# NONPOINT SOURCE WATERSHED ASSESSMENT:
# JAMES FITZGERALD MARINE RESERVE CRITICAL COASTAL AREA

**California Coastal Commission**
**December 2008**

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Front Cover: James V. Fitzgerald CCA map courtesy of San Mateo County Public Works, June 2008

# ACRONYMS

| | |
|---|---|
| ABAG | Association of Bay Area Governments |
| ASBS | Area of Special Biological Significance |
| BMP | Best Management Practice |
| CCA | Critical Coastal Areas |
| CCC | California Coastal Commission |
| cfs | Cubic feet per second |
| CWA | Clean Water Act |
| EPA | Environmental Protection Agency |
| FIB | Fecal Indicator Bacteria |
| FMR | James V. Fitzgerald Marine Reserve |
| GIS | Geographic Information System |
| MBNMS | Monterey Bay National Marine Sanctuary |
| MM | Management Measure |
| MWSD | Montara Water and Sanitary District |
| NPS | Nonpoint Source |
| NPS WA | Nonpoint Source Watershed Assessment |
| POST | Peninsula Open Space Trust |
| RCD | Resource Conservation District |
| RWQCB | Regional Water Quality Control Board |
| SC | Steering Committee |
| SFEI | San Francisco Estuary Institute |
| SMC | San Mateo County |
| SWRCB | State Water Resources Control Board |
| TMDL | Total Maximum Daily Load |

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# CHAPTER 1. INTRODUCTION

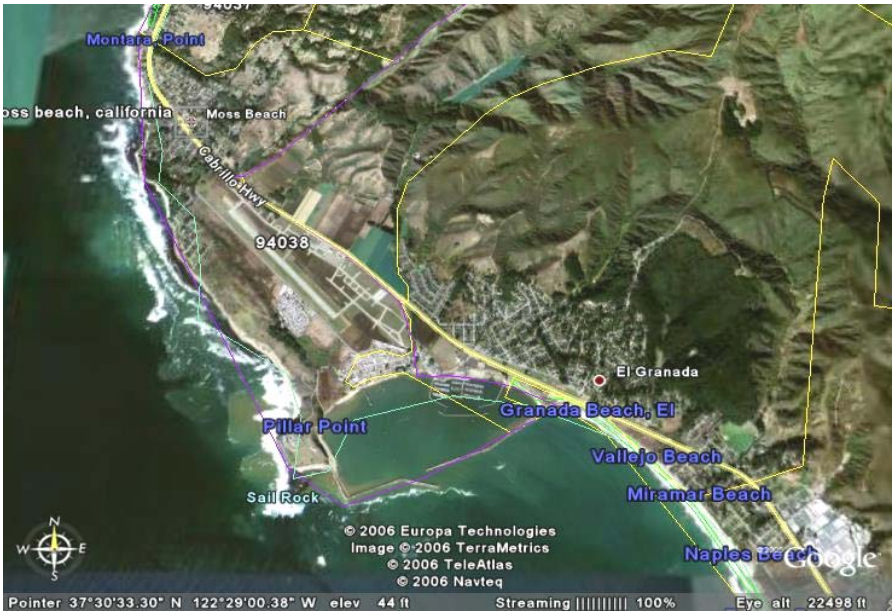


**Figure 1.** James V. Fitzgerald Marine Reserve CCA Aerial[1]

This Nonpoint Source Watershed Assessment (NPS WA) provides background information and characterization of the Midcoast watersheds on the San Mateo County, California coast that comprise the James Fitzgerald Marine Reserve Critical Coastal Area (CCA) (see Figure 1), based on the review, compilation and analysis of existing data available at the time of the pilot project. The intent of this NPS WA is to form the basis for and to direct the development of an Action Plan to address potential and known NPS pollution impacts and improve water quality conditions in and around the Fitzgerald Marine Reserve CCA. This NPS WA document is not intended to be an exhaustive nor comprehensive characterization of all watershed issues affecting the CCA as its primary impetus and focus is on water quality and NPS pollution. Additionally, there were limited time and resources to develop the Assessment document.

California's Critical Coastal Areas (CCA) Program is an innovative statewide program designed to identify coastal areas where water quality is threatened or impacted by new or expanding development and to accelerate the implementation of Management Measures[2] (MMs) identified in California's Nonpoint Source Plan http://www.coastal.ca.gov/nps/npsndx.html#NPS so that water quality is protected or restored. The CCA Program is a non-regulatory planning tool intended to foster collaboration among local stakeholders and government agencies, to better coordinate and direct resources to coastal watersheds in critical need of protection from polluted runoff. The Program is jointly administered by the State Water Resources Control Board and the California Coastal Commission, in partnership with many state and federal agencies. Through this program the state has identified one hundred (100) areas of the

1 Courtesy of Association of Bay Area Governments, 2006

2 Management measures establish performance expectations and, in many cases, describe actions that can be taken to prevent or minimize nonpoint source pollution or other negative impacts associated with uncontrolled and untreated runoff. Specific actions or practices for achieving the performance expectation are not included in the management measure statement.

coast as CCAs, which supports the acquisition of grant funding by prioritizing protection efforts. For more information on the CCA Program, see: http://www.coastal.ca.gov/nps/Web/cca_project.htm.

The state agencies participating in the CCA program identified five (5) pilot project areas throughout the coast where state agency staff are working with local stakeholders to test the benefits of developing watershed-based plans and implementing appropriate MMs to protect coastal resources (See Figure 1). James Fitzgerald Marine Reserve (FMR) is the pilot CCA project selected for the San Francisco Bay Area (coastal) based on criteria including: (1) existing water quality impairments, (2) value and sensitivity of coastal resources (e.g., it is an Area of Special Biological Significance-ASBS), (3) new or expanding threats to beneficial uses, and (4) high degree of local support.

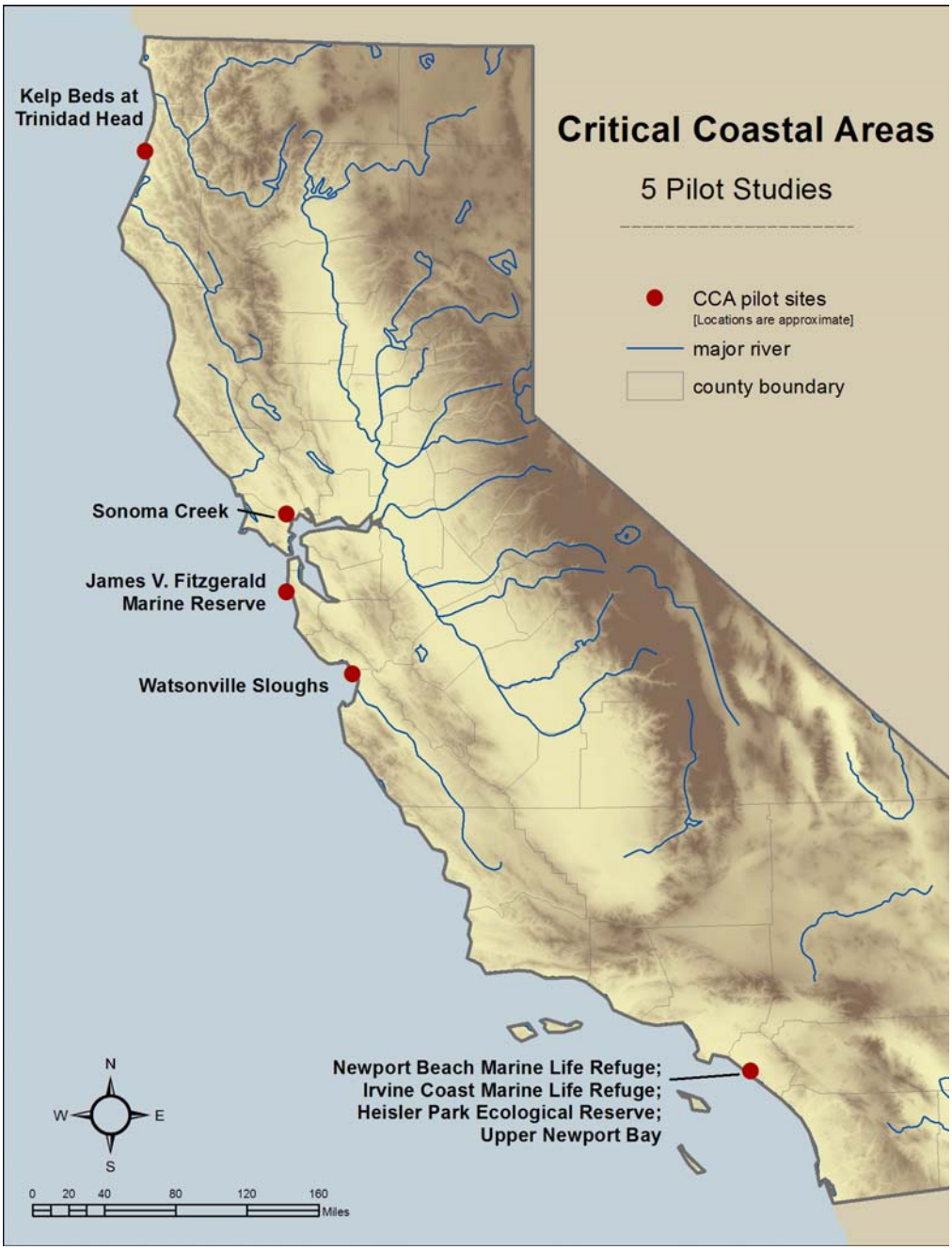


**Figure 2.** The five pilot Critical Coastal Areas (CCAs) (SFEI 2007)

*1.1 Goals, Objectives, Targets*

The overarching goal of the CCA program is to identify and remedy land-based nonpoint sources of coastal water pollution. The goals, objectives and targets identified for this FMR Pilot CCA Project (Pilot Project) include:

**GOALS**

- Improve water quality by minimizing or eliminating adverse water quality impacts to FMR from the contributing watersheds
- Foster a watershed ethic in the Midcoast communities that protects and improves coastal water quality
- Apply appropriate management measures to all land uses in the watersheds that flow into FMR to prevent NPS pollution from getting to the Reserve

**OBJECTIVES**

- Conduct a Watershed Assessment (WA) that identifies and evaluates existing and potential NPS pollution impacts to coastal and marine resources at and around the Reserve by compiling and analyzing available data;
- Characterize the contributing Midcoast watersheds to identify and compare all existing and potential sources and pathways of NPS pollutants and their impacts on the Reserve and coastal resources;
- Develop an Action Plan that identifies the steps required to address NPS impacts and improve water quality conditions in the CCA's watersheds, including evaluation and application of appropriate Management Measures
- Identify a schedule for highest priority actions
- Identify and secure funding to implement Action Plan
- Use pilot CCA Project as a collaborative model for other watersheds

**SCHEDULE/TARGETS**

- Complete full Assessment within one year
- Complete Action Plan within eight (8) months of completing Assessment
- Implement all highest priority actions within proposed schedule and re-evaluate actions and schedules biennially
- Reduce beach closures and advisories by 50% in 5 years
- De-list FMR, San Vicente Creek from 303(d) list for Coliform in 5 years
- Achieve water quality improvement and/or protection in the CCA as measured by reduced beach closures

*1.2 Pilot Project Structure*

The Pilot Project has the following structure: A Pilot Steering Committee (SC) has been meeting since January 2006 to advise the Pilot Project. The SC is comprised of staff from the following agencies and organizations: Coastal Commission, Regional and State Water Boards, San Mateo County (SMC) Public Works, Planning, SMC Parks and Recreation, San Mateo County Resource Conservation District, Montara Water and Sanitary District, Monterey Bay National Marine Sanctuary, and Moss Beach Ranch. There is also a larger stakeholder group comprised of interested state and local agencies, local organizations, environmental organizations, businesses, etc., that have participated in public scoping meetings and workshops and provide input at meetings, workshops and through the Pilot SC. Additionally, there is a Statewide Critical Coastal Area Committee, comprised of State agencies and partners (currently including: Coastal Commission, National Oceanic Atmospheric Administration, Regional Water Boards, State Water Board, Department of Forestry, Department of Fish and Game, Caltrans, California Coastal Conservancy, California CoastKeeper Alliance, San Francisco Bay Conservation and Development Commission, US EPA, Ocean Conservancy, CA

Department of Parks and Recreation, State Lands Commission). The Coastal Commission staff provides updates from the Pilot SC to the Statewide CCA Committee.

Further, since May 2006, the San Francisco Estuary Institute (SFEI) and Association of Bay Area Governments (ABAG) have been on board to assist with the major technical components of the Pilot Project such as management measure evaluation, impervious surface evaluation, and estimation of pollutant load reductions. SFEI received a $200,000 grant through the Environmental Protection Agency's (EPA) NPS Management Program (319(h)) (May 2006 through November 2007) to provide technical support and guidance for development of watershed assessments and tools to local stakeholders in three of the five pilot areas: two in the San Francisco Bay Area, FMR and Sonoma Creek, and one in the Central Coast, Watsonville Slough. SFEI also received an additional grant for $900,000, funded under the State Water Resources Control Board's Consolidated Grants Program, to continue their technical assistance in a second phase of the pilot project.

According to SFEI, there are four major tasks for the technical portion of each of the three pilot projects:

1) Identify land use types and major pollutants that contribute to NPS pollution;
2) Identify BMPs and Management Measures currently in place and organizations working to drive implementation and monitoring;
3) Estimate load reductions possible with current level of MM implementation and potential future load reductions with more widespread MM implementation; and
4) Evaluate methods for estimating effective impervious surface area and current efforts to calculate impervious coverage.

The short-term outcomes for the work conducted under SFEI's 319(h) grant included:

1) Compile and begin to analyze available information necessary to comprehensively assess each of the watersheds and near-shore areas affected by polluted runoff;
2) Contribute relevant information to stakeholder processes in each CCA that can lead to the development of Action Plans;
3) Identify high-priority information needs and decision-support required to facilitate additional implementation steps for NPS pollution reduction and protection and restoration of valued resources.

*1.3 Watershed Assessment Status*

The FMR CCA study area has received the least attention in terms of characterizing impairment of natural resources, recreational uses, or watershed functions and processes that might affect coastal resources and water quality. Unlike some of the other CCA pilot projects, few previous efforts have been undertaken to compile information from unpublished or widely dispersed sources. There has not been a watershed assessment or plan to date for the Midcoast watersheds that drain into FMR (see Figures 4 and 5 in Ch. 2), although there was an extensive multi-year process resulting in a Master Plan for the Reserve that identified potential water quality issues. This area also has not had a Total Maximum Daily Load (TMDL)[3] imposed by the San

3 Total Maximum Daily Loads (TMDLs) are action plans to restore clean water. Section 303(d) of the federal Clean Water Act requires that states identify water bodies -- bays, rivers, streams, creeks, and coastal areas -- that do not meet water quality standards, and the pollutants that impair

Francisco Bay Regional Water Quality Control Board but several waterbodies within the CCA study area are included on the State's impaired waterbodies list (303 (d)) and are slated for TMDLs in the future. (See also Chapter 3).

This NPS WA represents data collection efforts, findings, anecdotal narratives and hypotheses primarily provided by SFEI, ABAG and their consultants, based on available resources and information in accordance with their 319(h) grant tasks.[4] Additionally, the NPS WA relies on Coastal Commission documentation, literature reviews, interviews, meeting attendance, limited field reconnaissance and initial spatial analysis of existing and new Geographic Information System data layers. Bacteria monitoring throughout the project area has been a priority in the past as San Vicente Creek, the Pacific Ocean at Fitzgerald Marine Reserve, and Pillar Point Beach are listed for coliform bacteria on the Clean Water Act Section 303(d) list. The majority of existing water quality data for the CCA project area are coliform bacteria data. There is a lack of data for other water quality parameters. However, recommendations for water quality improvements in this document are not limited to bacteria. Furthermore, more data and other information exists for certain watersheds compared to others. This does not signify the relative condition or priorities of the creeks or pollutants of concern. Lastly, this NPS WA is not intended to satisfy any requirements of the California Environmental Quality Act.

SFEI used the following approach for the watershed assessment grant tasks under their 319(h) grant: (1) compiled existing information to assess water quality and beneficial use impairment; (2) identified the geographic extent and current mix of MMs to establish a "baseline" against which environmental improvements from more extensive application of MMs can be tracked; (3) estimated the impervious area in each watershed and evaluated its utility as an indicator of watershed health; and (4) evaluated suitable models and data requirements for estimating pollutant load reductions based on current and expanded MM implementation. This NPS WA and analysis provided the necessary first step to help the stakeholders to develop an Action Plan for each CCA in the next phase of this project (funded under SFEI's Proposition 50 grant).

Significant progress has been made on characterizing the CCA study area and developing a NPS WA. However, this planning and research effort is extensive and a) encompasses over three miles of complex shoreline and significant seaward areas, b) includes multiple watersheds and drainages, c) includes multiple local, state, and federal jurisdictions, and d) is designed to be responsive to a formal steering committee and public process. There are many codes, ordinances, plans, programs, agreements, sub-agreements, stakeholder concerns, and contracts that govern in San Mateo County's Midcoast and influence water quality that are difficult to capture in a NPS WA. More work is needed to identify relevant documentation. A combination of business owners, non-profit, local, regional, state and federal agency programs make up the monitoring and water quality programs for the area (described in Chapter 4.). Some efforts have been underway for several years, while others have recently started or are under discussion.

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them. TMDLs examine the water quality problems, identify sources of pollutants, and specify actions that create solutions. They are adopted by the Regional Water Board as amendments to the region's Basin Plan.

4 See References for primary source documents.

### *1.4 Document Structure*

This document is comprised of the following chapters:

Chapter 1. Introduction
Chapter 2. CCA Study Area
Chapter 3. Water Quality Conditions
Chapter 4. Programs, Projects and Plans
Chapter 5. Information Needs and Recommendations
Chapter 6. Conclusions

# CHAPTER 2. CCA STUDY AREA

**Figure 3**. James Fitzgerald Marine Reserve (Vitulano, 2002)

*2.1 Project Area and Subwatersheds*

The inland (eastern) boundary of the CCA Pilot Project study area is the Coastal Zone boundary.[5] The northern shoreline boundary includes the watershed of Martini Creek. The southern shoreline boundary includes Pillar Point Harbor. The seaward boundary is the mean high tide line. Figure 5 illustrates the CCA Pilot Project study area, the Coastal Zone boundary, the Area of Special Biological Significance boundary (see below), and creeks and watershed boundaries. The pattern of offshore currents, upwelling and the movement of offshore sediment in the FMR CCA is unknown and warrants further study. Findings of such a study might suggest an expanded seaward boundary.

Included in this 14.4-square mile study area are the unincorporated communities of Moss Beach, Seal Cove, Princeton, and parts of El Granada; as well as agricultural fields, equestrian facilities, a marina, industrial areas and over 4,000 acres of shrub/oak woodland managed in part by the Peninsula Open Space Trust (see Table 2 in this chapter).

Many of the subwatersheds in the CCA study area drain into an important Area of Special Biological Significance (ASBS), which includes the James Fitzgerald Marine Reserve (FMR).[6] The ASBS is located in coastal San Mateo County within the Monterey Bay National Marine Sanctuary (MBNMS), approximately seven (7) miles north of Half Moon Bay and 15 miles south of San Francisco (see Figure 4). The ASBS is about 5.5 miles long and was designated in 1969 by the State Water Resources Control Board. It

5 The coastal zone, in California, which was specifically mapped by the Legislature, covers an area larger than the State of Rhode Island. On land the coastal zone varies in width from several hundred feet in highly urbanized areas up to five miles in certain rural areas, and offshore the coastal zone includes a three-mile-wide band of ocean. See Figures 2 and 3 for the coastal zone boundary for FMR CCA .

6 The California State Water Resources Control Board, under its Resolution No. 74-28, designated certain Areas of Special Biological Significance in the adoption of water quality control plans for the control of wastes discharged to ocean waters. The ASBS are intended to afford special protection to marine life through prohibition of waste discharges within these areas. The concept of "special biological significance" recognizes that certain biological communities, because of their value or fragility, deserve very special protection that consists of preservation and maintenance of natural quality conditions to the extent practicable. What this designation means, is that within the State's waters, these areas are specially protected 'pollution-free' zones.' Thirty-four areas were designated as ASBS in the early 1970's. As intended, anyone may nominate additional candidates for ASBS designation. However, this has not happened.

includes a little over three (3) miles of shoreline (extending south from Point Montara to Pillar Point and 1,000 feet west into the ocean from the mean high tide line), intertidal and marine habitat, coastal bluffs, and the Pillar Point Marsh.

Within the ASBS, the three mile long Reserve (FMR) boasts rich biodiversity and is host to thousands of visitors who enjoy its unique tide pools and scenic bluffs each year. FMR includes 370 acres of intertidal and subtidal marine habitat below the high tide line and 32 acres of upland coastal bluffs with elevations up to 100 feet. San Mateo County Parks and Recreation and California Department of Fish and Game have joint custodianship over the Reserve. Pillar Point Marsh is located near the south end of the Reserve, separated by the Pillar Point Ridge. The Marsh is bordered on the north by a mobile home park, on the east by the airport, on the south by light industrial and residential property in Princeton and Pillar Point Harbor, and on the west by the U.S. Air Force radar station and an undeveloped 22-acre parcel of private land.

Fitzgerald Marine Reserve is noted by many as one of the richest, most biodiverse intertidal environments on the California coast. The Reserve is described as a semi-protected, outer coast, rocky intertidal habitat. The protection derives from a series of offshore subtidal reefs and rocky terraces that lessen the full impact of incoming waves that regularly batter the coastline. The reef consists of various kinds of sedimentary rock that is constantly weathered by wave action. These powerful forces sculpted tidal flats strewn with boulder fields, craggy outcroppings, deep surge channels with undercut banks, and tidal pools of a variety of sizes and depths. This highly diverse topography combined with the Reserve's protected setting, allows for organisms to attach themselves and find shelter. Many visitors to the Reserve consider tidal pools to be the most interesting of all the intertidal subhabitats because the pools show high biodiversity. Tide pools provide a habitat that frees organisms from one of the most stressful intertidal factors: drying out. Tide pools may contain a more diverse and often different association of organisms than found on adjacent exposed surfaces. Tide pools vary in depth and volume and therefore, consist of a continuum of subhabitats rather than a single habitat, depending on the particular situation of the individual pool.

At least three sub-watersheds drain directly to the ASBS (See Figures 4 and 5). For the purposes of this Pilot Project, the project area was expanded to also include several watersheds that are located adjacent to the FMR and may impact coastal water quality, including Martini Creek to the north, Pillar Point Marsh, Denniston Creek, and Deer Creek which drain to Pillar Point Harbor. Associated shoreline areas that may potentially affect water quality in the CCA, such as Pillar Point Harbor and Surfers Beach, have also been included in the project area. The watersheds of the CCA study area are generally small. Martini Creek is about 1 square mile, while Denniston and San Vicente Creek, the largest watersheds are about 4 square miles, and are situated below Montara Mountain, which is in the northern section of the Santa Cruz Mountain Range. The majority of the Fitzgerald Marine Reserve is comprised of nonnative vegetation including monterey cypress grove(s), invasive non-native species (i.e., german ivy, pampas grass), weedy species, ornamental plantings, and garden escapes.[7] Eucalyptus forests dominated by blue gum eucalyptus (non native) are ubiquitous in CCA watersheds.

7 Available at: http://www.co.sanmateo.ca.us/smc/department/home/0,,5556687_12305999_12328451,00.html

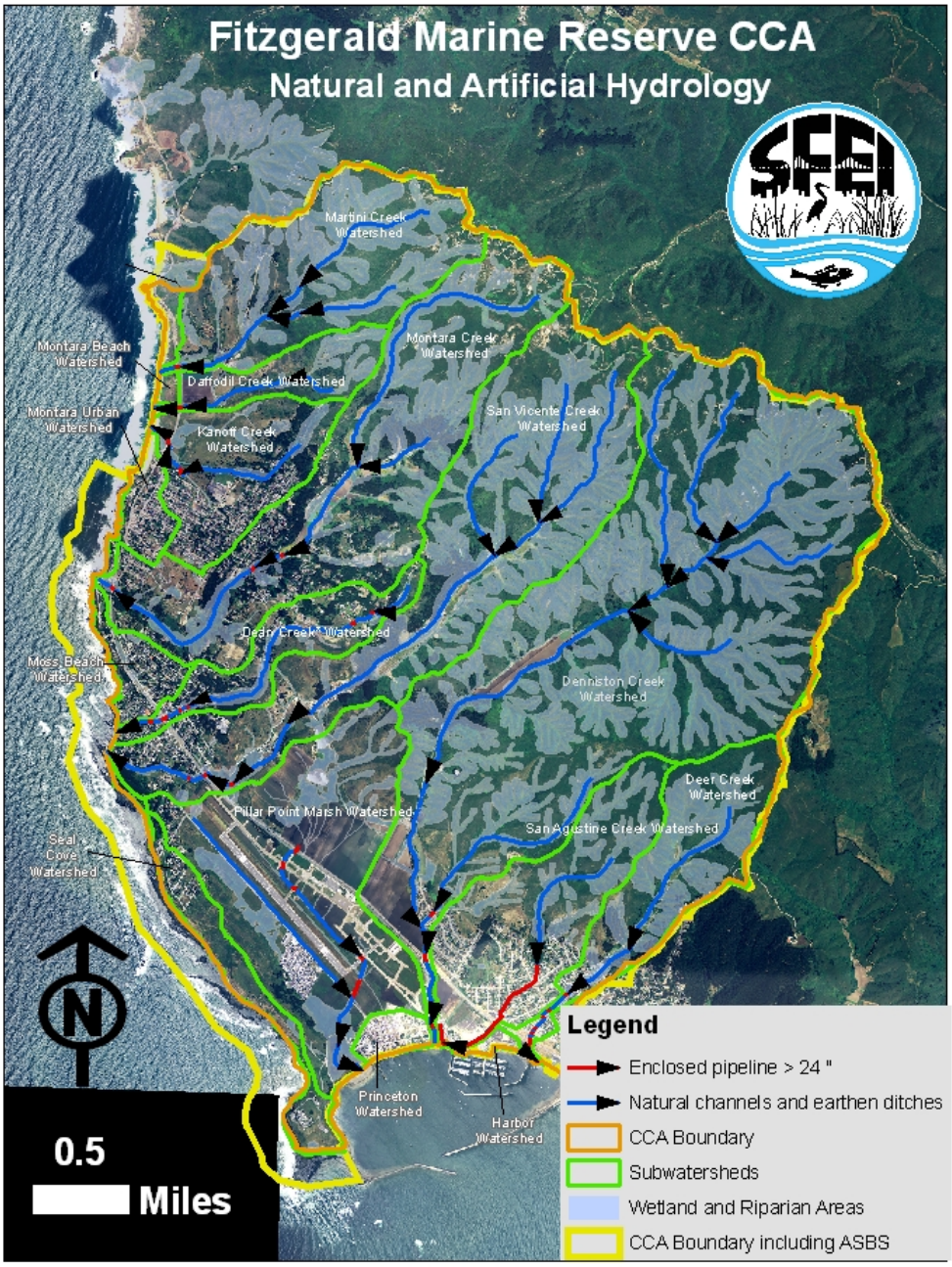
The following list (from north to south) contains all of the watersheds and associated shoreline areas that make up the CCA project area for the purposes of this report:

1. Martini Creek watershed;
2. Daffodil Creek watershed;
3. Kanoff Creek watershed;
4. Montara Creek watershed;
5. Sunshine Valley/Dean Creek watershed;
6. San Vicente Creek watershed;
7. Pillar Point Marsh drainage;
8. Denniston Creek watershed;
9. Deer Creek watershed; and
10. Pillar Point Harbor

**Figure 4.** James V. Fitzgerald Marine Reserve CCA. This map shows the boundary of the CCA but does not detail the individual sub-watersheds and shoreline areas of the study area.

