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2005 Ventura River and San Antonio Creek Watershed Sanitary Survey Update

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Kennedy/Jenks Consultants

Engineers & Scientists

Kennedy/Jenks Consultants

1000 S. Hill Road, Suite 200
Ventura, California 93001
805-658-0607
805-650-1522 (Fax)

Ventura River/San Antonio Creek Watershed Sanitary Survey 2005 Update

31 March 2006

Prepared for

City of San Buenaventura
336 Sanjon Road
P.O. Box 99
Ventura, California 93002-0099

K/J Project No. 0589056

Table of Contents

Table of Contents (cont'd)

Table of Contents (cont'd)

Table of Contents (cont'd)

Table of Contents (cont'd)

Table of Contents (cont'd)

Table of Contents (cont'd)

List of Tables

Table of Contents (cont'd)

List of Figures

List of Appendices

Table of Contents (cont'd)

Acronyms

AF	acre-feet
AL	Action Level
AMCL	alternative MCL
Avenue WTP	Ventura Water Treatment Plant
BWT	Business Plan (BP), Waste Producer (W), Underground Tank (T)
CAP	Cryptosporidium Action Plan
CCR	Consumer Confidence Report
CCTV	line cleaning and video inspection
CMMS	Computerized Maintenance Management System
CMWD	Casitas Municipal Water District
DBP	disinfection byproducts
DBPR	Disinfection By-Products Rule
DBPP	Disinfection Byproduct Precursors
DHS	California Department of Health Services
DTSC	Department of Toxic Substances Control
DU	Dwelling Unit
DWR	Department of Water Resources
DWSAP	Drinking Water Source Assessment and Protection
E&ERD	Ventura County Environmental and Energy Resources Division
EIS	Environmental Impact Statement
FBR	Filter Backwash Rule

FEMA	Federal Emergency Management Act
FOG	Fats, Oil and Grease
gpm	gallons per minute
HPC	heterotrophic plate count
GSA	General Services Agency (Ventura County)
GWR	Ground Water Rule
HHWCF	Household Hazardous Waste Collection Facility
I&I	inflow and infiltration
ICR	Information Collection Rule
IDSE	Initial Distribution System Evaluation
IESWTR	Interim Enhanced Surface Water Treatment Rule
IWPP	Integrated Watershed Protection Plan
L	Liter
LAFCO	Local Agency Formation Commission
LARWQCB	Los Angeles Regional Water Quality Control Board
LCR	Lead and Copper Rule
LRAA	locational running annual average
LT1ESWTR	Long-Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	Long-Term 2 Enhanced Surface Water Treatment Rule
LUFT	Leaking Underground Fuel Tank
MGD	million gallons per day
mg/l	milligrams per liter
MCL	Maximum Contaminant Level
ME-VR	Mass Emission Monitoring Station
M/DBP	Microbial/Disinfection Byproducts
ml	milliliter
MMM	Multimedia Mitigation
MOU	Memorandum of Understanding
MRDL	maximum residual disinfectant level
MS4	municipal separate storm sewer system
MTBE	Methyl Tertiary Butyl Ether
NA	No Action or Not Applicable

NDMA	N-nitrosodimethylamine
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelolometric turbidity units
OES	Office of Emergency Services
OVSD	Ojai Valley Sanitary District
PCA	possible contaminant activity
PHG	Public Health Goal
POE	points of entry
ppm	parts per million
REFRW	referred to Regional Water Quality Control Board
REFOA	referred to other government agency
RR	Rural Residential
RWQCB	Regional Water Quality Control Board
SCADA	Supervisory Control and Data Acquisition
SMP	Ventura Countywide Stormwater Quality Management Plan
SWTR	Surface Water Treatment Rule
TC	Thatcher Creek
TCR	Total Coliform Rule
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TTHM	Total Trihalomethanes
WWTP	Wastewater Treatment Plant
UR	Urban Residential
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UV	Ultraviolet light
VCEHD	Ventura County Environmental Health Department
VCFD	Ventura County Fire Department
VCWPD	Ventura County Watershed Protection District

VCWQMP	Ventura County Stormwater Quality Management Program
WWRB	Washwater Recovery Basin
WY	Water Year
µg/L	micrograms per Liter

Executive Summary for 2005 Sanitary Survey

The Surface Water Treatment Rule (SWTR), Section 64665, Watershed Sanitary Surveys, requires that all water systems subject to the SWTR shall conduct a sanitary survey of their watershed(s) at least every five years. The aim of the Sanitary Survey is to identify potential sources of contamination within the watershed, and to make recommendations on how to reduce the risks to water quality.

The first Watershed Sanitary Survey (1995 Report) for the City of San Buenaventura's Avenue Water Treatment Plant (Avenue WTP) was completed in October 1995. The 1995 Report evaluated the 51,000-acre watershed area drained by the lower Ventura River and the tributary San Antonio Creek system. As part of the requirement for a 5-year update, the City completed the 2000 Update to the Sanitary Survey in May 2001.

This 2005 Update, describes the changes in the watershed since the 2000 Sanitary Survey, and confirms the City's ongoing commitment to protecting the water quality of the lower Ventura River water source.

Sources of Contaminants

The 2005 Sanitary Survey confirmed the previous sanitary survey concerns for horse manure, sewer overflows, septic tanks near Casitas Springs, illegal dumping, oil wells and tanks. The 2005 Survey also identified new concerns for sediment transport with the planned removal of the Matilija Dam and the presence of gas utility pipelines near some of the creeks.

Compliance with Drinking Water Standards

The City is not using the surface water diversion, but has maintained the structures for possible use in the future. However the City is using groundwater under the direct influence (GUDI) of surface water from the sub-surface diversion and shallow wells that fall under the SWTR and the need for Watershed Sanitary Surveys. The Avenue WTP, the Avenue WTP with the improvements and the City monitoring programs are in compliance with the intent of the SWTR and related regulations.

Recommended Levels for Removal of Giardia and Other Viruses

The water source monitoring results show that Giardia, virus, and Cryptosporidium are less detection limits. Removal rates are currently 3-log for Giardia, 4-log for virus, and 2-log for Cryptosporidium based on the existing Avenue WTP. The Avenue WTP improvements due for completion in 2006 will increase removal rates to 6-log for Giardia, 4-log for Cryptosporidium, and greater than 9-log for virus.

Key Conclusions

Foster Park Intake Facilities and Avenue Water Treatment Plant

The City is not currently using the surface water diversion, but has maintained the structures for possible use in the future. The Avenue WTP, the planned improvements, and the City's monitoring programs are in compliance with the intent of the SWTR and related regulations.

Overall water quality

The 2005 Ventura County Storm Water Monitoring report provides a comprehensive statement that is representative of the water quality within study area during the period of 2001-4, "These results indicated that water quality in the watershed remained relatively stable during this four year period."

Giardia and *Cryptosporidium* were below detection limits in the City's water sampling program during the 2000 to 2005 period. The Title 22 monitoring of general mineral, general physical, radionuclide, and inorganic chemicals stayed within the historical range.

There were a few occasions of high Total Coliform (greater than 24,000 MPN) in the City's watershed monitoring. This is likely an indicator of ineffective septic tanks, bird excrement, or animal manure.

Potential Contamination Sources

New watershed monitoring and reporting programs developed during the period of 2001 through 2005 by the City, the County of Ventura, the Ventura River Stream Team (ChannelKeepers), and a number of interagency studies initiated since 2000, provide a more thorough understanding of the watershed than was available for previous Sanitary Surveys.

There continues to be potential water quality hazards in the watershed that need to be monitored. The potential contamination issues in the study area are shown in Figure 6. There are increasing concerns with respect to water quality risks from downstream sediment transport as a result of the future Matilija Dam removal. Septic tanks and gas utility pipelines were recognized in this 2005 Update, but these have existed in the watershed for decades.

Actions over the last five years that have reduced the risk of contamination are:

- New OVSD siphons that reduce the risk of spilling untreated wastewater,
- Horse manure awareness program,
- Successful operation of HHWCF, and
- Avenue WTP improvements.

Key Recommendations

Regulatory Compliance

It is recommended that the City conduct a review of water quality sampling for compliance with drinking water regulations and of treatment effectiveness of the Avenue WTP approximately six months after the modifications are completed and operational.

The City must submit the Initial Distribution System Evaluation (IDSE) plan for disinfection by-products by October 1, 2006. For the Long-term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), the City must submit a sampling plan for the first round of source water monitoring for *Cryptosporidium*, *E. coli*, and turbidity (or notice of intent to use grandfathered data) prior to July 1, 2006, and begin source water monitoring by October 31, 2006. Further details are in Section 8.

Coordination of Watershed Water Quality Monitoring Programs

Coordination is needed to avoid duplication of effort and to maintain standards of multi-agency monitoring efforts in the study area. The City will not need to continue monitoring in the upper San Antonio Creek watershed because of these other programs that cover the same locations and constituents (Ventura County Stormwater monitoring, Ventura River Stream Team, and Agricultural Waiver monitoring). Steps that the City may take include:

- Share data with others monitoring or studying the watershed.
- The Ventura County Watershed Protection NPDES Database may be the best place for combining electronic data from the multiple monitoring programs in the study area. It is recommended that the City obtain updates to the monitoring plans for the data collected for the NPDES Database and coordinate where necessary.
- Assist the Ag Waiver monitoring group thru the Ventura Farm Bureau or the Ventura County Agricultural Water Quality Coalition to coordinate their new monitoring requirements with existing programs.
- Update the water quality monitoring station GIS map (Figure 8) as changes are made. It is recommended to assign this to the City GIS Department with coordination by staff from the various monitoring programs.
- Agree on naming of sampling sites to avoid duplication of site names between different monitoring programs.

Modified Watershed Monitoring Program

Based on the efforts of the other active monitoring programs, the City can focus its watershed monitoring on the lower San Antonio Creek and Ventura River near Foster Park. It is recommended that the City confirm that the monitoring by the other organizations in the watershed conform to EPA requirements and reporting guidelines.

The recommendations for the City's watershed monitoring program are summarized in Table 8-1, which focuses on the lower portions of the contributing watersheds. The proposed

watershed sampling reduces frequencies of monitoring where previous monitoring has shown low or non-detected constituents.

Septic Conversion and Monitoring

The source assessments for the Nye Wells show that the septic systems (On-site Wastewater Treatment Systems) in Casitas Springs and the Burnham Road corridor pose some risk to the water supply for nitrates and pathogens that migrate in the alluvial groundwater and that could affect the shallow City wells. The City should work with the County Environmental Health Division and other agencies to seek funding and develop incentives for home owners to convert to sewer systems, especially in the lower Ventura River area.

It is recommended that the City initiate discussions with the Ventura County Storm Water Monitoring or the Stream Team to consider monitoring near the Arbolada and Siete Robles areas of Ojai where septic tanks are in areas that have high groundwater in wet years.

Participate in Matilija Dam Removal and Other Watershed Planning

The control, or lack of control, of the sediment transport from behind Matilija Dam is a water supply and water quality concern for all the wells and sub-surface diversions along the Ventura River. The City is participating in the planning and implementation process of the Matilija Dam removal and has provided suggestions for protecting the local water resources from the potential impacts to the Ventura River. Their suggestions have included a hazard mitigation measure to install two new wells in the Foster Park area prior to the removal phases of the dam. It is recommended that the City continue to put forward ideas and share data with the participating agencies.

Other watershed planning activities that the City is participating in, and is recommended to continue participation include:

- Integrated Regional Water Management Plan to obtain state Proposition 50 funding
- Ventura River Habitat Conservation Plan

Public Outreach to Reduce Effects of Horse and Stock Manure

The City should continue to work with the VCSWQMP to encourage distribution of information and to restart the educational program about the effects of horse or stock manure on water quality.

Coordination with the OVSD

Due to the significant potential impact of a sewer spill on the City's Foster Park water sources, the City should continue working with the OVSD to improve coordination in case a sewer overflow occurs. This may be accomplished by the following:

- Provide comments on the updates to any emergency planning or regulatory documents.
- Participate in a practice drill once a year for the emergency overflow manhole warning system.

Section 1: Introduction

1.1 Background

The City of San Buenaventura (City) owns and operates the 15 million gallon per day (MGD) Ventura Avenue Water Filtration Plant (Avenue WTP), which provides full conventional treatment. This plant processes lower Ventura River/San Antonio Creek water diverted at the City's Foster Park diversion facilities as well as Ventura River water provided by the Casitas Municipal Water District (CMWD). CMWD diverts its water from the upper Ventura River at the Robles Diversion, stores the diverted water in Lake Casitas and provides disinfection and pressure filtration before distributing the treated water to its wholesale and retail water customers. The City can take the treated Lake Casitas water directly into the Ventura water distribution system at two connections or re-treat the water at the Avenue WTP.

The Surface Water Treatment Rule (SWTR), Section 64665, Watershed Sanitary Surveys, requires that all water systems subject to the SWTR shall conduct a sanitary survey of their watershed(s) at least every five years. The goal of the Sanitary Survey is to identify potential sources of contamination and to recommend operational or watershed management steps to reduce risk of that contamination reaching the water supply.

The first Watershed Sanitary Survey (1995 Report) for the City of San Buenaventura's Avenue WTP was completed in October 1995. The 1995 Report evaluated the 51,000-acre watershed area drained by the lower Ventura River and the tributary San Antonio Creek system. To meet the requirement for a 5-year update, the City completed the 2000 Update to the Sanitary Survey in May 2001.

This 2005 Update Sanitary Survey, summarizes and updates the 2000 Sanitary Survey, and confirms the City's ongoing commitment to protecting the water quality of the lower Ventura River water source. Results from a number of recent studies on this watershed will be incorporated herein and, in turn, this report is designed to be usable for other water resource investigations. For example, concern for water quality and sediment transport is documented in the recent Environmental Impact Statement (EIS) for the removal of the Matilija Dam (U.S. Army Corps of Engineers [USACE] 2004) to protect water quality for steelhead habitat and domestic water supply.

The Watershed Sanitary Survey 2005 Update for the upper Ventura River is being completed by CMWD and is incorporated herein by reference.

1.2 Study Area Description

As shown on Figure 1, the sanitary survey study area is comprised of approximately 51,000 acres in the Ojai and Ventura River Valleys. The western portion of the study area drains directly to the Ventura River. The eastern area of the watershed is tributary to San Antonio Creek, which then also drains into the Ventura River south of the community of Oak View. About 80 percent of the time, there is no significant surface flow in the Ventura River

above the confluence with San Antonio Creek. There is generally year-round flow in the lower reaches of San Antonio Creek.

The study area includes the City of Ojai and the unincorporated areas of Casitas Springs, Live Oak Acres, Meiners Oaks, Mira Monte, and Oak View. The northern and eastern sections of the watershed are mountainous, including approximately 16,300 acres of the U.S. Forest Service Los Padres National Forest land. Areas east of the City of Ojai are primarily agricultural with some farm animal grazing.

The Ojai Valley Sanitary District (OVSD) provides sewer service for the City of Ojai and the unincorporated areas of Casitas Springs, Live Oak Acres, Meiners Oaks, Mira Monte, and Oak View. The OVSD also provides service outside its boundaries to community sewers in areas where private onsite sewage disposal problems may occur. OVSD annexation of these areas soon follows. The remainder of the watershed is on private sewage disposal systems and septic tanks.

Figure 1 shows the watershed boundary for the Upper and Lower Ventura River, the San Antonio Creek sub-basin, the study area boundary, and U.S. Forest Service lands. Also shown on Figure 1 are the locations of rainfall monitoring stations (rainfall and weather stations) and the location of the Avenue WTP.

Figure 2 shows in more detail the location of the City's diversion facilities and wells at Foster Park. Within the study area, sub-surface water diversions are made by the City at Foster Park (see Figure 2). The only other domestic water utility that diverts shallow subsurface water from the Ventura River is the Meiners Oaks County Water District. This is done with two shallow wells on the east side of the river and south of the Robles Diversion. Figure 2 includes information from a 2005 survey of the bank and stream channels (Fugro West, 2005).

There are other domestic water utilities in the watershed, but these pump from deeper groundwater wells. They are the Ventura River County Water District, the Southern California Water Company, Casitas Springs, Senior Canyon, and several smaller mutual water companies. CMWD supplies chloraminated and filtered surface water from Lake Casitas to its own retail customers, to the Avenue WTP for further treatment if taste and odors increase, and sometimes, directly to the City's water distribution system at two locations.

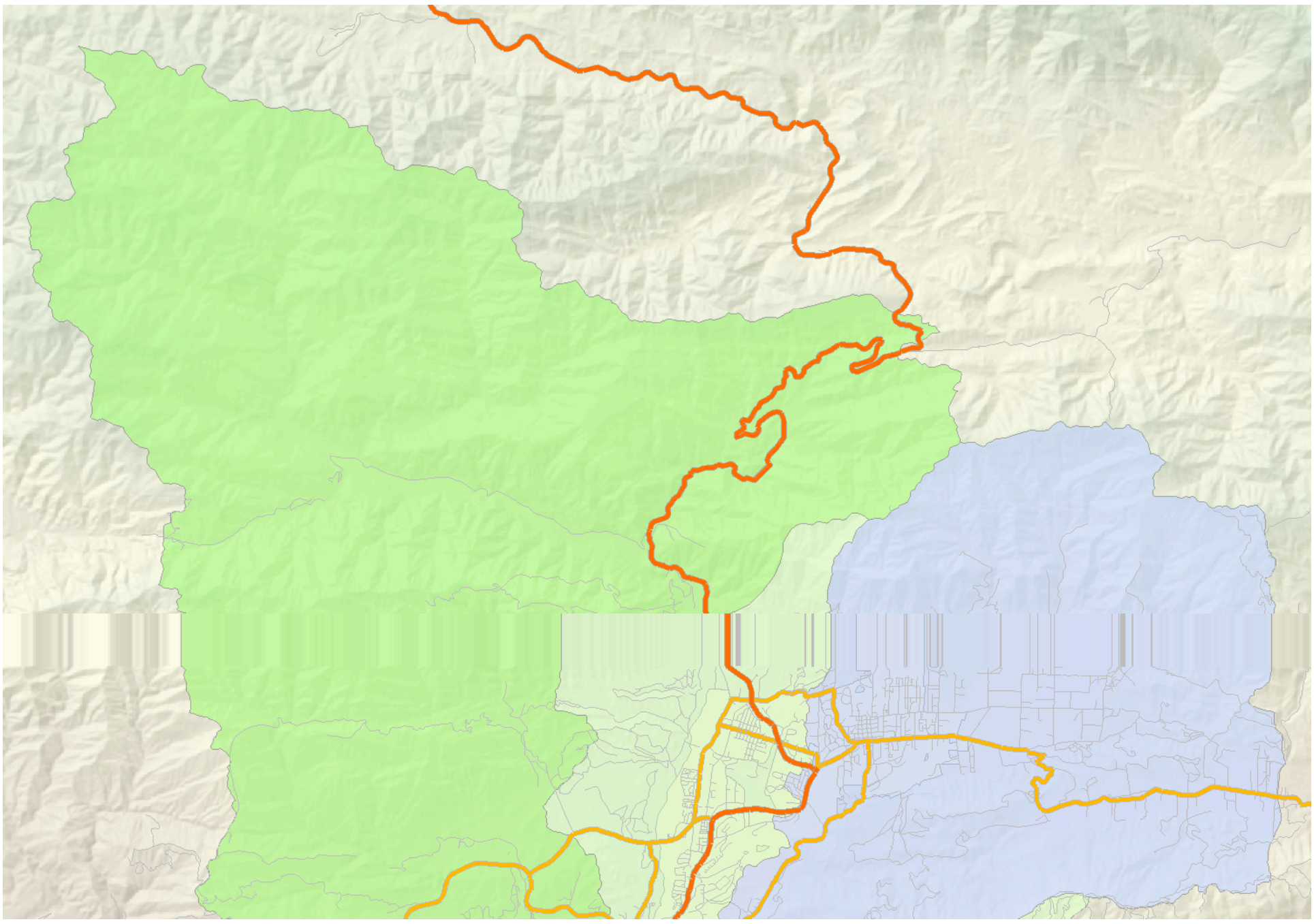
1.3 Report Organization

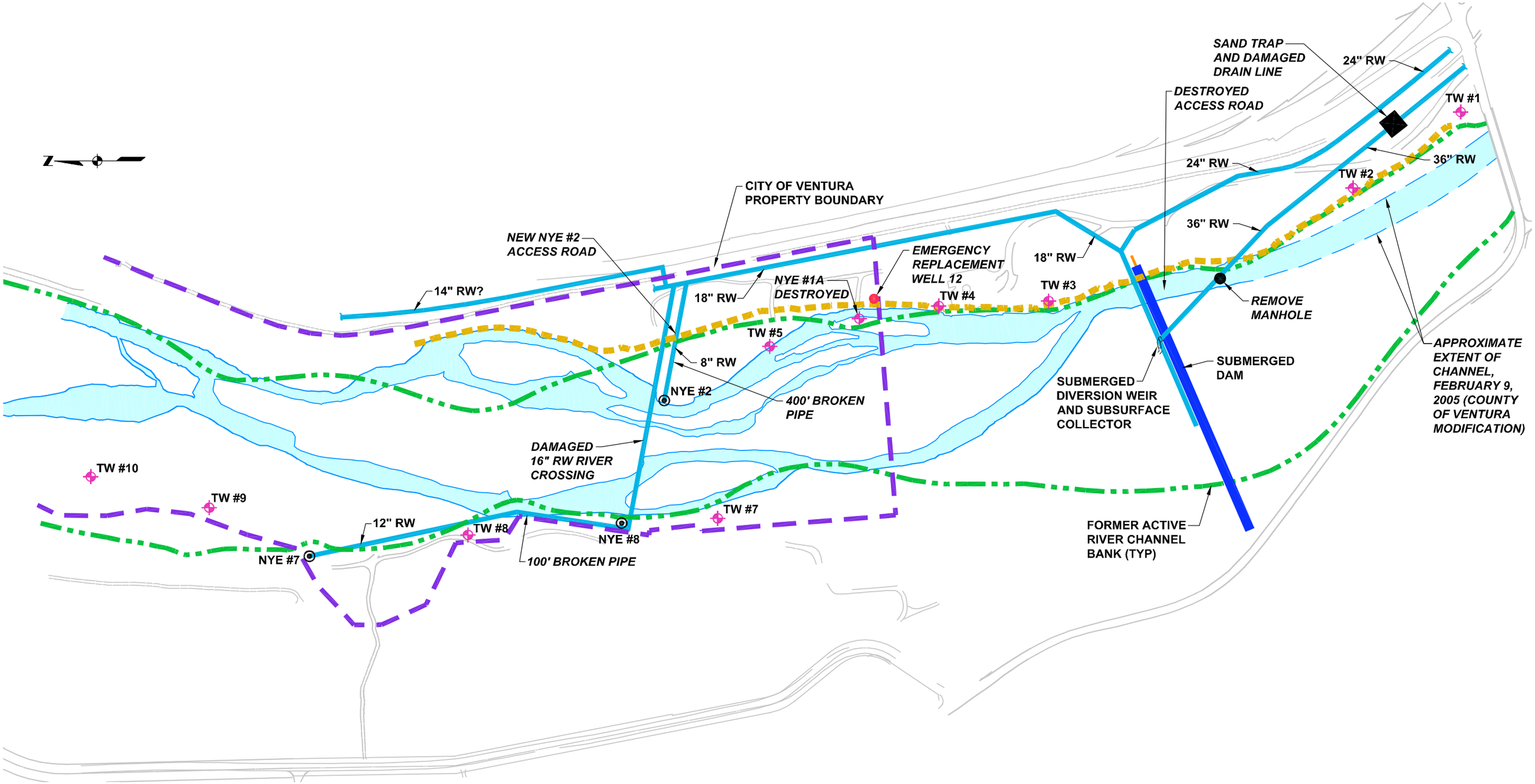
This 2005 Update summarizes significant changes in watershed conditions that affect the water quality of raw Ventura River water diverted at Foster Park since 1999. Available water quality data is provided for the 2000 to 2005 period. For information on watershed conditions that have not changed since 2000, the reader is referred to the 2000 Sanitary Survey.

1.3.1 Main Report - Volume 1

- Section 1 – Introduces the 2005 Update, provides the background and study area descriptions, and presents the report organization.

- Section 2 – Presents the 2005 status of the 2000 Sanitary Survey recommendations.





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USE OF DOCUMENTS

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LEGEND

	River bank, surveyed 1/28/2005
	Stream channels, surveyed 1/2005
	City of Ventura property boundary
	Former active river channel bank
WELL	Existing water supply well
TW	Foster Park Improvement Project test well
RW	Raw water to Avenue WTP

Kennedy/Jenks Consultants

City of San Buenaventura, California

Water Diversion Facilities Near Foster Park

0589056
March 2006

Figure 2

- Section 3 – Provides updated information on the lower Ventura River/San Antonio Creek watershed characteristics and water supply components.

- Section 4 – Summarizes descriptions of the current potential contamination sources in the watershed and an evaluation of the potentially significant impacts which each contamination source could have on watershed water quality.

- Section 5 – Provides updated information on the watershed control and management practices. Contacts with agencies having jurisdiction throughout the watershed are documented. Land use policies, wastewater discharge requirements, storm water regulations, fire control management, and other policies that are enforced throughout the watershed are discussed. Each discussion includes examples of existing activities/facilities that are in place in the watershed.

- Section 6 – Provides an update on water treatment regulations.

- Section 7 – Presents the water quality monitoring programs that are active in the watershed and provides the watershed raw water quality data.

- Section 8 – Presents the 2005 Update conclusions and recommendations.

