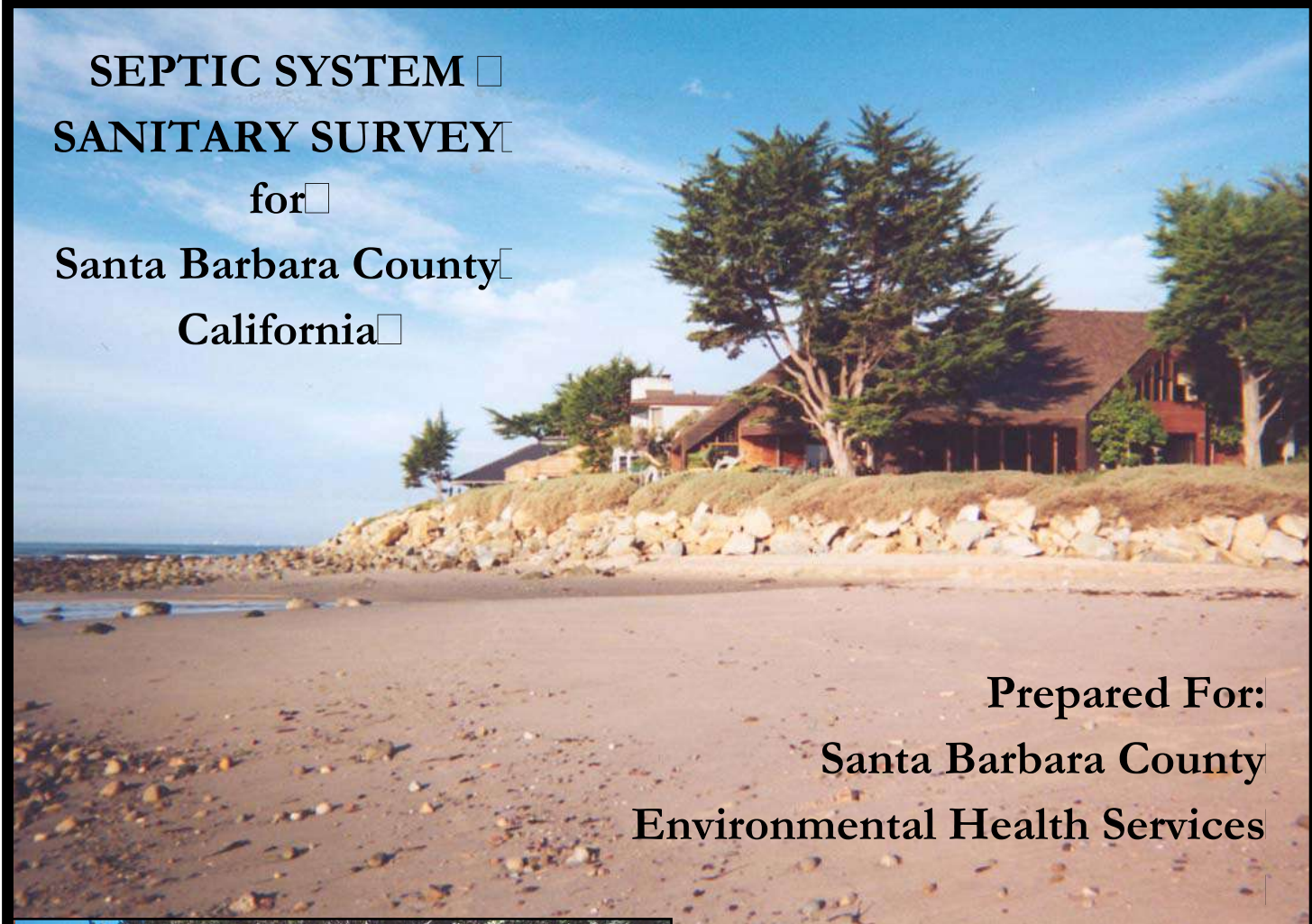
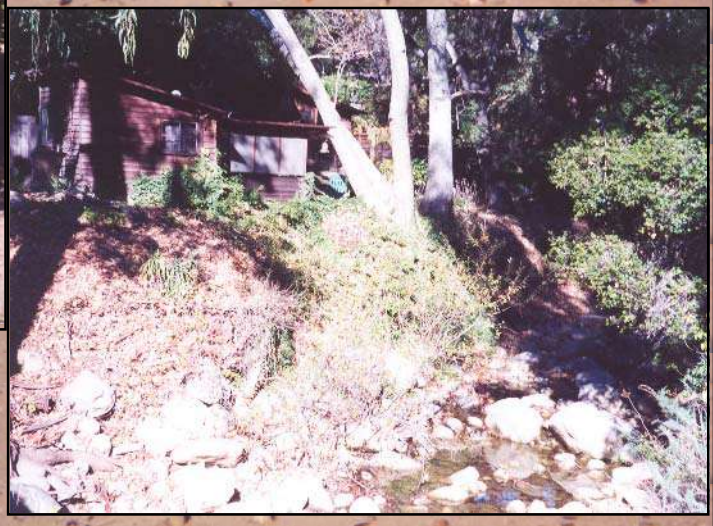
# SEPTIC SYSTEM SANITARY SURVEY for Santa Barbara County California



Prepared For:
Santa Barbara County
Environmental Health Services

March 2003



QUESTA
ENGINEERING CORPORATION

# SEPTIC SYSTEM
# SANITARY SURVEY

## FOR

## SANTA BARBARA COUNTY
## CALIFORNIA

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Prepared for

**COUNTY OF SANTA BARBARA**
**Environmental Health Services**
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Project #210029

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# SECTION 1

# INTRODUCTION AND BACKGROUND

## BACKGROUND

There are over 9,000 onsite sewage disposal systems (septic systems) in Santa Barbara County, generally providing a safe and effective means of handling domestic sanitation needs in rural areas of the County. However, many septic systems are located near streams and coastal waters where there is evidence of elevated bacteriological levels. In some instances this has created public health concerns and impacted the recreational uses of the waters. A large number of septic systems are also located in the inland regions of the County, discharging to soils and underlying groundwater resources that are relied upon as a source of drinking water. In some cases, elevated groundwater-nitrate levels have been observed in water supply wells in close proximity to areas having a high density of septic systems. There are other localized areas of the County where homeowners suffer from chronic surface failures and backup of failing septic systems due to poor soil conditions, drainage problems, limited land area or simply old, antiquated installations.

In response to the various local problems and the growing concerns about the use and public health and water quality impacts of septic systems, the Santa Barbara County Environmental Health Services has been engaged in a number of activities over the past several years to improve the understanding and overall management of septic systems in the County. Efforts in this regard have included the following:

- **County Wastewater Ordinance.** In 1999 the County regulations for onsite sewage disposal systems were updated with changes to Chapter 29, Article II of the County Code. Included in the Ordinance were changes related to system siting and design standards, requirements for provision of septic tank access risers, prohibition and required abandonment of hollow seepage pits, and new inspection and reporting requirements for septic system servicing. The Environmental Health Services has continued to review the regulations in light of new information and the passage of state legislation sponsored by Assembly member Hannah-Beth Jackson (AB 885), which calls for the adoption of new State standards for onsite systems by January 2004. Updates to the County regulations are expected to focus on management issues, provisions for use of enhanced treatment-disposal technologies and other improvements in design practices.

- **GIS Mapping.** In early 2000 the County undertook the development of a Geographic Information System (GIS) analysis to begin the process of locating, characterizing and tracking the septic systems in the unincorporated area of the County. GeoDigital Mapping Incorporated completed a report titled *Implementation of a GIS for Assessment of Septic System Risks in Santa Barbara*

*County*. The base map for the data was derived from parcel data created by the Santa Barbara County Assessors Office. Parcels on septic were identified through the Auditor's billing records, Assessor's property database and sanitary district records. The Environmental Health Services is in the process of converting historical and new "hard file" permit information into the GIS database system.

- **Septic Tank Inspection Reports**. The 1999 changes to the County Wastewater Ordinance instituted requirements for voluntary maintenance and mandatory reporting of the condition and noted deficiencies whenever a septic system is serviced. The program requires a licensed septic tank pumper to inspect and file a report with the Public Health Department whenever a septic tank is serviced. Based on these reports, notices of violation or recommendations for correction are mailed to the owner. For instance, when a hollow seepage pit is found, the homeowner is required, by Ordinance, to convert it to a drywell by filling it with gravel. Information contained in the Septic Tank Inspection Report includes: sketch of location of septic system in relation to residence, type of disposal system, septic tank information, condition of tank, signs of surfacing effluent, recommended repairs, and if the condition poses any imminent danger. Approximately 3,000 inspections/reports were completed in the first three years since this requirement went into effect.

