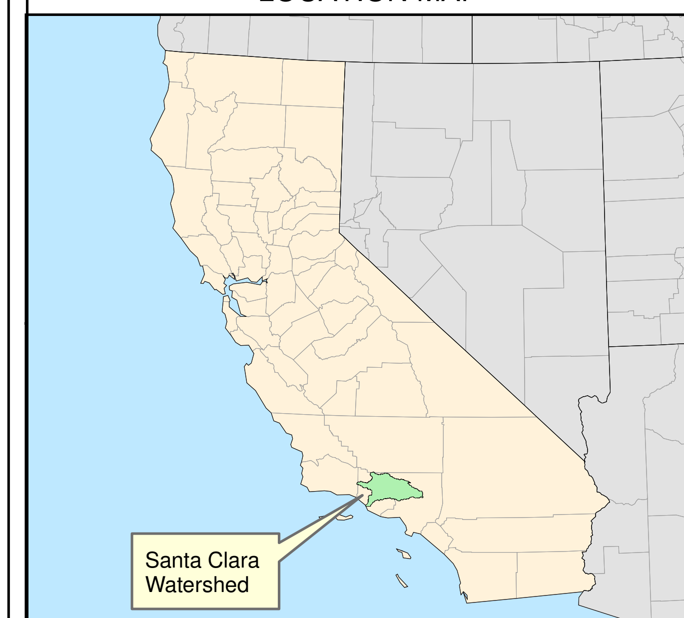
- 10
- 25
- 50
- 75
- 100

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: August 2005
DWN: RM JB CHKD: AM

0 5 10 Miles

Figure 29

# Distribution of Polycyclic Aromatic Hydrocarbons Sampling, Santa Clara Watershed


TITLE

Distribution of Polycyclic Aromatic Hydrocarbons Sampling, Santa Clara Watershed

LEGEND

**PAH Sample Counts**

20

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP

Santa Clara Watershed

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 30

TITLE

**Distribution of Polychlorinated Biphenyls (PCBs) Sampling, Santa Clara Watershed**


LEGEND

**PCB Sampling Counts**

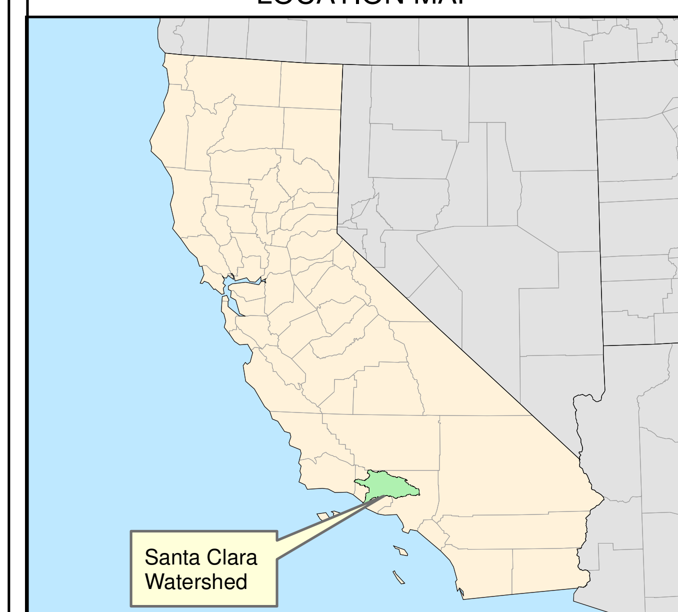
20

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N
W E
S

0 5 10 Miles

Figure 31

TITLE

## Distribution of DDT Samples (All Isomers), Santa Clara Watershed


LEGEND

**DDT, DDD, DDE and Methoxychlor Sample Counts**

● 20

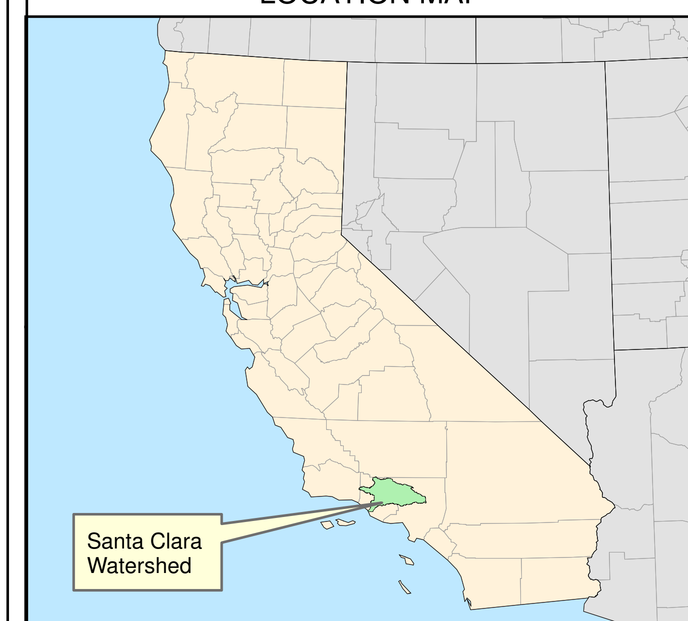
**Lakes**

**Stream**

**Santa Clara Watershed**

DDT counts include all isomers.

LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 32

TITLE

**Distribution of Aldrin, Dieldrin & Endrin Samples, Santa Clara Watershed**


LEGEND

**Aldrin, Endrin, and Dieldrin Counts**

20

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N
W E
S

0 5 10 Miles

Figure 33


TITLE

**Distribution of Heptachlor/ Heptachlor Epoxide Samples, Santa Clara Watershed**

LEGEND

**Heptachlor/Heptachlor Epoxide Sample Counts**

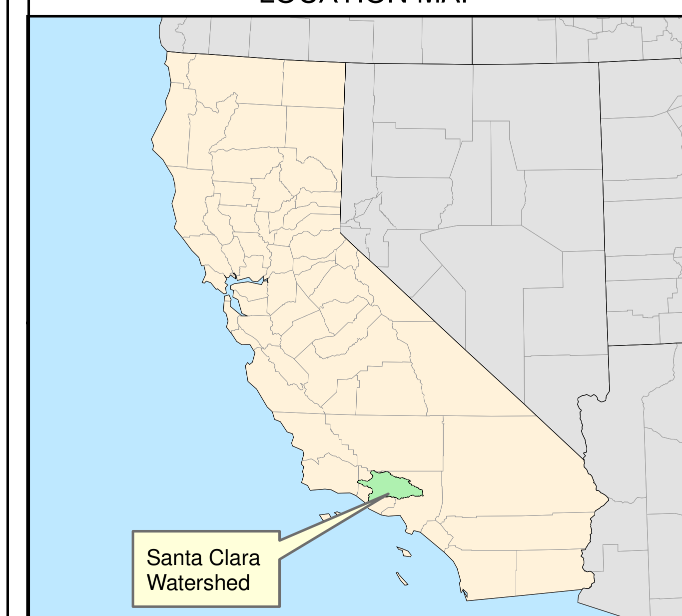
20

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 34


TITLE

**Distribution of Endosulfan Isomers, Santa Clara Watershed**

LEGEND

**Endosulfan Isomers**

● 20

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP

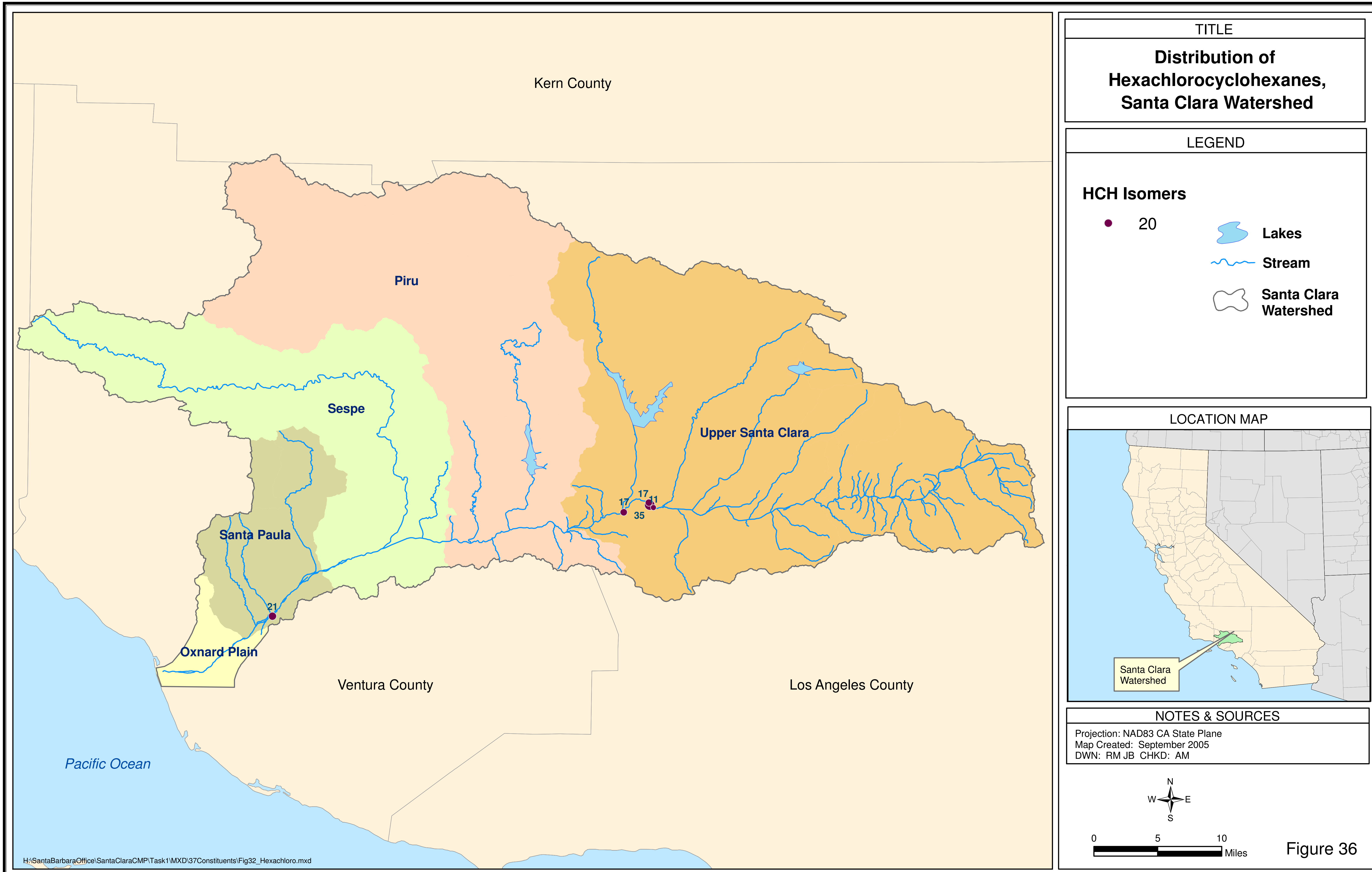

NOTES & SOURCES

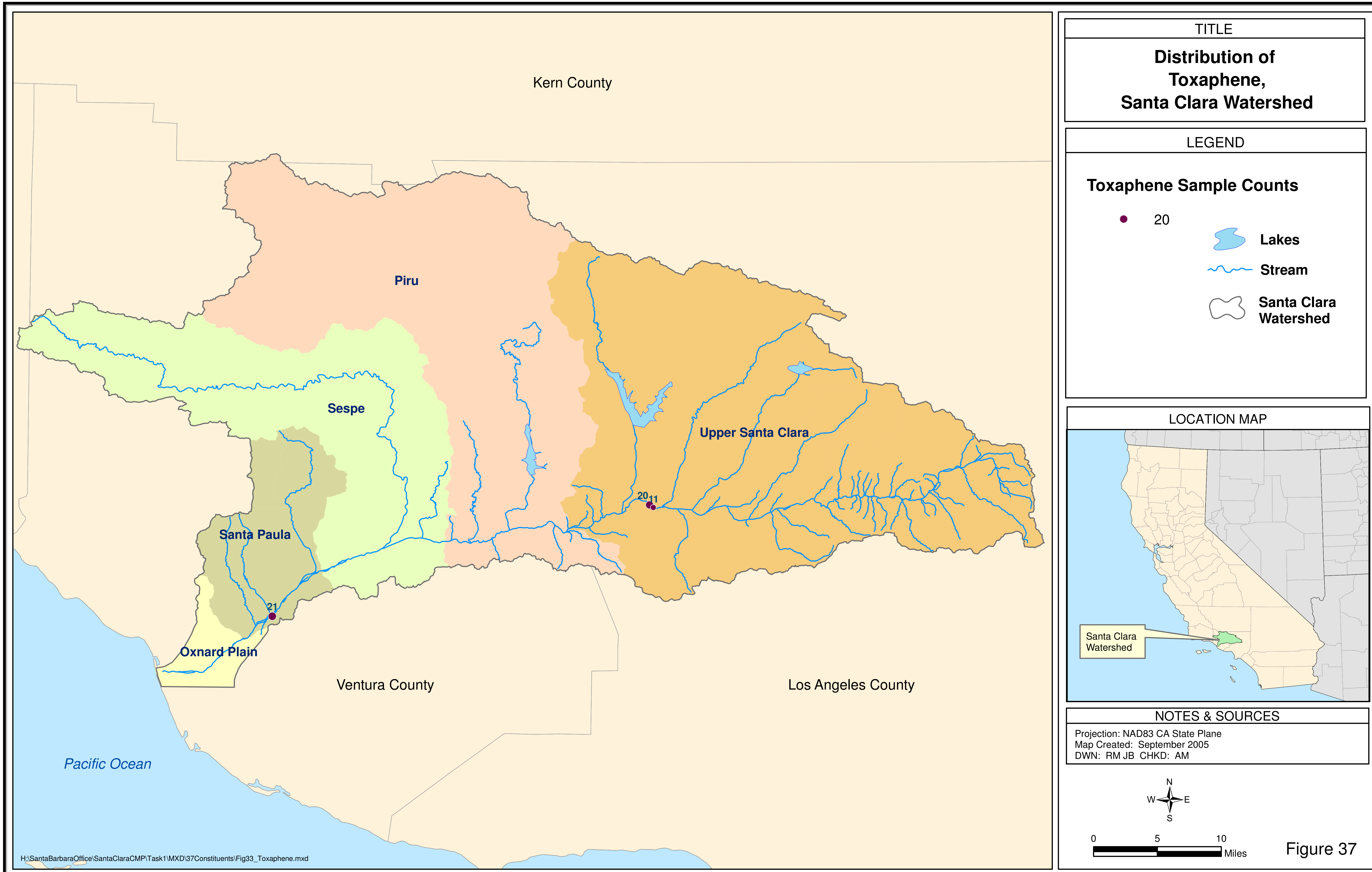
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

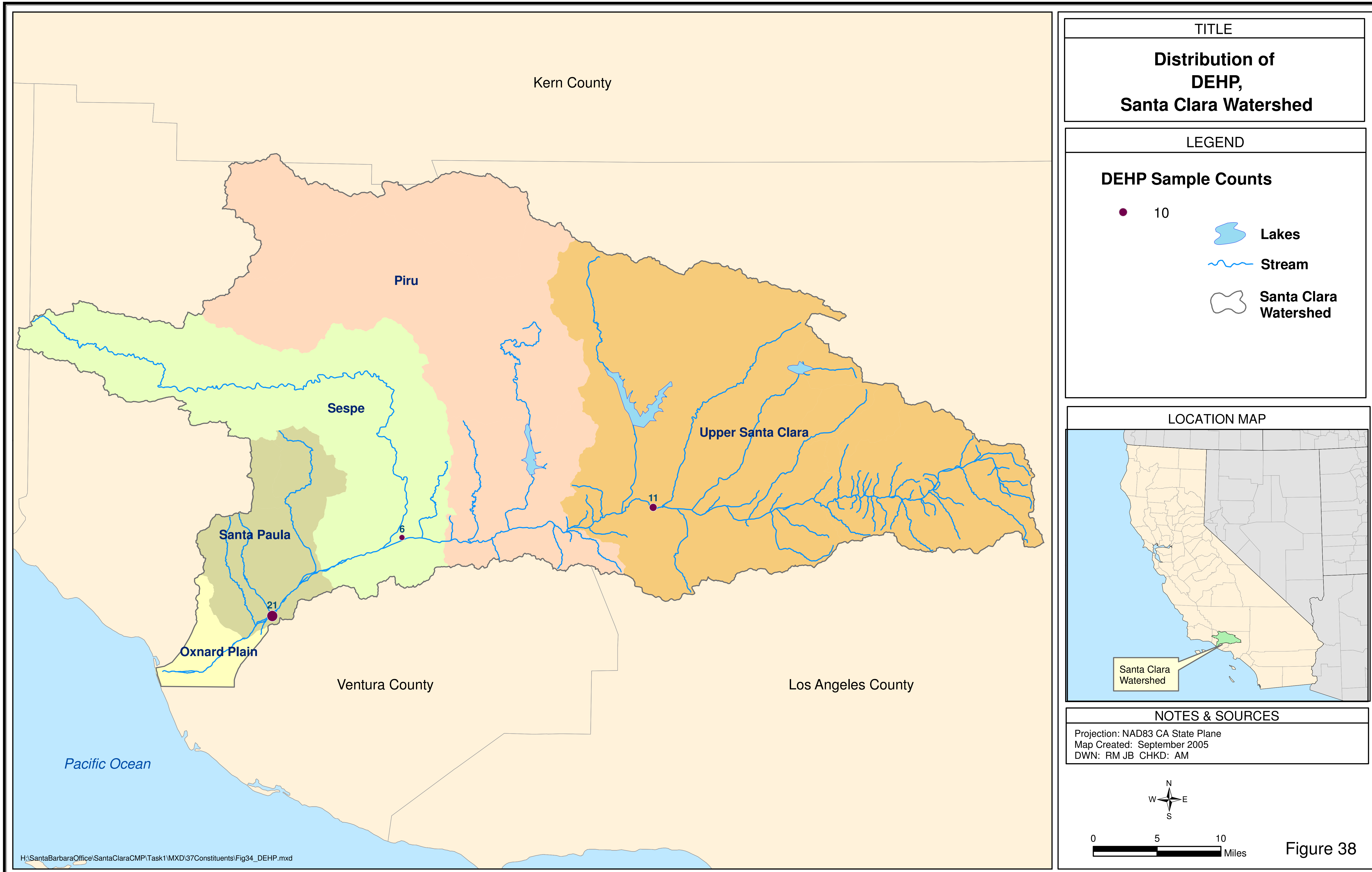
Figure 35


TITLE
Distribution of Hexachlorocyclohexanes, Santa Clara Watershed
LEGEND
HCH Isomers
20
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
17
17
11
35
21
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig32_Hexachloro.mxd
Figure 36



Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
20
11
21
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig33_Toxaphene.mxd
TITLE
Distribution of Toxaphene, Santa Clara Watershed
LEGEND
Toxaphene Sample Counts
20
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles


Figure 37



Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
6
11
21
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig34_DEHP.mxd
TITLE
Distribution of
DEHP,
Santa Clara Watershed
LEGEND
DEHP Sample Counts
10
Lakes
Stream
Santa Clara
Watershed
LOCATION MAP
Santa Clara
Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Figure 38


H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig35_Chlordane.mxd

TITLE

# Distribution of Chlordane, Santa Clara Watershed

LEGEND

**Chlordane Sample Counts**

- 20
- **Lakes**
- **Stream**
- **Santa Clara Watershed**

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N
W E
S

0 5 10
Miles

Figure 39


TITLE

**Distribution of Other Pesticides and Toxics, Santa Clara Watershed**

LEGEND

- Sample Counts
- Lakes
- Stream
- Santa Clara Watershed

LOCATION MAP


NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 40


TITLE

**Distribution of Chronic Daphnia Toxicity Tests, Santa Clara Watershed**

LEGEND

**Chronic Daphnia Toxicity Test Counts**

10

25

50

75

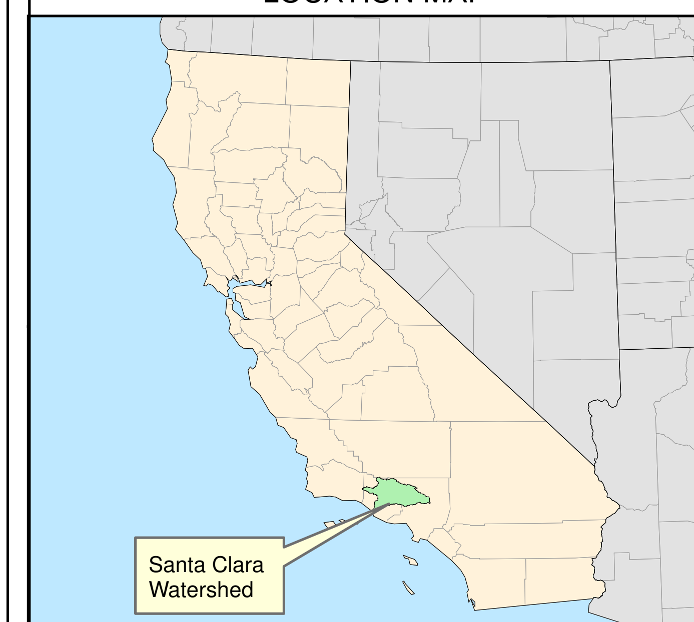
100

**Lakes**

**Stream**

**Santa Clara Watershed**

LOCATION MAP




NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM

N W E S

0 5 10 Miles

Figure 41

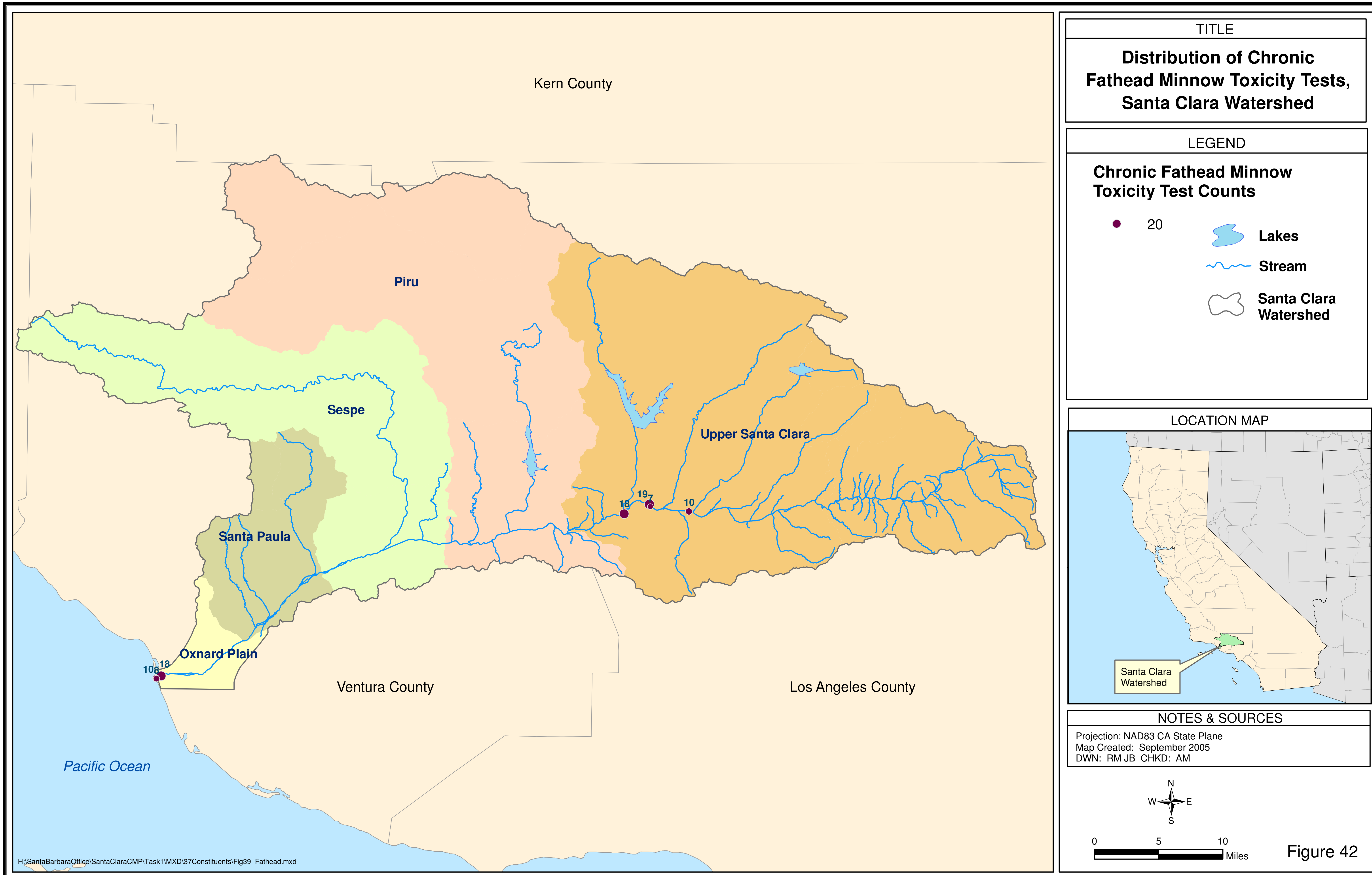

TITLE
Distribution of Chronic Fathead Minnow Toxicity Tests, Santa Clara Watershed
LEGEND
Chronic Fathead Minnow Toxicity Test Counts
20
Lakes
Stream
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
Ventura County
Los Angeles County
Pacific Ocean
18
19
7
10
106
18
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig39_Fathead.mxd