1.3.2 Appendices - Volume 2

The appendices contain information that has been updated since the 2000 Watershed Sanitary Survey. Documents provided include:

- Appendix A: Project Photographs

- Appendix B: Ventura County Watershed Protection District, Annual Rainfall Data

- Appendix C: Action Plan to Correct 2001 Storm Related Damages at Foster Park Water Facilities

- Appendix D: Ojai Valley Sanitary District Sewage Spill Prevention and Response Plans

- Appendix E: Letter dated January 11, 2006 from OVSD to Kennedy/Jenks Regarding Ventura River Watershed Survey Update Information

- Appendix F: 2003 Annual Pesticide Use Reports, Ventura County, Indexed by Commodity

- Appendix G: BWT Tables

- Appendix H: Ventura County Municipal Storm Water NPDES Permit

- Appendix I: Ojai Valley Sanitary District 2003 NPDES Permit

- Appendix J: Ventura River Watershed Wastewater Permits - NPDES

- Appendix K: State of the Watershed – Report on Surface Water Quality, The Ventura River Watershed
- Appendix L: 2004-05 Annual Report, Ventura Countywide Stormwater Quality Management Program
- Appendix M: Ventura County Watershed Protection District, Integrated Watershed Protection Plan, May 2005
- Appendix N: City of Ojai Urban Watershed Assessment and Restoration Plan

1.3.3 Appendices - Volume 3

- Appendix O: Ventura County Stormwater Quality Ordinance
- Appendix P: City of Ventura's 2001, 2002, 2003, 2004, 2005 Consumer Confidence Reports (CCR)
- Appendix Q: Water Quality Data
- Appendix R: 2002-2003 DHS Drinking Water Source Assessments
- Appendix S: Ojai Valley News Article
- Appendix T: 2000 Watershed Sanitary Survey Summary
- Appendix U: Federal and State Drinking Water Standards
- Appendix V: Ventura River Habitat Conservation Plan – Draft June 2004

1.4 Conduct of Study

The City retained Kennedy/Jenks Consultants (Kennedy/Jenks) to prepare this sanitary survey update. The City authorized this study on November 9, 2005. Only the lower Ventura River/San Antonio Creek watershed is covered by this survey. The upper Ventura River watershed (as shown in Figure 1) above the Robles Diversion is included by reference because CMWD prepares a watershed sanitary survey for that area.

During preparation of this 2005 Update, Kennedy/Jenks contacted numerous agencies involved with water quality, land use and other information regarding activities that could significantly affect the water quality within the watershed. Field surveys were made by a combination of driving and walking throughout the watershed. City staff supplied Kennedy/Jenks with various water quality data during the project. Various Ventura County Departments and the OVSD also provided considerable input to the content of this report.

Section 2: 2005 Status of 2000 Sanitary Survey Recommendations

This section reproduces the year 2000 Update Sanitary Survey recommendations and summarizes the 2005 status of each recommendation.

2.1 Water Quality Monitoring Improvements for Intake Facilities and Water Treatment Plant

2.1.1 TOC and Bromide Sampling

2.1.1.1 Year 2000 Recommendation

To establish a baseline for future surface water treatment and Disinfection Byproduct Precursors (DBPP) compliance, it was recommended that the City begin monthly testing for bromide and for TOC at the following sampling locations:

- Surface water diversion at Foster Park
- Four Nye wells
- Subsurface diversion at Foster Park (add this sampling station)
- Kingston Reservoir influent blend (Station 27)
- Treatment plant influent
- Treatment plant effluent

The TOC sampling was recommended to occur concurrently with testing of a source water sample from the Kingston Reservoir Influent (Station 27) for Alkalinity. This is to identify practical amounts of TOC removal since source water alkalinity impacts removal rates by enhanced coagulation.

The bromide portion of the sampling can (and should) be discontinued after 1 to 2 years when sufficient background information has been gathered.

Since the Avenue WTP/Foster Park Diversion Master Plan calls for discontinuing use of the surface diversion, it was recommended that a sampling station be constructed for the Ventura River Subsurface Diversion to collect subsurface water upstream of where it mixes with the diverted surface water. The subsurface water presumably has a higher water quality than the surface water; consequently, separate sampling stations would establish the relative water quality and source water treatment requirements for each source.

Sampling for TOCs, alkalinity and bromide will reveal source water quality differences, source water quality blending impacts, impacts of raw water storage in an uncovered storage reservoir, blending impacts with Lake Casitas water, and treatment removal efficiency. In addition, the data will provide a baseline for the City to establish whether the Step 1 or Step 2 TOC removal requirements will apply for DBPP compliance.

2.1.1.2 Year 2005 Status

Sampling was completed at all of the suggested locations. The Foster Park sources were damaged during the 2005 winter storms and are mostly off line as of January 2006. The subsurface diversion (capacity of 1,000 gallons per minute [gpm]) has been in service and the new Nye Well 11 (300 gpm) is expected by the spring of 2006. As a result, the Casitas water is either retreated or bypassed at the Avenue WTP when TOC concentrations are between three and four parts per million (ppm). Enhanced coagulation has not been implemented pending the restoration of the Foster Park sources and returning to normal operation when TOC concentrations are below 2 ppm. Foster Park sources are expected to be fully functional again in June 2006.

With regard to sampling at the four Nye wells, the shallow wells, Nye 11 on eastside and Nye 7 on the westside of the river, were found to be representative of the four wells in the Ventura River. Sampling of Wells 2 and 8 would be redundant.

The Ventura River TOC has always averaged less than 2 ppm, which is below the threshold for the need for enhanced coagulation treatment.

The bromide portion of the sampling was completed and will be discontinued as recommended. Since the source of bromide is geological, variability in the data is not expected.

2.1.2 Bacteriological/Parasitic Cyst Testing

2.1.2.1 Year 2000 Recommendation

For purposes of gaining better insight into the sanitary quality of the various surface water sources and their year-round water quality fluctuations, it was recommended that the City should add the following bacteriological/parasitic cyst testing procedures (see Table 2-1).

TABLE 2-1
PROPOSED BACTERIOLOGICAL SAMPLING PROGRAM

Sampling Location	Total Coliform (MPN/100 ml)	Fecal Coliform (MPN/100 ml)	Giardia/Crypto Cysts (cysts/100 l)
River surface diversion	Weekly[a]	Weekly	Quarterly[b] (when flowing)
River subsurface diversion[c]	Weekly	Weekly	Quarterly
Four Nye Wells	Quarterly	Quarterly	Quarterly
Station 27 (at plant)	Weekly[a]	Weekly	Quarterly
Kingston Res. Effluent[d]	Weekly	Weekly	Semi-annually
Plant effluent	Daily	Daily	Quarterly
OVSD Watershed Stations R1 and R2			Semi-annually[e]

Notes:
(a) Already practiced.
(b) Already practiced semi-annually.
(c) Sampling facilities need to be constructed.
(d) Downstream of backwash recycle point.
(e) In addition to water quality monitoring already conducted by OVSD.

For the surface water diversion point only, it was recommended the City should conduct fecal strep bacteria sampling on a monthly frequency when river flow is occurring. This will assist in helping to differentiate between animal waste and human waste contamination in the water.

Further, it was recommended that the recycled backwash water return point should be moved upstream of Kingston Reservoir to take advantage of the additional disinfection and settling benefits Kingston Reservoir provides.

2.1.2.2 Year 2005 Status

The City implemented a nutrient sampling program and the suggested bacteriological/parasitic cyst testing procedures as part of its watershed monitoring. Restoration of service of the surface water diversion is not planned as discussed previously. The recycled backwash water return point was moved upstream of Kingston Reservoir to the influent box. Future reclamation by the new membrane plant will filter the backwash water in a pressure sand filter and return the filtrate to Kingston Reservoir influent if turbidity is less than 2 NTU.

2.1.3 Evaluation of Nutrients and Potential Manure Water Quality Impacts

2.1.3.1 Year 2000 Recommendation

For purposes of gaining better insight into the presence of nutrients in the water and whether manure is getting into the water supply, the following *refined* sampling program were recommended (see Table 2-2).

TABLE 2-2
PROPOSED NUTRIENTS SAMPLING PROGRAM

Sampling Location	Organic N (as N)	Ammonia (as N)	Nitrite (as N)	Nitrate (as N)	Phosphates (as P)
River water diversion	Quarterly	Quarterly	Monthly[(a)]	Monthly[(a)]	Monthly[(a)]
River subsurface diversion[(b)]	Quarterly	Quarterly	Monthly[(a)]	Monthly	Monthly
Four Nye Wells	Quarterly	Quarterly	Monthly[(a)]	Monthly[(a)]	Monthly[(a)]
Treatment Plant influent	Quarterly	Quarterly			
Kingston Res. effluent	Quarterly	Quarterly			

Notes:
(a) Already practiced.
(b) Construct sampling facilities.

2.1.3.2 Year 2005 Status

The City implemented a sampling program. Due to variability of these nutrients this sampling will be ongoing. These nutrients are also affected by landscape fertilization runoff.

2.2 Water Quality Monitoring Improvement Recommendations for Watershed

2.2.1 Expanded Watershed Monitoring Program

2.2.1.1 Year 2000 Recommendation

In order to obtain confirmation/backup data in determining the sanitary significance (or lack) of suspect land uses in the watershed, it was recommended that additional sampling locations be created, and the use of three existing watershed sampling points be expanded. These additional sampling locations should be located along the Ventura River and along the San Antonio Creek system upstream and downstream from the following types of facilities:

- Unsewered population centers near surface water courses.
- Areas of questionable horse manure management.
- Agricultural areas.

One of the sampling station locations recommended in the earlier report, San Antonio Creek above its confluence with the Ventura River, has been established and maintained as Station R2 by OVSD since July 1996. Two additional sampling stations have been recommended along Thacher Creek (Stations TC1 and TC2) to establish a baseline water quality upstream of the unsewered Siete Robles Tract and above the agricultural and biosolids land application sites in the eastern Ojai Valley. Two recommended sampling stations on the Ventura River have been replaced by a single sampling station below Highway 150 since the Honor Farm operation has been cut back significantly. The location of recommended sample locations and existing sampling locations are discussed in Section 7.

It was recommended that each watershed sampling station be sampled every 2 months for the following water quality parameters:

- Total coliform bacteria
- Fecal coliform bacteria
- Fecal strep bacteria
- The nitrogen cycle (organic nitrogen, ammonia, nitrite, and nitrate)
- Phosphate
- Chloride
- Electrical conductance

Once about two years of baseline data have been compiled, it may be possible to reduce the number of watershed sampling stations. The baseline data will reveal which areas of the watershed are contributing contaminants to the City's river water sources. These areas will require continued monitoring. River monitoring stations for areas which have lower contaminant levels might be discontinued or continued at less frequent intervals.

2.2.1.2 Year 2005 Status

The expanded surface water sampling program was implemented successfully at locations where regular flow occurs, however, many stations do not have flow often enough to get bimonthly data and some locations have flow less than four months each year. The watershed program included sample locations upstream of and at the Soule Park Golf Course, but these locations seldom have flow, therefore, were difficult to obtain samples from.

With regard to unsewered population centers near surface water courses, septic tanks are still being used in eastern Ojai, Casitas Springs, and other areas of the study area. The feasibility of getting stream flow data affected by septic tank discharge is problematic and was relatively unsuccessful. When samples were obtained, nitrates were not higher than drinking water standards. The lack of flow and the low nitrate levels when there was flow at the upstream stations is indicative that the septic tanks only pose a risk during high flow events when there is opportunity to transport potential contaminants to the City's surface diversion site. Since the surface water diversion is not being used, and is not used during high flows, the risk of contamination from upstream septic tanks is minimal. Septic tanks pose more of a groundwater threat near their location, especially the septic tanks at Casitas Springs, to the City's sub-surface intake.

With regard to areas of questionable horse manure management, sample locations were established in conjunction with and to coincide with ChannelKeepers and Surfrider sample locations and should have been representative indications of the presence of manure. Identifying manure point sources in the unincorporated areas outside City limits and near the City of Ojai is problematic. The County of Ventura Stormwater Quality Management Program (VCWQMP) has been working on this problem.

The majority of agricultural areas occur in the easterly potion of the Ojai Valley. Stream flow data is rare and samples were non-conclusive when they were obtained. Further monitoring of agricultural runoff contaminants will be developed under the Agricultural Waiver monitoring program being established by the Ventura County Farm Coalition and private farmers. A letter of intent by farm owners to monitor sites individually or by joining a group for Agricultural Waiver monitoring will begin in August 2006.

The number of watershed sampling stations was reduced from the 2000 Sanitary Survey recommendation list after seeing which ones did not have flow or posed a special surface water threat to the City. The San Antonio Creek monitoring station SA1 has regular flow runoff from the Ojai Valley, will monitor any evidence of upstream surface water contaminants and will continue to be sampled on an ongoing basis for the contaminant list. Further detail on the recommended sampling plan is in Section 8.

2.2.2 Coordination with OVSD Ventura River Monitoring Program

2.2.2.1 Year 2000 Recommendation

It was recommended that:

- The City obtain regular data reports from OVSD for monitoring stations R1 and R2 which are located on the Ventura River and on San Antonio Creek above their confluence.

This would allow the City to avoid duplicating these key watershed water quality monitoring locations.

- There have been significant differences between the City and OVSD nitrate water quality results for OVSD Stations R1 and R2 and the City's surface water diversion. Analyzing several split samples would help determine whether the water quality differences are due to differences in the watershed or to differing laboratory testing procedures.

2.2.2.2 Year 2005 Status

Effective in August 2003, the Regional Water Quality Control Board (RWQCB) eliminated monitoring stations R1 and R2 in the study area (in addition to R6, R7, and R8 outside the study area) from the OVSD's National Pollutant Discharge Elimination System (NPDES) monitoring program because sufficient data was being collected by other programs such as: the City's Watershed Monitoring Program, and the storm water monitoring by VCWQMP (Appendix E, OVSD letter dated January 11, 2006).

The recommendation for split samples was not implemented, as the monitoring stations R1 and R2 were eliminated from OVSD's monitoring program. The variability between the samples was attributed to variations in tributary area, or other differences relating to the geographic location of the sampling locations. Unless nitrate concentrations show higher levels then MCLs, split sampling and duplicate sampling quality assurance steps will not be taken.

2.2.3 ChannelKeepers Watershed Monitoring Program Sampling Stations

2.2.3.1 Year 2000 Recommendation

The Ventura River Watershed Monitoring Program by Santa Barbara ChannelKeepers could be a part of or in addition to the City's water sampling program locations. Provisions should be made to continue monitoring of any water sampling stations that are integral to the City's watershed monitoring program. The City intends to share data when it is in a form that is easily understood, organized, and presented in a manner readily interpreted by lay-people.

2.2.3.2 Year 2005 Status

The City sampling locations were selected in coordination with and to compliment the sampling sites used by the ChannelKeepers (and Surfrider Foundation). Problems with stream flow have caused difficulties to obtain samples at certain locations. The City has organized its data and provided GIS maps with the sampling programs in this 2005 Update to disseminate data in a form that is easily understood, organized, and presented in a user-friendly manner.

2.2.4 Surface Water Intake Protection

2.2.4.1 Reduce Use of Surface Diversion Facilities

2.2.4.1.1 Year 2000 Recommendation

It was recommended that the City continue to pursue the *long-range goal* of reducing the use of the surface diversion facilities, taking as much water as possible from the subsurface diversion facilities instead. Design for new wells and retrofitting of existing wells was underway in 2000.

2.2.4.1.2 Year 2005 Status

These recommendations have been implemented. The Foster Park sources were damaged during the 2005 winter storms and are mostly off line as of January 2006. The surface diversion for all practical purposes is out of service and not expected to be used in the future. California Department of Health Services (DHS) has been informed of this (Jim Passanisi, 2006). The subsurface collector and the four Nye wells have been the only sources used since the 2000 Sanitary Survey was completed.

2.2.4.2 Protection for River Surface Diversion

2.2.4.2.1 Year 2000 Recommendation

As an *interim measure*, it was recommend that the City continue to maintain the signage installed at the intake structure identifying the site as a domestic water supply facility and that swimming or body contact is prohibited at this location. It was further recommended that this prohibition be reinforced by a daily patrol when the surface diversion is in service.

2.2.4.2.2 Year 2005 Status

The City and the DHS consider the surface diversion discontinued as an active source. No additional signage is necessary, other than what already exists at the site. Pictures of the surface diversion and an example of existing signage are shown in Appendix A-1.

2.3 Ojai Valley Sanitary District Facilities

2.3.1 Immediate Notification of Raw Sewage Spills

2.3.1.1 Year 2000 Recommendation

It was recommended that the City execute a formal memorandum of understanding (MOU) with OVSD that provides for the *immediate notification* of any raw sewage spills that OVSD staff becomes aware of, such as failure or overflow from:

- Lift stations
- Manholes
- Defective/broken sewer lines

This agreement should define the methods of notification during all hours of the day and the personnel on both sides to be involved. If possible, provision should be made for an automatic call out to the City's Central Dispatch and to CMWD during non-business hours. This will minimize the City's response time if the Ventura River surface diversion facilities must be shut down. Joint emergency response training for the Ventura Water Division and OVSD staff could help improve coordination of the two agencies' emergency operations.

2.3.1.2 Year 2005 Status

As of December 2005, the City has already established sufficient understanding with the OVSD for notification and other agreements are not necessary.

The City monitors a manhole at the confluence of the Ventura River and San Antonio Creek. There is a float that will rise if there is a problem and set off an alarm that is transmitted to the Avenue WTP. It then generates an alarm on the Avenue Supervisory Control and Data Acquisition (SCADA) system and if it is not acknowledged it will generate a call out through the SCADA alarm to the on-call operator. This manhole is pictured in Appendix A-2.

2.3.2 Department of Health Services Notification

2.3.2.1 Year 2000 Recommendation

It was recommended that the City request that OVSD add the DHS to the District's Emergency Response Plan for prompt notification purposes in case of pipeline or lift station sewage failures causing raw sewage overflows.

2.3.2.2 Year 2005 Status

As per the OVSD's Sewage Spill Prevention and Response Plan (updated November 2004), notification to regulatory agencies must be done immediately, or as soon as the situation is stabilized in the case of an extreme emergency. In the event a sewage spill enters a waterway OVSD is required to contact first the Ventura County Environmental Health Department (unless the spill is in or into the Ventura River and/or San Antonio Creek above Foster Park; then due to potential potable water contamination, then the first contact is the City, Avenue WTP), then the State Office of Emergency Services, Los Angeles RWQCB, and California Department of Fish and Game.

2.3.3 Reduce OVSD Facility Vulnerability

2.3.3.1 Year 2000 Recommendation

The 2000 Watershed Sanitary Survey Update recommended that:

- The City encourage OVSD to continue relocating or reinforcing existing sewage collection system pipes, siphons, lift stations and other facilities vulnerable to storm damage. In addition, the City should also encourage OVSD to place future sewer construction in less vulnerable areas that are less prone to flood damage. If such

construction siting is not feasible, special construction safeguards should be implemented to the greatest degree economically and technically possible.

- The City encourages OVSD to continue its regular collection system preventative maintenance program.

- The City maintain awareness of and support for the daily patrols by OVSD, during and right after flooding conditions, of collection pipeline system facilities that are vulnerable to washout from flooding based on historical failures and based on vulnerability to damage due to the close proximity of facilities to creeks and the Ventura River. The daily patrols should continue, and this procedure should be formally incorporated into the OVSD Sewage Spill Prevention Plan.

2.3.3.2 Year 2005 Status

The City continues to support OVSD projects and the 2000 recommendations. Special construction safeguards are being implemented in part as part of a hazard mitigation project with Federal Emergency Management Act (FEMA) funding. Actions by OVSD with regard to facility vulnerability are described in Section 5.

2.4 Manure Management

2.4.1 County Sheriff's Honor Farm

2.4.1.1 Year 2000 Recommendation

Because of the elimination of pig manure at the County Sheriff's Honor Farm, no further recommendations were made with regards to pig manure management. However, it was recommended that if there were an increase in the number of horses or livestock at the Honor Farm, City staff should meet with County Sheriffs Honor Farm staff to ensure that manure management is implemented according to previous recommendations.

2.4.1.2 Year 2005 Status

The County Sheriff's Honor Farm closed in August 2003 (personal communication, Captain Glen Sander, of Ventura County Sheriff). A long-term plan for the facility has not been developed, but it is currently being evaluated for non-profit purposes (personal communication, Suzy Watkins, Ventura County General Services Agency [GSA]).

2.4.2 Animal Manure Management

2.4.2.1 Year 2000 Recommendation

It was recommended that the City initiate a 1 to 2 year sampling program to collect bacteriological data from the expanded watershed monitoring program. Further, City staff should then evaluate the data obtained and determine whether pursuing better horse manure management practices throughout the county is, in fact, needed. If it is needed, the City should

pursue such needs with the county and with the local landowners involved. Potential programs include:

- Encourage the City and County Stormwater Pollution Prevention staff and/or public interest groups like the Santa Barbara ChannelKeepers or Surfriders Foundation to develop a public education program to inform stable owners of manure management alternatives which could protect the watershed.

The City, County and public interest groups could also help publicize the OVSD manure composting program at the District's wastewater treatment plant.

2.4.2.2 Year 2005 Status

The City implemented a program to collect bacteriological data from the expanded watershed-monitoring program and implemented a Poster Public Education Program in conjunction with the Los Angeles RWQCB, the Natural Resources Conservation Service (NRCS), VCWQMP, and the Ventura County Environmental and Energy Resources Division (E&ERD).

The VCWQMP's "Who's Keeping and Eye on Manure?" outreach program educated the community about manure composting. The program has since lost funding and the outreach program has been discontinued. Under the Countywide Stormwater Program, horse owners have to submit an animal manure plan (personal communication, Paul Tante, Countywide Stormwater Program).

According to the E&ERD, there are no composting facilities in the county (personal communication, David Goldstein, E&ERD). The county is tightening regulations regarding composting and many composting facilities around the area have stopped taking manure. Ojai Valley Organics, a facility in Ojai that is owned by the county and operated by Santa Clara Organics, has also stopped taking manure for compost although it may accidentally get in the mix on a few occasions (personal communication, David Goldstein, E&ERD).

2.5 Unsewered Areas

2.5.1 Year 2000 Recommendation

It was recommended that City staff periodically discuss with OVSD and County Environmental Health Department staff the status of unsewered areas and what progress is being made to install sewers in these areas. The City should strongly support actions to obtain grant/loan funding to install sewers in unsewered areas already known to be troublesome. The expanded watershed sampling program may provide support data to demonstrate that the lack of sewers in certain areas is negatively impacting water quality and thus causing a public health hazard.

2.5.2 Year 2005 Status

The expanded watershed monitoring program for surface water did try to include unsewered areas in eastern Ojai, but creeks in the area were found to be very difficult to sample as discussed in Section 2.2.3.2 above as a result of low flows. It is believed that the risk is

relatively low because of the lack of flow to transport contaminants. The City of Ojai controls this area and should address the septic tank issue.

Septic tanks in the Casitas Springs pose a potential groundwater threat and should be considered a high priority for conversion to sewers.

2.6 Casitas Municipal Water District

2.6.1 Year 2000 Recommendation

In the 2000 Watershed Sanitary Survey Update, it was recommended that:

- The City support the CMWD to effectively implement the recommendations made in the Lake Casitas Watershed Sanitary Survey to improve and protect water quality in the "upper" Ventura River watershed.

- If CMWD converts its disinfection system to chloramination, the City should consider converting its disinfection system to chloramination as well. This would reduce the potential for creation of trihalomethanes (THM) in the City's drinking water.

Recommendations from the CMWD's March 2001 Update to the Watershed Sanitary Survey for the upper Ventura River watershed were:

- Casitas should continue to move toward the implementation of chloramines and pH adjustment facilities.

- Casitas should continue to move toward the protection of the watershed through the removal of homes by the Bureau of Reclamation.

- Casitas should request the U.S. Forest Service to keep monitoring mining issues of the Casitas Reservoir Watershed area. The Homestead Mining claim is due for reconsideration in the next two years.

2.6.2 Year 2005 Status

Coordination with CMWD is ongoing. The City's Water Utility Manager provides comments to CMWD regarding the Matilija Dam removal project and other watershed issues that may arise. The City also converted its disinfection system to chloramination in order to be consistent with the disinfectant in the Casitas MWD system and to minimize the potential for THM formation.

2.7 Other Emergency Notifications

2.7.1 Year 2000 Recommendation

It was recommended that the City maintain emergency response coordination plans with the agencies listed below that call for timely notification of City Water Operations staff (during any

hour of the day) when any emergency conditions occur in the watershed that could have serious impacts on water quality.

- City of Ojai
- Ventura County Environmental Health Department
- RWQCB
- California Highway Patrol
- California Department of Forestry
- Ventura County Fire Department
- Office of Emergency Services
- U. S. Forest Service
- DHS

2.7.2 Year 2005 Status

The City's water Emergency Response Plan includes contacts and coordination information amongst these agencies.

2.8 Unauthorized Activity

2.8.1 Year 2000 Recommendation

It was recommended that City staff continue to watch closely for unauthorized activities that could impact watershed water quality. In particular, the future activities of the commercial tree trimming service should be monitored. Whenever questionable practices are observed, such as on-site storage of wastes near the river or illegal earth movement, they should be reported for follow-up enforcement action to the following agencies with jurisdiction:

- County of Ventura - Conditional Use Permit Process
- Fish and Game and other agencies having direct river condition interests and responsibilities
- RWQCB
- Corps of Engineers
- National Marine Fisheries Service

2.8.2 Year 2005 Status

The City staff strives to keep abreast of issues in the watershed demonstrated by participating in numerous watershed management programs, such as the Ventura County Integrated Regional Water Management Plan, other local water agency groups, and through increased interagency coordination described in detail in Section 5.11.

2.9 Permanent Household Hazardous Waste Collection Facility (HHWCF)

2.9.1 Year 2000 Recommendation

As discussed in the 2000 Update, the County of Ventura (2000) opened a permanent HHWCF at the former fire station immediately south of the Avenue WTP on Ventura Avenue. The City and DHS have stated their specific concerns for this site.