- **Public Education**. A website has been established, educational pamphlets have been developed, and periodic workshops are put on by Environmental Health staff throughout the County to help inform and educate homeowners about the new County regulations and basic operational and maintenance aspects of septic systems.

- **Septic to Sewer Conversions**. The Environmental Health staff has been supportive of local efforts to investigate and develop plans for extension of public sewers to areas experiencing chronic septic system problems, and has received State grant monies to facilitate these efforts. State Budget Act 2000/2001 allocated grant monies to the County to fund engineering feasibility studies for sewer expansion in septic system problem areas, identify areas negatively impacted by septic systems and establish a low-interest loan program to assist in conversion of existing septic systems to sewer, where appropriate. The project primarily targets South Coast homes located within the boundaries of existing sanitary districts and in close proximity to sanitary sewers, failing systems, and problem systems discovered through sanitary surveys.

  Sanitary Sewer Conceptual Design Studies, privately funded by Homeowners Associations, have been completed for several coastal developments, including Sand Point Road Community, Beach Club Road and Padaro Lane, Sandyland Cove, and Rincon Point Properties.

- **Septic System Sanitary Survey**. In 2000 the County received grant monies from the State to fund a County-wide survey of septic systems, which is the subject of this report.

## PURPOSE AND SCOPE OF SANITARY SURVEY

In June 2001, Questa Engineering Corporation was hired by Santa Barbara County Environmental Health Department to conduct this Septic System Sanitary Survey of Santa Barbara County. The purpose of the work was to collect and consolidate pertinent data regarding onsite sewage disposal systems, assess the associated impact on public health and water quality, and develop recommendations on ways to address certain types of problems or specific problem areas. The study covered the entire County; however, the primary focus of the work was centered on identified "Special Problem Areas" and other parts of the County where there are especially heavy concentrations of septic systems and/or suspected problems. The Study was not intended to isolate or evaluate the functioning status or impact from individual septic systems or specific properties.

The specific goals of the Sanitary Survey were to:

- Assess the impacts of existing onsite systems on surface water and groundwater;
- Identify areas of the County that are problematic for the use of onsite systems;
- Determine the condition of the onsite systems surveyed;
- Identify areas of the County where onsite system inspection and servicing is recommended;
- Identify areas were conversion of onsite systems to sanitary sewers is warranted and feasible.

The study involved the following major work elements:

1. Compilation and review of background file data, reports, maps and other information relevant to septic system practices and impacts;
2. Design and implementation of field and information surveys;
3. Design and implementation of water quality sampling study in areas of septic system usage;
4. Problem assessment, including GIS mapping and analysis of survey findings, water quality data and other factors; and
5. Report preparation, including presentation of data, findings, identification/rating of problem areas, and recommendations relative to septic system management practices and needs for public sewerage.

## REPORT ORGANIZATION

The Sanitary Survey was conducted and this report was prepared following the outline detailed in the contract Scope of Services. Following the Introduction and Background

(**Section 1**) and Executive Summary (**Section 2**) the report contains the following major sections:

- **Section 3** of the report presents a general overview of the **Geology, Soils, and Water Resources of Santa Barbara County**, which form the environmental setting for the review of septic system conditions and impacts.

- **Section 4** discusses **Existing Septic System Practices**, including a review of the regulatory framework, septic system design and siting requirements, and a basic inventory of septic system usage in the County. This section of the report identifies 24 "Focus Areas", representing the areas of special interest and/or most significance from the standpoint of septic system usage and impacts. The data presented in the remainder of the report is organized around these Focus Areas.

- **Section 5** presents the results of **Septic System Information Surveys** completed for the study, including review of prior work and compilation and discussion of County permit file information, septic system inspection reports, and the results of questionnaire surveys completed by contractors, consultants and homeowners.

- **Section 6** covers **Surface Water Quality Impacts**, including a review of prior and other relevant studies, and the results of the surface water quality bacteriological sampling program conducted as part of this study.

- **Section 7** addresses **Groundwater Quality Impacts**, based on review and analysis of available monitoring data and reports.

- **Section 8** presents a **Problem Assessment**, in which a review and rating is made of each of the 24 Focus Areas, based on various factors, including geologic and soil suitability, overall number and density of septic systems, age and type of systems, proximity and risks to surface waters and groundwaters, and evidence of water quality impacts.

- **Section 9** concludes the report with a series of general **Management Recommendations** and specific measures deemed appropriate for each of the Focus Areas covered in the Sanitary Survey.

References and various appendices are included at the end of the document to complete the report.

## AUTHORIZATION AND FUNDING

Funding of this study was provided through a grant to Santa Barbara County Public Health Department from the 2000-2001 State Budget Act. The work was conducted by Questa Engineering Corporation under a contract with Santa Barbara County, dated June 5, 2001.

# SECTION 2

# EXECUTIVE SUMMARY

## INTRODUCTION

This report presents the results of a Septic System Sanitary Survey of Santa Barbara County conducted by Questa Engineering Corporation for the Santa Barbara County Environmental Health Services. The study is one of a number of efforts that the County has undertaken over the past several years in response to the growing concerns about the use and public health and water quality impacts of septic systems. Other activities to improve the understanding and overall management of septic systems in the County have included:

- **County Wastewater Ordinance.** Updating of County regulations for onsite sewage disposal systems, including the prohibition of hollow "seepage pits".

- **GIS Mapping.** Development of a Geographic Information System (GIS) analysis to begin the process of locating, characterizing and tracking the septic systems in the unincorporated area of the County.

- **Septic Tank Inspection Reports**. Requirements for inspection, evaluation and reporting of the condition and noted deficiencies whenever a septic system is serviced.

- **Public Education**. Provision of educational information and workshops on basic operational and maintenance aspects of septic systems.

- **Septic to Sewer Conversions**. Acquisition of State funding to support local efforts to investigate and develop plans for extension of public sewers to areas experiencing chronic septic system problems.

The Septic System Sanitary Survey was undertaken with the express purpose of collecting and consolidating pertinent data regarding onsite sewage disposal systems, assessing the associated impact on public health and water quality, identifying and evaluating specific areas that are problematic for the use of septic systems, and developing recommendations on ways to address certain types of problems or specific problem areas. The study covered the entire County; however, the primary focus of the work was centered on identified "Special Problem Areas" and other parts of the County where there are especially heavy concentrations of septic systems and/or suspected problems. The Study was not intended to isolate or evaluate the functioning status or impact from individual septic systems or specific properties.

## GEOLOGY, SOILS AND WATER RESOURCES

### Geology

The geology of Santa Barbara County is related to the tectonic and depositional history of the area. The northeast portion of the county is mountainous with a northeast to southwest structural trend paralleling the San Andreas Fault. The southeast and south coast portions of the county have a structural trend of east-west, which includes the Santa Ynez Mountains. The western coast and adjacent low-lying valleys and hills in the north-central region trend mainly west-northwest to east-southeast.

***South Coast Region.*** In the south coast and coastal mountains portion of the county, the rocks are characterized by a folded stratigraphic sequence that increases in age, in general, from the southwest to the northeast across the Santa Ynez Mountains. Alluvial deposits are also present along the coast and in stream valleys and include alluvium and alluvial fan deposits of silt, sand and gravel, and boulder-cobble fanglomerate and conglomerate. A large amount of residential development utilizing septic systems has occurred in areas that lie at the interface between the alluvial deposits and the Quaternary and Tertiary sedimentary formations, especially in the Goleta, Santa Barbara and Carpinteria areas.

Bedrock types include shale, siliceous shale, siltstone, and sandstone. Most of the bedrock of the area has low permeability and low percolation rates. Shale, mudstone, and claystone have very low permeability. Geologic formations posing the most difficult constraints for septic systems include the Rincon, Monterey, Sespe and (locally) Santa Barbara formations due to very low or highly variable permeability. Surficial sedimentary deposits are generally favorable for septic system, but may have constraints locally due to excessively fast percolation rates, steep slopes, drainage, flooding, and high groundwater conditions.

***West Coast and North-Central Region***. The west coast and north-central portion of the county is dominated by Quaternary sedimentary deposits and underlying Tertiary deposits. In the river valleys and low-lying coastal plains, deposits are dominated by surficial sediments and older dissected surficial deposits. These sediments include recent and older beach sands, dune sands, stream channel deposits of gravel, sand, and silt, remnants of beach terrace and alluvial fan deposits, and the Orcutt Sand, a wind-blown sand deposit. These deposits are generally moderate to well drained with variable percolation rates; however, locally, permeability and septic system suitability can be restricted due to accumulation of finer-grained sediments or high water table conditions.

***Northeastern Region.*** The northeastern portion of the county consists of the San Rafael and Sierra Madre Mountains. This part of the county is very sparsely developed, with very few septic systems. These mountains are dominated by a sequence of folded Tertiary and Cretaceous age sedimentary deposits. Rock types include sandstone, siltstone, claystone, shale and conglomerate.