Figure 42

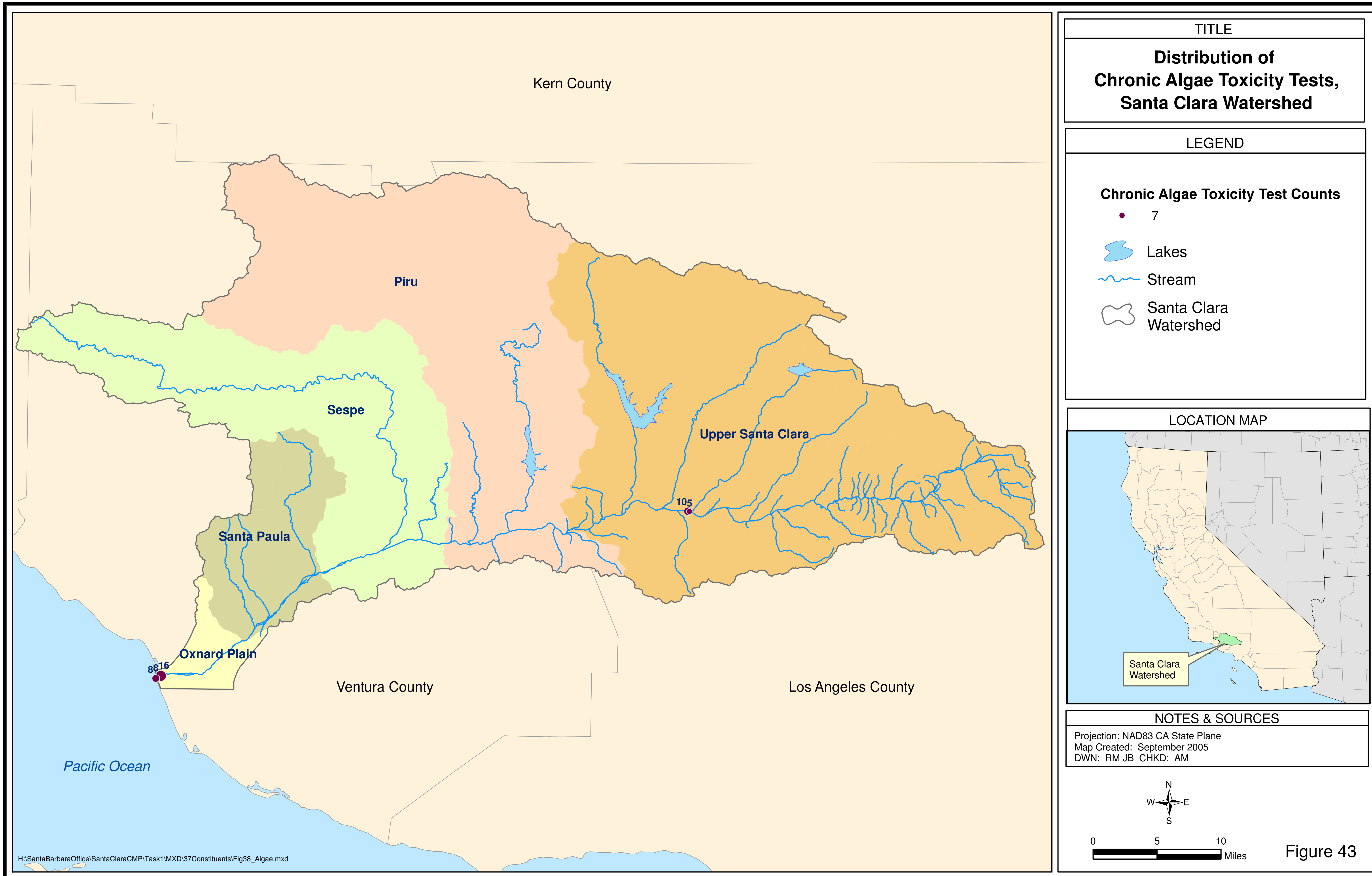
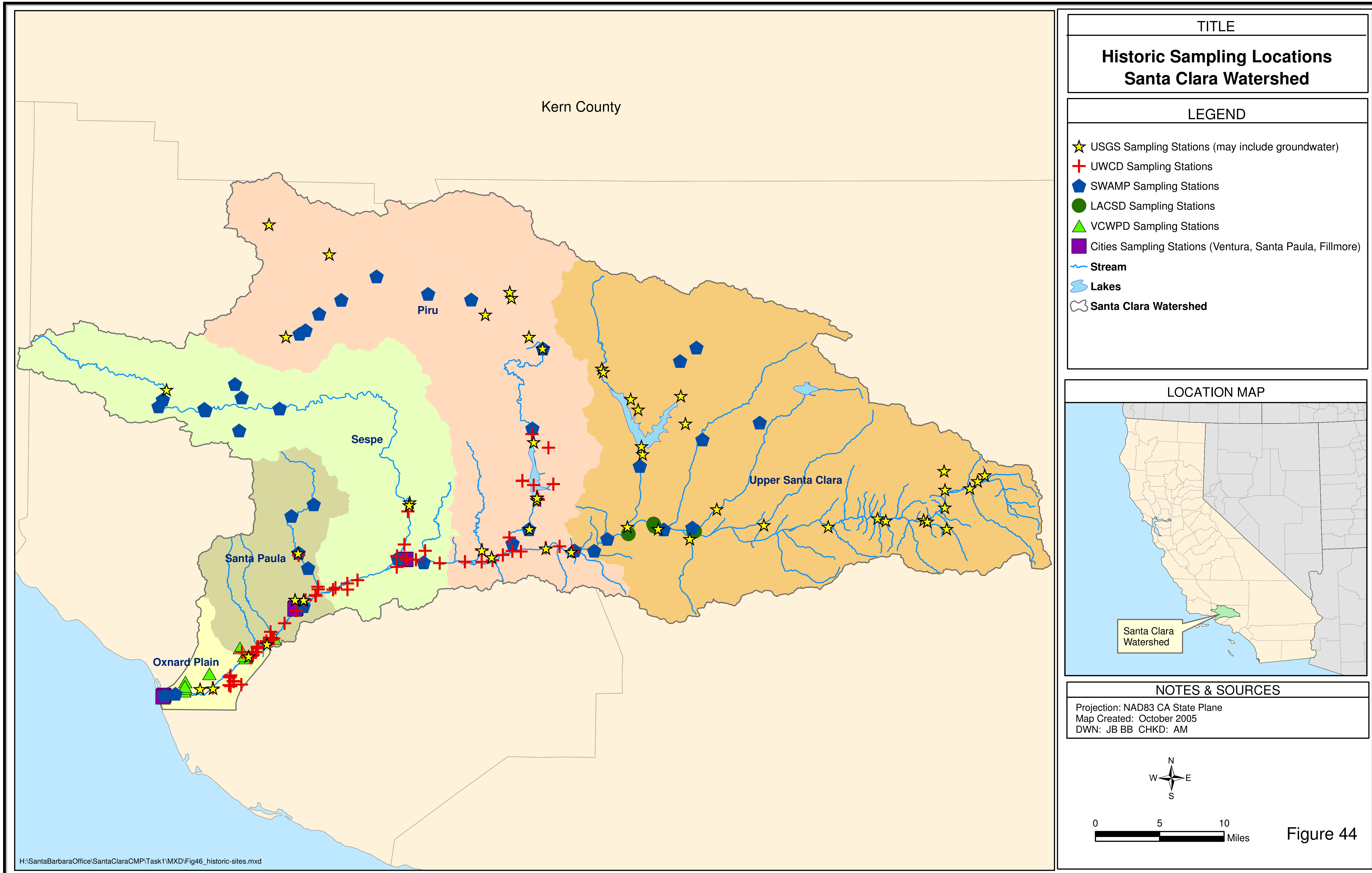

TITLE
Distribution of
Chronic Algae Toxicity Tests,
Santa Clara Watershed
LEGEND
Chronic Algae Toxicity Test Counts
7
Lakes
Stream
Santa Clara
Watershed
LOCATION MAP
Santa Clara
Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: RM JB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
105
88
16
Ventura County
Los Angeles County
Pacific Ocean
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\37Constituents\Fig38_Algae.mxd

Figure 43


TITLE
Historic Sampling Locations
Santa Clara Watershed
LEGEND
USGS Sampling Stations (may include groundwater)
UWCD Sampling Stations
SWAMP Sampling Stations
LACSD Sampling Stations
VCWPD Sampling Stations
Cities Sampling Stations (Ventura, Santa Paula, Fillmore)
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: October 2005
DWN: JB BB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
H:\SantaBarbaraOffice\SantaClaraCMP\Task1\MXD\Fig46_historic-sites.mxd
Figure 44

TITLE

**Distribution of DGA Sampling Sites**
**Santa Clara Watershed**


LEGEND

- **Data Gap Analysis Sampling Sites**
- **Stream**
- **Lakes**
- **Santa Clara Watershed**

LOCATION MAP

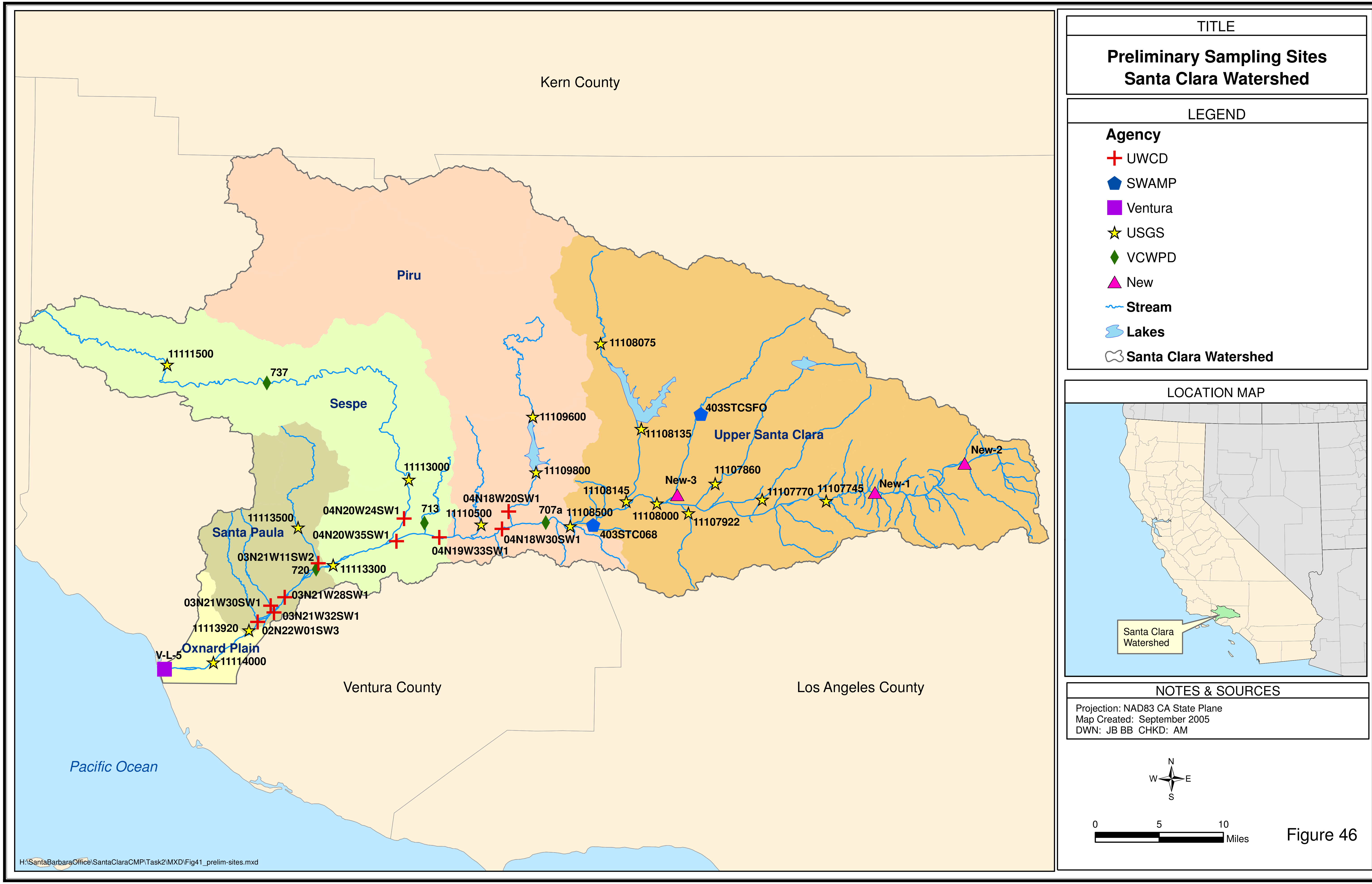

NOTES & SOURCES

Projection: NAD83 CA State Plane
Map Created: October 2005
DWN: JB BB CHKD: AM

N
W E
S

0 5 10 Miles

Figure 45


TITLE
Preliminary Sampling Sites
Santa Clara Watershed
LEGEND
Agency
UWCD
SWAMP
Ventura
USGS
VCWPD
New
Stream
Lakes
Santa Clara Watershed
LOCATION MAP
Santa Clara Watershed
NOTES & SOURCES
Projection: NAD83 CA State Plane
Map Created: September 2005
DWN: JB BB CHKD: AM
N
W
E
S
0
5
10
Miles
Kern County
Ventura County
Los Angeles County
Pacific Ocean
Piru
Sespe
Upper Santa Clara
Santa Paula
Oxnard Plain
11111500
737
11113000
11113500
04N20W24SW1
713
04N20W35SW1
04N19W33SW1
11110500
04N18W20SW1
707a
04N18W30SW1
11108500
403STC068
11109600
11109800
11108075
11108135
403STCSFO
11108145
New-3
11108000
11107922
11107860
11107770
11107745
New-1
New-2
03N21W11SW2
720
11113300
03N21W28SW1
03N21W30SW1
03N21W32SW1
11113920
02N22W01SW3
V-L-5
11114000
H:\SantaBarbaraOffice\SantaClaraCMP\Task2\MXD\Fig41_prelim-sites.mxd
Figure 46

# Appendix A
# Supplementary Tables

# APPENDIX A
# SUPPLEMENTARY TABLES

## Table A-1. Sensitive Plant and Wildlife Species with Potential to Occur in the 500-Year Floodplain of the Santa Clara River

| Common Name | Scientific Name | Federal Status | State Status |
|---|---|---|---|
| **PLANTS** | | | |
| Peirson's morning-glory | *Calystegia peirsonii* | Category 2 | List 4 |
| Nevin's barberry | *Berberis nevinii* | Category 1 | Endangered, List 1B |
| Slender-horned spineflower | *Dodecahema leptoceras* | Endangered | Endangered |
| Short-jointed beavertail cactus | *Opuntia basilaris var. brachyclada* | Category 2 | List 1B |
| Ventura marsh milkvetch | *Astragalus pycnostachyus var. lanosissimus* | No status | No status |
| Ojai fritillary | *Fritillaria ojaiensis* | Category 2 | List 1B |
| Salt marsh bird's beak | *Cordylanthus maritimus ssp. Maritimus* | Endangered | Endangered |
| **FISH** | | | |
| Unarmored threespine stickleback | *Gasterosteus aculeatus williamsoni* | Endangered | Endangered |
| Arroyo chub | *Gila orcuttii* | Category 2 | Species of Special Concern |
| Santa Ana sucker | *Catostomus santaanae* | Category 2 | Species of Special Concern |
| Southern steelhead trout | *Oncorhynchus mykiss iridius* | No status | Threatened |
| Tidewater goby | *Eucyclogius newberryi* | Endangered | Species of Special Concern |
| **INVERTEBRATES** | | | |
| Sandy beach tiger beetle | *Cicindela hirticollis gravida* | Category 2 | No status |
| Western least bittern | *Ixobrychus exilis hesperis* | Category 2 | Species of Special Concern |
| **BIRDS** | | | |
| Western snowy plover | *Charadrius alexandrinus nivosus* | Threatened | Species of Special Concern |
| California least tern | *Sterna antillarum browni* | Endangered | Endangered |
| Long-billed curlew | *Numenius americanus* | Category 2 | Species of Special Concern |
| White-faced ibis | *Plegadis chihi* | Category 2 | Species of Special Concern |
| Bank swallow | *Riparia riparia* | No Status | Threatened |
| Belding's savannah sparrow | *Ammodramus sandwichensis beldingi* | Category 2 | Endangered |
| Least Bell's vireo | *Vireo bellii pusillus* | Endangered | Endangered |
| Southwestern willow flycatcher | *Empidonax trailii extimus* | Endangered | Endangered |

| Common Name | Scientific Name | Federal Status | State Status |
|---|---|---|---|
| Yellow warbler | *Dendroica petechia brewsteri* | No Status | Species of Special Concern |
| Yellow-breasted chat | *Icteria virens* | No Status | Species of Special Concern |
| Loggerhead shrike | *Lanius ludovicianus* | No Status | Species of Special Concern |
| Western yellow-billed cuckoo | *Coccyzus americanus occidentalis* | No Status | Endangered |
| White-tailed kite | *Elanus caeruleus* | No Status | Fully Protected |
| Cooper's hawk | *Accipiter cooperii* | No Status | Species of Special Concern |
| Northern harrier | *Circus cyaneus* | No Status | Species of Special Concern |
| Sharp-shinned hawk | *Accipiter striatus* | No Status | Species of Special Concern |
| **REPTILES** | | | |
| San Diego horned lized | *Phrynosoma coronatum blainvillii* | Category 2 | Species of Special Concern |
| Two-striped garter snake | *Thamnophis hammondii hammondii* | Category 2 | No status |
| South coast garter snake | *Thanophis sirtalis sp.* | No Status | No Status |
| **AMPHIBIANS** | | | |
| Southwestern pond turtle | *Clemmys marmorata pallida* | Category 2 | Species of Special Concern |
| Silverly legless lizard | *Anniella pulchra pulchra* | Category 2 | Species of Special Concern |
| Arroyo toad | *Bufo microscaphus californicus* | Endangered | Species of Special Concern |
| California red-legged frog | *Rana aurora draytonii* | Proposed Endangered | Species of Special Concern |
| **MAMMALS** | | | |
| Mountain lion | *Felis concolor* | No Status | Fully Protected |
| Townsend's big-eared bat | *Plecotus townsendii* | No Status | Species of Special Concern |
| Western mastiff bat | *Eumops perotis* | No Status | Species of Special Concern |

Source: Biological Resources of the Santa Clara River, Volume I 1996.

# Table A-2. Water Quality Report

Los Angeles Regional Water Quality Control Board

Table 2-1. Beneficial Uses of Inland Surface Waters.

Table Page 1

| WATERSHED[a] | Hydro. Unit No. | MUN | IND | PROC | AGR | GWR | FRSH | NAV | POW | REC1 | REC2 | COMM | AQUA | WARM | COLD | SAL | EST | MAR | WILD | BIOL | RARE | MIGR | SPWN | SHELL | WET[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VENTURA COUNTY COASTAL STREAMS** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Los Sauces Creek | 401.00 | P* | I | I | I | I | | | | I | I | | | I | I | | | | E | | | I | I | | |
| Poverty Canyon | 401.00 | P* | I | I | I | I | | | | I | I | | | I | I | | | | E | | | I | I | | |
| Madranio Canyon | 401.00 | P* | I | I | I | I | | | | I | I | | | I | I | | | | E | | | I | I | | |
| Javon Canyon | 401.00 | P* | I | I | I | I | | | | I | I | | | I | I | | | | E | | | I | I | | |
| Padre Juan Canyon | 401.00 | P* | I | I | I | I | | | | I | I | | | I | I | | | | E | | | I | I | | E |
| McGrath Lake c | 403.11 | | | | | | | | | Ed | Ed | P | | | | | E | | E | | Ee | | | | E |
| Big Sycamore Canyon Creek | 404.47 | P* | | | | I | | | | I | I | | | I | E | | | | E | | | P | P | | E |
| Little Sycamore Canyon Creek | 404.45 | P* | | | | | | | | I | I | | | I | | | | | E | | E | | P | | |
| **VENTURA RIVER WATERSHED** | | | | | | | | | | | | E | | | | | | | | | | | | | |
| Ventura River Estuary c | 402.10 | | | | | | | E | | E | E | E | | E | | | E | E | E | | Ee | Ef | Ef | E | E |
| Ventura River | 402.10 | P* | E | | E | E | E | | | E | E | | | E | E | | | | E | | E | E | E | | E |
| Ventura River | 402.20 | E | E | E | E | E | E | | | E | E | | | E | E | | | | E | | Eg | E | E | | E |
| Cañada Larga | 402.10 | P* | | I | I | I | I | | | I | I | | | I | I | | | | E | | | I | I | | |
| Lake Casitas | 402.20 | E | E | E | E | P | P | | P | Ph | E | | | E | E | | | | E | | E | | | | |
| Lake Casitas tributaries | 402.20 | E* | | | P | E | | | | E | E | | | E | E | | | | E | | P | E | E | | E |
| Coyote Creek below dam | 402.20 | P* | | | | E | | | | P | | | | E | E | | | | E | | | E | E | | E |
| San Antonio Creek | 402.20 | E | E | E | E | E | | | | E | E | | | E | E | | | | E | | | E | E | | E |
| San Antonio Creek | 402.32 | E | E | E | E | E | E | | | E | E | | | E | E | | | | E | | | E | E | | E |
| Lion Creek | 402.31 | I* | I | I | I | | | | | I | I | | | I | I | | | | E | | | | | | |
| Reeves Creek | 402.32 | I* | I | I | I | I | | | | I | I | | | I | I | | | | E | | | I | I | | |
| Mirror Lake | 402.20 | P* | | | | E | | | | P | E | | | E | | | | | E | | | | | | E |
| Ojai Wetland | 402.20 | P* | | | | | | | | P | E | | | E | | | | | E | | | | | | E |
| Matilija Creek | 402.20 | P* | | | | E | | | | E | E | | | | E | | | | E | | | E | E | | E |
| Murietta Canyon Creek | 402.20 | P* | | | | E | | | | E | E | | | | E | | | | E | | | E | E | | E |
| North Fork Matilija Creek | 402.20 | E* | E | E | E | E | | | | E | E | | | E | E | | | | E | | E | E | E | | E |
| Matilija Reservoir | 402.20 | E | | | E | E | E | | | E | E | | | E | E | | | | E | | | E | E | | E |
| **SANTA CLARA RIVER WATERSHED** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Santa Clara River Estuary c | 403.11 | | | | | | | E | | E | E | E | | | | | E | E | E | | Ee | Ef | Ef | | E |
| Santa Clara River | 403.11 | P* | E | E | E | E | E | | | E | E | | | E | E | | | | E | | E | E | | | E |
| Santa Clara River | 403.21 | P* | E | E | E | E | E | | | Ed | E | | | E | | | | | E | | E | E | | | E |
| Santa Clara River | 403.31 | P* | E | E | E | E | E | | | Ed | E | | | E | | | | | E | | E | E | | | E |
| Santa Clara River | 403.41 | P* | E | E | E | E | E | | | E | E | | | E | | | | | E | | E | E | | | E |
| Santa Clara River | 403.51 | P* | E | E | E | E | E | | | E | E | | | E | | | | | E | | E | | | | E |
| Santa Clara River (Soledad Cyn) | 403.55 | E* | E | E | E | E | E | | | E | E | | | E | | | | | E | | Ei | | | | E |
| Santa Paula Creek | 403.21 | P | E | E | E | E | E | | | E | E | | | E | E | | | | E | | E | E | E | | |

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See pages 2-3,4 for more details).

Footnotes are consistent on all beneficial use tables.
a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries
Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody.
Any regulatory action would require a detailed analysis of the area.
c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).
d Limited public access precludes full utilization.
e One or more rare species utilize all ocean, bays, esturaries, and coastal wetlands for foraging and/or nesting.
f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.
g Condor refuge.
h Water contact recreational activities prohibited by Casitas MWD.
i Soledad Canyon is the habitat of the Unarmored Three-Spine Stickleback.

2-6

Los Angeles Regional Water Quality Control Board

Table 2-1. Beneficial Uses of Inland Surface Waters (Continued).

Table Page 2

| WATERSHED[a] | Hydro. Unit No. | MUN | IND | PROC | AGR | GWR | FRSH | NAV | POW | REC1 | REC2 | COMM | AQUA | WARM | COLD | SAL | EST | MAR | WILD | BIOL | RARE | MIGR | SPWN | SHELL | WET[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SANTA CLARA RIVER WATERSHED (CONT)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sisar Creek | 403.21 | P | E | P | E | E | | | | E | E | | | E | E | | | | E | | Eg | | E | | E |
| Sisar Creek | 403.22 | P | E | P | E | E | | | | E | E | | | E | E | | | | E | | Eg | | E | | E |
| Sespe Creek | 403.31 | P | E | E | E | E | | | | E | E | | | E | E | | | | E | E | E | E | E | | E |
| Sespe Creek | 403.32 | P | E | P | E | E | | | | E | E | | | E | E | | | | E | E | Eg | E | E | | E |
| Timber Creek | 403.32 | P* | | | | E | | | | E | E | | | | E | | | | E | E | E | E | E | | E |
| Bear Canyon | 403.32 | P* | | | | E | | | | E | E | | | E | P | | | | E | E | E | E | E | | E |
| Trout Creek | 403.32 | P* | | | | E | | | | E | E | | | E | E | | | | E | | E | E | E | | E |
| Piedra Blanca Creek | 403.32 | P* | | | | E | | | | E | E | | | | E | | | | E | | E | E | E | | E |
| Lion Canyon | 403.32 | P* | | | | E | | | | E | E | | | E | E | | | | E | | | E | E | | E |
| Rose Valley Creek | 403.32 | P* | | | | E | | | | E | E | | | E | E | | | | E | | | | E | | E |
| Howard Creek | 403.32 | P* | | | | E | | | | E | E | | | | E | | | | E | E | E | E | E | | E |
| Tule Creek | 403.32 | P* | | | | E | | | | P | E | | | | P | | | | E | E | E | E | E | | E |
| Potrero John Creek | 403.32 | P* | | | | E | | | | E | E | | | | P | | | | E | | E | E | E | | E |
| Hopper Creek | 403.41 | P* | E | | E | E | E | | | E | E | | | E | E | | | | E | | Eg | | | | E |
| Piru Creek | 403.41 | P | E | E | E | E | E | | | E | E | | | E | E | | | | E | | Eg | E | E | | E |
| Piru Creek | 403.42 | P | E | E | E | E | E | | | E | E | | | E | E | | | | E | | Eg | | E | | E |
| Lake Piru | 403.41 | P | E | E | E | E | P | | | E | E | | | E | E | | | | E | | E | | E | | |
| Lake Piru | 403.42 | P | E | E | E | E | P | | P | E | E | | | E | E | | | | E | | E | | E | | |
| Pyramid Lake | 403.42 | E | E | E | E | E | P | | E | E | E | | | E | E | | | | E | | E | | | | |
| Cañada de los Alamos | 403.43 | I* | | | I | I | I | | | I | I | | | I | I | | | | E | | E | | | | |
| Gorman Creek | 403.43 | I* | | | I | I | | | | I | I | | | I | I | | | | E | | P | | | | |
| Lockwood Creek | 403.42 | I* | | | I | I | | | | I | I | | | I | I | | | | E | | | | | | |
| Lockwood Creek | 403.44 | I* | | | I | I | I | | | I | I | | | I | I | | | | E | | | | | | |
| Tapo Canyon | 403.41 | P* | | | P | | | | | P | E | | | E | | | | | E | | | | | | |
| Castaic Creek | 403.51 | I | I | I | I | I | I | | | I | E | | | I | | | | | E | | E | | | | |
| Castaic Lagoon | 403.51 | E* | E | E | E | E | E | | | E | E | | | E | | | | | E | | | | | | |
| Castaic Lake | 403.51 | E | E | E | E | E | E | | E | E | E | | | E | I | | | | E | | E | | E | | |
| Elderberry Forebay | 403.51 | E | E | E | E | E | E | | E | Ek | E | | | E | | | | | E | | E | | E | | |
| Elizabeth Lake Canyon | 403.51 | I | I | I | I | I | I | | | I | E | | | I | | | | | E | | | | | | |
| San Francisquito Canyon l | 403.51 | I | I | I | I | I | I | | | I | I | | | I | | | | | E | | E | | I | | E |
| South Fork (Santa Clara River) | 403.51 | I* | I | I | I | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Drinkwater Reservoir | 403.51 | P* | | | | E | | | | Pk | E | | | P | | | | | E | | E | | | | E |
| Bouquet Canyon | 403.51 | E I | EI | PI | P I | E | P | | | Em | E | | | E | E | | | | E | | | | P | | E |
| Bouquet Canyon | 403.52 | P | P | P | E | E | P | | | Em | E | | | E | E | | | | E | | E | | | | E |
| Dry Canyon Creek | 403.51 | I | I | I | I | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Dry Canyon Reservoir j | 403.51 | E | E | E | E | P | P | | P | Pk | E | | | E | | | | | E | | | | | | |
| Bouquet Reservoir | 403.52 | E | E | E | E | E | E | | P | Pk | E | | | E | | | | | E | | | | | | |

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See pages 2-3,4 for more details).

Footnotes are consistent on all beneficial use tables.
a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
g Condor refuge.

j Out of service.
k Public access to reservoir and its surrounding watershed is prohibited by Los Angeles County Department of Public Works.
l The majority of the reach is intermittent; there is a small area of rising ground water creating perennial flow.
m Access prohibited by Los Angeles County Department of Public Works in the concrete-channelized areas.

Los Angeles Regional Water Quality Control Board

Table 2-1. Beneficial Uses of Inland Surface Waters (Continued).

Table Page 3

| WATERSHED[a] | Hydro. Unit No. | MUN | IND | PROC | AGR | GWR | FRSH | NAV | POW | REC1 | REC2 | COMM | AQUA | WARM | COLD | SAL | EST | MAR | WILD | BIOL | RARE | MIGR | SPWN | SHELL | WET[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SANTA CLARA RIVER WATERSHED (CONT)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mint Canyon Creek | 403.51 | I | I | I | I | I | I | | | Im | I | | | I | | | | | E | | | | | | |
| Mint Canyon Creek | 403.53 | I* | I | I | I | I | I | | | Im | I | | | I | | | | | E | | | | | | |
| Agua Dulce Canyon Creek | 403.54 | I* | I | I | I | I | I | | | I | I | | | I | | | | | E | | E | | | | |
| Agua Dulce Canyon Creek | 403.55 | I* | | | I | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Aliso Canyon Creek | 403.55 | P* | | | P | E | | | | E | E | | | E | | | | | E | | | | | | E |
| Lake Hughes | 403.51 | P | P | P | P | P | P | | | E | E | | | E | | | | | E | | | | | | |
| Munz Lake | 403.51 | P* | P | P | P | E | P | | | E | E | | | E | | | | | E | | | | | | |
| Lake Elizabeth | 403.51 | P | P | P | P | P | P | | | E | E | | | E | | | | | E | | E | | | | |
| **CALLEGUAS-CONEJO CREEK WATERSHED** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mugu Lagoon c | 403.11 | | | | | | | E | | Pn | E | Ed | | | | | E | E | Eo | E | Ee,p | Ef | Ef | Ed | E |
| Calleguas Creek Estuary c | 403.11 | | | | | | | P | | Pn | E | E | | | | | E | | E | | Ee,p | Ef | Ef | | E |
| Calleguas Creek | 403.11 | P* | | | E | E | E | | | E | E | | | E | E | | | | E | | Ep | | | | E |
| Calleguas Creek | 403.12 | P* | E | E | E | E | | | | Eq | E | | | E | | | | | E | | | | | | |
| Revolon Slough | 403.11 | P* | P | | E | E | | | | Eq | E | | | E | | | | | E | | | | | | E |
| Beardsley Wash | 403.61 | P* | | | | | E | | | E | E | | | E | | | | | E | | | | | | |
| Conejo Creek | 403.12 | P* | E | E | E | E | | | | Eq | E | | | E | | | | | E | | | | | | |
| Conejo Creek | 403.63 | P* | | | | I | I | | | I | I | | | I | | | | | E | | | | E | | |
| Arroyo Conejo | 403.64 | P* | | | | I | I | | | I | I | | | I | | | | | E | | E | | | | |
| Arroyo Conejo | 403.68 | P* | | | | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Arroyo Santa Rosa | 403.63 | P* | | | | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Arroyo Santa Rosa | 403.65 | P* | | | | I | I | | | I | I | | | I | | | | | E | | | | | | |
| North Fork Arroyo Conejo | 403.64 | P* | | | E | E | | | | E | E | | | E | | | | | E | | | | E | | |
| Arroyo Las Posas | 403.12 | P* | P | P | P | E | | | | E | E | | | E | P | | | | E | | | | | | |
| Arroyo Las Posas | 403.62 | P* | P | P | P | E | E | | | E | E | | | E | P | | | | E | | | | | | |
| Arroyo Simi | 403.62 | P* | I | | | I | I | | | I | I | | | I | | | | | E | | E | | | | |
| Arroyo Simi | 403.67 | I* | I | | | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Tapo Canyon Creek | 403.66 | I* | | P | P | I | | | | I | I | | | I | | | | | E | | | | | | |
| Tapo Canyon Creek | 403.67 | I* | | P | P | I | | | | I | I | | | I | | | | | E | | | | | | |
| Gillibrand Canyon Creek | 403.66 | P* | | | | I | I | | | I | I | | | I | | | | | E | | | | | | |
| Gillibrand Canyon Creek | 403.67 | P* | | | | I | | | | I | I | | | I | | | | | E | | | | | | |
| Lake Bard (Wood Ranch Reservoir) | 403.67 | E | E | E | E | P | | | | Pr | Er | | | E | | | | | E | | | | | | |
| **LOS ANGELES COUNTY COASTAL STREAMS** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arroyo Sequit | 404.44 | P* | | | | I | | | | E | E | | | E | E | | | | E | | E | E | E | | E |
| San Nicholas Canyon Creek | 404.43 | P* | | | | | | | | I | I | | | I | | | | | E | | | | | | |

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See pages 2-3,4 for more details).