- In continuing protests to the County, the City should encourage the County to relocate the HHWCF, especially when the capacity of the current facility and its operating plan must be increased.
- The DHS may require the City to make capital improvements or increase site monitoring to improve protection of the Avenue WTP site.

2.9.2 Year 2005 Status

To mitigate the HHWCF's risk, and other risks to contamination of the City's potable water supply, the City is implementing the Avenue WTP capital replacement project that will remove the open basins. The new membrane plant will be housed inside a building. Operations of the HHWCF also reduce any risk to the water supply by having only monthly hazardous material collections, and storage of hazardous materials is not allowed.

2.10 Increased Sampling and Laboratory Analysis Costs

2.10.1 Year 2000 Recommendation

It was recommended that the City investigate the feasibility of performing recommended giardia/cryptosporidium sample collection and analyses in-house.

2.10.2 Year 2005 Status

Giardia/cryptosporidium samples are now collected in-house. In-house testing, however, is not accomplished and will not be available at the City Lab.

Section 3: Watershed Characteristics and Water Supply System Components

3.1 Watershed Study Area

The watershed study area has remained the same as the previous watershed sanitary surveys.

3.2 Land Use

The major land uses within the lower Ventura River/San Antonio Creek watershed are agricultural, commercial, light industrial, and residential. These uses are outlined in the "Ojai Valley Area Plan" which was last updated by the Ventura County Planning Department in 1995, and amended in 1999. It was not updated during the 2000 through 2005 period.

Open space and residential uses account for over 99 percent of the watershed. Residential use is categorized by dwelling units (DU) per acre. Rural residential use, designated RR5 and RR2, represents 0.5 and 1.22 DU/acre, respectively. Urban residential use is designated UR, followed by the range of intensity as measured in dwelling units per acre. A designation of UR 2-4, for example, represents intensities of 2 to 4 DU/acre. Rural institutional use, designated RI, represents camps and educational facilities set in a rural environment. Other uses include commercial and light industrial. Table 3-1 is a list of these designations and the percentage of developed watershed area assigned to each land use:

TABLE 3-1
OJAI VALLEY AREA PLANNING AREA LAND USE

Designation	Percentage of Developed Watershed
RI	14.4
RR5	30.4
RR2	22.4
UR 1-2	18.2
UR 2-4	5.2
UR 4-6	2.0
UR 6-10	4.0
UR 10-20	1.4
Commercial	1.5
Industrial	0.4

Development in the watershed has generally been limited to floodplain areas. Most of the land in the Ventura River valley is privately held.

Included in the watershed is the incorporated City of Ojai and several unincorporated population centers, including Casitas Springs, Live Oak Acres, Meiners Oaks, Mira Monte, and Oak View.

For incorporated cities, land use and land development is controlled by the policies of each city's General Plan and the regulations set forth in each city's zoning ordinance. The County's General Plan and zoning ordinance control land use and development in unincorporated areas. Use of land within the boundaries of the Los Padres National Forest is controlled by the U.S. Department of Agriculture (USDA) Forest Service.

Population data for the study area was provided by the US Census data, and shown in Table 3-2. Land uses within the City of Ojai are included in the Ojai City Land Use Element. The City of Ojai reported little development during the last five years, which is likely attributable to the City's stringent development code. The largest growth in population compared to the previous Sanitary Survey was the Oak View/Mira Monte area, increasing from 8,125 in 2000 to the current estimate of 11,209.

TABLE 3-2
STUDY AREA POPULATION ESTIMATE

City/Town	Population Estimate
Casitas Springs	1,121
Meiners Oaks	3,921
Mira Monte	6,915
Oak View	4,294
City of Ojai	7,862
Other Unincorporated Areas	774
Total Population in the Study Area	24,887

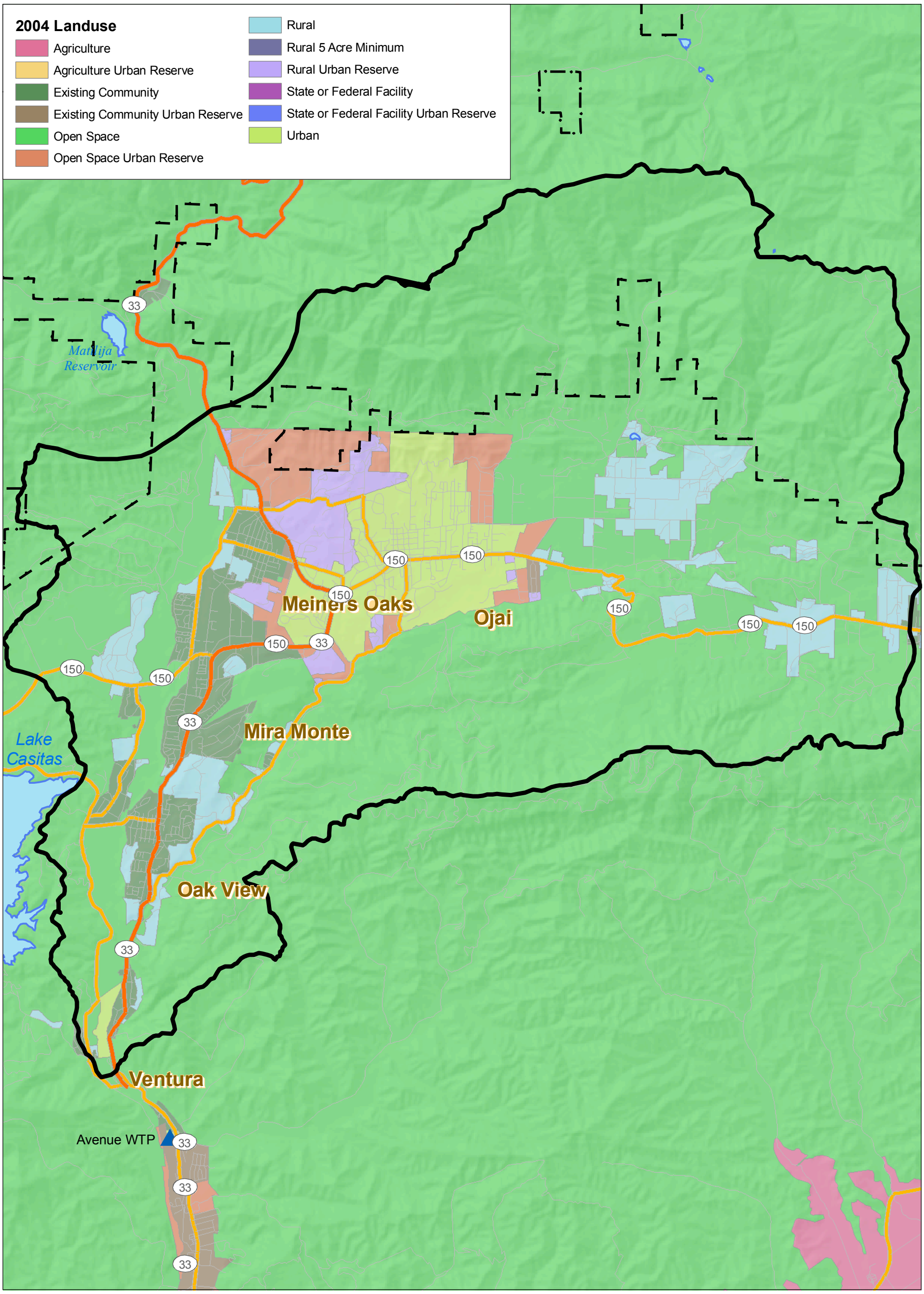
Source: Community populations from Maps Etc, 2004 and City of Ojai, Other areas from 2000 US Census

Figure 3 shows the latest available land use survey of the study area (2004) provided by Ventura County Resource Management Agency. As shown in the figure, most of the land is not developed within the study area.

Figure 4 compares the 2004 land use with 2000 land use to see where the changes have taken place over the last 4 years. Categories of land use in Figures 4 are based on the Farmland Mapping and Monitoring Program of the California Division of Land Resource Protection, and are defined as:

- Prime Farmland (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. Download information on the soils qualifying for Prime Farmland. More general information on the definition of Prime Farmland is also available.

- Farmland of Statewide Importance (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. Download information on the soils qualifying for Farmland of Statewide Importance.



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City of San Buenaventura, California

2004 Landuse

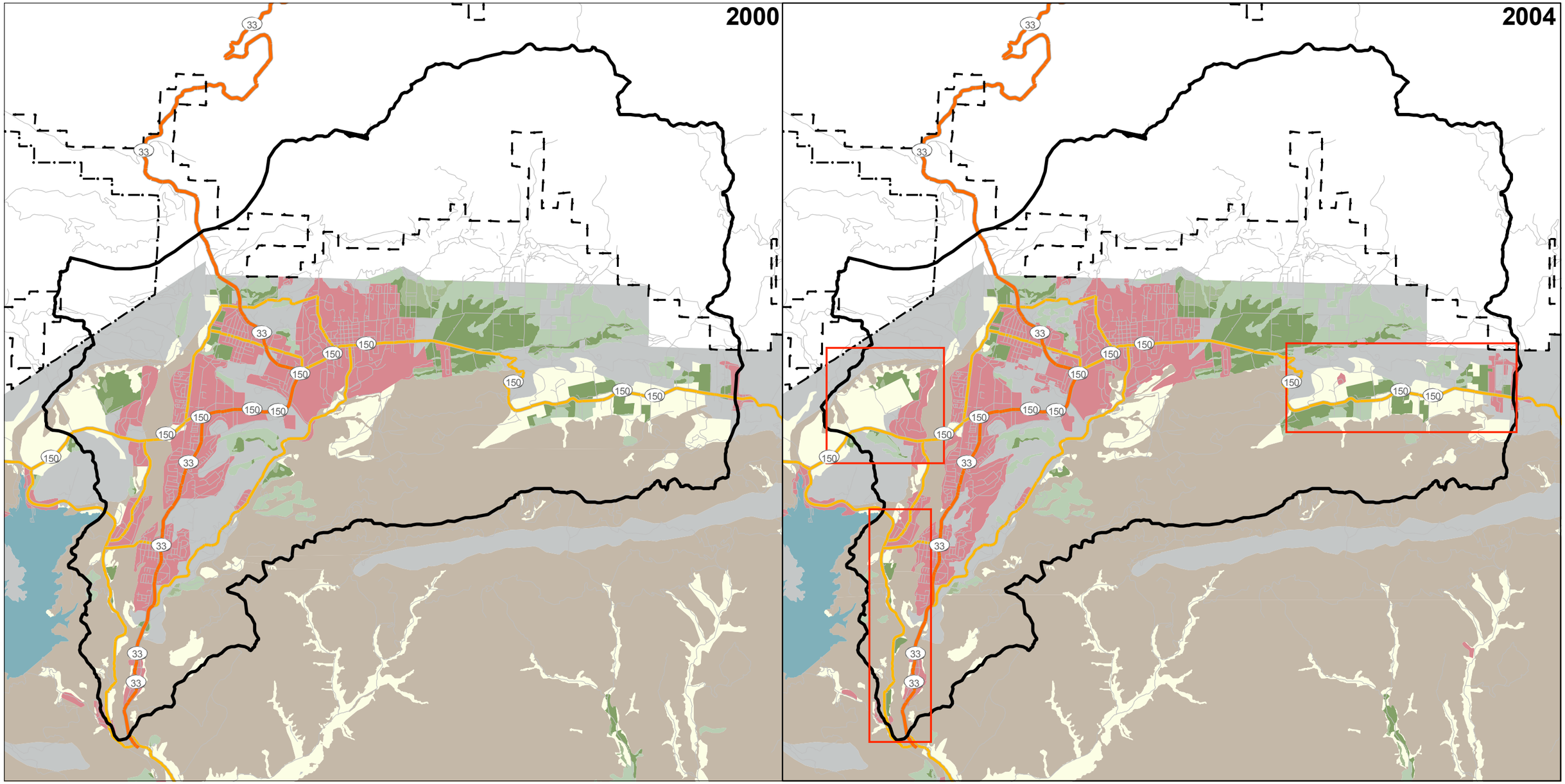
0589056
March 2006

Figure 3

Explanation

- Study Area Boundary
- National Forest Boundary
- Highway
- Major Road
- Local Road

0 6,000 12,000 Feet



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Farmland Mapping and Monitoring Program

- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Grazing Land
- Urban and Built-Up Land
- Other Land
- Water
- Farmland of Local Potential
- Irrigated Farmland
- Nonirrigated Farmland
- Not Surveyed

Explanation

- Major Landuse Changes
- Study Area Boundary
- National Forest Boundary
- Highway
- Major Road
- Local Road

N

0 1 2 3 Miles

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City of San Buenaventura, California

Changes in Major Catagories of Land Use from 2000 to 2004

0589056
March 2006

Figure 4

- Unique Farmland (U): Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

- Farmland of Local Importance (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. Download a complete set of the Farmland of Local Importance definitions in PDF format.

- Grazing Land (G): Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

- Urban and Built-up Land (D): Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- Other Land (X): Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

3.3 Natural Setting

No known changes with respect to topography, geology, or wildlife have occurred since 2000. The 2004/05 winter brought the second wettest rain season on record in southern California, which caused a number of problems within the watershed relating to flooding, damage to roadways and monitoring locations, the destruction of some pipes and a well near Foster Park, and landslides in the watershed.

3.4 Existing Hydrologic Monitoring

Updated hydrological information was provided by the Ventura County Watershed Protection District (VCWPD). The County maintains numerous rain gauges at precipitation stations throughout the County. There are ten precipitation stations within the Ventura River/San Antonio Creek Watershed (see Figure 1). Five of these gauges are standard-type gauges which record yearly data, while the remaining five are both standard-type and recorder-type gauges from which daily records are obtained. Rainfall data is collected for each gauging station by local residents and provided to the County for compilation. The average yearly

rainfall for the past five years, from water year (WY)[1] 2000 to WY 2004 ranges from 21.2 inches at the driest station (Station 165, Ojai – Stewart Canyon) to 30.8 inches at the wettest station (Station 163c, Sulfur Mountain). February is usually the wettest month. Rainfall data for WY 2000 to WY 2004 for the watershed are provided in Appendix B.

Other hydrological characteristics of the watershed, such as stream flow characteristics, reservoir or lake characteristics, wetlands characteristics and groundwater recharge have not changed significantly over the last five years.

A portion of the City's water supply is upper Ventura River water which CMWD diverts at the Robles Diversion, stores in Lake Casitas, and then pressure filters and disinfects before providing the treated water to its retail and wholesale customers, including the City.

One proposed project may create major changes in the movement of sediment in the Ventura River, the removal of Matilija Dam. This project is in the planning stages and the USACE has completed an EIS that considers the impacts to the watershed (USACE, 2004).

3.5 City of San Buenaventura Water Supply System

The main water supply for the western portion of the City is served from the Ventura River, either from the Foster Park facilities or the Casitas Municipal Water District facilities. This discussion focuses on the Foster Park facilities.

In October 2002, the City and Kennedy/Jenks completed the *Preliminary Design Report - Avenue Water Treatment Plant/Foster Park Facility Improvements Project*. In this report the City considered potential improvements to increase the yield from the Foster Park Well Field and Diversion Facilities and to improve the treated water quality, treatment capacity and reliability provided by the Avenue WTP. To support the Foster Park facilities improvements work, Fugro West completed a *Hydrogeologic Investigation - Avenue Water Treatment Plant/Foster Park Improvements Project* in July 2002.

Figure 2 shows the locations of the City's facilities near Foster Park.

3.5.1 Foster Park Well Field and Diversion Facilities

Prior to 2001, the Foster Park Well Field and Diversion Facilities consisted of the Ventura River surface diversion, a subsurface collector consisting of a perforated pipe upstream of a submerged dam and four active Nye wells, which pump groundwater under the direct influence of the river. Environmental constraints have resulted in the loss of the surface diversion, the loss of a well, conveyance pipeline to two wells, and the need to construct a replacement well.

3.5.2 Storm Damage and Repairs

From 2000 to 2005, three major storm periods had flood runoff that damaged the City's Foster Park facilities. This section provides a summary of the major repairs to those facilities. The

[1] A Water Year (WY) is defined by Ventura County as October 1 through September 30; so WY 2000 is from October 1, 1999 through September 30, 2000.

Action Plan to Correct 2001 Storm Related Damages at Foster Park Water Facilities documents the damages and necessary improvements, and is provided in Appendix C. Figure 2 presents a schematic of the planned Foster Park facility improvements.

March 2001 Storm: Following the damage caused by the March 2001 storm event and associated active channel widening, the City completed the following emergency repairs:

- Nye Well No. 1 - Partially replaced the nearly destroyed well by converting Test Well No. 1A into an interim production well of lesser capacity.
- Nye Well No. 2 - Replaced a 30-foot section of the 6-inch discharge pipe connecting to the east bank of the Ventura River with a deeper buried section of pipe.
- Nye Wells No.'s 7 and 8 - The river eroded the riverbank and came within 10 feet of the wellheads. No well damage occurred.

March 2004 Storm: The City made plans and began the permitting process to complete the following repairs:

- Interim Well No. 1A - Replace this damaged interim well with one that had been planned on the east bank of the river and made a pipeline connection to the water delivery pipeline in the area.
- Nye Well No. 2 - Repair the connection of Nye Well No. 2 to the existing 24-inch raw water pipeline outside the eastside of the riverbank.
- Nye Well No. 7 - A section of the concrete pipe that runs between Nye Wells 7 and 8 was washed away when the bank eroded. The pipeline between Nye Wells No. 7 and No. 8 was repaired, restoring production in Nye Well No. 7.
- Nye Well No. 8 - Additional launchable riprap was installed around the Nye Well No. 8 for protection.

January and February 2005 Storms: The most extreme runoff events of the 2000 to 2005 period occurred in January and February 2005. Flood flows cut away portions of Highway 33 near the Rancho Arnez grade, and reshaped the river channel near the Foster Park diversion facilities, cutting the water conveyance pipeline from Nye Wells 2, 7 and 8. As of February 2006:

- Nye Well No. 11 has been drilled to replace Well No. 1A and pump motor installed. Permits are in process for the other repairs, but have not been obtained as of February 2006.
- Permits are in process for the following:
  - Repair of pipelines from Nye Wells 2, 7, and 8
  - Service access to Nye Well 2

3.5.3 Foster Park Water Production

In 1996, Fugro West Inc. reported in its *Hydrogeologic Study for the Ventura Avenue Treatment Plant/Foster Park Master Plan* that the average production from the Foster Park facilities for the

1986 through 1995 period was 6,400 acre-feet (AF)/year. In Table 4-3 of the 2000 Report, it was shown that the water diversion from Foster Park from 1996 through 1999 declined to about 5,000 AF/year. This was noted to be due primarily to increased water purchases from CMWD rather than low water yields. Since 2000, storm damage has directly impacted the City's ability to deliver water from the Foster Park facilities, as shown in Table 3-3 below.

TABLE 3-3
2000 - 2004 WATER DIVERSIONS FROM FOSTER PARK (AF)

Source	2000	2001	2002	2003	2004	5-Year Total	5-Year %
Nye Wells	4,850	4,444	4,331	5,076	4,792	23,493	75
Subsurface River Intake	1,699	1,281	1,620	1,646	1,326	7,572	24
Surface River Intake	231	2	0	0	0	233	<1
Total	6,780	1,727	5,951	6,722	6,118	31,298	100.0

Source: City's Water Production Records

In their 1996 hydrogeologic study, Fugro West, Inc., concluded that the long-term potential yield of upgraded Foster Park facilities could be 7,000 additional AF/year for a total of 13,400 AF/year (Fugro West Inc., 1996). To achieve this yield would require improvements to the existing well field and diversion facilities.

In July 2002 Fugro West completed a study entitled, *Hydrogeologic Investigation - Avenue Water Treatment Plant/*Foster *Park Improvements Project.* In that study, Fugro West, Inc. conducted an evaluation of the river subsurface conditions based on test well drilling and short-term pumping at ten (10) locations. The resulting data were used to select the sites for up to five new wells at 350 to 400-foot spacing.

3.5.4 Proposed Foster Park Well Field and Diversion Facilities Improvements

According to the 1999 *Avenue Treatment Plant/Foster Park Master Plan* (Kennedy/Jenks 1999), eliminating the need to maintain/restore/operate the surface diversion facility and constructing additional wells and/or a subsurface collection facility would have several advantages, including providing a more reliable water supply, better raw water quality, and improved ability to meet DHS requirements. The City's stated goal for Foster Park water production is 8,500 to 10,500 gpm for average and peak demand conditions. Opportunities for meeting this goal through improvement of existing facilities and development of new wells were assessed through the 2002 hydrogeologic investigation.

Conservatively estimating an average production rate for each well of 1,500 gpm, the City's water supply goals can be met by installing four new wells (including replacing Wells No. 1A and No. 2). A summary of the system yield with the existing, new and improved facilities is provided in the Table 3-4:

TABLE 3-4
PROPOSED WATER SUPPLY YIELD AT FOSTER PARK

Water Supply Element	Instantaneous Yield		Cumulative Yield	
	GPM	MGD	GPM	MGD
Existing Well Field (Nye Well No.'s 7 and 8)	2,250	3.24	2,250	3.24
Subsurface Collector	1,300	1.87	3,550	5.11
New Well Field (4 or 5 wells)	6,000	8.64	9,550	13.75
Improvement of Existing Facilities	400	0.58	9,950	14.33

Source: Provided by Kennedy/Jenks, 2006

The City's plans for permanent Foster Park facilities improvements have been postponed due to delays in approval of the associated Environmental Impact Report and negotiations required thereon. However, if successful, the City's plans for Foster Park in the next several years include:

- Replace Well No. 2 which is the active river channel with a new production well set back from the east river bank.
- Harden and upgrade the wellheads at Wells No.'s 7 and 8.
- Add two or three new production wells set back from the east river bank.

The plan is that all new wells would be setback from the riverbank by at least 50 feet, would have their motors, meters, valves and piping above the 100-year flood elevation and would have the well casings hardened for protection from flood carried debris should the river bank become scoured away.

3.5.5 Avenue Water Treatment Plant Improvements

The City is in the process of improving and upgrading the Avenue WTP, which is over 70 years old. The objectives for the Avenue WTP Membrane Filtration Project include:

- Improve Reliable Capacity. The Avenue WTP's improved reliable treatment capacity initially will be 10 MGD with the ability to provide 15 MGD of treated water in the future. The March 2001 flooding in the Ventura River caused damage to City facilities at Foster Park. The reliable capacity of the Foster Park Facilities would need to be restored to provide 15 MGD to the Avenue WTP.
- Meet Current and Future Regulations. The Avenue WTP improvements will ensure the facility can meet the requirements of the current and proposed regulations including the Stage 1 and Stage 2 Disinfectants/Disinfection By-Products Rule (DBPR) and the Interim and Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The objective of the DBPR is to minimize the formation of potentially carcinogenic disinfection byproducts (DBP) through alternative disinfectants and/or disinfection processes. The objective of the LT2ESWTR is to ensure adequate pathogen removal

and pathogen inactivation through disinfection. The Avenue WTP treatment process will minimize DBP formation without sacrificing pathogen removal and inactivation. The minimum pathogen treatment objectives for the Avenue WTP now include 3-log *Giardia*, 4-log virus removal-inactivation and 2-log *Cryptosporidium* removal.

- Provide High Quality Water from Multiple Sources. The source water to the Avenue WTP includes subsurface collector water, groundwater from the Nye wells and treated water from CMWD, each with different water quality issues. The Avenue WTP improvements provide the capability of treating each of these sources and providing high quality water.

- Incorporate the Shift to Chloramine Disinfection. The City has shifted to using chloramine disinfection in the water distribution system to help minimize disinfection byproduct formation. The Avenue WTP Membrane Filtration Project integrates with the 2004 Chloramination Systems for Various Treatment Facilities project.

- pH Corrosion Control. Caustic Soda will be added to get 7.6 to 7.7 pH range.

- Provide Simplified, Safe Plant Operations. The Avenue WTP improvements will minimize the number and volume of chemicals, including hazardous and toxic chemicals required for the process, and keep the overall treatment process as simple as possible.

The improvements at the Avenue WTP includes: construction of new sludge drying beds and washwater recovery basins; construction of a new raw water reservoir outlet pipe and source water pump station, construction of a new Chemical Building with gas chlorine storage feed as well as coagulant, caustic soda and miscellaneous membrane cleaning chemical storage and feed systems; construction of a new Membrane Building with submerged ultrafiltration membrane filters and associated equipment, piping, valves, instrumentation and controls; and new site utilities and improvements, including site security work.

Table 3-5 presents the removal and inactivation credits that the Avenue WTP will achieve with the new membrane filtration system and free chlorine disinfection in Power Reservoir and the treatment objectives of the LT2ESWTR. The new WTP can provide greater removal and inactivation than is required.

TABLE 3-5
AVENUE WTP REMOVAL AND INACTIVATION CREDITS

Pathogen	Zenon 1000 UF Log Removal Credit[c]	Power Reservoir Free Chlorine Log Inactivation[a]	Total Avenue WTP Log Removal-Inactivation	LT2ESWTR Treatment Removal-Inactivation Objectives
Giardia	4	2	6	3.0[b]
Cryptosporidium	4	N/A	4	2.0
Virus	3.5	>6	>9	4.0[b]

Notes:
(a) Based on 0.5 mg/l chlorine residual, 15°C, pH 7 and 1.7 hrs of contact time at low level (206 feet) and max flow (15 MGD). Power Reservoir is assumed to have a T_{10} to hydraulic detention time ratio of 0.1 to 1.
(b) MF/UF membrane systems are required to provide at least 0.5 log *Giardia* inactivation or 2-log virus inactivation in addition to removal credits.
(c) DHS approved credits based upon previous testing

3.5.6 Casitas Municipal Water District Purchases

The City currently can take CMWD water through the CMWD No. 1 turnout, which sends the water to Kingston Reservoir. The Lake Casitas water mixes with the raw water diverted from Foster Park before entering the Avenue WTP for treatment or can be bypassed around the plant. The CMWD No. 2 connection feeds directly into the City's Hall Canyon Reservoir.