**Figure 5.** Fitzgerald Marine Reserve CCA Natural and Artificial Hydrology (SFEI 2008)

Critical Coastal Areas Project
SWRCB Contract #06-345-552-0
San Francisco Estuary Institute
Contact: Kat Ridolfi (kat@sfei.org)
June 2008




Sources: Background Imagery: NAIP 2005
Enclosed pipelines, natural channels and earthen ditches, and Subwatersheds:William Lettis and Associates
* Dean Creek is also known as Sunshine Valley Creek
Wetlands and Riparian Areas:SFEI

1. *Martini Creek* has a base flow of about 100-200 gpm, and the Martini Creek watershed is approximately 650 acres (above Old San Pedro Trail bridge is about 524 acres) (SMC Public Works 2008, Balance 2005). The watershed is dominated by coastal scrub habitat and is host to the only remaining viable population of the federally and state endangered Hickman's cinquefoil plant (*Potentilla hickmanii*). This is among the rarest species in California and is known from a single small population on Monterey Peninsula and from a handful of plants in cultivation.

**Figure 6.** Martini Creek watershed, photos by Rich Allen

2. *Daffodil Creek* watershed is approximately 175 acres. Daffodil Creek flows year-round and is fed by springs. The precise location of the source springs are unknown. Daffodil Canyon is vegetated with a dense mosaic of coastal scrub with riparian vegetation along the stream channel. (Balance 2005)

3. *Kanoff Creek* watershed is approximately 360 acres and begins at a small stock pond downstream of a Montara Water and Sanitary District well. The watershed is partially urbanized.

**Figure 7.** Kanoff Creek watershed, photos by Carolann Towe

4. *Montara Creek* watershed is approximately 1,085 acres. Montara Creek is fed by several springs at its headwaters with a flow of about 70 GPM. The headwater streams are in a steep and rugged portion of a canyon; it is estimated that these streams are at an elevation of 800 feet. The upper portion of Montara Creek has two branches. The North fork has a watershed area of 290 acres and consists of a small stream. Montara Creek has discontinuous summer flows through a swale or very shallow alluvial channel with relatively undifferentiated banks for about 1,000 feet on the valley bottom. The valley bottom of the north canyon of Montara creek is farmed, except for a spring fed 1.5 acre wetland, directly west of Montara Creek at 350 feet elevation, and riparian corridor along the Creek. Downstream from the wetland, Montara Creek channel becomes increasingly evident and articulated, eventually incising about 10 feet into the floor of the valley. From this point downstream, the creek flows continuously during summers and winter dry spells, likely gaining flow from alluvial seepage as it descends (about 50 vertical feet over a distance of 900 lateral feet) to where the north fork joins the south fork of Montara Creek. Downstream of this confluence, the channel is well defined. About 2800 feet downstream of the confluence, a florist operates an on-line permanent dam and small reservoir (agricultural pond) (Balance 2005).

**Figure 8.** Montara Creek watershed, photos by Carolann Towe

5. *Sunshine Valley Creek* or *Dean Creek* to the northeast of the Reserve parallels Sunshine Valley Road and flows between the intersection of California Avenue and Cove Street to the beach. Sunshine Valley/Dean Creek watershed is approximately 360 acres. San Mateo County owns the property at approximately 37°31'34.12N and 122°30'58.52"W at California Avenue through which the creek drains. The property was acquired by the County to be incorporated into Fitzgerald Marine Reserve. Sunshine Valley/Dean Creek flows to Kelp Cove north of the main entrance to the Reserve.

**Figure 9.** Sunshine Valley/Dean Creek watershed, photos by Carolann Towe

6. *San Vicente Creek* flows to the Fitzgerald Marine Reserve. The watershed is 1170 acres or approximately 1.8 square miles (SMC Public Works). The length of all forks of the watercourse is 5.4 miles. It originates from two main perennial forks south of the South Peak area on San Francisco Watershed land on Montara Mountain at about 1700 feet elevation. The two forks form steep ravines and converge at 400 feet elevation where they are joined by a tributary at about 1600 feet downstream continuing down to the ocean. The lower watershed is urbanized in the vicinity of the Reserve. San Vicente Creek is culverted under Etheldore Road, Highway 1, Marine Boulevard and Cypress Avenue.

**Figure 10.** San Vicente Creek watershed, photos by Carolann Towe

7. *Pillar Point Marsh* drainage is approximately 785 acres, of which the Marsh occupies approximately 66 acres total area. The Marsh consists of upper freshwater marsh to the northeast of West Point Avenue and lower salt marsh and beach to the southwest of West Point Road. Pillar Point Marsh lies at the mouth of Denniston Creek and the town of Princeton. Although not directly connected by surface flow, water levels in the marsh are affected by Denniston Creek's recharge. Pillar Point Marsh is one of the largest principal wetland/riparian areas along the San Mateo County coast. In addition to supporting a wide variety of plant and animal species, the Marsh functions as a water purifier and sediment basin. While generally recognized as a surface water resource, the Pillar Point Marsh may be more appropriately described as a groundwater fed lowland area (generally below 10 feet mean sea level [msl]), the lowest portion of which is subject to tidal inflows during high tides. On the land surface, however, the hydrology of Pillar Point Marsh has been periodically altered since it was first noted in local maps in the 1800s.

**Figure 11.** Pillar Point Marsh drainage, photos by Carolann Towe

8. *Denniston Creek* flows parallel to San Vicente Creek and empties into Pillar Point Harbor, east of the Reserve. Denniston Creek watershed is approximately 2,725 acres. Denniston Creek is spring fed, and it originates in steep coastal hills and then flows through a lower-gradient rural valley and suburban area before it empties into Princeton Harbor. Denniston Reservoir is created by a dam on Denniston Creek in an unincorporated section of San Mateo County. The reservoir is at an elevation of 115 feet and is located approximately one mile east of Highway 1. The headwaters of this spring-fed creek system have a bedrock geology that consists of easily erodible granitic rocks. This weathered rock is the source of much of the sand in Denniston Creek. Natural watershed erosion processes and large precipitation events in the Denniston Creek watershed produce large amounts of sand and finer particles that are transported downstream. Similar to San Vicente Creek, Denniston Creek is culverted at Highway 1, Capistrano Avenue and Prospect Avenue. Denniston Creek's riparian corridor is densely vegetated along most reaches of the creek. Willow-alder riparian forest is the main type of riparian plant community found throughout Denniston Creek. (CCWD 2006)

**Figure 12.** Denniston Creek watershed, photos by Carolann Towe

9. *Deer Creek*, also known as El Granada Creek, is a small perennial stream. Fed by a watershed of 413 acres, the creek flows through the unincorporated community of El Granada, discharging, via an outfall, directly into Pillar Point Harbor near the boat launch ramp (PWA 1999). The geomorphic conditions in the uppermost reaches of the watershed appear to be dominated by processes related to the introduction of sediment from the valley hillslopes by mass wasting and landsliding. The channel in the upper watershed is deeply incised until it reaches the area around the reservoir (Howard Donley Assoc., Inc., 1981). The reservoir was constructed in the early 1900's, and its estimated capacity was 45.0 acre-feet. Nearly the entire corridor of Deer Creek downstream is developed to the edge of the creek.

**Figure 13.** Deer Creek watershed, photos by Carolann Towe

10. *Pillar Point Harbor* is an enclosed watershed with complex inputs and water flows. It contains an inner boat harbor, pier, and saltwater/brackish tidal marsh (Pillar Point Marsh). It receives drainage from Denniston and Deer Creeks, storm drains, outflow pipes, and large, mixed use areas including an airport, agricultural, commercial and residential sections. Pillar Point Harbor contains five beaches: Capistrano Beach, Yacht Club Beach, Marsh Beach, Mavericks Beach, Inner Harbor Beach, and Beach House Beach. Pillar Point Harbor comprises an inner harbor and outer harbor. The inner harbor berths 180 commercial fishing vessels and approximately 200 recreational boats.

**Figure 14.** Pillar Point Harbor**,**
photos by Carolann Towe

*2.2 Climate and Geology*

The region has a coastal Mediterranean climate with distinct wet and dry seasons. Nearly 95 percent of the precipitation is recorded during the months of October through April, with over 80 percent of the precipitation falling from November through March. Winter storms are typically temperate Pacific fronts. The average annual precipitation at Half Moon Bay (recorded since 1948) is 26.8 inches (NCDC 2002). The region has steady minimum temperatures throughout the year. The summer dry season is generally characterized by cool and foggy weather, and frosts are rare in the winter. Minimum temperatures have averaged 50 to 52 degrees Fahrenheit in summer months and 45 degrees in winter months. Fog is an integral part of the local climate. Fog moderates heat and drought of the summer season and is considered a contributor to the water supply in the area.

The CCA study area occurs along the western edge of the California Coast Ranges in a region topographically dominated by Montara Mountain. Marine terraces and coastal valleys extend between the ocean and the crest of Montara Mountain, 2 miles to the east and over 1,800 feet higher. The marine terraces are dissected by streams of small watersheds, originating on steep slopes of the mountain. The steep canyons and ravines of the upper watersheds change abruptly to broad flat-bottomed and steep-walled lower valleys. The valleys are filled with sediment to depths of up to more than 100 feet above the canyon bottoms. Sediment from San Vicente and Denniston Creeks has also accumulated in a down-faulted basin (Pillar Point graben),

forming the coastal plain on which the Half Moon Bay Airport was established. (MWSD Public Works Plan, Phase 1 Draft EIR MHA Inc 2005).

The dominant aquifer on the Mid-Coast is the unconsolidated deposits of the Pillar Point graben, commonly called the “Airport Aquifer.” The basin has accumulated coarse-grained alluvial fan and stream deposits that are primarily decomposed granite from Montara Mountain, deposited by San Vicente Creek on the north and Denniston Creek on the south. Extending headward along both creeks are coarse-grained alluvial aquifers and underlying fractured granitic bedrock aquifers. The aquifer types that comprise the CCA study area represented in the Mid-Coast include the two sub-basin groupings of valley and coastal plain aquifers (Balance 2002): Martini Creek south to Dean Creek, which includes Montara Creek and San Vicente Creek south to Denniston Creek, including the Airport aquifer.

*2.3 Land Use and Demographics*

Assessing the FMR CCA watershed requires an understanding of the regional and local political, institutional, demographic and economic forces that are shaping and impacting Midcoastside communities and natural resources. Included here is a brief overview of some of these factors.

The 2007 reported population of the study area (including Montara, Moss Beach and El Granada) is approximately 11,150. The number of households is estimated at nearly 4,000. The sub-region is highly influenced by proximity to the coastline, and its historically constraining transportation access and topography. “Coastsiders” view themselves as dwelling in a rural and semi-rural area. In the Midcoast there is an urban and a rural boundary set in the Local Coastal Plan Nevertheless, the Midcoastside is urbanizing. County planners estimate that the Midcoastside is at the mid-point of its planned buildout. (See Appendix E).

Overlapping special districts service a variety of local and visitor needs. Each district has a stake in the community’s future, and some have capital improvement plans that may improve water quality in the area, such as water and sewer infrastructure improvements.

The road network is extensive. A new tunnel is being constructed on State Highway One to replace the existing Devil’s Slide, which closes periodically due to landslides. Conservation of lands has put significant areas within and outside of the coastal plain and coastal terraces into public protection status.

Numerous San Mateo County programs provide services to the Midcoastside due to its unincorporated community status. The geographic distance from the mid-coast to the County center of government (Redwood City) poses challenges in service delivery and communication for both the county and the mid-coast population.

The growing popularity of the area creates a demand for more services, and the visiting population is becoming a large factor in long range planning and natural resource protection efforts. The agricultural community maintains a presence and land for development is going for premium prices. Some advocates for shoreline areas are seeking strong marine protection status to cope with population and related environmental pressures.

The FMR CCA study area encompasses an array of land uses such as residential, public recreation, commercial, open space, wetlands, and agricultural. Half Moon Bay Airport is directly east of the CCA, and Pillar Point Harbor marina is located immediately south of the ASBS. The southern half of the study area is less populated with the southern terminus, near Pillar Point, being occupied by a large military radar station.

Mavericks is a world-renowned big wave break which breaks over an ocean reef that is one-half mile off the coast just outside of Pillar Point harbor south of Pillar Point in Half Moon Bay, California. The reef is just outside of Sail Rock. Today it considered one of the most challenging waves in the world as riders are presented with waves as high as 50 feet, remarkably strong currents, dangerous rocks, shallow reefs, and frigid water temperatures. The 2006 contest saw tens of thousands of spectators descend on the area, who trampled vegetation, scrambled up the sides of cliffs, stood on reefs at low tide and left garbage. Contest organizers have since educated helicopter pilots on the need to limit low flights that can scare harbor seals and shorebirds from their resting places and will erect barriers protecting hillsides that are prone to erosion and tidal areas flush with barnacles, sea anemone and other marine life.

**Figure 15**. Mavericks, Half Moon Bay, CA[8]

Table1 (below) describes the major land use categories of the FMR CCA while Table 2 describes the land uses by watershed or drainage. Table 2 was compiled through a combination of methods including SC discussions, archival research, the SMC LCP Update map, and anecdotal/local knowledge.

8 http://www.mavericksurf.com/Multimedia/Default.aspx?id=160, accessed July 7, 2008.

**Table 1.** Land Use of James V. Fitzgerald Marine Reserve CCA[9]

| Land Use Category | Portion of Study Area (%) |
|---|---|
| Agriculture | 4 |
| Commercial or Industrial | 1 |
| Open Space or Forested | 84 |
| Urban or Residential | 11 |
| Total | 100% |

*Pertinent land use regulations*

San Mateo County's General Plan, last updated in 1986, is the locally governing document that guides decision-making for the County. General Plans are required to contain background, issue and policy statements on nine specific subjects which are called "elements." The nine mandatory elements are: (1) Land Use, (2) Circulation, (3) Housing, (4) Conservation, (5) Open Space, (6) Seismic Safety, (7) Noise, (8) Scenic Highway, and (9) Safety. The 1976 California Coastal Act requires every local government with land within the Coastal Zone to prepare a Local Coastal Program, including a land use plan. The Coastal Act requires this land use plan to be part of the General Plan. This land use plan and all amendments must be approved for consistency with Coastal Act policies by the California Coastal Commission.

The Local Coastal Program (LCP) is the primary document regulating land use in the coastal zone and study area. It was certified by the California Coastal Commission in November 1980. In April 1981, the County assumed responsibility for implementing the State Coastal Act, including issuing Coastal Development Permits, in the unincorporated area of San Mateo County. The Coastal Commission, in December 2000, awarded the County $40,537 to contribute to a multi-year comprehensive update of the Mid-Coast LCP. The eventual update will include clarification of 20-year-old policies and was approved by the County Board of Supervisors in 2006 and has been submitted for Coastal Commission review and certification. In the recent LCP update amendment, the County considered water quality policies to address impervious surface limits and winter grading restrictions, among other updates. This amendment and tentative approval will need to be certified by the California Coastal Commission (See also Appendix A). At the time of this report, San Mateo was considering a watershed protection ordinance as part of a larger watershed protection strategy and outreach.

9 Source: National Landcover Dataset 1999 in SFEI, 2007

**Table 2.** Major land uses in Midcoast Watersheds[10]

| Land Use | Creeks and Watersheds | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Martini Creek | Daffodil Creek | Kanoff Creek | Montara Creek | Sunshine Valley/ Dean Creek | San Vicente Creek | Denniston Creek | Pillar Point Marsh | Pillar Point Harbor | Deer Creek |
| Agriculture | X | X | X | X | X | X | X | X | | X |
| Confined Animal Facilities | X | | X | X | X | X | X | | | |
| Equestrian Facilities | | | | X | X | X | X | | | |
| Equestrian Uses | | | X | X | X | X | X | | | |
| Other Uses | | | X | | | | | | | X |
| Row Crops/Flower Farms | X | X | X | X | | X | X | X | | |
| Air Force Station | | | | | | | | X | | |
| Airport, Light Industrial | | | | | | X | X | X | | |
| Aquaculture | | | | | | | | | X | |
| Coastside Commercial Recreation | | | | | | | X | X | X | X |
| Estuarine Habitat | X | X | X | X | X | X | X | X | X | X |
| Industrial-Light Industrial | | | | | | | | X | | |
| Industrial-Waterfront Marine | | | | | | | X | X | | X |
| Institutional | | | X | X | | X | X | | | |
| Marina-Commercial Recreational | | | | | | | | | X | X |
| Marine Habitat | | | | | | | | | X | |
| Municipal-water sources, Reservoirs | | | | X | | X | X | X | | |
| Neighborhood Commercial | | | X | | X | | | | | X |
| Open Space | X | X | | X | | X | X | X | | X |
| Public Recreation-Marine Reserve, Parks, Beach | X | X | X | X | X | X | X | X | X | X |
| Rare, Endangered, Unique Sp. Habitat | X | X | X | X | X | X | X | X | X | X |
| Residential-Low Density | | | | | | | X | X | | |
| Residential-Medium Density | | | X | X | X | X | X | X | | |
| Residential-Medium High Density | | | | X | | X | | X | | X |
| Residential-Very Low Density | X | | X | X | | X | | X | | |
| Riparian Corridor | X | X | X | X | X | X | X | | | X |
| Rural/Dirt Roads | X | X | X | X | X | X | X | X | | |
| Septic Systems | X | | X | X | X | X | X | X | | X |
| State Highway | X | X | X | X | X | X | X | | | X |
| Trails | X | X | X | X | X | X | X | X | | X |
| Wetland | X | X | X | X | X | X | X | X | | |
| Wildlife Refuge, Reserve, Sci. Study Area | | | | | X | X | | X | | |

10. The information from this table is not grounded in field research.

*2.4 Hydrology and Impervious Area*

Impervious cover refers to hard surfaces that do not allow water to penetrate the soil, such as rooftops, driveways, streets, swimming pools, and patios. Water quality degradation increases with percent imperviousness. The increased volume and velocity of runoff from developed urban areas can greatly accelerate the erosion of downstream natural channels.

Two primary effects of impervious surface are: (1) increased pollutant loading into the drainage network and receiving waters, and (2) alteration of the physical and biological integrity of water via bank and bed erosion, increased flood risk, reduced groundwater recharge, and adverse in-stream habitat impacts. These are some examples of hydromodification-the modification of a stream's hydrograph caused in general by increases in flows and durations that result when land is developed. Areas that are not otherwise defined as impervious can sometimes function like they are impervious. For example, a residential lawn would normally allow for runoff to slowly filter into the ground. After saturation, however, runoff might flow directly into the street or a driveway, just as if it were made of concrete. Since impervious surfaces make up a large portion of the landscape altered by humans, aquatic degradation is also linked to "developed areas" (including agriculture, residential, industrial, etc.).[11]

Based on these relationships between impervious area and aquatic degradation, the percentage of impervious area (IA) in a watershed has emerged as an indicator used to predict the degradation of stream health. A number of studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of beneficial uses of downstream receiving waters. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. Studies show that in most cases, when impervious cover is less than 10% of a watershed, streams remain healthy. Above 10%, common signs of degradation may occur, including: excessive stream channel erosion, reduced groundwater discharge, increased size and frequency of floods, increased contaminants in water, and overall degradation of aquatic habitat. Between 10-25%, major alterations in stream morphology occur that significantly reduce habitat quality. At greater than 25% impervious cover, streams suffer from loss of habitat, floodplain connectivity, and bank stability as well as decreased water quality[12].

Analyzing IA is important for its many management implications. For example the San Francisco Bay Regional Water Quality Control Board has indicated that "Impervious surface data can serve as an indicator of stream health, an effectiveness measurement of stormwater program effectiveness in pollutant and flow controls, and as a parameter to prioritize stormwater management activities and stream restoration efforts, etc." IA could be used to help identify sources of current pollutant loads, and where they might increase in the future. Another application for using IA is to predict the impacts of hydromodification.

A range of issues was researched related to impervious area (IA) and its application to the CCA program as a tool to analyze and forecast NPS pollution and its impacts on coastal watersheds such as FMR. For example, the percent IA in FMR was

11 Hill et al 2003

12 CA WALUP-How Urbanization Affects the Water Cycle

calculated and estimated, and next steps were recommended for refining this estimate and using IA in the future for selecting appropriate management actions (see Tables 3, 4 below). The conclusions were that the impacts of increasing urbanization on IA are variable; there are many methods of measurement; and the influences of IA on stream health are variable. Further, the method used to estimate IA was not the most accurate and researchers are awaiting the results of a related project to identify whether land use coefficients can be used throughout California for estimating current IA in any watershed. There was no attempt made in the limited program study to address the relationship between imperviousness and expected degradation of beneficial uses caused by increased pollutant loadings and effects of changes in the hydrologic regime.

The estimate still provided a sense of the relative percent IA among the watersheds. This information related to impervious area can be used to identify mitigation measures to minimize additional impacts on stream environments and water quality during Action Plan development, and track changing land use and correlations with changing stream conditions. The proximity of impervious surfaces to receiving waters is another important consideration. SFEI plans to build on their analysis under their Prop 50 grant to make recommendations to local government on how they can incorporate IA analysis into building permit fees, land use planning ordinances, county codes, and other policy and regulatory tools with the ultimate goal to protect and restore beneficial uses. For details of their analysis, see Appendix B.

Two types of methods were used to estimate impervious area: Total Impervious Area and Impervious Area. The most important difference between these two methods is that the first (see Table 3) depicts an estimate of the current IA in the CCA study area (9.35%), whereas the second (Table 4) predicts the future IA in the CCA study area (15.3%). As indicated above, some studies have shown that between 10-25% imperviousness, there can be major alterations in stream morphology that significantly reduce habitat quality and impact stream quality. Incorporating all the pieces of the watershed reviewed above (which comprise about 62.38% of the total CCA study area), it was estimated that the FMR CCA area is comprised of 9.35% impervious area (Table 3).

**Table 3.** Estimate of Impervious Area for Certain Components of the FMR CCA Study Area

| Component | Total Acres | % of Watershed | IA (acres) | IA (%) |
|---|---|---|---|---|
| San Vicente, Dean, and Montara sub-watersheds[13] | 2,496.00 | 28.64% | 174.72 | 7.00% |
| Denniston Creek sub-watershed | 2,368.00 | 27.17% | 47.36 | 2.00% |
| Half Moon Bay airport | 290.00 | 3.33% | 45.30 | 15.62% |
| Roads | 232.55 | 2.67% | 232.55 | 100.00% |
| Pillar Point Air Force Base | 48.96 | 0.56% | 8.30 | 16.95% |
| **Total** | **5,435.51** | **62.38%** | **508.23** | **9.35%** |

13 The Program's estimate of impervious area for Dean, Montara, and San Vicente Creek watersheds (Figure 4) represents roughly 50% of the estimated build- out of the mid-coastside LCP planning study area. The Denniston Creek watershed estimate of impervious area amounts to roughly one third that of Dean, Montara, and San Vicente Creek watersheds. These conditions are contrasted with other watersheds in northern San Mateo County with greater population densities in "Comparative Imperviousness and Population/Household Size and Population Projection at Buildout (ABAG Jan. 2007)."

**Table 4.** Estimate of Future Impervious Area in the CCA Study Area[14]

| ICE Project Land Use | Total Acres | IA Coefficient (%) | IA (% of watershed) |
|---|---|---|---|
| Agriculture and Grazing | 480.79 | 4 | 0.22% |
| High Density Commercial | 196.99 | 85 | 1.92% |
| High Density Residential | 942.94 | 69 | 7.47% |
| Industrial | 345.61 | 87.5 | 3.47% |
| Low Density Commercial | 0.00 | 74.5 | 0.00% |
| Low Density Residential | 163.52 | 40 | 0.75% |
| Medium Density Residential | 0.00 | 55 | 0.00% |
| Mixed Use | 0.00 | 82 | 0.00% |
| Planned Development | 0.00 | N/A | 0.00% |
| Public Lands and Open Space | 6,578.98 | 2 | 1.51% |
| Urban Reserve | 5.13 | N/A | 0.00% |
| Water | 0.00 | 0 | 0.00% |
| Total | **8,713.96** | | **15.34%** |

14 Based on San Mateo County General Plan buildout scenarios, Information Center for the Environment (ICE) at Davis's land use categories, and Office of Environmental Health Hazard Assessment's coefficients.

# CHAPTER 3. WATER QUALITY CONDITIONS

The intent of this section is to identify existing water quality conditions in the key coastal water bodies and shoreline areas that comprise the FMR CCA study area, an aggregate of watersheds and drainages, and their associated shoreline areas that have not, until this time, been considered one study area. The following information represents a summary of existing water quality information for the FMR CCA study area. These watersheds and drainages include (from north to south) Martini Creek, Daffodil Creek, Kanoff Creek, Montara Creek, Dean/Sunshine Valley Creek, San Vicente Creek, Pillar Point Marsh, Denniston Creek, and Deer Creek. Receiving waters of Pillar Point Harbor were also included due to potential water quality impacts to the CCA. Due to the variety of documented or potential impairments and quality of data for each sub-watershed and budget limitations, this report does not include an analysis of all of the information for the entire CCA, but pertinent data and information sources are identified. Instead, the following compilation summarizes issues of concern by drainage or shoreline area.

Fitzgerald Marine Reserve (FMR) study area has not been thoroughly characterized in terms of impairment of natural resources, recreational uses, or watershed functions and processes that might affect key ecosystem support services (e.g., pollution filtration/sequestration; maintenance of biodiversity; flood attenuation; groundwater recharge). Few previous efforts have been undertaken to compile information from unpublished or widely dispersed sources. The majority of the information below comes from a preliminary draft technical memo and accompanying maps and data provided by ABAG staff for the CCA project staff (Van Velsor and Strahan 2006). The information provided by ABAG originated from a variety of reports, interviews, programs, plans, and other documents referenced throughout this section. A combination of business owners, non-profit, local, regional, state and federal agency programs make up the monitoring and water quality programs for the area and are summarized in Chapter 4. Some efforts have been underway for several years, while others have recently started or are under discussion. San Mateo County Environmental Health Division monitors the levels of fecal indicator bacteria (E. coli) present in several of the creeks that drain into the project area on a weekly basis. Sampling is conducted every Monday at the mouth of the creek. Monterey Bay National Marine Sanctuary Snapshot Day data give an overview of water quality with respect to physical, chemical and biological parameters for a single annual sample. These data are collected once per year in the spring, on as close to the same day as possible each year. Appendix G includes Water Quality Objectives related to Snapshot Day. The exceedances are highlighted below for each watershed summary as appropriate. San Mateo's Surfrider Chapter monitored the levels of fecal indicator bacteria (E. coli and Enterococcus) in one of the creeks monitored by the county and two other creeks that were not part of the county monitoring program, on a weekly basis. Sampling was conducted on a Saturday morning for the period of April 2005 through April 2007.