**Soils**

***South County.*** The South County soils are divided into three main categories as follows:

*Alluvial Fans, Flood Plains, Valleys, and Tidal Flats*. Alluvial fans, flood plains, valleys, and tidal flats are mostly located along the coast and adjacent drainage ways. The soils are formed from sedimentary-derived alluvium. The soils are generally moderately to severely limited for leachfield use due to flooding, wetness, moderately sloping ground, and slow permeability. Some sandy areas have rapid permeability.

*Terraces and Coastal Valleys.* The terraces and coastal valleys are located within four miles of the Pacific Ocean and along the coastline. In these areas the soils tend to be relatively deep, formed in alluvium derived from sedimentary rock, and are moderately well drained to well drained. In general, these areas tend to be suitable for leachfield systems; however, there are some sections within this area where steep slopes and slow permeability present moderate to severe limitations for leachfield use.

*Foothills and Mountains*. The soils in the foothills and mountains are loamy sands and clays derived from shale, sandstone sediments, and some igneous rock. Leachfield suitability ranges from moderately to severely limited, although most soils are severely limited. The limitations are due to slow percolation rates, steep slopes, and shallow depths to bedrock.

***North County***. The North County soils are divided into four categories as follows:

*Alluvial Fans, Flood Plains, Valleys, and Terraces.* These soils are deep and range from somewhat excessively well drained to somewhat poorly drained and occur on nearly level to moderately steep slopes. The soils are formed in alluvium derived mostly from sedimentary rock. The soils have a broad range in permeability, from slow to rapid, depending upon the relative amount of sands, silts and clays in the sedimentary deposits. Consequently, the areas include soil types that range from slightly to severely limited for leachfield use.

*Terraces and Adjacent Uplands.* The terraces and adjacent upland soils are somewhat excessively drained to somewhat poorly drained sands to clay loams. Slow permeability, slopes, and poor drainage slightly to severely limit leachfield use in these areas.

*Uplands and High Terraces*. These soils are sands to clays derived from sedimentary and igneous rock. Leachfield suitability ranges from moderately to severely limited, though most soils are severely limited. The limitations are due to slow percolation rates, steep slopes, and shallow depths to bedrock.

*Miscellaneous Land Types.* Miscellaneous land types include sedimentary rock landscape and coastal sand dunes and beaches, which have relatively little or no significance or impact on the use and effects of septic systems in Santa Barbara County. They are used for watershed and recreation.

**Surface Waters**

Santa Barbara County contains six principal watersheds: South Coast, Santa Ynez, San Antonio, Santa Maria, Cuyama and Sisquoc River. The South Coast Watershed is unique in that it consists of north-south flowing drainages flowing from their headwaters in the Santa Ynez Mountains to the Pacific Ocean. The other principal watersheds generally drain from east to west. In all watersheds, flow is highly dependent upon rainfall, with little base flow (i.e., from groundwater) and no significant snowmelt. Average annual rainfall in the County ranges from 9 inches in New Cuyama to 24 inches in the Santa Ynez Mountains; annual rainfall along the coast is in the range of 16 to 18 inches.

**Groundwaters**

Overall, groundwater supplies an estimated 75-85% of Santa Barbara County's commercial, industrial, and agricultural water. However, some areas, such as the Goleta Water District, have used almost no groundwater for several years. There are eleven major groundwater basins, located in four geographically distinct regions of the county. There are also four relatively small and/or undeveloped groundwater basins in the county.

***South County.*** Five major groundwater basins are located between the Santa Ynez Mountains and the Pacific Ocean: Carpinteria, Montecito, Santa Barbara, Foothills and Goleta. The basins are generally composed of unconsolidated material from uplift and erosion of the mountains.

***Santa Ynez River.*** Three major groundwater basins lie within the drainage area of the Santa Ynez River: Santa Ynez Uplands; Buellton Uplands; and Lompoc Groundwater Basin.

***North County.*** The North County Groundwater Basins include the San Antonio and Santa Maria Valley Groundwater Basins. Land use is dominated by agriculture, though ranching, urban development, and oil development are also distributed through the basins.

***Cuyama.*** Encompassing 255 square miles, the Cuyama Groundwater Basin is located between the Caliente Range to the north and the San Rafael Mountains to the south. Roughly twenty percent of the basin's area underlies northeastern Santa Barbara County, with most of the basin extending into Ventura, Kern, and San Luis Obispo Counties.

## EXISTING SEPTIC SYSTEM PRACTICES

### Regulatory Framework

In California, all wastewater treatment and disposal systems, including individual septic systems, fall under the overall regulatory authority of the State Water Resources Control Board and the nine California Regional Water Quality Control Boards (Regional Boards). The Regional Board's involvement in regulation of onsite systems most often involves the formation and implementation of basic water protection policies. These are reflected in the individual Regional Board's Basin Plan, generally in the form of guidelines, criteria and/or prohibitions related to the siting, design, construction and maintenance of onsite systems. The Regional Boards generally delegate regulatory authority for septic systems to counties, cities or special districts, subject to the condition that the local agency commits to enforcing the minimum requirements contained in the Basin Plan policies. The Regional Boards generally elect to retain permitting authority over large and/or commercial or industrial onsite systems.

Santa Barbara County falls within the jurisdiction of the Central Coast Regional Water Quality Control Board (Regional Board). The Regional Board has adopted policies and requirements pertaining to onsite systems that are contained within the Water Quality Control Plan for the Central Coast Basin, more commonly referred to as the "Basin Plan". The onsite systems element of the Basin Plan sets forth various objectives, guidelines, general principles and recommendations for the for the use of onsite systems that cover various topics related to siting, design, construction, operation, maintenance and corrective/enforcement actions.

Since 1991, onsite sewage disposal systems in Santa Barbara County have been regulated by the County Public Health Department, Environmental Health Services Division. Prior to that, permitting of onsite systems came under the administrative authority of the County Building Department.

Santa Barbara County regulations for onsite sewage disposal systems are contained in Chapter 29, Article II of the County Code, which was most recently updated in 1999. This is commonly referred to as the "County Wastewater Ordinance". These regulations set forth specific requirements related to (a) permitting and inspection of onsite systems; (b) septic tank design and construction; (c) drywell and disposal field requirements; and (c) servicing, inspection, reporting and upgrade requirements. Standards pertaining to system sizing and construction are contained in the California (Uniform) Plumbing Code. Additional requirements for onsite systems in Santa Barbara County may be adopted as part of Community Plans or as project-specific mitigation measures or conditions applied to development proposals lying within a designated Special Problem Area of the County.

### Septic System Design and Siting Requirements

Santa Barbara County septic system requirements provide for the use of conventional systems including septic tanks for treatment and leachlines or drywells for disposal.