Footnotes are consistent on all benefical use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).

d Limited public access precludes full utilization.

e One or more rare species utilize all ocean, bays, esturaries, and coastal wetlands for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.

m Access prohibited by Los Angeles County DPW in the concrete-channelized areas.

n Area is currently under control of the Navy: swimming is prohibited.

o Marine habitats of the Channel Islands and Mugu Lagoon serve as pinneped haul-out areas for one or more species (i.e., sea lions).

p Habitat of the Clapper Rail.

q Whenever flow conditions are suitable.

r Public access prohibited by Calleguas MWD.

## Table A-3. Active Monitoring Report Plans (MRP) in the Santa Clara River Watershed

Available MRP Data from LA RWQCB Permit Database http://www.swrcb.ca.gov/rwqcb4/html/permits/permits.html
Compiled by VCWPD 5_2005
GW = groundwater, SW = surface water

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Mun Separate Storm Sewer, MS4 | CI-7388 | Fillmore, CA | | Ventura County Program | | | |
| Mun Separate Storm Sewer, MS4 | CI-7388 | Oxnard, CA | | Ventura County Program | | | |
| Mun Separate Storm Sewer, MS4 | CI-7388 | Ventura, CA | | Ventura County Program | | | |
| Mun Separate Storm Sewer, MS4 | CI-7388 | Santa Paula, CA | | Ventura County Program | | | |
| Mun Separate Storm Sewer, MS4 | CI-7388 | Ventura County, CA | | Ventura County Program | | | |
| Mun Separate Storm Sewer, MS4 | CI-7388 | All Storm Drains, Ventura County, CA 93009 | | Ventura County Program | | | |
| Ventura WWRP | CI-1822 | 1400 Spinnaker Dr, Ventura, CA 93002 | SW | Total waste flow | mgd | recorder | continuous1/ |
| Ventura WWRP | CI-1822 | 1401 Spinnaker Dr, Ventura, CA 93002 | SW | Turbidity5/ | NTU | recorder | continuous1/ |
| Ventura WWRP | CI-1822 | 1402 Spinnaker Dr, Ventura, CA 93002 | SW | Total residual chlorine | mg/L | recorder | continuous1/ |
| Ventura WWRP | CI-1822 | 1403 Spinnaker Dr, Ventura, CA 93002 | SW | Total and fecal coliform5/ | MPN/100 ml | grab | daily |
| Ventura WWRP | CI-1822 | 1404 Spinnaker Dr, Ventura, CA 93002 | SW | Settleable solids | ml/L | grab | daily |
| Ventura WWRP | CI-1822 | 1405 Spinnaker Dr, Ventura, CA 93002 | SW | BOD520oC | mg/L | 24-hour composite | daily |
| Ventura WWRP | CI-1822 | 1406 Spinnaker Dr, Ventura, CA 93002 | SW | Suspended solids | mg/L | 24-hour composite | daily |
| Ventura WWRP | CI-1822 | 1407 Spinnaker Dr, Ventura, CA 93002 | SW | Dissolved oxygen | mg/L | grab | daily |
| Ventura WWRP | CI-1822 | 1408 Spinnaker Dr, Ventura, CA 93002 | SW | Temperature | oF | grab | weekly |
| Ventura WWRP | CI-1822 | 1409 Spinnaker Dr, Ventura, CA 93002 | SW | pH | | grab | weekly |
| Ventura WWRP | CI-1822 | 1410 Spinnaker Dr, Ventura, CA 93002 | SW | Oil and grease | pH | grab | weekly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP | CI-1822 | 1411 Spinnaker Dr, Ventura, CA 93002 | SW | Total dissolved solids | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1412 Spinnaker Dr, Ventura, CA 93002 | SW | Fluoride | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1413 Spinnaker Dr, Ventura, CA 93002 | SW | Phosphate as P | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1414 Spinnaker Dr, Ventura, CA 93002 | SW | Phosphorous | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1415 Spinnaker Dr, Ventura, CA 93002 | SW | Ammonia nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1416 Spinnaker Dr, Ventura, CA 93002 | SW | Nitrate nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1417 Spinnaker Dr, Ventura, CA 93002 | SW | Nitrite nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1418 Spinnaker Dr, Ventura, CA 93002 | SW | Organic nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1419 Spinnaker Dr, Ventura, CA 93002 | SW | Total Kjeldahl nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1420 Spinnaker Dr, Ventura, CA 93002 | SW | Detergents (as MBAS) | mg/L | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1421 Spinnaker Dr, Ventura, CA 93002 | SW | Chronic toxicity6/ | TUc | 24-hour composite | monthly |
| Ventura WWRP | CI-1822 | 1422 Spinnaker Dr, Ventura, CA 93002 | SW | Chlorophyll *a*13/ | mg/L | grab | monthly |
| Ventura WWRP | CI-1822 | 1423 Spinnaker Dr, Ventura, CA 93002 | SW | Cyanide | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1424 Spinnaker Dr, Ventura, CA 93002 | SW | Aluminum | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1425 Spinnaker Dr, Ventura, CA 93002 | SW | Antimony | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1426 Spinnaker Dr, Ventura, CA 93002 | SW | Arsenic | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1427 Spinnaker Dr, Ventura, CA 93002 | SW | Barium | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1428 Spinnaker Dr, Ventura, CA 93002 | SW | Beryllium | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1429 Spinnaker Dr, Ventura, CA 93002 | SW | Cadmium | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1430 Spinnaker Dr, Ventura, CA 93002 | SW | Chromium VI2/ | µg/l | grab | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP | CI-1822 | 1431 Spinnaker Dr, Ventura, CA 93002 | SW | Cobalt | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1432 Spinnaker Dr, Ventura, CA 93002 | SW | Copper | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1433 Spinnaker Dr, Ventura, CA 93002 | SW | Iron | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1434 Spinnaker Dr, Ventura, CA 93002 | SW | Lead | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1435 Spinnaker Dr, Ventura, CA 93002 | SW | Mercury | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1436 Spinnaker Dr, Ventura, CA 93002 | SW | Molybdenum | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1437 Spinnaker Dr, Ventura, CA 93002 | SW | Nickel | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1438 Spinnaker Dr, Ventura, CA 93002 | SW | Selenium | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1439 Spinnaker Dr, Ventura, CA 93002 | SW | Silver | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1440 Spinnaker Dr, Ventura, CA 93002 | SW | Thallium | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1441 Spinnaker Dr, Ventura, CA 93002 | SW | Vanadium | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1442 Spinnaker Dr, Ventura, CA 93002 | SW | Zinc | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1443 Spinnaker Dr, Ventura, CA 93002 | SW | Benzene | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1444 Spinnaker Dr, Ventura, CA 93002 | SW | Bromoform | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1445 Spinnaker Dr, Ventura, CA 93002 | SW | Bromodichloromethane | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1446 Spinnaker Dr, Ventura, CA 93002 | SW | Carbon tetrachloride | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1447 Spinnaker Dr, Ventura, CA 93002 | SW | Chloroform | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1448 Spinnaker Dr, Ventura, CA 93002 | SW | Dibromochloromethane | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1449 Spinnaker Dr, Ventura, CA 93002 | SW | Dichloromethane | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1450 Spinnaker Dr, Ventura, CA 93002 | SW | Tetrachloroethylene | µg/l | grab | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP | CI-1822 | 1451 Spinnaker Dr, Ventura, CA 93002 | SW | Phenols: | | | |
| Ventura WWRP | CI-1822 | 1452 Spinnaker Dr, Ventura, CA 93002 | SW | chlorinated | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1453 Spinnaker Dr, Ventura, CA 93002 | SW | non-chlorinated | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1454 Spinnaker Dr, Ventura, CA 93002 | SW | Bis(2-ethylhexyl)phthalate | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1455 Spinnaker Dr, Ventura, CA 93002 | SW | PCBs7/ | ng/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1456 Spinnaker Dr, Ventura, CA 93002 | SW | Aldrin | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1457 Spinnaker Dr, Ventura, CA 93002 | SW | Dieldrin | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1458 Spinnaker Dr, Ventura, CA 93002 | SW | Chlordane | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1459 Spinnaker Dr, Ventura, CA 93002 | SW | Endrin | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1460 Spinnaker Dr, Ventura, CA 93002 | SW | Heptachlor | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1461 Spinnaker Dr, Ventura, CA 93002 | SW | Heptachlor epoxide | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1462 Spinnaker Dr, Ventura, CA 93002 | SW | Endosulfan | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1463 Spinnaker Dr, Ventura, CA 93002 | SW | Toxaphene | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1464 Spinnaker Dr, Ventura, CA 93002 | SW | DDT | µg/l | 24-hour composite | quarterly |
| Ventura WWRP | CI-1822 | 1465 Spinnaker Dr, Ventura, CA 93002 | SW | Acetone | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1466 Spinnaker Dr, Ventura, CA 93002 | SW | Total xylene | µg/l | grab | quarterly |
| Ventura WWRP | CI-1822 | 1467 Spinnaker Dr, Ventura, CA 93002 | SW | Pesticides3/ | µg/l | 24-hour composite | semiannually |
| Ventura WWRP | CI-1822 | 1468 Spinnaker Dr, Ventura, CA 93002 | SW | Remaining USEPA4/ priority pollutants (excluding asbestos, Attachment 1) | µg/l | 24-hour composite | semiannually |
| Ventura WWRP | CI-1822 | 1469 Spinnaker Dr, Ventura, CA 93002 | SW | HCH8/ | µg/l | 24-hour composite | semiannually |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP | CI-1822 | 1470 Spinnaker Dr, Ventura, CA 93002 | SW | Radioactivity9/ | pCi/L | 24-hour composite | semiannually |
| Ventura WWRP | CI-1822 | 1471 Spinnaker Dr, Ventura, CA 93002 | SW | Dioxin congeners | pg/L | 24-hour composite | semiannually |
| Ventura WWRP | CI-1822 | 1472 Spinnaker Dr, Ventura, CA 93002 | SW | Acute toxicity11/ | TUa | 24-hour composite | semiannually 10/ |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Water Elevation | Feet-sea level | 24-hour composite | annually12/ |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | pH | pH | --- | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Turbidity | NTU | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Total petroleum hydrocarbon (EPA Method 8015M HC Scan) | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Volatile Organic Compounds and MTBE (EPA Method 8260) | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Semi-Volatile Organics (8270) | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | PNAs (EPA Method 8310) | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Base/Neutrals and Acids (EPA Method 625) | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Pesticides (EPA Method 8081) | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Herbicides | µg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | CAM Metals | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Chloride | mg/l | grab | Semi-annually |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Sulfate | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Nitrate | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Total Alkalinity | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Hardness | mg/l | grab | Quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Electrical Conductivity | millimhos/cm | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Chemical Oxygen Demand | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Biological Oxygen Demand | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Dissolved Oxygen | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Carbon Dioxide | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Total Organic Carbon | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | GW&SW | Total Dissolved Solids | mg/l | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | Bacteria Plate Count | Colonies /gm | grab | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | Soil Moisture Content | % | | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | Total Petroleum Hydrocarbons(EPA Methods 418.1 & 8015-C4 to C28 Hydrocarbon Scan) | mg/kg | | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | Total Petroleum Hydrocarbons *(EPA Methods 418.1, 8015 Modified-Extractable & 8015 Modified-Purgable)* | mg/kg | | Quarterly |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | Volatile Organic Compounds *(EPA Method 8240B or Method 8260A or EPA Methods 8010/8020 or Methods 8010/8021)* | µg/kg | | Once per 1,000 CY |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | Semi-volatile Organic compounds *(EPA Method 8270)* | µg/kg | | Once per 5,000 CY |
| North Shore Mandalay Bay Devlp | CI-8215 | N Corner of West 5th & Harbor, Oxnard, CA | Soil | CAM Metals | mg/kg | | Once per 5,000 CY |
| ISCO MACHINERY | CI-8367 | 4796 W Sierra Highway, Acton, CA 93510 | Gw | Total coliform | MPN/100mL | | Once per 5,000 CY |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| ISCO MACHINERY | CI-8367 | 4797 W Sierra Highway, Acton, CA 93510 | Gw | Fecal coliform | MPN/100mL | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4798 W Sierra Highway, Acton, CA 93510 | Gw | Enterococcus | MPN/100mL | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4799 W Sierra Highway, Acton, CA 93510 | Gw | Ammonia-N | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4800 W Sierra Highway, Acton, CA 93510 | Gw | Nitrate-N | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4801 W Sierra Highway, Acton, CA 93510 | Gw | Nitrite-N | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4802 W Sierra Highway, Acton, CA 93510 | Gw | Organic nitrogen | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4803 W Sierra Highway, Acton, CA 93510 | Gw | Phosphorus | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4804 W Sierra Highway, Acton, CA 93510 | Gw | Total dissolved solids | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4805 W Sierra Highway, Acton, CA 93510 | Gw | Boron | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4806 W Sierra Highway, Acton, CA 93510 | Gw | Chloride | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4807 W Sierra Highway, Acton, CA 93510 | Gw | Sulfate | mg/L | grab | semi-annually |
| ISCO MACHINERY | CI-8367 | 4808 W Sierra Highway, Acton, CA 93510 | Gw | Fluoride | mg/L | grab | semi-annually |
| Jack In The Box, Inc. | CI-8311 | 3838 W Sierra Hwy, Acton, CA 93510 | Gw | Total coliform | MPN/100mL | grab | semi-annually |
| Jack In The Box, Inc. | CI-8312 | 3839 W Sierra Hwy, Acton, CA 93510 | Gw | Fecal coliform | MPN/100mL | grab | quarterly |
| Jack In The Box, Inc. | CI-8313 | 3840 W Sierra Hwy, Acton, CA 93510 | Gw | Enterococcus | MPN/100mL | grab | quarterly |
| Jack In The Box, Inc. | CI-8314 | 3841 W Sierra Hwy, Acton, CA 93510 | Gw | Ammonia-N | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8315 | 3842 W Sierra Hwy, Acton, CA 93510 | Gw | Nitrate-N | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8316 | 3843 W Sierra Hwy, Acton, CA 93510 | Gw | Nitrite-N | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8317 | 3844 W Sierra Hwy, Acton, CA 93510 | Gw | Organic nitrogen | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8318 | 3845 W Sierra Hwy, Acton, CA 93510 | Gw | Phosphorus | mg/L | grab | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Jack In The Box, Inc. | CI-8319 | 3846 W Sierra Hwy, Acton, CA 93510 | Gw | Total dissolved solids | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8320 | 3847 W Sierra Hwy, Acton, CA 93510 | Gw | Boron | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8321 | 3848 W Sierra Hwy, Acton, CA 93510 | Gw | Chloride | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8322 | 3849 W Sierra Hwy, Acton, CA 93510 | Gw | Sulfate | mg/L | grab | quarterly |
| Jack In The Box, Inc. | CI-8323 | 3850 W Sierra Hwy, Acton, CA 93510 | Gw | Fluoride | mg/L | grab | quarterly |
| Veterans of Foreign Wars | CI-8264 | 16208 Sierra Highway, Canyon Country, CA | SW | pH | pH Units | grab | quarterly |
| Veterans of Foreign Wars | CI-8264 | 16209 Sierra Highway, Canyon Country, CA | SW | Total dissolved solids | mg/L | grab | Annually |
| Veterans of Foreign Wars | CI-8264 | 16210 Sierra Highway, Canyon Country, CA | SW | Sulfate | mg/L | grab | Annually |
| Veterans of Foreign Wars | CI-8264 | 16211 Sierra Highway, Canyon Country, CA | SW | Chloride | mg/L | grab | Annually |
| Veterans of Foreign Wars | CI-8264 | 16212 Sierra Highway, Canyon Country, CA | SW | Boron | mg/L | grab | Annually |
| Veterans of Foreign Wars | CI-8264 | 16213 Sierra Highway, Canyon Country, CA | SW | Total Nitrogen | mg/L | grab | Annually |
| Veterans of Foreign Wars | CI-8264 | 16214 Sierra Highway, Canyon Country, CA | SW | Nitrate-N | mg/L | grab | Annually |
| Veterans of Foreign Wars | CI-8264 | 16215 Sierra Highway, Canyon Country, CA | SW | Nitrite-N | mg/L | grab | Annually |
| Mun Separate Storm Sewer, MS4 | CI-8264 | San Clarita, CA | | Los Angeles County Program | | grab | Annually |
| Tract 46647 | CI-8308 | Carson Mesa & S. Pacific RailR, Acton, CA 93510 | | No Document | | | |
| Valencia Facility | CI-6024 | 25200 W. Rye Canyon Rd, Santa Clarita, CA 19355 | | No Document | | | |
| Earl Schmidt Filtration Plant | CI-6544 | 32700 N. Lake Highes Rd, Castaic,CA 91310 | | No Document | | | |
| Santa Paula WWRP | CI-1759 | 905 Corporation St, Santa Paula, CA 93061 | | No Document | | | |
| Val Varde Co. Park Swim Pool | CI-7140 | 30300 W. Arlington st, Saugus, CA 91350 | | No Document | | | |
| Amusement Park, Valencia | CI-6045 | 26101Magic Mountain PKWY, Valcencia, CA 91355 | | No Document | | | |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Castaic Power Plant | CI-6112 | 37700 Templin Hwy, Castaic,CA 91310 | | No Document | | | |
| Natural River Management Plan | CI-8099 | along Santa Clara River, Santa Calarita, CA | | No Document | | | |
| Three Prod. Well Aquifer Test | CI-8840 | 25359 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Total Waste Flow | gal/day | | |
| Three Prod. Well Aquifer Test | CI-8840 | 25360 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Temperature | oF | totalizer | continuously |
| Three Prod. Well Aquifer Test | CI-8840 | 25361 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | pH | pH | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25362 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Total Suspended Solids | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25363 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Turbidity | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25364 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | BOD5 @ 20°C | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25365 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Settleable Solids | ml/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25366 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Sulfides | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25367 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Oil and Grease | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25368 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Total Dissolved Solids | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25369 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Sulfate | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25370 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Chloride | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25371 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Detergents as Methylene Blue Active Substances (MBAS) | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25372 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Boron | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25373 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Nitrogen | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25374 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Residual Chlorine | mg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25375 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Perchlorate | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25376 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Acetone | µg/L | grab | per event |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Three Prod. Well Aquifer Test | CI-8840 | 25377 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Acrolein | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25378 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Acrylonitrile | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25379 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Benzene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25380 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Bromoform | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25381 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Carbon Tetrachloride | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25382 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Chlorobenzene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25383 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Chlorodibromomethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25384 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Chloroethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25385 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Chloroform | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25386 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Dichlorobromomethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25387 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,1-Dichloroethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25388 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,2-Dichloroethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25389 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,1-Dichloroethylene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25390 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,2-Dichloropropane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25391 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,3-Dichloropropylene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25392 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Ethylbenzene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25393 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Ethylene dibromide | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25394 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Methyl bromide | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25395 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Methyl chloride | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25396 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Methylene chloride | µg/L | grab | per event |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Three Prod. Well Aquifer Test | CI-8840 | 25397 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Methyl ethyl ketone | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25398 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Methyl Tertiary Butyl Ether (MTBE) | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25399 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,1,2,2-Tetrachloroethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25400 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Tetrachloroethylene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25401 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Toluene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25402 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,2-trans-Dichloroethylene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25403 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,1,1-Trichloroethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25404 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,1,2-Trichloroethane | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25405 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Trichloroethylene | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25406 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Vinyl chloride | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25407 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Xylenes | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25408 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Di-isopropyl ether (DIPE) | µg/L | grab | per event |
| Three Prod. Well Aquifer Test | CI-8840 | 25409 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | 1,4-Dioxane | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25410 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Napthalene | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25411 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | N-Nitrosodimethyl amine (NDMA) | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25412 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Tertiary butyl alcohol (TBA) | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25413 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Total Petroleum Hydrocarbons | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25414 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Phenols | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25415 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Phenolic Compounds (chlorinated) | µg/L | grab | annually |
| Three Prod. Well Aquifer Test | CI-8840 | 25416 San Fernando Rd, Santa Clarita, CA 91350 | GW & SW | Acute Toxicity | %survival | grab | annually |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Former Just Gas | CI-8557 | 2441Vineyard Ave, Oxnard,CA 93030 | SW | Flow | gal/day | grab | annually |
| Former Just Gas | CI-8558 | 2441Vineyard Ave, Oxnard,CA 93031 | SW | pH | pH | totalizer | continuously |
| Former Just Gas | CI-8559 | 2441Vineyard Ave, Oxnard,CA 93032 | SW | Temperature | °F | grab | monthly |
| Former Just Gas | CI-8560 | 2441Vineyard Ave, Oxnard,CA 93033 | SW | Total Suspended Solids | mg/L | grab | monthly |
| Former Just Gas | CI-8561 | 2441Vineyard Ave, Oxnard,CA 93034 | SW | Turbidity | NTU | grab | monthly |
| Former Just Gas | CI-8562 | 2441Vineyard Ave, Oxnard,CA 93035 | SW | BOD520oC | mg/L | grab | monthly |
| Former Just Gas | CI-8563 | 2441Vineyard Ave, Oxnard,CA 93036 | SW | Settleable Solids | ml/L | grab | monthly |
| Former Just Gas | CI-8564 | 2441Vineyard Ave, Oxnard,CA 93037 | SW | Sulfides | mg/L | grab | monthly |
| Former Just Gas | CI-8565 | 2441Vineyard Ave, Oxnard,CA 93038 | SW | Total petroleum hydrocarbons | mg/L | grab | monthly |
| Former Just Gas | CI-8566 | 2441Vineyard Ave, Oxnard,CA 93039 | SW | Benzene | mg/L | grab | monthly |
| Former Just Gas | CI-8567 | 2441Vineyard Ave, Oxnard,CA 93040 | SW | Toluene | mg/L | grab | monthly1 |
| Former Just Gas | CI-8568 | 2441Vineyard Ave, Oxnard,CA 93041 | SW | Ethylbenzene | mg/L | grab | monthly1 |
| Former Just Gas | CI-8569 | 2441Vineyard Ave, Oxnard,CA 93042 | SW | Xylenes | mg/L | grab | monthly1 |
| Former Just Gas | CI-8570 | 2441Vineyard Ave, Oxnard,CA 93043 | SW | Ethylene dibromide | mg/L | grab | monthly1 |
| Former Just Gas | CI-8571 | 2441Vineyard Ave, Oxnard,CA 93044 | SW | Lead | mg/L | grab | monthly1 |
| Former Just Gas | CI-8572 | 2441Vineyard Ave, Oxnard,CA 93045 | SW | Methyl tertiary butyl ether (MTBE) | mg/L | grab | monthly1 |
| Former Just Gas | CI-8573 | 2441Vineyard Ave, Oxnard,CA 93046 | SW | Naphthalene | mg/L | grab | monthly1 |
| Former Just Gas | CI-8574 | 2441Vineyard Ave, Oxnard,CA 93047 | SW | Di-isopropyl ether (DIPE) | mg/L | grab | monthly1 |
| Former Just Gas | CI-8575 | 2441Vineyard Ave, Oxnard,CA 93048 | SW | Tertiary butyl alcohol (TBA) | mg/L | grab | monthly1 |
| Former Just Gas | CI-8576 | 2441Vineyard Ave, Oxnard,CA 93049 | SW | Acute Toxicity | % survival | grab | monthly1 |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP Order update of above | CI-1822 | 1400 Spinnaker Dr, Ventura, CA 93002 | SW | Flow | mgd | grab | annually |
| Ventura WWRP Order update of above | CI-1822 | 1401 Spinnaker Dr, Ventura, CA 93002 | SW | Suspended solids mg/L | mg/L | recorder/totalizer | continuous1/ |
| Ventura WWRP Order update of above | CI-1822 | 1402 Spinnaker Dr, Ventura, CA 93002 | SW | BOD520°C mg/L | mg/L | 24-hour composite | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1403 Spinnaker Dr, Ventura, CA 93002 | SW | Chromium VI2/ mg/L | µg/L | 24-hour composite | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1404 Spinnaker Dr, Ventura, CA 93002 | SW | Pesticides3/ mg/L | µg/L | grab | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1405 Spinnaker Dr, Ventura, CA 93002 | SW | USEPA priority4/ mg/L pollutants (Attachment 1) | µg/L | 24-hour composite | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1406 Spinnaker Dr, Ventura, CA 93002 | SW | Total waste flow | mgd | 24-hour composite | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1407 Spinnaker Dr, Ventura, CA 93002 | SW | Turbidity5/ | NTU | recorder | continuous1/ |
| Ventura WWRP Order update of above | CI-1822 | 1408 Spinnaker Dr, Ventura, CA 93002 | SW | Total residual chlorine | mg/L | recorder | continuous1/ |
| Ventura WWRP Order update of above | CI-1822 | 1409 Spinnaker Dr, Ventura, CA 93002 | SW | Total and fecal coliform5/ | MPN/100 ml | recorder | continuous1/ |
| Ventura WWRP Order update of above | CI-1822 | 1410 Spinnaker Dr, Ventura, CA 93002 | SW | Settleable solids | ml/L | grab | daily |
| Ventura WWRP Order update of above | CI-1822 | 1411 Spinnaker Dr, Ventura, CA 93002 | SW | BOD520oC | mg/L | grab | daily |
| Ventura WWRP Order update of above | CI-1822 | 1412 Spinnaker Dr, Ventura, CA 93002 | SW | Suspended solids | mg/L | 24-hour composite | daily |
| Ventura WWRP Order update of above | CI-1822 | 1413 Spinnaker Dr, Ventura, CA 93002 | SW | Dissolved oxygen | mg/L | 24-hour composite | daily |
| Ventura WWRP Order update of above | CI-1822 | 1414 Spinnaker Dr, Ventura, CA 93002 | SW | Temperature | oF | grab | daily |
| Ventura WWRP Order update of above | CI-1822 | 1415 Spinnaker Dr, Ventura, CA 93002 | SW | pH | pH | grab | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1416 Spinnaker Dr, Ventura, CA 93002 | SW | Oil and grease | mg/L | grab | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1417 Spinnaker Dr, Ventura, CA 93002 | SW | Total dissolved solids | mg/L | grab | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1418 Spinnaker Dr, Ventura, CA 93002 | SW | Fluoride | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1419 Spinnaker Dr, Ventura, CA 93002 | SW | Phosphate as P | mg/L | 24-hour composite | monthly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP Order update of above | CI-1822 | 1420 Spinnaker Dr, Ventura, CA 93002 | SW | Phosphorous | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1421 Spinnaker Dr, Ventura, CA 93002 | SW | Ammonia nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1422 Spinnaker Dr, Ventura, CA 93002 | SW | Nitrate nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1423 Spinnaker Dr, Ventura, CA 93002 | SW | Nitrite nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1424 Spinnaker Dr, Ventura, CA 93002 | SW | Organic nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1425 Spinnaker Dr, Ventura, CA 93002 | SW | Total Kjeldahl nitrogen | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1426 Spinnaker Dr, Ventura, CA 93002 | SW | Detergents (as MBAS) | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1427 Spinnaker Dr, Ventura, CA 93002 | SW | Chronic toxicity6/ | TUc | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1428 Spinnaker Dr, Ventura, CA 93002 | SW | Chlorophyll a13/ | mg/L | 24-hour composite | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1429 Spinnaker Dr, Ventura, CA 93002 | SW | Cyanide | µg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1430 Spinnaker Dr, Ventura, CA 93002 | SW | Aluminum | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1431 Spinnaker Dr, Ventura, CA 93002 | SW | Antimony | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1432 Spinnaker Dr, Ventura, CA 93002 | SW | Arsenic | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1433 Spinnaker Dr, Ventura, CA 93002 | SW | Barium | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1434 Spinnaker Dr, Ventura, CA 93002 | SW | Beryllium | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1435 Spinnaker Dr, Ventura, CA 93002 | SW | Cadmium | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1436 Spinnaker Dr, Ventura, CA 93002 | SW | Chromium VI2/ | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1437 Spinnaker Dr, Ventura, CA 93002 | SW | Cobalt | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1438 Spinnaker Dr, Ventura, CA 93002 | SW | Copper | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1439 Spinnaker Dr, Ventura, CA 93002 | SW | Iron | µg/L | 24-hour composite | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP Order update of above | CI-1822 | 1440 Spinnaker Dr, Ventura, CA 93002 | SW | Lead | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1441 Spinnaker Dr, Ventura, CA 93002 | SW | Mercury | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1442 Spinnaker Dr, Ventura, CA 93002 | SW | Molybdenum | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1443 Spinnaker Dr, Ventura, CA 93002 | SW | Nickel | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1444 Spinnaker Dr, Ventura, CA 93002 | SW | Selenium | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1445 Spinnaker Dr, Ventura, CA 93002 | SW | Silver | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1446 Spinnaker Dr, Ventura, CA 93002 | SW | Thallium | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1447 Spinnaker Dr, Ventura, CA 93002 | SW | Vanadium | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1448 Spinnaker Dr, Ventura, CA 93002 | SW | Zinc | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1449 Spinnaker Dr, Ventura, CA 93002 | SW | Benzene | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1450 Spinnaker Dr, Ventura, CA 93002 | SW | Bromoform | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1451 Spinnaker Dr, Ventura, CA 93002 | SW | Bromodichloromethane | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1452 Spinnaker Dr, Ventura, CA 93002 | SW | Carbon tetrachloride | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1453 Spinnaker Dr, Ventura, CA 93002 | SW | Chloroform | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1454 Spinnaker Dr, Ventura, CA 93002 | SW | Dibromochloromethane | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1455 Spinnaker Dr, Ventura, CA 93002 | SW | Dichloromethane | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1456 Spinnaker Dr, Ventura, CA 93002 | SW | Tetrachloroethylene | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1457 Spinnaker Dr, Ventura, CA 93002 | SW | Phenols: | | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1458 Spinnaker Dr, Ventura, CA 93002 | SW | chlorinated | µg/L | | |
| Ventura WWRP Order update of above | CI-1822 | 1459 Spinnaker Dr, Ventura, CA 93002 | SW | non-chlorinated | µg/L | 24-hour composite | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP Order update of above | CI-1822 | 1460 Spinnaker Dr, Ventura, CA 93002 | SW | Bis(2-ethylhexyl)phthalate | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1461 Spinnaker Dr, Ventura, CA 93002 | SW | PCBs7/ | ng/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1462 Spinnaker Dr, Ventura, CA 93002 | SW | Aldrin | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1463 Spinnaker Dr, Ventura, CA 93002 | SW | Dieldrin | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1464 Spinnaker Dr, Ventura, CA 93002 | SW | Chlordane | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1465 Spinnaker Dr, Ventura, CA 93002 | SW | Endrin | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1466 Spinnaker Dr, Ventura, CA 93002 | SW | Heptachlor | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1467 Spinnaker Dr, Ventura, CA 93002 | SW | Heptachlor epoxide | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1468 Spinnaker Dr, Ventura, CA 93002 | SW | Endosulfan | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1469 Spinnaker Dr, Ventura, CA 93002 | SW | Toxaphene | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1470 Spinnaker Dr, Ventura, CA 93002 | SW | DDT | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1471 Spinnaker Dr, Ventura, CA 93002 | SW | Acetone | µg/L | 24-hour composite | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1472 Spinnaker Dr, Ventura, CA 93002 | SW | Total xylene | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1473 Spinnaker Dr, Ventura, CA 93002 | SW | Pesticides3/ | µg/L | grab | quarterly |