Hydromodification is included as a category altering the integrity of water in the California Nonpoint Source Plan and an issue of increasing significance for the San Francisco Bay Region. While the watersheds within the pilot area have seen far fewer modifications than those in the more urban areas of the county, numerous opportunities to prevent additional hydromodification and restore key stream functions in certain locations may emerge. Future SFEI studies will quantify to what extent the natural hydrology in the study area has already been altered, and has thereby disturbed the

dynamic equilibrium of streams, and to what extent additional hydromodification, if left unchecked, may contribute to continuing losses of watershed processes and functions. Hydromodification generally exacerbates stream bank and bed erosion, sediment deposition at hydraulic constrictions, such as inadequately sized culverts, and hence contributes to flooding and loss of key stream functions. A recently-formed committee of San Mateo County officials and citizens, the Storm Drainage Council, will be investigating this issue in more detail in 2008.

Section 303(d) of the Clean Water Act (CWA) requires each state to identify those water bodies that do not meet water quality standards on a list known as the "303(d) list". A given water body can appear on the list for one or more water quality constituents. Total Maximum Daily Loads (TMDLs) are plans developed by the Regional Water Quality Control Boards (RWQCBs) in California in order to improve water quality for a particular pollutant. The development of the TMDL is a long process including multiple reports and a public comment period, but once the TMDL is issued, regulatory action can be taken (in the form of a permit, waiver, or enforcement order) to implement the actions prescribed in the staff report. Thus, once a pollutant is put on the 303(d) list, it becomes a regulatory priority (SF Bay RWQCB 2003). The pollutants that appear on the 303(d) list tend to dominate much of the research that goes into improving beneficial uses of water bodies due to the regulatory requirements attached to them. However, the list only includes narrowly-defined "pollutants" and does not include other "pollution"[15] that may come from several, diffuse sources. Diffuse, or NPS pollution is the focus of the CCA program, and so pollutants not on the 303(d) List that are "issues of concern" are also included in this summary below. These have been identified by local stakeholders and relevant information sources including existing management plans, reports, city and county General Plans, and Environmental Impact Reports (EIRs). The focus includes any "man-made or man-induced alteration of the chemical, physical, or biological integrity of water" (Section 502(19) of the Clean Water Act). While efforts to produce the summary were thorough, they were not exhaustive, and should be updated as information emerges or changes (updated General Plans, ordinances, state legislation, etc.).

The narrative below provides more detail on what the impairment status is in each drainage, its associated shoreline area, and the uncertainties associated with the available data (issues also summarized in Table 6). The current issues of concern and sources, listed below and in Appendix F, *NPS Pollutants, Description and Potential Impacts on CCA*, are based on data from a variety of sources or on potential impacts associated with specific land uses and activities that deserve additional investigation and include:

- Fecal bacteria (303d list San Francisco Bay RWQCB; Surfrider, San Mateo County Environmental Health, MBNMS Snapshot Day)
- Hydromodification and flooding (San Mateo County Drainage Council; technical team reconnaissance)
- Sediments (Coastside County Water District 2004)
- Nutrients (San Mateo County Department of Parks et al. 2002)
- Pesticides (San Mateo County Department of Parks et al. 2002)
- Mercury (303d list San Francisco Bay RWQCB)

15 The CWA defines "pollutant" fairly broadly as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water…The term "pollution" means the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water." (Clean Water Act §502).

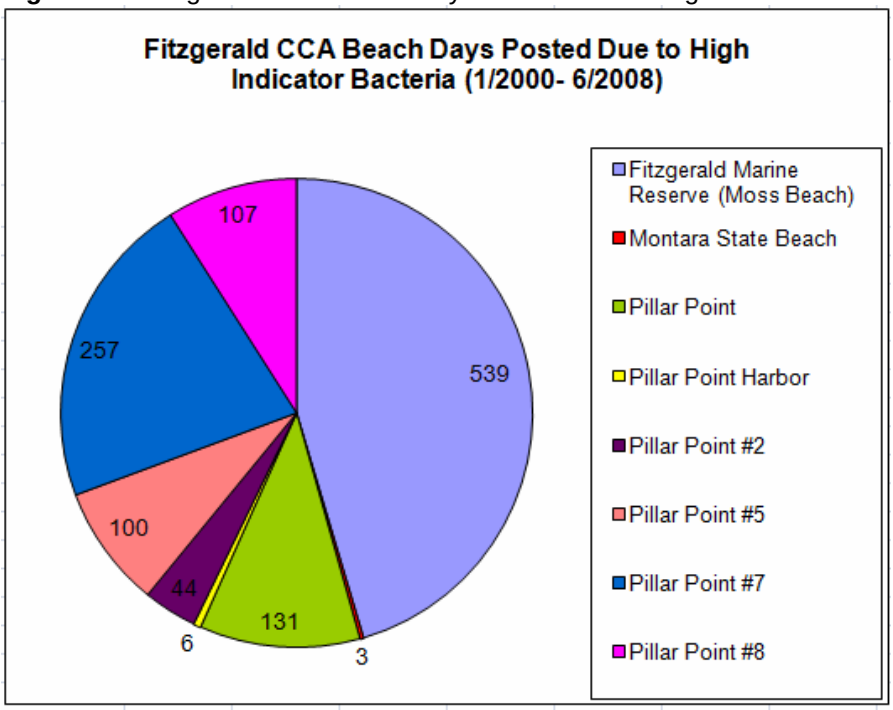
- 1,2,3-trichlorpropane (MHA Inc 2005)
- Manganese (MHA Inc 2005)
- MTBE (MHA Inc 2005)

A primary pollutant of concern in the study area, and the driver for the CCA project in this region, is Coliform Bacteria. Additional issues that could also impact water quality and deserve additional investigation were raised at a 2007 stakeholder CCA pilot project workshop, including:

- Copper
- Offshore water circulation
- Effects of stormwater on creek integrity, including impervious surfaces, and how to handle increased volumes of runoff
- Invasive species
- Emerging pollutants (e.g. personal care products, pharmaceuticals)

In 1997, AB 411 (Chapter 765, Statutes of 1997) mandated that beaches with storm drains that discharge during dry weather and visited by more than 50,000 people per year be monitored at least weekly from April 1 through October 31 by the local health officer or environmental health agency. Beginning in 1999, Department of Health Services (DHS) regulations implementing AB 411 required that local officials must post beaches that exceed standards set by the DHS with warning signs. Beaches suspected of being contaminated with sewage must be immediately closed until bacterial monitoring indicates the waters are safe for human contact. AB 1946 (Chapter 152, Statutes of 2000) requires local health officers to submit to the SWRCB, on or before the 15th day of each month, documentation of all beach postings and closures.[16]

**Figure 16.** Fitzgerald CCA Beach Days Posted Due to High Indicator Bacteria[17]




16 http://www.waterboards.ca.gov/water_issues/programs/beaches/beach_water_quality/background.shtml

17Pillar Point, Pillar Point Harbor, Pillar Point #2, #5, #7, #8 refer to monitoring locations within the harbor breakwalls sampled weekly by County of San Mateo Environmental Health per the State Water Resources Control Board AB411 recreational water contact requriements.

**Fig. 17.** San Mateo County Environmental Health Weekly AB411 Sampling Data - Creeks within the CCA[18]

| Site | Analyte | # of Samples | Date Range | Min | Max | Median | Average[19] | Water Quality Objectives* |
|---|---|---|---|---|---|---|---|---|
| San Vicente Creek | Total Coliform (MPN/100mL) | 347 | 10/6/1998 - | <10 | >24,192 | 3,255 | 5,359 | **Total Coliform** |
| San Vicente Creek | Fecal Coliform (MPN/100mL) | 348 | 12/10/2007 | <10 | >24,192 | 697 | 1,198 | Median: <240 MPN/100mL |
| Sunshine Valley Creek | Total Coliform (MPN/100mL) | 34 | 2/20/2007 - | 223 | >24,192 | 5,483 | 8,819 | Max: 10,000 MPN/100mL |
| Sunshine Valley Creek | Fecal Coliform (MPN/100mL) | 34 | 12/17/2007 - | <10 | >24,192 | 41 | 902 | **Fecal Coliform** |
| Martini Creek | Total Coliform (MPN/100mL) | 232 | 4/29/2002 | <10 | >24,192 | 1,435 | 2,519 | Geomean: <200 MPN/100mL |
| Martini Creek | Fecal Coliform (MPN/100mL) | 231 | 12/10/2007 | <10 | 1,860 | 63 | 127 | *Source: Basin Plan Objectives for Water Contact Recreation |

Three water bodies within the CCA study area that have been placed on the 2006 SFBRWQCB's 303(d) list (approved by EPA June 2007) as impaired by the following pollutants are:

San Vicente Creek – Coliform bacteria

Pacific Ocean at Pillar Point Beach – Coliform bacteria and Pillar Point-mercury

Pacific Ocean at Fitzgerald Marine Reserve – Coliform bacteria

These waterbodies all have proposed TMDLs slated to be completed in 2019. More investigation is needed for each drainage and shoreline area in the study area to evaluate to what extent management practices designed to de-list the above water bodies may be applicable for others as well. The information compiled and summarized below is the result of current efforts.

Beneficial uses of some of the listed water bodies are described in the San Francisco Bay Regional Water Quality Control Board's Basin Plan. Additionally, Table 5 below (adapted from Table 2-7 of the FMR Draft Final Master Plan (2002)) describes the existing and potential beneficial uses of San Vicente Creek, Denniston Creek, and Pillar Point (Princeton) Marsh. These include:

18 This is a summary of data collected for creeks for this program. For detailed AB411 creek data, see Appendix H.

19 The average may be more or less due to detection limits and manipulation of the data. Not to be used for statistical analysis.

**Table 5.** [20]

**EXISTING (*) AND POTENTIAL (O) BENEFICIAL USES OF SAN VICENTE CREEK, DENNISTON CREEK, AND PILLAR POINT (PRINCETON) MARSH SAN MATEO COUNTY**

| | San Vicente Creek | Denniston Creek | Pillar Point Marsh |
|---|---|---|---|
| Municipal supply (MUN) | * | * | |
| Agricultural supply (AGR) | * | * | |
| Water-contact recreation (REC-1) | 0 | * | * |
| Non-contact water recreation (REC-2) | 0 | * | * |
| Warm fresh water habitat (WARM) | | * | |
| Cold fresh water habitat (COLD) | * | * | |
| Wildlife habitat (WILD) | * | * | * |
| Preservation of rare and endangered species (RARE) | * | * | |
| Fish migration (MIGR) | * | * | |
| Fish spawning (SPWN) | * | * | |
| Fresh water habitat (FRESH) | | | * |
| Brackish water habitat (BRACKISH) | | | * |
| Salt water habitat (SALT) | | | * |

### *3.1 Martini Creek*

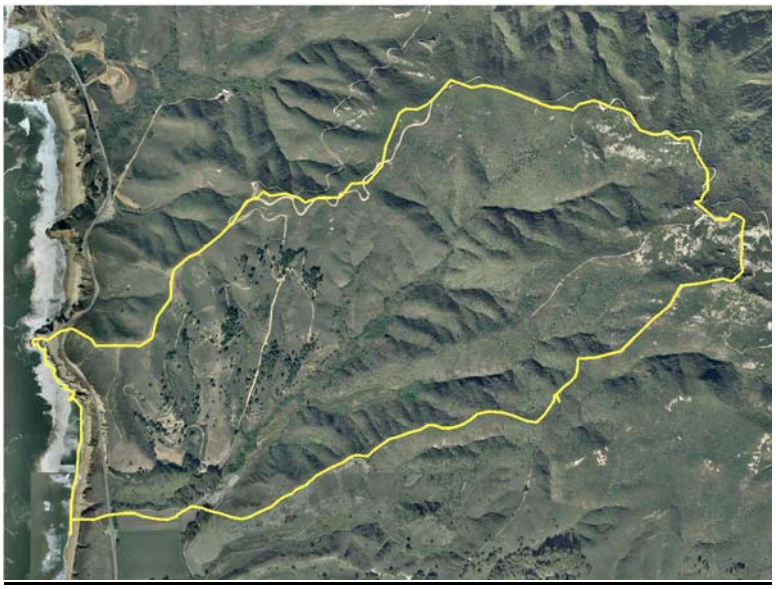


**Figure 18.** Martini Creek-2005 Imagery provided by San Mateo County

20 source: Fitzgerald Marine Reserve Master Plan, Brady, 2002. Available from : http://www.eparks.net/vgn/images/portal/cit_609/123937472f.hydrology.pdf

In 2005, Snapshot Day sampling results showed exceedances of water quality objectives for pH, but in 2006 it was within limits (Hoover 2005 and Hoover 2006). Martini Creek is monitored weekly by County Environmental Health for fecal indicator bacteria. Levels of bacteria are not considered to be problematic. Montara Beach was posted one time in 2000 for a total of 3 days due to high indicator bacteria concentrations (see Appendix H).

*3.2 Daffodil Creek*

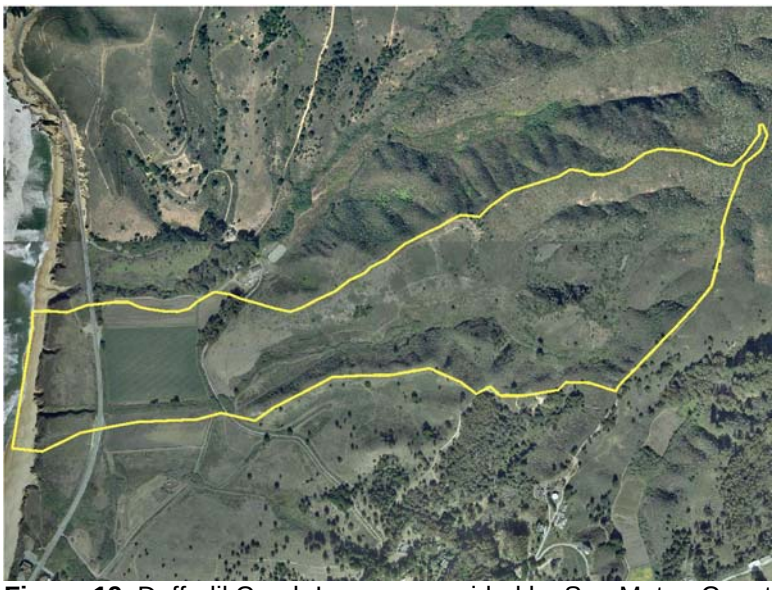


**Figure 19.** Daffodil Creek-Imagery provided by San Mateo County

No water quality information was available at the time of this report. Research needs to be conducted to understand land uses, hydrology, biota and related water quality conditions in Daffodil Creek to evaluate any risks to natural and recreational resources. Montara Beach was posted one time in 2000 for a total of 3 days due to high indicator bacteria concentrations (see Appendix H).

*3.3 Kanoff Creek*

**Figure 20.** Kanoff Creek-Imagery provided by San Mateo County

No water quality information was available at the time of this report. Research needs to be conducted to understand land uses, hydrology, biota and related water quality conditions in Kanoff Creek to evaluate any risks to natural and recreational resources. Montara Beach was posted one time in 2000 for a total of 3 days due to high indicator bacteria concentrations (see Appendix H).

*3.4. Montara Creek*

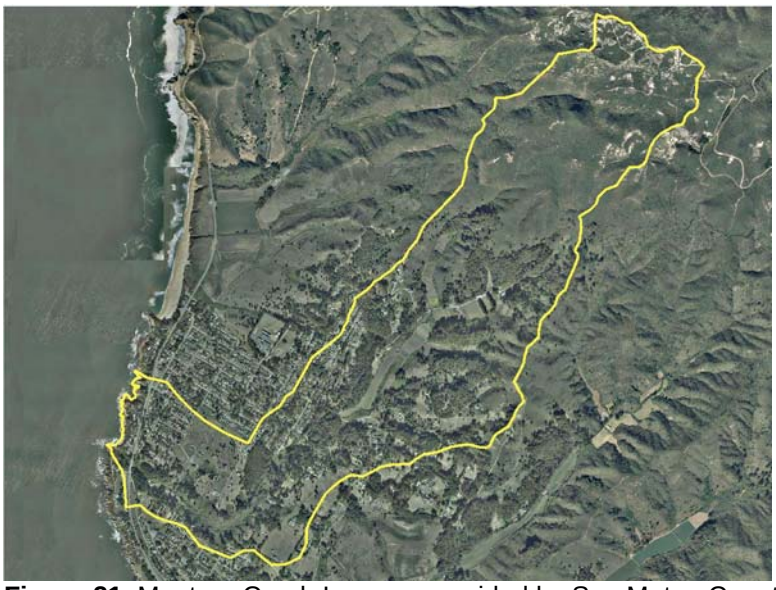


**Figure 21.** Montara Creek-Imagery provided by San Mateo County

An MTBE source is located 2000 feet to the south of Montara Water and Sanitary District (MWSD) pumping well. In 2003, sampling results showed 529 μg/l of MTBE in the groundwater at Alta Vista well #1, far greater than the state standard of 13 μg/l set by the State Department of Health Services (2000). An EIR issued in 2005 by MWSD reported that the district was using a remediation system to keep the contaminated plume from migrating into the water that is pumped for domestic use (MWSD 2005). In late October 2007, MWSD announced that it would begin pumping 50-150 gallons per minute from one of the Alta Vista wells for drinking water supply, though it was unclear whether it was the same well near the MTBE source (Smydra 2007a). Montara Creek exceeded the WQO for pH during snapshot day 2005, but in 2006 it was within limits (Hoover 2005 and Hoover 2006).

Technical team reconnaissance noted numerous drainage issues such as flooding and inadequate storm drain infrastructure throughout the residential area of Montara, which are likely to contribute to hydromodification of Montara Creek and a small neighboring drainage on the north side of Montara (Kanoff Creek).

The California Department of Transportation (Caltrans) discharges storm water from its facilities into the Pacific Ocean at Montara Point (close to where Montara Creek drains into the ocean). Water quality sampling has been conducted at this site for the ASBS program. Through an evaluation of the segment of Highway 1 from Pacifica to Half Moon Bay, annual pollutant loads have been estimated through research completed at CSU Sacramento's Office of Water Programs for conventional parameters, nutrients, and metals (CSU Sacramento Office of Water Programs 2006). Further research is

needed to determine if any of these constituents is a major concern for the Reserve and nearby waterways. Extensive research has been performed by the agency on coliform contamination in storm water discharge structures that drain highly urbanized areas. A regional program of road maintenance occurs pursuant to CalTrans' Stormwater Management Plan which can help minimize pollutants from entering the waterways. Montara Beach was posted one time in 2000 for a total of 3 days due to high indicator bacteria concentrations (see Appendix H).

*3.5 Sunshine Valley/Dean Creek*

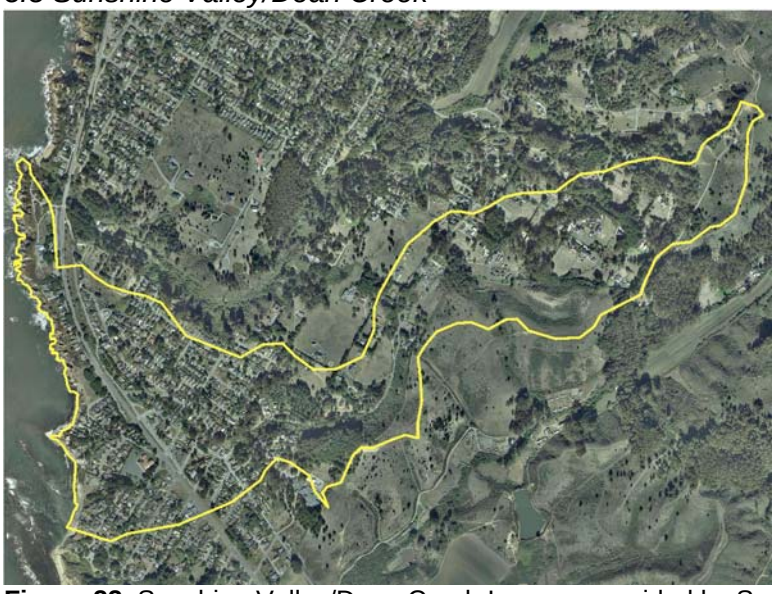


**Figure 22.** Sunshine Valley/Dean Creek-Imagery provided by San Mateo County

Beach postings/advisories and/or closures at the mouth of the creek indicate that the creek exceeds WQOs for E. coli and coliform bacteria (San Mateo County Environmental Health). Although no data were collected, the FMR Resource Assessment speculated about possible problems with coliform bacteria, nitrates and ammonia, and sedimentation associated with upstream ranching and equestrian operations. Further investigation is needed to determine if problems actually exist and what the sources are.

*3.6 San Vicente Creek*

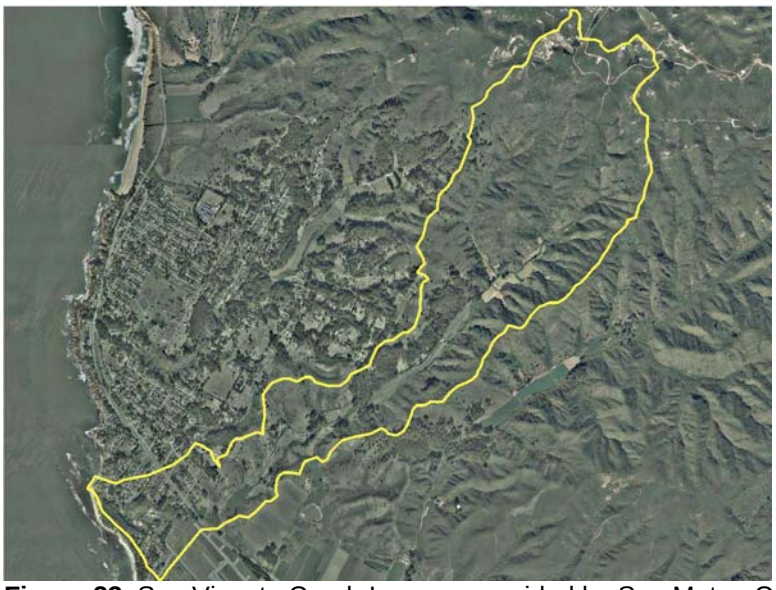


**Figure 23.** San Vicente Creek-Imagery provided by San Mateo County

This watershed has received the most attention due to voluntary efforts of land managers and regular data collection by the San Mateo County Environmental Health Department. It is an highly accessible and visible area due to the location of the parking lot for the reserve at the mouth of the Creek. A collaborative monitoring effort between landowners, tenants, San Mateo County and an environmental group in the San Vicente watershed, from 1999 to the present, has monitored the creek on a monthly basis for fecal indicator bacteria. The number of samples that exceed the WQO for *E. coli* have consistently decreased for sites on the east side of Highway 1 since 2000. This is likely due to successful implementation of best management practices and corrective actions upstream (San Mateo County Department Environmental Health 2007). However, the mouth of San Vicente Creek at the Fitzgerald Marine Reserve is still regularly posted for exceeding WQOs for coliform bacteria. Fitzgerald Marine Reserve's Moss Beach was posted 15 times in the last 8 years. The beach was posted for a total of 539 days due to high indicator bacteria concentrations (see Appendix H). These high concentrations of bacteria at the creek mouth may be from legacy sources, tributaries not sampled, or other sources. It is also suspected that storm drains that receive runoff from residential and public areas west of Highway 1 may be contributing bacteria. At all sampling locations within the CCA, bacteria concentrations are typically highest immediately after rains, but diminish thereafter" (San Mateo County Department of Parks 2004).

The FMR Master Plan mentions concerns about nitrate, ammonia, industrial chemicals, and pesticide contamination of the creek, although no recent studies have been completed with reliable data to show such elevated levels. Possible sources of nutrients speculated by Park planners, not necessarily in priority order, include:

- equestrian facilities,
- fertilizers applied to farmlands,
- septic leach fields,
- underground broken sewer pipes,
- runoff from impervious surfaces associated with a range of land uses.

*3.7 Pillar Point Marsh*

**Figure 24.** Pillar Point Marsh-Imagery provided by San Mateo County

The shoreline area of the marsh is regularly posted for water quality exceedances (total coliform, E. coli, and enterococcus) based on testing performed by the San Mateo County Environmental Health Department. The RCD's grant-funded project to identify sources of coliform and other pathogens will hopefully provide information to eliminate that water quality concern.

Montara Water and Sanitary District (MWSD) maintains groundwater wells on the airport property that are periodically tested by the state Department of Health Services (DHS) for drinking water safety. In 2002, monitoring results indicated that the aquifer below the Airport that contributes seepage into the marsh (where MWSD draws its water from) had levels of 1,2,3-trichloropropane, also known as TCP, (a soil fumigant used in the past in agriculture areas) that exceeded advisory levels21. The well was again tested in 2003 and levels still exceeded the DHS action level (DHS 2003). In addition, the northernmost well has levels of nitrate that periodically exceed the maximum contaminant level of 45 mg/L (MWSD 2005). The District is working on mixing water sources to dilute the high levels of nitrate but more information is needed to indicate whether either TCP or nitrate have migrated from the aquifer to the marsh.

The Half Moon Bay Airport maintains a storm water permit and has regularly submitted monitoring reports of its discharge in accordance with its NPDES permit to the RWQCB, though and currently there is no concern over the quality of discharge from the airport (Half Moon Bay Airport 2006).

21 The chemical is unregulated so it does not have a Maximum Contaminant Level, but DHS has an advisory level of 0.0005 μg/L due it its identification as a possible carcinogen and acute effects on humans such as burning of skin and eyes (SWRCB 2003).

A sewage pump station operated by the Sewer Authority Mid-Coastside (SAM, a joint powers authority responsible for operation and maintenance of sewer lines for the City of Half Moon Bay, and Granada and Montara Sanitary Districts) next to the marsh is reportedly under-sized for the amount of material it is expected to handle. "SAM has had frequent sewage overflow incidents during the wet season" throughout its service area totaling 197 between 2000 and 2005, including at least 14 that directly entered the Pacific Ocean via either Pillar Point Marsh or Montara Creek (EPA 2006). In 2006, two major spills entered the Ocean within a few weeks of each other totaling 7,000 gallons, and put beach visitors and surfers at risk of exposure to pathogen contamination. Further, the Environmental Protection Agency categorized sewer lines in El Granada, Montara and Half Moon Bay as "insufficient," prompting them to investigate the Sewer Authority Mid-Coastside for wet weather sewage overflows (Perkins 2007). In response to these overflows, SAM is installing several holding tanks to store overflow water during the wet season. At the time this report was released, they were in the process of installing six tanks in Montara and El Granada (Smydra 2007b).