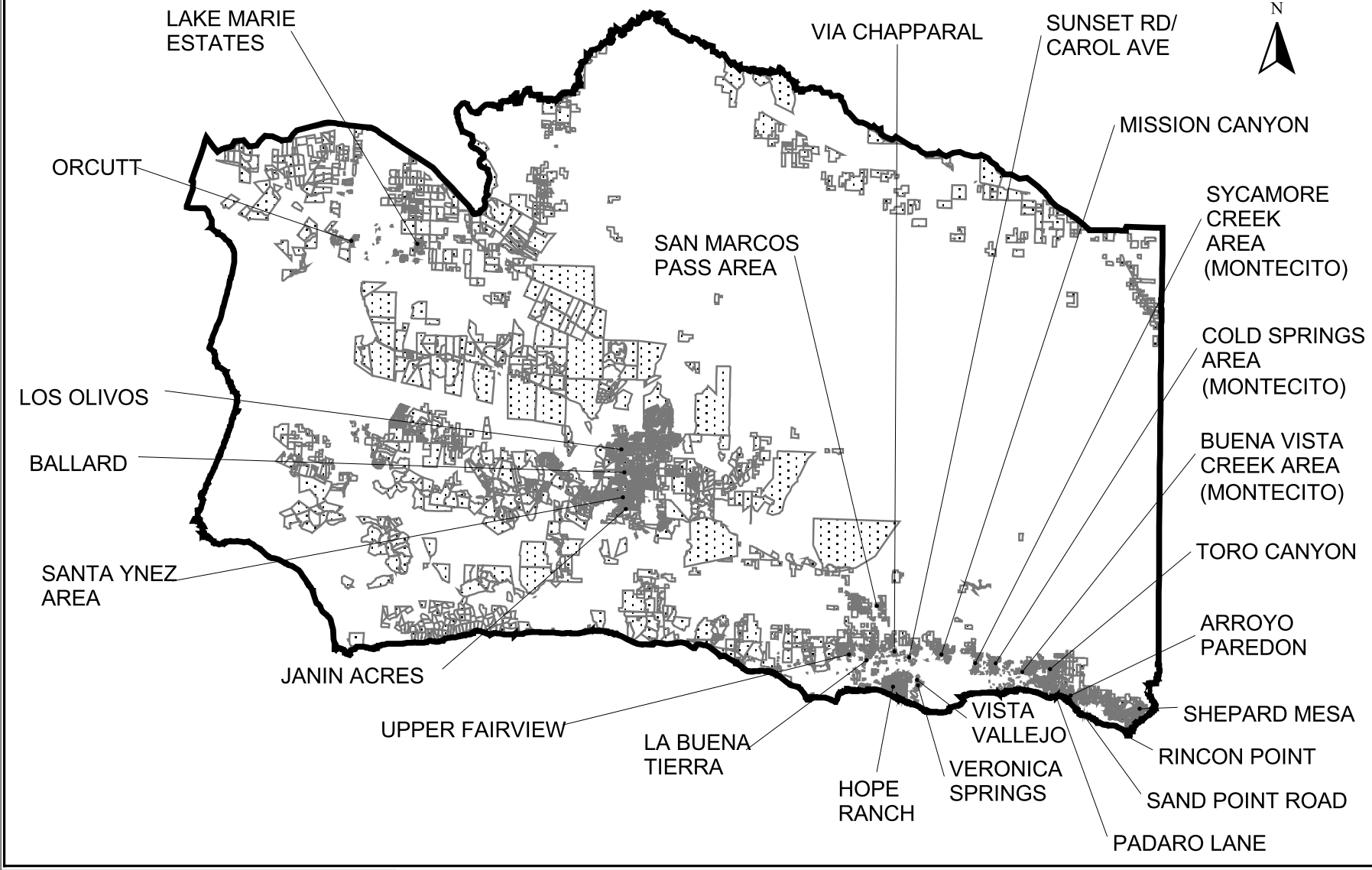
Leachlines are the preferred method of disposal; drywells are permissible only where the use of leachlines is infeasible. Hollow "seepage pits" have been prohibited since 1999. There are only a small number of "alternative" systems (less than 10) in the County; these are systems that provide additional treatment (beyond the septic tank) or different methods of disposal (e.g. mounds, or pressure-dosing leachfields) designed to overcome specific soil or groundwater constraints.

Standard criteria in County regulations follow the Basin Plan guidelines, and address such factors as (a) soil characteristics and depth; (b) percolation rates; (c) vertical separation to groundwater; (d) maximum ground slope; (e) setback distances to wells and water features; (f) system sizing; and (g) reserve area for future drainfield replacement/expansion.

**Septic System Usage in Santa Barbara County**

***GIS Mapping.*** In early 2000, Santa Barbara County undertook a project using Geographic Information System (GIS) analysis to begin the process of locating, characterizing and tracking the septic systems in the unincorporated area of the County. The study determined that there are an estimated 8,749 properties in unincorporated areas served by septic systems, plus an additional 581 parcels within sewer districts that also have septic systems, despite the availability of sewers. The Health Department has used this work as a springboard to begin the "hard file" conversion of years of septic system permit history into the Department's permit software program and the GIS database. The Septic System Sanitary Survey helped advance this effort and also was able to take advantage of some of the first "batches" of information converted to the GIS database system.

***Identification of Focus Areas.*** The GIS mapping information shows that septic system usage in Santa Barbara County includes a large number of systems scattered widely throughout the County, with heavy concentrations around the main population areas of the South Coast and the Santa Ynez Valley and, to lesser extent, the Orcutt and Santa Maria areas (see **Figure 2-1**). Under the Septic System Sanitary Survey, the GIS mapping data, along with reconnaissance field surveys and other information, was used to help identify 24 "Focus Areas", which encompass the heaviest concentrations of septic systems and the areas of potentially greatest concern from a public health and water quality perspective. The Focus Areas encompass defined neighborhoods or geographical areas warranting special attention; they also provide the basis for presenting the full range of conditions and problems that need to be addressed in regard to septic system usage in the County. These location of the Focus Areas are indicated in **Figure 2-1** and described in **Table 2-1**. They encompass about 4,300 septic systems, or approximately 45% of the total number of systems in the County. They include roughly 2,850 parcels in the South Coast and about 1,450 parcels in the Santa Ynez Valley and North County. The largest numbers of systems covered in the list are in Hope Ranch, Montecito Area, Santa Ynez and Los Olivos. The smallest Focus Areas identified are Rincon Point several small subdivisions in the Goleta foothills area and near Orcutt.

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SEPTIC SYSTEM USAGE AND FOCUS AREAS
SANTA BARBARA COUNTY
SEPTIC SYSTEM SANITARY SURVEY

FIGURE
2-1

**TABLE 2-1**
**FOCUS AREA DESCRIPTION**

| Focus Area | Area (Acres) | Number of Septic Systems | Description |
|---|---|---|---|
| **CARPINTERIA AREA** | | | |
| **Rincon Point** | 10 | 36 | Beachfront development area at Santa Barbara-Ventura County line; high groundwater conditions, small lots abutting Rincon Creek and ocean. Nearshore ocean waters listed as 303(d) impaired water body for pathogens; prior water quality studies Lower Rincon Creek Watershed Study (DNA study) and South Coast Characterization Study. Sewer study in progress. |
| **Shepard Mesa** | 448 | 119 | Special Problem Area; large-lot rural residential area; Rincon Creek and Carpinteria Creek watershed |
| **Arroyo Paredon** | 303 | 84 | Semi-rural area near Carpinteria in area of orchards and greenhouses near Foothill Road. Drains via Arroyo Paredon Creek to ocean at Serena area. |
| **Sand Point Rd** | 85 | 70 | Beachfront area between Carpinteria Marsh and Pacific Ocean along Sand Point Road and Avenue Del Mar; small lots on dune sands with high groundwater conditions; preliminary sewer feasibility study completed by Carpinteria Sanitary District. |
| **Padaro Lane** | 47 | 53 | Beachside area east of Loon Point (Summerland); many beachfront lots on dune sands with high groundwater conditions; preliminary sewer feasibility study completed by Carpinteria Sanitary District. |
| **Toro Canyon** | 1,058 | 297 | Toro Canyon Plan Area; medium to large lot rural residential area; difficult soil and topographic constraints and close proximity to East and West Toro Creek. Special septic system requirements adopted for area in Toro Canyon Plan. |
| **MONTECITO AREA** | | | |
| **Buena Vista Creek Area** | 544 | 340 | Large semi-rural residential area located above E. Valley Road in Romero Creek and Buena Vista Creek drainage basins. Very high density of septic systems on small lots in vicinity of Orchard Avenue and Tabor Lane; difficult terrain and soil conditions in higher elevations; located in Montecito Sanitary District. |
| **Cold Springs Area** | 379 | 141 | Semi-rural residential area located above E. Valley Road in Cold Springs-Montecito Creek drainage basins. Difficult terrain and soil conditions in higher elevations; located in Montecito Sanitary District. |
| **Sycamore Creek Area** | 340 | 175 | Semi-rural residential area located above Sycamore Canyon Road adjacent to Santa Barbara; medium to large lots; difficult terrain and soil conditions in higher elevations; creek encroachment-setback problems; located in Montecito Sanitary District. |
| **SANTA BARBARA AREA** | | | |
| **Mission Canyon** | 485 | 253 | Special Problem Area; large semi-rural residential area adjacent to Santa Barbara in generally steep terrain with difficult soil and geologic conditions for septic systems; several alternative septic system designs (evapotranspiration systems) used to overcome constraints; drains to Mission Creek through Botanical Gardens, which is listed as 3030(d) impaired water body for pathogens; prior water quality sampling data from South Coast Characterization Study and Project Clean Water. |
| **Vista Vallejo** | 12 | 49 | Pocket of small residential lots surrounded by Santa Barbara urban area near Santa Barbara Golf Club; many old septic systems 40+ years old; located in Arroyo Burro Creek watershed. |
| **Veronica Springs** | 82 | 77 | Semi-rural residential area on hilly terrain near mouth of Arroyo Burro Creek; some parcels border tributary stream; variable to difficult soil and geologic conditions for septic systems; Arroyo Burro Creek listed as 303(d) impaired water body for pathogens. |
| **Sunset St/Carol Av Area** | 25 | 84 | Pocket of small residential lots surrounded by Santa Barbara urban area near La Cumbre Road; many very small lots with limited septic system repair options; local water supply wells potentially at risk. |
| **Hope Ranch** | 1,947 | 809 | Medium to large-lot semi-rural residential community on rolling hills and coastal terraces west of Santa Barbara; drains via local tributary stream to ocean, Arroyo Burro Creek and Goleta area to west; mix of older and new homes with significant equestrian uses. |