| Ventura WWRP Order update of above | CI-1822 | 1474 Spinnaker Dr, Ventura, CA 93002 | SW | Remaining USEPA4/priority pollutants (excluding asbestos, Attachment 1) | µg/L | 24-hour composite | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1475 Spinnaker Dr, Ventura, CA 93002 | SW | HCH8/ | mg/L | 24-hour composite | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1476 Spinnaker Dr, Ventura, CA 93002 | SW | Radioactivity9/ | pCi/L | 24-hour composite | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1477 Spinnaker Dr, Ventura, CA 93002 | SW | Dioxin congeners | pg/L | 24-hour composite | semiannually |
| Ventura WWRP Order update of above | CI-1822 | 1478 Spinnaker Dr, Ventura, CA 93002 | SW | Acute toxicity11/ | TUa | 24-hour composite | semiannually 10/ |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Ventura WWRP Order update of above | CI-1822 | 1479 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Total and fecal coliform | MPN/l00 ml | 24-hour composite | annually12/ |
| Ventura WWRP Order update of above | CI-1822 | 1480 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Residual chlorine | mg/L | grab | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1481 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Hardness | mg/L | grab | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1482 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Salinity2/ | ppt | grab | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1483 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Temperature2/ | °F | field | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1484 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Dissolved oxygen2/ | mg/L | field | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1485 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Total Phosphorous as P | mg/L | field | weekly |
| Ventura WWRP Order update of above | CI-1822 | 1486 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Ammonia nitrogen | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1487 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Nitrate nitrogen | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1488 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Nitrite nitrogen | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1489 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Organic nitrogen | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1490 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Total Kjeldahl nitrogen | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1491 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Chlorophyll a | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1492 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Priority pollutants | mg/L | grab | monthly |
| Ventura WWRP Order update of above | CI-1822 | 1493 Spinnaker Dr, Ventura, CA 93002 | Receiving Water | Chronic toxicity1/ | TUc | grab | quarterly |
| Tunnel No. 104 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91321 | SW | Flow | gal/day | grab | semiannually |
| Tunnel No. 105 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91322 | SW | Temperature | °F | recorder | continuously |
| Tunnel No. 106 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91323 | SW | pH | standard units | continuous | quarterly |
| Tunnel No. 107 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91324 | SW | Oil and Grease | mg/L | grab | quarterly |
| Tunnel No. 108 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91325 | SW | BOD5 @ 20°°C | mg/L | grab | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Tunnel No. 109 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91326 | SW | Sulfides | mg/L | grab | quarterly |
| Tunnel No. 110 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91327 | SW | Total dissolved solids | mg/L | grab | quarterly |
| Tunnel No. 111 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91328 | SW | Settleable solids | mg/L | grab | quarterly |
| Tunnel No. 112 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91329 | SW | Total suspended solids | mg/L | grab | quarterly |
| Tunnel No. 113 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91330 | SW | Sulfate | mg/L | grab | quarterly |
| Tunnel No. 114 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91331 | SW | Phenols | mg/L | grab | quarterly |
| Tunnel No. 115 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91332 | SW | Chloride | mg/L | grab | quarterly |
| Tunnel No. 116 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91333 | SW | Boron | mg/L | grab | quarterly |
| Tunnel No. 117 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91334 | SW | Nitrate and Nitrite (as | mg/L | grab | quarterly |
| Tunnel No. 118 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91335 | SW | Total petroleum hydrocarbons | µg/l | grab | quarterly |
| Tunnel No. 119 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91336 | SW | Beta-BHC | µg/l | grab | quarterly2 |
| Tunnel No. 120 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91337 | SW | Copper | µg/l | grab | monthly3 |
| Tunnel No. 121 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91338 | SW | Selenium | µg/l | grab | monthly3 |
| Tunnel No. 122 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91339 | SW | Acute toxicity | % survival | grab | monthly3 |
| Tunnel No. 123 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91340 | SW | Chronic toxicity | TUc | grab | quarterly4 |
| Tunnel No. 124 | CI-6313 | 1/4 Mile SE of San Fernando Rd, Santa Clarita, CA 91341 | SW | Priority pollutants1 | µg/l | grab | quarterly4 |
| Drainage Ben. Assess Area 6&18 | CI-6945 | 18657 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Flow | gal/day | grab | quarterly5 |
| Drainage Ben. Assess Area 6&19 | CI-6945 | 18658 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Temperature | °F | ---- | daily |
| Drainage Ben. Assess Area 6&20 | CI-6945 | 18659 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | BOD5 @ 20°°C | mg/L | grab | monthly |
| Drainage Ben. Assess Area 6&21 | CI-6945 | 18660 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Total suspended solids | mg/L | grab | semiannually |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Drainage Ben. Assess Area 6&22 | CI-6945 | 18661 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Boron | mg/L | grab | semiannually |
| Drainage Ben. Assess Area 6&23 | CI-6945 | 18662 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Oil and Grease | mg/L | grab | semiannually |
| Drainage Ben. Assess Area 6&24 | CI-6945 | 18663 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Settleable solids | mg/L | grab | quarterly |
| Drainage Ben. Assess Area 6&25 | CI-6945 | 18664 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Sulfides | mg/L | grab | quarterly |
| Drainage Ben. Assess Area 6&26 | CI-6945 | 18665 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | pH | pH | grab | quarterly |
| Drainage Ben. Assess Area 6&27 | CI-6945 | 18666 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Sulfate | mg/L | grab | monthly |
| Drainage Ben. Assess Area 6&28 | CI-6945 | 18667 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Chloride | mg/L | grab | monthly |
| Drainage Ben. Assess Area 6&29 | CI-6945 | 18668 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Total dissolved solids | mg/L | grab | monthly |
| Drainage Ben. Assess Area 6&30 | CI-6945 | 18669 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Nitrate + Nitrite as Nitrogen | mg/L | grab | monthly |
| Drainage Ben. Assess Area 6&31 | CI-6945 | 18670 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Bis (2-ethylhexyl) phthalate | µg/l | grab | monthly |
| Drainage Ben. Assess Area 6&32 | CI-6945 | 18671 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Indeno (1, 2, 3-cd) pyrene | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&33 | CI-6945 | 18672 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Cyanide1 | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&34 | CI-6945 | 18673 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Copper1 | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&35 | CI-6945 | 18674 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Lead1 | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&36 | CI-6945 | 18675 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Mercury1 | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&37 | CI-6945 | 18676 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Thallium1 | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&38 | CI-6945 | 18677 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Priority pollutants | µg/l | grab | monthly2 |
| Drainage Ben. Assess Area 6&39 | CI-6945 | 18678 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Acute toxicity | % survival | grab | annually |
| Drainage Ben. Assess Area 6&40 | CI-6945 | 18679 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Chronic toxicity | TUc | grab | semiannually |
| Drainage Ben. Assess Area 6&41 | CI-6945 | 18680 Nathan Hill Rd, Santa Clarita, CA 91386 | SW | Total petroleum hydrocarbons | µg/l | grab | semiannually |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Treatment Saugas Well NO. 1 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91355 | GW & SW | Flow | gal/day | grab | annually |
| Treatment Saugas Well NO. 2 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91356 | GW & SW | pH | pH | totalizer | monthly1 |
| Treatment Saugas Well NO. 3 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91357 | GW & SW | Temperature | °F | grab | monthly |
| Treatment Saugas Well NO. 4 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91358 | GW & SW | Total Dissolved Solids | mg/L | grab | monthly |
| Treatment Saugas Well NO. 5 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91359 | GW & SW | Sulfate | mg/L | grab | monthly |
| Treatment Saugas Well NO. 6 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91360 | GW & SW | Chloride | mg/L | grab | monthly |
| Treatment Saugas Well NO. 7 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91361 | GW & SW | Boron | mg/L | grab | monthly |
| Treatment Saugas Well NO. 8 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91362 | GW & SW | Nitrogen2 | mg/L | grab | monthly |
| Treatment Saugas Well NO. 9 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91363 | GW & SW | Total Suspended Solids | mg/L | grab | monthly |
| Treatment Saugas Well NO. 10 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91364 | GW & SW | Turbidity | NTU | grab | monthly |
| Treatment Saugas Well NO. 11 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91365 | GW & SW | BOD520oC | mg/L | grab | monthly |
| Treatment Saugas Well NO. 12 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91366 | GW & SW | Oil and Grease | mg/L | grab | monthly |
| Treatment Saugas Well NO. 13 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91367 | GW & SW | Settleable Solids | ml/L | grab | monthly |
| Treatment Saugas Well NO. 14 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91368 | GW & SW | Residual Chlorine | mg/L | grab | monthly |
| Treatment Saugas Well NO. 15 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91369 | GW & SW | Copper (Cu) | mg/L | grab | monthly |
| Treatment Saugas Well NO. 16 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91370 | GW & SW | Lead (Pb) | mg/L | grab | monthly3 |
| Treatment Saugas Well NO. 17 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91371 | GW & SW | Total Chromium | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 18 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91372 | GW & SW | 1,1 Dichloroethane | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 19 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91373 | GW & SW | 1,1 Dichloroethylene | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 20 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91374 | GW & SW | 1,1,1 Trichloroethane | µg/l | grab | monthly3 |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Treatment Saugas Well NO. 21 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91375 | GW & SW | 1,1,2 Trichloroethane | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 22 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91376 | GW & SW | 1,1,2,2 Tetrachloroethane | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 23 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91377 | GW & SW | 1,2 Dichloroethane | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 24 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91378 | GW & SW | 1,2-Trans Dichloroethylene | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 25 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91379 | GW & SW | Tetrachloroethylene | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 26 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91380 | GW & SW | Trichloroethylene | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 27 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91381 | GW & SW | Carbon Tetrachloride | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 28 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91382 | GW & SW | Vinyl Chloride | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 29 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91383 | GW & SW | Total Trihalomethanes | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 30 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91384 | GW & SW | Benzene | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 31 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91385 | GW & SW | Methyl tertiary butyl ether (MTBE) | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 32 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91386 | GW & SW | Perchlorate | µg/l | grab | monthly3 |
| Treatment Saugas Well NO. 33 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91387 | GW & SW | 1-4 Dioxane | µg/l | grab | monthly4 |
| Treatment Saugas Well NO. 34 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91388 | GW & SW | N-Nitrosodimethylamine (NDMA) | mg/L | grab | monthly |
| Treatment Saugas Well NO. 35 | CI-8798 | Magic Mountain PWKY, Santa Clarita, CA 91389 | GW & SW | Acute Toxicity | % survival | grab | monthly |
| Golf Course & L.A. Co. Wells | CI-8876 | Hasley Canyon, Castaic, CA 91311 | | No Document | | | |
| Well #11 | CI-8292 | 121 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Waste Flow | gal/day | recorder | continuously |
| Well #11 | CI-8292 | 122 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | pH | pH | grab | once per event1 |
| Well #11 | CI-8292 | 123 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Temperature | oF | grab | once per event1 |
| Well #11 | CI-8292 | 124 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Suspended Solids | mg/L | grab | once per event1 |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Well #11 | CI-8292 | 125 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Turbidity | NTU | grab | once per event1 |
| Well #11 | CI-8292 | 126 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | BOD5 20°C | mg/L | grab | once per event1 |
| Well #11 | CI-8292 | 127 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Settleable Solids | ml/L | grab | once per event1 |
| Well #11 | CI-8292 | 128 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Residual Chlorine | mg/L | grab | once per event1 |
| Well #11 | CI-8292 | 129 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Dissolved Solids | mg/L | grab | once per event1 |
| Well #11 | CI-8292 | 130 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Sulfate | mg/L | grab | once per event1 |
| Well #11 | CI-8292 | 131 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Chloride | mg/L | grab | once per event1 |
| Well #11 | CI-8292 | 132 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | (Nitrate+Nitrite) as Nitrogen | mg/L | grab | once per event1 |
| Well #11 | CI-8292 | 133 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Copper | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 134 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Lead | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 135 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Chromium | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 136 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,1-Dichloroethane | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 137 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,1-Dichloroethylene | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 138 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,1,1-Trichloroethane | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 139 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,1,2-Trichloroethane | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 140 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,1,2,2-Tetrachloroethane | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 141 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,2-Dichloroethane | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 142 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,2-trans Dichloroethylene | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 143 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Tetrachloroethylene | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 144 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Trichloroethylene | µg/L | grab | once per event1 |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Well #11 | CI-8292 | 145 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Carbon Tetrachloride | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 146 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Vinyl Chloride | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 147 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Trihalomethanes | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 148 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Benzene | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 149 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Methyl tertiary butyl ether | µg/L | grab | once per event1 |
| Well #11 | CI-8292 | 150 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Perchlorate | µg/L | grab | annually |
| Well #11 | CI-8292 | 151 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | N-Nitrosodimethyl amine | µg/L | grab | annually |
| Well #11 | CI-8292 | 152 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1,4-Dioxane | µg/L | grab | annually |
| Well #11 | CI-8292 | 153 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Acute Toxicity | % survival | grab | annually |
| Well Nos. 7 & 10 | CI-8603 | 154 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Flow | gal/day | totalizer | continuously |
| Well Nos. 7 & 11 | CI-8603 | 155 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | pH | pH | grab | monthly |
| Well Nos. 7 & 12 | CI-8603 | 156 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Temperature | °F | grab | monthly |
| Well Nos. 7 & 13 | CI-8603 | 157 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Dissolved Solids | mg/L | grab | monthly |
| Well Nos. 7 & 14 | CI-8603 | 158 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Sulfate | mg/L | grab | monthly |
| Well Nos. 7 & 15 | CI-8603 | 159 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Chloride | mg/L | grab | monthly |
| Well Nos. 7 & 16 | CI-8603 | 160 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Boron | mg/L | grab | monthly |
| Well Nos. 7 & 17 | CI-8603 | 161 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Nitrogen1 | mg/L | grab | monthly |
| Well Nos. 7 & 18 | CI-8603 | 162 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Total Suspended Solids | mg/L | grab | monthly |
| Well Nos. 7 & 19 | CI-8603 | 163 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Turbidity | NTU | grab | monthly |
| Well Nos. 7 & 20 | CI-8603 | 164 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | BOD520oC | mg/L | grab | monthly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Well Nos. 7 & 21 | CI-8603 | 165 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Oil and Grease | mg/L | grab | monthly |
| Well Nos. 7 & 22 | CI-8603 | 166 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Settleable Solids | ml/L | grab | monthly |
| Well Nos. 7 & 23 | CI-8603 | 167 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Residual Chlorine | mg/L | grab | monthly |
| Well Nos. 7 & 24 | CI-8603 | 168 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Perchlorate | µg/L | grab | annually |
| Well Nos. 7 & 25 | CI-8603 | 169 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | 1-4 Dioxane | µg/L | grab | annually |
| Well Nos. 7 & 26 | CI-8603 | 170 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | N-Nitrosodimethylamine (NDMA) | µg/L | grab | annually |
| Well Nos. 7 & 27 | CI-8603 | 171 N. Cemetery Rd, Santa Paula, CA 93060 | GW & SW | Acute Toxicity | %surviva l | grab | annually |
| Bouquet Canyon Bridge Widening | CI-8649 | Bouquet Canyon Rd/Valencia Bl, Santa Claritra, CA | | No Document | | | |
| Emergency Dewatering | CI-8892 | 27601 Canyon View Dr. Santa Clarita, CA | GW | Flow | gal/day | totalizer | monthly1 |
| Emergency Dewatering | CI-8892 | 27602 Canyon View Dr. Santa Clarita, CA | GW | pH | pH | grab | monthly |
| Emergency Dewatering | CI-8892 | 27603 Canyon View Dr. Santa Clarita, CA | GW | Temperature | °F | grab | monthly |
| Emergency Dewatering | CI-8892 | 27604 Canyon View Dr. Santa Clarita, CA | GW | Total Dissolved Solids | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27605 Canyon View Dr. Santa Clarita, CA | GW | Sulfate | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27606 Canyon View Dr. Santa Clarita, CA | GW | Chloride | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27607 Canyon View Dr. Santa Clarita, CA | GW | Boron | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27608 Canyon View Dr. Santa Clarita, CA | GW | Nitrogen2 | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27609 Canyon View Dr. Santa Clarita, CA | GW | Total Suspended Solids | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27610 Canyon View Dr. Santa Clarita, CA | GW | Turbidity | NTU | grab | monthly |
| Emergency Dewatering | CI-8892 | 27611 Canyon View Dr. Santa Clarita, CA | GW | BOD520oC | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27612 Canyon View Dr. Santa Clarita, CA | GW | Oil and Grease | mg/L | grab | monthly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Emergency Dewatering | CI-8892 | 27613 Canyon View Dr. Santa Clarita, CA | GW | Settleable Solids | ml/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27614 Canyon View Dr. Santa Clarita, CA | GW | Sulfides | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27615 Canyon View Dr. Santa Clarita, CA | GW | Phenols | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27616 Canyon View Dr. Santa Clarita, CA | GW | Residual Chlorine | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27617 Canyon View Dr. Santa Clarita, CA | GW | Methylene Blue Active Substances (MBAS) | mg/L | grab | monthly |
| Emergency Dewatering | CI-8892 | 27618 Canyon View Dr. Santa Clarita, CA | GW | Acute Toxicity | % survival | grab | annually |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22116 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Flow | gal/day | totalizer | continuously* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22117 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | pH | pH | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22118 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Temperature | °F | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22119 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Total Dissolved Solids | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22120 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Sulfate | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22121 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Chloride | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22122 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Boron | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22123 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Nitrogen1 | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22124 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Total Suspended Solids | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22125 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Turbidity | NTU | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22126 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | BOD520oC | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22127 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Oil and Grease | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22128 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Settleable Solids | ml/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22129 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Sulfides | mg/L | grab | monthly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22130 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Phenols | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22131 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Residual Chlorine | mg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22132 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Methylene Blue Active Substances (MBAS) | µg/L | grab | monthly |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22133 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | 1,1,2 Trichloroethane | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22134 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | 1,1,2,2 Tetrachloroethane | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22135 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | 1,2 Dichloroethane | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22136 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Carbon Tetrachloride | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22137 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Dichlorobromo-methane | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22138 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Perchlorate | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22139 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Copper | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22140 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Lead | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22141 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Selenium | µg/L | grab | monthly* |
| Fmr. Whittaker-Bermite WTP | CI-8727 | 22142 Soledad Canyon Rd, Santa Clarita, CA 91350 | GW | Acute Toxicity | %surviva l | grab | annually |
| McDonald's Restaurant | CI-7464 | 49714 Gorman School Rd, Gorman, CA | GW & SW | Flow | gal/day | totalizer | Continuously * |
| McDonald's Restaurant | CI-7464 | 49715 Gorman School Rd, Gorman, CA | GW & SW | pH | pH | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49716 Gorman School Rd, Gorman, CA | GW & SW | Temperature | °F | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49717 Gorman School Rd, Gorman, CA | GW & SW | Total Suspended Solids | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49718 Gorman School Rd, Gorman, CA | GW & SW | Turbidity | NTU | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49719 Gorman School Rd, Gorman, CA | GW & SW | BOD520oC | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49720 Gorman School Rd, Gorman, CA | GW & SW | Oil and Grease | mg/L | grab | semiannually |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| McDonald's Restaurant | CI-7464 | 49721 Gorman School Rd, Gorman, CA | GW & SW | Settleable Solids | ml/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49722 Gorman School Rd, Gorman, CA | GW & SW | Sulfides | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49723 Gorman School Rd, Gorman, CA | GW & SW | Phenols | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49724 Gorman School Rd, Gorman, CA | GW & SW | Residual Chlorine | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49725 Gorman School Rd, Gorman, CA | GW & SW | Methylene Blue Active Substances (MBAS) | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49726 Gorman School Rd, Gorman, CA | GW & SW | TDS | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49727 Gorman School Rd, Gorman, CA | GW & SW | Sulfate | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49728 Gorman School Rd, Gorman, CA | GW & SW | Chloride | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49729 Gorman School Rd, Gorman, CA | GW & SW | Nitrogen | mg/L | grab | semiannually |
| McDonald's Restaurant | CI-7464 | 49730 Gorman School Rd, Gorman, CA | GW & SW | Acute Toxicity | % survival | grab | annually |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Total Waste Flow | gal/day | Recorder | continuously |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | pH | pH unit | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Temperature | ºF | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Turbidity | NTU | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Total Suspended Solids | mg/L | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Settleable Solids | ml/L | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | BOD520ºC | mg/L | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Oil and Grease | mg/L | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Copper | µg/L | grab | monthly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Sulfides | mg/L | grab | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Methylene Blue Active Substances (MBAS) | mg/L | grab | quarterly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Residual Chlorine | mg/L | grab | quarterly |
| Santa Clara river Bridge Exp | CI-8374 | Hwy 101 @ Santa Clara River, Ventura, CA | GW & SW | Acute Toxicity | %surviva l | grab | annually |
| Townhomes Tract 5353 | CI-8856 | River St, Fillmore, CA 93015 | GW & SW | Flow | gal/day | totalizer | continuously 1 |
| Townhomes Tract 5354 | CI-8856 | River St, Fillmore, CA 93016 | GW & SW | pH | pH | grab | monthly |
| Townhomes Tract 5355 | CI-8856 | River St, Fillmore, CA 93017 | GW & SW | Temperature | °F | grab | monthly |
| Townhomes Tract 5356 | CI-8856 | River St, Fillmore, CA 93018 | GW & SW | Boron | mg/L | grab | monthly |
| Townhomes Tract 5357 | CI-8856 | River St, Fillmore, CA 93019 | GW & SW | Nitrogen2 | mg/L | grab | monthly |
| Townhomes Tract 5358 | CI-8856 | River St, Fillmore, CA 93020 | GW & SW | Total Suspended Solids | mg/L | grab | monthly |
| Townhomes Tract 5359 | CI-8856 | River St, Fillmore, CA 93021 | GW & SW | Turbidity | NTU | grab | monthly |
| Townhomes Tract 5360 | CI-8856 | River St, Fillmore, CA 93022 | GW & SW | BOD520oC | mg/L | grab | monthly |
| Townhomes Tract 5361 | CI-8856 | River St, Fillmore, CA 93023 | GW & SW | Oil and Grease | mg/L | grab | monthly |
| Townhomes Tract 5362 | CI-8856 | River St, Fillmore, CA 93024 | GW & SW | Settleable Solids | ml/L | grab | monthly |
| Townhomes Tract 5363 | CI-8856 | River St, Fillmore, CA 93025 | GW & SW | Sulfides | mg/L | grab | monthly |
| Townhomes Tract 5364 | CI-8856 | River St, Fillmore, CA 93026 | GW & SW | Phenols | mg/L | grab | monthly |
| Townhomes Tract 5365 | CI-8856 | River St, Fillmore, CA 93027 | GW & SW | Residual Chlorine | mg/L | grab | monthly |
| Townhomes Tract 5366 | CI-8856 | River St, Fillmore, CA 93028 | GW & SW | Methylene Blue Active Substances (MBAS) | µg/L | grab | monthly |
| Townhomes Tract 5367 | CI-8856 | River St, Fillmore, CA 93029 | GW & SW | Acute Toxicity | %surviva l | grab | annually |
| Valencia WWRP | CI-7296 | 28185 The Old Road, Valencia, CA 91355 | GW & SW | Flow | gal/day | totalizer | continuously |
| Valencia WWRP | CI-7296 | 28186 The Old Road, Valencia, CA 91355 | GW & SW | pH | pH | grab | quarterly |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| Valencia WWRP | CI-7296 | 28187 The Old Road, Valencia, CA 91355 | GW & SW | Temperature | °F | grab | quarterly |
| Valencia WWRP | CI-7296 | 28188 The Old Road, Valencia, CA 91355 | GW & SW | Total Suspended Solids | mg/L | grab | quarterly |
| Valencia WWRP | CI-7296 | 28189 The Old Road, Valencia, CA 91355 | GW & SW | Turbidity | NTU | grab | quarterly |
| Valencia WWRP | CI-7296 | 28190 The Old Road, Valencia, CA 91355 | GW & SW | BOD520oC | mg/L | grab | quarterly |
| Valencia WWRP | CI-7296 | 28191 The Old Road, Valencia, CA 91355 | GW & SW | Oil and Grease | mg/L | grab | monthly |
| Valencia WWRP | CI-7296 | 28192 The Old Road, Valencia, CA 91355 | GW & SW | Settleable Solids | ml/L | grab | monthly |
| Valencia WWRP | CI-7296 | 28193 The Old Road, Valencia, CA 91355 | GW & SW | Sulfides | mg/L | grab | monthly |
| Valencia WWRP | CI-7296 | 28194 The Old Road, Valencia, CA 91355 | GW & SW | Residual Chlorine | mg/L | grab | monthly |
| Valencia WWRP | CI-7296 | 28195 The Old Road, Valencia, CA 91355 | GW & SW | Methylene Blue Active Substances (MBAS) | mg/L | grab | semiannually |
| Valencia WWRP | CI-7296 | 28196 The Old Road, Valencia, CA 91355 | GW & SW | Total Dissolved Solids | ml/L | grab | semiannually |
| Valencia WWRP | CI-7296 | 28197 The Old Road, Valencia, CA 91355 | GW & SW | Sulfate | mg/L | grab | semiannually |
| Valencia WWRP | CI-7296 | 28198 The Old Road, Valencia, CA 91355 | GW & SW | Chloride | mg/L | grab | semiannually |
| Valencia WWRP | CI-7296 | 28199 The Old Road, Valencia, CA 91355 | GW & SW | Boron | mg/L | grab | semiannually |
| Valencia WWRP | CI-7296 | 28200 The Old Road, Valencia, CA 91355 | GW & SW | Nitrogen | mg/L | grab | semiannually |
| Valencia WWRP | CI-7296 | 28201 The Old Road, Valencia, CA 91355 | GW & SW | Phenols | mg/L | grab | annually |
| Valencia WWRP | CI-7296 | 28202 The Old Road, Valencia, CA 91355 | GW & SW | Acute Toxicity | % survival | grab | annually |
| Ventura Co. Emergency Proj. | CI-8868 | Various locations, Ventura, CA | GW & SW | Being Upgraded | | | |
| Fillmore WWTP | CI-6523 | C Street & River St, Fillmore, CA 93015 | | No Document | | | |
| Saugus WWRP | CI-2960 | 26200 Springbrook Ave, Saugas, CA 91350 | SW | Being Upgraded | | | |
| Valencia WWRP | CI-4993 | 28185 The Old Road, Valencia, CA 91355 | | Being Upgraded | | | |

| Facility Name | Facility Number | Location | Type GW/ SW | Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|---|---|---|---|
| College Of The Canyons | CI-7324 | 26455 N Rockwell Canyon Rd, Santa Clarita | SW | Being Upgraded | | | |
| Aquatic Pesticides/Weed Control | CI-8785 | 32353 W Triunfo Rd, Westlake Village, CA 91361 | | No Document | | | |
| William E. Warner Power Plant | CI-6610 | Pyramid Lake Rd, Pyramid Lake, CA 91310 | SW | Being Upgraded | | | |
| Foothill Feeder Power Plant | CI-6743 | 31849 N Lake Hughes Rd, Castaic, CA 91384 | | No Document | | | |

# Appendix B
# Data Gap Analysis Comments and Responses

# Ventura County
# Watershed Protection District
## Planning & Regulatory
## Hydrology Section
## MEMORANDUM

**DATE:** **August 24, 2005**

**FROM:** **Mark Bandurraga**

**SUBJECT:** **CMP Data Gap Analysis Comments**

The review of the subject submittal is based on the scope of work for this task, including determining data gaps and providing a framework for comparison of historical data with appropriate benchmark values. The contract specifies that the document should contain the following:
1. Basin Plan beneficial use designations and water quality objectives from the Basin Plan and other sources such as the Water Quality Standards in 40 CFS Part13 (California Toxics Rule)
2. Comparison of historical data to benchmark values
3. Evaluation of spatial coverage of historical data
4. Evaluation of temporal coverage of historical data
5. Evaluation whether additional sampling is needed to characterize the health of the watershed.