Under the City's water purchase agreement with CMWD dated June 28, 1995, the City agreed to purchase at least 6,000 AF/year from CMWD. In October 1996 Casitas began operating its direct filtration water treatment plant. At that time the pipeline delivering water to Ventura was converted from a raw water pipeline to a treated water pipeline. This allowed the City to take Casitas water directly into the City's water distribution system through the CMWD No. 2 turnout without additional treatment at the Avenue WTP. After October 1996 the City started taking water through CMWD No. 2 more frequently, as shown in Table 3-6 for the years 2000 through 2004. During October and November when Lake Casitas turns over, Ventura customers have complained about the taste and odor of the CMWD water supply (Kennedy/Jenks 1999). To avoid this problem, the City maximizes its use of Casitas water during the July to September period and reduces CMWD water purchases during the Fall or retreats the CMWD water to lower taste and order complaints from the public.

TABLE 3-6
WATER PURCHASES FROM CASITAS MUNICIPAL WATER DISTRICT (AF/YEAR)

Turnout	2000	2001	2002	2003	2004
CMWD No. 1	2,821	3,033	3,380	1,984	3,195
CMWD No. 2	2,395	2,625	3,182	2,389	3,062
Total	5,216	5,658	6,562	4,373	6,257

As recommended in the Master Plan (Kennedy/Jenks 1999), the City is implementing or has implemented several improvements including:

- Shift the primary delivery point to CMWD No. 2. This allows concurrent use of the Ventura River Foster Park supply and CMWD water.
- Connect the CMWD No. 1 turnout directly to the 400/260R Zone along Ventura Avenue at the Valley Vista Booster Pump Station.
- Add piping to allow taking CMWD No. 1 water directly into the distribution system (210 Zone).
- Add additional motor operated valves to allow remote control of the various delivery points.

Direct use of the CMWD water without additional treatment at the Avenue WTP requires additional monitoring of the CMWD water quality.

CMWD converted from traditional chlorination to chloramination disinfection. Consequently, the City in 2004 converted the City's system–wide disinfection system to chloramination. This should reduce the potential for creation of THMs in the City's drinking water as well as eliminating the potential for taste and odor complaints at the interface between chlorinated and chloraminated water in the distribution system.

3.6 Water Conveyance Facilities from Foster Park Diversion Facilities to Avenue Water Treatment Plant

No changes have occurred since 2000 to the conveyance facilities from Foster Park Diversion Facilities to the Avenue WTP.

3.7 Emergency Response Agencies/Responsibilities

The OVSD has upgraded its emergency notification equipment and response program as described in Section 2.3 Ojai Valley Sanitary District Facilities. The updated Sewage Spill Prevention and Response Plan, dated November 2004 is included as Appendix D. OVSD maintains the manhole with an overflow sensor near the confluence of San Antonio Creek and the Ventura River.

Section 4: Potential Contamination Sources in the Watershed

4.1 Sanitary Survey Methods

Regulatory agencies contacted for the 2000 Sanitary Survey were again contacted regarding changes in land uses, operations, and policies and permitting procedures that would affect the watershed and ultimately water quality of the surface water streams. OVSD provided significant assistance to the sanitary survey team regarding their sewage collection facilities, water quality testing results, sewage spills, GIS data, and OVSD facility upgrades. Field survey inspections by driving and walking were conducted during December 2005 through February 2006. Photographs of the monitoring points and other watershed features that affect water quality are provided in Appendix A. Locations of the photographs taken on the field survey are shown on Figure 5.

4.2 Potential Contaminants

A map showing potential contaminants in the study area is presented in Figure 6. These contaminants were identified in the current and previous sanitary surveys. Only if there is evidence of a potential contamination being mitigated was it taken off the map, such as one of the golf courses or the Honor Farm.

4.2.1 Sediment from Matilija Dam

The USACE has developed proposals to remove the Matilija Dam that quickly filled with sediments since its construction in 1947. There is now only about 500 AF of storage capacity in what once was a reservoir designed for over 7,000 AF of storage. Of concern is the risk from sediment being carried over the dam with large floods if no other action is taken, or with a slurry and pipeline sediment removal project. The EIS for the removal of the dam (USACE 2004) discussed the potential sediment contamination and the effects of the sediment on the groundwater recharge downstream of the dam. With our without the Matilija Dam removal Project, sediment transfer to the recharge areas of the lower Ventura River and sediment effects on the riverbed aquifer are a concern for the following reasons:

- Extra sediment will fill pore spaces, may form a seal, and decrease the effective storage in the riverbed aquifer.
- Extra sediment may affect operation of the Los Robles diversion structure, impacting flow down the main channel.
- The sediment will affect the geomorphology of the river.

If the proposed slurry line and sediment removal take place, there will be impacts of that operation to consider.

4.2.2 Sewered versus Unsewered Areas

The unsewered areas within the watershed are essentially unchanged from 2000. Only minor additions have been made in the Arbolada area of Ojai and in the Casitas Springs area. The problem areas also remain the same as reported in the 2000 Sanitary Survey as far as contamination potential from overflowing septic tanks in high groundwater areas.

Siete Robles Tract. This area in eastern Ojai has high groundwater (8 to 10 feet to the water table) and artesian wells. During the rainy season, the septic tanks and leachfields are often within the water table increasing the potential for surfacing effluent. Many residents have their septic systems pumped to tanker trucks frequently during the rainy season that haulers take away to Santa Clara Sanitation for disposal.

Arbolada. This area north of the intersection of Highways 33 and 150 has a high water table and, in some areas, a shallow depth to bedrock. Some property owners have been denied permission to develop because of poor conditions for septic systems. In 2005, some of the residents constructed a sewer collection system in the lower lying southern portion of this neighborhood and have connected to OVSD.

Areas Southwest of Intersection of Highway 150 and Burnham Road (Los Encinos). Septic system problems in this area are caused mainly by clay soils that significantly reduce percolation rates. In 2003 OVSD connected a sewer line to the Montessori school on Highway 150 at the northern edge of this neighborhood.

Live Oak Acres. Septic system problems in this area are caused by the high water table.

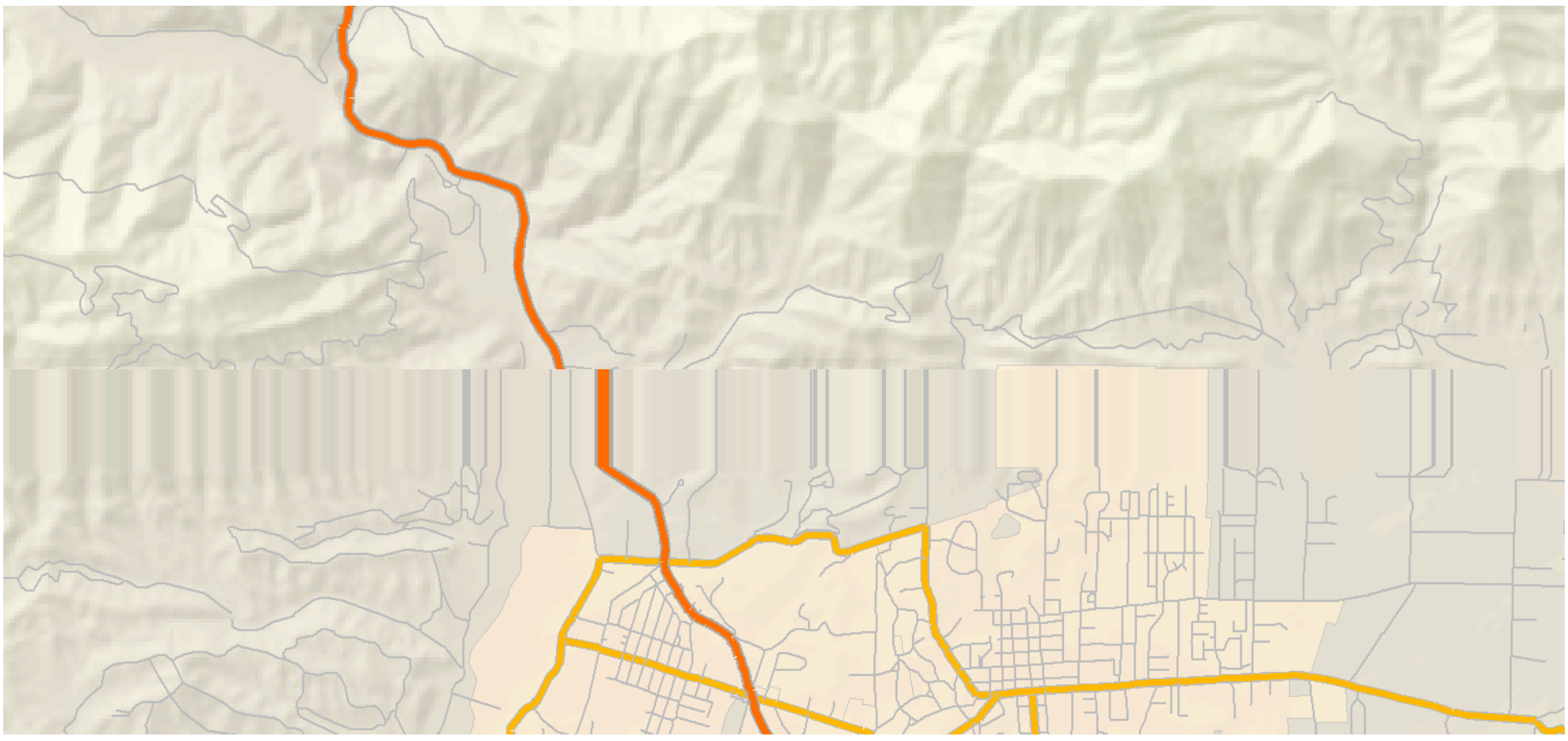
Santa Ana Road. The unsewered housing development along Santa Ana Road west of the Ventura River and just north of Foster Park has septic sewer problems due primarily to the high water table. This area is difficult to access by sewer line because of having to cross the Ventura River.

Casitas Springs within OVSD Boundary. The Casitas Springs area within the OVSD boundary is partially served by sewers and partially by septic systems as shown on Figure 6. Portions of Casitas Springs have good soils for septic systems; however, repairs at the older homes are often needed for failing septic systems. According to OVSD, new homeowners are beginning to connect to the sewage collection system. OVSD is working with a number of homeowners to repair their connections to the sewer system after the January and February 2005 mudslides.

Casitas Springs outside OVSD Boundary. Similar conditions exist for these older homes outside the OVSD boundaries as for the homes within the Sanitary District boundaries. They do not have the option to connect to the OVSD collection system unless they annex to the District.

4.2.3 Domestic Wastewater – Ojai Valley Sanitary District

OVSD is the governing agency for domestic wastewater collection, treatment, and disposal within the watershed. The OVSD service area has remained essentially unchanged since 2000 and is shown in Figure 7. OVSD's wastewater treatment plant provides tertiary level treatment with nutrient reduction treatment facilities. The OVSD WWTP location and discharge point



remain unchanged at a location along the Ventura River, which is outside and downstream from the watershed study area.

OVSD's 2003 NPDES permit for treated wastewater disposal is included as Appendix I. A listing of other NPDES permits within the Ventura River watershed is provided in Appendix J.

4.2.4 OVSD Sewage Lift Stations in Watershed

Four of OVSD's six lift stations are located within the study area. Their locations are shown on Figure 7. The pump stations are monitored 24 hours a day via a radio-based telemetry system connected directly into the OVSD Treatment Plant SCADA system. By the spring of 1999, OVSD had installed its DCS telemetry system at its facilities throughout the District. This telemetry system transmits up to the minute operational information, flows, and alarms to the treatment plant's SCADA system. The SCADA system is equipped with a call out system that receives alarms and automatically contacts standby personnel during off-hours.

OVSD upgraded the SCADA equipment during 2000 to 2005, and took over operation of a small 6th lift station at the Park and Ride at the Highway 33 and 150 intersections in Ojai.

OVSD continued to maintain five (5) emergency generators, three of which are portables, which could be moved to run the OVSD headquarters if necessary. The Matilija Lift Station could be pumped periodically by vacuum truck during the emergency period.

4.2.4.1 Sewer Line Crossings Under/Near Ventura River and Tributaries

The OVSD sewer lines which cross the Ventura River and its tributary creeks have continued to fail periodically because of damage during flood events, however, spill volumes for 2000 to 2005 as compared to 1995 to 2000 are much less due to the many system improvements by OVSD. Spills are commonly related to blockages. OVSD documents major line breaks in great detail including records of staff emergency response and repairs activities, estimates of the total volume of sewage spilled, and photographic documentation of the storm damage and repairs. A discussion of the system upgrades is provided below. A listing of reported sewage spills of 200 gallons or more is provided in Table 4-1. None of the spills affected flowing water.

TABLE 4-1
OJAI VALLEY SANITARY DISTRICT SEWAGE SPILL SUMMARY (200 GAL. OR MORE)
REPORTING PERIOD 2000 TO 2004

Date	Problem	Spill Amount	Time Called	Time Arrived	Completed	Location	Reason for Spill
10/26/2000	Mainline - Blockage	2,000 gal	1030	1045	1930	Stewart Cyn. Easement	Roots
12/16/2000	Mainline - Blockage	1,375 gal	745	810	1030	Apricot & Santa Ana Blvd	Grease
1/19/2001	MH - Blockage	1,000 gal	1820	1835	1200	Quail Street Easement	Trash placed in MH
6/16/2001	Mainline - Blockage	5,625 gal	1045	1115	1320	330 Padre Juan	Roots
4/20/2003	Mainline - Blockage	500 gal	1830	1850	130	1055 N. Ventura Ave	Concrete Rubble
5/19/2003	Manhole Overflowing	1,000 gal	840	850	1130	Maricopa Hwy/Carrillo St	Grease
7/27/2003	Mainline – Blockage	2,700 gal	1056	1135	1330	Shady Ln/Hwy 150	Grease
7/5/2004	Broken Force Main	1,500 gal	930	1015	2215	Canada Larga Crossing	Pipe Failure
11/9/2004	Mainline - Blockage		2216	2246	115	1259 Tico Rd	Grease and Roots

4.2.4.2 Ventura River and San Antonio Creek Crossings

The sewer line crossing the Ventura River at Highway 150 Bridge was replaced with a siphon to eliminate the potential for washout. The siphon with two 10-inch and one 12-inch diameter pipeline, was installed in 2003 using Horizontal Directional Drilling that placed the 3,100 foot siphon approximately 200 feet below the surface at its deepest point.

A similar siphon design is currently being constructed on San Antonio Creek to replace a trunk line that was washed out during the Spring 2005 floods. This will be a double barrel siphon.

4.2.4.3 OVSD System Improvements

In the spring of 2000, OVSD completed line cleaning and video inspection (CCTV) and repairs on the seven-mile trunkline that parallels Creek Road (OVSD, letter dated January 11, 2006, included as Appendix E). These repairs included lining 3,100 feet of Techite pipe using Insituform's CIPP, in an area of the trunkline that had failed during the 1998 storms. Also during 2000, OVSD completed a three-year line cleaning effort in which the entire sewer system was cleaned. In 2001, an accelerated rehabilitation program to reduce of inflow and infiltration (I&I) in the collection system was initiated. This effort resulted in the CCTV of 151,000 feet of line, and smoke testing of 301,000 feet primarily within the City of Ojai and Oak View areas. The CCTV tapes were reviewed for sources of I&I, and those sewer segments identified with I&I were repaired. The repairs performed included:

- Replacement of 3,130 feet of line using open trench technology
- Replacement of 5,409 feet of line using pipe bursting technology
- Performed 55 point repairs
- Replaced 9 manholes, and performed chemical grouting on another 106 manholes
- Replaced and upgraded the Vactor (line cleaning), CCTV equipment, and Computerized Maintenance Management System (CMMS)

Subsequent repairs performed between 2002 through 2004 included:

- Performed 55 point repairs in the Oak View area
- Performed 21 point repairs in the Meiners Oaks area
- Replaced an additional 600+ feet of sewer line in the Ojai and Oak View area
- Raised and replaced 172 manhole rings and covers to reduce I&I impacts (the ring and cover replacement is an ongoing, as identified I&I reduction effort (OVSD, letter dated January 11, 2006)

A comparison of the rainfall and effluent for the five-year periods of January 1996 to December 2000 and January 2001 to December 2005 showed a reduction in effluent due to the measures taken above. While rainfall was about 3 percent lower in the later period, the effluent was 10 percent less. OVSD estimates this to be a reduction in I&I of 420 MG (or 1,289 AF).

4.2.4.4 Sewer Infrastructure Rehabilitation

OVSD has maintained an aggressive effort to rehabilitate the sewer infrastructure and reduce I&I and the potential for sewage outflows. Prior to wet weather in the fall of 2003, OVSD installed manhole lid liners and/or corks in all 2,215 manholes to reduce rainfall-induced inflow. This is now an annual wet weather preparation task as described in Appendix E (OVSD letter dated January 11, 2006). Other notable accomplishments include:

- Completed line cleaning and CCTV inspection of the entire OVSD collection system, including the trunklines. A second round of cleaning and CCTV inspection is now in-progress to provide OVSD with a detailed sewer line evaluation and asset condition assessment since improvements have been made.
- Purchased 10 portable flow meters for I&I detection and subsequent reduction.
- OVSD has 59,500 feet of line that has been identified for scheduled root inhibitor application as part of the Root Control Program.
- Sewer lines totaling 17,300 feet are on a Hot Spot list for accelerated cleaning to reduce the potential for blockages.

- A FOG (Fats, Oil and Grease) Program has been implemented and all food service establishments are/will be under permit as part of the pretreatment program.

4.2.4.5 Septic System Upgrades

OVSD has 46 homes that upgraded from septic systems to the District's sewer system between 2000 through 2004 (OVSD, letter dated January 11, 2006). Another 33 have been converted from septic to sewers in the Oak View and Ojai area during 2005. In Casitas Springs another eight homes are scheduled to convert from septic systems to sewers during 2006.

4.2.4.6 OVSD's Sewage Spills and Overflows Prevention and Response Plan

In November 2004, OVSD updated its Sewage Spills and Overflows Prevention and Response Plan (last updated in 2000). A copy of the 2004 Plan can be found in Appendix D.

A number of preventative measures are included in the 2004 Plan. The District's six pumping stations are monitored 24-hours a day via a radio-based telemetry system connected directly into the OVSD treatment plant SCADA system. This telemetry system transmits up-to-the-minute operation information. Additionally, to prevent or reduce the impact of short-term power failures, the five largest pumping stations have been provided with emergency standby power capability. To minimize sewage overflows and spills, OVSD schedules the cleaning of all main sewer lines over a three-year period, while line segments that have root, grease, or odor problems known as "hot spots" are cleaned more frequently.

Among the parties to be notified in an emergency, the November 2004 plan contains the following phone numbers for sewage spill notifications:

- State Office of Emergency Services (OES) at: 800-852-7550.

- Ventura County Environmental Health Department (VCEHD):
  - Business Hours (805) 654-2813
  - After Hours (805) 320-6244 or (805) 655-9181

  Unless:

  The spill is in or into the Ventura River and/or San Antonio Creek above Foster Park; then due to potential potable water contamination, first contact the Avenue WTP at:

  - Business Hours (805) 652-4548 7 days/week 7am - 3:30pm, or (805) 652-4500 M-F 8am - 5pm
  - After Hours (805) 339-4399, Police and Fire Dispatch

  And then notify VCEHD next.

Ventura's central dispatch will report the incident and call Water Department standby personnel. The plan also contains phone numbers for the Los Angeles ARWQCB and California Department of Fish and Game. The plan does not contain daytime and/or nighttime phone numbers for the DHS (Santa Barbara office), which is intimately involved in the regulation of drinking water quality.

4.2.5 Golf Courses

There are currently two existing golf courses in the watershed as shown on Figure 5; the Ojai Valley Inn Golf Course and Country Club, and the Soule Park Golf Course. These two golf courses border San Antonio Creek. The impacts on water quality in San Antonio Creek from the golf courses are not believed to be significant based on review of nitrate and pesticide data that may indicate over fertilization or treatment for insects.

The 2000 Sanitary Survey reported that a third golf course in the watershed, the proposed Fairmont Golf Course, was in the planning stages. According to the Ventura County Planning Department, General Services Agency, the construction of the Fairmont Golf Course never went forward, and the land was subsequently purchases by Ojai Valley Land Conservancy who intends to keep it as a wilderness preserve with access for hiking and horseback riding.

4.2.6 Organized Recreational Facilities within Watershed

The Ventura River/San Antonio Creek watershed continues to offer a diverse array of outdoor activities. The watershed has parks, campgrounds, golf courses, ten miles of equestrian trails and retreat facilities. The Ventura County Parks and Recreation Department reported no significant changes in the operation of the recreational facilities within the watershed.

4.2.6.1 Ojai Valley Land Conservancy

The Ojai Valley Land Conservancy worked at developing the trails and trail heads for hiking and horseback riding along the Ventura River, in the area between the Los Robles Diversion and Highway 150.

4.2.6.2 Arnaz Program Center

The Arnaz Program Center is a camp privately owned and operated by the Girl Scouts of Tres Condados. A portion of the property borders San Antonio Creek. A number of buildings are connected to the OVSD collection system and water is provided to the facility by CMWD.

4.2.6.3 Foster Park

Foster Park is a historic park, first developed in 1906. The Ventura River flows through the park. Activities in the park include fishing and hiking. Family and group barbecue areas are also provided. Dogs are not allowed in the day use section. There are no known reported changes in operation of this facility.

4.2.6.4 Ojai Valley Bike Equestrian Trail

The Ojai Valley Trail parallels Highway 33 from Foster Park. Permitted activities along the trail include equestrian, bicycling, walking, and jogging. Dogs are permitted on leash only. There are no known reported changes in operation of this facility.

4.2.6.5 Camp Comfort

Camp Comfort is located within the Ojai Valley. The San Antonio Creek flows through the park. Activities in the park include campsite with full hookups including water and sewer utilities. Also provided are laundry facilities and indoor showers. Dogs are not allowed in the day use section. There are no known reported changes in operation of this facility.

4.2.6.6 Dennison Park

Dennison Park is located within the Ojai Valley. Activities within the park include family and group barbecue areas, individual campsites, and fire pits. There are no known reported changes in operation of this facility.

4.2.6.7 Soule Park

Soule Park, next to the Soule Park Golf Course, is the most frequently used Ventura County park. Activities in the park include tennis, an equestrian arena, softball field, and children's playgrounds. Family and group barbecue areas are located throughout the park. Dogs are not allowed. There are no known reported changes in operation of this facility.

4.2.6.8 Camp Ramah

Camp Ramah is a private, organized, sewered camping facility in McDonald Canyon, northeast of Meiners Oaks. In 2005, over 1,300 campers attended the summer month program at the camp. There are no known changes in the operation of this facility with respect to watershed contaminants.

4.2.7 Educational Facilities in the Watershed

There are no known changes to water runoff from the existing educational facilities in the study area.

4.2.8 Correctional Institutions in Watershed

The County Sheriff's Honor Farm closed in August 2003 (personal communication, Captain Glen Sander, Ventura County Sheriff's Department). This was the only correctional facility in the watershed. A long-term plan for reuse of the facility has not been developed, but it is currently being evaluated for non-profit purposes (personal communication, Suzy Watkins, Ventura County GSA).

4.2.9 Mine Runoff

The Ventura County Planning Department confirmed that there are currently no active or inactive mines within the Ventura River/San Antonio Creek watershed.

4.2.10 Recycled Water in Watershed

Currently there is no use of reclaimed water in the watershed study area. OVSD's wastewater treatment plant does provide for tertiary treatment, which is suitable for non-potable use of reclaimed water.

One of the issues is the distance from the OVSD treatment plant to potential recycled water users and there is some discussion of satellite WWTPs in the mid to upper portions of the watershed.

The City owns the effluent from the OVSD and is evaluating ways to utilize recycled water.

4.2.11 Biosolids Applications on Lands within Watershed

There is no current application of biosolids in the watershed. All of the City biosolids are trucked to Kern County.

4.2.12 Agricultural Crops Grown

According to the Ventura County Agricultural Commissioner's office, the principal crops grown within the watershed are citrus and avocados. Additionally, there are only small patches of field or row crops grown within the watershed.

4.2.13 Pesticide and Herbicide Use

Information on pesticide and herbicide use in California is available from the State Department of Pesticide Regulations. Pesticide use reports for Ventura County from 2000 to 2003 were available, indexed by commodity and chemical. A representative report for 2003 is provided in Appendix F. On a Countywide basis, from 2000 to 2003, the total amount of pesticides applied to agricultural crops has decreased 7 percent (approximately 509,750 pounds). While over the same time period, the total number of agricultural applications Countywide increased by about 18 percent (approximately 14,669 applications). Statistics for the study area were not available.

4.2.14 Farm Animal Grazing Areas

The Ventura County Agricultural Commission was contacted for updated information on current animal grazing areas within the watershed. According to the office, the only reports of farm animal grazing are for cattle from the State Agricultural Office. The County office does not track horses in the watershed area. As the Sheriff's Honor Farm was closed in 2003, the Ventura County Agricultural Commissioner's Office no longer receives reports on swine.

There are no known large herds grazing areas within the watershed, although there are minor grazing leases upstream of the study area. There are no concentrated feedlot or slaughterhouse animal facilities that would affect water quality within the watershed.

There is the presence of horse stables and resulting manure adjacent to San Antonio Creek and along the Ventura River. Should horse manure be stockpiled or stored along and near creek banks, this presents a threat to water quality during rainy weather periods and rising floodwater

events. The major potential concerns are that these manures may be adding parasitic cysts and bacteriological contamination to the creek. Also of concern is the addition of nitrate/phosphate nutrients to the river/creek system at these sites.