Pillar Point Air Force facility is located on the headlands of Pillar Point, and its runoff drains to the ocean. The facility's water quality data have been submitted to the State Water Resources Control Board in response to a request for exception to the Ocean Plan Discharge Prohibitions to the Pacific Ocean. The facility's discharge through a drainage swale exceeds Ocean Plan standards, and a range of programs have been proposed to remediate storm water runoff conditions. However, NPDES permits are not required at this facility since its storm water discharges are not associated with industrial, construction or municipal activities.

Transport of sediment and other constituents from the Headlands to the Pillar Point Marsh is one area of concern due to erosion caused by frequent foot traffic and a network of informal trails. These informal trails on the Pillar Point bluffs have developed into a substantial network of storm water conveyance channels.[22] Peninsula Open Space Trust (POST), the State Coastal Conservancy, and San Mateo County Parks have been developing plans for the trail network on POST property to control erosion and improve the trail network as part of the California Coastal Trail with appropriate erosion control measures. Management of the area to avoid further compaction and erosion should be the subject of discussion among agencies with jurisdiction in the area. There are six different AB 411 monitoring locations in the Pillar Point area. Since 2000, there have been 41 separate postings for a total of 645 days (see Appendix H).

22 The Mavericks Big Wave surf competition attracted 50,000 spectators in 2006 to various viewing places including Pillar Point Marsh, the harbor, and surrounding beaches, and bluffs. The competition was called off in 2007 due to small waves (Mavericks Surf Adventures LLC 2007).

*3.8 Denniston Creek*

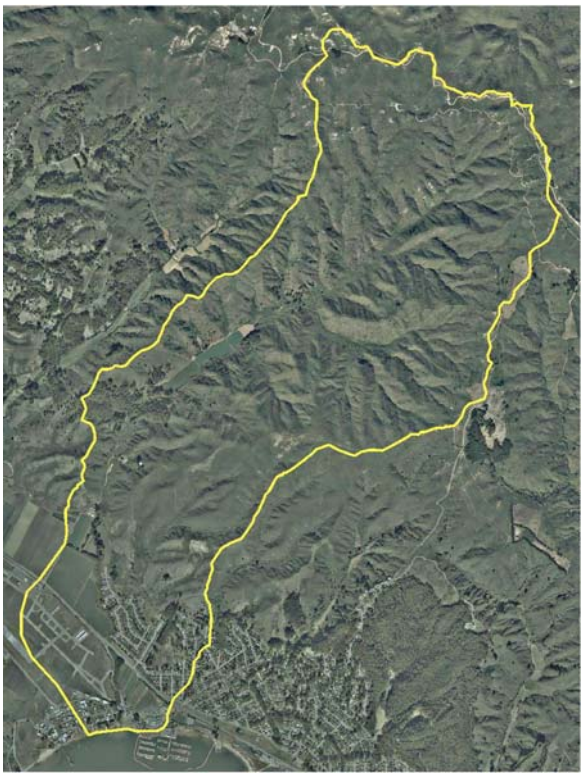


**Figure 25.** Denniston Creek-Imagery provided by San Mateo County

The mouth of Denniston Creek is monitored once annually during MBNMS Snapshot Day and was monitored by Surfrider San Mateo from September 2005 through April 2007. MBNMS Snapshot data show that the creek exceeded accepted state standards for E.coli in recreational water for the first time in 2006 (Hoover 2006). Monitoring has been taking place annually since 2001. Surfrider data exhibited regular spikes in both E.coli and Enterococcus over the period samples were collected. The San Mateo County Resource Conservation District was recently awarded a grant to perform a source-tracking analysis of bacteria into Pillar Point Harbor, which will include monitoring of Denniston Creek for bacterial contributions.

Multiple investigations of Denniston Creek have observed high sedimentation rates throughout the watershed. Possible sources include normal erosion of soils in alluvial pockets within the larger granite rock structure that are easily erodible and produce fine sand in the creek, particularly in the headwaters. The Denniston Reservoir, located in the upper watershed has been dredged by the U.S. Army Corps of Engineers to remove these inputs of fine-grained sediment. In addition, the surrounding land is steep and consists of sandy loam soils which are also highly erodible. Additional sources of sediment include channelization of the creek in sections to accommodate unpaved roads and the absences of riparian vegetation, which accelerates natural bank erosion, and sediment washed off of agricultural fields in the upper watershed through sheet flow (Coastside County Water District 2005a). Surveying of the creek by Department of Fish and Game staff confirmed the high sedimentation, particularly below one of the unnamed tributaries where turbidity was significantly higher. However, it was unclear whether the sediment came from natural erosion or from upstream land use (Department of Fish and Game 2006). More investigation is needed.

The Coastside County Water District obtains a reported 23% of its water supply from Denniston Creek (19% from surface flows, 4% from groundwater)**,** and maintains a Denniston Creek Treatment Plant in the coastal terrace, east of the Half Moon Bay Airport. The diversions are under a SWRCB water rights permit and limit the District to no more than a total of four cubic feet per second (cfs). The amount of surface water diversion is "limited by the low flow in the creek during the summer months, and when the production is low in drought years." It is unknown what the total watershed yield is compared to the permitted diversions. The well field is reportedly not under the control of a water rights permit, but a Coastal Development Permit limits the annual water extraction from the wells to 130 million gallons per year (mgy) (Coastside County Water District, 2005b). The combined extraction of water from both surface and groundwater sources in the Denniston Creek watershed could potentially lead to hydromodification of the channel, however so far there are no data that would indicate any changes to the channel geometry. There are six different AB 411 monitoring locations in the Pillar Point area. Since 2000, there have been 41 separate postings for a total of 645 days (see Appendix H).

### *3.9 Deer Creek*[23]

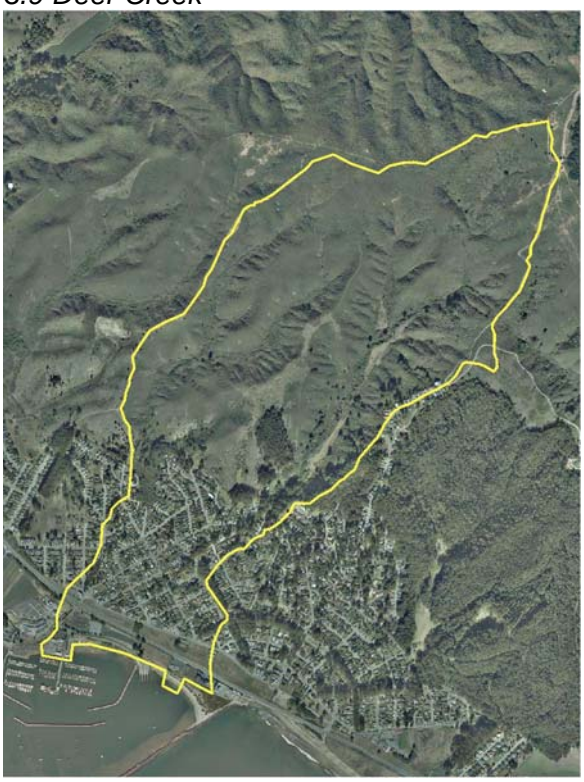


**Figure 26.** Deer Creek-Imagery provided by San Mateo County

Snapshot Day sampling determined that Deer Creek exceeded WQO's for E.coli and dissolved oxygen in 2004 and turbidity in 2006. These are also the only two years that MBNMS Snapshot Day monitoring took place. There are six different AB 411 monitoring locations in the Pillar Point area. Since 2000, there have been 41 separate postings for a total of 645 days (see Appendix H). No other data have been located for Deer Creek. More research needs to be conducted to understand land uses, hydrology, biota and related water quality conditions in Deer Creek to evaluate any risks to natural and recreational resources.

23 Also referred to as El Granada Creek.

*3.10 Adjacent Receiving Waters and Other Drainages*
Included on the map in Appendix D (ABAG 2007) are the extent of septic systems in the area associated with rural residential development. This map does not capture retired septic systems and their leach fields. It also does not show which on-site disposal systems are relatively new and state-of-the-art, and which ones may be aging and in need of upgrades. Some areas of septic system placement are not yet illustrated. The cumulative effects of areas with on-site sewage disposal systems on stream and nearshore water quality are not analyzed. However, an immediate response program is in place for rapid enforcement if required.

*Pillar Point Harbor*

**Figure 27.** Pillar Point Harbor-Imagery provided by San Mateo County

Characteristic of commercial harbors, the Pillar Point Harbor generates waste from commercial fishing operations, recreational and residential boats, urban runoff from piers, and related structures, docks, roads, trailer parking, parking lots, boat maintenance and fueling facilities. The beach around the Harbor is regularly posted for exceeding WQOs for bacteria in areas where it is monitored by the County's Environmental Health Department. At this time, the sources and pathways of the excess bacteria are unknown, but a recent grant award to the San Mateo County Resource Conservation District includes a microbial source-tracking analysis to help determine them. There are six different AB 411 monitoring locations in the Pillar Point area. Since 2000, there have been 41 separate postings for a total of 645 days (see Appendix H).

The Harbor has a capital improvements plan for maintenance and future development that includes dredging, pier replacement (subject to Coastal Commission Coastal Development Permit conditions for preventing or minimizing water quality impacts already attached to the project), shoreline erosion protections, boat docking additions, rest room replacement and enhancements to visitor-serving facilities and commercial uses. Any disturbance of the Harbor's sediments can potentially affect water quality (including temperature, salinity, pH, dissolved oxygen, suspended solids, turbidity, nutrients, and trace metals and organic contaminants that are bound to sediments) and threaten species resident in the area due to the re-suspension of sediment (U.S. Navy 1990 in U.S. Army Corps of Engineers 2004). Some of these improvements could also have the potential to contribute non-point source pollutants; however there are many

measures in place through efforts of the harbormaster, the Coastal Commission, and other groups, to implement management measures to reduce water quality impacts. Fuel spills are a significant issue for most harbors, including Pillar Point, and a management program is in place to respond to them. The Harbor does not currently have a coordinated program in place to address potential sewage disposal issues of boats that serve as permanent or semi-permanent residences. However, County Environmental Health Division staff hopes to use an existing model for a coordinated effort that is in place in Sacramento County. Abalone farming occurs in the Harbor and is also subject to special permitting to avoid excessive nutrients or other kinds of water contamination. The permit includes prohibitions and provisions designed to protect the beneficial uses of the Harbor. Monitoring reports have not been submitted to the RWQCB for a few years.

*Fitzgerald Marine Reserve*

FMR receives runoff from storm water discharges emanating from 38 points along the FMR shoreline (SCCWRP and SWRCB 2003). San Mateo County conducted reconnaissance in 2007 to document the sources of the discharges. Of the 38 total discharges, 1 was a US Air Force discharge near Pillar Point, 8 were natural seeps and gullies, 3 were creeks, 9 were discharges from private property, and 17 were municipal discharges from County maintained or related facilities. The California Ocean Plan prohibits the discharge of point and nonpoint source waste into the ASBS, unless the SWRCB grants an exception. Therefore, the County submitted an application and request for exception for discharges into the ASBS on December 31, 2007. The application included a summary of beneficial uses, County plans and policies to protect beneficial uses, biological data, historical data, watershed characteristics, existing pollution control and BMPs, alternatives analysis, compliance history, and public interest (County 2007).

To provide current water quality information for the exception application, San Mateo County conducted water quality monitoring in December 2007 at several locations. Elevated levels of vehicle-derived pollutants including copper, PAHs, and oil and grease were detected in samples from a discharge in Moss Beach. PAHs (above the Ocean Plan objective) were also detected in San Vicente Creek. Samples from Dean Creek exceeded Basin Plan standards for *E. Coli* and *Enterococci* (County 2007). Fitzgerald Marine Reserve's Moss Beach was posted 15 times in the last 8 years. The beach was posted for a total of 539 days due to high indicator bacteria concentrations (see Appendix H).

The Reserve is subject to a Master Plan for improvements to aid with runoff control for new construction for a new interpretive center and a model parking lot for pollution prevention. A collaborative fecal indicator bacteria monitoring effort between landowners, tenants, San Mateo County and an environmental group in the San Vicente watershed, from 1999 to the present, continues. The County Park staff at the Reserve is teaming with the San Mateo Countywide Water Pollution Prevention Program (formerly STOPPP) to devise low impact development techniques to assist meeting resource protection goals stated in the Master Plan for the Marine Reserve. Staff also intends to discuss with neighboring communities how they can more effectively manage storm water runoff which goes directly into the Reserve to meet the discharge prohibitions of the Ocean Plan.

Pesticides and industrial chemicals (notably DDTs and PCBs) are additional possible issues of concern, though their source and current level of threat is unknown, though the

FMR Master Plan mentions a possible connection between pesticides and upstream nursery operations. The use of both DDT and PCBs has been banned or restricted for several decades. The latest data that indicated elevated tissue concentrations in bivalves was through the State Mussel Watch program in 1981 (San Mateo County Department of Parks et al 2002, p. 133)**.**

*El Granada Shoreline*
MBNMS's First Flush sampling program volunteers found that the waters exceeded WQOs for orthophosphate, E. coli, zinc, copper, and total suspended solids.

> "E. coli concentrations for all of the time series ranged between 92,000 to >241,920 MPN/100ml at (El Granada). These were some of the highest concentrations measured at all of the sites during the First Flush events. Oil and grease samples were also analyzed by making a composite sample from each time series at each site. The El Granada site reported 1.8 ppm and the Half Moon Bay site 3.5 ppm. These concentrations were the highest of all the sites as well" (Hoover 2005).

While most of the El Granada shoreline is technically just south of the FMR CCA Study Area, a combination of ocean currents and an incoming tide could send runoff from creeks and storm drains that discharge to the shoreline into Pillar Point Harbor, affecting water quality in the Harbor and potentially up the coast as well.

**Table 6.** Issues of concern for shoreline areas and sub-watersheds of the Fitzgerald Marine Reserve CCA[24]

| **Sub-watershed or Shoreline Area** | Martini Creek and Shoreline | Montara Creek and Point | Sunshine Valley/ Dean Creek | San Vicente Creek | Denniston Creek and shoreline | Deer Creek | Pillar Point | | | El Granada Shoreline (*outside of CCA boundaries) | Fitzgerald Marine Reserve |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pillar Pt. Marsh/ Airport Aquifer | Pillar Point Harbor | Pillar Point Head-lands | | |
| **Known Issue(s) of concern (sources)** | ▪ pH (Snapshot Day) | ▪ pH (Snapshot Day) | ▪ coliform bacteria<br>▪ E. coli (SM County Environmental Health) | ▪ coliform bacteria<br>▪ E. coli (SM County Environmental Health) | ▪ E. coli (Snapshot Day)<br>▪ Enterococcus (Surfrider)<br>▪ Sediment (Coastside County Water District 2005; DFG 2006; Snapshot Day) | ▪ Turbidity (Snapshot Day) | | ▪ coliform bacteria<br>▪ E. coli (SM County Environmental Health) | ▪ Sediment<br>▪ | ▪ Oil and grease<br>▪ Ortho-phos-phate<br>▪ E. coli<br>▪ Zinc<br>▪ Copper<br>▪ Total Suspended Solids (Snap-shot Day and First Flush) | ▪ DDT<br>▪ PCB (San Mateo County Depart-ment of Parks 2005) |
| **Potential Issues of Concern (sources)** | ▪ coliform bacteria<br>▪ E. coli (SM County Environmental Health) | ▪ MTBE (in groundwater)<br>▪ Oil<br>▪ Grease<br>▪ Sediment<br>▪ Nutrients<br>▪ Coliform bacteria (MWSD 2005) | ▪ Nitrate<br>▪ ammonia<br>▪ Sediment (San Mateo County Department of Parks 2005) | ▪ Nitrate<br>▪ ammonia (San Mateo County Department of Parks 2005) | | | ▪ Nitrates<br>▪ Manganese<br>▪ 1,2,3-trichloro-propane (TCP)<br>▪ Sediment (MWSD 2005) | ▪ Nutrients | | | |

24 Note that Daffodil and Kanoff Creeks are not included in this table as water quality information was not available at the time of the report.

# CHAPTER 4. PROGRAMS, PROJECTS AND PLANS

FMR CCA has a variety of water quality programs, projects, and plans that have contributed to water quality assessment of the area, have brought stakeholders together and have inventoried natural resources. The major current and planned projects are summarized below in Table 7, developed in part from discussions with Steering Committee representatives and others, and exist as “living” documents intended to be updated as needed. Some of these programs plans and projects have also been briefly mentioned in other sections of this report. Additionally, a variety of management measures and practices are implemented throughout the CCA Study Area, addressing agriculture, hydromodification, marinas and recreational boating, urban development, wetlands and riparian areas. Appendix C provides an inventory of known Management Measures (MMs)/Management Practices (MPs) currently implemented in the FMR CCA, including a list of organizations contacted for the MM inventory. See Appendix D for a map of “Current Best Management Practices for Control of Land Based Sources of Marine Pollutants.” This map identifies general types of issues of concern these management practices are designed to address, providing parameters and sources. However, it does not show locations of specific BMPs.

**Table 7.** Key Plans, Programs, and Projects in the FMR CCA

| Project | Lead Organization or Agency and Link | Status |
|---|---|---|
| Monterey Bay National Sanctuary (MBNMS) Water Quality Protection Program Action Plans | National Oceanic and Atmospheric Administration (NOAA) and MBNMS http://montereybay.noaa.gov/resourcepro/water-pro.html | Completed |
| Central Coast Water Quality Data Synthesis, Assessment, and Management (SAM) project | NOAA (MBNMS) http://www.ccamp.net/sam/index.php/Main_Page | 2006 |
| Snapshot Day Water Quality Monitoring Program | Coastal Watershed Council (CWC) and NOAA (MBNMS) http://montereybay.noaa.gov/monitoringnetwork/about_us.html | Ongoing |
| Friends of Fitzgerald Marine Reserve Docent Program | Friends of Fitzgerald Marine Reserve, http://fitzgeraldreserve.org/docents.html | Ongoing |
| Fitzgerald Marine Reserve Master Plan | San Mateo County (SMC) Department of Parks http://www.eparks.net/smc/department/home/0,2151,5556687_10575186,00.html | Completed |
| The Fitzgerald State Marine Park Resource Assessment | SMC Department of Parks http://www.eparks.net/smc/department/home/0,2151,5556687_10575186,00.html | Completed, 2004 |
| Fitzgerald Marine Reserve Parking Lot and Visitors Center Low Impact Development Renovation | SMC Department of Parks | Future (to be completed in 2009) |
| Parks Volunteer Program | SMC Department of Parks, http://www.co.sanmateo.ca.us/smc/department/home/0,2151,5556687_10575178,00.html | Ongoing |
| San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) | City/County Association of Governments San Mateo County and EOA, Inc. http://www.flowstobay.org/ | Ongoing |
| Midcoast Local Coastal Program Update Project | SMC Planning and Building Department http://www.co.sanmateo.ca.us/smc/department/home/0,,5557771_5558929_285833942,00.html | Ongoing |
| Recycle Works (includes "Green Business Program) | SMC Public Works http://www.recycleworks.org/smco/ | Ongoing |
| Prescription Drug Disposal Program | SMC Health Department, http://www.co.sanmateo.ca.us/smc/department/home/0,,1954_1882836_1012584009,00.html | Ongoing |
| Toxics Program | SMC Health Department, http://www.smhealth.org/smc/department/home/0,2151,1954_187544,00.html | Ongoing |
| Groundwater Protection Program | SMC Health Department, http://www.smhealth.org/smc/department/home/0,,1954_191102_193952,00.html | Ongoing |
| Recreational Water Quality Program (includes water quality testing at Pacific beaches and creek mouths) | SMC Health Department, http://www.smhealth.org/smc/department/home/0,,1954_191102_194438,00.html | Ongoing |

**Table 7.** Key Plans, Programs, and Projects in the FMR CCA (continued)

| Project | Lead Organization or Agency and Link | Status |
|---|---|---|
| Watershed Protection Program | SMC County Manager's Office, http://www.co.sanmateo.ca.us/smc/department/home/0,,1909_1207226097_1207226099,00.html | Ongoing |
| Midcoast Groundwater Study | SMC Planning and Building Department | Completed Fall 2008 |
| Montara Water and Sanitary District Public Works Plan Phase I Draft Environmental Impact Report | MHA, Inc. http://mwsd.montara.org/Montara_DEIR_10_2005.pdf | Completed |
| Areas of Special Biological Significance Program | State Water Resources Control Board http://www.waterboards.ca.gov/water_issues/programs/grants_loans/asbs/ | In progress |
| Identification of Sources of Fecal Pollution Impacting Pillar Point Harbor | Resource Conservation District www.sanmateorcd.org/harbor.html | In progress |
| Watershed Discovery Workshops | Resource Conservation District www.sanmateorcd.org | ongoing |
| Conservation Technical Assistance and Cost-share Programs for Landowners | Natural Resources Conservation Service and Resource Conservation District www.sanmateorcd.org | |
| Adult B-Wet Grant (NOAA) | San Mateo County Resource Conservation District; partner agency: MBNMS | In progress |
| Montara Beach Coalition Beach Clean Ups | Montara Beach Coalition www.montarabeach.com | ongoing |
| Level I Water Quality Baseline Studies for Coastal Waters of Point Reyes National Seashore and Golden Gate National Recreation Area | UC Davis Bodega Marine Lab (John Largier, PhD) | Draft Report Due Sep 2008 |

*4.1 San Mateo County Water Pollution Prevention Program*

The Marine Reserve and its contributing watersheds all fall under the jurisdiction of unincorporated San Mateo County. San Mateo County is part of San Mateo County Water Pollution Prevention Program, a consortium of 20 cities within San Mateo County and the County. Activities under the Program apply to both San Francisco Bay areas and coastal areas. The Program's Stormwater Management Plan (November 2003) describes activities between April 2004 and June 2010 to prevent and control stormwater pollution in San Mateo County. It serves as the basis of the Program's NPDES stormwater permit.

The Stormwater Management Plan is organized around five major stormwater pollution prevention and control components: (1) Municipal Maintenance, (2) Industrial and Illicit Discharge Controls, (3) Public Information and Participation, (4) New Development and Construction Controls, (5) Watershed Assessment and Monitoring. Each component includes goals, recent achievements and future tasks. To illustrate, the primary goals of Watershed Assessment and Monitoring include assessing water quality conditions in representative San Mateo County watersheds, determining whether specific pollutants are adversely affecting local waterways, and developing plans to address any pollutants of concern. To achieve these goals, the Program proposes to use its General Program to continue to use environmental indicators to assess representative watersheds; develop and implement pollutant-specific control programs for pollutants believed to be impairing local waterways; participate in regional efforts to monitor and solve water quality impairment problems, among other activities. Revised performance standards, pollution prevention practices that the member agencies have

committed to implement, are also included for five of the components as an Appendix to the Stormwater Plan. For example, the Program added new performance standards to help implement the amended NPDES C.3 requirements such as source control measures, requiring the use of source control and hydrograph modification measures in addition to site design and stormwater treatment measures for projects with significant stormwater pollution potential.[25]

General activities under each of the five components in the Stormwater Management Plan apply to all of the co-permittees in San Mateo County. Research is underway to determine if specific implementing activities have occurred for some or all of these components or are planned for the Midcoast areas of unincorporated San Mateo County. For example, in 2002, the Program developed information about the amounts of impervious surface cover in 17 watersheds and the condition of creek channels, including some of the Mid-Coast watersheds, summarized in a report entitled *Characterization of Watershed Imperviousness and Creek Channel Modifications for 17 Watersheds* (Jan 2002) (see Appendix B).

In February 2003, the Regional Board amended the Program's National Pollutant Discharge Elimination System (NPDES) permit to add Provision C.3, which has more specific requirements for the municipalities to control stormwater from new development and redevelopment projects. C.3. requires that the municipalities improve their performance standards to achieve the control of stormwater pollutants to the maximum extent practicable. At the time of this Report, the Regional Board had developed a draft Municipal Regional Permit for the whole Bay Area including San Mateo County. If adopted, this MRP would supercede San Mateo County's NPDES Permit. The proposed MRP consolidates six county specific Phase I municipal stormwater NPDES permits into one permit (Alameda, Contra Costa, Santa Clara, San Mateo, Fairfield-Suisun, and Vallejo). The draft permit was released for public comment on December 4, 2007, but has not yet been approved. The proposed permit includes requirements for the following components: Municipal Operations, New Development and Redevelopment, Industrial and Commercial Site Controls, Illicit Discharge and Elimination, Construction Site Controls, Public Information and Outreach, Water Quality Monitoring, Pesticides Toxicity Controls, Trash Reduction, Mercury Controls, PCBs Controls, Copper Controls, Polybrominated Diphenyl Ethers (PBDE), Pesticides, and Selenium, and Exempt and Conditionally Exempt Discharges. Examples of some of the new requirements include: 1) Install enhanced trash management control measures in 10% of the urban area and install full capture trash management devices in at least 5% of the urban area; 2) Size threshold for regulated new and redevelopment projects is reduced from 10,000 to 5,000 square feet; 3) Increased water quality monitoring at pump stations and TMDL related monitoring for mercury, PCBs, and pesticides; 4) Pilot projects to divert stormwater from pump stations into the sanitary sewer system and treatment plants; and 5) Additional reporting requirements.

25 Additionally, Half Moon Bay Airport has a stormwater management plan that contains multiple best management practices to address stormwater runoff and water quality around the site, though there is currently no estimate of pollutant loadings (Wadleigh, personal communication 4/05/07). Half Moon Bay Airport is reportedly a small aviation facility relative to other aviation facilities on the Peninsula, but sees its share of activity during clear weather conditions.

*4.2 Analysis of programs, projects, and plans*

This section primarily focuses on technical results for management measure (MM) evaluation and load reductions. An analysis of the effectiveness of these practices was not conducted and would be important to know the best way to address water quality impacts in the study area.

*4.2a Analysis of Management Measure Framework and Load Reduction Model*

Coastal Commission staff compiled a draft MM inventory for the Fitzgerald CCA. ABAG and SFEI staff then added to and updated the inventory as they gathered more information from other organizations, related projects, and through feedback at a public Winter workshop (February 2007) (see Appendix C). One persistent problem that surfaced in all three pilot areas was assuring local organizations that information on private land will be kept confidential. In this way landowners won't feel they are targeted for private lawsuits if results indicate that the BMPs they implemented aren't as effective in reducing pollution as predicted.