The submittal appears to comply with the scope of work with the exception of the discussion of the Water Quality Standards in part 1 above and the beneficial use designations from the Basin Plan. These items should be added to the CMP. I expect these revisions to be incorporated in the data gap analysis portion of the draft CMP. My substantive comments are:

1. The scoring criteria presented on page 2 and 3 are report to consider both spatial location and sample frequency, but subsequent sections provide a score for each parameter and then discusses the spatial distribution separately. Therefore, it appears difficult to combine the two criteria. My suggestion is to have two scores for each parameter, frequency (none, poor, moderate, rich) and spatial distribution (none, poor, moderate, rich) with different symbols to show in your tables.
2. Table 6 should be separated into river reaches to show where the water quality objectives change. The beneficial uses for each reach should be included per the scope. It is acceptable to me to show the combined minimum and maximum exceedances for the entire river in an additional table, but please clarify in the table and

in the section whether those include only the 2000-05 data used in the data gap analysis or all of the values included in the database.

3. Section 5- Chemical constituents bullet– please clarify if you are recommending additional sampling for these constituents in light of the low historical concentrations in the available sampling results. A summary table showing your recommendations for additional sampling would be useful here. The summary table should show whether you are recommending additional sampling locations or increased sampling frequency at existing locations based on your analyses.
4. Of the latest Constituent list I had, I could not find Arochlors, BHCs, Bis Phthalate, chloramines, chlordane, chlorpyrifos, cyanide, dachtal, diazinon, fecal enterococcus, methoxyclor, mirex, or nonachlor in your evaluation. Please clarify why they were not included and extend the analyses to include them.
5. Page 10, Section 3.0 last paragraph- appears to contradict itself- says spatial distribution is adequate and inadequate.

My minor comments are as follows:

1. Page 1 Sec 1 2nd paragraph last sentence – delete "received"
2. Page 1 Sec 1 3rd paragraph 1st sentence – replace visualize with plot.
3. Page 2 Sec 1 3rd bullet metal measurements….dissolved forms were…..delete rarely
4. Page 4 Sec 2.1 Once you defined your criteria labels, please be consistent. You use sufficient instead of moderate and describe data moderate in several different ways. For the sake of clarity, I think it is okay to be somewhat repetitive in the use of the labels. Under Sespe, you may wish to point out the that USGS has extensive flow data for the Sespe Creek tributary (Provides 60% of the Santa Clara River Watershed flow) and VCWPD has 35 years of data for Pole and Hopper Creeks near Fillmore.
5. Page 5 Oxnard Plain- Please clarify how the data management assumptions affect your conclusion that no data were reported for the Oxnard Section.
6. Page 7 Sec 2.4 2nd sentence- Please clarify this sentence- does not make sense to me.
7. Page 8 Sec 2.5 1st paragraph 3rd sentence- delete "will"
8. Page 10, Section 3.0 2nd to last paragraph NPDES-permitted
9. Page 10, Section 3.0 last paragraph- replace ignored with not sampled. Replace permitting with permit. Replace thickly with densely.
10. Page 10 Sec 4 Explain that these conclusions are based on data collected prior to 1995 and may not be applicable currently. Provide references used in SCREMP section in reference list.
11. Page 14 Sec 4.2 AWQC not defined

12. Page 15 1st bullet, last sentence – replace new data with additional sampling
13. Figures- choose color scheme to make sure they copy well in black and white- symbols should also be chosen accordingly. For many figures, the Santa Clara Watershed label on the location map does not point to the watershed.
14. Figure 35- it is difficult to see the color differences between the various sampling stations – the symbols should be enlarged or changed. What is R4 in the legend?

**Response to Comments**
To: Mark Bandurraga

1. Substantive Comment 1: The scoring criteria presented on page 2 and 3 are report to consider both spatial location and sample frequency, but subsequent sections provide a score for each parameter and then discusses the spatial distribution separately. Therefore, it appears difficult to combine the two criteria. My suggestion is to have two scores for each parameter, frequency (none, poor, moderate, rich) and spatial distribution (none, poor, moderate, rich) with different symbols to show in your tables.

**Response:** AMEC has expanded on the definition of each score in order to more effectively discuss spatial distribution and frequency

2. Substantive Comment 2: Table 6 should be separated into river reaches to show where the water quality objectives change. The beneficial uses for each reach should be included per the scope. It is acceptable to me to show the combined minimum and maximum exceedances for the entire river in an additional table, but please clarify in the table and in the section whether those include only the 2000-05 data used in the data gap analysis or all of the values included in the database.

**Response:** Per the scope of work AMEC has not separated the table into river reaches but provided detailed based on sub-basins. Table 5 has been included to show where water quality objective change within the sub-basins and to provide greater detail and clarity. The beneficial uses for each sub-basin have been included into the document as an appendix.

3. Substantive Comment 3: Section 5- Chemical constituents bullet– please clarify if you are recommending additional sampling for these constituents in light of the low historical concentrations in the available sampling results. A summary table showing your recommendations for additional sampling would be useful here. The summary table should show whether you are recommending additional sampling locations or increased sampling frequency at existing locations based on your analyses.

**Response:** Recommendations based on the gap analysis have been included as part of the sampling locations memorandum and Section 6.0 of the Draft CMP.

4. Substantive Comment 4: Of the latest Constituent list I had, I could not find Arochlors, BHCs, Bis Phthalate, chloramines, chlordane, chlorpyrifos, cyanide, dachtal, diazinon, fecal enterococcus, methoxyclor, mirex, or nonachlor in your evaluation. Please clarify why they were not included and extend the analyses to include them.

**Response:** Fecal enterococcus has been included with the fecal coliform analysis. BHC's, arochlors, chloramines and Bisphthalate are included in the analysis for PCB's. Chlordane, diazanon, mirex, methoxyclor, cyanide, nonachlor have been included in the analysis since the analysis has been expanded to extend 10 years.

5. Substantive Comment 5: Page 10, Section 3.0 last paragraph- appears to contradict itself- says spatial distribution is adequate and inadequate.

**Response:** Section has been revised to provide greater clarity in conclusions.

**Response to Minor Comments:** All editorial comments have been incorporated. Figures have been edited to be easier for printing in black and white and provide greater detail. Effects of data management assumptions on results have been explained.

Mark,
I am forwarding comments from Greg Gauthier to you.
Richard Sweet

>From: GGauthier@aol.com
>To: rsweet_46@hotmail.com, pjenkin@sbcglobal.net, trobinson@bren.ucsb.edu,
> bthiel@scwrp.org, wingd@sbcglobal.net
>Subject: Re: FW: Santa Clara River Data Gap Analysis Review REQUEST!!!!
>Date: Wed, 24 Aug 2005 19:46:49 EDT
>
>Richard,
>
>A few observations/questions:
>
>The data source list identifies the following sources:
>
>â€¢ Ventura County Watershed Protection District
>â€¢ Los Angeles County Regional Water Quality Control Board - Surface
>Water
>Ambient
>Monitoring Program
>â€¢ Los Angeles County Sanitation District
>â€¢ Los Angeles County Department of Public Works
>â€¢ United States Geological Services (USGS)
>â€¢ United Water Conservation District
>â€¢ City of Ventura
>â€¢ City of Santa Paula
>â€¢ City of Fillmore
>
>The references section lists only the following two sources:
>
>RWQCB, 1994. Water Quality Control Plan â€“ Los Angeles Region. California
>Regional Water
>Quality Control Board, Los Angeles Region, 101 Centre Plaza Drive,
>Monterey
>Park, CA
>91754. (Chapter 3: Water Quality Objectives)
>
>VCWPD and LADPW, 2005. Chapter 5: Santa Clara River Enhancement and
>Management
>Plan (SCREMP). Prepared for Ventura County Watershed Protection District,
>Los
>Angeles County Department of Public Works and SCREMP Project Steering
>Committee.
>AMEC Earth and Environmental (author), Santa Barbara, CA. (Chapter 5:
>Current
>Conditions)
>
>Were data submitted by the others listed under sources rejected and not
>included in the analysis? If so, why?
>
>The city of Santa Clarita also is missing as a data source or reference.

>Much of the upper watershed data, as evidenced by the  maps, seem centered
>on
>Santa Clarita.  Was data obtained from Santa  Clarita?  If not, it is hard
>to
>imagine that Heather does not have some  data that could inform the gaps
>analysis.
>
>Greg  Gauthier
>Wetlands Recovery Project
>PO Box 22405
>Santa Barbara, CA  93121
>805-892-4858
>805-259-9539 cell

**Comments on the Data Gap Analysis Received from Friends of the Santa Clara River via e-mail:**

Richard,
A few observations/questions:
**Comment 1**
The data source list identifies the following sources:

Ventura County Watershed Protection District
Los Angeles County Regional Water Quality Control Board - Surface Water Ambient Monitoring Program
Los Angeles County Sanitation District
Los Angeles County Department of Public Works
United States Geological Services (USGS)
United Water Conservation District
City of Ventura
City of Santa Paula
City of Fillmore

The references section lists only the following two sources:

RWQCB, 1994. Water Quality Control Plan “ Los Angeles Region. California Regional Water Quality Control Board, Los Angeles Region, 101 Centre Plaza Drive, Monterey Park, CA 91754. (Chapter 3: Water Quality Objectives)

VCWPD and LADPW, 2005. Chapter 5: Santa Clara River Enhancement and Management Plan (SCREMP). Prepared for Ventura County Watershed Protection District, Los Angeles County Department of Public Works and SCREMP Project Steering Committee.

AMEC Earth and Environmental (author), Santa Barbara, CA. (Chapter 5: Current Conditions)

Were data submitted by the others listed under sources rejected and not included in the analysis? If so, why?

**Response: No data submitted was rejected from the database. Data which did not meet the analysis criteria (more than 10 years old, too little frequency) were excluded from the analysis. The reference section has been expanded to include data provided by the various stakeholders. Table 6 has been provided to show in detail which data are included in the database.**

**Comment 2:**
The city of Santa Clarita also is missing as a data source or reference. Much of the upper watershed data, as evidenced by the maps, seem centered on Santa Clarita. Was data obtained from Santa Clarita? If not, it is hard to imagine that Heather does not have some data that could inform the gaps analysis.

**Response: The City of Santa Clarita did not provide data for the project. City of Santa Clarita representative was present at multiple stakeholder meetings when data acquisition was discussed and data was offered by various stakeholders. Further, per Heather Merenda, water quality testing within City of Santa Clarita is primarily conducted by LADPW, therefore data received from LADPW should cover this area of the watershed.**

Greg Gauthier
Wetlands Recovery Project
PO Box 22405
Santa Barbara, CA 93121
805-892-4858
805-259-9539 cell

**From Darla Wise, VCWPD**

The following are my comments on the data gap analysis draft report as a follow-up to the three items we discussed on the phone.

1. The Watershed Protection District monitors SCR surface water quality at the Freeman Diversion facility under an NPDES Stormwater permit. Monitoring takes place six times per year (4 wet and 2 dry) starting in 2001 and includes priority pollutants and toxicity (ceridaphnia dubia, fat head minnows, and purple sea urchin), both chronic and acute. A substantial amount of data is collected as part of our program and has not been included in the cmp data gap analysis. I'm sure the findings of the gap analysis will change once you take into account the missing NPDES stormwater program data. Also, the CMP Access DB that you provided us is missing the NPDES stormwater data at the Freeman Diversion.

2. The WPD NPDES Stormwater Monitoring Program is not mentioned as one of the agencies providing data for the gap analysis. This is especially surprising in that the DB AMEC is using for the CMP data analysis was provided by the District.

3. The inclusion of a summary table of data quantity and temperal quality for each parameter vs stream reach would be very beneficial and make the results much easier to understand.

Let me know if you have any questions/comments regarding my comments.
Thanks

**Comments Received from Darla Wise, VCWPD via e-mail:**

The following are my comments on the data gap analysis draft report as a follow-up to the three items we discussed on the phone.

1. The Watershed Protection District monitors SCR surface water quality at the Freeman Diversion facility under an NPDES Stormwater permit. Monitoring takes place six times per year (4 wet and 2 dry) starting in 2001 and includes priority pollutants and toxicity (ceridaphnia dubia, fat head minnows, and purple sea urchin), both chronic and acute. A substantial amount of data is collected as part of our program and has not been included in the cmp data gap analysis. I'm sure the findings of the gap analysis will change once you take into account the missing NPDES stormwater program data. Also, the CMP Access DB that you provided us is missing the NPDES stormwater data at the Freeman Diversion.

**Response: Data from the Freeman Diversion was mistakenly excluded from the original analysis. It has been inserted back into the database and the analysis was re-run to include it. The CMP Access DB purposely excluded the VCWPD data so that it could be uploaded into the Master DB at VCWPD without inserting duplicate entries, per comments AMEC received on the draft database. Toxicity data criteria for the gap analysis included chronic toxicity testing for freshwater (aquatic) species. Toxicity data received from VCWPD included acute testing (ceridaphnia) and salt water species (sea urchin and abalone) and therefore did not meet the gap analysis criteria.**

2. The WPD NPDES Stormwater Monitoring Program is not mentioned as one of the agencies providing data for the gap analysis. This is especially surprising in that the DB AMEC is using for the CMP data analysis was provided by the District.

**Response: See response above.**

3. The inclusion of a summary table of data quantity and temperal quality for each parameter vs stream reach would be very beneficial and make the results much easier to understand.

**Response: The gap analysis was divided by parameter vs. sub-basin per the Scope of Work.**

Let me know if you have any questions/comments regarding my comments.
Thanks

August 25, 2005

Mark Bandurraga, Senior Hydrologists
Ventura County Watershed Protection District

Subject: Draft Data Gap Analysis Comments from Friends of the Santa Clara River

Mr. Bandurraga,

In reference to the 8/17/05 document from Megan Schwartz to you, these are Friends of the Santa Clara River's (FSCR) comments. Please note that the SCREMP specifies that the Santa Clara River's (SCR) effect on the coast line and near-shore ocean should be addressed.

1. On page 1, additional entities that may have data to be considered include the Ventura County Environmental Health Department (near shore bacteria, e.g. McGrath and Surfer's Knoll), Ventura Harbor District (dredging parameters), McGrath State Park (various), the So. Ca. Coastal Water Research Project (various) and the State Coastal Commission – Coastal Cleanup Day (trash at McGrath and Surfer's Knoll).
2. On page 3, Table 1, could parameters for turbidity, plant debris (e.g. arundo) and solid waste be added as well as a near shore ocean water segment?
3. On page 5, Upper Santa Clara, first sentence: I believe westernmost should be replaced with eastern.
4. On page 6, Table 3, please add a near shore ocean water segment.
5. On page 7, Table 4, please add a near shore ocean water segment. Wouldn't it be appropriate to include sediment monitoring results here since organic constituents may be carried with it? Also, it may be appropriate to include older data for persistent chemicals.

Thank you for the opportunity to comment on this draft document. I can be reached at 644-2802 or via email at rsweet_46@hotmail.com.

Richard Sweet, Board member FSCR

Cc: Ron Bottorff, FSCR and Paul Jenkin, Surfrider Foundation-Ventura County Chapter

August 25, 2005

Mark Bandurraga, Senior Hydrologists
Ventura County Watershed Protection District

Subject: Draft Data Gap Analysis Comments from Friends of the Santa Clara River

Mr. Bandurraga,

In reference to the 8/17/05 document from Megan Schwartz to you, these are Friends of the Santa Clara River's (FSCR) comments. Please note that the SCREMP specifies that the Santa Clara River's (SCR) effect on the coast line and near-shore ocean should be addressed.

1. On page 1, additional entities that may have data to be considered include the Ventura County Environmental Health Department (near shore bacteria, e.g. McGrath and Surfer's Knoll), Ventura Harbor District (dredging parameters), McGrath State Park (various),the So. Ca. Coastal Water Research Project (various) and the State Coastal Commission – Coastal Cleanup Day (trash at McGrath and Surfer's Knoll).

**Response: The database and list of data providers was completed in late July. Requesting additional data at this date would be outside the scope of work.**

2. On page 3, Table 1, could parameters for turbidity, plant debris (e.g. arundo) and solid waste be added as well as a near shore ocean water segment?

**Response: Parameter list was circulated throughout stakeholder group and decided upon in May 2005. Adding additional parameters is outside the scope of work.**

3. On page 5, Upper Santa Clara, first sentence: I believe westernmost should be replaced with eastern.

**Response: Comment has been incorporated.**

4. On page 6, Table 3, please add a near shore ocean water segment.

**Response: The near ocean water segment is included in the Oxnard Plain sub-basin within the analysis.**

5. On page 7, Table 4, please add a near shore ocean water segment. Wouldn't it be appropriate to include sediment monitoring results here since organic constituents may be carried with it? Also, it may be appropriate to include older data for persistent chemicals.

**Response: The near ocean water segment is included in the Oxnard Plain sub-basin within the analysis. Sediment monitoring data is outside of the stated scope of work and therefore has not been collected for this analysis. Older data for persistent chemicals would have been included if it had more than five individual records per station (including separate dates of collection) and was collected and measured after January 1, 1995.**

Thank you for the opportunity to comment on this draft document. I can be reached at 644-2802 or via email at rsweet_46@hotmail.com.

Richard Sweet, Board member FSCR

Cc: Ron Bottorff, FSCR and Paul Jenkin, Surfrider Foundation-Ventura County Chapter

# California Regional Water Quality Control Board
## Los Angeles Region
**Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful**

**Alan C. Lloyd, Ph.D.**
*Agency Secretary*

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

**Arnold Schwarzenegger**
*Governor*

**TO:** Megan Schwartz
AMEC

**FROM:** Elizabeth Erickson
TMDL Unit #2

**DATE:** September 6, 2005

**SUBJECT:** Comments on: Data Gap Analysis: Santa Clara River Comprehensive Monitoring Plan

The study is a good start and came up with some interesting results, specifically the need for sampling outside the Valencia and Saugus outfall locations. Here are some specific comments.

1) Why is the data format proprietary when it was created with public grant money for a public institution?

2) Data older than 5 years is not considered 'obsolete' by our organization; in fact it represents the historical basis for maintaining or changing an objective. Perhaps this data could be maintained in a separate file. The file as presented is useful for selecting new sampling sites, but it would be misleading to label the short term data base as sufficient for making assessments on water quality standards.

3) Eliminating sample sites with fewer than 5 samples means that citizen records and small study projects are not considered, whereas samples collected by Districts and Municipalities are emphasized. While this may be useful at this stage, it gives the data base and decisions based upon it less credibility with the public.

4) The characterization of water quality distribution in the Upper Santa Clara as 'good with poor distribution' avoids an important issue. Limit to sampling site is virtually absent with the exception of a few points. The value of the samples at those sites gives no information about more than 10 years of exclusion from other parts of the upper watershed. In fact only a mile or so of river have been sampled. This description needs to be changed.

5) The absence of sample locations I n the Oxnard Plain and in Piru should be emphasized.

6) The description of the nutrient distribution argues that a few outfall samples constitute sufficient sampling of a pollutant found in non-point discharge. The lack of information should be emphasized.

7) Again, the report lists the lack of information on PAH, PCB, DDT, aldrin/dieldrin/endrin, heptachlor, endosulfan, toxaphene without emphasizing that there is virtually no information on the chemicals in the watershed.

8) There is no evidence to support the statement that sample location distribution on the Santa Clara is sufficient.

**Response to Comments from Elizabeth Erickson, Regional Water Quality Control Board**

The study is a good start and came up with some interesting results, specifically the need for sampling outside the Valencia and Saugus outfall locations. Here are some specific comments.

1) Why is the data format proprietary when it was created with public grant money for a public institution?

Response: The report has been amended to remove this statement.

2) Data older than 5 years is not considered 'obsolete' by our organization; in fact it represents the historical basis for maintaining or changing an objective. Perhaps this data could be maintained in a separate file. The file as presented is useful for selecting new sampling sites, but it would be misleading to label the short term data base as sufficient for making assessments on water quality standards.

Response: The temporal data inclusion criteria was changed from 5 years to 10 years, so now any data that is post 01/01/1995 has been included in the DGA.

3) Eliminating sample sites with fewer than 5 samples means that citizen records and small study projects are not considered, whereas samples collected by Districts and Municipalities are emphasized. While this may be useful at this stage, it gives the data base and decisions based upon it less credibility with the public.

Response: As stated above, all data provided was included in the database. Sample sites with fewer than 5 samples were considered data poor for the purposes of the data gap analysis when considering recommendations for future monitoring sites.

4) The characterization of water quality distribution in the Upper Santa Clara as 'good with poor distribution' avoids an important issue. Limit to sampling site is virtually absent with the exception of a few points. The value of the samples at those sites gives no information about more than 10 years of exclusion from other parts of the upper watershed. In fact only a mile or so of river have been sampled. This description needs to be changed.

Response: The description has been changed to "stations distributed over lower third of subwatershed".

5) The absence of sample locations in the Oxnard Plain and in Piru should be emphasized.

Response: The lack of sample locations in these areas has been emphasized within Section 5.4 regarding Temporal and Spatial Distribution of Samples.

6) The description of the nutrient distribution argues that a few outfall samples constitute sufficient sampling of a pollutant found in non-point discharge. The lack of information should be emphasized.

Response: The lack of information regarding nutrient sampling has been emphasized.

7) Again, the report lists the lack of information on PAH, PCB, DDT, aldrin/dieldrin/endrin, heptachlor, endosulfan, toxaphene without emphasizing that there is virtually no information on the chemicals in the watershed.

Response:  The report has been amended to emphasize that these constituents constitute a large data gap.

8) There is no evidence to support the statement that sample location distribution on the Santa Clara is sufficient.

Response:  Data gap analysis has been re-run including all data submitted by every agency. Text has been added to the document to support the above statement.

Hello Megan and Mark,

Below are my comments and questions regarding the distributed Data Gap Analysis: SCR-CMP report. I hope this will be helpful in finalizing this comprehensive study.

Best regards,

Tim

---------------------------------------------------
Timothy H. Robinson
Researcher
Bren School of Environmental Science & Management
4422 Bren Hall
University of California
Santa Barbara, CA 93106-5131
T: 805-893-8356
F: 805-893-7612
E-mail: trobinson@bren.ucsb.edu

**Comments and Questions:**

- Didn't the City of Santa Clara contribute data and participate in this project? Their absence on the list is curious.
- In the assumptions listed on page 2, you should add a bullet that all data used were of similar quality both analytically and how the sample was taken in the field and transported to the laboratory. This is important and problematic as samples analyzed with field kits are not of the same caliber as samples analyzed in an analytical laboratory. I assume the dataset includes some of each.
- The qualitative scoring criteria needs better explanation. I am sure AMEC used some quantitative scoring that underlies the final qualitative assignment. This is important for comparing this report with other studies (e.g., the entire SCR dataset would be considered "data poor" compared to the hundreds of stream samples taken annually on each stream in the Santa Barbara area for the Santa Barbara Coastal LTER project at UCSB). Also the criteria do not distinguish between main stem and tributary samples, a key point when looking at the health of the Santa Clara River and watershed.
- Why are there so few samples from the upper watershed above Acton? Were there no development activities in those regions requiring monitoring (e.g., ranching, farming, mining, etc)?
- Nutrient section: you need to be clear on what type of phosphorus you are including. Were data entries for phosphate, total phosphorus or total available phosphorus? The distinction is important when looking at eutrophication issues and biogeochemical processes.
- Last paragraph of section 3.0: first sentence, the sampling stations distribution might be "adequate" but the frequency makes the data of limited use. Also the outlet data at the mouth in your example is limited as well with only 6 of the 34 parameters listed in the presented database.
- Section 4.0: The document distributed must be a subset of the entire effort as the reference list was limited to two citations with more in the text. Also there was no Appendix A, Tables 38-40, etc. If the conclusions presented in this section are strictly from other sources, than that needs to be presented with more clarity. I received Table 6 but where are the previous tables? You need to explain what is meant by minimum and maximum state water quality objectives. The maximum is the more familiar term.

- Section 4.3: Ammonia is used throughout the document but here you change to Total Ammonia. Include a definition to clarify the distinction. Nitrate: the second sentence contradicts the first unless the water quality control criteria are different than previously stated. Why the qualifier of “at least” in the first sentence when you are giving percentages?
- Section 5.0: In the summaries you use the term “adequate”. This needs to be clearly defined to better assess the actual data coverage. Nutrients: the only data with decent frequency for nutrients are associated with NPDES facilities and not the Upper and Santa Paula reaches. Calibration of the WARMF model used for the Nutrient TMDL was difficult given inadequate data coverage for ammonia, nitrate and of course phosphate. This paragraph needs to be carefully written given the amount of attention given to nutrient issues.
- Maps/figures: Figure 35 should be first and include cities, and NPDES facilities (i.e. Figure 22). This would give the background and orientation needed for the rest of the document. You might have been just as effective putting the data presented in Figures 1-34 in a table as there was a lot of graphical repetition and not that much information gained towards understanding the health of the watershed.
- I was hoping to see recommendations and thought this was one of the objectives of the study.

**Response to Comments: Timothy Robinson**

Comment: Didn’t the City of Santa Clara contribute data and participate in this project? Their absence on the list is curious.

Response: The City of Santa Clarita did not contribute data. According the Heather Merenda of the City, they have little data to provide as LACSD conducts most water quality testing within the City limits.

Comment: In the assumptions listed on page 2, you should add a bullet that all data used were of similar quality both analytically and how the sample was taken in the field and transported to the laboratory. This is important and problematic as samples analyzed with field kits are not of the same caliber as samples analyzed in an analytical laboratory. I assume the dataset includes some of each.

Response: This was not an assumption of the dataset for the purposes of the data gap analysis. While AMEC agrees that how samples are analyzed is important in conducting a comprehensive and standardized monitoring program, the purpose of the gap analysis was to determine where and how often samples were being taken. The data set contains some of each and the database provided to VCWPD indicates as such for each entry.

Comment: The qualitative scoring criteria needs better explanation. I am sure AMEC used some quantitative scoring that underlies the final qualitative assignment. This is important for comparing this report with other studies (e.g., the entire SCR dataset would be considered “data poor” compared to the hundreds of stream samples taken annually on each stream in the Santa Barbara area for the Santa Barbara Coastal LTER project at UCSB). Also the criteria do not distinguish between main stem and tributary samples, a key point when looking at the health of the Santa Clara River and watershed.

Response: AMEC has added text to the document to further describe the scoring assignment. Analysis of data was conducted for both the main stem and tributary samples. Where tributaries were sampled is included for each constituent within the different subwatersheds.

Comment: Why are there so few samples from the upper watershed above Acton? Were there no development activities in those regions requiring monitoring (e.g., ranching, farming, mining, etc)?

Response: Determining why sampling has not occurred in a particular location is outside of the scope of the project. Samples may not have been taken due to little or no accesses in this part of the watershed and because this part of the watershed may be dry the majority of the year.

Comment: Nutrient section: you need to be clear on what type of phosphorus you are including. Were data entries for phosphate, total phosphorus or total available phosphorus? The distinction is important when looking at eutrophication issues and biogeochemical processes.

Response: Data entry for phosphorus included phosphate, total phosphorus and total available phosphorus. The table for this section has been revised to include both total phosphorus and phosphate with separate scores for each.

Comment: Last paragraph of section 3.0: first sentence, the sampling stations distribution might be “adequate” but the frequency makes the data of limited use. Also the outlet data at the mouth in your example is limited as well with only 6 of the 34 parameters listed in the presented database.

Response:  This section has been expanded to provide a more thorough discussion including the points above.

Comment:  Section 4.0: The document distributed must be a subset of the entire effort as the reference list was limited to two citations with more in the text. Also there was no Appendix A, Tables 38-40, etc. If the conclusions presented in this section are strictly from other sources, than that needs to be presented with more clarity. I received Table 6 but where are the previous tables? You need to explain what is meant by minimum and maximum state water quality objectives. The maximum is the more familiar term.