**TABLE 2-1**
**FOCUS AREA DESCRIPTION**

| Focus Area | Area (Acres) | Number of Septic Systems | Description |
|---|---|---|---|
| **GOLETA AREA** | | | |
| **La Buena Tierra Area** | 31 | 27 | Small pocket of semi-rural residences at north edge of Goleta; drains through orchards and urban area to San Jose and Maria Ygnacio Creek; moderate to good conditions for septic systems. |
| **Via Chapparal/La Paloma Ave** | 102 | 59 | Rural residential area in foothills north of Goleta near Highway 154; rolling hills with numerous small seasonal drainage channels; moderate to difficult conditions for septic systems. |
| **Upper Fairview Area** | 397 | 97 | Rolling foothills and creekside area at north edge of Goleta on Vegas Creek; includes Holliday Hills subdivision and La Goleta Road area. Moderate to poor soil and geologic conditions for septic systems; includes some multi-family residential properties and commercial business (Infogenesis). This area is characterized by shallow perched groundwater and very poor percolation. |
| **Painted Cave Area** | 44 | 78 | Small parcels located in steep, rugged terrain near Painted Cave area and San Marcos Trout Club; older systems for homes built on National Forest; very poor/difficult conditions for septic systems. |
| **SOUTH COUNTY TOTAL** | | **2,848** | |
| **SANTA YNEZ AREA** | | | |
| **Los Olivos** | 280 | 343 | Special Problem Area; large number of small to very small lots in densely developed septic town setting; shallow groundwater in large portions of town; drywells discharge directly to water table; groundwater nitrate impacts documented; recommended for wastewater management plan by Regional Water Quality Control Board; prior septic tank maintenance study; dissected by Alamo Pintado Creek, tributary to Santa Ynez River. |
| **Ballard** | 173 | 129 | Special Problem Area; medium to large-lot rural town; medium to high density of septic systems; fair to good conditions for septic systems; many older developed properties with possible code compliance problems; adjacent to Alamo Pintado Creek, tributary to Santa Ynez River. Flood control improvements completed at the northeast end of the village alleviated shallow groundwater issues. |
| **Santa Ynez Area** | 1,610 | 669 | Large number and density of semi-rural and rural residential development on east side of Santa Ynez; soil conditions range from good to very poor due to undulating topography and high (perched) groundwater conditions caused by deposition from old stream meanders. |
| **Janin Acres** | 207 | 98 | Special Problem Area; rural residential subdivision and some commercial properties, located between Santa Ynez and Solvang; shallow restrictive soils favoring deep trenches and drywells have apparently led to elevated nitrate levels in groundwater/local water supply wells (Rancho Marcelino Water Company). |
| **NORTH COUNTY** | | | |
| **Lake Marie Estates** | 134 | 181 | Large semi-rural subdivision located east of Orcutt; relatively small lots in fair to good soil conditions; many older systems and some localized problems due to restrictive (slowly permeable) subsoils. |
| **Orcutt** | 98 | 38 | Large rural residential lots located west of Orcutt; fair to good soil conditions; older systems and possible localized problems due to restrictive (slowly permeable) subsoils. |
| **NORTH COUNTY TOTAL** | | **1,458** | |
| **GRAND TOTAL** | | **4,306** | |

## SEPTIC SYSTEM INFORMATION SURVEYS

A major part of the Septic System Sanitary Survey was devoted to researching, compiling and reviewing existing information from a variety of sources, including: (a) prior septic system surveys; (b) personal experience and permit and complaint files maintained by the County Health Department and the Regional Water Board; (c) Septic Tank Inspection reports; (d) personal knowledge and experience of septic tank contractors and consultants; and (e) individual homeowners. This information forms a large part of the basis for assessing the status of septic system practices in the County.

### Prior Studies

The only significant prior septic system surveys in Santa Barbara County were conducted in the Santa Ynez area. In 1975 the County completed a door-to-door survey in Los Olivos. The septic systems were found to be functioning satisfactorily, but most of the systems were determined to be discharging directly to groundwater during certain times of the year. In 1995 a Septic Tank Maintenance District Study was completed for the Santa Ynez area. This involved review of current practices and problems and an assessment of the feasibility of establishing a maintenance program to address the problems. No action has been taken to implement the conclusions and recommendations of the study.

### County Records

***Permit Files.*** One of the main sources of septic system information are County permit files. Since 1991 septic system permit files have been maintained by the Public Health Department, in the Main Office (Santa Barbara) and North County Office (Santa Maria). Before that septic system permitting was the responsibility of the Building Department. Building Department septic system records are scattered and sketchy, and were not researched and compiled as part of this Study. It is estimated that there is permit information on file with the Health Department for about 25 to 30% of the septic systems in the County.

As part of the Sanitary Survey, an extensive review of permit files was completed. The file information was assembled in an excel spreadsheet, which was then incorporated into the GIS database for use along with the 800 to 900 electronic permit files already compiled by the Health Department staff. At the conclusion of the search, approximately 2,500 permit files were added to the County's permit database. From these data it was determined that permits issued over the past 10 years included 376 new construction, 173 modifications, 607 repairs, 251 abandonment, and 288 certification of existing systems. In terms of system types, the data show an almost even, 50-50 split between leachline and drywell designs.

***Complaint Files.*** The Health Department maintains records of complaints that are received in regard to various public health or sanitation matters. Septic system surfacing and nuisance odor problems are a common complaint issue. As part of the Sanitary

Survey individual complaint files were reviewed, concentrating mainly on information for the various defined Focus Areas. Complaint information was entered into excel spreadsheets, and made available for integration into the GIS database. During the period of 1993 through 2001, there were a total of 88 septic system-related complaints in the 24 Focus Areas examined in this Study. Of the complaints filed, approximately one-third were confirmed as a problem that the Health Department was able to trace to a malfunctioning septic system or greywater discharge. The Focus Areas recording the greatest number of complaints (six or more) were Hope Ranch, Mission Canyon, Sunset/Carol Avenue Area (Santa Barbara), Toro Canyon and Veronica Springs. The greatest numbers of confirmed problems (three or more) were the Sunset/Carol Avenue Area, Painted Cave Area, and Santa Ynez.

**Septic Tank Inspection Reports**

Septic tank inspection reports provided significant information for the Sanitary Survey. As part of this Sanitary Survey, data from the first three years of Septic Tank Inspection Reports were compiled and reviewed. Concurrent with the Sanitary Survey, the Health Department staff converted the hard copy Inspection Reports into an electronic format linked to the GIS database. The data reviewed included inspections for a total of 1,820 parcels, completed through December 2001.

Overall, the Inspection Reports for the first three years of this mandatory inspection program revealed 75 dry well/seepage pit failures, 59 leachline failures, and 223 additional unspecified failures. Failures are defined as those systems noted in the inspection reports as: (a) failed disposal field with discharge to surface; (b) disposal field not absorbing septic effluent; or (c) discharge of groundwater to surface/drainage (possible failure). This amounts to a total of 357 system failures that were identified in a 3-year period (roughly 120 per year) and have been (or will be) addressed with appropriate corrective action. These represent significant septic system problems that may have not been identified and addressed, were it not for the County's mandatory inspection and reporting program. Additionally, the Inspection Reports show that several hundred maintenance issues were identified and corrected through the septic system evaluations.

Inspection data for the various Focus Areas showed the following:

1. **Inspection Rate.** Overall, about 25% of the septic systems in these Focus Areas were serviced during the first three years of the Inspection Reporting Program. The areas having the greatest inspection activity, as a percentage of the number of systems, were Padaro Lane, Hope Ranch, Veronica Springs, Buena Vista Creek, Cold Springs, Sycamore Creek, Mission Creek, Upper Fairview and Toro Canyon. In these areas, the rate of inspection ranged from 25 to 33%. The areas with the lowest rate of inspection (less than 15% of the systems) were Painted Cave, Lake Marie Estates and Orcutt area.

2. **Maintenance Rate**. Overall, system maintenance work was required on approximately 5.3 % of the systems in these Focus Areas during the 3-year reporting period. The areas reporting the greatest maintenance activity, as a percentage of total systems, were Sand Point Road, Hope Ranch, Rincon Point, Sycamore Creek and Mission Canyon. As a percentage of inspections performed, the greatest amount of required maintenance was reported to be in Rincon Point, Sand Point Road, Ballard, Santa Ynez, and Sunset/Carol Ave. Area.

3. **Failure Rate.** Overall, system failures were observed in about 4.3% of the total systems in these Focus Areas during this 3-year reporting period. The greatest number of failures were observed in Hope Ranch, Santa Ynez, Toro Canyon, Buena Vista Creek, Los Olivos and Sycamore Creek areas. As a percentage of the total systems in the area, Arroyo Paredon and Padaro Lane had the highest rate of failure (8%). The areas reporting the lowest number and rate of failures were Rincon Point, Orcutt area, Ballard, Painted Cave, and Mission Canyon.