SFEI staff also developed a framework to identify MMs, using a two-step process for assessing the status of existing management measures and to evaluate if they are likely to be sufficient to restore the integrity of water and the uses associated with it. First, they identified basic information requirements needed to match land and water use categories in the CA NPS Implementation Strategy with those that actually are present in the study areas. Second, they modified a "Pressure-State-Response" (PSR) model (OECD 1993) to assist their evaluation of whether steps taken so far to reduce existing or projected pressures on valuable resources have been sufficient to restore the integrity of water and beneficial uses dependent on it.

There are both pluses and minuses to the framework. The framework was useful in identifying which MMs were necessary in a watershed but it was a bit difficult to then apply it to assess status. SFEI accumulated a large body of information through interviews and a survey but found it difficult to concisely quantify all the qualitative data that was collected. Some MMs could include a wide variety of actual on-the-ground actions (such as grazing management). Without parcel-specific information, SFEI found it hard to communicate findings, especially since most landowners would not approve the public distribution of the information that they provided them. In addition, it is difficult to track the maintenance and effectiveness of each MM. That information would be much more substantive in identifying information gaps and education or funding needs for each CCA. They also found it difficult to assess the status of the MMs. At first they categorized them into "tiers" of implementation, but after trying to categorize them all, they realized that many MMs could fall under more than one tier and some are in between if, for example, landowners simply implement BMPs for aesthetic or environmental reasons as opposed to a set policy or program in place to enforce such implementation. SFEI also found that the actual MMs sometimes varied across watersheds due to County regulations, thus making it difficult to compare MM types between watersheds. For example, the types of urban erosion control MMs varied widely and had different standards and enforcement mechanisms that backed them up. SFEI hopes to compare effectiveness of MMs across the three pilot CCAs in the next phase of the project.

*Load Reduction Model*

Through literature research and interviews from SFEI and ABAG with local government and other agencies, non-governmental organizations, and other

stakeholders, as well as a public workshop, a list was compiled of priority NPS issues and the known MMs currently implemented were summarized to the best of their ability or where appropriate in the watershed (See Appendix C). Eight models were reviewed that have been used to assess and predict pollutant load reduction scenarios under various levels of BMP implementation. The recommended model, the BASINS suite, fits the CCA program well because it can integrate GIS data, model multiple pollutants, and it is supported by the EPA's technical team for any issues that arise. SFEI notes that it will be used in the next phase of the project, however for the preliminary work completed under their grant; the BASINS suite was not used. SFEI then modeled load reductions per their grant tasks. SFEI found it difficult to gather local data that are specific to a dry, coastal climate, as much of the research on BMP performance is conducted in the more humid East, Pacific Northwest, or Midwest.

There are many constraining factors because performance of BMPs is so site-specific. For example, the same structure on neighboring pieces of land could have totally different performance due to varying slope, soil type, climate, level of maintenance, and other factors. Estimating load reductions was a challenge given the budget for the modeling task under SFEI's grant. It was noted that more detailed estimation will be possible under the next phase of the project, (under their Prop 50 grant).

Preliminary results were available using the San Vicente Creek sub-watershed of the FMR CCA as a case study. This site was chosen due to its extensive BMP implementation, a landowner who regularly participates in the Fitzgerald CCA Steering Committee meetings, as well as regular water quality monitoring data available through San Mateo County and the San Mateo Resource Conservation District. Between 2002 and 2006 the Moss Beach Ranch Equestrian Center implemented numerous BMPs including fencing in the creek to exclude livestock, allowing vegetation to grow along the creek, improving their manure management plan, and putting in vegetated filter strip barriers along fields, vegetated water channels, and sediment traps. Over the course of the BMP implementation, the amount of E.*Coli* present in the creek decreased by over a factor of ten (San Mateo County Environmental Health Services). Unfortunately, the creek was not sampled for nutrients and sediment, but presumably the BMPs that reduced the E.*Coli* load so dramatically may have reduced the other pollutant loads as well.

The load reduction predictions were performed in order to propose various scenarios and predict achievable results given certain land use conditions. A simple spreadsheet-based software developed by Tetra Tech and the US EPA called Spreadsheet Tool for Estimating Pollutant Loads (STEPL) was used due to time and budget restrictions. Results indicate that considerable uncertainties are associated with using the STEPL model for extrapolation of BMPs to the watershed scale. Further were also difficulties in characterizing the watershed (e.g., determining soil types, infiltration rates, soil erodibility, etc.). Some additional calibration and follow up work will be conducted in the next phase of this project in order to more accurately predict possible reductions in pollutant loads and to make recommendations for the most effective combination of management measures for the coastal California climate.

# CHAPTER 5. INFORMATION NEEDS AND RECOMMENDATIONS

As indicated in previous sections, the FMR study area has received the least attention in terms of characterizing impairment of natural resources, recreational uses, or watershed functions and processes. Few previous efforts have been undertaken to compile information from unpublished or widely dispersed sources, and this area had not previously experienced a watershed planning process-likely because the study area is a collection of several small watersheds and shoreline areas that had never before been considered a “study area.”

This report is a watershed assessment and should be updated as conditions and local policy change that could affect sources of pollution, land use, and the current policies and programs in place that address water quality. Remaining information needs for the FMR pilot area are described below in Table 8. More general water quality data were lacking in each of the sub-watersheds of the FMR study area. Extensive monitoring for bacteria occurred in the San Vicente Creek watershed, but more data on nutrients, pesticides, sediment, and other parameters in all the watersheds would help with assessing impairment status and identifying water quality priorities.

The remaining technical needs and data collection tasks that would significantly improve the depth of analysis in an assessment to inform an Action Plan are also described below in Table 9, including the need to develop more site-specific load reduction forecasts (through modeling efforts) as well as identifying specific management practices that will be able to accomplish those load reductions. According to SFEI, measuring the effectiveness of those appropriate management practices will also require more site-specific calibration and field verification to design an appropriate monitoring plan. Most of these tasks (historical analysis of land use and management, modeling pollutant loads, analysis of policy barriers to implementation of MMs, and identification of priority areas for MM implementation) will be completed under SFEI’s Prop 50 grant.

SFEI also found some expertise lacking that would have helped with their analysis of the FMR CCA. A consultation with a hydrologist would have been helpful to determine exactly where the boundaries of the pilot area are, the various hydrologic processes within the pilot area, and how they have changed over time due to a combination of both human and natural influences. Some efforts already under way will help to better understand the hydrology of the FMR CCA. SFEI under their Prop 50 grant has begun mapping storm drains in all of the pilot areas, which tend to change the otherwise natural flow of water through a watershed. SFEI has also started to conduct an analysis of the historical ecology of the pilot area to determine historic drainage patterns, locations and types of wetlands, land uses, and other factors that may have affected the hydrology of the area. In addition, the hydrology of the southern portion of the FMR CCA will be analyzed by Balance Hydrologics as it relates to their subcontract with the San Mateo County RCD to investigate sources of pathogens in Pillar Point Harbor.

Another area of expertise missing for the FMR CCA is a local watershed group focused on the area, specifically dedicated to the Midcoast of the San Mateo County, the area that includes the sub-watersheds of the pilot area. This would have been extremely helpful to have one central location of data on the watershed. SFEI’s analysis in

Sonoma and Watsonville depended on the prior and continued work of dedicated watershed groups who train volunteers, research habitat change, sensitive species, and other issues in the watershed, and maintain engaged stakeholder networks. These tasks can be considered as the "foundation" of the Action Plan, so that individual implementation projects can proceed within a watershed context.

One project that will supplement SFEI's analysis under their Prop 50 grant is a project to be conducted by the San Mateo County RCD, one of their technical partners for their Prop 50 grant. The RCD was recently awarded $845,000 from the SWRCB under the Clean Beaches Initiative (Consolidated Grants) to complete microbial source tracking analysis to identify the sources of pathogen pollution for Pillar Point Harbor, which is the discharge point for Denniston Creek, part of the FMR pilot area. It is necessary to identify sources of pathogen pollution in FMR as it is the only 303(d)-listed pollutant and the cause for frequent beach closures in the area. Microbial source tracking analysis has not been completed for FMR. This project will add to understanding of pathogen sources in the CCA so it can be applied to other areas of the California coast and consider additional management practices or greater geographic coverage of those already implemented and proven successful on a pilot scale.

**Table 8.** Information Needs in the FMR Pilot CCA Study Area (not prioritized in terms of importance)

- Nutrient data (entire study area)
- Pesticide data (entire study area)
- Source tracking for bacteria (entire study area)
- Sediment data (entire study area)
- Land use, hydrology, biota, and general water quality data (entire study area)
- Groundwater data (Pillar Point Marsh)
- Potential contaminant discharges from Pillar Point Air Force Station
- Water quality impacts of various marina activities including abalone farming, fish processing, sewage pump-out, etc. (Pillar Point Harbor)
- Potential contaminants in discharges that may go directly into the Reserve from neighboring residential areas
- Information regarding on-site sewage disposal system, sewer system, and other water and wastewater infrastructure upgrades, maintenance, and implications for water quality (entire study area)
- Effect on water quality at Pillar Point Harbor (and possibly other sections of the ocean up the coast) from El Granada shoreline discharge

**Table 9.** Summary of technical information needs for all 3 CCAs going forward

| Information Need | Specific Area | Status | Which task of SFEI Prop 50 Grant? |
|---|---|---|---|
| Analysis of policy barriers to implementation of MMs | All 3 CCAs | Will be completed under Prop 50 grant | Task 6 (Guidance for Local Government) |
| Current impervious cover | All 3 CCAs | Gap/could be completed in part by OEHHA | |
| Develop more site-specific load reduction forecasts | All 3 CCAs | Will be completed under Prop 50 grant | Task 5 (Identify appropriate implementation sites) |
| Historical analysis of land use and management | All 3 CCAs | Will be completed under Prop 50 grant | Task 3 (Historical Ecology) |
| Hydrologist to determine specific watershed boundaries | FMR | Will be completed under Prop 50 grant and partially under related project through the San Mateo County RCD | Tasks 3 (Historical Ecology)and 4 (Storm drain mapping) |
| Identify the best BMPs or MMs to achieve load reduction goals | All 3 CCAs | Will be partially completed under Prop 50 grant | Task 5 (Identify appropriate implementation sites) |
| More complete general water quality data | All 3 CCAs, but especially FMR | Gap | |
| Other watershed plans/studies that summarize data available | FMR | Gap | |
| Microbial source tracking | FMR | Will be completed by San Mateo County RCD | |

The following recommendations have also been proposed re: modeling load reductions:

1) Region specific, or, even better, watershed specific, information regarding land use, soil type, topography, precipitation, evaporation, and agricultural and livestock practices are needed. Some of these data are available (e.g., precipitation, topography); others will require special studies and communication with project stakeholders.
2) Streamflow data for any watersheds to be modeled should be obtained. The higher temporal resolution the better. Many California streams are already gauged and when appropriate data from nearby streams can be used to estimate flow in ungauged streams. In some cases it may be necessary to install gauges at some ungauged streams.

3) Continue water quality monitoring efforts in Critical Coastal Areas watersheds. These monitoring results will be important for calibrating and validating future modeling efforts.
4) Improve monitoring and documentation of implementation and management practices of existing BMPs. Guidelines for BMP monitoring and documentation exist on the International Stormwater Best Management Practices website (www.bmpdatabase.org).
5) Where detailed prediction capabilities are needed, and/or where possible, develop physically based watershed models for CCA watersheds. The freely available, EPA approved BASINS (Better Assessment Science Integrating Point and Non-Point Sources) modeling suite is recommended for future modeling efforts.

At the time of this Report, the Steering Committee with the help of SFEI had begun to identify a working list of priority actions that could form the basis of an Action Plan for FMR CCA to address many of the stated information needs. The top six broad action areas as of May 2008 are listed below. These have only been discussed in concept and all areas would need further fleshing out.

1. Water quality monitoring
2. Targeted BMP implementation
3. Targeted Midcoast NPS Outreach Campaign
4. Outreach, input, and support on County watershed policies
5. Technical assistance to landowners and builders for implementation of watershed policies
6. Permit streamlining for restoration projects

Additional identified early action areas that also need discussion and fleshing out include but are not limited to:

7. Map sewer lines throughout watershed and identify line breaks west of highway one
8. Expanding Green certification for businesses
9. Technical assistance to help landowners with on-site sewage disposal system upgrades and maintenance
10. Training for decision makers re: risks posed by on-site sewage disposal systems and need to enforce policies
11. Pervious parking lot and interpretive center for Reserve (or portion of entire project e.g. just pavement installation)

# CHAPTER 6. CONCLUSIONS

This Nonpoint Source Watershed Assessment provides background information and characterization of the Midcoast watersheds on the San Mateo County, California coast that comprise the James Fitzgerald Marine Reserve Critical Coastal Area (CCA), based on the review, compilation and analysis of existing data available at the time of the pilot project. The intent of this NPS WA is to form the basis for and to direct the development of an Action Plan to address potential and known NPS pollution impacts and improve water quality conditions in and around the Fitzgerald Marine Reserve CCA. The NPS PWA is not intended to be a finite, exhaustive nor comprehensive characterization of all watershed issues affecting the CCA as its primary impetus and focus is on water quality and NPS pollution. Additionally, there were limited time and resources to develop the Assessment document.

Few previous efforts have been undertaken in the FMR study area- a collection of several small watersheds and shoreline areas that had never before been considered a “study area”- to compile information from unpublished or widely dispersed sources and characterize impairment of natural resources, recreational uses and watershed functions and processes.

General water quality data were lacking in each of the sub-watersheds of the FMR study area. Extensive monitoring for bacteria occurred in the San Vicente Creek watershed, but more data on nutrients, pesticides, sediment, and other parameters in all the watersheds would help with assessing impairment status and identifying water quality priorities. Data collected would then be used to develop specific objectives for implementation of water quality remediation projects based on research and analysis.

The top six broad action areas in a working list of priority actions that could form the basis of an Action Plan for FMR CCA to address many of the stated information needs as of May 2008 are listed below. These have only been discussed in concept and all areas would need further fleshing out.

1. Water quality monitoring
2. Targeted BMP implementation
3. Targeted Midcoast NPS Outreach Campaign
4. Outreach, input, and support on County watershed policies
5. Technical assistance to landowners and builders for implementation of watershed policies
6. Permit streamlining for restoration projects

An Action Plan would need to identify constraints, impediments, opportunities, and priorities to remediate water quality in the appropriate watersheds and cost-effective, feasible water quality improvement projects. A timeline for implementing the proposed methods to achieve water quality objectives, outreach to the stakeholders/ collaborators and community at large, would need to be developed, as well as a monitoring plan and performance measures to track implementation of projects.

To ensure success of any developed Action Plan, it is important that FMR project stakeholders, including community members, continue to have a forum to share

information, collaborate and coordinate to identify priority implementation projects and identify and help obtain funding for these projects as appropriate.

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## *Appendix A: Land Use Regulations-Local Coastal Plan Update*

In the LCP update, the County considered water quality policies to address impervious surface limits and winter grading restrictions, among other updates. The Board of Supervisors has tentatively approved the following measures to better control stormwater drainage and prevent flooding: (1) Retain the existing Countywide Stormwater Pollution Prevention Program (STOPPP-since renamed); (2) Enact regulations that limit the amount of parcel area covered by pavement and ground level impervious surfaces; (3) Enact regulations that prohibit winter grading unless rigorous site containment occurs. Also, as part of this project, in April, 2005, the Board: (4) Approved new residential design review standards that include provisions to reduce the volume of surface runoff (see below). The Board has tentatively approved limiting the amount of parcel area that may be covered by ground level impervious surfaces at 10% of parcel area (for all uses), not to exceed 1,170 sq. ft. (for residential uses). Ground level applies to structures that are less than 18 inches in height. Further, The Board has approved Mid-Coast design review standards which include the following provisions to reduce surface runoff: (a) Minimize the hardscape or impervious areas and maximize permeable surfaces that have a more natural appearance and reduce runoff volume and pollution. (b) Use of surfaces that: (i) are more naturally appearing than asphalt or concrete, and (ii) decrease runoff and increase absorption. Such surfaces may include wood decks, perforated paving systems, and un-mortared brick, stone or tile. (iii) Driveways, walkways and parking areas should be no larger than allowable standards, and should drain into on-site landscaped areas. (iv) Minimize directly connected impervious areas using landscaping or other permeable surfaces to soften the visual appearance, allow absorption into the soil, and reduce runoff. This amendment and tentative approval will need to be certified by the California Coastal Commission.

## *Appendix B: Impervious Surface Analysis*

The following analysis of these efforts is composed of four components: review of the STOPPP impervious estimates (STOPPP name has since been changed to Water Pollution Prevention Program (Program)), Half Moon Bay airport, roads, Pillar Point Air Force Base, rural areas with compacted soils, and finally a comparison using the Office of Environmental Health Hazard Assessment (OEHHA) IA coefficients and the Information Center for the Environment (ICE) at UC Davis Project Land Use Categories.

The Program and its consultants, EOA, Inc., characterized IA within selected watersheds of San Mateo County, including four of the seven sub-watersheds that comprise the Fitzgerald Marine Reserve CCA. The Program, in general, is primarily focused on watersheds that flow to San Francisco Bay (the "Bay-side" communities). These were selected to include most of the major urban creek drainages on the Bay-side …and "the watersheds on the coast-side facing development pressure." (Konnan, personal communication).

The stated objective of the Program's study was: "To help planners minimize future development impacts on creek resources." Another objective (though not stated) is compliance with non-point source pollution and hydromodification control regulations.

Program consultants (EOA Inc.) developed creek channel modification categories[26] to help characterize each watershed based on limited field data and interviews. Extensive watershed channel modification surveys were not conducted due to budget limitations.

Program study authors note that the "methods used for estimating imperviousness have not been standardized" and that the land use designations in the Bredehorst study (1981) of IA "did not always exactly match those used by ABAG. Interpretation was required when applying Bredehorst's imperviousness coefficients to ABAG land use classes. Some [percent IA] coefficients [for land use categories] were based on best professional judgment" (Bredehorst 1981 p. 6).

When interpretation was necessary, the study authors relied on aerial photos, U.S. Geological Survey topographic maps, and ABAG land use descriptors to estimate TIA for the Denniston, San Vicente, Montara, and Dean Creek sub-watersheds (Figure 4). It was also assumed that all IAs were either completely impervious or completely pervious (while noting some grey areas like hardened construction site soils). "Imperviousness gradients" were approximated based on interpretation of topographic contour lines. Notably, ABAG land use types were reclassified into groups of similar land uses.

[26] Creek channel modification classifications: culvert, concrete-lined channel, earth channel, modified but not channelized, unmodified channel.

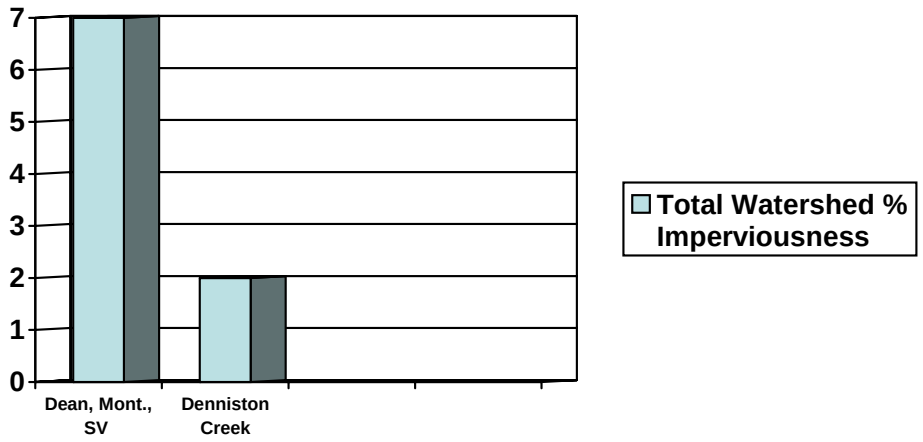



**Fig. 4. STOPPP** Imperviousness Estimates for Selected Mid-Coast Watersheds

Program study authors are transferring to the Midcoast some assumptions made in their analysis of bayside watersheds. Density of residential housing, for example, is thought by the authors to be a key factor in the degree of imperviousness in the bulk of the bayside watersheds. They also note that "cumulative imperviousness" in watersheds takes into account the influence of upstream drainages (which were discovered to be less developed than downstream areas in San Mateo County) and act as an offset to more developed areas.

The Half Moon Bay Airport occupies about a mile along Highway One between Princeton and Seal Cove. The airport is comprised of 290 total acres, of which staff at the San Mateo County Airports District estimate that approximately 43.5 acres, or 15% of the total airport facility, is impervious (James Wadleigh, personal communication). A master plan for the facility was prepared under the direction of prior management, and is now ten years old. Due to the age of the master plan and the change in management, ABAG assumes that it is no longer valid, and therefore they were not able to obtain more information on the future plans for the airport such as build-out scenarios or stormwater management.

Roads, as a large part of the transportation network, are often the largest contributor to impervious area in any area, given the automobile-based infrastructure of the U.S. (Arnold and Gibbons 1996). In the pilot area, roads include both California State Highway One and local roadway networks associated primarily with residential and commercial development.

It should be noted that shoulder widths can vary, depending on which Highway One segment is under study. This is due to a history of policy changes within the agency that reflect changes in highway design standards. As segments are updated, it is expected that the shoulder width will be ten feet. Field verifications will be required to confirm existing shoulder widths.

In addition to the state highway roads layer, MTC staff used the TeleAtlas road layer to classify the total miles of roadway by road type in order to capture the total amount of IA attributable to roads for the Fitzgerald pilot area. An analysis was

performed using the TeleAtlas dataset[27], overlaid with an aerial photograph of the project area to determine the "average road widths" by road type (Table 3).

**Table 3. Road type classification and widths used for impervious area analysis**

| Road Type | Range of Road Width | Example |
|---|---|---|
| Arterials | 65 feet wide | Hwy 1 |
| Collectors | 40 – 45 feet wide | California Ave |
| Local Roads | 25 – 35 feet wide | Palma St, 10th St |

Using the data in Table 3, each roadway functional class was assigned an "average road width" value for each road segment. The length and width of each segment was then multiplied to produce a total area for each segment (Table 4).

**Table 4. Area covered by roads in the Fitzgerald Marine Reserve pilot area**

| Road Class | Linear Miles | Acres |
|---|---|---|
| Arterials | 6.3371 | 50.1266 |
| Collectors | 2.9072 | 10.1785 |
| Local Roads | 49.4979 | 172.2462 |
| **Total** | **58.74** | **232.55** |

The Pillar Point Air Force Station (PPAFS) is located on the Pillar Point bluff that makes up the northern edge of Half Moon Bay and the western edge of Pillar Point Harbor. It houses radar equipment, and other instruments to support missile and space launches. Using a memo to the State Water Resources Control Board from the Air Force (2006) and a presentation at the Air Force facility (Tetra Tech 2006), ABAG was able to estimate the impervious area of the Pillar Point Air Force Satellite Tracking Station (PPAFS) to be 8.3 acres. The volume of annual runoff from Area 1, the area of concentrated impervious surfaces, is 1,525,000 gallons.

[27] Roadway Classifications are based upon the definitions supplied by the Base map vendor, TeleAtlas North America.

## *Appendix C: Inventory of MMs/MPs Known to be Currently Implemented in the FMR CCA and Organizations Contacted*[28]

| MM Category | MM Type[29] | MP employed | Implementer | Source |
|---|---|---|---|---|
| Agriculture[30] | 1B | Berms and ditches to divert rain/runoff away from manure | Landowners (with SMCRCD and NRCS) | Landowners |
| Agriculture | 1A | Invasive species control program for Pampas grass. | POST | POST staff |
| Agriculture | 1A, C | Fencing to keep animals out of creeks | Landowners (with SMCRCD and NRCS) | Landowners, |
| Agriculture | 1A, C | Filter Strips | Landowners (with SMCRCD and NRCS) | Landowners |
| Agriculture | 1A | Native re-vegetation and restoration | Landowners (with SMCRCD and NRCS) | Landowners |
| Agriculture | 1A | Road maintenance to prevent sediment from reaching creeks | Landowners (with SMCRCD and NRCS) | Landowners |
| Agriculture | 1B | Storage of manure away from creeks | Landowners (with SMCRCD and NRCS) | Landowners |
| Hydromodification | 5.4A | Hydromodification plan in place at the county | SMCPPP | SMCPP staff and consultants |
| Hydromodification | 5.3A | Trail planning and erosion control projects; phased elimination of informal hiking trails. | POST | POST staff |
| Hydromodification | 5.1A, 5.3A | Local Coastal Program proposed update: new 10% imperviousness rule for structures under 18 inches, and proposed new winter grading ordinance | San Mateo County | Local Coastal Program Update (draft 2006) |

[28] MM categories and types are derived from the "Plan for California's Nonpoint Source Pollution Control Program." See: http://www.coastal.ca.gov/nps/npsndx.html#NPS
[29] See NPS Plan for MM types.
[30] Agriculture as used in this document includes equestrian operation even though Equestrian operations are not defined as agriculture in San Mateo County.

## *Appendix C (continued)*

| MM Category | MM Type[31] | MP employed | Implementer | Source |
|---|---|---|---|---|
| Marinas and Recreational Boating | 4.3A, 4.2 A-G | 365 day/year, 24 hour Harbor District staff for ordinance enforcement to control dumping, painting, or to notify appropriate agency for action | Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.2F | A harbor ordinance requires the use of pump out stations. This also applies to live aboard boats. Sewage pump out facility is free. | Boat owners, Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.2A,E | Coastal Commission Clean Boater kits are distributed to existing and new tenants; harbor school tours (littering, dumping); other educational materials re. boat maintenance and waste control techniques available. | Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.3A | Education: Informational signage -- recycling/trash depositing; do not dump stenciling; pamphlets from San Mateo County Environmental Health Division re. hazardous waste management and used oil | Pillar Point Harbor staff, San Mateo County Environmental Health Division | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.1H | Harbor manages an oily bilge water separator (first on the CA Coast). Cleaned water is routed to sewer. | Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.1A | The County conducts weekly FIB tests on the harbor's water quality according to AB411 recreational water contact standards. | San Mateo County Environmental Health Division | San Mateo County RCD |

[31] See above NPS Plan for descriptions of management measure types.

## *Appendix C (continued)*

| MM Category | MM Type[32] | MP employed | Implementer | Source |
|---|---|---|---|---|
| Marinas and Recreational Boating | many | The Harbor is in the process of getting certification under the state's Clean Marina Program. Completion is expected early 2008. | Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.1H | There are pet litter bag dispensers and county dog control by-law signage at points of shoreline entry, but little money for monitoring of dog waste pick-up non-compliance. | Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.2B | There is a prohibition against dumping fish waste. | Boaters, Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.2C, D | There is a trench drain with oil/water separator across six lanes of boat ramps. | Pillar Point Harbor staff | Pillar Point Harbor staff |
| Marinas and Recreational Boating | 4.2D, 4.1F | Used oil recycling facility is free | San Mateo County Environmental Health Division | Pillar Point Harbor staff |
| Urban[33] | 3.6A | Educational materials are available to encourage the prevention of the dumping of medications. | SMCPPP, Sanitary Districts,SMC Sheriffs' Department | SMCPP staff and consultants |
| Urban | 3.3A | General categories of BMPs outlined in the Storm water Management Plan for Half Moon Bay Airport: fuel spill response, general maintenance, ditch clean outs, materials storage control | SMCPPP | County Airport staff |

[32] See above NPS Plan for descriptions of management measure types.
[33] Although the NPS plan uses "urban" for a category, many of the MPs in this table are employed on rural residential lands.