Response:  The reference section has been expanded to include all citations and all Appendices are included in the Draft CMP.  Table 6 has been expanded to show where objectives change within the various subwatersheds.  Text has been added to discuss the table.

Comment:  Section 4.3: Ammonia is used throughout the document but here you change to Total Ammonia. Include a definition to clarify the distinction. Nitrate: the second sentence contradicts the first unless the water quality control criteria are different than previously stated. Why the qualifier of “at least” in the first sentence when you are giving percentages?

Response: The qualified has been removed.  The second sentence was a typo and has been corrected to read “Nitrite”.  Section has been edited to read “ammonia,” no distinction necessary as data received did not distinguish between dissolved and total ammonia.

Comment:  Section 5.0: In the summaries you use the term “adequate”. This needs to be clearly defined to better assess the actual data coverage. Nutrients: the only data with decent frequency for nutrients are associated with NPDES facilities and not the Upper and Santa Paula reaches. Calibration of the WARMF model used for the Nutrient TMDL was difficult given inadequate data coverage for ammonia, nitrate and of course phosphate. This paragraph needs to be carefully written given the amount of attention given to nutrient issues.

Response:  The term adequate was used to describe where data for a constituent was rich or moderate in terms of both number of sample sites in a particular subwatershed and frequency. The paragraph has been expanded to describe this for each constituent.

Comment:  Maps/figures: Figure 35 should be first and include cities, and NPDES facilities (i.e. Figure 22). This would give the background and orientation needed for the rest of the document. You might have been just as effective putting the data presented in Figures 1-34 in a table as there was a lot of graphical repetition and not that much information gained towards understanding the health of the watershed.
Response:  The figures have been revised to better display the watersheds location in space. Table information for everything provided in the figures is available with the database created for the project.

Comment:  I was hoping to see recommendations and thought this was one of the objectives of the study.

Response:  Recommendations were provided in the preliminary sampling locations memo as the second deliverable under the scope of work.

PLACEHOLDER FOR UWCD COMMENTS

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## Comments on Data Gap Analysis Received from Dan Detmer, UWCD

### Data Management

**Comment 1:** The decision to ignore pre-2000 data is an interesting one, given that data is limited or sporadic in many sample locations. If data greater than five years old will indeed to be considered "obsolete" or "archaic" by this group, it would be useful to cite selected references that elaborate this philosophy. This approach to data management severely limits the possibility for long-term trend analysis.

**Response:** AMEC has changed its data inclusion criteria from "5 years or less" to "10 years or less". All data from 1995 onward is now considered in the Data Gap Analysis.

**Comment 2:** The decision to ignore sample stations with fewer than five measurements further limits the utility of this study. The averaging argument is flawed, as seasonal data for one year can provide valuable insight to the annual range of concentrations for a given contaminant. Limited data may not allow a good characterization of a problem at a certain location, but it can suggest the presence or absence of a water quality problem.

**Response:** Because of the initial volume of database records (>106K), and the fact that many of the records that contained 5 or fewer records consisted of redundant information (e.g. 5 individual pesticide records at the same location containing the same date of collection), it was collectively decided that five samples was a reasonable cut-off for the minimum number of samples at a single station over a 5 year period. The current revision of the DGA, however, has increased the amount of data by extending the earliest sample date to January 1995. This cut-off criteria would now result in a theoretical "average" (over a 10 year period) of 1 biannual sample per location. This current criteria appears to be more inclusive because 1 sample taken per location within a 2 year period can certainly be considered a "worst-case scenario" for meeting the minimum requirements of any particular environmental sampling regimen.

**Comment 3:** It appears that AMEC has not correctly integrated all of the water quality data provided by UWCD in May 2004. Data omissions will be noted in each Section. Further, the decision to ignore pre-2000 data limits data provided by UWCD to approximately 4.25 years, as no data updates were requested of UWCD over the past 15 months.

**Response:** AMEC has double-checked water quality data in database to ensure that all data provided to AMEC by UWCD and all other stakeholders has been included. A second data request for additional data was submitted to UWCD on 31 May 2005. In its response to the data request UWCD submitted flow data and no additional water quality data.

### Data Gap Analysis

**Comment 1:** The Data Gap Analysis would be strengthened by delineation of the boundaries of each subwatershed, and the rationale for placing the boundaries where they are. This document does not address hydrologic complexities specific to the Santa Clara River system, such as multiple dry reaches and areas of rising groundwater. An understanding of the flow regime of the river is critical to effectively differentiate gaps in data as opposed to lack of samples due to dry conditions.

**Response:** Text has been added to the data gap analysis defining the subwatershed boundaries. The dataset used for this analysis was the California Watershed Data (CALWATER 2.0) for the Santa Clara River Watershed. This data represents the CA

Department of Fish and Game CALWATER 2.0 data set of watershed units in California, clipped to the Santa Clara River Watershed. This data was downloaded from the California Department of Fish and Game (CDFG) web site. It was then clipped to the extent of the Santa Clara River Watershed and reprojected to CA State Plane, Zone 5, NAD 83, units feet by REGIS, UC Berkeley for the California Coastal Conservancy Watershed Inventory. The California Watershed Map (CALWATER version 2.0) is a set of standardized watershed boundaries meeting standardized delineation criteria. The hierarchy of watershed designations consists of four levels of increasing specificity: Hydrologic Region (HR), Hydrologic Unit (HU), Hydrologic Area (HA) , and Hydrologic Sub-Area (HSA). This shapefile can be downloaded from the California Environmental Information Catalog (http://gis.ca.gov/catalog/BrowseRecord.epl?id=4250).

An in-depth characterization of "hydrologic complexities" of the SCR is outside of the Scope of Work for the SCRCMP. We agree that surface water-ground water interaction is an important aspect of watershed hydrology but, unfortunately, AMEC is not in a position to critically evaluate these data without additional authorization and/or funding.

**Comment 2:** Some attempt to conform to regulatory divisions of the river, such as those established by the EPA and State Water Quality Control Board, should be considered in this report. For example, the Freeman Diversion near Saticoy is widely used as the boundary separating the Santa Paula and upstream reaches from the Oxnard Plain, and AMEC appears to draw the division at Brown Barranca located nearly three miles downstream. Another site with historical significance but not regulatory significance is the sample location near the Fillmore Fish Hatchery. This vicinity has long been viewed as the boundary of the Piru and Fillmore groundwater basins. AMEC includes this site in the Fillmore subwatershed, eliminating an established downstream sample site from the Pint subwatershed.

**Response:** Text has been added to the data gap analysis defining the subwatershed boundaries. For more information on the subwatershed boundaries, refer to the previous comment.

**Comment 3:** The report would be strengthened considerably by additional discussion on the criteria used in the qualitative scoring of data quality by watershed segment. This is a key element of the report, as it will presumably be relied upon to design the sampling plan, the next task in this study.

**Response:** Additional discussion regarding scoring criteria has been added to the report.

**Comment 4:** Additional discussion is required to clarify if tributary data were considered when evaluating the quality of data for each watershed segment. Tributary data are included on the watershed maps, but the text does not state if these data are considered in the data analysis.

**Response:** Tributary data are considered in the data analysis for each watershed segment. Text has been added to the report indicating this.

**Conventional Parameters**

**Comment 1:** Flow data provided to AMEC by UWCD on June 30, 2005 does not appear to have been incorporated in the report.

**Response:** Flow data provided by UWCD has been incorporated into the database and the report.

**Comment 2:** There appears to be numerous locations where TDS records were not correctly incorporated in the database or displayed on the Figure 10. It is surprising that an error of this magnitude was not recognized by the authors of the Data Gap Analysis. Additionally, more discussion needs to be devoted to the adequacy of data collection in reaches that have ample data with limited spatial distribution.

**Response:** Because AMEC staff are not familiar with historical records within each particular agency, we cannot discern whether a particular location is “missing” data. It is important to note that final effluent data (i.e. measurements made on waste streams before being discharged into the river) that may have included daily TDS analyses were not included in the DGA. With regard to “ample data with limited spatial distribution”, AMEC has provided a footnote for every parameter that appears to have a spatially biased distribution (e.g. limitied spatial distribution of locations in the lower third of the Oxnard Plain and Upper Santa Clara subwatershed)

**Metals**

**Comment 1:** It appears the copper and zinc data provided to AMEC by **UWCD** was not properly incorporated into the water quality database. It appears that lead data provided for the Freeman Diversion sample site was only partially incorporated into the water quality database.

**Response:** AMEC has made several calls to all agencies with regard to both initial and additional data requests. Additionally, all issues addressing the Freeman Diversion data have been settled.

**Nutrients**

**Comment 1:** It appears the nitrate and nitrite data provided to AMEC by UWCD was not properly incorporated into the water quality database for all sample locations.

**Response:** At this juncture, AMEC is confident that all data for all nitrogenous analyses have been incorporated into the database. Again, AMEC has omitted any final effluent data measurements, if these data apply to the above comment. Receiving water data that had been collected in concert with any NPDES activity(s) were retained in the database.

**Comment 2:** Additional discussion is warranted with regard to the distinction between phosphate and phosphorus data. Limited phosphate data is available for the Freeman Diversion sample site, but it is not included on Figure 23.

**Response:** At this juncture, AMEC is confident that all data for all phosphorus/phosphate analyses have been incorporated into the database. Again, AMEC has omitted any final effluent data measurements, if these data apply to the above comment. Receiving water data that had been collected in concert with any NPDES activity(s) were retained in the database.

**Organic Compounds**

**Comment 1:** It appears that data collection from Ventura County water reclamation plants remains incomplete as additional data exists that was not considered in the Data Gap Analysis. The City of Santa Paula samples for numerous organic compounds at the Freeman Diversion semi-annually as part of the discharge permit requirements. Additionally, data from Ventura

County Watershed Protection District's mass emission station at the Freeman diversion should also be available for evaluation as part of this process.

**Response:** At this juncture, AMEC is confident that all data for all organic chemical analyses have been incorporated into the database. Again, AMEC has omitted any final effluent data measurements, if these data apply to the above comment. Receiving water data that had been collected in concert with any NPDES activity(s) were retained in the database.

**Distribution of Samples**

**Comment 1:** Discussion in this section is inconsistent with text in the Data Management section where the decision is apparently made to ignore data more than five years old and sites with a limited sample history. This section also specifically discusses sampling of tributaries, where other sections do not clearly address tributaries even though recent tributary data is included on all figures. UWCD would encourage a comprehensive look at historical data for the river and tributaries, and the scope of the Data Gap Analysis should be consistent throughout the document.

**Response:** Discussions have been made more consistent throughout the report to include sampling of tributaries where applicable.

**Data Comparison to Criteria and Objectives**

**Comment 1:** The value and intent of recycling language from the SCREMP report is unclear and the use of this "obsolete and archaic" data summary is of questionable value.

**Response:** Language from the SCREMP report thoroughly summarizes the water quality objectives and beneficial use designations described in the Basin Plan. Further discussion has been provided in the report to explain its applicability to report findings.

**Comment 2:** Table 6 is of very little value. The approach is much too simplistic, and should be completed for each subwatershed for the specific regulatory standards that exist in those locations. Only then can AMEC make meaningful comments about how existing data compares to existing standards. The Data Gap Analysis is intended to determine where spatial, temporal and constituent data gaps exist. It appears that this section needs a lot more work.

**Response:** Table 6 has been expanded to provide greater detail regarding water quality objectives in each subwatershed where the objectives vary for a particular constituent.

**Data Summary in Relation to TMDLs**

**Comment 1:** This section would be improved by a more rigorous identification of specific reaches that exceed existing water quality criteria, and the identification of reaches where inadequate data exists to evaluate the water quality of the river system. TMDLs are not based on the quantity of samples in a given reach, but rather the water quality that prior sampling documents. The Santa Clara River is a complex and variable river system and the simplistic approach presented in Sections Four and Five of the Data Gap Analysis do not allow for the successful completion of the later tasks scheduled in developing a Comprehensive Monitoring Plan for the river.

**Response:** AMEC's scope of work calls for data and conclusions to be identified according to subwatershed, not reaches. The reaches contained within each subwatershed have been added to the descriptions of the subwatersheds within the report.

PLACEHOLDER FOR LACSD COMMENTS
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**Response to Comments provided by the Los Angeles County Sanitation District.**

Data Management Comment: There are only 9 organizations listed here as providing data. According to the Regional Board website there are 46 "active" NPDES permit holders that routinely conduct monitoring along the Santa Clara River watershed. We recommend that the report be revised to acknowledge that this data gap analysis is not exhaustive of what is currently being monitored as part of the Monitoring and Reporting Programs for each of the NPDES permit holders on the SCR, and only focused on a subset of constituents based on the VCWPD's pollutants of concern list.

**Response: NPDES water quality monitoring does not necessarily monitor in-stream and rather monitors water quality prior to release into stream, therefore this data was excluded from the analysis. The report has been revised to discuss NPDES permit holders and explain why their monitoring was not included. In addition, a table displaying all NPDES permit holders has been included in Appendix A of this document.**

Data Gap Analysis Comment 1: Page 3 of 16: "The scoring criteria are essentially based on the professional experience and judgment of several AMEC water quality experts. The criteria consider both spatial location and sample frequency, with the latter not taking concentration into consideration (e.g., whether the sample was above or below the instrument detection limit). The results for each compound, parameter or test are described below."
Comment: We recommend that AMEC provide some discussion on the methodology employed to score/assess data quality beyond just "best professional judgment." In addition the data gap analysis includes terms such as "frequency adequate," and "spatial distribution poor," in footnotes. What was the criteria for making these assessments? How was flow, and whether flow actually persists along the SCR watershed taken into account in the data gap analysis? Seems like some assessment of flow and where it persists should be included because there may be a reason why the samples are where they are, given that the river runs dry in certain areas. For example the USCR for the most part is dry upstream of the Saugus WRP. So there may be a good reason (e.g., there is no flow in the river in the upper two-thirds of the SCR) as to why the lower third of the USCR has all the data.

Response: **AMEC has added narrative text that provides a clear definition of the qualitative ranking criteria (i.e., -, +, ++, and +++) used for scoring the DGA.**

Data Gap Analysis Comment 2: Tables 2 – 5
Comment: The City of San Buenaventura owns and operates the Ventura Water Reclamation Facility which discharges tertiary treated effluent to the SCR estuary. However, Tables 2 –5 list the area of Oxnard as "data poor," even though this treatment plant has a number of effluent limits for metals, nutrients, organics, other chemical constituents and toxicity, which would suggest that they also conduct routine monitoring for these constituents. (See Regional Board Order Nos. R4-2002-0194, and 00-0143 and their respective monitoring and reporting programs). In addition, the City of San Buenaventura conducts routine receiving water monitoring for 5 stations on the SCR for coliform, priority pollutants, nitrogen and toxicity, which do not appear to be reflected in the data gap analysis or maps. This gap in the analyses reflects the need to review the waste discharge requirements and monitoring reporting programs for the major NPDES dischargers to the SCR. It would appear that other facilities, such as the Santa Paula WRP and Fillmore WRP would likely have similar WDRs and MRP requirements, which would suggest that their does exist data not included herein, that would call into question whether the Oxnard, Sespe and Santa Paula areas are truly "data poor" for inorganics, organics, and toxicity.

Response: The gap analysis was re-run to include the receiving water monitoring on the SCR. Other NPDES dischargers reporting programs have been reviewed and to not have receiving water monitoring which fit the criteria of the analysis. A table summarizing the MRP requirements has been included as an appendix to the Draft CMP per agreements made during May conference calls with AMEC, VCWPD, and LACSD.

Temporal and Spatial Distribution Comment: Page 10 of 16: “For example, it is clear, that two locations Valencia Water Reclamation Plant (VA001) and the Saugus Water Reclamation Plant (SA001) near the lower third of the Upper Santa Clara watershed are sampled on a fairly regular basis for almost all of the parameters. These two locations are NPDES permitted water treatment facilities. In contrast, locations within the upper portion of the Oxnard Plain, as well as both the Sespe and Piru watersheds (and associated creeks) are rarely, if ever, given attention with regard to regular or semi-regular monitoring plans.” Comment: see comments on Section 2.0 Tables 2 – 5 (above). There is regular monitoring being performed by the Cities of San Buenaventura, Santa Paula and Fillmore who own and operate their respective wastewater treatment facilities, that is not reflected in the data gap analysis. As an example, attached are the WDRs and MRPs for the City of San Buenaventura. AMEC should at a minimum also evaluate the WDRs and MRPs for the Cities of Santa Paula and Fillmore in order to better understand the routine monitoring that is already being conducted. Recommend that this paragraph be revised accordingly to accurately reflect the monitoring that is currently being conducted.

Response: **At this juncture, AMEC is confident that all data for all water quality parameters and/or analyses have been incorporated into the database. Again, AMEC has omitted any final effluent data (including NPDES information) measurements, if these data apply to the above comment. Receiving water data that had been collected in concert with any NPDES activity(s) were retained in the database.**

Comparison of Historical Water Quality Data to Water Quality Criteria and TMDL Objectives Comment 1: Discussion of SCREMP Trends (Pages 10-12). Comment: It should be noted that the discussion on trends is outdated and based on information collected prior to 2000 and mostly prior to 1996. Given that AMEC has considered pre-2000 data as “obsolete” or “archaic,” it would seem that this information is largely irrelevant and would recommend that this be removed and/or some discussion should be included that describes the usefulness of these trend descriptions, given the “archaic” nature of the data.

Response: The discussion of trends was included per the scope of work. The discussion has been amended to note that trends are based on information collected prior to 2000 and to describe the usefulness of the trend descriptions.

Comment 2: Table 6: Water Quality Objectives for the Santa Clara River
Comment: when evaluating the “Percent of Database Values Exceeding the Minimum/Maximum,” was the entire database used or only data from 2000-current? If the entire database was used, how is this evaluation consistent with the AMEC assumption that post-2000 data is archaic or obsolete and should not be used? Recommend that AMEC includes the number of samples and time frames when these samples were collected.

Response: The data analysis was expanded to include 1999 in order to completely cover the 5-year analysis period. Only data from 1999-current was included in evaluating the percent of the database exceeding the water quality objectives.

Comment 3: The current form of Table 6 is largely not useful for understanding compliance to basin plan objectives for chloride, TDS, sulfate, boron and nitrate+nitrite-N because those objectives all vary according to specific reach designations. We recommend that a footnote/disclaimer be included that clearly identifies the fact that not all data in the watershed have been used in the analysis, given previous comments. In addition the objective comparison is extremely conservative in that it does not evaluate the applicability of the objectives to the specific beneficial uses of specific reaches in the SCR. (i.e. the minimum might not apply to every single reach in the table, COLD designations do not apply in every single reach, MUN does not apply in every single reach, etc.)

Response: The table has been adjusted to provide more detail and information on the water quality objectives by sub-basin in order to be more useful for understanding compliance to basin plan objectives.

Comment 4: The current Basin Plan has been amended to include the USEPA 1999 Ammonia Criteria, but it appears that AMEC used the 1986 EPA criteria.

Response: The gap analysis has been amended to include the most recent criteria.

Data Summary in Relation to Current and/or Future TMDL's Comment: Comment: Given previous comments that there is regular monitoring being performed by the Cities of San Buenaventura, Santa Paula and Fillmore who own and operate their respective wastewater treatment facilities, some of the conclusions with respect to data gaps and data adequacy might need to be revised, given that it appears that not all data have been collected.

Response: **At this juncture, AMEC is confident that all data for all water quality parameters and/or analyses have been incorporated into the database. Again, no NPDES or final effluent data is being considered in the Data Gap Analysis. Receiving water data that had been collected in concert with any NPDES activity(s) were retained in the database.**

Comments on Figures: Figure 10: A number of agencies sample and measure for TDS along the SCR, including all of the major water reclamation plants (Ventura, Santa Paula, Fillmore, Saugus and Valencia WRPs) as well as United Water Conservation District. We would therefore question the validity of this figure and any conclusions made.

Response: **At this juncture, AMEC is confident that all data for all water quality parameters and/or analyses have been incorporated into the database. Again, no NPDES or final effluent data is being considered in the Data Gap Analysis. Receiving water data that had been collected in concert with any NPDES activity(s) were retained in the database.**

Comment 2: Figure 12: USGS has two active gauging stations (11108000) and (11109000) which are currently monitoring daily flow for the Upper SCR. Flows are also being monitored by the LACDPW in the Upper SCR and UWCD (at Freeman Diversion) for the Lower SCR. In addition flows are monitored at Piru Creek and Castaic Creek. So it would appear that this figure is not accurate. The following table is a survey of USGS flow gauging stations for the SCR:

Response: All flow data from USGS and other data provided by stakeholders has been included in the database. Only those data which meet the analysis criteria have been included in the analysis and the figure.

# Appendix C
# Preliminary Sampling Locations Comments and Responses

Hi Mark, these are very good comments and I do agree it is a fair first attempt for the CMP report. The consultant seems to have excluded all of our mass emission station data from the gap analysis, or probably did not recover it on time. Either way, they do have it now and should reference it in the analysis. The other comment is about how the L. A. County's portion of the watershed is being presented as "Upper Santa Clara subwatershed" rather than using the tributaries name. Also, I do not understand the basis for the Biological db selection criteria >5 records per station, why not less? And finally, I am not sure if the limits of data collection for the CMP study was to stay within the 500-year flood plain of the SCR or for the entire watershed (not clear in the SOW).

The next Task in the SOW is for the consultant to meet with the WRS to present the CMP and take on comments. If possible, I suggest we do just that. Thanks,

Arfan Haidary
Los Angeles County Department of Public Works
Watershed Management Division - Water Quality Section
626-458-4329

**From LADPW:**

Comment: The consultant seems to have excluded all of our mass emission station data from the gap analysis, or probably did not recover it on time. Either way, they do have it now and should reference it in the analysis.

Response: The mass emission station data has been included in the database and has been included in the data analysis. References have been amended to include data sources.

Comment: The other comment is about how the L. A. County's portion of the watershed is being presented as "Upper Santa Clara subwatershed" rather than using the tributaries name.

Response: The naming of the subwatershed is based on the hydrological data for the sub-basins that AMEC acquired. The dataset used for this analysis was the California Watershed Data (CALWATER 2.0) for the Santa Clara River Watershed. This data represents the CA Department of Fish and Game CALWATER 2.0 data set of watershed units in California, clipped to the Santa Clara River Watershed. The California Watershed Map (CALWATER version 2.0) is a set of standardized watershed boundaries meeting standardized delineation criteria. The hierarchy of watershed designations consists of four levels of increasing specificity: Hydrologic Region (HR), Hydrologic Unit (HU), Hydrologic Area (HA) , and Hydrologic Sub-Area (HSA). This shapefile can be downloaded from the California Environmental Information Catalog (http://gis.ca.gov/catalog/BrowseRecord.epl?id=4250).

Comment: Also, I do not understand the basis for the Biological db selection criteria >5 records per station, why not less?

Response: It was deemed necessary to have a minimum number of records for a single station over a ten year period due to the large volume of data. A sampling frequency of 5 sampling events over a ten year period yields a theoretical sampling rate of one sampling event every two years, which was thought to be inadequate from a data quality standpoint.

Comment: And finally, I am not sure if the limits of data collection for the CMP study was to stay within the 500-year flood plain of the SCR or for the entire watershed (not clear in the SOW).

Response: Data collection requests asked for all water quality data conducted in the watershed.

**Comments from LACSD were provided in Track Changes Format. Comments have been cut and pasted to be included here.**

**From LACSD:**

Comment: A TMDL is defined as the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and allocates the acceptable pollutant load to point and nonpoint sources. The TMDL is generally expressed in terms of either mass per time or concentration. Since TMDLs are of primary concern with regard to the use of future data, the siting and/or location of monitoring stations should include locations at, or slightly downstream, of real-time USGS gaging stations, so that pollutant loads from different subwatersheds or tributaries can be evaluated. Flow measurements (and in some cases chemistry data) could therefore be easily retrieved from the Internet for any particular day of the year. Also, USGS stations that no longer record stream flow data could still be useful sites to monitor because statistics on historical hydrological data would still allow a pollutant loadcalculation based on the known hydrological record of that particular tributary.

Response: Comment incorporated.

Comment: Section 6.1 Last sentence. What about surface water diversions, etc. Have these remained constant?

Response: Examining surface water diversions is outside the stated scope of work for the project.

Comment: Due to the continuity of the collected data and permanent nature of the gaging stations, it is recommended that all "flow composited" baseline sampling stations be located at the existing USGS gaging stations. I

Response: AMEC is in general agreement with this comment. There may be selected non-permanent locations (w/o existing gauges or structures) where flow compositing needs to be performed based on the responses of various stakeholders.

Comment: In regard to inorganic paramenters: If metals are expected to be an issue it may make sense to add constituents related to the Ugard Model (BLM), for example TOC/DOC, Ca, Mg, Na, Alkalinity, pH.

Response: The DGA recommends that selected "suites" of related elements or compounds be chosen over individual analytes. For example, measurement of all 23 metals on the "target analyte list" currently available at most laboratories yields more information at less cost than the selection of individual metals of concern, such as aluminum or thallium.

Comment: In response to chlorinated pesticides – Should we include O,P pesticides?

Response: Most organophosphate pesticides that have been perceived as “persistent, bioaccumulative or toxic” have been banned or are now strictly regulated. Newer classes of organophosphate pesticides have been designed to be less recalcitrant to degradation in the environment (e.g. shorter half-lives in water and soil). AMEC has not included these compounds because they are not on the original list of 48 compounds evaluated in the database. AMEC is also of the opinion that they should only be monitored on a smaller scale where local authorities might perceive a potential hazard to humans or wildlife (e.g. drainage of a large agricultural area that might be suspected as a source of OP). Otherwise, levels of OP are expected to be well below the limit of detection due to volume/dilution.

Comment: What constitutes “significant contamination” trigger for additional sediment quality investigations?

Response: The determination of “significant contamination” would have to be made by the stakeholders based on local, regional or State sediment quality guidelines and/or criteria.

# UNITED WATER CONSERVATION DISTRICT

"Conserving Water Since 1927"

October 18, 2005

Megan Schwartz
AMEC Earth and Environmental
1 East Anapamu Street
Santa Barbara, CA 93101

**Subject: UWCD Comments on Baseline Monitoring, Santa Clara River CMP**

United Water Conservation District (UWCD) appreciates the opportunity to comment on this portion of the Santa Clara River Comprehensive Monitoring Plan (CMP). We have had the opportunity to review the comments submitted by Ventura County Watershed Protection District and substantially agree with and support those comments. UWCD offers the following additional comments for consideration.

The Baseline Water Quality Monitoring document provides a draft of the basic deliverables required in Task 3 of the Scope of Work, but the document contains very little justification as to why specific sites are selected for additional monitoring of various water quality parameters at various frequencies. The multiple tasks itemized under Task 3 in the Scope of Work constitute much of the critical work of the CMP, but the current draft does not include any discussion of the detailed evaluation of multiple criteria that must be considered when designing a comprehensive monitoring program for a watershed as complex and variable as the Santa Clara River. Discussion of various criteria and site-specific considerations used in designing the monitoring program must be included in this document for the sampling decisions to be defensible and understood by both the public and the agencies that will likely assume responsibility for some of the future monitoring.

The baseline monitoring document contains limited reference to the Data Gap Analysis, which evaluated the quality of the data set at each existing monitoring location. It is unclear whether the substantial site information compiled in the creation of the historical water quality database and subsequent data gap analysis were used when proposing the preliminary sample locations and analytical suites for each site. Many of the comments in UWCD's August 26, 2005 letter to AMEC regarding the data gap analysis also pertain to the tables and information contained in the draft baseline monitoring document, suggesting corrections and improvements to the data gap analysis are still warranted. The tables and figures in the draft baseline water quality monitoring document still fail to include significant historical sample locations such as the Santa Clara River at Freeman Diversion, Santa Clara River near Willard Road, and the Santa

Clara River at Blue Cut. Further, existing monitoring of organics, metals and toxicity, performed by the County of Ventura and various wastewater treatment plants within the watershed are not accurately represented in the document. These established sample sites are located at hydrologically-significant locations and are logical places to continue sampling.

The map presented as Figure 41 effectively shows the name and location of existing sample locations within the watershed. Additional maps should be drafted that display the proposed analytical suite for each sample site. Much of the information contained in Table 9 should be presented on a watershed map, allowing a much easier evaluation of the spatial distribution of the various analytical suites identified in Section 6.2.

Recommendations for the temporal distribution of samples need to be stated explicitly for each sample location. The narrative description contained in the draft baseline monitoring document does not provide the specifics needed to assess the scope of the proposed monitoring program. Maps should be created showing the proposed location and frequency of each class of water quality parameter.

The proposed sample site "New-1" is located on a reach of Sespe Creek that is rather difficult to access. Justification should be provided for the selection of this proposed site. Proposed sites "New-2" and "New-3" should be considered for wet weather sampling as this is a relatively dry area within the watershed.

The complexity of the surface water and groundwater hydrology of the Santa Clara River prohibits the simplistic compliance evaluation presented in Table 7. A table needs to be generated for each reach, and a permanent sample location should be located at or near the downstream end of each reach designated by the Regional Water Quality Control Board. Sample locations should also be located near groundwater basin boundaries when these significant hydrologic areas do not correspond with the regulatory boundaries.