4.2.15 Wild Animals

There are no known changes in wild animal populations since 2000.

4.2.16 Oil and Gas Facilities

There were no reported changes in oil wells and oil storage tanks since 2000 in the study area. There are a number of gas pipelines that cross creeks in the Ojai area and have potential for spill to the waterways from flood, earthquake or traffic accidents. The field survey identified two such crossings (see Appendix A photographs).

Oil and gas facilities are included on the BWT lists and are subject to a three-year review for spill prevention, control, and countermeasure (SPCC) plans. SPCC Plans are a cornerstone of EPA's strategy to prevent oil and gas spills from reaching the nation's waters. Unlike contingency plans that address cleanup measures after a spill has occurred, SPCC Plans ensure that containment facilities are put in place and other countermeasures that would prevent oil spills from reaching navigable waters. Transfer facilities, such as pipelines, are included in the SPCCs. (Vintage Petroleum, 2001)

4.2.17 Hazardous Waste Spills

Since 2000, OES has reported 21 spills within the Ventura River watershed (see Table 4-2).

TABLE 4-2
OFFICE OF ENVIRONMENTAL SERVICES
SPILL SUMMARY
REPORTING PERIOD 2000 TO 2005

Spill Control No.	Date of Incident	Incident Location	City	Substance	Quantity	Unit
05-4685	8/9/05	Mckee St. and Encinal St.	Ventura	Unknown substance	Unknown	Unknown
05-3192	5/27/05	Taylor Lease//Taylor Well 151	Ventura	Produced water	10	bbl.
05-1630	3/11/05	Taylor Lease, near Taylor 142 Injection Wells, closest city of Ventura	Unincorporated county area	Produced water	10	bbl.
05-1279	2/25/05	1800 School Canyon Rd	Ventura	Produced water	200	bbl.
05-1006	2/14/05	Lloyd Lease, 3382 N. Ventura Ave	Ventura	Crude oil	10-20	bbl.
05-0307	1/11/05	3055 W. Pacific Coast Hwy -Test Location	Unincorporated county area	Crude oil	3	bbl.

Spill Control No.	Date of Incident	Incident Location	City	Substance	Quantity	Unit
		288				
05-0215	1/10/05	3382 N. Ventura Ave	Ventura	Crude oil	50	bbl.
05-0221	1/10/05	Creek Road, 1/2 miles off Hwy 33, between cities of Ojai and Ventura	Unincorporated county area	Sewage	Unknown	Unknown
05-0176	1/9/05	Hwy 33 above Casitas Springs, off Sulfur Mtn. Rd.	Unincorporated county area	Sewage	Unknown	Unknown
04-3497	7/5/04	Ventura Ave at McKee St.	Unincorporated county area	Sewage	25	gal
04-1175	3/2/04	1232 and 1234 Meyer Road (Ready Mix Concrete Plant)	Ojai	Waste product from concrete batch plant	80	tons
04-0997	2/23/04	1290 Meyer Rd.	Unincorporated county area	Horse Manure	5000	cubic yards
03-5250	10/9/03	On Sulfur Mtn. Rd (Closed dirt road) near 260 Oakview Ave., Oak View	Unincorporated county area	Unknown oil	100	gal
03-4622	9/4/03	500 N. Ventura Ave	Ventura	Oily water	Unknown	Unknown
02-4566	8/23/02	2 miles north of the City of Ventura on the Ventura Avenue Oil Field Taylor Lease	Ventura	Crude Oil	2	bbl.
02-1744	3/29/02	1800 School Canyon Rd.	Unincorporated county area	Crude Oil		
01-1329	3/5/01	6363 N. Ventura Ave.	Ventura	Secondary Effluent Sewage	600	gal
01-1211	2/27/01	1800 School Canyon Rd.	Unincorporated county area	Oily Water	1	bbl.
00-4984	10/26/00	An easement on Creek Road and Oak Creek Lane	Ojai	Raw sewage	2000	Gal
00-2418	5/27/00	1800 School Cyn. Rd.	Unincorporated county area	Mineral spirits	55	Gal
00-1630	4/9/00	Trailer Trap Farm 14, in the old Spanish Land Grants	Unincorporated county area	Crude oil	5	bbl.

Additionally, as part of the Ventura County Hazardous Materials Program, the County conducts annual facility inspections, is involved with hazardous materials emergency response, investigation of the illegal disposal of hazardous waste, public complaints, and storm water illicit discharge inspections. The Ventura County Environmental Health Division records the hazardous waste spills occurring within the watershed, and presents the information in a weekly

report, entitled, “Hazardous Materials Discharge Summary Report.” These weekly reports can be viewed on the County’s Hazardous Materials Program web page.

In a recent report, dated December 29, 2005, 550 pounds of “oily waste” was discovered discharged into an Oak View storm drain. See Appendix S for the Ojai Valley News Article reporting on this spill.

4.2.18 Geologic Hazards

There have been no major geologic hazards such as earthquakes within the watershed over the last five years. Landslides and mudslides were associated with the larger rainfall and flood events, with damage to roadways and some houses in January and February 2005. Sediment from the mudslides affected turbidity in the creeks and Ventura River, and unknown debris from houses and properties washed into the waterways.

4.2.19 Wildfires

There were a number of large wildfires in Ventura County over the past six years, but none in the study area. The School Canyon Incident started on November 18, 2005, north of the City, burning 3,891 acres and destroying 2 commercial buildings (Ventura County Fire Department [VCFD] 2006). This fire burned an area south of the Watershed.

4.2.20 Unauthorized Activities

The primary unauthorized activities noted within the watershed for the 2000 Watershed Sanitary Survey concerned two parcels owned by Mr. Appel, who has a landscape and tree trimming business that he conducted from both properties. One parcel is located at 7870 Arnaz Road; the other is APN 061-0-150-015. The Appel tree trimming operation, which included on-site tree trimming storage near/in the river channel, and occasional earthwork within the Ventura River, had the potential to affect water quality by rerouting of the river. Stored tree trimming waste was also washed away from the site periodically by flooding. The Ventura County District Attorney's office prosecuted Mr. Appel in 1996. He was convicted and put on three years probation (People vs. Appel 51CALAP4th 495, Case No. 3CR36644). This case is considered closed.

He was also prosecuted on civil charges by the U.S. Attorney's office. The court ordered Mr. Appel to complete a remediation program. During 2000, the Ninth Circuit reversed the Federal ruling on appeal and sent it back for a rehearing at the trial court. Current status of this civil case was not available.

Unauthorized storage of waste materials and building supplies within the floodplain may or may not continue in the future.

4.2.21 Abandoned Landfill and Transfer Station

One waste transfer station is at the eastern side of the Highway 150 bridge crossing of the Ventura River. The County has obtained a conditional use permit to run a green waste facility on that site (see photographs in Appendix A). A monitoring program was established by the permit

that requires groundwater monitoring to begin in 2006, and every three years thereafter (personal communication with Don Shepard, Ventura County 2006).

There are no other known active or abandoned landfills or transfer stations in the study area.

4.2.22 Underground Tanks

Many individuals and businesses, including gas stations, within the watershed continue to use underground storage tanks. Information about underground storage tanks is available at the VCEHD's web site. A list of business plan holders, hazardous waste producers, and underground storage tank sites (BWT List[2]) in Ventura County was developed from information at the website.

The VCEHD also maintains a list of closed underground tank sites. This list included 82 inactive underground tank sites located within or in the vicinity of the watershed (see Table A in Appendix G). These sites have been categorized as closed sites, which indicates that they have been cleaned up or retrofitted according to applicable clean-up procedures as directed by the RWQCB or the County of Ventura.

The BWT list also included 13 locations within or in the vicinity of watershed as "permitted" underground tank sites (see Table B in Appendix G).

A list of leaking underground fuel tank sites (LUFT) was also accessed at the Ventura County Environmental Health Departments web site. Fifty-eight (58) sites within or in the vicinity of the watershed were included on this list. These tanks have been identified as having been contaminated and requiring site assessment. Farm tanks are exempt from County Agency review and are handled by the RWQCB. Once the County confirms that the sites have been contaminated, the business or property owner must furnish the County with a work plan for site clean up. The Ventura County Tank Regulatory Department is in charge of tank inspection and permitting of tank operation, abandonment, and installation/removal. The list characterizes these sites as currently undergoing preliminary site assessment, site characterization, remedial action, or as being closed. The majority of these tanks within the watershed are listed as closed (see Table C in Appendix G).

4.2.23 Hazardous Waste and Business Plan

The VCEHD requires companies handling 55 gallons, 500 pounds, or 200 cubic feet or more of hazardous materials to obtain a special business plan. The business plan identifies how the hazardous materials are handled onsite, how much material is handled at any time, how it is stored, where storage is, and procedures to be used in case of emergencies. A listing of 81 business plan holders within or in the vicinity of the watershed was included on the BWT list (see Table D in Appendix G).

[2] BWT List: The Business Plan, Hazardous Waste Producers, and Operating Underground Tanks Site Address List indicates by site address whether EHD has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) Information.

4.2.24 Hazardous Waste Generators

The current BWT list also includes 55 sites within or in the vicinity of the watershed considered hazardous waste generators. A hazardous waste generator is defined as any business generating materials that have been categorized as hazardous by the Title 22 Code of Regulations (see Table E in Appendix G). There is no information at this time to suggest that any of these hazardous waste generators have caused a surface water quality problem.

4.2.25 Solid, Liquid and Hazardous Waste Sites

A listing of the inactive hazardous material sites (BWT list) is provided in Table F in Appendix G. The permanent HHWCF in the watershed is still operable and discussed in Section 4.2.27.

4.2.26 Toxic Waste Sites

The Department of Toxic Substances Control (DTSC) maintains an automated database, known as "CalSites," that contains information on properties in California where hazardous substances have been released, or where the potential for such a release exists. The DTSC "CalSites" database was accessed to update the list of toxic waste sites in the watershed involving contaminated onsite soils or shallow groundwater contamination problems. Three sites that were identified in the previous report remain on the CalSite list; two have been referred to other agencies by the DTSC, and one is characterized as needing No Further Action (NFA). In 2000, a forth site in the watershed was identified, the Nordoff High School Expansion site (see Table 4-3). The Phase 1 Environmental Assessment conducted for the site was reviewed by DTSC and a No Action (NA) determination was made for it. There is no further information to show that any of these four sites has caused a surface water quality problem within the watershed.

TABLE 4-3
TOXIC WASTE SITES

CalSite Facility	Category[(a)]
Farmont Corporation, Off Hwy 150 at Rancho Matilija, Ojai	REFRW
Corpus Paving, 1370 South Rice Road, Ojai	REFOA
O.W. Stovall, 505 Prospect Street, Oak View	NFA
Nordoff High School Expansion, 1401 Maricopa Hwy, Ojai	NA

Note:
(a) REFRW – referred to Regional Water Quality Control Board
REFOA – referred to other government agency
NFA – no further action
NA – no action

4.2.27 Permanent Household Hazardous Waste Collection Facility (HHWCF)

The HHWCF in operation, located within the Ventura River watershed next to the Avenue WTP. The City is implementing the Avenue WTP replacement project to remove the open basins that

had a potential risk of hazardous material entering the basins. The operation of the facility is limited to monthly deposits of household hazardous materials and appointments are requested so as to limit the potential for spills or misplacing the wastes.

There have been no changes in operations from 2000 to 2005 for this facility; nor are there any spills or violations of significance to report (personal communication, Don Sheppard, Ventura County E&ERD).

4.2.28 Urban Area Runoff and Industrial Waste Discharges

Urban and industrial runoff is regulated under the NPDES. The RWQCB permit for Ventura County Stormwater Discharges, NPDES Permit No. CA-S004002, dated August 2000, is attached as Appendix H. This permit expired on July 27, 2005. A new permit is planned to be available in Summer 2006.

4.3 Significance of Actual and Potential Contamination Sources

4.3.1 Significant Improvements in Actual and Potential Contamination Sources

During the 2000 to 2004 period, there were some significant changes that reduced the actual and potential contaminant sources within the Ventura River and San Antonio Creek watershed study area. Significant positive changes include:

- OVSD installing siphon crossings of the Ventura River (2003) and San Antonio Creek (2005-6)
- OVSD Emergency Response Plan
- Horse Manure control efforts by the Ventura County Environmental and Energy Resources Divisions, and the Storm Water Quality Monitoring Program.
- Closing of the Honor Farm
- Successful operation of the permanent HHWF

4.3.2 Significant Actual and Potential Contamination Sources

Based on the information summarized above, it is the opinion of Kennedy/Jenks that the following potential contaminant sources the watershed may be significant from a water quality perspective:

<u>Actual Contamination Sources</u>

- Horse manure stockpiles

- Septic tanks in Casitas Springs and the Burnham Road corridor

- Illegal activities such as dumping in the river or storm drains

Potential Contamination Sources

- Sediments from Matilija Dam. The expected sediment, either from natural erosion during floods or the slurry pipeline project proposed by the USACE, poses a direct challenge to clogging the subsurface diversion, and the function of recharge and extraction by the City's Nye Wells, the wells of the Ventura River County Water District, and Meiners Oaks Water District.

- Oil wells and tanks. These have emergency plans to keep oil from waterways, so only if those fail oil affect the water sources.

- Gas utility pipelines. These are also covered by emergency plans, so are only potential problems if the emergency plans fail.

Section 5: Watershed Control and Management Practices

This section summarizes updates since 2000 to the watershed management practices that are used by the private entities and public agencies that exercise any watershed controls within the Ventura River/San Antonio Creek watershed. Control measures discussed in this section are those that may impact the water quality of the watershed. The categories of watershed management programs and practices described in 2000 are included in the descriptions below. The changes are summarized and updates to those categories are discussed. The 2005 status of recommendations made in 2000 is discussed in Section 2.

This section focus on control and management practices that affect surface water supplies. The delayed but potential effects of groundwater from its interface with surface water have not been ignored. In this and the previous Sanitary Surveys, issues of groundwater contamination of hazardous materials, leaking underground tanks, septic tanks are discussed because they have the potential to affect what becomes surface flow at Foster Park. Reviews were made for the groundwater monitoring by the Ventura River County Water District, Meiners Oaks County Water District and the Ojai Groundwater Management Agency.

5.1 Watershed Management Practices and Programs

There are a number of different programs that monitor the water quality in the watershed. The active management practices and monitoring programs during 2000 through 2004 are described below and in more detail about the monitoring programs in Section 7. An overview of the existing monitoring data from these efforts is also in Section 7 and included in the Los Angeles RWQCB State of the Watershed report, provided as Appendix K.

5.1.1 Toxic Substances Monitoring Program

The State Toxic Substances Monitoring Program is a program to assess the quality of waters throughout the state. Fish, other organisms, and sediment are collected and analyzed for metals and organic chemicals (primarily pesticides). Sampling in the watershed has occurred in:

- Ventura River mainstem downstream of the OVSD discharge for metals and organics in 1993, 1998, 1999, 2000, and 2001
- Ventura River mainstem upstream of the Ojai plant discharge for metals and organics in 1998, 1999, 2000, and 2001

5.1.2 Ojai Valley Sanitary District

OVSD has taken steps to manage its operations and effects on the watershed. OVSD has implemented system maintenance and improvements, such as siphon crossings of the Ventura River and San Antonio Creek and I&I management.

OVSD has a monitoring program for its system and outfall. A receiving water monitoring program is implemented by Ventura County Stormwater Monitoring and the Ventura River

Stream team. The monitoring supports compliance evaluation, nonpoint source identification, and potential Total Maximum Daily Load (TMDL) development.

OVSD currently monitors for a broad array of conventional pollutants as well as bacterial indicators at eight sites in the main stem, as well as in San Antonio Creek and Canada Larga.

5.1.3 California Department of Water Resources

The Department of Water Resources (DWR) monitors minerals and conventional pollutants at few locations on the main stem as well as on Matilija Creek below the dam.

5.1.4 Casitas Municipal Water District

The CMWD produces an Annual Water Quality Report for their customers that provide water quality information about Lake Casitas and Mira Monte wells for general, bacteriological, organic chemicals, radiological parameters.

The CMWD also monitors in the main stem Ventura River, Lake Casitas, and in tributaries leading into and out of the lake for total and fecal coliform as well as minerals. Methyl Tertiary Butyl Ether (MTBE) is also monitored in the lake.

5.1.5 Ventura County Watershed Protection District

The current Stormwater NPDES permit adopted in 2000 includes a monitoring and reporting program which requires monitoring at mass emissions stations in the County and more specifically requires bioassessment monitoring in the Ventura River. The mass emissions site was established on the Ventura River mainstem at Foster Park west of Highway 33, on the south side of Casitas Vista Road, just west of Foster Park Bridge. This site was sampled three times during Spring 2001 during wet weather for conventional pollutants, metals, bacterial indicators, pesticides, semi-volatiles, and chronic toxicity. The bioassessment program shall include an analysis of the community structure of the instream macroinvertebrate assemblages in urban runoff-impacted stream segments at experimental sites. The County began monitoring fifteen such sites in Fall 2001 on a watershed-wide scale. Many sites will overlap with water quality monitoring sites of the Ventura River Stream team sponsored by the Santa Barbara ChannelKeeper.

5.1.6 City of San Buenaventura

The City Planning and Public Works Departments actively participate in City water supply policy and planning, and well as in interagency studies of the watershed.

The City has multiple monitoring programs in and for the Ventura River supply:

1. Source water monitoring (Title 22): Includes water sources and the distribution system. These results are reported to DHS and the public in the Consumer Confidence Reports.

2. Watershed monitoring: developed after the 2000 Sanitary Survey, monitors locations in the watershed on a weekly, monthly, or annual basis; for conventional pollutants,

minerals, coliform, and metals. The watershed program is meant to provide early warning of contamination plumes and provide baseline data for new treatment regulations described in Section 6.

3. Avenue WTP operations – monitoring of the process at various points to check the plant operations.

5.1.7 Ventura River Stream Team

The Santa Barbara ChannelKeeper, in conjunction with the Regional Board, VCFCD, the City, and the OVSD, started a Ventura River Stream Team to conduct a watershed-wide water quality monitoring program which began in 2001. Fourteen sites are monitored for conventional pollutants and bacterial indicators under this program. The group is pursuing additional funding to continue the effort as well as conduct additional work relating to habitat conditions.

5.2 County General Plan Policies

Ventura County continues to have land use and building permit authority throughout the watershed, with the exception of the area designated as the Los Padres National Forest and the City of Ojai. Other jurisdictions in the watershed include the Los Padres National Forest and the CMWD. Most of the unincorporated Ventura River/San Antonio Creek watershed is covered by the Ojai Valley Area Plan, which constitutes a portion of the Ventura County General Plan. The Ojai Valley Area Plan and Ventura County General Plan have both been amended since 2000 as follows in Table 5-1:

TABLE 5-1
OJAI VALLEY AREA PLAN AND VENTURA COUNTY GENERAL PLAN

Document Title	Date adopted or last amended
Ventura County General Plan	
Goals, Policies and Programs	01-27-04
Resources Appendix	09-19-00
Hazards Appendix	01-27-04
Land Use Appendix	06-19-01
Public Facilities and Services Appendix	03-26-02
Ojai Valley Area Plan	11-19-99

Aspects of General Plan Policies with particular bearing on watershed management and control are land use/population, sewage disposal, storm water regulations, and transportation.

Regarding land use and population, the majority of the watershed is zoned open space, agricultural, or low density residential. Land use goals include limiting growth to already established urban and rural residential areas. Land use policies include provisions to minimize environmental degradation while providing developable land to serve the needs of valley residences in terms of residential, commercial, industrial, and open space land uses.

These plans and policies have not changed significantly since the 2000 Sanitary Survey.

5.3 Federal Agency Plans and Policies

No known major changes. According to the LARWQCB (2002) the Los Padres National Forest staff is planning on a comprehensive watershed analysis within their jurisdiction, focusing first on the Sespe Watershed and then the Ventura River Watershed. Part of the analysis will focus on impacts from forest fires, recreation, and road construction, all of which affect water quality within the watershed.

5.4 Wastewater Discharge Requirements

Effective August 2003, the RWQCB eliminated monitoring stations R1, R2, R6, R7, and R8 from the OVSD's NPDES monitoring program because sufficient data was being collected by other programs such as: the City's Ventura Stream Team, and VCWQMP (OVSD, letter dated January 11, 2006). A copy of OVSD's 2003 NPDES permit is included as Appendix I.

Wastewater Discharge Requirements are specified in the Ventura Countywide Stormwater NPDES Permit. A listing of the other NPDES permits within the Ventura River watershed is provided as Appendix J.

5.5 Storm Water Regulations

The Ventura River/San Antonio Creek Watershed is covered under the Ventura County Stormwater Quality Management Program (VCWQMP); the 2004-2005 Annual Report is included as Appendix L. Under this program, the County of Ventura, the VCWPD, and the cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley, and Thousand Oaks are jointly responsible as Co-Permitees under Order No. 00108 of NPDES Permit No. CAS004002 for the Waste Discharge Requirements for Stormwater Management Urban Runoff Discharges. Provisions of this permit are included in Appendix H. This permit was granted to the VCFCD in August 2000, with the other jurisdictions listed as "Co-Permitees." This permit expired in July 2005. A new permit will be available in Summer 2006.

5.6 Lease Agreements

The Ventura County GSA reported that there are currently no lease agreements in the study area.

In 2005, a determination was made to protect all roadless areas in Los Padres National Forest from oil and gas development (USDA Forest Service 2005). The determination concluded a 10-year study of the national forest's oil and gas resources and leasing potential. As part of that decision, leasing would be prohibited on 715,000 out of the total 767,000 acres studied. Of the remaining 52,000 acres that will be available for leasing, approximately 48,000 acres will be available only with a strict "no surface occupancy" stipulation; meaning no development or disturbance whatsoever of the land surface. Oil and gas resources would have to be accessed through directional or slant drilling from national forest lands where development is allowed or from nearby private lands. While the Watershed is not susceptible to leasing of oil and gas

reserves, this decision does help to protect the overall water quality in the region from future development of such resources.

5.7 Recreational Activities and Policies

There are no known changes to recreational activities and policies within the study area.

5.8 Erosion Control/Soil Management Policies

The Ventura County Resources Control District administers the County's Hillside Erosion Program (Program). The Program establishes minimum standards and regulations for construction and maintenance of fill, excavation and grading within new developments. There are no known changes to erosion control/soil management policies related to the Program.

5.9 Fire Management

There are no known changes to fire management policies within the watershed.

5.10 Hazardous Waste

There have been no changes with regard to hazardous waste operations from 2000 to 2005; nor are there any spills or violations of significance to report (personal communication, Don Sheppard, Ventura County E&ERD).

5.11 Septic Tank Regulations

Currently the Ventura County Environmental Health Division has the authority to deny building permits for new construction or remodeling if there are not adequate conditions for septic systems.

Proposed changes in the septic system regulations, also called "On-site Wastewater Treatment Systems" (OWTS), are being studied in an EIR process, and final regulations are expected in October 2006. The regulations in their current form would increase pretreatment requirements, groundwater monitoring, and setback distances required. The relative costs of a septic system will increase. The new regulations are aimed at protecting groundwater quality as well as surface water quality (SWRCB, 2006).

5.12 Agricultural Runoff

The Los Angeles Regional Water Board has been engaged in a lengthy process to develop a Conditional Ag Waiver for discharges from irrigated lands. On November 3, 2005, the Regional Board adopted the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region (Order No. R4-2005-0080). The waiver applies to all irrigated lands in Los Angeles and Ventura counties and will affect several thousand growers. Any grower who owns or conducts irrigation operations and from which a discharge occurs is covered by the waiver (note: the definition of a discharge is very broad and includes

percolation to groundwater and stormwater runoff). Growers must register with the Regional Water Board by filing a notice by August 3, 2006.

Growers will have the option of complying with the waiver on an individual basis or as part of a group of other growers (called a discharger group). Few growers are expected to register for individual coverage since the obligations on a single grower will be extensive and expensive to implement. The Ventura Farm Bureau and the Ventura County Agricultural Water Quality Coalition are preparing a group monitoring plan and associated documents that are required to be submitted in August 2006.

Once water quality monitoring plans are approved, water quality data will begin to be collected. Additional monitoring will be required to localize the source from which the impairment is originating. Once a source is identified, best management practices will need to be implemented in an effort to remove the impairment to water quality. Non-compliance with the notice provision of the waiver is a violation and can subject growers to enforcement.

5.13 Water Agency Coordination Measures

This split jurisdiction between the City and the planning agencies means that interagency coordination is necessary for this watershed. The City continues to be the only major water agency directly using surface water collected from the Ventura River Watershed between their Foster Park diversion and CMWD's Los Robles diversion. Ventura County has local planning jurisdiction over about fifty percent of the Foster Park diversion watershed. The northern portion of the watershed is under the jurisdiction of Los Padres National Forest. The City of Ojai is the third entity with local planning jurisdiction.

Long-range plans for the Los Padres National Forest do not call for significantly altering the land use within the federally owned watershed. As stated above, the Los Padres National Forest intends to complete a comprehensive watershed analysis within their jurisdiction, on the upper Ventura River Watershed.

Overall there continues to be consistency among allowable land uses throughout the watershed (predominantly open space) and the goal of preserving water quality.

There were five major developments in interagency coordination since the 2000 Sanitary Survey:

Matilija Dam Ecosystem Restoration Project: The Feasibility Study (2004) and Environmental Impact Statement (2004) by the U.S. Corps of Engineers, VCWPD, and others created a forum to address many of the Ventura River water supply sediment, and flooding issues. Matilija Dam Project objectives were to (1) improve aquatic and terrestrial habitat, to benefit fish and species along Matilija Creek and the Ventura River, (2) restoration of hydrologic and sediment transport regime in support of downstream coastal beach sand replenishment to pre-dam conditions, and (3) enhancement of recreational opportunities along Matilija Creek (including U.S. Forest Service land) and the downstream Ventura River system. Numerous study subcommittees were formed to support the Project, providing for a wealth of information and understanding about the watershed.