## *Appendix C (continued)*

| MM Category | MM Type[34] | MP employed | Implementer | Source |
|---|---|---|---|---|
| Urban | 3.6A | Informational pamphlets about water conservation and sewer programs are available at Sanitary District's office. | SMCPPP | SMCPP staff and consultants |
| Urban | 3.3A | Restaurants are trained in oil and grease management. | Restaurants | Pillar Point Harbor staff |
| Urban | 3.5E | Vegetated shoulders on Highway 1 function as filters. | Caltrans | Caltrans staff |
| Urban | 3.1, 3.2, 3.3 | City and County Association of Governments (C/CAG) manages implementation of the County Stormwater Permit with a variety of consultant and county staff programs, including the SMCPP program, Watershed Protection Maintenance Standards, erosion and sediment control, construction site design and monitoring, culvert cleanouts, contract requirements for water pollution control, contract requirements for erosion control, training programs in waste management and handling. | SMCPPP | SMCPP staff and consultants |

[34] See above NPS Plan for descriptions of management measure types.

## *Appendix C (continued)*

| MM Category | MM Type[35] | MP employed | Implementer | Source |
|---|---|---|---|---|
| Wetlands/Riparian Areas | 6B | County Parks Division restoration program on San Vicente Creek: involves bank stabilization, invasive species and trash removal | County Parks Division | County Parks Division staff |
| Wetlands/Riparian Areas | 6A | There are standard creek setbacks (35-50 ft) which all agricultural users are required to use. | POST | POST staff |

**Organizations contacted to obtain current MM/MP information**

| |
|---|
| City/County Association of Governments for San Mateo County (C/CAG) |
| Fitzgerald Marine Reserve |
| Golden Gate National Recreation Area (GGNRA) |
| Gulf of the Farallones National Marine Sanctuary |
| Half Moon Bay Airport |
| Montara Water and Sanitary District (MWSD) |
| Monterey Bay National Marine Sanctuary(MBNMS) |
| Peninsula Open Space Trust (POST) |
| Pillar Point Harbor |
| San Francisco Bay Regional Water Quality Control Board |
| San Mateo County Water Pollution Prevention Program (Program) |
| San Mateo County Agricultural Commission |
| San Mateo County Department of Public Works |
| San Mateo County Environmental Health Department |
| San Mateo County Parks Department |
| San Mateo County Planning and Building Division |
| San Mateo County Resource Conservation District (SMCRCD) |
| Sewer Authority Mid-Coastside |
| Tetra Tech (consultants to Pillar Point Air Force Station) |
| Department of the Air Force at Pillar Point Satellite Tracking Station |
| Private Landowners |

[35] See above NPS Plan for descriptions of management measure types.

## *Appendix D: Current Best Management Practices for Control of Land-Based Sources of Marine Pollutants (ABAG 2007)*

Critical Coastal Areas Pilot Program:
James Fitzgerald Marine Reserve - State of California Area of Special Biological Significance

# Current Best Management Practices for Control of Land-Based Sources of Marine Pollutants

### 303d listed waterbodies

- San Vicente Creek
- Pacific Ocean at Pillar Point Beach
- Pacific Ocean at Fitzgerald Marine Reserve

### Water Quality Parameters and Typical Sources

Pathogens:

- Human, domestic/wild animal, avian waste
- Via waste disposal systems
- Via urban and rural run-off
- Seepage from disposal sites

Nutrients:

- Soil erosion
- Street runoff
- Disposal sites and effluent discharges

Sediment:

- Soil erosion
- Bed and stream bank erosion
- Ditch erosion
- Re-suspended sediments

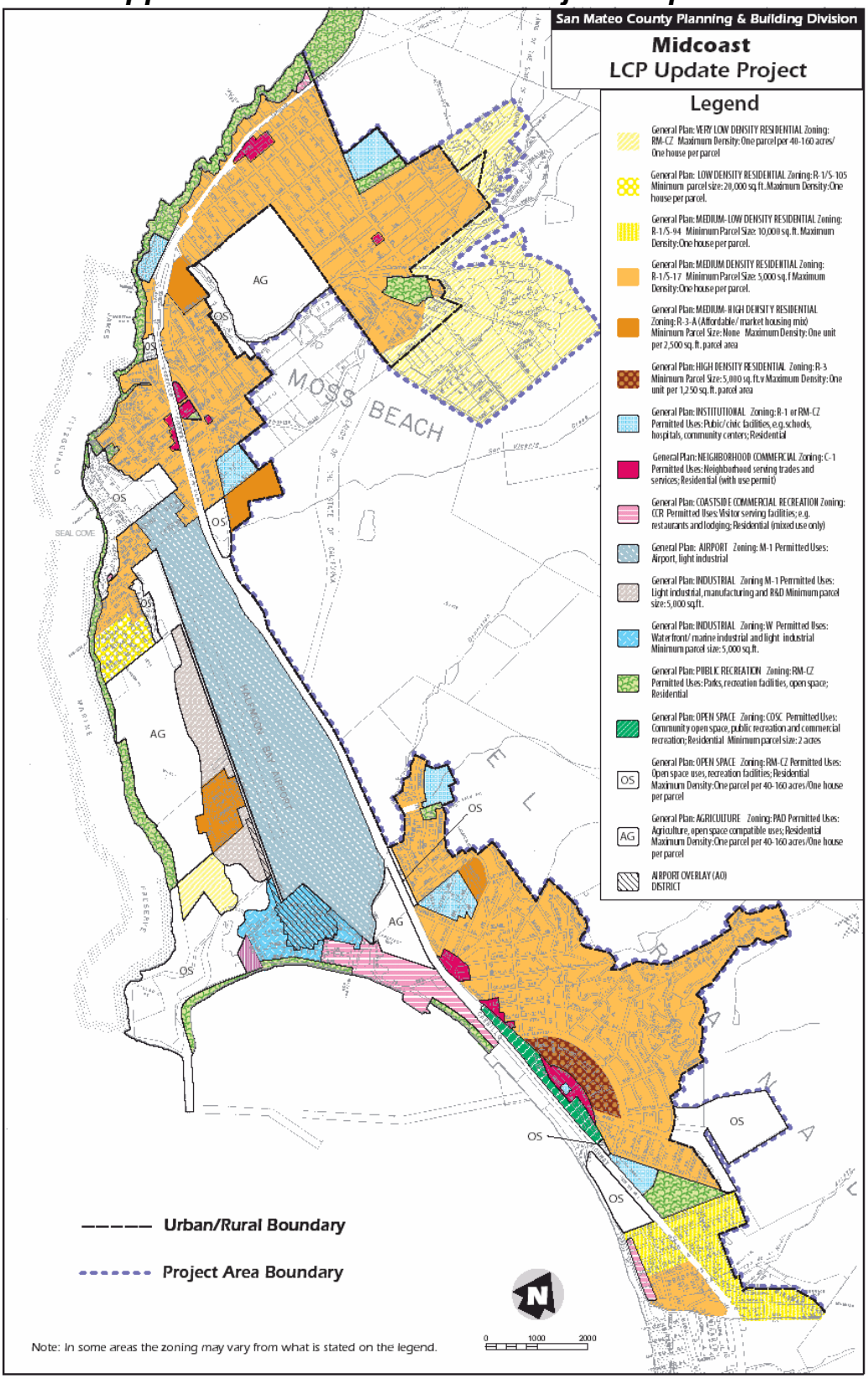
Mercury [draft 303(d) list]:

- Waste disposal and discharge
- Run-off
- Mining waste
- Dumpsites
- Paint peeling
- Re-suspended sediments
- Atmospheric deposition

### Sampling of Best Management Practices In Use in San Mateo County

1. Good housekeeping
2. Preventative maintenance
3. Filtration systems
4. Public, agency and land owner education and training
5. Spill prevention and containment
6. Stockpile covering and containment
7. Re-rounting of storm water
8. Wash water containment
9. Waste retrieval and recycling
10. Visual site inspections of facilities
11. Storage and handling protocols
12. Storm water Pollution Prevention Plans
13. Pavement sweeping
14. Inspection of storm water conveyances and construction sites
15. Erosion control and grading site stabilization
16. Catch basin inspection and cleaning
17. Maintenance standards re. endangered species and watershed protection
18. Industrial and commercial permit conditions
19. Pretreatment inspections
20. Structural stormwater treatment controls
21. Evaluation of illicit discharge controls
22. Spill tracking program
23. Control of pesticide spraying in rights-of-way
24. Routine maintenance of some homeowner association stormdrains

# *Appendix E: Midcoast LCP Project Map 2002*



## *Appendix F: NPS Pollutants, Description, Potential Impacts on CCA*

| Nonpoint Source Pollutant/Issue | Description | Potential Impacts on CCA Study Area |
|---|---|---|
| **Fecal bacteria (indicators of pathogens)** | Bacteria can come from sources such as leaking septic tanks and sewers, untreated sewage, pets, birds, animal and wildlife waste. | Bacteria can contaminate drinking water supplies, shellfish beds, recreation areas; lead to Hepatitis or other infections; result in beach closures or advisories; limit recreational activities such as swimming, boating, surfing or diving; result in prohibitions on shellfish harvesting. People can come into contact with bacteria through their access to recreation areas; surfers can come into direct contact with bacteria in the ocean, especially after storm events |
| **Hydromodification** | Hydromodification is the development-induced change to the natural hydrological processes and runoff characteristics of a watershed. | Hydromodification can increase rates and duration of flow, enlarge sediment loads, creek bed down cutting and erosion that lead to loss of creek habitat and aquatic diversity |
| **Sediments** | Sediment can come from activities such as land clearing, development, grading, construction and natural processes as well as stream channelization | Excess sediment can smother spawning and feeding areas, increase turbidity which can impact recreational activities, transport or harbor pollutants |
| **Nutrients** | Nutrients can come from sources and activities such as leaking septic tanks, treated or partially treated sewage, garden and roadside fertilizers, pet excrement and landscaping practices | Excessive nutrients can cause human health problems, fish kills and diseases, algae blooms, water quality problems such as increased turbidity, and decreased oxygen levels, which can impact recreational activities |
| **Pesticides** | A pesticide is any substance intended to control, destroy, repel, or attract a pest. Pesticides can be natural or synthetic and come from a variety of sources and practices such as urban and agricultural runoff, from gardens or landscaping applications, or from the improper use or disposal of household or other products containing pesticides-e.g., herbicides, fungicides | Pesticides can reduce populations of organisms, tend to persist and bioaccumulate in the food chain, can cause behavioral and structural changes, can cause acute or chronic effects in aquatic organisms |
| **Mercury** | Mercury is a naturally occurring metal used in a wide variety of applications. It has traditionally been used to make products like thermometers, switches, and some light bulbs. Mercury is released into the environment either directly to water via waste systems, or much more commonly, directly to the atmosphere. Mercury in the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microorganisms can change it into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans. Pillar Point was recently included on the state's impaired waterbodies (303(d)) list for mercury. | Methylmercury can build up in fish to levels that are many thousands of times greater than mercury levels in the surrounding water. In some lakes, rivers, and coastal waters in California, methylmercury has been found in some types of fish at concentrations that may be harmful to human health. Mercury exposure at high levels can harm the brain, heart, kidneys, lungs, and immune system of people of all ages. Birds and mammals that eat fish are more exposed to mercury than other animals in water ecosystems. Similarly, predators that eat fish-eating animals may be highly exposed. At high levels of exposure, methylmercury's harmful effects on these animals include death, reduced reproduction, slower growth and development, and abnormal behavior. |

## *Appendix F (continued)*

| | | |
|---|---|---|
| **1,2,3-trichlorpropane** | 1,2,3-Trichloropropane is a colorless, heavy liquid with a sweet but strong odor. It evaporates almost as fast as water does at normal temperatures. Small amounts of 1,2,3-trichloropropane will dissolve in water. 1,2,3-Trichloropropane can dissolve several substances, such as oils and waxes, the way water dissolves salt. For this reason, it has been and may continue to be used as an industrial solvent, paint remover, and cleaner. In general, 1,2,3-trichloropropane may be released during its manufacture, during the manufacture of other industrial chemicals which forms 1,2,3-trichloropropane as an unwanted by-product, or by its application or the application of products containing 1,2,3-trichloropropane as an impurity. For example, the presence of 1,2,3-trichloropropane in pesticides and nematicides employed in soil fumigation has been identified as a potential source for the release of this chlorinated compound into the environment . | Although 1,2,3-trichloropropane is usually not found in the environment, disposal at hazardous waste sites in the past, or release during spills and accidents have led to higher levels in nearby water, soil, and groundwater. In water, half of it will evaporate into the air within hours or several days. Very little of it will stick to the soil at the bottom of rivers, lakes, or ponds, and very little of it will be expected to concentrate in fish or other seafood**.** People who are exposed to 1,2,3-trichloropropane can have eye and throat irritation. |
| **Manganese** | Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese can also be combined with carbon to make organic manganese compounds. Common organic manganese compounds include pesticides, and fuel additives in some gasolines. | At elevated concentrations, manganese has been reported to kill fish in less than 24 hours. In humans, very large doses of ingested manganese can cause some diseases and liver damage. Consumer complaints arise when high levels of manganese are found in drinking water or domestic water because of the brownish staining of laundry and objectionable tastes in beverages which may occur. |
| **MTBE** | MTBE (methyl tertiary-butyl ether) is a chemical compound that is manufactured by the chemical reaction of methanol and isobutylene; it is produced in very large quantities and is almost exclusively used as a fuel additive in motor gasoline. It is one of a group of chemicals commonly known as "oxygenates" because they raise the oxygen content of gasoline. At room temperature, MTBE is a volatile, flammable and colorless liquid that dissolves rather easily in water. Because MTBE dissolves easily in water and does not "cling" to soil very well, it migrates faster and farther in the ground than other gasoline components, thus making it more likely to contaminate public water systems and private drinking water wells. MTBE does not degrade (breakdown) easily and is difficult and costly to remove from ground water. | A growing number of studies have detected MTBE in ground water throughout the country; in some instances these contaminated waters are sources of drinking water. Low levels of MTBE can make drinking water supplies undrinkable due to its offensive taste and odor. |

## *Appendix F (continued)*

| | | |
|---|---|---|
| **Copper** | Copper is an abundant naturally occurring trace element found in the earth's crust that is also found in surface waters. Copper is a micronutrient at low concentrations and is essential to virtually all plants and animals. At higher concentrations copper can become toxic to aquatic life. Copper may be released into the environment through copper mining activities, agricultural activities (e.g., through its use as a mildewcide, fungicide, and/or algaecide), manufacturing activities (e.g., manufacturing of leather and leather products, fabricated metal products, electrical equipment, and automobile brake pads), and through marina-related activities such as it's use as a toxic agent in antifouling boat paints. Traditional bottom paints (soft-sloughing) are designed to release dissolved copper to repel marine growth on boat hulls. Copper may also enter the environment through natural processes, such as volcanic eruptions, windblown dusts, decaying vegetation, and forest fires. Additionally, copper is found in most municipal effluents due to the corrosion of copper plumbing. | Copper is persistent in the environment and can accumulate in sediments, marine plants, and animals. Elevated levels of copper are toxic in aquatic environments and may adversely affect fish, invertebrates, plants, and amphibians. Acute toxic effects may include mortality of organisms; chronic toxicity can result in reductions in survival, reproduction, and growth. In humans, small amounts of copper are necessary to maintain good health; however, higher concentrations of copper may cause health effects such as irritation of the nose, mouth, and eyes; nausea; and diarrhea. |
| **Emerging pollutants (e.g. personal care products, pharmaceuticals)** | Emerging contaminants can be defined as any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment, but has the potential to enter the environment and cause known or suspected adverse ecological and/or human health effects. Emerging contaminants are commonly derived from municipal, agricultural, and industrial wastewater sources and pathways. | Bioaccumulation in the aquatic foodchain, human carcinogens, can impact food source of fish, can produce genetic abnormalities in fish, result in fish kills, The health effects of mixtures of low concentrations of emerging contaminants on wildlife or humans are not known, but antibiotic resistance in bacteria is common, as are endocrine-disrupting effects in fish and amphibians. More studies on the fate and transport of these compounds are being conducted and the search continues to identify other compounds that may have an effect on biota and human health. |

## *Appendix F (continued)*

| | | |
|---|---|---|
| **Invasive Species** | An "invasive species" is defined as a species that is (1) non-native (or alien) to the ecosystem under consideration and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can be plants, animals, and other organisms (e.g., microbes). Human actions are the primary means of invasive species introductions. (http://www.invasivespeciesinfo.gov/docs/council/isacdef.pdf) | Invasive species effects on water resources can be direct, as in the case of many aquatic nuisance species, or indirect, as in terrestrial species that change water tables, runoff dynamics, fire frequency, and other watershed attributes that in turn can alter water body condition. |
| **Offshore Water Circulation** | Pollutant distributions in receiving bodies are determined by water movement at various scales. Surf zone transport is dominated by waves. Near shore transport is dominated by currents, wind and tides. Offshore, transport is dominated by large-scale currents. How pollutants 'partition' between these zones is key to understanding the ultimate fate of pollutants. "Dilution is the solution to pollution." However, effective dilution is dependent on how a pollutant partitions between these zones. A pollutant that remains within the surf zone will have lower effective dilution. Compounding this is the fact that the surf zone is where human contact is greatest. | The Fitzgerald Marine Reserve is an open coastline with (generally) significant tidal and wave energy. During the wet season pollutants enter the ocean via channels, pipe outlets, and overland flow. These outlets generally discharge material into the surf zone. Due to density differences between the fresh and saline waters and to storm build (essentially the piling up of ocean water against the coast), discharged material is likely to become 'trapped' within the surf zone. |

## References:


http://toxics.usgs.gov/regional/emc

http://www.neiwpcc.org/mercury/

http://www.deq.state.or.us/wq/pubs/factsheets/willamette/mercury.pdf

http://www.epa.gov/waterscience/criteria/

http://www.tennessee.gov/environment/wpc/305b/2002/305(b) causes.pdf

East Bay Mud presentation on ECS

Alameda Countywide Clean Water Program - Fact Sheet on Hydromodification Management Requirements

Clean Marina Toolkit: http://www.coastal.ca.gov/ccbn/toolkit/marina-toolkit.pdf

Personal Communication, John Oram, San Francisco Estuary Institute

## *Appendix G: Snapshot Day and Water Quality Objectives*

Snapshot Day is an annual water quality monitoring event coordinated by the Monterey Bay Sanctuary Citizen Watershed Monitoring Network and the Coastal Watershed Council. On the first Saturday of May over 150 citizens monitor 180 sites on rivers and streams along the Central California Coast. Volunteers take field measurements of air and water temperature, dissolved oxygen, conductivity, pH, and transparency or turbidity. They also collect water samples to be analyzed at a lab for nitrate as N, orthophosphate as P, and *E. coli.* Water Quality Objectives used to compare the results are found in Table 1 along with the source of the objective.

**Table 1: Water Quality Objectives**

| Parameter (units) | Water Quality Objective | Source of Objective |
|---|---|---|
| Dissolved Oxygen (ppm) | Not lower than 7 or greater than 12 | Basin Plan Objective for Cold Water Fish |
| pH | Not less than 6.5 or more than 8.5 | General Basin Plan objective |
| Water Temperature (°C) | Not more than 22 | Basin Plan Objective for Cold Water Fish |
| Transparency (cm) | Not less than 25 | Central Coast Ambient Monitoring Program (CCAMP) |
| Nitrate as N (ppm) | Not to exceed 2.25 | Central Coast Ambient Monitoring Program (CCAMP) |
| Orthophosphate as P (ppm) | Not to exceed 0.12 | Central Coast Ambient Monitoring Program (CCAMP) |
| *E. coli* (MPN/100ml) | Not to exceed 400 | EPA Ambient Water Quality Criteria |

# *Appendix H: State Water Resources Control Board Beach Water Quality Monitoring Data*

California Environmental Protection Agency
STATE WATER RESOURCES CONTROL BOARD
BEACH WATCH

**Beach Advisory Report**

Report Criteria: From: 01/01/2000 ; To: 04/30/2008 ; Activity: BEACH_POSTING ; Agency: 38 ;

| Agency Name | Beach Name | Date Closed | Date Opened | Days Posted | BMDs | Cause | Source |
|---|---|---|---|---|---|---|---|
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 8/20/2001 | 8/23/2001 | 3 | 0.85 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 12/20/2001 | 12/21/2001 | 1 | 0.28 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 5/20/2003 | 5/23/2003 | 3 | 0 | Other | Creeks/Rivers-Wet |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 5/29/2003 | 6/4/2003 | 6 | 0.08 | Unknown cause | Creeks/Rivers-Dry. |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 8/12/2003 | 8/14/2003 | 2 | 0.11 | Unknown cause | Creeks/Rivers-Wet |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 9/17/2003 | 9/22/2003 | 189 | 10.74 | Unknown cause | Domestic/Ag animals |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 1/20/2000 | 5/3/2000 | 104 | 5.91 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 2/17/2000 | 5/11/2000 | 84 | 4.77 | Rain | Unknown |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 5/25/2000 | 8/27/2000 | 94 | 5.34 | Other | Domestic/Ag animals |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 9/20/2000 | 9/23/2000 | 3 | 0.17 | Other | Unknown |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 6/8/2005 | 6/12/2005 | 4 | 0.2 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 6/8/2005 | 6/12/2005 | 4 | 1.24 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 1/10/2007 | 1/24/2007 | 14 | 0.8 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 3/8/2007 | 3/28/2007 | 20 | 1.14 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 1/30/2008 | 2/7/2008 | 8 | 0.4 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Montara State Beach | 5/8/2000 | 5/11/2000 | 3 | 0.34 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point | 7/31/2001 | 8/2/2001 | 2 | 0.23 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point | 6/15/2002 | 9/5/2002 | 82 | 4.66 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point | 10/23/2002 | 10/30/2002 | 7 | 1.99 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point | 12/18/2002 | 12/24/2002 | 6 | 0.34 | Rain | Urban runoff-Wet |
| San Mateo County Environmental Health | Pillar Point | 7/2/2003 | 7/9/2003 | 7 | 0.2 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point | 7/22/2003 | 7/29/2003 | 7 | 0.4 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point | 8/19/2003 | 9/8/2003 | 20 | 0 | Other | Wildlife |

# *Appendix H (continued)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| San Mateo County Environmental Health | Pillar Point #5 | 1/20/2000 | 3/1/2000 | 41 | 0.58 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #5 | 2/14/2000 | 3/8/2000 | 23 | 1.31 | Rain | Unknown |
| San Mateo County Environmental Health | Pillar Point #5 | 3/16/2000 | 3/23/2000 | 7 | 0.4 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #5 | 4/20/2000 | 4/27/2000 | 7 | 0.4 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #5 | 5/3/2000 | 5/18/2000 | 15 | 0.85 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #5 | 9/1/2004 | 9/8/2004 | 7 | 2.18 | Unknown cause | Wildlife |
| San Mateo County Environmental Health | Pillar Point #7 | 2/2/2006 | 5/18/2006 | 105 | 5.25 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #7 | 2/22/2007 | 3/8/2007 | 14 | 0.87 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #7 | 8/29/2007 | 9/6/2007 | 8 | 0.5 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #7 | 9/26/2007 | 10/3/2007 | 7 | 0.44 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #7 | 10/11/2007 | 11/15/2007 | 35 | 2.18 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #7 | 12/5/2007 | 12/12/2007 | 7 | 0.44 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #7 | 12/19/2007 | 12/31/2007 | 12 | 0.75 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #7 | 12/27/2007 | 1/24/2008 | 28 | 1.4 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #7 | 1/30/2008 | 2/6/2008 | 7 | 0.35 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #7 | 2/13/2008 | 3/4/2008 | 20 | 1 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #7 | 4/9/2008 | 4/16/2008 | 7 | 0.35 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #7 | 4/23/2008 | 4/30/2008 | 7 | 0.35 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #8 | 1/31/2007 | 2/7/2007 | 7 | 0.4 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #8 | 2/22/2007 | 3/14/2007 | 20 | 1.14 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #8 | 10/3/2007 | 10/11/2007 | 8 | 0.46 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #8 | 10/31/2007 | 11/15/2007 | 15 | 0.93 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #8 | 11/29/2007 | 12/19/2007 | 20 | 1.24 | Bacterial standards violation | Coastal outlets |
| San Mateo County Environmental Health | Pillar Point #8 | 1/8/2008 | 1/24/2008 | 16 | 0.8 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #8 | 1/30/2008 | 2/6/2008 | 7 | 0.35 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #8 | 2/13/2008 | 2/21/2008 | 8 | 0.4 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point #8 | 2/27/2008 | 3/4/2008 | 6 | 0.3 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point 2 | 1/8/2001 | 1/17/2001 | 9 | 2.56 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point 2 | 1/9/2001 | 1/17/2001 | 8 | 4.54 | Rain | Unknown |
| San Mateo County Environmental Health | Pillar Point 2 | 2/21/2001 | 2/27/2001 | 6 | 1.7 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point 2 | 3/6/2001 | 3/13/2001 | 7 | 1.99 | Unknown cause | Unknown |
| San Mateo County Environmental Health | Pillar Point 2 | 5/19/2004 | 5/25/2004 | 6 | 1.86 | Other | Wildlife |

# *Appendix H (continued)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| San Mateo County Environmental Health | Pillar Point 2 | 6/1/2004 | 6/9/2004 | 8 | 2.49 | Other | Urban runoff-Wet |
| San Mateo County Environmental Health | Pillar Point Harbor | 12/18/2002 | 12/24/2002 | 6 | 1.7 | Unknown cause | Unknown |
| **Fitzgerald CCA Totals:** | | | | **1,187** | **82.65** | | |

California Environmental Protection Agency
STATE WATER RESOURCES CONTROL BOARD
BEACH WATCH

**Beach Advisory Report**

Report Criteria: From: 01/01/2000 ; To: 04/30/2008 ; Activity: BEACH_CLOSURE ; Agency: 38 ;

| Agency Name | Beach Name | Date Closed | Date Opened | Days Posted | BMDs | Cause | Source |
|---|---|---|---|---|---|---|---|
| San Mateo County Environmental Health | Fitzgerald Marine (Moss Beach) | 2/2/2006 | 2/7/2006 | 5 | 0.25 | SSO unknown cause | Sanitary Sewer Overflow |
| San Mateo County Environmental Health | Montara State Beach | 2/20/2002 | 2/22/2002 | 2 | 0.91 | Pump Station Failure | Sewage |
| San Mateo County Environmental Health | Montara State Beach | 2/20/2002 | 2/27/2002 | 7 | 1.99 | Pump Station Failure | Sewage |
| San Mateo County Environmental Health | Pillar Point #8 | 3/30/2006 | 4/6/2006 | 7 | 0.35 | SSO unknown cause | Sanitary Sewer Overflow |
| San Mateo County Environmental Health | Pillar Point 2 | 12/3/2001 | 12/10/2001 | 7 | 1.99 | Other | Unknown |
| **Fitzgerald CCA Totals:** | | | | **28** | **5.49** | | |