Thanks you for considering these comments. We recognize that this is a complex watershed and designing a robust water quality monitoring program for the Santa Clara River is not an easy task. Please feel free to contact us as issues arise and we might be able to help.

Sincerely,

Dan Detmer
Senior Hydrogeologist

CC Mark Bandurraga, VCWPD

**From UWCD:**

Comment: The document contains very little justification as to why specific sites are selected for additional monitoring of various water quality parameters at various frequencies. The current draft does not include any discussion of the detailed evaluation of multiple criteria that must be considered when designing a comprehensive monitoring program for a watershed as complex and variable as the SCR.

Response: One of the purposes of the CMP is to “develop baseline conditions for the watershed and have a mechanism to measure improvements of degradations in the watershed”. Although AMEC is of the understanding that the term “baseline” assumes the monitoring plan would be designed as if no historical data were available, the development of the Data Gap Analysis does include data that is instructive in the selection of Preliminary Site Locations. With this in mind, AMEC first chose key sites (many still “active”) that are “located at the lowest downstream point of each subbasin”. Additional sites were then added according to shapefiles received from various stakeholders. AMEC agrees that the watershed is “complex and variable” and therefore spatial and temporal information was used to select locations to try to reduce this complexity and/or variability. For example, selection of locations that are more uniformly spaced will eliminate past data gaps that were a result of long reaches that contained no sampling stations.

Comment: Discussion of various criteria and site-specific considerations used in designing the monitoring program must be included in this document for the sampling decisions to be defensible and understood by both the public and the agencies that will likely assume responsibility for some of the future monitoring.

Response: As discussed in the previous comment, AMEC’s intent is to develop a “baseline” monitoring plan. Since baseline conditions generally assume that there is no previous information on which to select current site locations, the incorporation of most of the site locations utilized in the past now allows the luxury of being well ahead of the game in terms of what constitutes an operational definition of “baseline.” A discussion of “various criteria and site-specific considerations” is, in many cases, not possible since the Data Gap Analysis has shown that no data has been collected for several long reaches of the river such as the section of Santa Clara River within Piru and Oxnard Plain. AMEC therefore suggests that each stakeholder review the current Site Locations map (Figure 46) and adjust locations or sampling frequencies based on local or regional concerns (some of which will be outside of the purview of AMEC’s information base).

Comment: The baseline monitoring document contains limited reference to the Data Gap Analysis, which evaluated the quality of the data set at each existing monitoring location. It is unclear whether the site information compiled in the creation of the database and gap analysis were used when proposing the preliminary sample locations and analytical suites for each site.

Response: Per M. Bandurraga response to comments and changes made to the draft Data Gap Analysis are to be included in the Draft CMP. All information compiled and used in the gap analysis were used when proposed preliminary sampling locations.

Comment: The tables and figures in the draft baseline water quality monitoring document still fail to include significant historical sample locations.

Response: The tables and figures in the document include all sampling locations that were included in the Data Gap Analysis. Locations that are missing were excluded because they did not fit the criteria used to conduct the analysis. Figure 43 has been added to display all historical sampling sites.

Comment: Existing monitoring of organics, metals and toxicity, performed by the County of Ventura and various wastewater treatment plants within the watershed are not accurately represented. These established sites are located at hydrologically-significant locations and are logical places to continue sampling.

Response: The tables and figures in the document include all sampling locations that were included in the Data Gap Analysis. Locations that are missing were excluded because they did not fit the criteria used to conduct the analysis.

Comment: The map presented as Figure 41 effectively shows the name and location of existing sample locations within the watershed. Additional maps should be drafted that display the proposed suite for each sample site. Information contained in Table 9 should be presented on a watershed map, allowing a much easier evaluation of the spatial distribution of the various analytical suites identified in Section 6.2.

Response: The use of tables with codes for the various classes of constituents allows all stakeholders the opportunity to review locations and frequency of sampling. The generation of another large set of complex maps is outside of the scope of the CMP.

Comment: Recommendations for the temporal distribution of samples need to be stated explicitly for each sample location. Maps should be created showing the proposed location and frequency of each class of water quality parameter.

Response: The sampling frequency is currently stated for each class of parameters and/or constituents. If there is currently no statement addressing sampling frequency for any individual parameter or constituent, the table will be updated to reflect that omission.

Comment: The proposed site “New-1” is located on a reach of the Sespe Creek that is difficult to access. Justification should be provided for selecting the location of this site.

Response: From a monitoring perspective, the location of “New-1” would allow for collection of baseline conditions approximately midway between the long section of the Sespe Creek between sites 737 and 11112500. Although it may not be feasible to monitor this location due to accessibility difficulties, it is a location that should be considered and monitored, if possible.

Comment: Proposed sites “New-2” and “New-3” should be considered for wet weather sampling as this is a relatively dry area in the watershed.

Response: AMEC agrees with this comment.

Comment: A table like Table 7 needs to be generated for each reach.

Response: Per AMEC’s scope of work, we have examined the water quality objectives and beneficial uses of the river according to the hydrologic sub-basins. Additional tables showing where objectives vary by sub-basin have been created and are included in the document.

Comment: A permanent sample location should be located at or near the downstream end of each reach designated by the RWQCB. Sample locations should also be located near groundwater basin boundaries when these significant hydrologic areas do not correspond with the regulatory boundaries.

Response: AMEC is open to adding or moving selected Preliminary Sampling Locations based on supplemental (or missing) information provided by the stakeholders.

**Comments from VCWPD were provided via Track Changes. Comments have been retyped and included along with responses here.**

***Mark Bandurraga Comments***

**Baseline Water Quality Monitoring**

Comment 1: Need discussion of monitoring objectives here as defined in the Scope of Work, like: The purpose of the Baseline Monitoring Plan is to develop baseline conditions for the watershed seasonally and spatially, and have a mechanism to measure improvements or degradations of water quality in the watershed.

Response: Comment incorporated.

**Monitoring Station Locations**

Comment: Per the Scope of Work, monitoring points were to be selected based on the following: 1) downstream points of Santa Clara sub-basins, 2) land uses in the watershed, 3) system morphology, 4) sensitive habitat, 5) historical data availability (this should be results of data gaps), 6) potential problem areas. Document should have a discussion of each of these topics, maps showing the locations of critical areas, and discuss how these factors were integrated into the decision to use existing monitoring stations or add new ones.

Response: The selection of baseline monitoring locations took into account the downstream portions of tributaries and the results of the Data Gap Analysis. In fact, many of the stations selected will have historical data associated with them, against which future monitoring data can be compared. System morphology affects hydrology, which is taken into account by monitoring flow. Sensitive habitat is a very general term which can be addressed at the local level (i.e. if desired, current station locations can be repositioned or new stations can be added to address wetlands or diversions).

Comment: "Also, USGS stations that no longer record stream flow data could still be useful sites to monitor because statistics on historical hydrological data would still allow a TMDL calculation based on the known hydrological record of that particular tributary. Most flow fluctuations are due to rainfall patterns, which can be assumed to remain fairly constant over decades." I do not agree with this statement and would like references to studies where this approach has been taken. In my experience you would need to create and maintain a hydrology model to predict flow volumes and peaks which can take a lot of resources.

Response: Statement has been removed from the document.

Comment: "While our data gap analysis only covered subwatersheds, it is important moving forward to adequately monitor reaches in order to adequately characterize the nature of the entire watershed." Please clarify this statement – I don't understand its intent.

Response: Statement has been removed from document.

Comment: The issue to me is not that the reach is too long, but that the data show changes in water quality through the reach. Or perhaps there wasn't sufficient data to adequately characterize the baseline conditions? This section should discuss the difference between characterizing the baseline conditions and measuring changes in water quality and whether the recommended stations accomplish one or both objectives.

Response: **I**The sampling design of the baseline monitoring plan intended to ensure that stations were regularly spaced while, at the same time, also ensuring that there were enough "integrator" stations within each tributary and within the Santa Clara River. Additionally, the Scope of Work principally addressed data gaps, not water quality. Because the data within the database was not assessed in a quantitative fashion, there is no frame of reference upon which to assess "water quality through the reach" or "sufficient data to adequately characterize baseline conditions".

Comment: Table 8 revised to show a number of USGS stations that are not currently operational based on USGS website end date. This should be addressed in study since they are not existing stations as originally thought. Table 8 should show what types of data are available from each gauge – some gauges are peak only. The USGS only provides daily averages and peaks on their website – is this suitable for TMDL calculations? Also, some USGS gauges in LA County were taken over by LACDPW last year and are not currently operated or maintained by the USGS. Please contact Ben Willardson (bwillard@ladpw.org) of LACDPW to confirm these gauge locations.

Response: Discontinued or "inactive" stations can still be used if the infrastructure is still intact (for example, a lockable metal shed with a stilling well that would allow a tube to be inserted for a flow compositing device). USGS daily averages and peaks provided are suitable for TMDL calculations. The maps have been revised to select locations that are "active" sites.

**Temporal Distribution of Samples**

Comment: This study should recommend monitoring to achieve the monitoring objectives – let the stakeholders worry about funding.

Response: Comment incorporated.

Comment: Need to present the reasons choices were made for each type of sampling at each monitoring station.

Response: Comment incorporated. Chemical and physical parameters are recommended at every monitoring station. Biological assessment and sediment sampling is recommended only at select sites.

Comment: Provide justification for the choice of monitoring frequency. VCWPD's NPDES monitoring is more frequent than quarterly and it would be better to add additional tests to our current sampling that to make us obtain samples at different intervals than is required by RWQCB.

Response: Comment incorporated. Increased recommended monitoring frequency.

Comment: Again, you should recommend necessary sampling to achieve monitoring objectives based on your expertise and let the stakeholders worry about the funding.

Response: Revised recommendations based on this input.

**Table 8**

Comment: Need to address changes if USGS station is not operational – please see USGS website to verify end date. Some gauges identified as UWCD are actually VCWPD. Gauges marked as USGS (VCWPD) are operated and maintained by VCWPD but the data are provided as part of a contract to USGS for them to publish as official records; Also, I'm told that UWCD doesn't have continuous records at some of their stations – please verify with them.

Response: AMEC verified end data of USGS stations. Included some stations that are not currently operational since infrastructure is most likely still present and location is accessible. Revised recommended locations to also include mainly stations are that currently active.

**Table 9**

Comment: If sample type is G or FC only, is this dry weather only? If it is G, WW is this wet weather only? This will be difficult to achieve on a quarterly basis.

Response: **G and FC is yearround. Wet weather sampling occurs only in the rainy season because these sampling locations are expected to be dry most of the year.**

**Inorganic Parameters**

Comment: Arsenic, cadmium, chromium, selenium are not included in data gap analysis list, please explain why they are included here.

Response**:** These parameters are included in the metal suites recommended. The lack of data on other elements or metals that have the potential to be toxic constitutes a "data gap". If the first round of data show low levels of metals throughout the watershed, then those particular metals can be eliminated in future sampling rounds. We are making the supposition that more data is better than less, especially since the cost of selecting 5 or 6 individual metals will be equivalent to running TAL metal suites.

**Organic Parameters**

Comment: Explain why other organic parameters included in the data gap analysis are omitted from the monitoring program – any omission is because there are no data gaps or you have concluded there is no reason to sample for it in the future?

Response: The organic parameters were added back in.

Comment: Explain why these additional parameters (VOCs, SVOCs, phthalate esters, estrogens, pharmaceuticals, organometallics) were not included in the data gap analysis and why they would be important to included in the monitoring program.

Response: The addition of any of these constituents are optional. AMEC has simply made the stakeholders aware of the fact that current topics, like EDCs or pharmaceuticals in surface waters, may have importance to both the stakeholders and public health.

Comment: Need explanation why sampling frequency is once per quarter and more info about wet and dry weather sampling.

Response: Comment incorporated.

Comment: Should identify which recommended stations already have sampling and the sampling frequency for these stations. Is the quarterly sampling to be in addition to the on-going monitoring? For example, the freeman Diversion station is sampled by VCWPD 6 times per year in dry and wet weather. It appears that many of these sampling locations will be done in addition to other monitoring for NPDES requirements in the watershed?

Response: AMEC has provided an additional map showing which stations are actively being sampled. Recommended sampling frequency has increased to monthly in order to provide better baseline data and better correspond with other NPDES requirements in the watershed. In essence, as a baseline monitoring program, the program should begin as if no data ever existed at all. Therefore, monthly sampling events may in some cases correspond with was is currently occurring in the watershed, however in other cases it may require that agencies begin monitoring at additional sites or increase their frequency of monitoring at current sites. These issues will need to be decided by the stakeholders after the completion of the CMP.

**Table 7**

Comment: Comments on data gap analysis required this table to be separated into subbasins.

Response: Additional tables with subbasin information added.

**Physical Parameters**

Comment: “Routine discharge measurements” Does this mean measurements during water quality sampling or continuous flow measurements?

Response: Depending on the profile of the river bottom at any individual monitoring location, it may be easier to simply measure discharge using manual techniques (e.g. a flow meter to measure velocity and a measuring tape to integrate the cross-sectional area of the stream). Continuous flow monitoring is difficult to implement if a viable infrastructure is not in place (e.g. a preexisting rating curve based on the presence of a historical gaging station).

Comment: “Routine discharge measurements need to be added to existing stations that failed to monitor it in the past, as well as at newly selected stations that have been added to enhance the spatial distribution of monitoring activities within the CMP.” This statement is inconsistent with Table 9 that appears to show numerous stations where flow sampling is not recommended.

Response:  Table 9 shows the current status of flow for each monitoring station.  AMEC recommends additional flow measurements, where feasible.

Comment:  Explain why this sampling is not necessary at the upstream tributaries.

Response:  Statement revised to include upstream tributaries.

Comment:  "The recommended sampling frequency is once per quarter."  Need explanation why, and continuous in-stream measurements of these parameters as mentioned in the scope of work was not concluded to be appropriate.  Budgetary considerations should not be your concern.

Response:  Comment incorporated.

**Biological Parameters**

Comment:  "Tributaries can be included if evidence warrants inclusion of monitoring stations within these waterbodies."  You should be recommending monitoring if needed based on your analysis results.  Otherwise this statement should be moved to a section discussion monitoring program revisions in the CMP.

Response:  Statement deleted from the document.

Comment:  "Chlorophyll a is a good indicator of primary productivity within the water column" but was not included in the data gap analysis because…..  "Other measurements of primary productivity such as periphyton growth and functional community indices should be performed at selected stations within the watershed."  Where is this indicated in Table 9?  Please explain and clarify.

Response: Statements deleted from the document and recommendations revised to provide more clarity.

Comment:  "The USEPA Rapid Bioassessment Protocols present well structured forms and guidelines that will allow the evaluation of both aquatic habitat and the structure and function of native aquatic wildlife."  Are these different than the parameters discussed above?  If so, they should be specified and an explanation provided for why they should be included.

Response: Comment incorporated.

Comment:  Explain the rationale for selecting biannual sampling rather than semi annual or quarterly?  Cost should not be an issue, but your conclusions should be based on your professional judgement and achieve the desired monitoring objectives.

Response:  Rationale is based on the slow changes that typically occur in the biological communities.  Sampling recommendation revised to annually.

Comment: "It is recommended that these parameters be measured at all downstream tributary stations and at selected locations along the Santa Clara River, especially those locations that are closest to wastewater treatment facilities."  Explain why this sampling is not necessary at the upstream tributaries or at all locations along the river.

Response:  Explanation provided within the text.

Comment:  “At a minimum, a baseline survey should be conducted at all stations during the initial water quality survey.”  This is the first time this is mentioned – is it discussed somewhere else in the document?  Reference that section or explain here.

Response:  The phrase “all stations” should be “most stations”.  RBP protocols are time-consuming and expensive.  If the stakeholders decide an RBP has been changed to be conducted at all of the selected monitoring stations, then there will be more information available to biologists to make an informed decision on local or regional impacts.

Comment:  The Scope of Work says that bioassessments usually include a reference site outside of the watershed to provide a baseline quality level for comparison purposes.  Please include your recommendation for a reference site or state why you do not think one is necessary for this monitoring program.

Response:  Explanation provided within text.  In some studies, reference locations, which are chosen to represent non-impacted sites that have a similar habitat structure (e.g. similar benthic substrate), are assessed so that a comparison of biological indices can be made.  However, the purpose of the CMP is to determine “baseline” conditions against which future assessments can be compared.  Therefore, the use of  “reference” sites does not need to be considered in the selection of bioassessment protocols.

Comment:  It does not appear that this discussion meets the requirements of the scope of work in which AMEC’s biologist will design an appropriate sampling strategy for the bioassessment.

Response:  AMEC has revised the section to further meet the scope of work.

Comment:  This section does not address aquatic habitat sampling as required by the scope of work or the toxicological testing as discussed in the scope of work.

Response:  Comment incorporated.

**Sediment Quality**

Comment:  “Rivers that periodically experience fast moving waters, such as the Santa Clara River and its tributaries, are generally depleted of depositional sediment due to frequent scouring events after heavy rain storms.”  I do not agree with this statement.  The SCR is a dynamic system, continually bringing in sediment from its tributaries and moving it down through the mainstem.

Response:  Statement has been revised “Rivers that periodically experience flood waters, such as the Santa Clara River and its tributaries, may have sections that are depleted of depositional sediment due to frequent scouring events (during or after heavy rain storms).”

Comment:  “It is recommended that before a sediment sampling plan is put into place, a reconnaissance survey first be conducted at or near each monitoring station to determine if significant deposits of sediment exist on the river bottom.”  If this is your recommendation then why does Table 9 specify sediment sampling at selected locations?  Please explain.

Response:  Statement revised to specify sediment sampling locations.

Comment: “Recommended measurements for constituents of concern would include inorganics and persistent bioaccumulative or toxic organic compounds.” Delete or specify which are necessary based on your experience.

Response: Comment incorporated. All organic parameters included in DGA are included in the recommended sampling.

Comment: Explain why other organic chemicals included in data gap analyses are excluded from this sampling.

Response: Comment incorporated.

**Watershed Hydraulics**

Comment: “Currently, it appears that the numbers and location of surface water gaging stations is adequate.” Please explain what criteria were used in your analysis to reach this conclusion. This conclusion may change after Table 8 is updated with the correct information.

Response: Section revised and explanation provided.

Comment: Provide reference and summary of the conclusions in “Water Resources Report on the Santa Clara River.”

Response: Statement regarding the above-stated report has been removed.

Comment: This section does not meet the requirements of the scope of work to evaluate the adequacy of the rainfall stations in the watershed. For example, there are a few gauges that can measure snow in the watershed at higher elevations so that hydrology models can simulate runoff correctly. These is also a limited number of gauges at higher elevations to measure the higher rainfall intensities due to orographic effects. You may with to include some of the language in the scope of work as to why Watershed Hydraulics is important, and summarize completed and congoing studies to prepare surface and groundwater models of the watershed, such as the LACSD sufface/gw model of the upper watershed, UWCD’s GW model of the lower watershed and ongoing efforts by VCWPD, USACE, and LADPW to prepare hydraulic, hydrologic, and sediment transport models of the entire watershed. These models will help to fill in gaps in the stream gauge network.

Response: AMEC has obtained shapefiles for this data and completed the above-stated evaluation.

**Conclusion**

Comment: Rewrite this section after changes to preceeding are done.

Response: Section has been rewritten.

# Appendix D
# Draft CMP Comments and Responses

# Ventura County
# Watershed Protection District
## Planning & Regulatory
## Hydrology Section
## MEMORANDUM

**DATE:** **December 30, 2005**

**FROM:** **Mark Bandurraga**

**SUBJECT:** **Draft CMP Substantive Comments**

Minor comments are provided in redline/strikeout text as tracked changes in WORD file.

Major comments are as follows:

Section 5.5 Comparison of Historical Data to Water Quality Criteria and TMDL Objectives

**Comment**: The conclusions presented from the SCREMP documents were based on data that were omitted from the data gap analysis because you only included the last 10 years based on your assumptions above. Therefore, how valid are any of these conclusions? Your argument against using any current data to draw these conclusions seems to argue against these conclusions as well. It seems that at least you should look at the current data to see if they confirm the old conclusions? The LACSD and UWCD datasets should be robust enough for this.

Section 6.0 Baseline Water Quality Monitoring

"Additionally, because the term baseline suggests environmental conditions that might exist during "average" conditions, the collection of stormwater, although mentioned in the scope of work, should be revisited by the stakeholders in terms of obtaining data that is meaningful over the long term." **Comment**: You appear to recommend wet-weather sampling in subsequent tables so is this discussion about baseline conditions consistent with your recommendations?

"This strategy also corresponds with the scope of work which states that monitoring points are to be selected based on: 1) downstream points of Santa Clara sub-basins; 2) land uses in the watershed; 3) system morphology; and 4) historical data availability. Other factors mentioned in the scope of work, such as sensitive habitats and potential problem areas, should be discussed at a local level to address individual water quality questions beyond the baseline sampling program described in this document."
**Comment**: Please clarify how a systematic sampling strategy incorporates these factors in the station selection? Sensitive habitats and potential problem areas are specifically mentioned in the scope of work for you to evaluate in this document but this wasn't done.

"Table 13 presents more detailed information on each of the recommended monitoring stations including the site number, name, a brief description of the location, the agency currently using/sponsoring the monitoring station, and its current monitoring status."

**Comment**: Need brief discussion of each proposed site in text to determine how it was selected based on the criteria listed in scope- land use, sensitive habitat, potential water quality problems, etc.  I do not see the point of duplicate stations upstream in undeveloped watersheds (see comments added to table) or duplicate stations closely clustered together. Need to discuss if any of these existing stations are currently used for WQ sampling and if existing sampling covers any recommended constituents. Need to evaluate historic flow data on USGS sites and discuss if proposed site has flow during summer months to make sure that monthly sampling frequency make sense.  Suggest reducing the number of proposed sites in report based on comments in report and improving the recommendations with the supporting data discussed above.

Table 14-
**Comment**: Once preliminary sampling site list is revised, revise, Table 14.

Major comments from Mark Bandurraga, VCWPD

**Comment 1**: Section 5.5 **-** The conclusions presented from the SCREMP documents were based on data that were omitted from the data gap analysis because you only included the last 10 years based on your assumptions above. Therefore, how valid are any of these conclusions? Your argument against using any current data to draw these conclusions seems to argue against these conclusions as well. It seems that at least you should look at the current data to see if they confirm the old conclusions? The LACSD and UWCD datasets should be robust enough for this.

**Response**: AMEC believes that the last 10 years of data is adequate to define any trends in water quality over time. Defining trends over space may be more of a challenge because, as was discussed at the most recent meeting, there is considerable heterogeneity between station locations (e.g. "clustering"). AMEC has considered this request and has produced graphs that depict changes in water quality parameters, over a time span of 10 years, for chloride, nitrate, sulfate and TDS. These graphs and a summary of the results has been incorporated into the report.

**Comment 2:** Section 6.0 **-** "Additionally, because the term baseline suggests environmental conditions that might exist during "average" conditions, the collection of stormwater, although mentioned in the scope of work, should be revisited by the stakeholders in terms of obtaining data that is meaningful over the long term." You appear to recommend wet-weather sampling in subsequent tables so is this discussion about baseline conditions consistent with your recommendations?

**Response**: Table 14 indicates that some recommended sampling locations may be better suited to wet weather sampling due to low flow conditions the remainder of the year. However, details regarding the goals and implementation of wet-weather sampling should be determined by the stakeholders in a program separate from the baseline monitoring program provided by the CMP.

**Comment 3**: Section 6.0 "This strategy also corresponds with the scope of work which states that monitoring points are to be selected based on: 1) downstream points of Santa Clara sub-basins; 2) land uses in the watershed; 3) system morphology; and 4) historical data availability. Other factors mentioned in the scope of work, such as sensitive habitats and potential problem areas, should be discussed at a local level to address individual water quality questions beyond the baseline sampling program described in this document." Please clarify how a systematic sampling strategy incorporates these factors in the station selection? Sensitive habitats and potential problem areas are specifically mentioned in the scope of work for you to evaluate in this document but this wasn't done.

**Response**: The selection of Preliminary Sampling Locations focused on 1) optimizing the use of historical data (e.g. choice of USGS stations includes both flow and chemistry data) 2) optimizing the use of current/traditional sampling stations 3) ensuring integrator stations for most tributaries and 4) ensuring adequate distance between adjacent stations (as the watershed is so vast). Although the guidelines prescribed in the scope were considered, it became apparent, subsequent to evaluating the watershed, that they were not critical components for siting sampling locations. For example, much of the land use of the watershed is agricultural but, since the data for chlorinated pesticides appeared to be limited or below the limits of detection, agricultural land use may not necessarily be adequate criteria for selection of sampling locations. Additionally, the delineation of sensitive habitat is not altogether clear within each subwatershed and, even if they were properly delineated, these areas are more important from the standpoint of "protection" rather than inclusion in a routine monitoring study design.

**Comment 4**: "Table 13 presents more detailed information on each of the recommended monitoring stations including the site number, name, a brief description of the location, the agency currently using/sponsoring the monitoring station, and its current monitoring status." Need brief discussion of each proposed site in text to determine how it was selected based on the criteria listed in scope- land use, sensitive habitat, potential water quality problems, etc. I do not see the point of duplicate stations upstream in undeveloped watersheds (see comments added to table) or duplicate stations closely clustered together. Need to discuss if any of these existing stations are currently used for WQ sampling and if existing sampling covers any recommended constituents. Need to evaluate historic flow data on USGS sites and discuss if proposed site has flow during summer months to make sure that monthly sampling frequency make sense. Suggest reducing the number of proposed sites in report based on comments in report and improving the recommendations with the supporting data discussed above.

**Response**: The selection of Preliminary Sampling Locations focused on 1) optimizing the use of historical data (e.g. choice of USGS stations includes both flow and chemistry data) 2) optimizing the use of current/traditional sampling stations 3) ensuring integrator stations for most tributaries and 4) ensuring adequate distance between adjacent stations (as the watershed is so vast). Although the guidelines prescribed in the scope were considered, it became apparent, subsequent to evaluating the watershed, that they were not critical components for siting sampling locations. For example, much of the land use of the watershed is agricultural but, since the data for chlorinated pesticides appeared to be limited or below the limits of detection, agricultural land use may not necessarily be an adequate criteria for selection of sampling locations. Additionally, the delineation of sensitive habitat is not altogether clear within each subwatershed and, even if they were properly delineated, these areas are more important from the standpoint of “protection” rather than inclusion in a routine monitoring study design. However, AMEC did expand the comments in the table to include reasoning for why each sample station was included in the recommendations. In addition, AMEC deleted site 723 and New-1 per comments from VCWPD and UWCD. AMEC also included information regarding whether active stations are measuring flow, water quality or both. Sampling locations in undeveloped portions of the watershed serve to help establish baseline water quality conditions and a measure from which to compare sample results taken in other developed areas of the watershed.

It is important to note that the term “preliminary” was used to identify the fact that the locations selected are certainly subject to debate, comment and relocation. AMEC encourages the relocation of any (or all) stations to ensure that the routine measurement of water quality and resultant data is optimal.

**Comment 5**: Once preliminary sampling site list is revised, revise, Table 14.

**Response**: Comment incorporated.

**DRAFT** Comprehensive Water Quality Monitoring Plan
For Santa Clara River Watershed
(dated 28 Nov 05)

Comments from Darla Wise and Dave Thomas

| | |
|---|---|
| Page i | DT- CLWA Castaic Lake Water Agency NOT Casitas … |
| Page ii | DT- List of Figures - figure's 3 and 4 reversed and figures are NOT matching maps. |
| Page 3 | DT- 3.1 Land Use – percentages add up to 96.8 %, missing 3.2 %? |
| | DT- 3.2 Vegetation – NO mention of Arundo donax (giant reed) in watershed? giant cane? |
| Page 5 | DT- 4.2.1 Distribution of Rainfall Stations – (1) miss-spelling? gage vs gauge (2) the reference of a storage gauge in the Matilija wilderness areas is NOT true. It is in the Ventura River Watershed, NOT the Santa Clara River Watershed. |
| Page 6 | DT- 4.2.2 reference to the historic gauge @ Hwy 101: site move prior to 2000 due to rating problems to Hwy 118, and again moved to Freeman in 2003'ish. |
| Page 11 | DT- 5.1 NO mention of the database being supplied to AMEC by the District at our cost $ |
| | DT- Missing data reference bullets for City of Santa Paula, City of Fillmore and USGS. |
| Page 26 | TL- Not listed or shown on Figure 41 (shown incorrectly in draft as Figure 37) are NPDES chronic toxicity test results |
| Page 35 | DT- NOTE: …it is rarely advantageous to change either a monitoring location … VCWPD has a possible ME-SCR move in the next permit! |
| Page 36 | TL- Strategy described in 6.1.1 is not "systematic" as defined in 6.1 – this methodology has targeted locations, whereas a systematic approach has locations at regular intervals |
| Page 40 | DT- site 737 is a 4 mile hike. Why not sample at Lions Campground (drivable) or ½ mile hike to Trout Creek (u/s Bear Creek). NOTE: wet months sampling could be a safety problem. |

Questions:

1. DT- Do we have an analytical cost on all parameters yet.
2. DT- Any Grant, TMDL, SWQBC, etc… $ moneys$ available.

Comments from Darla Wise and Dave Thomas, VCWPD
**Minor editing comments all incorporated – major comments and responses listed below.**

**Comment 1:** Section 3.2 Vegetation – There is no mention of arundo donax in the watershed?

**Response:** Arundo donax has been included as a primary component of disturbed riparian habitat throughout the watershed.