LAFCO Study: The Ventura Local Agency Formation Commission (LAFCO) is the boundary agency for cities and most special districts in the orderly formation and expansion of local government agencies, preserve agricultural land resources, and discourage urban sprawl.

In 2003, Ventura LAFCO conducted municipal service reviews on water and wastewater agencies within Ventura County. In this regard, the Ventura LAFCO seeks to encourage; one report focusing on agencies within the Ventura River watershed (Ojai-Sa Buenaventura service review) (Ventura LAFCO 2003). The reviews were intended to promote more efficient services, to identify areas of improvement and to assess service provisions. In general, that report concluded that the agencies in the Ojai-San Buenaventura service review are providing efficient water and wastewater services, with some room for improvement with regard to growth and population projections.

City of Ojai Urban Watershed Assessment and Restoration Plan: In 2005, the City of Ojai, with funding from the California Department of Fish and Game, prepared a comprehensive assessment and restoration plan for the watersheds that drain into the City limits. The primary purpose of the Plan was to identify specific problems of the Ojai creeks relevant to Steelhead Trout, and to develop a plan to restore fish habitat and to address the land use issues that adversely affect the habitat and the ecological health of the watersheds (see Appendix N for more detail on the Plan).

Ventura River Habitat Conservation Plan (HCP): Eleven different agencies within the Ventura River watershed are collectively involved in an HCP planning process to prepare a GIS database for the Ventura River watershed, to conduct steelhead habitat and passage studies on San Antonio Creek and North Fork Matilija Creek, and to provide public education and outreach activities within the watershed. See Appendix V for more details of the HCP.

Ventura County Integrated Regional Watershed Planning: The Integrated Watershed Protection Plan (IWPP) was formed by VCWPD. This is long-range planning effort that has the following objectives: (1) to provide a systematic process for the inclusion of projects into the VCWPD's Capital Improvement Plan over its five-year planning period, and (2) to improve the long-range VCWPD planning process for the 20-year period subsequent to the Capital Improvement Plan by allocating projected revenues to identified projects. The IWPP also provides a Level-of-Service evaluation that identifies the need for additional project funding to achieve desired flooding mitigation goals.

The VCWPD is broken up into four zones; Zone 1 follows the boundaries of the Ventura River watershed and is the relevant zone for this Sanitary Survey. Benefit assessment monies collected from each zone are dedicated to support activities within that zone.

Table 5-2 lists some of the projects planned for the Ventura Rivers watershed Zone 1 (see Appendix M for more detail on the IWPP for Zone 1).

TABLE 5-2
IWPP VENTURA RIVER WATERSHED ZONE 1 PROJECTS

Project Name	Location	Problem Description	Preliminary Solution
Canada Larga Channel Improvements	North of Ventura, Zone 1	The Creek shortcut Canada Larga Road during Jan. 2005 storm. Overbank flooding caused agriculture and property damages.	Make the short cut permanent. Excavate 1,500-foot long channel and/or build levees.
Coyoto Creek (Red Mountain Canyon) Debris Basin	0.5 mile downstream of Casitas Dam, Zone 1	Excessive debris and sediments fill coyote creek and causing flooding to residents along the creek.	Routine maintenance to clean out debris bushes in the stream, enforce floodplain management regulations, build a debris basin at the mouth of Red Mountain Canyon to hold approximately 10,000 cubic yards sediment.
Coyote Creek Right-of-Way	City of Ventura, from Santa Ana Road to Ventura River along Coyote Creek	Need right of way or easement to get adequate access for needed repairs and future maintenance.	Right of way acquisition.
Dron Creek Detention/Debris Basin	City of Ojai	High Debris Bulking Factor (1.67), very high sediment yield fill existing channel and cause flooding.	Construct debris basin(s) in the canyon(s) north of Gridery Road. Additional feasibility study will be required to develop a detailed design concept and to determine the potential for causing erosion in the downstream channel.
Howard Ave. Drain	Skyline Area in Oakview	No access road to maintain the earth channel.	Extend 36-inch pipe from Howard Ave. upstream 1,060 feet to Brandt Ave. within existing 12-foot wide easement.
Ojai Basin Safe Yield Study	East Ojai, Zone 1	Increasing groundwater demand from the City of Ojai and the removal of Matilija Dam, requires a better understanding of the resources.	Conduct a demand and supply study to determine the safe yield of the Ojai Basin along with the demands.
Other Thatcher Creek Flood Mitigation Projects	East of Ojai	Thatcher Creek is, in general, inadequate in passing 100-year flood flows. Steep channels also bring down significant amounts of sediment.	Modeling study needs to be carried out, system deficiency be identified, and projects be implemented.

Section 6: Water Treatment Regulations

One element of this watershed sanitary survey includes an assessment of the City's compliance with existing/future regulations as they relate to the City's Avenue WTP and the impacted water distribution system. This assessment applies to the existing WTP and the proposed modified/improved plant. This assessment does not include operations of City wells, existing wellhead treatment facilities, or the purchase of fully treated surface water from CMWD. This section discusses the drinking water quality regulations relevant to the City's surface water supply. The section presents the current regulations, as well as regulations being developed. A listing of the current Federal and State water quality standards can also be found in Appendix U. In addition, this section will include a summary of the City's monitoring program.

6.1 Background

The City completed an in-depth evaluation of the Avenue WTP (Kennedy/Jenks 1999), which included issues other than treatment plant capacity/plant performance. These additional issues included source water improvements on the Ventura River such as discontinuing the surface intake and drilling more shallow wells. The City Plan (1999) included numerous recommendations intended to improve the existing treatment plant in terms of both capacity and treatment efficiency.

6.1.1 Existing Treatment Plant

The existing Avenue WTP is a conventional filtration plant with a capacity of 15 MGD. The chemicals currently being used in the treatment process include gaseous chlorine, 48 percent liquid alum (approximately 4 mg/l), polymers, and blended polyphosphate for corrosion control. Corrosion control treatment is used at all times. The existing plant is to be replaced and improved in the near future by addition of submerged ultrafiltration membranes. This is expected to be complete in July 2007. DHS is aware of the proposed improvements, and approved a State revolving fund loan based on the compliance with cryptosporidium removal and the LT2ESWTR.

Kingston Reservoir (an uncovered raw water storage facility) has a capacity of 10 MG. There are two flocculation basins, two sedimentation basins, and three rapid sand gravity filters at the Avenue WTP. Power Reservoir (a covered treated water storage reservoir that functions as a clearwell) and chlorine contact facility has a capacity of 16 MG. Chlorine can be applied at four different plant locations.

The pressure zones influenced by the Avenue WTP are as follows: Zones 210, 260, 400, 430, 466, 599 and 605. In the past, CMWD water has been discharged into Kingston Reservoir during low demand periods for re-treatment to prevent taste and odor or other water quality issues. During high demand periods, CMWD water is conveyed directly into the City's distribution system (zones 210, 260, and 400/260R). The CMWD chloraminates their water for disinfection by-product control. The City provides chloramination of their water to make the water sources compatible and to continue controlling excessive disinfection by-product formation in its own water sources and in the water purchased from CMWD.

6.1.2 Proposed Treatment Plant

The City initiated construction of the Avenue WTP improvements in June 2005 with completion anticipated in July 2007. Improvements include constructing a new 10 MGD ultra filtration plant to replace the existing 15 MGD conventional plant. The City's proposed new membrane filtration treatment process will remove suspended solids from the source water through a physical straining process using Zenon 1000 series submerged membranes. The ultrafiltration process produces a higher quality of filtered water than the conventional treatment process with fewer chemicals. The improvements to the Avenue WTP also include filtration and disinfection of the recycled filter backwash water to meet the objectives of the California Cryptosporidium Action Plan (CAP) and the Filter Backwash Rule. The improvements to the Avenue WTP will increase the reliability of the system to provide safe drinking water.

Abandonment of the river's surface water intake and using only shallow subsurface river flow is expected to result in a raw water influent flow containing a turbidity of less than 10 NTU at all times and provide raw water with much lower coliform bacteria densities, thus reducing the overall treatment requirements.

Ultrafiltration membranes will use a vacuum driven (immersed type) membrane separation process that separates particulate matter from the source by physical straining. Approximately every 45 minutes to 60 minutes, the membranes will perform an automatic backwash cycle for a period of 1 to 2 minutes to discharge captured solids. Chemical coagulation will not be required for turbidity and particulate removal, therefore the spent washwater will typically contain only concentrated solids removed from the source water.

Spent washwater, containing water and solids (e.g., silts from the Ventura River), will be captured in washwater recovery basins (WWRB). At an average source water turbidity of 0.2 NTU, the spent washwater turbidity will be approximately 2 NTU, and at the maximum source water turbidity of 1 NTU, the spent washwater turbidity will be approximately 15 NTU. Small amounts of sodium hypochlorite (5 to 10 mg/l) and/or citric acid or caustic soda may be added periodically to the washwater supply to the membranes to suppress bio-fouling and possible scaling.

6.2 Current Regulations

This section provides a summary of the current rules and regulations governing drinking water quality. Those discussed include the following:

- Total Coliform Rule
- Lead and Copper Rule
- Information Collection Rule
- Surface Water Treatment Rule
- Cryptosporidium Action Plan
- Stage 1 Disinfectants and Disinfection By-Products Rule
- Interim Enhanced Surface Water Treatment Rule
- Long Term 1 Enhanced Surface Water Treatment Rule

- Stage 2 - Disinfectants and Disinfection Byproducts Rule
- Long-Term 2 Enhanced Surface Water Treatment Rule

6.2.1 Total Coliform Rule

The Total Coliform Rule (TCR) requires stringent control and/or reduction of pathogenic bacteria in distributed water (Federal Register, 1989). Coliforms are found in human and animal wastes, as well as in soils. The presence of coliforms, which may not necessarily be disease causing, often indicates that gastroenteric infection-causing organisms may be present. Therefore, coliforms are used as a surrogate for all potentially pathogenic bacteria because of prevalence, resistance, and relative ease of monitoring. The TCR established monitoring and sanitary survey requirements for surface water systems and monitoring for groundwater systems. Current regulations require that suppliers monitor water quality in the distribution system through a routine sampling program approved by DHS.

The City conducts daily in-house bacteriological testing using the presence/absence method at the City's WWTP lab and weekly testing by a certified laboratory (on Mondays). The unfiltered surface water sources are sampled weekly at Sampling Station 27 (the "flume"). At this location the river water is already mixed with the Nye well water and is still unchlorinated. There is also monthly bacteriological sampling of the individual Nye wells for total and fecal coliform bacteria.

The City provides adequate disinfection of the filtered water based on data from the plant effluent and distribution system. The City achieves compliance with the TCR. A summary of City water quality data is provided in Section 7.

6.2.2 Lead and Copper Rule

The Lead and Copper Rule (LCR) regulates excessive corrosion leaching of these toxic metals from pipe materials, including service piping and customers' on-site piping. (Federal Register, 1991) The LCR establishes action levels (AL) for lead and copper in treated water collected from likely customer taps in first-draw samples following overnight stagnation.

Lead solder and copper tubing are common materials used in household plumbing and/or customer service connection pipe. Lead and copper are soluble in water and can be leached from pipe, solder and/or fixtures under corrosive water quality conditions. The presence of these metals in drinking water, especially lead, can cause adverse impacts on health, particularly in children. Lead is associated with retarding physical development and interfering with mental development.

The U.S. Environmental Protection Agency's (EPA's) Lead and Copper Rule is intended to protect the public not just from the water delivered to the consumers' service pipe connection, but also after it has flowed through the consumers' plumbing to the tap. The LCR establishes action levels to be lower than 0.015 mg/l for lead and 1.3 mg/l for copper in at least 90 percent of the most likely consumer tap samples in first draw samples after overnight stagnation. Sampling must also be conducted at points of entry (POE) to the distribution system to verify that lead and copper in the source of supply do not exceed the USEPA criteria.

The City's consumer tap sampling program conducted to date achieves compliance with the 90th percentile action levels for copper (1.3 mg/l) and lead (0.015 mg/l). A summary of City water quality data is provided in Section 7.

6.2.3 Information Collection Rule

The Information Collection Rule (ICR) was a key element in the USEPA's Microbial/Disinfection Byproducts (M/DBP) Regulatory Negotiation (Reg-Neg) process and was intended to provide more definitive information on specific source water quality, microorganism contaminants and treatment process performance including disinfection by-product generation. (Federal Register, 1996) This federal regulation required most public water systems serving more than 100,000 people to collect data on their source and treated water and provide these data to the USEPA for evaluation.

The City was not required to participate in this data collection program because at the time the water system served less than 100,000 persons.

6.2.4 Surface Water Treatment Rule

The Surface Water Treatment Rule (SWTR) was implemented to provide protection against Giardia cysts and pathogenic enteric viruses. The federal SWTR requires that the water treatment process achieve a minimum of 99.9 percent (3-log) removal and/or inactivation of Giardia cysts and 99.99 percent (4-log) removal and/or inactivation of enteric viruses. This must be accomplished through a combination of physical removal and disinfection. The DHS generally requires that the water treatment process provide the minimum removal and/or inactivation requirements for Giardia and viruses in the federal SWTR (99.9 percent (3-log) for Giardia cysts and 99.99 percent (4-log) for viruses).

A well-designed and operated "conventional filtration treatment plant," can receive credit for at least 99.7 percent (2.5-log) removal of Giardia cysts and 99 percent (2-log) removal of enteric viruses. These removal credits currently require that the filtered water turbidity be less than or equal to 0.5 NTU for at least 95 percent of the measurements taken each month. Disinfection must be used to achieve the rest of the combined removal-inactivation requirement. This requires providing 68 percent (0.5-log) inactivation of Giardia cysts and 99 percent (2-log) inactivation of enteric viruses via disinfection.

The DHS, with regulatory primacy in California, regulations include a daily average filtered water turbidity requirement of 0.2 NTU for water treatment plants that were new or upgraded after 5 June 1991. The SWTR also requires that systems demonstrate, by monitoring and recording, that they continuously maintain a disinfectant residual of at least 0.2 mg/l in water delivered to the distribution system.

Raw, in-plant, and filtered water turbidities are monitored at Avenue WTP as required. Maximum allowable gravity filtration rates (up to 6.0 gpm/ft^2) are complied with, as are the Maximum Contaminant Levels (MCLs) for filter performance of water being conveyed from the filters into Power Reservoir.

Each of the three filter units, and the blended filter water, is equipped with a continuous analyzer. A particle counter is provided in the plant. The final turbidity analyzer is equipped with a 0.3-NTU alarm set point. When Kingston Reservoir effluent turbidities are high (over 10 NTU), the river water is not used.

After filter backwashing, each filter is automatically wasted for 10 minutes or until the effluent has a turbidity of not more than 0.1 NTU. Until this turbidity level is achieved, the filtered water is not allowed to enter the clearwell (Power Reservoir).

The filter backwash water is recovered. Sedimentation is the only treatment provided at this time for this recovered water. In the past, DHS has noted that the returned filter backwash water has averaged 4 to 5 NTU in turbidity and that this turbidity level exceeds their 2 NTU guideline. This finding, however, does not appear to have significantly impacted filtration plant performance.

The City achieves compliance with the SWTR. A summary of City water quality data is provided in Section 7.

6.2.5 Cryptosporidium Action Plan

The DHS developed the Cryptosporidium Action Plan (CAP) in response to increased public health concern regarding the protozoan pathogen *Cryptosporidium* parvum. The return of spent filter backwash water and sedimentation basin waste solids has been shown in several studies to contain significantly higher particle concentrations than many source water supplies. Blending these high-risk recycle streams with the source water stream is a particular concern.

The CAP established new turbidity goals for settled water, filtered water, and return water. The settled (clarified) water turbidity goal includes settled water turbidity between 1 and 2 NTU at all times. The filtered water turbidity goals include a 0.1 NTU goal for both individual filters beginning 4 hours after a filter backwash and for the combined filtered water from all the filters at all times, and a 0.3 NTU goal for individual filters within 4 hours following a filter backwash. The CAP also includes a return (recycle) water turbidity goal set at 2.0 NTU.

To comply with the goals of this plan, the City will limit the recycled water return rate to no more than 5 percent of the raw water flow rate and to improve the treatment provided for the recycled water to achieve a turbidity of not more than 2.0 NTU. The return point will be moved upstream of Kingston Reservoir to take advantage of the additional disinfection and settling benefits. These changes will be included in the Avenue WTP improvements currently under construction.

The City has performed raw water sampling for *Giardia* and *Cryptosporidium* at numerous raw water and treated water locations. The data obtained do not indicate detectable levels of *Giardia* and/or *Cryptosporidium* cysts.

The City achieves compliance with the CAP. A summary of City water quality data is provided in Section 7.

6.2.6 Stage I Disinfectants/Disinfection By-Product Rule

The Stage 1 Disinfectants and Disinfection By-Products Rule (DBPR) was published in the Federal Register on 16 December 1998. The Stage 1 DBPR set new MCLs for selected disinfection by-products, and established maximum residual disinfectant levels (MRDLs) and treatment techniques for control of DBP precursors (DBPPs). The Stage 1 DBPR regulated both oxidants that are used for disinfection and the chemical compounds formed when the oxidants used to disinfect microbial contaminants in drinking water react with organic and inorganic compounds in the source water. Disinfectants include ozone, chlorine dioxide, chlorine, chloramines, and ultraviolet light (UV) radiation. Surface water systems supplying more than 10,000 people were required to comply with this rule beginning 2 January 2002.

The Stage 1 DBPR revised the THM MCL, created a new MCL for HAA5, and also included MCLs for bromate and chlorite as part of the new regulations. The Total THM (TTHM) MCL was reduced from 0.1 mg/l (100 µg/l) to 0.080 mg/l (80 µg/l). The HAA5 MCL was set at 0.060 mg/l (60 µg/l). The bromate MCL was set at 0.010 mg/l (10 µg/l) and the chlorite MCL was set at 1.0 mg/l. In addition, the Stage 1 DBPR included maximum contaminant level goals and MRDLs for chlorine, chloramines and chlorine dioxide.

Based on the alkalinity and TOC quality of the raw water, the filtration plant may be exempted from the enhanced coagulation requirements contained in the Stage I rule. The TOC of the raw water is generally less than 2 mg/l; however, the City should review TOC sampling and analysis since a few treated water samples exceeded 2 mg/l over the last 4 years.

The City provides chloramination disinfection of the treated effluent. Water purchased from the CMWD is also treated with chloramines. Chloramines reduce TTHM/HAA5 formation in the City distribution system and storage reservoirs. Chloramination treatment may require the maintenance of much higher total chlorine residuals. Use of chloramines may require the water system to be monitored much more extensively and frequently and require the overall water system and all of its components to be kept as clean and sanitary as possible. All of the above are necessary for maintaining a sanitary water distribution system free of significant nitrification-related problems. Several utilities already using chloramines to limit disinfection by-product formation have experienced serious bacteriological and physical water quality problems, mainly because they did not have a nitrification control plan. The City has developed a comprehensive nitrification control plan for the operations and facilities of the entire water system, including a careful review of the inlet/outlet arrangement of all major reservoirs.

This rule has an MCL for bromate of 10 µg/L. The City should consider requesting DHS to reduce bromine sampling of source waters since most samples were less than detection limits.

The rule also has MCLs for total chlorine residual (4.0 mg/l) and chlorite (1.0 mg/l), neither of which were exceeded in the City's plant effluent. In addition, the City implemented a treatment plant influent/effluent TOC sampling program. Sampling indicated values generally less than 2 mg/l for the plant influent and effluent.

The City achieves compliance with the Stage 1 DBPR. A summary of City water quality data is provided in Section 7.

6.2.7 Interim Enhanced Surface Water Treatment Rule and Long-Term 1 Enhanced Surface Water Treatment Rule

The Interim Enhanced Surface Water Treatment Rule (IESWTR), published in the Federal Register on 16 December 1998, required utilities to conduct raw water bacteriological sampling. This rule requires meeting lower treated water turbidity MCL of 0.3 NTU (from 0.5 NTU) 95 percent of the time. The Long Term 1 Enhanced Surface Water Treatment Rule (LT1-ESWTR) was published on 14 January 2002. The intent of the LT1ESWTR was to improve public health protection through the control of microbial contaminants, particularly *Cryptosporidium*, for public water systems that use surface water, or ground water under the influence of surface water, and serve fewer than 10,000 people. The intent of the Filter Backwash Rule (FBR) was to reduce the risk that contaminants removed in the pretreatment and filtration processes are not returned in the recycle water flow. The FBR, published in the Federal Register 8 June 2001, required large in-plant recycle streams to be blended with source water "prior to the point of primary coagulant addition." The City complies with the California CAP (see Section 7.2.5) which is more stringent than the FBR.

In general, the City's raw surface water samples (Station SC1) contains a total coliform bacteria level of less than 100 MPN/100 ml, though at times the levels have exceeded 1,000 MPN/100 ml. Fecal coliform testing indicated samples were generally less than 2 MPN/100 ml, with levels exceeding 5 only twice. Also, it is very important for the City to continue providing disinfection of the raw water as part of the treatment process, considering the fluctuating bacteriological quality of the river water. As previously discussed, the City's surface water diversion is not planned to be restored to service which should reduce raw water turbidity and coliform spikes. Total coliform bacteria levels at the sampling location following blending of the river water and water from the Nye wells (Kingston Reservoir) were much lower than at the river intake, perhaps due to dilution with the water from Nye wells.

The City achieves the turbidity MCL of 0.3 NTU (95 percent of the time) and the filter spiking allowances of less than 2.0 NTU, less than 1.0 NTU, and less than 0.3 NTU. This compliance also means that the Avenue WTP qualifies for the 2-log *Cryptosporidium* cyst removal credit, which is another requirement of the IESWTR. Improvements to the Avenue WTP will allow the City to continue to achieve this aspect of plant performance.

This rule requires that the City maintain minimum (measurable) chlorine residual in all parts of the surface water impacted distribution system. The City maintains minimum chlorine residuals of at least 0.2 mg/l within all parts of the system.

The City achieves compliance with the IESWTR and LT1ESWTR. A summary of City water quality data is provided in Section 7.

6.2.8 Stage 2 - Disinfectants and Disinfection Byproducts Rule

The Stage 2 - Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) was published in the Federal Register on January 4, 2006. The Stage 2 DBPR builds upon the Stage 1 DBPR (see Section 7.2.6) to address higher risk public water systems for protection measures beyond those required for existing regulation. The THM and HAA5 MCLs will be 80 µg/l and 60 µg/l, respectively. Compliance with the maximum contaminant levels for both TTHM and HAA5 will

be calculated for each monitoring location in the distribution system. This approach, referred to as the locational running annual average (LRAA), differs from current requirements, which determine compliance by calculating the running annual average of samples from all monitoring locations across the system.

In addition, the City will be required to conduct an "Initial Distribution System Evaluation" (IDSE) to identify the locations with high disinfection byproduct concentrations. There are four IDSE options: (1) standard monitoring, (2) conducting a system specific study and modeling requirements, (3) obtaining a 40/30 waiver, and (4) obtaining a very small system waiver. The IDSE will include sampling for THMs and HAA5 at locations of highest potential for disinfection byproduct formation. The IDSE results will not be used for compliance purposes.

Systems with a population between 50,000 and 249,999 using chloramines for oxidation and disinfection must collect samples at 16 locations during the IDSE. The 16 locations must include the following: 3 near the entry (connection) to the distribution system, 4 with an average residence time, 5 locations representing the highest TTHM concentrations, and 4 representing the highest HAA5 concentrations. These locations may be used by the systems as the sampling sites for future compliance monitoring with the approval of DHS.

The Stage 2 DBPR also requires each system to determine if they have exceeded an operational evaluation level, which is identified using their compliance monitoring results. The operational evaluation level provides an early warning of possible future MCL violations, which allows the system to take proactive steps to remain in compliance. A system that exceeds an operational evaluation level is required to review their operational practices and submit a report to their state that identifies actions that may be taken to mitigate future high DBP levels, particularly those that may jeopardize their compliance with the DBP MCLs. The operational evaluation includes an examination of system treatment and distribution operational practices, including changes in sources or source water quality, storage tank operations, and excess storage capacity, which may contribute to high TTHM and HAA5 formation.

The City must submit the IDSE plan by October 1, 2006. Then the City must complete IDSE monitoring by September 30, 2008, and submit the final report by January 1, 2009. The City must begin Stage 2 DBPR compliance monitoring by April 1, 2012.

6.2.9 Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)

The Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) was published in the Federal Register on January 5, 2006. The LT2ESWTR builds upon earlier rules to address higher risk public water systems for protection measures beyond those required for existing regulations. The purpose of LT2ESWTR is to reduce illness linked with the contaminant *Cryptosporidium* and other pathogenic microorganisms in drinking water. The LT2ESWTR will supplement existing regulations by targeting additional *Cryptosporidium* treatment requirements to higher risk systems. Current regulations require filtered water systems to reduce source water *Cryptosporidium* levels by 2-log (99 percent). Recent data on *Cryptosporidium* infectivity and occurrence indicate that this treatment requirement is sufficient for most systems, but additional treatment is necessary for certain higher risk systems. These higher risk systems include filtered water systems with high levels of *Cryptosporidium* in their water sources and all

unfiltered water systems, which do not treat for *Cryptosporidium*. This rule also contains provisions to reduce risks from uncovered finished water reservoirs and provisions to ensure that systems maintain microbial protection when they take steps to decrease the formation of disinfection byproducts that result from chemical water treatment.

Filtered systems serving at least 10,000 people must sample their source water for *Cryptosporidium*, *E*. *coli*, and turbidity at least monthly for 24 months. Systems may use previously collected (grandfathered) data in lieu of conducting new monitoring, and systems are not required to monitor if they provide the maximum level of treatment required under the rule. Systems must collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants. Systems that recycle filter backwash water must collect source water samples prior to the point of filter backwash water addition.