**Contractor-Consultant Questionnaire Survey**

A questionnaire was developed and distributed to contractors and consultants that provide septic system services within Santa Barbara County to information, such as: (a) the types of septic system problems frequently encountered; (b) areas of concern; (c) problem ratings; (d) opinion on long term septic system management needs; and (e) comments or recommendations on standards, regulations, pumper inspection report requirements, monitoring needs, or any comments in general. Fourteen contactors/consultants responded to the survey.

In general the South Coast was given a medium overall problem rating. Specific focus areas that were assigned a high problem rating include Rincon Point, Padaro Lane, Sand Point Road, and Cold Springs area. Improved practices, which include routine system inspection, alternative design, community system, and sewers, were recommended for Rincon Point, Padaro Lane, Sand Point Road, Toro Canyon and Hope Ranch. In the North County, the overall problem rating was ranked as low to medium. Routine system inspections and allowing alternative designs were recommended for the Santa Ynez area. A minority of the respondents either had no opinion or felt the program is OK as is. Specific comments and recommendations received from contractors/consultants are listed in **Table 2-2**.

**Homeowner Questionnaire Survey**

A septic system questionnaire was developed and distributed to residents in the watershed areas that were selected for water quality sampling and for focused evaluation. In conjunction with the mail-out survey, five public meetings were held in the South Coast and North County areas during April 2002. The purpose of the questionnaire survey and meetings was three-fold: (1) to inform the residents in the study area about the Sanitary Survey and share some of the preliminary findings; (2) to allow homeowners to provide direct input to the Sanitary Survey regarding their own personal knowledge and

**TABLE 2-2**
**CONTRACTOR-CONSULTANT COMMENTS AND RECOMMENDATIONS**

■ Design Standards and Regulations

- ◊ Recycler Systems.
- ◊ Efforts to update ordinance is good.
- ◊ Encourage sewer connections.
- ◊ Recommend minimum depth under 4" perforated pipe to be no less than 36".
- ◊ Old systems are typically undersized
- ◊ Require grease traps where needed.
- ◊ Install diverter valve instead of distribution box
- ◊ Upgrade septic system, as needed, when house is remodeled.
- ◊ Seasonal saturation is a problem
- ◊ Old drywells are not gravel filled

■ Septic system pumper/inspection reporting requirements

- ◊ Enforce codes to repair or replace failed systems.
- ◊ Require mandatory pumping every 2-3 years.
- ◊ Drywells on pumper's maps should be checked for rock.
- ◊ Properly pumping the septic tank and making sure invert is properly installed in the tank would solve most leachfield failures.

■ Other monitoring/inspection needs

- ◊ Safety.
- ◊ Pumpers completing inspection reports must be knowledgeable in the installation and maintenance of the systems that they inspect.

■ Other

- ◊ Montecito, Hope Ranch, and Padaro Lanes are good candidates for sewer because of poor percolation rates and/or high groundwater makes sites unsuitable for septic systems.
- ◊ Poor design of the septic system is the rule rather than the exception.
- ◊ Mainly old septic systems experiencing failure.
- ◊ Eliminate use of septic systems.

experience with the septic system on their property; and (3) to provide a forum for discussion of septic system issues in general as a matter of public outreach and education. Out of approximately 3,860 questionnaire survey forms mailed to property owners, a total of 576 (15%) questionnaires were completed and returned by homeowners

Briefly, information obtained from the homeowner questionnaire survey included the following:

- **Type of Disposal System.** Approximately two-thirds indicated their system include leachlines for disposal; a little less than one-third reported dry wells/seepage pits.

- **Greywater Systems.** Approximately 7% reported having greywater systems.

- **Age of System**. About 16% indicated their system to be less than 10 years old, and nearly 60% stated that their system was more than 10 years old; the remainder indicated no knowledge of the system age.

- **Pumping of System**. About half of the people indicated they have their septic tank pumped out about once every 2 to 5 years, which is the normally recommended frequency. About the same number indicated less frequent pumping. Some (6%) indicated pumping once a year and, in Hope Ranch, about 2% reported more than one pumping per year, which is generally indicative of more frequent system problems.

- **Repairs.** Roughly 40% indicated that their septic system had been repaired at some point in time; and virtually all indicated that the repair was effective.

- **Problems Observed.** About 12% indicated that they had observed problems with their system, including: (a) slow drainage of plumbing fixtures and backup into the house; (b) wet areas and/or odors in the leachfield area; and (c) surfacing sewage (i.e., liquid on the ground surface). The predominant response for all problems was that the conditions occurred in response to heavy rainfall or for "unexplained reasons".

- **Other Homeowner Comments**. About 5% entered other comments on the survey form in the space provided. Most of the individual comments fell into three main categories: (1) expressing frustration with the operation of their septic system and urging the extension of sewers to their area; (2) emphasizing that septic systems can be effective as long as they are maintained properly; and (3) complaints about failures of neighboring septic systems.

## SURFACE WATER QUALITY IMPACTS

A major impetus for this Septic System Sanitary Survey was the chronic observation of high bacteriological readings in the ocean waters along the South Coast of Santa Barbara County. Discharges from septic systems located near the ocean or in the contributing watershed areas were identified as one possible source for these high readings. Various water quality sampling efforts have been conducted in the past, and there are other on-going studies and sampling programs that provide information on surface water quality conditions in Santa Barbara County. However, there have been no comprehensive water quality sampling studies directed specifically at septic system areas in the County. To address this "data gap", a surface water quality sampling effort was conducted as part of the Sanitary Survey. The purpose of the sampling program was to document the water quality conditions in surface streams in areas of the County where there are large concentrations of septic systems, to aid in assessing whether or not (and where) surface water contamination may be occurring as a result of existing septic system practices.

### Sampling Program

***Sampling Locations.*** Surface water sampling stations were selected to isolate, as much as possible, surface waters in areas having a relatively large number or heavy concentration of septic systems or where there have been historic problems or special concern regarding septic system usage. Initially, 53 sampling stations were identified for sampling on 20 different streams that flow through areas of the County served by septic systems. Approximately two-thirds of the sampling stations were on streams in the South Coast area, a few in the Orcutt area, and the remainder in the Santa Ynez area. Because of unusually low rainfall-runoff conditions during the period of the study, several of the proposed sampling stations were dry throughout the sampling period. Out of the original 53 identified sampling stations, only 33 had sufficient streamflow and were able to be sampled during the study.

***Water Quality Constituents***. The sampling program focused strictly on bacteriological impacts, which is the primary public health consideration relative to septic system practices and, generally, the best indicator of septic system influence. Each sample was analyzed for the following bacteria indicators: Total Coliform, *E. coli*, and Enterococcus.

***Sampling Period and Methods***. The water quality sampling was conducted over an approximate 14-week period in the winter and spring of 2002, starting the last week of January and extending into the first week of May. Six full sampling runs were conducted during the study period. The sampling program was designed to avoid sampling during rainfall-runoff periods, in order to avoid collection of stormwater runoff pollutants from other sources (e.g., animal wastes). There were no major storms during the sampling period; all samples were taken during what would be considered non-rainy periods.

**Summary of Sampling Results and Findings**

The results and findings from the sampling data can be summarized as follows:

1. A large percentage of the sample results were in excess of water contact recreation criteria for all bacteria indicator organisms; and this was common to most of the streams sampled.

2. Streams showing the lowest bacteriological readings and fewest incidents of exceedances included:
   - Romero Creek
   - Buena Vista Creek
   - Montecito Creek
   - Mission Creek
   - San Antonio Creek
   - Maria Ygnacio Creek
   - San Jose Creek

3. Streams showing the highest bacteriological readings and the most incidents of exceedances included:
   - Rincon Creek
   - Arroyo Paredon
   - East Toro Creek
   - West Toro Creek
   - Sycamore Creek
   - Arroyo Burro Tributary
   - Hope Ranch (unnamed creek)
   - Alamo Pintado Creek

4. The percentage of all values found to be in excess of bacteriological water quality objectives for each indicator organism were as follows:

| Parameter | Log Mean | Single Sample Maximum |
|---|---|---|
| Total Coliform | 91% | 35% |
| *E. coli* | 39% | 28% |
| Enterococcus | 73% | 53% |

5. The percentage of values exceeding the State Health Department standards and Basin Plan objectives for water contact recreation (28 to 91 percent) was similar to the findings from the 1999 South Coast Watershed Characterization Study, which reported exceedance percentages of 30 to 90 percent for the four streams investigated in that study.