**Comment 2:** Section 4.2.1 (1) miss-spelling? gage vs gauge (2) the reference of a storage gauge in the Matilija wilderness areas is NOT true. It is in the Ventura River Watershed, NOT the Santa Clara River Watershed.

**Response:** Comment incorporated. Reference to Matilija wilderness removed.

**Comment 3:** 4.2.2 reference to the historic gauge @ Hwy 101: site moved prior to 2000 due to rating problems to Hwy 118, and again moved to Freeman in 2003'ish.

**Response:** Comment incorporated.

**Comment 4:** NOTE: …it is rarely advantageous to change either a monitoring location …VCWPD has a possible ME-SCR move in the next permit!

**Response:** Comment noted. AMEC has selected preliminary samplknig locations which may be finalized during statholder discussions.

**Comment 5:** Strategy described in 6.1.1 is not "systematic" as defined in 6.1 – this methodology has targeted locations, whereas a systematic approach has locations at regular intervals

**Response:** Staying within the strict definition of "systematic sampling" would obviate all of the guidelines suggested in Task 3 (e.g. siting of furthest downstream stations on tributariess as "integrator" stations). AMEC will therefore change the term "systematic sampling strategy" to "a slightly modified systematic sampling strategy".

**Comment 6:** site 737 is a 4 mile hike. Why not sample at Lions Campground (drivable) or ½ mile hike to Trout Creek (u/s Bear Creek). NOTE: wet months sampling could be a safety problem.

**Response:** Some of the stations in the upper reaches of tributaries were selected to ensure adequate spatial representation. Preliminary sampling locations may, upon agreement of stakeholders, be relocated to more accessible areas that provide the same level of spatial representation.

# UNITED WATER CONSERVATION DISTRICT

"Conserving Water Since 1927"

December 30, 2005

Megan Schwartz
AMEC Earth & Environmental
1107 9th Street, Suite 210
Sacramento, CA 95814

**Subject: UWCD Comments on DRAFT Santa Clara River CMP**

United Water Conservation District (UWCD) appreciates this opportunity to comment on the November 2005 draft of the Santa Clara River Comprehensive Monitoring Plan (CMP). UWCD staff have reviewed the draft CMP and attended the December 15, 2005 meeting in Santa Clarita, where AMEC staff detailed the scope of the work embodied in the draft CMP.

As detailed previously in our November 18, 2005 comment letter regarding baseline monitoring within the watershed, we feel that the CMP falls short of adequately addressing the criteria listed in Task 3 in the Scope of Work for this project. Task 3 lists the criteria to be considered by the consultant when proposing sites sampling locations, including the specific task to *place monitoring stations at strategic locations based on system morphology, land uses, sensitive habitat areas, historical data, and potential problem areas.* The CMP does not significantly address these criteria, and this was confirmed by statements by AMEC staff during the Santa Clarita meeting. The primary site selection criteria cited by AMEC in the public meeting was that proposed sites had some history of monitoring, active and former USGS gaging sites were strongly favored, and that sites were evenly distributed along the Santa Clara River and significant tributaries.

At the recent Santa Clarita meeting AMEC staff confirmed that the Data Gap Analysis was purely a quantitative exercise, considering only the number of records available for various constituents. Task 2 in the project Scope of Work states that the consultant will prepare a *framework for comparison of historical data with appropriate benchmark values, compare historical data with benchmark values, and evaluate... the historical data... to characterize the health of the watershed.* Section 5.5 in the draft CMP summarizes a number of published or recognized water quality problems and threats in the watershed, and Table 12 offers a bulk comparison of data from the watershed to the range of water quality objectives for the various reaches of the river. While Table 12 has some utility, this bulk comparison and subsequent discussions by contaminant class falls well short of completing the Data Gap Analysis detailed in the

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project Scope of Work. At a minimum, a table comparing observed values to water quality objectives needs to be developed for each reach or basin. This is a critical component of the CMP that would assist monitoring agencies in prioritizing current or future monitoring schedules to further assess areas identified as problematic. These tables would also be more informative if the number of records for each constituent were listed along with the percent of values exceeding the water quality objective for each reach.

The second paragraph of section 6.1 significantly dilutes the scope of the CMP by characterizing a baseline study as one that samples a waterbody at regular intervals. While such a strategy may be appropriate for waterbodies with continuous flow where little historical data exists, it is poorly suited for rivers such as the Santa Clara where multiple wet and dry reaches exist during any given year. The draft CMP contains language detailing what *should* be done when designing a Comprehensive Monitoring Plan, and the reader is left with the impression that these detailed evaluations were actually conducted prior to site selection. We recommend that the CMP clearly state the limited criteria employed for site selection (even distribution of sites and sites with historical water quality or flow data, and that no consideration was given to the past quality of surface waters).

Section 6.1.1 of the draft CMP details the criteria used in selecting monitoring locations. Absent from the short list of criteria is consideration of surface water-groundwater inaction, which significantly influences the hydrology of this river system. While AMEC has added some sites near the groundwater basin boundaries, it would be best to explicitly note that hydrology was generally not a factor considered when proposing monitoring sites. UWCD offers the following comments on proposed monitoring sites detailed in the draft CMP:

Sespe Creek: Gage 111130000 is the active USGS gage at the lower reach of the watershed, the recommended site at gage 11112500 is currently inactive and therefore a poor choice for a sampling location.

Sespe Creek: Site 04N20W24SW1 should be substituted for site 04N20W26SW1. Surface water readily percolates to groundwater in this portion of the Sespe Creek fan, and site -24SW1 has flow more often than site -26SW1.

Sespe Creek: Site "New-1" is very difficult to access, and there are virtually no anthropogenic water quality inputs between this site and site 737. We don't feel sample collection at this site would be a wise use of resources.

Piru Creek: Gage 11109800 is the active USGS gage on Piru Creek below Santa Felicia Dam. Site 11109800 is preferable to the recommended site at gage 11110000, which has not been active for 30 years and is too close to site 04N18W20SW1.

Piru Creek: Pyramid Lake should be added to all watershed maps to accurately represent conditions in the upper Piru Creek watershed.

Santa Clara River: Recommended site 11113900, Santa Clara River near Saticoy, should be replaced by site 03N21W32SW1, Santa Clara River at Freeman

Diversion. Several agencies conduct ongoing sampling at the Freeman Diversion, and it is the logical point to continue sampling.
Santa Clara River: We could access no information for site 11113300. Please provide more details on the site location. This site appears to be located in the vicinity of Willard Road, and the active UWCD sample site 03N21W12SW1, in an area of rising groundwater near the downstream boundary of the Fillmore groundwater basin.
Santa Clara River: There is a clear disparity in the number of Santa Clara River sites proposed in Ventura County compared to Los Angeles County. Thirteen sites are proposed for the approximately 38 river miles in Ventura County, and four sites are proposed for the approximately 46 river miles in Los Angeles County, some of which may only be viable as wet weather sites. There is a great deal of interest in water quality and flow conditions in the reach of the Santa Clara River between the City of Santa Clarita and the vicinity of Piru Creek, as this reach is heavily influenced by wastewater discharges. Historical data exists for this reach, sourcing from both the ongoing NDPES monitoring by Los Angeles County Sanitation Districts (LACSD) and various special studies.
Santa Clara River: LACSD NPDES river monitoring site R-C is located a short distance downstream of USGS gage 11108000. Flow is unlikely to change significantly between these points, and perhaps the monitoring for these two sites can be consolidated. LACSD site R-D is located downstream of the plant discharge point, and the next important point where historical records exist is LACSD site R-E, located just upstream of the confluence with Castaic Creek. USGS Water-Resources Investigations Report 03-4277 also provides data for these sample locations. Additional sites are also recommended near Potrero Canyon and at Blue Cut, where historical records also exist. We urge that AMEC review this section of the river and propose additional monitoring at existing sites R-E (Castaic confluence), Potrero Canyon, and Blue Cut.

The frequency of sampling and the suite of analytes for each site appear to be a reasonable "wish list" for future sampling if funds are abundant. As sampling implementation is dependent on the unknown future availability of funds for this purpose, specific comments will be reserved for the appropriate time.

As discussed in the recent meeting in Santa Clarita, it may be worthwhile to consider modifying the four classes of monitoring parameters. AMEC staff stated that the group of physical parameters was intended to be measurable in the field. TDS is not directly measurable in the field, and should be included with the inorganic parameters. To our knowledge, TSS is not directly measurable in the field, but turbidity could possibly be substituted for TSS if a field measurement is valued. Akin to the suggestion to run a "suite" of metals to economize on lab costs, a "general mineral" analysis should be considered to provide a suite of inorganic parameters.

Wet-weather monitoring was also discussed at the Santa Clarita meeting, but it remains unclear if such monitoring will be incorporated in the monitoring program or not.

Regardless, the suggestion to monitor organic parameters at the CMP sample sites following the first wet weather and following the first hour of rainfall in subsequent events is problematic. Many of the proposed monitoring sites will not respond that quickly to rainfall, especially under dry antecedent conditions, and the staffing requirements to sample so many sites within a short time period is difficult to coordinate.

In summary, we are disappointed that after all the effort expended to compile a comprehensive surface water quality database for the Santa Clara River watershed, it is basically neglected when designing the monitoring program. AMEC's attempt to characterize the health of the river system in a single table is totally inadequate. The absence of proposed river monitoring sites in western Los Angeles County is apparently a major oversight and must be corrected. However, with additional work we believe the draft CMP will likely emerge as a functional monitoring plan that will meet the objectives detailed in the project Scope of Work. Despite the shortcomings detailed here, we commend AMEC for making good progress towards producing a well-written document and a functional monitoring plan for a complex river system. We look forward to reviewing future drafts of the CMP and encourage AMEC to improve the document by incorporating comments presented here and in our prior comment letters.

Sincerely,

Dan Detmer

Dan Detmer
Senior Hydrogeologist

CC Mark Bandurraga, VCWPD

Comments from Dan Detmer, UWCD

**Comment 1:** As detailed in our Nov. 18 comment letter regarding baseline monitoring within the watershed, we feel that the CMP falls short of adequately addressing the criteria listed in Task 3 in the SOW for this project. Task 3 lists the criteria to be considered by the consultant when proposing sites sampling locations, including the specific task to *place monitoring stations at strategic locations based on system morphology, land uses, sensitive habitat areas, historical data, and potential problem areas.* The CMP does not significantly address these criteria, and this was confirmed by statements by AMEC staff during the Santa Clarita meeting. The primary site selection criteria cited by AMEC in the meeting was that proposed sites had some history of monitoring, active and former USGS gaging sites were strongly favored, and that sites were evenly distributed along the river and significant tributaries.

**Response:** The selection of Preliminary Sampling Locations focused on 1) optimizing the use of historical data (e.g. choice of USGS stations includes both flow and chemistry data) 2) optimizing the use of current/traditional sampling stations 3) ensuring integrator stations for most tributaries and 4) ensuring adequate distance between adjacent stations (as the watershed is so vast). Although the guidelines prescribed in the scope were considered, it became apparent, subsequent to evaluating the watershed, that they were not critical components for siting sampling locations. For example, much of the land use of the watershed is agricultural but, since the data for chlorinated pesticides appeared to be limited or below the limits of detection, agricultural land use may not necessarily be adequate criteria for selection of sampling locations. Additionally, the delineation of sensitive habitat is not altogether clear within each subwatershed and, even if they were properly delineated, these areas are more important from the standpoint of “protection” rather than inclusion in a routine monitoring study design.

**Comment 2:** At the Santa Clarita meeting, AMEC staff confirmed that the Data Gap analysis was a purely quantitative exercise, considering only the number of records available for various constituents. Task 2 in the SOW states that the consultant will prepare a *framework for comparison of historical data with appropriate benchmark values, compare historical data with benchmark values, and evaluate…the historical data… to characterize the health of the watershed.* Section 5.5 in the draft CMP summarizes a number of published or recognized water quality problems and threats in the watershed and Table 12 offers a bulk comparison of data from the watershed to the range of water quality objectives for the various reaches of the river. While Table 12 has some utility, this bulk comparison and subsequent discussions by contaminant class falls well short of completing the Data Gap Analysis detailed in the SOW. At a minimum, a table comparing observed values to water quality objectives needs to be developed for each reach of basin. This a critical component of the CMP that would assist monitoring agencies in prioritizing current or future monitoring schedules to further assess areas identified as problematic. These tables would also be more informative if the number of records for each constituent were listed along with the percent of values exceeding the water quality objective for each reach.

**Response:** The scope of work states that AMEC is to analyze the sampling media of the historical data to determine if additional sampling is necessary to characterize the health of the watershed. Therefore, the data gap analysis was conducted to analyze the sampling locations and frequency on the watershed as opposed to conducting a data analysis to attempt to characterize the watershed’s health. As stated in Appendix B of the Draft CMP, data gaps were analyzed by parameter and not reach per the scope of work. In response to comments received at the stakeholder meeting, AMEC has produced graphs that depict changes in water quality parameters, over a time span of 10 years, for chloride, nitrate, sulfate and TDS in order to compare these results to conclusions regarding this parameters in the SCREMP presented in the CMP.

**Comment 3:** The second paragraph of Section 6.1 significantly dilutes the scope of the CMP by characterizing a baseline study as one that samples a waterbody at regular intervals. While such a strategy may be appropriate for waterbodies with continuous flow where little historical data exists, it is poorly suited for rivers such as the Santa Clara where multiple wet and dry reaches exist during any given year. The draft CMP contains language detailing what should be done with designing a Comprehensive Monitoring Plan, and the reader is left with the impression that these detailed evaluations were actually conducted prior to site selection. We recommend that the CMP clearly state the limited criteria employed for site selection (even distribution of sites and sites with historical water quality or flow data, and that no consideration was given to the past quality of surface waters).

**Response:** Further details have been provided in the report regarding the selection of each individual site for inclusion into the baseline monitoring program. The criteria employed for site selection is detailed prior to Table 13 in the CMP.

**Comment 4:** UWCD offers the following comments on proposed monitoring sites detailed in the draft CMP:

- Sespe Creek: Gage 111130000 is the active USGS gage at the lower reach of the watershed, the recommended site at gage 11112500 is currently inactive and therefore a poor choice for a sampling location.
- Sespe Creek: Site 04N20W24SW1 should be substituted for site 04N20W26SW1. Surface water readily percolates to groundwater in this portion of the Sespe Creek fan, and site -24SW1 has flow more often than site -26SW1.
- Sespe Creek: Site “New-1” is very difficult to access, and there are virtually no anthropogenic water quality inputs between this site and site 737. We don’t feel sample collection at this site would be a wise use of resources.
- Piru Creek: Gage 11109800 is the active USGS gage on Piru Creek below Santa Felicia Dam. Site 11109800 is preferable to the recommended site at gage 11110000, which has not been active for 30 years and is too close to site 04N18W20SW1.
- Piru Creek: Pyramid Lake should be added to all watershed maps to accurately represent conditions in the upper Piru Creek watershed.
- Santa Clara River: Recommended site 11113900, Santa Clara River near Saticoy should be replaced by site 03N21W32SW1, Santa Clara River at Freeman Diversion. Several agencies conduct ongoing sampling at the Freeman Diversion, and it is the logical point to continue sampling.
- Santa Clara River: We could access no information for site 11113300. Please provide more details on the site location. This site appears to be located in the vicinity of Willard Road, and the active UWCD sample site 03N21W12SW1, in an area of rising groundwater near the downstream boundary of the Fillmore groundwater basin.
- Santa Clara River: LACSD MPDES river monitoring site R-C is located a short distance downstream of USGS gage 11108000. Flow is unlikely to change significantly between these points, and perhaps the monitoring for these two sites can be consolidated. LACSD site R-D is located downstream of the plant discharge point, and the next important point where historical records exist is LACSD site R-E, located just upstream of the confluence with Castaic Creek. USGS Water

Resources Investigation Report 03-4277 also provides data for these sample locations. Additional sites are also recommended near Potrero Canyon and at Blue Cut, where historical records also exist. We urge that AMEC review this section of the river and propose additional monitoring at existing sites R-E, Potrero Canyon, and Blue Cut.

**Response:** As requested, USGS gage 11112500 has been replaced by USGS Gage 11113000. UWCD site 04N20W24SW1 has been substituted for UWCD site 04N20W26SW1. Site New-1 has been left on the list of recommended preliminary sites but may be removed by the local monitoring agency based on accessibility and/or availability of resources. USGS gage 11110000 has been replaced by USGS gage 11109800. USGS gage 11113900 has been replaced by UWCD site 03N21W32SW1. USGS gage 11113300 is located on the Santa Clara River near Santa Paula. Available data for this site includes peak streamflow and water quality samples. For more information regarding this site, please refer to the following website: http://waterdata.usgs.gov/nwis/inventory/?site_no=11113300. USGS gage 11108000 was selected, however, the local monitoring agency may substitute LACSD site R-C, if desired. A priority had been placed on selecting USGS gage stations, when possible, due to the available streamflow data. SWAMP sites 403STC068 near Potrero Canyon and USGS gage 11108500 near Blue Cut have also been added. These changes are reflected in Figure 46 and Table 13.

**Comment 5:** There is a clear disparity in the number of Santa Clara River sites proposed in Ventura County compared to Los Angeles County. Thirteen sites are proposed for the approximately 38 river miles in Ventura County, and four sites are proposed for the approximately 46 river miles in Los Angeles County, some of which may only be viable as wet weather sites. There is a great deal of interest in water quality and flow conditions in the reach of the Santa Clara River between the City of Santa Clarita and the vicinity of Piru Creek, as this reach is heavily influenced by wastewater discharges. Historical data exists for this reach, sourcing from both the ongoing NPDES monitoring by LACSD and various special studies.

**Response:** AMEC did not select site locations based on county jurisdiction. Again, the nature of the sampling locations was “preliminary” and therefore subject to debate and possible relocation. Adding stations is contingent on limitations of funding as well.

**Comment 6:** It may be worthwhile to consider modifying the four classes of monitoring parameters. AMEC staff stated that the group of physical parameters was intended to be measurable in the field. TDS is not directly measurable in the field, and should be included with the inorganic parameters. To our knowledge, TSS is not directly measurable in the field, but turbidity could possibly be substituted for TSS if a field measurement is valued. Akin to the suggestion to run a “suite” of metals to economize on lab costs, a “general mineral” analysis should be considered to provide a suite of inorganic parameters.

**Response:** AMEC has added text to the CMP to reflect that this class of parameters was grouped as a commonly measured class and not as much because they are easily measured in the field. Therefore, while the suggested is noted, AMEC has not reorganized the four classes of monitoring parameters.

**Comment 7:** The suggestion to monitor organic parameters at the CMP sample sites following the first wet weather and following the first hour of rainfall in subsequent events is problematic. Many of the proposed monitoring sites will not respond that quickly to rainfall, especially under dry antecedent conditions, and the staffing requirements to sample so many sites within a short time period is difficult to coordinate.

**Response:** Comment incorporated. Suggestion has been removed from the text.

Comments from Christian Alarcon, LACSD

**Comments from LACSD were received via Track Changes in the Draft CMP document. All minor editorial comments were incorporated. Major comments and corresponding responses are listed below.**

**Comment 1:** Table 4 includes inorganic and metals MCLs as water quality objectives; however, these would only be applicable for waters designated as MUN. The table should clarify that the objectives listed are not applicable to all waters.

**Response:** Comment incorporated. A footnote has been added to the table.

**Comment 2:** "Phosphate is typically more stimulatory to phytoplankton populations." Phosphate may or may not be more stimulatory to phytoplankton depending on whether the water is nitrogen limited.

**Response:** Comment incorporated. The sentence has been amended.

**Comment 3:** "The construction of trend analyses over either time or space for any single water quality parameter might therefore lead to conclusions that may be misleading." If the conclusions drawn from such trend analyses may be misleading, then such analyses should not be conducted as part of this document.

**Response:** AMEC will revise the text to convey the message that one needs to be cautious about data that is collected from a number of different sources and/or laboratories. The term "misleading" will not be used.

**Comment 4:** "Based on data presented in the SCREMP, the following conclusions were made with regard to Surface Water Quality." Since this data was not used in the data gap analysis and is from pre-1995, this information does not appear to be relevant. These conclusions should be deleted.

**Response:** AMEC will revise the text to clarify that the data characterized between 1994 and 2005 is different than the data used to illustrate trends within the SCREMP. Further, an analysis of the current data in comparison to the conclusions in the SCREMP document has been added to the report.

**Comment 5:** "These TMDLs will be addressing long-standing water quality issues like elevated surface water concentrations of chloride, ammonia, nitrate/nitrite, fecal coliform, pH and organic enrichment/low dissolved oxygen." Several of the listings mentioned have been delisted and the paragraph should be revised.

**Response:** Comment incorporated. Paragraph has been revised to reflect current listings.

**Comment 6:** Table 12 presents a highly misleading view of water quality exceedances in the Santa Clara River Watershed. An accurate portrayal of the incidence of water quality exceedances in the Santa Clara River can only be obtained by comparing data collected in each read of the river with the objectives for that reach. This table should either be deleted or be expanded to include a comparison of data in each reach to the objectives for that reach.

**Response:** As stated in the response to comments for the Data Gap Analysis, an analysis of the water quality objectives by reach is outside the stated scope of work. In addition, AMEC believes that examining the percentage of stations that exceed the water quality objectives has some utility. It a large percentage of the measurements in the database a below the water quality objective then there is a good indication that a problem may not exist even if local authorities perceive of one.

**Comment 7:** Figure 44 has our stations listed under "LASCD" and not "LACSD". Also, there are several stations incorrectly labeled as ours. We have not monitored stations in the tributaries or downstream of the county line.

**Response:** Figure 44 has been adjusted to properly display the following five stations monitored by LACSD: RA, RB, RC, RD and RE.

**Comment 8:** There should be a discussion of how the sampling strategy uses the selection criteria to locate the sampling stations.

**Response:** The selection of Preliminary Sampling Locations focused on 1) optimizing the use of historical data (e.g. choice of USGS stations includes both flow and chemistry data) 2) optimizing the use of current/traditional sampling stations 3) ensuring integrator stations for most tributaries and 4) ensuring adequate distance between adjacent stations (as the watershed is so vast). Although the guidelines prescribed in the scope were considered, it became apparent, subsequent to evaluating the watershed, that they were not critical components for siting sampling locations. For example, much of the land use of the watershed is agricultural but, since the data for chlorinated pesticides appeared to be limited or below the limits of detection, agricultural land use may not necessarily be adequate criteria for selection of sampling locations. Additionally, the delineation of sensitive habitat is not altogether clear within each subwatershed and, even if they were properly delineated, these areas are more important from the standpoint of "protection" rather than inclusion in a routine monitoring study design.

**Comment 9:** Table 13 should have a summary on how the sampling stations were selected based on the criteria stated in the previous section.

**Response:** The "Comment/Status" column addresses whether the station selected was chosen to preserve existing/historical data (e.g. "Active" or "Existing" station or whether there was a clear indication of a data gap (e.g. due to spatial heterogeneity). In addition, text has been added to the report detailing why each sampling station was selected for inclusion into the baseline monitoring program.

**Comment 10:** Table 14 should compare the recommended monitoring program with the current monitoring program for each sampling station.

**Response:** A comparison of the recommended monitoring program with the current monitoring program for each sampling station is outside AMEC's stated scope of work.

**Comment 11:** It may be worthwhile to include diazinon and chlorpyrifos since there are proposed 303(d) listings for this constituents (based on SWAMP data). However, depending on whether other existing data has been evaluated, these proposed listings may or may not end up on the final 303(d) list. Also, since PAHs, PCBs, and chlorinated pesticides are rarely detected, they should be monitored less frequently than monthly.

**Response:** As discussed in the most recent meeting, the laboratory methods selected should cover “suites” of compounds rather than choosing individual analytes. AMEC is in agreement that diazinon and chlorpyrifos should be included in the initial stages of sampling. Should these compounds not yield useful quantitative information (e.g. 100% of samples yield “ND”) as time progresses, the laboratory can be called and the selection of analytes can be adjusted.

**Comment 12:** Wet weather sampling is a priority in TMDLs and should be included in this plan.

**Response:** Wet weather sampling is not considered a “baseline” condition. The responsibility for this type of sampling should fall within the confines of a regional stormwater management program(s).

**Comment 13:** Bacteria sampling should not be directed towards the WRPs. It will be more useful at other sites where recreation may occur.

**Response:** Bacterial sampling will be conducted during the initial baseline sampling event (at all stations) and then, based on the results, reevaluated in terms of where additional sampling should take place.

**Comment 14:** The Data Quality Objectives section is vague. Specifying a requirement for a laboratory intercalibration study, in which all agencies/laboratories conducting monitoring under this program would be required to participate, may help to provide a framework to work out analytical and sampling issues and ensure adequate data quality for this program. This has been done for other regional monitoring programs, i.e. the Stormwater Monitoring Coalition’s Model Monitoring Program through SCCWRP.

**Response:** Comment incorporated. Text has been added to the report stating that stakeholders may consider the use of a laboratory intercalibration study in the future.

## Comments from Michael Lyons, Regional Water Quality Control Board

**Received via email:**

SWAMP sampled the Santa Clara River Watershed a few years ago, and over the next several months I will need to develop a work plan to spend @ $200,000 for SCR and Calleguas Creek monitoring (sampling would occur in 2007, or possibly 2006). Last time we sampled 30 random stations and 8 targeted stations plus 1 estuary station. I would like to talk to your group about whether it makes sense to do a randomized sampling every five years or perhaps sample all of your proposed stations every five years for bioassessment and toxicity and some other things, which I could help pay for.

I'm also attached to the NPDES section and can modify the POTW and stormwater sampling requirements to help implement your proposed plan.

I quickly reviewed the draft document and I am impressed with how far along you are. A few comments from my perspective and based on my experience in doing something similar for the San Gabriel River Watershed.

Bacteriological sampling on a monthly basis will not be useful - our Basin Plan objectives require that we have 4-5 samples per month to determine compliance, so we can live with weekly sampling (which results in 4 samples per month most of the time and occasionally 5), but not monthly. However, it may be possible to reduce the number of stations that need to be sampled by focusing on areas of high recreational use. In the San Gabriel River, the POTW puts out better quality water (bact-wise) than the ambient water, so we have agreed to dispense with upstream-downstream monitoring at the point of discharge and monitor high use areas instead.

It may be useful to define a slightly different sampling plan for the "estuary". The wadeable stream bioassessment protocol won't work there, so typically we would sample with a grab device to characterize the benthic macroinvertebrate community. Sediment chemistry and sediment toxicity measurements would be useful there. And the usual water column sampling.

We have not done much sampling for sediment in freshwater areas. One problem is the transient nature of the bottom deposits. Another is the lack of freshwater sediment quality objectives to use to evaluate the results. I think that it would be a good idea to do a screening study to look for some areas of deposition and perhaps sample a few indicator sites. Wherever sediment chemisty is done, sediment toxicity and bioassessment also should be done - the sediment quality objectives for bays and estuaries will rely upon this triad and I wouldn't be surprised if that's how things are done if we eventually extend these to freshwater systems.

The proposed monitoring plan doesn't seem to address bioaccumulation monitoring. In the past, we have collected fish from a few locations as part of the now-defunct Toxic Substances Monitoring Program, but it was pretty haphazard and it would be nice to have a regular sampling program at key locations (wouldn't necessarily need to be done annually, perhaps every few years). We also have been doing bagged bivalves at certain locations in each watershed - as the document mentions, this can help alleviate the problem of finding that organics in the water column often are below detection limits. On that note, it may be desirable to require laboratory analysis of water samples with clean techniques and other methods to achieve extremely low detection levels.

I've been ignoring lakes under SWAMP since I don't have enough money to go around. It appears that your plan also has ignored them. USEPA has expressed plans to focus on lake monitoring in 2006 and hope to pour a lot of money into this, although they have not suggested what indicators they think that we should monitor. I don't know if the group has considered this in the Santa Clara River Watershed, but it might be useful to talk about it. I know that some people are interested in bact monitoring where there are swimming beaches and fish tissue monitoring where people catch fish. It would be possible to do benthic infaunal sampling in lakes, but we don't really have an assessment tool for that yet. And it's not clear if we need to do sediment monitoring.

I'd like to attend the December 15th meeting and I hope that I can be helpful.

**Comment 1:** I'm also attached to the NPDES section and can modify the POTW and stormwater sampling requirements to help implement your proposed plan.

**Response 1:** Comment incorporated. Greater detail regarding RWQCB implementation assistance added to the document.

**Comment 2:** Bacteriological sampling on a monthly basis will not be useful - our Basin Plan objectives require that we have 4-5 samples per month to determine compliance, so we can live with weekly sampling (which results in 4 samples per month most of the time and occasionally 5), but not monthly.

**Response 2:** Comment incorporated. Bacteriological sampling changed to weekly.

**Comment 3:** The proposed monitoring plan doesn't seem to address bioaccumulation monitoring. In the past, we have collected fish from a few locations as part of the now-defunct Toxic Substances Monitoring Program, but it was pretty haphazard and it would be nice to have a regular sampling program at key locations (wouldn't necessarily need to be done annually, perhaps every few years).

**Response 3:** Bioaccumulation monitoring is not within the stated scope of work. This monitoring may be addressed by stakeholders when determining future implementation of the plan.