# *Appendix H (continued)*

**San Mateo County Environmental Health Weekly AB411 Sampling Data - Creeks within the CCA.**

**San Vicente Creek**

| StationID | SampleDate | ParameterCode | Result | Units | AnalysisMethod |
|---|---|---|---|---|---|
| San Vicente Creek | 10/6/1998 | Fecal Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 10/20/1998 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 11/3/1998 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 11/10/1998 | Fecal Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 11/17/1998 | Fecal Coliforms | 950 | MPN/100ml | MTF |
| San Vicente Creek | 12/1/1998 | Fecal Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 12/8/1998 | Fecal Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 12/15/1998 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 12/22/1998 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 12/29/1998 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 1/5/1999 | Fecal Coliforms | 700 | MPN/100ml | MTF |
| San Vicente Creek | 1/12/1999 | Fecal Coliforms | 460 | MPN/100ml | MTF |
| San Vicente Creek | 1/19/1999 | Fecal Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 1/27/1999 | Fecal Coliforms | 1400 | MPN/100ml | MTF |
| San Vicente Creek | 2/2/1999 | Fecal Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 2/9/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 2/16/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 2/23/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 3/2/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 3/9/1999 | Fecal Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 3/16/1999 | Fecal Coliforms | 1400 | MPN/100ml | MTF |
| San Vicente Creek | 3/23/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 3/30/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 4/6/1999 | Fecal Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 4/13/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 4/20/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 4/27/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 5/4/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 5/11/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 5/18/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 5/25/1999 | Fecal Coliforms | 230 | MPN/100ml | MTF |
| San Vicente Creek | 6/1/1999 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 6/8/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 6/15/1999 | Fecal Coliforms | 460 | MPN/100ml | MTF |
| San Vicente Creek | 6/22/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 6/29/1999 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 7/7/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 7/13/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 7/20/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 7/27/1999 | Fecal Coliforms | 340 | MPN/100ml | MTF |
| San Vicente Creek | 8/3/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 8/10/1999 | Fecal Coliforms | 5400 | MPN/100ml | MTF |

| | | | | | |
|---|---|---|---|---|---|
| San Vicente Creek | 8/18/1999 | Fecal Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 8/24/1999 | Fecal Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 8/30/1999 | Fecal Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 9/7/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 9/14/1999 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 9/21/1999 | Fecal Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 9/28/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 10/5/1999 | Fecal Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 10/13/1999 | Fecal Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 10/18/1999 | Fecal Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 10/25/1999 | Fecal Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 11/1/1999 | Fecal Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 11/8/1999 | Fecal Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 11/15/1999 | Fecal Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 11/22/1999 | Fecal Coliforms | 170 | MPN/100ml | MTF |
| San Vicente Creek | 11/29/1999 | Fecal Coliforms | 230 | MPN/100ml | MTF |
| San Vicente Creek | 12/6/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 12/13/1999 | Fecal Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 12/20/1999 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 12/28/1999 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 1/3/2000 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 1/10/2000 | Fecal Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 1/17/2000 | Fecal Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 1/24/2000 | Fecal Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 1/31/2000 | Fecal Coliforms | 10 | MPN/100ml | MTF |
| San Vicente Creek | 2/7/2000 | Fecal Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 2/14/2000 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 2/22/2000 | Fecal Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 2/28/2000 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 3/6/2000 | Fecal Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 3/13/2000 | Fecal Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 3/20/2000 | Fecal Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 3/27/2000 | Fecal Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 4/3/2000 | Fecal Coliforms | 700 | MPN/100ml | MTF |
| San Vicente Creek | 4/10/2000 | Fecal Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 4/17/2000 | Fecal Coliforms | 5400 | MPN/100ml | MTF |
| San Vicente Creek | 4/24/2000 | Fecal Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 5/1/2000 | Fecal Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 5/8/2000 | Fecal Coliforms | 5400 | MPN/100ml | MTF |
| San Vicente Creek | 5/15/2000 | Fecal Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 5/22/2000 | Fecal Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 5/30/2000 | Fecal Coliforms | 700 | MPN/100ml | MTF |
| San Vicente Creek | 6/5/2000 | Fecal Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 6/12/2000 | Fecal Coliforms | 751 | MPN/100ml | MTF |
| San Vicente Creek | 6/20/2000 | Fecal Coliforms | 1515 | MPN/100ml | MTF |
| San Vicente Creek | 6/26/2000 | Fecal Coliforms | 1178 | MPN/100ml | MTF |
| San Vicente Creek | 7/10/2000 | Fecal Coliforms | 910 | MPN/100ml | MTF |

| | | | | | |
|---|---|---|---|---|---|
| San Vicente Creek | 7/17/2000 | Fecal Coliforms | 3026 | MPN/100ml | MTF |
| San Vicente Creek | 7/24/2000 | Fecal Coliforms | 855 | MPN/100ml | MTF |
| San Vicente Creek | 7/31/2000 | Fecal Coliforms | 728 | MPN/100ml | MTF |
| San Vicente Creek | 8/8/2000 | Fecal Coliforms | 269 | MPN/100ml | MTF |
| San Vicente Creek | 8/14/2000 | Fecal Coliforms | 1019 | MPN/100ml | MTF |
| San Vicente Creek | 8/21/2000 | Fecal Coliforms | 1119 | MPN/100ml | MTF |
| San Vicente Creek | 8/29/2000 | Fecal Coliforms | 833 | MPN/100ml | MTF |
| San Vicente Creek | 9/5/2000 | Fecal Coliforms | 2613 | MPN/100ml | MTF |
| San Vicente Creek | 9/12/2000 | Fecal Coliforms | 504 | MPN/100ml | MTF |
| San Vicente Creek | 9/18/2000 | Fecal Coliforms | 1467 | MPN/100ml | MTF |
| San Vicente Creek | 9/25/2000 | Fecal Coliforms | 3076 | MPN/100ml | MTF |
| San Vicente Creek | 10/2/2000 | Fecal Coliforms | 3873 | MPN/100ml | MTF |
| San Vicente Creek | 10/10/2000 | Fecal Coliforms | 1597 | MPN/100ml | MTF |
| San Vicente Creek | 10/16/2000 | Fecal Coliforms | 557 | MPN/100ml | MTF |
| San Vicente Creek | 10/23/2000 | Fecal Coliforms | 960 | MPN/100ml | MTF |
| San Vicente Creek | 10/30/2000 | Fecal Coliforms | 1450 | MPN/100ml | MTF |
| San Vicente Creek | 11/7/2000 | Fecal Coliforms | 880 | MPN/100ml | MTF |
| San Vicente Creek | 11/13/2000 | Fecal Coliforms | 327 | MPN/100ml | MTF |
| San Vicente Creek | 11/20/2000 | Fecal Coliforms | 354 | MPN/100ml | MTF |
| San Vicente Creek | 11/27/2000 | Fecal Coliforms | 272 | MPN/100ml | MTF |
| San Vicente Creek | 12/4/2000 | Fecal Coliforms | 1439 | MPN/100ml | MTF |
| San Vicente Creek | 12/12/2000 | Fecal Coliforms | 2143 | MPN/100ml | MTF |
| San Vicente Creek | 12/18/2000 | Fecal Coliforms | 384 | MPN/100ml | MTF |
| San Vicente Creek | 12/28/2000 | Fecal Coliforms | 1935 | MPN/100ml | MTF |
| San Vicente Creek | 1/8/2001 | Fecal Coliforms | 727 | MPN/100ml | MTF |
| San Vicente Creek | 1/16/2001 | Fecal Coliforms | 1050 | MPN/100ml | MTF |
| San Vicente Creek | 1/22/2001 | Fecal Coliforms | 960 | MPN/100ml | MTF |
| San Vicente Creek | 1/29/2001 | Fecal Coliforms | 1291 | MPN/100ml | MTF |
| San Vicente Creek | 2/5/2001 | Fecal Coliforms | 350 | MPN/100ml | MTF |
| San Vicente Creek | 4/29/2002 | E. Coli | 1539 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/6/2002 | E. Coli | 278 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/13/2002 | E. Coli | 336 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/20/2002 | E. Coli | 581 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/28/2002 | E. Coli | 134 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/3/2002 | E. Coli | 933 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/10/2002 | E. Coli | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/17/2002 | E. Coli | 839 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/24/2002 | E. Coli | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/1/2002 | E. Coli | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/8/2002 | E. Coli | 479 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/15/2002 | E. Coli | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/22/2002 | E. Coli | 2143 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/30/2002 | E. Coli | 1331 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/5/2002 | E. Coli | 1309 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/12/2002 | E. Coli | 1935 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/19/2002 | E. Coli | 2602 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/26/2002 | E. Coli | 1650 | MPN/100ml | Colilert 18 |

| | | | | | |
|---|---|---|---|---|---|
| San Vicente Creek | 9/3/2002 | E. Coli | 1702 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/9/2002 | E. Coli | 905 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/16/2002 | E. Coli | 1785 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/23/2002 | E. Coli | 2924 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/15/2002 | E. Coli | 1860 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/21/2002 | E. Coli | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/28/2002 | E. Coli | 2489 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/4/2002 | E. Coli | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/18/2002 | E. Coli | 1017 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/25/2002 | E. Coli | 1106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/4/2002 | E. Coli | 909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/9/2002 | E. Coli | 471 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/17/2002 | E. Coli | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/23/2002 | E. Coli | 108 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/30/2002 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/6/2003 | E. Coli | 419 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/13/2003 | E. Coli | 201 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/21/2003 | E. Coli | 246 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/27/2003 | E. Coli | 613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/3/2003 | E. Coli | 156 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/10/2003 | E. Coli | 1178 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/24/2003 | E. Coli | 1119 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/3/2003 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/10/2003 | E. Coli | 288 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/17/2003 | E. Coli | 203 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/19/2003 | E. Coli | 249 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/24/2003 | E. Coli | 487 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/31/2003 | E. Coli | 419 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/7/2003 | E. Coli | 295 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/14/2003 | E. Coli | 985 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/21/2003 | E. Coli | 909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/28/2003 | E. Coli | 697 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/5/2003 | E. Coli | 1058 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/12/2003 | E. Coli | 288 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/19/2003 | E. Coli | 363 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/27/2003 | E. Coli | 1467 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/2/2003 | E. Coli | 691 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/9/2003 | E. Coli | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/16/2003 | E. Coli | 644 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/23/2003 | E. Coli | 1050 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/30/2003 | E. Coli | 1956 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/7/2003 | E. Coli | 959 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/14/2003 | E. Coli | 813 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/14/2003 | E. Coli | 987 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/21/2003 | E. Coli | 364 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/28/2003 | E. Coli | 620 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/4/2003 | E. Coli | 1313 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 8/11/2003 | E. Coli | 384 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/18/2003 | E. Coli | 960 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/25/2003 | E. Coli | 1187 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/1/2003 | E. Coli | 556 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/8/2003 | E. Coli | 766 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/15/2003 | E. Coli | 331 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/22/2003 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/29/2003 | E. Coli | 399 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/6/2003 | E. Coli | 481 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/14/2003 | E. Coli | 480 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/20/2003 | E. Coli | 189 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/27/2003 | E. Coli | 987 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/9/2004 | E. Coli | 373 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/16/2004 | E. Coli | 638 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/23/2004 | E. Coli | 1198 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/30/2004 | E. Coli | 644 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/7/2004 | E. Coli | 907 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/13/2004 | E. Coli | 5794 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/20/2004 | E. Coli | 1850 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/27/2004 | E. Coli | 4611 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/4/2004 | E. Coli | 404 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/12/2004 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/18/2004 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/25/2004 | E. Coli | 727 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/2/2004 | E. Coli | 697 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/8/2004 | E. Coli | 435 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/22/2004 | E. Coli | 288 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/29/2004 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/6/2004 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/13/2004 | E. Coli | 794 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/20/2004 | E. Coli | 364 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/27/2004 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/3/2005 | E. Coli | 109 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/10/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/18/2005 | E. Coli | 175 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/31/2005 | E. Coli | 203 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/7/2005 | E. Coli | 109 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/14/2005 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/22/2005 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/28/2005 | E. Coli | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/7/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/14/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/21/2005 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/28/2005 | E. Coli | 275 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/4/2005 | E. Coli | 228 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/11/2005 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/18/2005 | E. Coli | 173 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 4/25/2005 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/2/2005 | E. Coli | 109 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/9/2005 | E. Coli | 272 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/16/2005 | E. Coli | 171 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/23/2005 | E. Coli | 155 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/31/2005 | E. Coli | 1787 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/6/2005 | E. Coli | 1333 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/14/2005 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/20/2005 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/27/2005 | E. Coli | 148 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/5/2005 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/11/2005 | E. Coli | 529 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/18/2005 | E. Coli | 670 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/25/2005 | E. Coli | 426 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/1/2005 | E. Coli | 399 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/9/2005 | E. Coli | 385 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/15/2005 | E. Coli | 1483 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/22/2005 | E. Coli | 771 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/29/2005 | E. Coli | 583 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/6/2005 | E. Coli | 933 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/12/2005 | E. Coli | 1259 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/19/2005 | E. Coli | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/26/2005 | E. Coli | 556 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/4/2005 | E. Coli | 393 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/11/2005 | E. Coli | 275 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/17/2005 | E. Coli | 683 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/24/2005 | E. Coli | 1376 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/31/2005 | E. Coli | 504 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/7/2005 | E. Coli | 613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/14/2005 | E. Coli | 703 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/21/2005 | E. Coli | 1956 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/28/2005 | E. Coli | 384 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/5/2005 | E. Coli | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/12/2005 | E. Coli | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/19/2005 | E. Coli | 295 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/27/2005 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/3/2006 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/9/2006 | E. Coli | 122 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/12/2006 | E. Coli | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/17/2006 | E. Coli | 120 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/23/2006 | E. Coli | 327 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/30/2006 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/6/2006 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/13/2006 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/19/2006 | E. Coli | 295 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/27/2006 | E. Coli | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/6/2006 | E. Coli | 1081 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 3/13/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/20/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/27/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/3/2006 | E. Coli | 1607 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/4/2006 | E. Coli | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/10/2006 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/17/2006 | E. Coli | 134 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/24/2006 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/1/2006 | E. Coli | 30 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/8/2006 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/15/2006 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/22/2006 | E. Coli | 512 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/30/2006 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/2/2006 | E. Coli | 495 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/16/2006 | E. Coli | 373 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/30/2006 | E. Coli | 471 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/6/2006 | E. Coli | 313 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/13/2006 | E. Coli | 1250 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/27/2006 | E. Coli | 565 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/4/2006 | E. Coli | 1378 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/11/2006 | E. Coli | 275 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/18/2006 | E. Coli | 1019 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/26/2006 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/2/2007 | E. Coli | 413 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/8/2007 | E. Coli | 7701 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/17/2007 | E. Coli | 341 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/22/2007 | E. Coli | 161 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/29/2007 | E. Coli | 211 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/12/2007 | E. Coli | 175 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/20/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/21/2007 | E. Coli | 364 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/26/2007 | E. Coli | 354 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/5/2007 | E. Coli | 250 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/12/2007 | E. Coli | 576 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/19/2007 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/27/2007 | E. Coli | 275 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/2/2007 | E. Coli | 288 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/9/2007 | E. Coli | 842 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/16/2007 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/23/2007 | E. Coli | 617 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/1/2007 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/7/2007 | E. Coli | 441 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/15/2007 | E. Coli | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/21/2007 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/29/2007 | E. Coli | 175 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/4/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/11/2007 | E. Coli | 83 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 6/18/2007 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/25/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/2/2007 | E. Coli | 805 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/9/2007 | E. Coli | 465 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/16/2007 | E. Coli | 313 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/30/2007 | E. Coli | 785 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/9/2007 | E. Coli | 1017 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/13/2007 | E. Coli | 1153 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/20/2007 | E. Coli | 233 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/28/2007 | E. Coli | 185 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/4/2007 | E. Coli | 231 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/10/2007 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/17/2007 | E. Coli | 148 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/24/2007 | E. Coli | 341 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/1/2007 | E. Coli | 1054 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/9/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/15/2007 | E. Coli | 1198 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/22/2007 | E. Coli | 148 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/30/2007 | E. Coli | 148 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/5/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/19/2007 | E. Coli | 1354 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/26/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/3/2007 | E. Coli | 3255 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/10/2007 | E. Coli | 243 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/6/1998 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 10/20/1998 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 11/3/1998 | Total Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 11/10/1998 | Total Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 11/17/1998 | Total Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 12/1/1998 | Total Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 12/8/1998 | Total Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 12/15/1998 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 12/22/1998 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 12/29/1998 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 1/5/1999 | Total Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 1/12/1999 | Total Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 1/19/1999 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 1/27/1999 | Total Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 2/2/1999 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 2/9/1999 | Total Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 2/16/1999 | Total Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 2/23/1999 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 3/2/1999 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 3/9/1999 | Total Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 3/16/1999 | Total Coliforms | 1800 | MPN/100ml | MTF |
| San Vicente Creek | 3/23/1999 | Total Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 3/30/1999 | Total Coliforms | 3500 | MPN/100ml | MTF |

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|---|---|---|---|---|---|
| San Vicente Creek | 4/6/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 4/13/1999 | Total Coliforms | 1400 | MPN/100ml | MTF |
| San Vicente Creek | 4/20/1999 | Total Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 4/27/1999 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 5/4/1999 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 5/11/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 5/18/1999 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 5/25/1999 | Total Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 6/1/1999 | Total Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 6/8/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 6/15/1999 | Total Coliforms | 1100 | MPN/100ml | MTF |
| San Vicente Creek | 6/22/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 6/29/1999 | Total Coliforms | 440 | MPN/100ml | MTF |
| San Vicente Creek | 7/7/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 7/13/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 7/20/1999 | Total Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 7/27/1999 | Total Coliforms | 340 | MPN/100ml | MTF |
| San Vicente Creek | 8/3/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 8/10/1999 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 8/18/1999 | Total Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 8/24/1999 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 8/30/1999 | Total Coliforms | 3300 | MPN/100ml | MTF |
| San Vicente Creek | 9/7/1999 | Total Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 9/14/1999 | Total Coliforms | 2200 | MPN/100ml | MTF |
| San Vicente Creek | 9/21/1999 | Total Coliforms | 5400 | MPN/100ml | MTF |
| San Vicente Creek | 9/28/1999 | Total Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 10/5/1999 | Total Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 10/13/1999 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 10/18/1999 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 10/25/1999 | Total Coliforms | 5400 | MPN/100ml | MTF |
| San Vicente Creek | 11/1/1999 | Total Coliforms | 16000 | MPN/100ml | MTF |
| San Vicente Creek | 11/8/1999 | Total Coliforms | 16000 | MPN/100ml | MTF |
| San Vicente Creek | 11/15/1999 | Total Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 11/22/1999 | Total Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 11/29/1999 | Total Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 12/6/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 12/13/1999 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 12/20/1999 | Total Coliforms | 790 | MPN/100ml | MTF |
| San Vicente Creek | 12/28/1999 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 1/3/2000 | Total Coliforms | 490 | MPN/100ml | MTF |
| San Vicente Creek | 1/10/2000 | Total Coliforms | 330 | MPN/100ml | MTF |
| San Vicente Creek | 1/17/2000 | Total Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 1/24/2000 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 1/31/2000 | Total Coliforms | 10 | MPN/100ml | MTF |
| San Vicente Creek | 2/7/2000 | Total Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 2/14/2000 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 2/22/2000 | Total Coliforms | 5400 | MPN/100ml | MTF |

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|---|---|---|---|---|---|
| San Vicente Creek | 2/28/2000 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 3/6/2000 | Total Coliforms | 2800 | MPN/100ml | MTF |
| San Vicente Creek | 3/13/2000 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 3/20/2000 | Total Coliforms | 2400 | MPN/100ml | MTF |
| San Vicente Creek | 3/27/2000 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 4/3/2000 | Total Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 4/10/2000 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 4/17/2000 | Total Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 4/24/2000 | Total Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 5/1/2000 | Total Coliforms | 3500 | MPN/100ml | MTF |
| San Vicente Creek | 5/8/2000 | Total Coliforms | 24000 | MPN/100ml | MTF |
| San Vicente Creek | 5/15/2000 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 5/22/2000 | Total Coliforms | 9200 | MPN/100ml | MTF |
| San Vicente Creek | 5/30/2000 | Total Coliforms | 1700 | MPN/100ml | MTF |
| San Vicente Creek | 6/5/2000 | Total Coliforms | 1300 | MPN/100ml | MTF |
| San Vicente Creek | 6/12/2000 | Total Coliforms | 4352 | MPN/100ml | MTF |
| San Vicente Creek | 6/20/2000 | Total Coliforms | 5012 | MPN/100ml | MTF |
| San Vicente Creek | 6/26/2000 | Total Coliforms | 4370 | MPN/100ml | MTF |
| San Vicente Creek | 7/10/2000 | Total Coliforms | 5172 | MPN/100ml | MTF |
| San Vicente Creek | 7/17/2000 | Total Coliforms | 6294 | MPN/100ml | MTF |
| San Vicente Creek | 7/24/2000 | Total Coliforms | 1211 | MPN/100ml | MTF |
| San Vicente Creek | 7/31/2000 | Total Coliforms | 2014 | MPN/100ml | MTF |
| San Vicente Creek | 8/8/2000 | Total Coliforms | 1539 | MPN/100ml | MTF |
| San Vicente Creek | 8/14/2000 | Total Coliforms | 2352 | MPN/100ml | MTF |
| San Vicente Creek | 8/21/2000 | Total Coliforms | 2755 | MPN/100ml | MTF |
| San Vicente Creek | 8/29/2000 | Total Coliforms | 1956 | MPN/100ml | MTF |
| San Vicente Creek | 9/5/2000 | Total Coliforms | 15530 | MPN/100ml | MTF |
| San Vicente Creek | 9/12/2000 | Total Coliforms | 1309 | MPN/100ml | MTF |
| San Vicente Creek | 9/18/2000 | Total Coliforms | 6488 | MPN/100ml | MTF |
| San Vicente Creek | 9/25/2000 | Total Coliforms | 8164 | MPN/100ml | MTF |
| San Vicente Creek | 10/2/2000 | Total Coliforms | 8664 | MPN/100ml | MTF |
| San Vicente Creek | 10/10/2000 | Total Coliforms | 3654 | MPN/100ml | MTF |
| San Vicente Creek | 10/16/2000 | Total Coliforms | 2046 | MPN/100ml | MTF |
| San Vicente Creek | 10/23/2000 | Total Coliforms | 3076 | MPN/100ml | MTF |
| San Vicente Creek | 10/30/2000 | Total Coliforms | 9804 | MPN/100ml | MTF |
| San Vicente Creek | 11/7/2000 | Total Coliforms | 3654 | MPN/100ml | MTF |
| San Vicente Creek | 11/13/2000 | Total Coliforms | 1720 | MPN/100ml | MTF |
| San Vicente Creek | 11/20/2000 | Total Coliforms | 1250 | MPN/100ml | MTF |
| San Vicente Creek | 11/27/2000 | Total Coliforms | 2247 | MPN/100ml | MTF |
| San Vicente Creek | 12/4/2000 | Total Coliforms | 8664 | MPN/100ml | MTF |
| San Vicente Creek | 12/12/2000 | Total Coliforms | 4352 | MPN/100ml | MTF |
| San Vicente Creek | 12/18/2000 | Total Coliforms | 2755 | MPN/100ml | MTF |
| San Vicente Creek | 12/28/2000 | Total Coliforms | 3873 | MPN/100ml | MTF |
| San Vicente Creek | 1/8/2001 | Total Coliforms | 19862 | MPN/100ml | MTF |
| San Vicente Creek | 1/16/2001 | Total Coliforms | 8164 | MPN/100ml | MTF |
| San Vicente Creek | 1/22/2001 | Total Coliforms | 2909 | MPN/100ml | MTF |
| San Vicente Creek | 1/29/2001 | Total Coliforms | 8664 | MPN/100ml | MTF |