Filtered water systems will be classified in one of four treatment categories (or bins) based on their monitoring results. For calculating bin placement, a total of at least 48 samples need to have been collected; the bin concentration is equal to the arithmetic mean of all sample concentrations. For a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected. Systems classified in higher treatment bins must provide 1.0 to 2.5-log additional treatment for *Cryptosporidium*. Systems will select from a wide range of treatment and management strategies in the "microbial toolbox" to meet their additional treatment requirements. Systems classified in Bin 3 and Bin 4 must achieve at least 1 log of additional treatment using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV light.

The City must submit a sampling plan for the first round of source water monitoring for *Cryptosporidium*, *E*. coli, and turbidity (or notice of intent to use grandfathered data) prior to July 1, 2006, and begin source water monitoring by October 31, 2006. The City must submit all data and required information for grandfathering by December 1, 2006. The City must submit a *Cryptosporidium* treatment bin classification and supporting data for approval by April 1, 2009. The City must complete additional *Cryptosporidium* treatment requirements by April 1, 2012. The must submit a sampling plan for the second round of source water monitoring by January 1, 2015, and start monitoring by April 1, 2015. The City must submit a *Cryptosporidium* treatment bin classification and supporting data from the second round for approval by October 1, 2017.

6.3 Future Regulations

6.3.1 Ground Water Rule

USEPA's Science Advisory Board concluded in 1990 that exposure to microbial contaminants such as bacteria, viruses, and protozoa (e.g., *Giardia* lamblia and *Cryptosporidium*) was likely the greatest remaining health risk management challenge for drinking water suppliers. The proposed Ground Water Rule (GWR) will require, for the first time that all public water systems using groundwater supplies protect against disease-causing viruses and bacteria, such as E. coli. (Federal Register, 2000c) This rule also applies to any system that mixes surface and ground water if the ground water is added directly to the distribution system and provided to consumers without treatment. The GWR provides a strategy for identifying risks of fecal

contamination and establishes multiple barriers, including sanitary surveys and disinfection, to protect public water systems that include groundwater sources. Universal disinfection of all wells is not expected; however, USEPA is expected to require all vulnerable water systems to disinfect. Treatment will require 4-log (99.99 percent) virus removal/inactivation. In order to obtain a 4-log virus removal/inactivation, USEPA is expected to list ultraviolet light, ozone, and ultrafiltration as alternative best available technology. The USEPA has not released a revised schedule for a final rule.

6.3.2 Radon Rule

The proposed Radon Rule was scheduled to be promulgated in 2001, but has not been finalized yet. Radon is a naturally occurring radioactive gas that may cause cancer, and may be found in drinking water and indoor air. Radon-222 is an inert, noble gas formed from the radioactive decay of radium-226, as part of the uranium-238 decay series. The proposed Radon Rule includes a radon MCL of 300 pCi/l. A higher alternative MCL (AMCL) at 4,000 pCi/l is possible if the primacy agency or a public water purveyor implement a Multimedia Mitigation (MMM) Program focused on reducing the risk of radon exposure in indoor air environments. The USEPA has not released a revised schedule for a final rule.

6.4 Regulations for Other Compounds

DHS established in 2000 an MCL of 13 micrograms per liter (µg/l) for the gasoline additive methyl tertiary butyl ether (MTBE). A secondary MCL of 5 µg/l, established in 1999, addressed taste and odor concerns. Limited MTBE sampling involving the Ventura River water sources indicated that MTBE was not detected.

DHS established an Action Level of 20 µg/l for the disinfection by-product known as N-nitrosodimethylamine (NDMA). City sampling indicated that samples were significantly less than the AL.

Section 7: Surface Water Quality Monitoring Programs

There are a number of surface water quality monitoring programs in the study area. The active programs during 2000 to 2005 are described in this section. Results of these monitoring programs are presented in Appendices P and Q.

7.1 City of Ventura

As previously mentioned, the City owns and operates a full-scale, state-certified laboratory to test water quality. The City routinely collects samples in its distribution system and reports these in the Consumer Confidence Reports (Appendix P). Sampling points in the distribution system are shown in Table 7-1.

In addition to the water quality monitoring of the intake facilities, Avenue WTP, and four Nye wells, the City collects water quality samples at 11 sites located throughout the watershed. Seven of these additional watershed sampling locations were added since the 2000 Report (see Table 7-2). Figure 8 shows the locations of the City's monitoring stations and Appendix A-1 has photographs of each monitoring site. Since 2002, the City has monitored water quality along the Ventura River and San Antonio Creek at these sites for cryptosporidium, Giardia, bacteria, nutrients, bromide, TOC, chloride, and conductivity. Details on the frequency and constituent type sampled at each location are provided in Table 7-2. Results of the sampling are in Appendix Q Table Q-1A.

A summary of the City's overall water quality delivered to its customers in 2000 through 2005 can be found in the Consumer Confidence Report (CCR) located in Appendix P. The pressure zones influenced by the Avenue WTP are as follows: Zones 210, 260, 400, 430, 466, 599, and 605.

TABLE 7-1
DISTRIBUTION SYSTEM SAMPLING LOCATIONS

Zone No.	Sampling Station No.	Sampling Station Name
210	22	Harbor Boulevard
260	31	McKinley and Katherine
400	34	Seneca Street and Montalvo
430	1	Hospital and Foothill
466	30	Hillcrest and Catalina
599	32	Breaker Drive and Breaker Court
605	3	Victoria and Foothill

TABLE 7-2
2005 STATUS OF VENTURA RIVER/SAN ANTONIO CREEK WATERSHED MONITORING SITES

Planned Sampling Frequency: **W** - Weekly; **M** - Monthly; **MI** - Monthly/Intermittent; **B** - Bimonthly; **Q** - Quarterly; **S** - Semi-Annual

(2000-2005) Sampling Status Key:

pa	Partially active
a	active
i	inactive

				Laboratory:	City Sanitation Department												Truesdale		BioVer	FGL
Sta. Status	**Site ID**	**Location**	**Latitude**	**Longitude**	**Total Coliform**	**Fecal Coliform**	**Fecal Streptococcus/ Enterococcus**	**TKN**	**Ammonia (NH3)**	**Nitrite (NO2)**	**Nitrate (NO3)**	**Phosphate (PO3)**	**Chloride**	**Conductivity**	**Alkalinity**	**Gen'l Mineral, Gen'l Physical, & Inorganics**	**Bromide**	**TOC**	**Giardia / Cryptosporidium Cysts**	**NDMA**
Intake Facilities and Water Treatment Plant																				
a	**NW11**	Nye Well 11 Source	34.358750	119.309900	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**			**M**	**M**	**Q**	
a	**NW8**	Nye Well 8 Source	34.359983	119.312350	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**			**M**	**M**	**Q**	
a	**SC1**	Intake Subsurface	34.355233	119.310233	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**		**S**	**M**	**M**	**Q**	
a	**VR3/VRFP**	Ventura River/ Foster Park Surface (new VR3)	34.355400	119.309917	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**		**S**	**M**	**M**	**Q**	
a	**TPI**	Treatment Influent	34.345050	119.296150	**M**	**M**		**M**	**M**								**M**	**M**	**Q**	
a	**27-Flume**	27 Kingston Reservoir Raw Water @ Flume	34.344400	119.294383	**W**	**W**									**M**		**M**	**M**		
a	**TPE**	Treatment Effluent	34.345050	119.296150													**M**	**M**	**Q**	**S**
a	**CMD#1**	Casitas Municipal Water District #1	34.345050	119.296150														**M**		
Existing Watershed Sampling Points in 2000																				
a	**Old VR1**	Ventura River, N of Casitas Springs Trailer Park	34.373867	119.307850	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**					**Q**	
a	**VR2**	Ventura River @ Santa Ana Bridge	34.399550	119.308000	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**						
a	**SA1**	San Antonio Creek	34.382367	119.302650	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**					**Q**	
Additional Watershed Sampling Points																				
a	**SA2**	Thatcher/ San Antonio Cr	34.433667	119.248917	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**						
a	**PC1**	Stewart/ Fox Creeks	34.434267	119.248833	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**						
a	**New VR1**	Ventura River @ Casitas Springs (N.of Nye 7)	34.362917	119.311533	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**					**Q**	
pa	**SA3**	San Antonio Creek @ Soule Park	34.442767	119.231667	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**						
pa	**SA4**	Upper San Antonio Creek @ Grand Ave.	34.454383	119.221817	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**						
pa	**TC1**	Thatcher Creek @ Soule Park	34.442483	119.231483	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**	**MI**						
pa	**LC1**	Lion Canyon Creek	34.422250	119.263550	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**	**B**						
i	**NW1**	Nye Well 1 and 1A	34.357817	119.309867																
i	**Old VR3**	Ventura River @ Highway 150 Bridge	34.424722	119.302500																
i	**VR4**	Ventura River below Robles Diversion	At study area boundary																	
i	**NW2**	Nye Well 2	34.357900	119.309900																
i	**NW7**	Nye Well 7	34.362567	119.312683																

Additionally, as a water supplier, the City must complete an evaluation of its drinking water supply with respect to Public Health Goals (PHG) every three years. The goals are not mandatory limits and are based solely on public health risk factors. The City completed an evaluation in 2004, which determined that six chemicals exceeded a PHG. These were lead, copper, uranium, gross alpha and beta particles, and radium 226. Copper and lead can be found in water as a result of the corrosion of plumbing fixtures used in most homes. The City has conducted tests to optimize its treatment with corrosion inhibitors in an effort to further reduce lead and copper levels. High levels of lead can result in kidney problems or high blood pressure, and delays in physical and mental development in children. High levels of copper are known to cause gastrointestinal disturbance and kidney damage. The remaining four chemicals are naturally occurring radioactive isotopes that typically occur in the drinking water by the erosion of natural deposits and are considered carcinogenic. Noncarcinogenic effects of uranium on the kidneys and the liver, and radium to cause tumors have been documented.

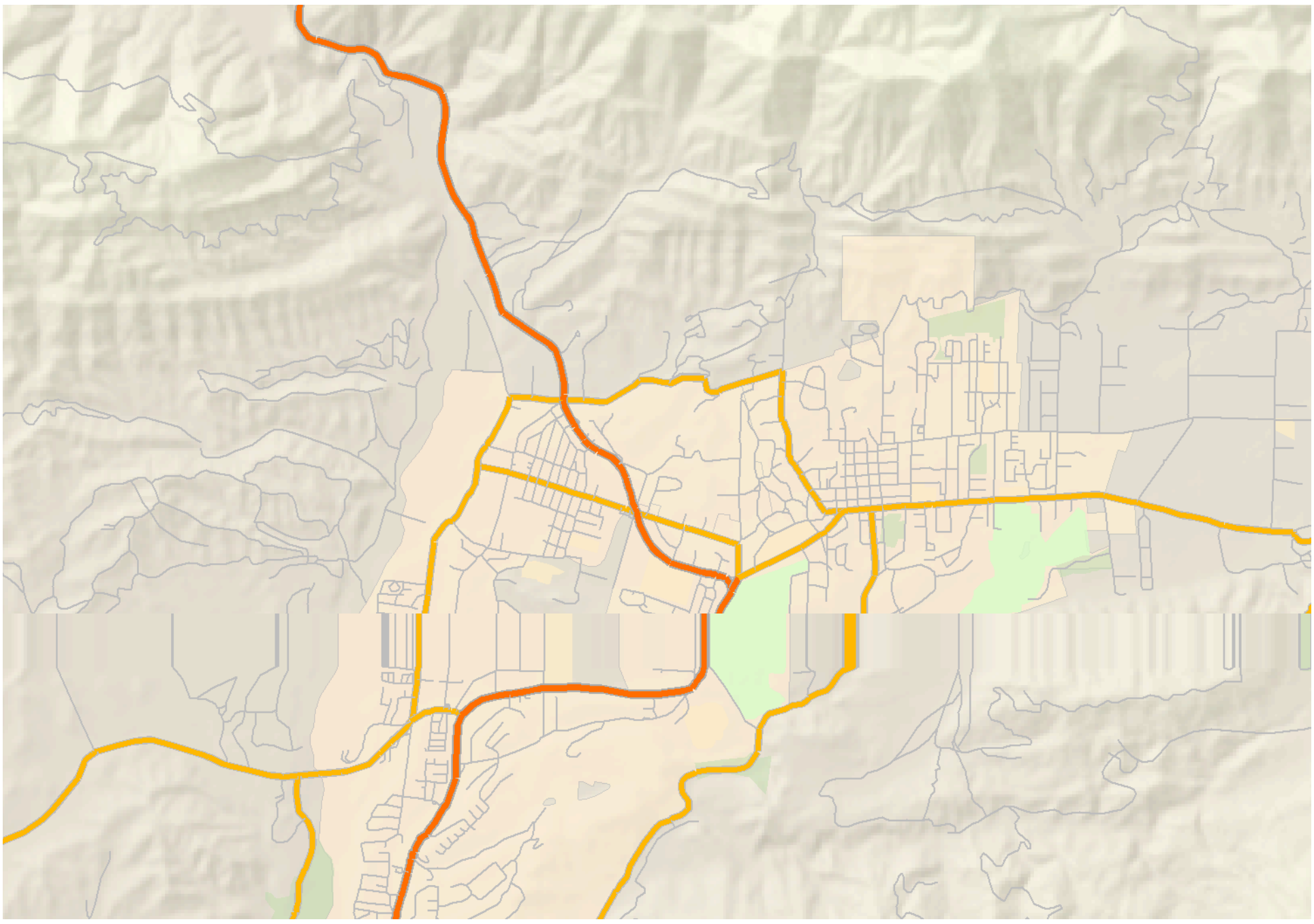
7.2 Ojai Valley Sanitary District

As part of the NPDES permit for the OVSD WWTP to discharge treatment plant effluent, an NPDES monitoring program is required to monitor the Ventura River upstream and downstream from the point of plant effluent river discharge. In June 2003, OVSD's NPDES monitoring program changed. Status of the sampling stations summarized in Table 7-3 and locations are shown in Figure 8.

TABLE 7-3
OVSD VENTURA RIVER WATER SAMPLING STATIONS

Station Name	Location	Status	Latitude	Longitude
R1	Ventura River just upstream of the San Antonio Creek confluence	Eliminated	34.33806	119.298010
R2	San Antonio Creek before entering the Ventura River	Eliminated	34.33806	119.296810
R3	Just north of treatment plant	Active	34.34542	119.300100
R4	Just south of treatment plant	Active	34.34302	119.299500
R5	Ventura River immediately south of Canada Larga Creek confluence	Active	34.38013	119.305640
R6	Just north of Shell Road	Eliminated		
R7	At the Ventura River estuary	Eliminated		
R8	Canada Larga Creek prior to confluence with Ventura River	Eliminated	34.37973	119.303840

The monitoring stations' numbering stayed the same to avoid the potential for future data being misinterpreted due to "like" station numbers, but at different locations. The RWQCB eliminated the above monitoring stations as other monitoring programs were collecting sufficient data. The OVSD staff assists the Ventura County/Storm Water personnel when they are performing the annual bio-assessment and nutrient sampling that is included with the information prepared for this Update.



The OVSD Water Quality Data is provided in Appendix Q of this report. This includes:

- Table Q-2A: Monthly Effluent & River Stations Sampling Results
- Table Q-2B: Toxicity Data
- Table Q-2C: Annual River Priority Pollutants Results
- Table Q-3B: Nutrient Data for the Annual In-stream Bioassessment of the Ventura River Watershed

7.3 Ventura County Storm Water Monitoring Program

The VCWQMP was discussed in Section 5.5. As part of the countywide Municipal NPDES Permit (Permit No. CAS004002), the VCWQMP must implement a Monitoring and Reporting Program, Ventura Countywide Stormwater Quality Urban Impact Mitigation Plan, and Ventura Countywide Stormwater Quality Management Plan (SMP). Additionally, a copy of the Ventura Countywide Stormwater Quality Ordinance is provided as Appendix O. There are two pertinent parts of the VCWQMP that are of particular interest for the Ventura River watershed:

- Bioassessment Monitoring
- Mass Emission Monitoring

Locations of these stations are shown in Figure 8.

7.3.1 Bioassessment Monitoring

Biological assessments (bioassessments) of water resources integrate the effects of water quality over time and are capable of simultaneously evaluating multiple aspects of water and habitat quality. When integrated with physical and chemical assessments, bioassessments help to further define the effects of point and non-point source discharges of pollutants and provide a more appropriate means for evaluating impacts of non-chemical substances, such as sedimentation and habitat destruction. A work plan for in-stream bioassessment monitoring in the Ventura River watershed was developed and submitted in January 2001 to the RWQCB as part of the revised SMP. For four (4) years, starting in 2001, bioassessment monitoring has been conducted once a year in the fall to establish baseline data. Bioassessment monitoring is conducted during the fall because it is the time period during which flows are most consistent and macroinvertebrates are most productive and diverse. The fall season provides a consistent, stable environment for sampling that allows for macroinvertebrate comparability from year to year.

In the 2004/05 Annual Report there were 15 monitoring stations representing main streams and tributaries. The Annual Report also includes results and conclusions for the year 2004 Bioassessment Monitoring. Table 7-4 lists these sampling stations.

TABLE 7-4
2004 VENTURA RIVER WATERSHED BIOASSESSMENT MONITORING SAMPLING LOCATIONS

Sta. ID	Name	Description and Comments	Latitude (D.M.S.)	Longitude (D.M.S.)	Elev.
0	Ventura River – Main Street Bridge	Mainstem Ventura River, first site above estuary with fresh water.	34 16 54.23	119 18 24.09	19
2	Canada Larga Creek	Canada Larga Creek, downstream of grazing.	34 20 31.7	119 17 08.2	293
3	Canada Larga Creek	Canada Larga Creek, above main area of grazing impact.	34 22 23.3	119 14 8.8	334
4	Ventura River – Foster Park	Mainstem Ventura River. Closest downstream site to confluence with San Antonio Creek. Station is also mass emission station. Bioassessment downstream from Foster Park Bridge	34 21 07.9	119 18 23.7	200
5	San Antonio Creek – near Ventura River	San Antonio Creek, first upstream site from confluence with Ventura River.	34 22 50.9	119 15 46.8	347
6	Ventura River – Santa Ana Rd.	Mainstem Ventura River	34 23 59.1	119 18 29.7	403
7	Lion Canyon Creek – upstream confluence San Antonio Creek	Lion Canyon Creek (tributary to San Antonio Creek) First upstream location from confluence. Site with heavy sediment load and influence by nearby stables and grazing.	34 25 19.3	119 15 46.8	623
8	Stewart Canyon Creek – upstream conf. San Antonio Creek	Stewart Creek (tributary to San Antonio Creek) First upstream location from confluence. Within close proximity to the City of Ojai and less densely developed residential lots.	34 26 07.1	119 14 49.3	685
9	San Antonio Creek near Stewart Canyon Creek	San Antonio Creek. Within close proximity to the City of Ojai and less densely developed residential lots.	34 26 1.8	119 14 52.7	650
10	North Fork Matilija Creek – upstream Ventura River conf.	North Fork Matilija Creek above influence of Matilija Dam and below rock quarry.	34 29 06.0	119 17 59.4	978
11	North Fork Matilija Creek – at gauging station	North Fork Matilija Creek above influence of Matilija Dam and above rock quarry.	34 29 35.1	119 18 18.6	1,360

Sta. ID	Name	Description and Comments	Latitude (D.M.S.)	Longitude (D.M.S.)	Elev.
12	Ventura River – below Matilija Dam	Matilija Creek. First station above urban influence.	34 29 2.4	119 18 1.7	1020
13	Matilija Creek – below community	Matilija Creek above dam and below community. Site has excessive amount of algae.	34 30 04.5	119 20 51.7	1,355
14	Matilija Creek – at gate at end of road	Matilija Creek. Above dam and above community. Dry – Not Sampled	34 30 16.9	119 22 26.3	1,553
15	San Antonio Creek above Lion Creek	San Antonio Creek above Lion Creek	34 25 19.3	119 15 46.8	623

The 2005 Annual Report provided a historical analysis of all the Bentic Microinvertibrate (BMI) collected from 2001 through 2004. The physical habitat and IBI scores for the first four years of the Ventura watershed BMI monitoring program were combined and are presented graphically by site. Since the San Diego Index of Biological Integrity (SD IBI) was applied to the BMI data in past three years (2001 to 2003), it was computed for the 2004 survey data, and then combined with the previous three years so that the SD IBI scores could be compared to the new metric, Southern California Index of Biological Integrity.

Figures 9-10, 9-11, and 9-12 are extracted from the report and shown below. They indicate that the SD IBI consistently ranked sites in the watershed as either good or very good, while the So CA IBI ranked the same sites as poor or fair. In addition, the best physical habitat conditions can be found on the main stem of the Ventura River, upper San Antonio Creek and Matilija Creek, while the worst habitat conditions can be found on San Antonio Creek and Stewart Canyon Creek.

Figure 9-10: Physical habitat scores for sites in the Ventura Watershed, 2001 to 2004

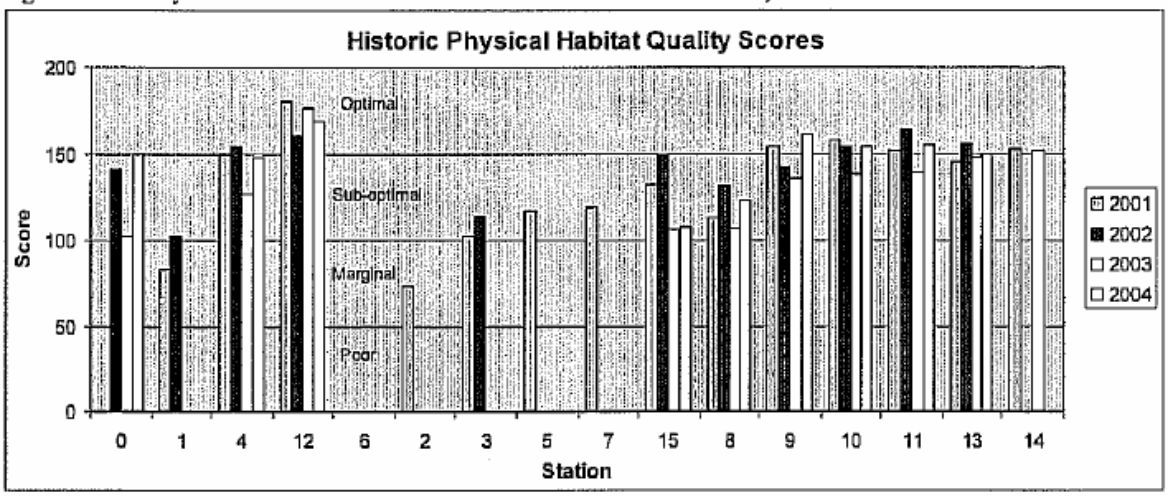


Figure 9-11: So CA IBI scores for sites in the Ventura Watershed, 2001 to 2004

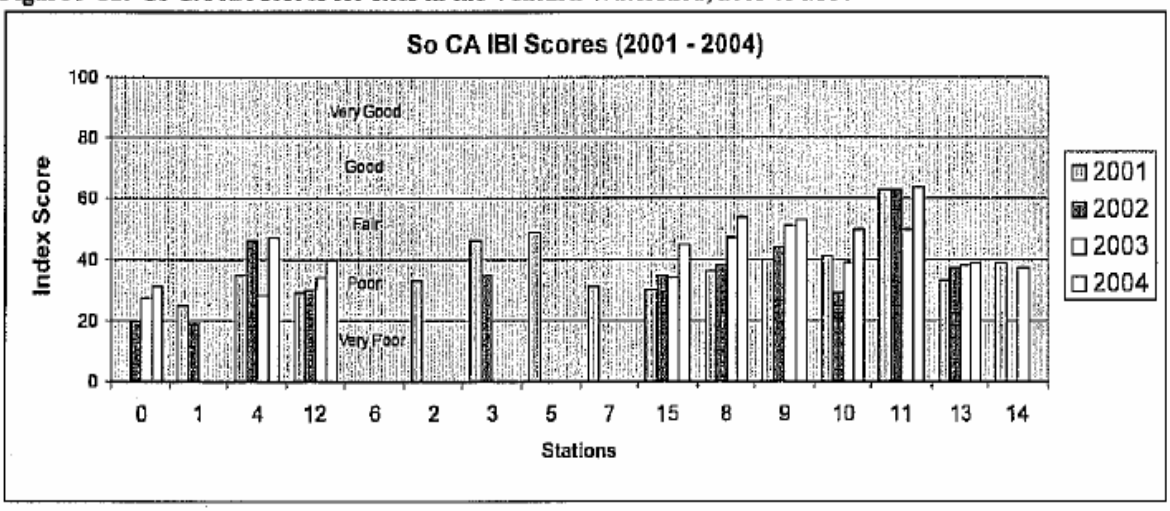
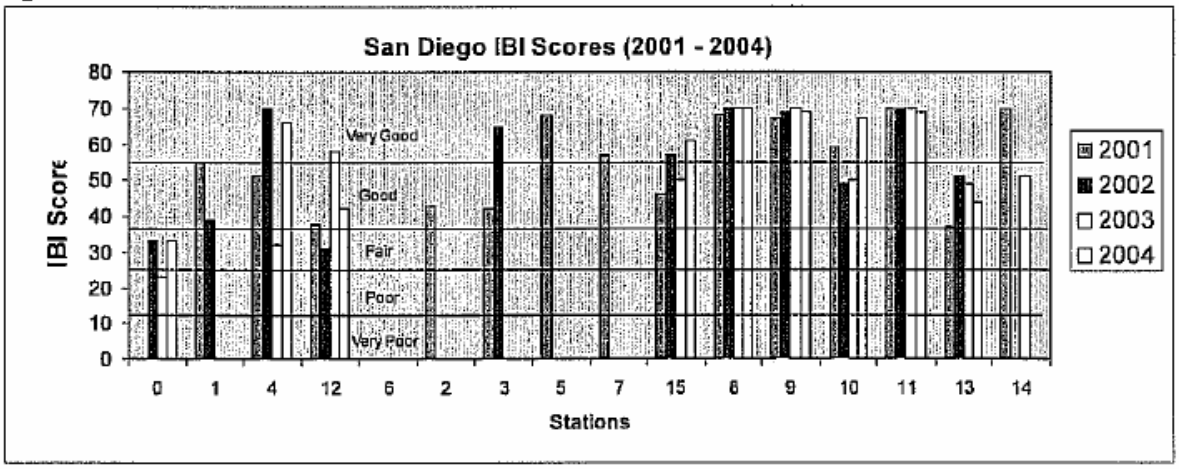


Figure 9-12: SD IBI scores for sites in the Ventura Watershed, 2001 to 2004



The report concludes that the types and abundances of species found throughout the watershed during the four year period changed very little. Most of the changes were subtle shifts in the relative abundances of groups of species that were common throughout the watershed. These results indicated that water quality in the watershed remained relatively stable during this four year period.