## GROUNDWATER QUALITY IMPACTS

Standard criteria for siting and design are intended to prevent adverse impacts on groundwaters from onsite sewage disposal systems. The most important factors are the provision of sufficient depth of unsaturated soil below the leachfield (or drywell) where filtering and breakdown of wastewater constituents can take place. Without adequate separation distance to the water table, groundwater becomes vulnerable to contamination with pathogenic bacteria and viruses, as well as other wastewater constituents (e.g.,

nitrogen). Highly permeable soils (e.g., sands and gravels) also provide minimal treatment of the percolating wastewater and normally require greater separation distances to afford proper groundwater protection. Additionally, where there is a high concentration or density of septic systems in a given area (i.e., small lot sizes), groundwater can be degraded from the accumulation of nitrate, chloride and other salts that are not filtered or otherwise removed to a significant extent by percolation through the soil. Adverse effects on groundwater quality from septic systems can show up in the form of degraded or contaminated well water supplies, or potentially as subsurface seepage into streams, lakes, lagoons or ocean waters.

The Septic System Sanitary Survey for Santa Barbara County did not include any field investigation or testing of groundwater quality. Instead, a review was made of available groundwater quality information to help in identifying areas of existing or threatened impacts from onsite sewage disposal systems. The information was obtained from published reports, County and Regional Water Board studies, and monitoring data from selected water supply wells in the County. The findings are summarized below.

**Groundwater Basin Information**

Information from the Santa Barbara County Water Agency and the Central Coast Regional Water Quality Control Board indicates that groundwater quality is generally adequate for existing and potential uses in most of the groundwater basins in the County. However, the data indicate evidence of increasing nitrate levels in several of the major groundwater basins, namely, Santa Maria, Cuyama and Santa Ynez. The Regional Board has identified these groundwater basins for further investigation to determine the specific sources and develop appropriate measures to arrest, control or manage the nitrate problems. Agricultural operations are believed to be responsible for most of the observed increases in groundwater-nitrate concentrations. However, in the Santa Ynez Valley, the large concentrations of septic systems are also considered to be a contributing factor.

**Water System Information**

Review of groundwater data for small water system wells located in and around the defined Focus Areas show reasonably good groundwater quality, with respect to nitrate concentrations, for most of the systems. There are noticeably higher nitrate concentrations in several of the wells in the Santa Ynez and Los Olivos area, corresponding with findings of the Regional Board's groundwater-nitrate assessment study. None of the systems reported nitrate levels in excess of the drinking water limit of 45 mg/L; however, there were several showing results approaching the limit.

Groundwater quality data reported for small water systems in the South Coast area are generally lower in nitrate levels than in the Santa Ynez Valley, with the following exceptions.

***Veronica Springs – Vista Vallejo Area.*** The Las Positas Mutual Water Company has one inactive well (#1) that has shown a consistently high nitrate concentration, virtually

at the drinking water limit of 45 mg/L. This well draws its supply beginning at a depth of 75 feet and may be influenced by discharges from septic systems in the Veronica Springs area or, more likely, the Vista Vallejo area, which is located immediately to the north of the well.

***Sunset Road/Carol Avenue Area***. Nitrate data for the Amber Gardens and Lincolnwood Subdivision water wells in the Sunset Road/Carol Avenue area of Santa Barbara show an increasing trend in nitrate concentration over the past 20 years, with levels approaching the drinking water limit in recent years. Both wells are in relatively close proximity and downgradient of the "pocket" of septic systems in the Sunset Road/Carol Avenue area, where numerous drywells are used due to the relatively small lot sizes of these parcels. Based on the dense concentration of septic systems on relatively small lots so close by, there is a reasonable likelihood that the elevated nitrate concentrations in these wells is due mainly to septic system discharges.

**Local Problem Areas**

Two specific groundwater pollution problem areas have been documented in septic system areas in Santa Barbara County. These are Los Olivos and Janin Acres in the Santa Ynez Valley. The finding of elevated groundwater-nitrate problems in both of these areas was a significant factor in the Board of Supervisors' designation of these two areas as Special Problem Areas.

***Los Olivos***. In 1975 the Santa Barbara County Health Department conducted a door-to-door sanitary survey of residences and businesses in Los Olivos to assess the status of septic system conditions. The study revealed that about 60% of the properties were served by drywells that generally extend into permeable alluvial deposits and discharge directly to the groundwater during certain times of the year. A follow-up water quality sampling effort in 1977 showed conclusively that the high density of septic systems discharging into or immediately above the water table in Los Olivos is contributing to a significant increase locally in the groundwater-nitrate concentration. Some of the wells registered nitrate concentrations virtually at the drinking water limit of 45 mg/L.

***Janin Acres***. The Janin Acres subdivision, located between Solvang and Santa Ynez, was developed in the late 1960s and obtains its water supply from two local wells owned and operated by the Rancho Marcelino Water Company. Many of the parcels in the subdivision utilize deep trenches or drywells for onsite sewage disposal. Sampling of the Rancho Marcelino water wells over the past 40 years has indicated a significant increase in nitrate concentration that coincides with the development of the subdivision and the use of onsite sewage disposal systems in the area. The nitrate concentrations found in the wells has increased from less than 10 mg/l to over 50 mg/L (i.e., exceeding the drinking water limit) during this time period. The data show a strong correlation between groundwater quality degradation and the installation and use of septic systems in the Janin Acres subdivision and neighboring areas in Santa Ynez (to the north).

## PROBLEM ASSESSMENT

Using the data collected in the study, an overall problem assessment was made for each of the identified septic system Focus Areas. The purpose of this assessment was to define or rate the degree of the septic system problems in each of the Focus Areas related to environmental effects and provision of basic sanitation requirements. Septic system performance is affected by numerous factors that cannot be reduced to simple calculations; and evidence of system performance often changes over time and is not easily discerned from a one-time inspection or survey. Accordingly, the analysis incorporated a combination of factual (scientific) data, anecdotal information obtained from files, surveys and interviews, and professional judgment exercised by the project team based on many years of experience in this field. The results are intended to establish, as much as possible, an objective picture of the septic system operational and environmental conditions in each area to guide decisions on long-term management of these systems or, as necessary, their eventual replacement with more appropriate methods of sanitary waste treatment and disposal.

### Assessment Factors

The following assessment factors and rating system were used as the basis for judging the suitability and performance of septic systems in each Focus Area.

***Geology/Soils/Groundwater Constraints***. The basic physical suitability of an area for the use of onsite sewage disposal systems is dictated more than anything else by the geology, soils and groundwater conditions. For this factor, a "High" rating was assigned to areas where siting constraints were judged to be significant because of the geology, soils or known high groundwater conditions. A "Medium" rating was assigned where there was found to be evidence of probable or variable, site-specific constraints. A "Low" rating was assigned to areas where the conditions appear, from all available evidence, to be generally suitable for septic system use with few or no serious inherent geologic, soils or groundwater constraints.

***Lot Size and Density of Systems***. Generally, the larger the lot size, the greater the ability for septic systems to be located and operated safely and effectively. For this factor, a "High" rating was assigned to areas having a high percentage of lot sizes less than 0.5 acres. A "Medium" rating was assigned for areas with lot sizes predominantly 0.5 to 1.0 acre or larger; and a "Low" rating was assigned for areas with lot sizes generally greater than 1.0 acres.

***Total Number of Septic Systems***. The number of septic systems in a given area is important from the standpoint of judging the total population that may be exposed to public health hazards or nuisances from malfunctioning systems. For this factor, a "High" rating was assigned to areas having generally 100 or more properties served by septic systems. However, there were also a few areas with a relatively small number of systems ("pockets") surrounded by urban development on public sewers that were also assigned a "High" rating. In these few instances the potential impacts on the surrounding

(urban area) population were taken into account. A "Medium" rating was assigned generally for areas with 50 to 100 septic systems; and a "Low" rating was assigned to areas with about 50 or fewer septic systems.

***Type and Age of Systems***. This factor was included to give consideration to the age of the septic systems, which are an indicator of the likely technology and design standards in use, which, in turn, can be a reflection on the probable compliance with current codes and industry standards. For this factor, a "High" rating was assigned to virtually all Focus Areas. The only areas receiving a "Medium" rating were those judged to have reasonably suitable soil/site conditions in areas well removed from surface waters and groundwater impact areas. The basis for this distinction was that the potential for finding code compliance problems or system failure problems in these areas is less, despite the system age. No areas were believed to warrant a "Low" rating with respect to system type and age.

***Survey Information***. This factor provided for the consideration of a wide variety of background information and input regarding the general condition, suitability and performance of septic systems in each area as reflected in the information surveys and inspection data. Considerable professional judgment was used to interpret and apply the survey information. In general, the information was reviewed to look for an indication of chronic or repeated problems and other comments indicative of the level of septic system problems or concerns in each area. Based on this review, each area was rated, qualitatively, as "High", "Medium" or "Low", depending on the preponderance of the evidence available.