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|---|---|---|---|---|---|
| San Vicente Creek | 2/5/2001 | Total Coliforms | 2046 | MPN/100ml | MTF |
| San Vicente Creek | 4/29/2002 | Total Coliforms | 11198 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/6/2002 | Total Coliforms | 1650 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/13/2002 | Total Coliforms | 780 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/20/2002 | Total Coliforms | 7701 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/28/2002 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/3/2002 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/10/2002 | Total Coliforms | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/17/2002 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/24/2002 | Total Coliforms | 8664 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/1/2002 | Total Coliforms | 12996 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/8/2002 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/15/2002 | Total Coliforms | 10462 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/22/2002 | Total Coliforms | 5475 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/30/2002 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/5/2002 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/12/2002 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/19/2002 | Total Coliforms | 12996 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/26/2002 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/3/2002 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/9/2002 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/16/2002 | Total Coliforms | 6867 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/23/2002 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/15/2002 | Total Coliforms | 9208 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/21/2002 | Total Coliforms | 7701 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/28/2002 | Total Coliforms | 7270 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/4/2002 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/18/2002 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/25/2002 | Total Coliforms | 8864 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/4/2002 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/9/2002 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/17/2002 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/23/2002 | Total Coliforms | 1723 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/30/2002 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/6/2003 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/13/2003 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/21/2003 | Total Coliforms | 1793 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/27/2003 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/3/2003 | Total Coliforms | 2359 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/10/2003 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/24/2003 | Total Coliforms | 2359 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/3/2003 | Total Coliforms | 1058 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/10/2003 | Total Coliforms | 1439 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/17/2003 | Total Coliforms | 794 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/19/2003 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/24/2003 | Total Coliforms | 1313 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/31/2003 | Total Coliforms | 2098 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 4/7/2003 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/14/2003 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/21/2003 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/28/2003 | Total Coliforms | 3654 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/5/2003 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/12/2003 | Total Coliforms | 1374 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/19/2003 | Total Coliforms | 1553 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/27/2003 | Total Coliforms | 10462 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/2/2003 | Total Coliforms | 7270 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/9/2003 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/16/2003 | Total Coliforms | 6488 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/23/2003 | Total Coliforms | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/30/2003 | Total Coliforms | 7270 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/7/2003 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/14/2003 | Total Coliforms | 8164 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/14/2003 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/21/2003 | Total Coliforms | 1296 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/28/2003 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/4/2003 | Total Coliforms | 9208 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/11/2003 | Total Coliforms | 1455 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/18/2003 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/25/2003 | Total Coliforms | 10462 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/1/2003 | Total Coliforms | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/8/2003 | Total Coliforms | 2143 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/15/2003 | Total Coliforms | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/22/2003 | Total Coliforms | 1467 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/29/2003 | Total Coliforms | 4160 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/6/2003 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/14/2003 | Total Coliforms | 2359 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/20/2003 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/27/2003 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/9/2004 | Total Coliforms | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/16/2004 | Total Coliforms | 12033 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/23/2004 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/30/2004 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/7/2004 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/13/2004 | Total Coliforms | 12033 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/20/2004 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/27/2004 | Total Coliforms | 17328 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/4/2004 | Total Coliforms | 1223 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/12/2004 | Total Coliforms | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/18/2004 | Total Coliforms | 1723 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/25/2004 | Total Coliforms | 4352 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/2/2004 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/8/2004 | Total Coliforms | 1467 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/22/2004 | Total Coliforms | 1515 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/29/2004 | Total Coliforms | 1539 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 12/6/2004 | Total Coliforms | 1236 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/13/2004 | Total Coliforms | 2755 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/20/2004 | Total Coliforms | 1515 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/27/2004 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/3/2005 | Total Coliforms | 15530 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/10/2005 | Total Coliforms | 4108 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/18/2005 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/31/2005 | Total Coliforms | 1872 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/7/2005 | Total Coliforms | 1500 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/14/2005 | Total Coliforms | 766 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/22/2005 | Total Coliforms | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/28/2005 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/7/2005 | Total Coliforms | 1722 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/14/2005 | Total Coliforms | 4352 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/21/2005 | Total Coliforms | 581 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/28/2005 | Total Coliforms | 6488 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/4/2005 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/11/2005 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/18/2005 | Total Coliforms | 1624 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/25/2005 | Total Coliforms | 1624 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/2/2005 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/9/2005 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/16/2005 | Total Coliforms | 1850 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/23/2005 | Total Coliforms | 816 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/31/2005 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/6/2005 | Total Coliforms | 24191 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/14/2005 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/20/2005 | Total Coliforms | 1935 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/27/2005 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/5/2005 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/11/2005 | Total Coliforms | 12996 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/18/2005 | Total Coliforms | 8164 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/25/2005 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/1/2005 | Total Coliforms | 14136 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/9/2005 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/15/2005 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/22/2005 | Total Coliforms | 9208 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/29/2005 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/6/2005 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/12/2005 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/19/2005 | Total Coliforms | 5475 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/26/2005 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/4/2005 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/11/2005 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/17/2005 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/24/2005 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/31/2005 | Total Coliforms | 3654 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 11/7/2005 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/14/2005 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/21/2005 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/28/2005 | Total Coliforms | 2359 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/5/2005 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/12/2005 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/19/2005 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/27/2005 | Total Coliforms | 3078 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/3/2006 | Total Coliforms | 6486 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/9/2006 | Total Coliforms | 4884 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/12/2006 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/17/2006 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/23/2006 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/30/2006 | Total Coliforms | 1291 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/6/2006 | Total Coliforms | -99 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/13/2006 | Total Coliforms | 4352 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/19/2006 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/27/2006 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/6/2006 | Total Coliforms | 19862 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/13/2006 | Total Coliforms | 5475 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/20/2006 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/27/2006 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/3/2006 | Total Coliforms | 5475 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/4/2006 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/10/2006 | Total Coliforms | 7270 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/17/2006 | Total Coliforms | 6131 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/24/2006 | Total Coliforms | 1291 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/1/2006 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/8/2006 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/15/2006 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/22/2006 | Total Coliforms | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/30/2006 | Total Coliforms | 12033 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/2/2006 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/16/2006 | Total Coliforms | 1050 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/30/2006 | Total Coliforms | 1259 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/6/2006 | Total Coliforms | 1112 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/13/2006 | Total Coliforms | 1669 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/27/2006 | Total Coliforms | 15531 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/4/2006 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/11/2006 | Total Coliforms | 8664 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/18/2006 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/26/2006 | Total Coliforms | 960 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/2/2007 | Total Coliforms | 1376 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/8/2007 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/17/2007 | Total Coliforms | 1126 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/22/2007 | Total Coliforms | 399 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 1/29/2007 | Total Coliforms | 1198 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| San Vicente Creek | 2/12/2007 | Total Coliforms | 2481 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/20/2007 | Total Coliforms | 1172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/21/2007 | Total Coliforms | 1119 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 2/26/2007 | Total Coliforms | 4352 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/5/2007 | Total Coliforms | 1207 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/12/2007 | Total Coliforms | 1313 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/19/2007 | Total Coliforms | 373 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 3/27/2007 | Total Coliforms | 1935 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/2/2007 | Total Coliforms | 933 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/9/2007 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/16/2007 | Total Coliforms | 1956 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 4/23/2007 | Total Coliforms | 6488 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/1/2007 | Total Coliforms | 1333 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/7/2007 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/15/2007 | Total Coliforms | 4884 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/21/2007 | Total Coliforms | 441 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 5/29/2007 | Total Coliforms | 1291 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/4/2007 | Total Coliforms | 1126 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/11/2007 | Total Coliforms | 1313 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/18/2007 | Total Coliforms | 1872 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 6/25/2007 | Total Coliforms | 2098 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/2/2007 | Total Coliforms | 5794 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/9/2007 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/16/2007 | Total Coliforms | 5794 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 7/30/2007 | Total Coliforms | 15531 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/9/2007 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/13/2007 | Total Coliforms | 5794 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/20/2007 | Total Coliforms | 3654 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 8/28/2007 | Total Coliforms | 11120 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/4/2007 | Total Coliforms | 1733 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/10/2007 | Total Coliforms | 12997 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/17/2007 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 9/24/2007 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/1/2007 | Total Coliforms | 7270 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/9/2007 | Total Coliforms | 11198 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/15/2007 | Total Coliforms | 1720 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/22/2007 | Total Coliforms | 15530 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 10/30/2007 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/5/2007 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/19/2007 | Total Coliforms | 4352 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 11/26/2007 | Total Coliforms | 1043 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/3/2007 | Total Coliforms | 5172 | MPN/100ml | Colilert 18 |
| San Vicente Creek | 12/10/2007 | Total Coliforms | 1223 | MPN/100ml | Colilert 18 |

# *Appendix H (continued)*

**San Mateo County Environmental Health Weekly AB411 Sampling Data - Creeks within the CCA.**

**Sunshine Valley Creek/Dean Creek**

| StationID | SampleDate | ParameterCode | Result | Units | AnalysisMethod |
|---|---|---|---|---|---|
| Sunshine Valley Creek | 2/20/2007 | E Coli | 309 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 2/26/2007 | E Coli | 74 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 3/5/2007 | E Coli | 20 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 3/19/2007 | E Coli | 41 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 4/16/2007 | E Coli | 110 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 4/23/2007 | E Coli | 243 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/1/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/7/2007 | E Coli | 84 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/15/2007 | E Coli | 20 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/21/2007 | E Coli | 426 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/29/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 6/4/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 6/11/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 6/18/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/2/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/9/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/16/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/30/2007 | E Coli | 20 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 8/13/2007 | E Coli | 10 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 8/20/2007 | E Coli | 73 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 9/10/2007 | E Coli | 96 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 9/17/2007 | E Coli | 41 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 9/24/2007 | E Coli | 134 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/1/2007 | E Coli | 63 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/9/2007 | E Coli | 20 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/15/2007 | E Coli | 480 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/22/2007 | E Coli | 246 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 11/5/2007 | E Coli | 31 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 11/19/2007 | E Coli | 41 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 11/26/2007 | E Coli | 20 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/3/2007 | E Coli | 63 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/6/2007 | E Coli | 3448 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/10/2007 | E Coli | 275 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/17/2007 | E Coli | 24192 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 2/20/2007 | Total Coliform | 12033 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 2/26/2007 | Total Coliform | 1722 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 3/5/2007 | Total Coliform | 1491 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 3/19/2007 | Total Coliform | 933 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 4/16/2007 | Total Coliform | 17328 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 4/23/2007 | Total Coliform | 5794 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/1/2007 | Total Coliform | 2046 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/7/2007 | Total Coliform | 4884 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/15/2007 | Total Coliform | 594 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/21/2007 | Total Coliform | 4352 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 5/29/2007 | Total Coliform | 1162 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 6/4/2007 | Total Coliform | 2909 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 6/11/2007 | Total Coliform | 223 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 6/18/2007 | Total Coliform | 7701 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/2/2007 | Total Coliform | 24192 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/9/2007 | Total Coliform | 4352 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Sunshine Valley Creek | 7/16/2007 | Total Coliform | 24192 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 7/30/2007 | Total Coliform | 10462 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 8/13/2007 | Total Coliform | 1203 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 8/20/2007 | Total Coliform | 24192 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 9/10/2007 | Total Coliform | 12997 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 9/17/2007 | Total Coliform | 24192 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 9/24/2007 | Total Coliform | 5172 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/1/2007 | Total Coliform | 17328 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/9/2007 | Total Coliform | 3945 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/15/2007 | Total Coliform | 11198 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 10/22/2007 | Total Coliform | 6488 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 11/5/2007 | Total Coliform | 8664 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 11/19/2007 | Total Coliform | 2098 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 11/26/2007 | Total Coliform | 1012 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/3/2007 | Total Coliform | 820 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/6/2007 | Total Coliform | 24192 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/10/2007 | Total Coliform | 5794 | MPN/100ml | Colilert 18 |
| Sunshine Valley Creek | 12/17/2007 | Total Coliform | 24192 | MPN/100ml | Colilert 18 |

# *Appendix H (continued)*

**San Mateo County Environmental Health Weekly AB411 Sampling Data - Creeks within the CCA.**

**Martini Creek**

| StationID | SampleDate | ParameterCode | Result | Units | AnalysisMethod |
|---|---|---|---|---|---|
| Martini Creek | 4/29/2002 | E. Coli | 547 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/6/2002 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/13/2002 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/20/2002 | E. Coli | 228 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/28/2002 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/3/2002 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/10/2002 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/17/2002 | E. Coli | 96 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/24/2002 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/1/2002 | E. Coli | 30 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/8/2002 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/15/2002 | E. Coli | 134 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/22/2002 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/29/2002 | E. Coli | 84 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/5/2002 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/12/2002 | E. Coli | 350 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/19/2002 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/27/2002 | E. Coli | 96 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/3/2002 | E. Coli | 148 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/11/2002 | E. Coli | 231 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/16/2002 | E. Coli | 624 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/23/2002 | E. Coli | 118 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/7/2002 | E. Coli | 288 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/15/2002 | E. Coli | 185 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/21/2002 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/28/2002 | E. Coli | 97 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/4/2002 | E. Coli | 171 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/12/2002 | E. Coli | 86 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/18/2002 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/25/2002 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/2/2002 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/9/2002 | E. Coli | 97 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/16/2002 | E. Coli | 1860 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/23/2002 | E. Coli | 121 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/30/2002 | E. Coli | 189 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/2/2003 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/6/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/8/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/13/2003 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/15/2003 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/21/2003 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/22/2003 | E. Coli | 52 | MPN/100ml | Colilert 18 |

| | | | | | |
|---|---|---|---|---|---|
| Martini Creek | 1/27/2003 | E. Coli | 355 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/29/2003 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/3/2003 | E. Coli | 644 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/5/2003 | E. Coli | 156 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/10/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/18/2003 | E. Coli | 97 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/24/2003 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/3/2003 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/10/2003 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/17/2003 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/24/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/31/2003 | E. Coli | 233 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/7/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/14/2003 | E. Coli | 148 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/21/2003 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/28/2003 | E. Coli | 96 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/5/2003 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/12/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/19/2003 | E. Coli | 228 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/27/2003 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/2/2003 | E. Coli | 97 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/9/2003 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/16/2003 | E. Coli | 158 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/23/2003 | E. Coli | 85 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/30/2003 | E. Coli | 314 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/7/2003 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/14/2003 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/21/2003 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/28/2003 | E. Coli | 85 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/4/2003 | E. Coli | 158 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/11/2003 | E. Coli | 888 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/18/2003 | E. Coli | 384 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/25/2003 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/1/2003 | E. Coli | 109 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/8/2003 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/15/2003 | E. Coli | 85 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/29/2003 | E. Coli | 547 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/6/2003 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/14/2003 | E. Coli | 771 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/20/2003 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/27/2003 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/9/2004 | E. Coli | 134 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/16/2004 | E. Coli | 1092 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/23/2004 | E. Coli | 909 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/30/2004 | E. Coli | 520 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/7/2004 | E. Coli | 72 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/13/2004 | E. Coli | 52 | MPN/100ml | Colilert 18 |

| | | | | | |
|---|---|---|---|---|---|
| Martini Creek | 9/20/2004 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/27/2004 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/4/2004 | E. Coli | 318 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/12/2004 | E. Coli | 189 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/18/2004 | E. Coli | 171 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/25/2004 | E. Coli | 331 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/1/2004 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/8/2004 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/22/2004 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/29/2004 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/6/2004 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/13/2004 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/20/2004 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/27/2004 | E. Coli | 959 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/3/2005 | E. Coli | 97 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/10/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/18/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/31/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/7/2005 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/14/2005 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/22/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/28/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/7/2005 | E. Coli | 97 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/14/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/21/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/28/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/4/2005 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/11/2005 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/18/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/25/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/2/2005 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/7/2005 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/9/2005 | E. Coli | 72 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/16/2005 | E. Coli | 189 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/23/2005 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/1/2005 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/6/2005 | E. Coli | 135 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/13/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/20/2005 | E. Coli | 185 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/27/2005 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/5/2005 | E. Coli | 122 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/11/2005 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/18/2005 | E. Coli | 121 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/25/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/1/2005 | E. Coli | 216 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/15/2005 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/22/2005 | E. Coli | 63 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 8/29/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/6/2005 | E. Coli | 201 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/12/2005 | E. Coli | 175 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/19/2005 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/26/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/5/2005 | E. Coli | 134 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/11/2005 | E. Coli | -99 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/17/2005 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/24/2005 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/31/2005 | E. Coli | 98 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/7/2005 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/14/2005 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/21/2005 | E. Coli | 158 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/28/2005 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/5/2005 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/3/2006 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/9/2006 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/12/2006 | E. Coli | 246 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/23/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/30/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/6/2006 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/13/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/27/2006 | E. Coli | 24 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/6/2006 | E. Coli | 228 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/13/2006 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/20/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/27/2006 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/3/2006 | E. Coli | 110 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/10/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/17/2006 | E. Coli | 187 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/24/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/1/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/8/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/15/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/22/2006 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/30/2006 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/2/2006 | E. Coli | 246 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/16/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/23/2006 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/30/2006 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/6/2006 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/13/2006 | E. Coli | 313 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/27/2006 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/4/2006 | E. Coli | 108 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/11/2006 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/18/2006 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/26/2006 | E. Coli | 52 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 1/2/2007 | E. Coli | 637 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/22/2007 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/29/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/29/2007 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/5/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/13/2007 | E. Coli | 63 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/20/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/26/2007 | E. Coli | 384 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/5/2007 | E. Coli | 42 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/12/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/19/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/26/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/26/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/9/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/16/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/23/2007 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/30/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/7/2007 | E. Coli | 195 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/14/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/21/2007 | E. Coli | 134 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/29/2007 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/4/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/12/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/18/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/26/2007 | E. Coli | 122 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/2/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/10/2007 | E. Coli | 670 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/16/2007 | E. Coli | 173 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/30/2007 | E. Coli | 86 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/9/2007 | E. Coli | 62 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/13/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/20/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/27/2007 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/4/2007 | E. Coli | 52 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/10/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/17/2007 | E. Coli | 86 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/17/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/24/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/1/2007 | E. Coli | 51 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/9/2007 | E. Coli | 74 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/15/2007 | E. Coli | 41 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/22/2007 | E. Coli | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/29/2007 | E. Coli | 85 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/5/2007 | E. Coli | 96 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/13/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/19/2007 | E. Coli | 616 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/26/2007 | E. Coli | 364 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 12/3/2007 | E. Coli | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/10/2007 | E. Coli | 31 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/29/2002 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/6/2002 | Total Coliforms | 932 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/13/2002 | Total Coliforms | 201 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/20/2002 | Total Coliforms | 7270 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/28/2002 | Total Coliforms | 441 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/3/2002 | Total Coliforms | 988 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/10/2002 | Total Coliforms | 993 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/17/2002 | Total Coliforms | 1309 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/24/2002 | Total Coliforms | 878 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/1/2002 | Total Coliforms | 959 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/8/2002 | Total Coliforms | 852 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/15/2002 | Total Coliforms | 1309 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/22/2002 | Total Coliforms | 960 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/29/2002 | Total Coliforms | 1224 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/5/2002 | Total Coliforms | 1098 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/12/2002 | Total Coliforms | 1162 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/19/2002 | Total Coliforms | 1239 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/27/2002 | Total Coliforms | 988 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/3/2002 | Total Coliforms | 1284 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/11/2002 | Total Coliforms | 1430 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/16/2002 | Total Coliforms | 959 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/23/2002 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/7/2002 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/15/2002 | Total Coliforms | 1483 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/21/2002 | Total Coliforms | 530 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/28/2002 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/4/2002 | Total Coliforms | 1956 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/12/2002 | Total Coliforms | 1019 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/18/2002 | Total Coliforms | 1607 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/25/2002 | Total Coliforms | 1331 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/2/2002 | Total Coliforms | 1597 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/9/2002 | Total Coliforms | 1650 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/16/2002 | Total Coliforms | 6488 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/23/2002 | Total Coliforms | 1720 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/30/2002 | Total Coliforms | 1081 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/2/2003 | Total Coliforms | 605 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/6/2003 | Total Coliforms | 1464 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/8/2003 | Total Coliforms | 428 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/13/2003 | Total Coliforms | 1098 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/15/2003 | Total Coliforms | 1162 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/21/2003 | Total Coliforms | 1720 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/22/2003 | Total Coliforms | 932 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/27/2003 | Total Coliforms | 2143 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/29/2003 | Total Coliforms | 1050 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/3/2003 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 2/5/2003 | Total Coliforms | 1956 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/10/2003 | Total Coliforms | 650 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/18/2003 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/24/2003 | Total Coliforms | 884 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/3/2003 | Total Coliforms | 1597 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/10/2003 | Total Coliforms | 839 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/17/2003 | Total Coliforms | 345 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/24/2003 | Total Coliforms | 413 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/31/2003 | Total Coliforms | 1515 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/7/2003 | Total Coliforms | 1187 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/14/2003 | Total Coliforms | 1291 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/21/2003 | Total Coliforms | 1046 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/28/2003 | Total Coliforms | 1553 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/5/2003 | Total Coliforms | 537 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/12/2003 | Total Coliforms | 683 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/19/2003 | Total Coliforms | 1354 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/27/2003 | Total Coliforms | 1585 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/2/2003 | Total Coliforms | 960 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/9/2003 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/16/2003 | Total Coliforms | 1523 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/23/2003 | Total Coliforms | 464 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/30/2003 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/7/2003 | Total Coliforms | 1086 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/14/2003 | Total Coliforms | 2909 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/21/2003 | Total Coliforms | 1723 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/28/2003 | Total Coliforms | 1597 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/4/2003 | Total Coliforms | 2187 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/11/2003 | Total Coliforms | 1094 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/18/2003 | Total Coliforms | 1515 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/25/2003 | Total Coliforms | 2143 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/1/2003 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/8/2003 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/15/2003 | Total Coliforms | 1450 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/29/2003 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/6/2003 | Total Coliforms | 905 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/14/2003 | Total Coliforms | 354 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/20/2003 | Total Coliforms | 988 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/27/2003 | Total Coliforms | 987 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/9/2004 | Total Coliforms | 1467 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/16/2004 | Total Coliforms | 2481 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/23/2004 | Total Coliforms | 2063 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/30/2004 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/7/2004 | Total Coliforms | 288 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/13/2004 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/20/2004 | Total Coliforms | 565 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/27/2004 | Total Coliforms | 331 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/4/2004 | Total Coliforms | 591 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 10/12/2004 | Total Coliforms | 624 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/18/2004 | Total Coliforms | 512 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/25/2004 | Total Coliforms | 3448 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/1/2004 | Total Coliforms | 990 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/8/2004 | Total Coliforms | 146 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/22/2004 | Total Coliforms | 785 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/29/2004 | Total Coliforms | 605 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/6/2004 | Total Coliforms | 882 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/13/2004 | Total Coliforms | 1354 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/20/2004 | Total Coliforms | 583 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/27/2004 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/3/2005 | Total Coliforms | 6488 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/10/2005 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/18/2005 | Total Coliforms | 2063 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/31/2005 | Total Coliforms | 2359 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/7/2005 | Total Coliforms | 2481 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/14/2005 | Total Coliforms | 1597 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/22/2005 | Total Coliforms | 2187 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/28/2005 | Total Coliforms | 839 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/7/2005 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/14/2005 | Total Coliforms | 15530 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/21/2005 | Total Coliforms | 488 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/28/2005 | Total Coliforms | 1050 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/4/2005 | Total Coliforms | 2143 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/11/2005 | Total Coliforms | 1658 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/18/2005 | Total Coliforms | 1198 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/25/2005 | Total Coliforms | 3130 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/2/2005 | Total Coliforms | 1782 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/7/2005 | Total Coliforms | 833 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/9/2005 | Total Coliforms | 1785 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/16/2005 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/23/2005 | Total Coliforms | 12996 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/1/2005 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/6/2005 | Total Coliforms | 1236 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/13/2005 | Total Coliforms | 10 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/20/2005 | Total Coliforms | 1935 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/27/2005 | Total Coliforms | 2987 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/5/2005 | Total Coliforms | 1553 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/11/2005 | Total Coliforms | 15530 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/18/2005 | Total Coliforms | 6488 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/25/2005 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/1/2005 | Total Coliforms | 5475 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/15/2005 | Total Coliforms | 1250 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/22/2005 | Total Coliforms | 2595 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/29/2005 | Total Coliforms | 631 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/6/2005 | Total Coliforms | 880 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/12/2005 | Total Coliforms | 663 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 9/19/2005 | Total Coliforms | 985 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/26/2005 | Total Coliforms | 605 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/5/2005 | Total Coliforms | 2142 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/11/2005 | Total Coliforms | 305 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/17/2005 | Total Coliforms | 1331 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/24/2005 | Total Coliforms | 987 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/31/2005 | Total Coliforms | 836 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/7/2005 | Total Coliforms | 1650 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/14/2005 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/21/2005 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/28/2005 | Total Coliforms | 441 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/5/2005 | Total Coliforms | 323 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/3/2006 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/9/2006 | Total Coliforms | 1664 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/12/2006 | Total Coliforms | 2247 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/23/2006 | Total Coliforms | 1935 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/30/2006 | Total Coliforms | 1669 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/6/2006 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/13/2006 | Total Coliforms | 1439 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/27/2006 | Total Coliforms | 15530 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/6/2006 | Total Coliforms | 9208 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/13/2006 | Total Coliforms | 1789 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/20/2006 | Total Coliforms | 2046 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/27/2006 | Total Coliforms | 717 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/3/2006 | Total Coliforms | 3255 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/10/2006 | Total Coliforms | 2841 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/17/2006 | Total Coliforms | 2755 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/24/2006 | Total Coliforms | 14136 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/1/2006 | Total Coliforms | 8664 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/8/2006 | Total Coliforms | 2143 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/15/2006 | Total Coliforms | 4106 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/22/2006 | Total Coliforms | 1884 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/30/2006 | Total Coliforms | 9804 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/2/2006 | Total Coliforms | 988 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/16/2006 | Total Coliforms | 471 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/23/2006 | Total Coliforms | 1010 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/30/2006 | Total Coliforms | 443 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/6/2006 | Total Coliforms | 1145 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/13/2006 | Total Coliforms | 663 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/27/2006 | Total Coliforms | 6867 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/4/2006 | Total Coliforms | 571 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/11/2006 | Total Coliforms | 2613 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/18/2006 | Total Coliforms | 1054 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/26/2006 | Total Coliforms | 471 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/2/2007 | Total Coliforms | 1720 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/22/2007 | Total Coliforms | 109 | MPN/100ml | Colilert 18 |
| Martini Creek | 1/29/2007 | Total Coliforms | 830 | MPN/100ml | Colilert 18 |

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|---|---|---|---|---|---|
| Martini Creek | 1/29/2007 | Total Coliforms | 670 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/5/2007 | Total Coliforms | 364 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/13/2007 | Total Coliforms | 504 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/20/2007 | Total Coliforms | 408 | MPN/100ml | Colilert 18 |
| Martini Creek | 2/26/2007 | Total Coliforms | 3873 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/5/2007 | Total Coliforms | 455 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/12/2007 | Total Coliforms | 345 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/19/2007 | Total Coliforms | 143 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/26/2007 | Total Coliforms | 1187 | MPN/100ml | Colilert 18 |
| Martini Creek | 3/26/2007 | Total Coliforms | 1076 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/9/2007 | Total Coliforms | 350 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/16/2007 | Total Coliforms | 1523 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/23/2007 | Total Coliforms | 3076 | MPN/100ml | Colilert 18 |
| Martini Creek | 4/30/2007 | Total Coliforms | 332 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/7/2007 | Total Coliforms | 860 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/14/2007 | Total Coliforms | 644 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/21/2007 | Total Coliforms | 547 | MPN/100ml | Colilert 18 |
| Martini Creek | 5/29/2007 | Total Coliforms | 1669 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/4/2007 | Total Coliforms | 987 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/12/2007 | Total Coliforms | 278 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/18/2007 | Total Coliforms | 3654 | MPN/100ml | Colilert 18 |
| Martini Creek | 6/26/2007 | Total Coliforms | 1172 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/2/2007 | Total Coliforms | 669 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/10/2007 | Total Coliforms | 1309 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/16/2007 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| Martini Creek | 7/30/2007 | Total Coliforms | 1274 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/9/2007 | Total Coliforms | 1674 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/13/2007 | Total Coliforms | 1607 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/20/2007 | Total Coliforms | 2755 | MPN/100ml | Colilert 18 |
| Martini Creek | 8/27/2007 | Total Coliforms | 958 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/4/2007 | Total Coliforms | 1785 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/10/2007 | Total Coliforms | 2382 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/17/2007 | Total Coliforms | 1439 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/17/2007 | Total Coliforms | 20 | MPN/100ml | Colilert 18 |
| Martini Creek | 9/24/2007 | Total Coliforms | 2172 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/1/2007 | Total Coliforms | 1541 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/9/2007 | Total Coliforms | 488 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/15/2007 | Total Coliforms | 1467 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/22/2007 | Total Coliforms | 24191 | MPN/100ml | Colilert 18 |
| Martini Creek | 10/29/2007 | Total Coliforms | 7701 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/5/2007 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/13/2007 | Total Coliforms | 256 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/19/2007 | Total Coliforms | 24192 | MPN/100ml | Colilert 18 |
| Martini Creek | 11/26/2007 | Total Coliforms | 17328 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/3/2007 | Total Coliforms | 4611 | MPN/100ml | Colilert 18 |
| Martini Creek | 12/10/2007 | Total Coliforms | 2359 | MPN/100ml | Colilert 18 |