7.3.2 Mass Emission Monitoring

The purpose of mass emission monitoring is to identify pollutant loads to the ocean and identify long- term trends in pollutant concentrations. Mass Emission sites are located in the lower reaches of major watersheds. Through water quality monitoring at these sites, the Stormwater Monitoring Program is intended to evaluate the cumulative effects of stormwater and other surface water discharges on beneficial uses in the watershed prior to discharge to the ocean. Both Mass Emission and Receiving Water stations measure water quality parameter concentrations in a surface water body, whereas Land Use monitoring stations permit the water quality characterization of discharges to surface water bodies. Mass Emission monitoring

stations measure water quality parameter concentrations resulting from discharges throughout an entire watershed. The Mass Emission drainage area is much larger than the drainage area for the Receiving Water sites and includes other sources of discharge, such as wastewater treatment plants, non-point sources, and groundwater discharges.

Mass Emission stations are located in the three major Ventura County watersheds: Calleguas Creek, Ventura River, and Santa Clara River. However, the monitoring location for the Ventura River Watershed was relocated in 2005. The Ventura River NPDES Mass Emission Monitoring Station (ME-VR) which was formerly located on Casitas Vista Road at Foster Park was determined to be unsafe due to land slide activities observed during the heavy rainfalls of January and February 2005. Safety concerns with the station's location at Foster Park prompted the SMP to relocate the ME-VR station to the OVSD's WWTP (located at 6363 North Ventura Avenue, Ventura, CA). The new ME-VR station (ME-VR2) is located approximately one mile downstream of the station's former location. The new monitoring site is a safer location on the Ventura River than the previous sites due to the presence of a levee on the east side and bedrock on the west side of the site. The new location also provides an improved ability to secure monitoring equipment. Monitoring in ME-VR2 station was initiated in May 2005.

A table of the constituents monitored for the Mass Emission Monitoring and results from the monitoring are included in Appendix Q. The full report of the Mass Emission Monitoring from 2002 to 2004 can be accessed through VCWQMP: Ventura Countywide Stormwater Quality Mid-year Monitoring Report.

7.4 Ventura Stream Team

The Ventura River Watershed Monitoring Program "Stream Team" is a volunteer-based water quality monitoring program established jointly by the Santa Barbara ChannelKeeper in conjunction with the Regional Board, VCFCD, the City, and the OVSD. Their goals are to develop and implement regular and precise testing of standard water quality parameters that will establish baseline information on a watershed level, establish a trained volunteer monitoring base, and locate previously unidentified point sources of pollution.

There are 15 sites chosen for this monitoring program. There are four Lower Ventura River sites, two Canada Larga sites, four San Antonio Creek sites, and four Upper Ventura River sites of which four represent four distinct reaches or sub-watersheds. Site selection is based on:

- Sites that are representative of a certain reach or sub-watershed
- Sites that are accessible, especially during high water events
- History of monitoring at that site
- Even spacing throughout watershed
- Area of special interest
- Sites that are representative of diverse range of land uses

Table 7-5 summarizes the fifteen sites chosen for this Watershed Monitoring Program, and their locations are shown in Figure 8.

The Ventura Stream Team conducts monthly on-site testing at the designated location on the Ventura River. They measure physical and chemical parameter in the field using portable, hand-held instruments. On-site data collected includes dissolved oxygen, turbidity, conductivity, pH, temperature and flow. Water samples, collected at each site, are processed in Channelkeeper's laboratory for three Public Health bacterial indicators: Total coliform, E. Coli, and Enterococcus, using approved standard methodology as Colilert-18 and Enterolert-24 by Idexx Laboratories. Parameters such as ammonium, nitrite plus nitrate, orthophosphate, total dissolved nitrogen and particulate carbon, nitrogen and phosphorus are measured and analyzed through the cooperation of the Santa Barbara Channel – Long Term Ecological Research Project at the University of California, Santa Barbara. Occasional tests for other ions and contaminants are also done. In addition, site characteristics such as vegetation and aquatic life are also being assessed and recorded during sample collection on standardized forms.

Data collected by Ventura Stream Team is summarized and available in Appendix Q. The State of the Ventura River Report, provided in Appendix K, covers the review of the Ventura River watershed from January 2001 to the end of the 2004 WY.

TABLE 7-5
VENTURA STREAM TEAM WATER SAMPLING SITES

Station Name	Location	Description
VRW001	Main Bridge	Ventura River just below the Main Street Bridge
VRW002	Stanley Drain	Ventura River just at the confluence with the Stanley Drain
VRW003	Shell Road	Ventura River at the Shell Road Bridge
VRW004	Lower Canada Larga	Off of Ventura Avenue, just south of the Canada Larga Bridge
VRW005	Upper Canada Larga	3.5 miles up Canada Larga Road, at a small bridge over the creek
VRW006	Foster Park	Along the Ventura River, just downstream from Foster Park at the Casitas Vista Drive Bridge
VRW007	San Antonio Creek	On Old Creek Rd, just off of Highway 33
VRW008	Lion Canyon	On Lion Creek, just above the confluence with San Antonio Creek
VRW009	Stewart/Fox	Adjacent to site 10, where the Stewart and Fox drainages combines
VRW010	Thacher/San Antonio	Adjacent to site 9, where the upper San Antonio and Thacher drainages combines
VRW011	Santa Ana	Ventura river at the Santa Ana Road bridge
VRW012	Highway 150	Ventura river at the Highway 150 bridge
VRW013	Matilija	Approximately 1 kilometer downstream of the Matilija Dam
VRW014	North Fork Matilija	Along the North Fork Matilija
VRW015	Upper Matilija	Approximately 1.5 miles above the Matilija Dam in Matilija Canyon

7.5 DHS Drinking Water Source Assessments

DHS's Division of Drinking Water and Environmental Management established the California Drinking Water Source Assessment and Protection (DWSAP) Program to provide information to communities wanting to develop local programs to protect their sources of drinking water. The DWSAP Program address both groundwater and surface water sources. The assessments typically include: a delineation of the area around a drinking water source through which contaminants might move and reach that drinking water supply; an inventory of possible contaminating activities (PCAs) that might lead to the release of microbiological or chemical contaminants within the delineated area; and a determination of the PCAs to which the drinking water source is most vulnerable.

A Summary of the DHS Drinking Water Source Assessments for the four Nye Wells (Nos. 1A, 2, 7, and 8) for 2002 and/or 2003 are summarized in Table 7-6 and found in Appendix R indicate that there have been no contaminants detected in these wells. However, the sources are still considered vulnerable to PCA's located near the drinking water source.

TABLE 7-6
SUMMARY OF DHS SOURCE WATER ASSESSMENTS FOR THE FOUR NYE WELLS TREATED AT THE AVENUE WTP

Water Source	Assessment date	Identified Vulnerabilities (PCAs)
Nye Well No. 1A	Mar-03	Automobile – Repair Shops Grazing (> 5 large animals or equivalent per acre) Illegal activities/unauthorized dumping Junk/scrap/salvage yards Machine shops Septic systems – low density (< 1 acre) Sewer collection systems
Nye Well No. 2	Apr -02	
Nye Well No. 7	Apr-02	
Nye Well No. 8	Apr-02	

7.6 Water Sampling by Others in Study Area

7.6.1 Los Angeles Regional Water Quality Control Board

The Los Angeles RWQCB had a previous monitoring program for the Ventura River Watershed that was discussed in the 2000 Sanitary Survey. Another program, the Surface Water Ambient Monitoring Program (SWAMP) administered by the State Water Resources Control Board, was introduced in 2001. SWAMP is a statewide monitoring effort designed to assess the conditions of surface waters throughout the state of California. Responsibility for implementation of monitoring activities resides with the nine RWQCBs that have jurisdiction over their specific geographical areas of the state. Monitoring is conducted in SWAMP through the Department of Fish and Game and US Geological Survey master contracts and local RWQCBs monitoring contracts.

The Los Angeles RWQCB SWAMP coordinator, Mike Alliance, was contacted regarding the program and indicated that monitoring for the Ventura River will start in Spring 2006. The

monitoring for the Ventura River will be limited to two sampling stations and will include analysis of sediment chemistry, toxicity, metals, organics, nutrients and conventional water chemistry. SWAMP's effort to monitor the Ventura River would only take a snapshot of the water quality in the river and would not include bacteriological testing mainly because of its current funding limitations.

On November 3, 2005, the Regional Board adopted the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region (Order No. R4-2005-0080). The waiver applies to all irrigated lands in Los Angeles and Ventura counties and will affect several thousand growers. Any grower who owns or conducts irrigation operations and from which a discharge occurs is covered by the waiver (note: the definition of a discharge is very broad and includes percolation to groundwater and stormwater runoff). Growers, or growers groups, must register with the Regional Water Board by filing a notice by August 3, 2006.

7.6.2 Ventura River County Water District

This District has four wells and an agreement with Casitas MWD for purchase of water when drought reduces the ability of the agency' wells to meet demand. VRCWD conducts ground water quality sampling and provides CCR's to its customers. These wells are not under the direct influence of surface water.

7.6.3 Meiners Oaks County Water District

The Meiners Oaks County Water District has four wells, of which two are shallow wells located adjacent to the Ventura River, downstream of the Robles Diversion. The District, in July 1995, began treating its river well supply through a pressure filter system. Since then, the District has not conducted any additional Giardia or Cryptosporidium testing.

In 2004, Meiners Oaks County Water District CCR identified their sources of water for supply as four groundwater wells drilled 100 to 400 feet into underground aquifers and one connection to receive surface water from Lake Casitas. They can meet their demand using groundwater. The surface water system connection is only used for emergency supply during repairs of their groundwater wells or when demand is higher that usual. On those occasions, a blend of surface and ground water is delivered throughout their system.

Because this water source is considered under the influence of surface water, a copy of MOCWD 2004 CCR is included in Appendix Q.

7.6.4 City of Ojai

As described in Section 5.11, the City of Ojai, in coordination with the CDFG, prepared an assessment of the Ojai Urban Watershed and Restoration Plan (David Magney Environmental Consulting 2005), see Appendix N.

7.6.5 Casitas Municipal Water District

The CMWD provides a separate Sanitary Survey for the monitoring program in the Upper Ventura River Watershed.

7.7 Groundwater Monitoring

The groundwater purveyors in the study area all monitor their drinking water wells per DHS regulations for groundwater supplies. Reviews were made of the groundwater monitoring reported in the Consumer Confidence Reports by the Ventura River County Water District, Meiners Oaks County Water District and the 2004 annual report by the Ojai Groundwater Management Agency. There were instances where wells on the East end of Ojai showed high TDS, Iron, Manganese and Nitrates. Because of the distance and travel times to the lower Ventura River from the Ojai area, these are not considered a potential threat to surface water quality at this time.

Section 8: Conclusions and Recommendations

8.1 Conclusions

8.1.1 Changes in Water Quality

The 2005 Ventura County Storm Water Monitoring report provides a comprehensive statement that is representative of the water quality within study area during the period of 2001-4, "The types and abundances of species found throughout the watershed during the four year period changed very little. Most of the changes were subtle shifts in the relative abundances of groups of species that were common throughout the watershed. These results indicated that water quality in the watershed remained relatively stable during this four year period."

The County Storm Water Monitoring analyzed the high runoff events of January and February 2005, reporting a flush of high suspended solids, metals, organics and pesticides.

Giardia and *Cryptosporidium* were below detection limits in the City's water sampling program during the 2000 to 2005 period. The Title 22 monitoring of general mineral, general physical and inorganic chemicals stayed within the historical range, and radionuclide's had no exceedances.

There were a few occasions of high Total Coliform (greater than 24,000 MPN) in the City's watershed monitoring. This is likely an indicator of ineffective septic tanks, bird excrement, or animal manure. In March 2003, there were a number of stations that recorded high Total Coliform after the first major runoff event in two years. The influent of the Avenue WTP did not show the high Total Coliform because of the use of subsurface intake and wells.

8.1.2 Foster Park Intake Facilities and Avenue Water Treatment Plant

The City is not currently using the surface water diversion, but has maintained the structures for possible use in the future. The City is however, using the groundwater that is under the direct influence (GUDI) of surface water from the sub-surface diversion and from shallow wells that meet the requirements of the SWTR and the need for Watershed Sanitary Surveys by DHS.

The Avenue WTP, the planned improvements, and the City's monitoring programs are in compliance with the intent of the SWTR and related regulations.

8.1.3 Potential Contamination Sources

8.1.3.1 Survey of Watershed

New watershed monitoring and reporting programs developed during the period of 2001 through 2005 by the City, the County of Ventura, the Ventura River Stream Team (ChannelKeepers), and a number of interagency studies initiated since 2000, provide a more thorough understanding of the watershed than was available for previous Sanitary Surveys.

Photographs of the City's monitoring sites in the watershed are provided in Appendix A-2. These photographs are numbered and shown as to location on Figure 8.

8.1.3.2 Primary Sites of Potential Contamination

There continues to be potential water quality hazards in the watershed that need to be monitored. The potential contamination issues in the study area are shown in Figure 6.

Actions over the last five years that have reduced the risk of contamination are:

- New OVSD siphons that reduce the risk of spilling untreated wastewater,
- Horse manure awareness program,
- Successful operation of HHWCF, and
- Avenue WTP improvements.

There are increasing concerns with respect to water quality risks from downstream sediment transport as a result of the future Matilija Dam removal. Septic tanks and gas utility pipelines were recognized in this 2005 Sanitary Survey Update, but these have existed in the watershed for decades.

8.1.4 Watershed Control and Management

8.1.4.1 Interagency Watershed Studies

The many active watershed level studies demonstrate the importance of water resources and water quality to the stakeholders in the watershed. Furthermore, the level of activity also demonstrates the benefit of interagency cooperation in providing for the understanding and planning for use of the limited resources in the watershed.

8.1.4.2 Monitoring Programs

Water quality monitoring of the Ventura River and San Antonio creek has sharply increased over the 2000 to 2005 period. The new watershed monitoring programs by the City, the OVSD, the Ventura River Stream Team by ChannelKeepers, the County Storm Water Monitoring all have developed over the last five years. Additionally, the Agricultural Waiver Program beginning in late 2006 will monitor agricultural runoff. The City's experience and the increase in other monitoring programs since the last Sanitary Survey in 2000 has served to consolidate some sampling stations.

8.2 2005 Recommendations

This section provides various recommendations for water quality monitoring and for specific actions that the City can take to improve watershed water quality.

8.2.1 Regulatory Compliance Monitoring and Studies

It is recommended that the City conduct a review of water quality sampling for compliance with drinking water regulations and of treatment effectiveness of the Avenue WTP approximately six months after the modifications are completed and operational. The potential for additional pre-treatment with powdered activated charcoal for improving TOC removal and post-treatment using ultraviolet light for improving *Cryptosporidium* removal should be considered. Minimizing TTHMs and HAA5s with additional treatment may be important once compliance with the Stage 2 DDBPR and the LT2ESWTR are enforced in the future.

The City must submit the Initial Distribution System Evaluation (IDSE) plan by October 1, 2006. IDSE monitoring must be completed by September 30, 2008, and the final report is to be submitted by January 1, 2009. The City must begin Stage 2 DBPR compliance monitoring by April 1, 2012.

Regarding the LT2ESWTR, the City must submit a sampling plan for the first round of source water monitoring for *Cryptosporidium*, *E. coli*, and turbidity (or notice of intent to use grandfathered data) prior to July 1, 2006, and begin source water monitoring by October 31, 2006. The City must submit all data and required information for grandfathering by December 1, 2006. The City must submit a *Cryptosporidium* treatment bin classification and supporting data for approval by April 1, 2009. The City must complete additional *Cryptosporidium* treatment requirements by April 1, 2012. The City must submit a sampling plan for the second round of source water monitoring by January 1, 2015, and start monitoring by April 1, 2015. The City must submit a *Cryptosporidium* treatment bin classification and supporting data from the second round for approval by October 1, 2017.

8.2.2 Coordination of Watershed Water Quality Monitoring Programs

Coordination is needed to avoid duplication of effort and to maintain standards of multi-agency monitoring efforts in the study area. The City will not need to continue monitoring in the upper San Antonio Creek watershed because of these other programs that cover the same locations and constituents (Ventura County Stormwater monitoring, Ventura River Stream Team, and Agricultural Waiver monitoring). Steps that the City may take include:

- Share data, including providing the Sanitary Survey and other water quality reports to others monitoring or studying the watershed.

- The Ventura County Watershed Protection NPDES Database may be the best place for combining electronic data from the multiple monitoring programs in the study area. It is recommended that the City obtain updates to the monitoring plans for the data collected for the NPDES Database and confirm the sampling locations, what constituents are tested for, frequency of sampling, sampling agency/staff, and other information so that the City can determine which locations are duplicative of the City's monitoring efforts.

- Assist the Ag Waiver monitoring group thru the Ventura Farm Bureau or the Ventura County Agricultural Water Quality Coalition to coordinate their new monitoring requirements with existing programs.

- Update the water quality monitoring station GIS map (Figure 8) as sites are changed. Continue to show stations that are discontinued because they would still have a data record that could be useful to others. It is recommended to assign this to the City GIS Department with coordination by staff that does the water quality sampling.

- Agree on naming of sampling sites to avoid duplication of site names between different monitoring programs, and possible confusion about individual sites. Recommend keeping one site name per sampling site and have distinct program labels to avoid having multiple records for the same site label. Distinct names such as VR1 and VR11 are recommended rather than New VRI and Old VR1.

8.2.3 Modified Watershed Monitoring Program

Based on the efforts of the other active monitoring programs, the City can focus its watershed monitoring on the lower San Antonio Creek and Ventura River near Foster Park. The upper portions of the watershed are currently monitored by multiple other groups. The Watershed Monitoring Program does not cover the Title 22 regulations by DHS, but covers the source waters and potential watershed contaminants. Title 22 monitors alkalinity, general minerals, general physical, inorganic, organic, radionuclides, and higher frequencies of coliform tests for DHS.

It is recommended that the City confirm that the monitoring by the other organizations in the watershed conform to EPA requirements and reporting guidelines.

The recommendations for the City's watershed monitoring program are summarized in Table 8-1, which focuses on the lower portions of the contributing watersheds. The proposed watershed sampling reduces frequencies of monitoring where previous monitoring has shown low or non-detected constituents. TKN was eliminated because of the low test results and the partially overlapping coverage of by the Ammonia test. The source water collection point, 27-Flume, will have the most constituents monitored.

Further modification to the Watershed Monitoring Program may be needed in the future. It is possible to reduce sampling frequencies if concentrations and results continue to be low. Tests can be added at any time if there are some high results or emergencies. Sampling for TOC, bromide, and *Giardia/Cryptosporidium* may need to be adjusted once a monitoring plan is made for the Stage 2 DDBPR and the LT2ESWTR regulations.

8.2.4 Septic Conversion and Monitoring

The source assessments for the Nye Wells show that the septic systems (On-site Wastewater Treatment Systems) in Casitas Springs and the Burnham Road corridor pose some risk to the water supply for nitrates and pathogens that migrate in the alluvial groundwater and that could affect the shallow City wells. The City should work with the County Environmental Health Division and other agencies to seek funding and develop incentives for home owners to convert to sewer systems, especially in the lower Ventura River area.

TABLE 8-1
2006 RECOMMENDED VENTURA RIVER/SAN ANTONIO CREEK WATERSHED MONITORING

This does not include Title 22 sampling or sampling for in-plant operations for some of the same stations

Planned Sampling Frequency: M - Monthly;
B - Bimonthly; **Q** - Quarterly; **S** - Semi-Annual

			Laboratory:	City Sanitation Department											Truesdale		BioVer	FGL
Site ID	**Location**	**Latitude**	**Longitude**	**Total Coliform**	**Fecal Coliform**	**Fecal Streptococcus/ Enterococcus**	**TKN**	**Ammonia (NH3)**	**Nitrite (NO2)**	**Nitrate (NO3)**	**Phosphate (PO3)**	**Chloride**	**Conductivity**	**Alkalinity**	**Bromide (a)**	**TOC (a)**	**Giardia / Cryptosporidium Cysts (a)**	**NDMA**
Intake Facilities and Water Treatment Plant																		
SA1	San Antonio Creek at Old Creek Road	34.382367	119.302650	**M**	**M**				**M**	**M**	**M**	**M**	**M**				**M**	
NW11	Nye Well 11 Source	34.358750	119.309900	**M**	**M**				**M**	**M**	**M**	**M**	**M**			**M**		
NW8	Nye Well 8 Source	34.359983	119.312350	**M**	**M**				**M**	**M**	**M**	**M**	**M**			**M**		
SC1	Intake Subsurface	34.355233	119.310233	**M**	**M**				**M**	**M**	**M**	**M**	**M**			**M**		
VRFP	Ventura River/ Foster Park Surface (New VR3)	34.355400	119.309917	**M**	**M**				**M**	**M**	**M**	**M**	**M**			**M**		
27-Flume	27 Kingston Reservoir Raw Wtr @ Flume	34.344400	119.294383	**M**	**M**	**M**		**M**	**M**	**M**	**M**	**M**	**M**		**S**	**M**	**M**	
TPI	Treatment Influent	34.345050	119.296150	**M**	**M**											**M**		
TPE	Treatment Effluent	34.345050	119.296150															**S**
CMD#1	Casitas Municipal Water District #1	34.345050	119.296150													**M**		
If find constituent of concern at any of the source samples (Nye wells or diversions) then add:																		
VR2	Ventura River @ Santa Ana Bridge	34.399550	119.308000	**M**	**M**				**M**	**M**	**M**	**M**	**M**				**M**	

Notes:
(a) Sampling for these constituents may need to be adjusted once a monitoring plan is made for the Stage 2 DDBPR and the LT2ESWTR regulations.
The reductions in monitoring of sources were made because of low or ND results over the last 5 years. The collection point, 27-Flume , continues to have most all constituents monitored.
TKN was eliminated because of the low test results and the partially overlapping coverage by the Ammonia test.
Sampling frequency was reduced for other constituents that had low results, but some tests are needed as baseline information for the water treatment regulations.
Title 22 covers Alkalinity, General Minerals, General Physical, inorganics, organics, radionuclides, and higher frequencies of coliform tests.
Tests can be added at any time if there are some high results or emergencies.
Further streamlining of the Watershed Monitoring may be possible by reducing frequencies if test results continue to be low.

It is recommended that the City initiate discussions with the Ventura County Storm Water Monitoring or the Stream Team to consider monitoring near the Arbolada and Siete Robles areas of Ojai where septic tanks are in areas that have high groundwater in wet years.

8.2.5 Participate in Matilija Dam Removal and Other Watershed Planning

The control, or lack of control, of the sediment transport from behind Matilija Dam is a water supply and water quality concern for all the wells and sub-surface diversions along the Ventura River. The City is participating in the planning and implementation process of the Matilija Dam removal and has provided suggestions for protecting the local water resources from the potential impacts to the Ventura River. Their suggestions have included a hazard mitigation measure to install two new wells in the Foster Park area prior to the removal phases of the dam. It is recommended that the City continue to put forward ideas and share data with the participating agencies.

Other watershed planning activities that the City is participating in, and is recommended to continue participation include:

- Integrated Regional Water Management Plan to obtain state Proposition 50 funding
- Ventura River Habitat Conservation Plan

8.2.6 Public Outreach to Reduce Effects of Horse and Stock Manure

The City should continue to work with the VCSWQMP to encourage distribution of information and to restart the educational program about the effects of horse or stock manure on water quality.

8.2.7 Coordination with the OVSD

Due to the significant potential impact of a sewer spill on the City's Foster Park water sources, the City should continue working with the OVSD to improve coordination and operations in case a sewer overflow occurs. Ways this may be accomplished include the following:

- Provide comments on the updates to any emergency planning or regulatory documents.
- Participate in a practice drill once a year for the emergency overflow manhole warning system in the spring or summer so that there is time to make changes before the next wet season.

8.2.8 Design Standards Review

The City should periodically review well and other water system design standards with the intent to minimize potential contamination sources to the Foster Park water supply.

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Personal Communications

Teresa Lubin, Ventura County Department of Parks, General Services Agency

Jim Passanisi, City of San Buenaventura

Mike Oakley, City of San Buenaventura

David Goldstein, Ventura County Environmental and Energy Resources Division

Ronald Sheets, Operations Superintendent, Ojai Valley Sanitary District

Glen Sander, Captain, Ventura County Sheriff's Department

Gary Hails, Ventura County Environmental Health Division

Carey DuFrain, Ventura County Agricultural Commissioner's Office

Paul Tantet, Ventura County Watershed Protection District

Don Sheppard, Ventura County Environmental and Energy Resources Division

Suzy Watkins, Ventura County General Services Agency

Walter Beil, Vintage Petroleum, LLC.