***Proximity/Threat to Surface Water Uses***. Avoiding impacts to coastal waters as well as streams, lakes and lagoons are an important aspect of septic system use and management. This is affected by largely by proximity to surface waters and the nature or uses of the waters. For this factor, a "High" rating was assigned where septic systems immediately adjoin coastal waters, perennial streams or other significant seasonal watercourses. A "Medium" rating was assigned where the watercourses in the area were judged to be primarily seasonal in nature. A "Low" rating was assigned where there were few if any identifiable watercourses judged to be at risk of impact from septic systems in the area.

***Proximity/Threat to Groundwater Uses***. Properly sited and operated septic systems can generally be relied upon to provide suitable protection to groundwaters. However, older and deep drywell systems as well as high concentrations of septic systems may contribute pollutants directly to the water table without sufficient opportunity for soil absorption or dispersion. For this factor a "High" rating was assigned to areas overlying major groundwater basins of the County. A "Medium" rating was assigned where only portions of the Focus Area overly a groundwater basin. A "Low" rating was assigned where the area is located outside any active or known groundwater basins, such as in the upper foothill areas north of Goleta or immediately along the coast.

***Evidence of Water Quality Impact***. Impacts on both surface water quality and groundwater quality were a major impetus for the funding and authorization of this Septic

System Sanitary Survey. The results from the surface water bacteriological sampling program conducted as part of this study, as well as results from other prior water quality investigations, were considered in judging each area. Generally, where water quality impacts have been documented which have caused or threaten to cause exceedance of water quality criteria (i.e., standards), a "High" rating was assigned. A "Medium" rating was assigned where water quality results are suggestive of a possible impact from septic systems; and a "Low" rating was assigned where, to date, there is little or no existing or prior evidence of water quality impact that would implicate septic systems in the area.

### Summary of Results

**Table 2-3** displays, in summary form, the results of the problem assessment of each of the 24 Septic System Focus Areas according to the various factors adopted for the analysis. In the far right-hand column an overall rating for the area is suggested based on collective consideration of the various individual factors.

## MANAGEMENT RECOMMENDATIONS

A series of recommendations were formulated and to address septic system problems in Santa Barbara County identified through this Sanitary Survey. Recommendations include various general management measures that can be implemented by the County Environmental Health Services to address certain types of problems or situations, as well as more specific measures applicable to the individual Focus Areas examined in the study.

### General Recommendations

Based partly on the results of this Sanitary Survey and partly on a broader overview of current practices, the following general recommendations are made to improve overall management of septic systems in Santa Barbara County.

***Water Quality Monitoring.*** The water quality monitoring program developed and conducted during this Sanitary Survey should be continued. A regular sampling program is warranted to maintain a minimum baseline level of water quality information in areas of special concern, to track any trends that may arise, and generally help to recognize problems and assist in ongoing assessment of the overall effectiveness of septic systems in the County.

***Septic System Information Review***. A periodic review and evaluation of septic system information compiled in the County's permit and GIS database system should be made. As inspection data continues to become available, review and analysis of the data will help to identify developing problems before they become severe and give guidance on changes in policies, practices or other measures as they become needed.

**TABLE 2-3**
**SEPTIC SYSTEM PROBLEM ASSESSMENT SUMMARY**

| FOCUS AREA | GEOLOGY/ SOILS/ GROUNDWATER CONSTRAINTS | LOT SIZES/ DENSITY OF SYSTEMS | TOTAL # OF SYSTEMS | SYSTEM TYPE AND AGE | SURVEY FINDINGS | PROXIMITY/ THREAT TO SURFACE WATER USES | PROXIMITY/ THREAT TO GROUNDWATER USES | EVIDENCE OF WATER QUALITY IMPACT | OVERALL PROBLEM RATING |
|---|---|---|---|---|---|---|---|---|---|
| **Rincon** | H | H | M | H | H | H | L | H | **HIGH** |
| **Shepard Mesa** | L | M | M | M | L | L | L | L | **LOW/MEDIUM** |
| **Arroyo Paredon** | L - M | M | M | M | M - H | M - H | M | M - H | **MEDIUM/HIGH** |
| **Padaro Lane** | M - H | H | M | M | M - H | H | L | L* | **MEDIUM/HIGH** |
| **Sand Point** | H | H | M | H | H | H | L | L* | **HIGH** |
| **Toro Canyon** | M | M | H | M - H | M - H | M | H | H | **MEDIUM/HIGH** |
| **Buena Vista Creek (Montecito)** | M | H | H | H | M - H | M | M - H | L* | **MEDIUM/HIGH** |
| **Cold Springs (Montecito)** | M | M | M | H | M | M | M - H | L | **MEDIUM** |
| **Sycamore Creek (Montecito)** | M | M | M - H | H | M - H | M | M - H | M | **MEDIUM/HIGH** |
| **Mission Canyon** | M - H | M - H | H | H | M | H | M | L | **MEDIUM/ HIGH** |
| **Hope Ranch** | M | L | H | M - H | H | M | L | M | **MEDIUM/HIGH** |
| **Veronica Springs** | M | M | M | H | M | H | H | M | **MEDIUM/HIGH** |
| **Sunset/Carol** | L | H | M - H | H | H | M | H | H | **HIGH** |
| **Vista Vallejo** | L | H | M | H | M | H | H | H | **MEDIUM/HIGH** |
| **Upper Fairview** | M - H | L | L - M | M | M | M | L - M | L* | **MEDIUM** |
| **La Buena Tierra** | L | M | L | M | L | L - M | L - M | L* | **LOW** |
| **Via Chaparral** | M | M | L | M - H | M | L - M | L - M | L* | **LOW/MEDIUM** |
| **Painted Cave Area** | M - H | H | L | H | M | M | M | L* | **MEDIUM/HIGH** |
| **Los Olivos** | M | H | H | H | M - H | H | H | H | **HIGH** |
| **Ballard** | M | H | M | M - H | M | H | M | M - H | **MEDIUM/HIGH** |
| **Santa Ynez Area** | M - H | M | H | H | H | M - H | M - H | M - H | **HIGH** |
| **Janin Acres** | M | M | M | H | M | M | H | H | **HIGH** |
| **Lake Marie Estates** | L - M | M | M | M | L | L | M | L* | **LOW/MEDIUM** |
| **Orcutt** | L | L | L | M | L | L | M | L | **LOW** |

*L = LOW; M = MEDIUM; H = HIGH*
** No sampling Data*

***Education and Training.*** Measures should be taken to provide or encourage training and education of septic system installers and pumping contractors. As regulations change and different technologies come into more common use, continuing education and training is needed to assure consistent understanding and application of practices and overall better performance and quality of onsite systems.

***Operating Permits.*** The County Wastewater Ordinance should be amended to provide a mechanism for the issuance of operating permits for systems employing alternative or enhanced treatment and disposal technologies, or for other special circumstances. Alternative technologies require a higher level of maintenance oversight which would be facilitated by the use of operating permits, requiring that routine inspection and reporting is carried out to assure that system components are checked and remain functional.

***Drywell Design Requirements.*** The County regulations for drywells should be revised to require the installation of dual (200%) capacity fields in all new installations, and enhanced treatment systems in problematic or sensitive locations. Drywells, while a necessary option in many instances in the County, are an inferior method of onsite sewage disposal. This is because they rely primarily on physical filtering and dispersal of wastewater constituents at depths and in geologic materials that typically lack the aerobic/biological activity which predominates in the near surface soil environment and helps to sustain the long-term functioning of leachline systems. Their useful life and effectiveness can be improved through the installation of redundant (200%) systems and a higher level of pre-treatment to compensate for the lack of favorable "soil" treatment processes at the deep depths where sewage effluent is released to the environment.

**Focus Area Recommendations**

Specific management recommendations for the various Focus Areas examined in the Sanitary Survey fall into several categories, ranging from case-by-case management of individual septic systems (i.e., status quo) to public sewer conversion projects as follows.

***Case-by-Case System Management.*** This reflects the current management program for septic systems in the County, where permitting of new systems, repairs and upgrades to existing systems, and response to complaints are dealt with on a system-by-system or "case-by-case" basis. This is an appropriate level of management for the majority of the County, including the following Focus Areas examined in this study:

- Shepard Mesa
- La Buena Tierra
- Lake Marie Estates
- Upper Fairview
- Via Chaparral
- Orcutt Area

***Mandatory Inspection-Upgrade Program.*** A mandatory inspection and upgrade program is recommended for several areas of the County due to the age and density of septic systems, difficult site conditions, general lack of information about the sewage disposal practices and actual evidence of or potential threat to public health and water quality. The aim would be to require an inspection and servicing of each septic system

similar to that performed under the existing Septic Tank Inspection requirements. Areas where this is recommended are as follows and encompass approximately 800 total septic systems:

- Arroyo Paredon
- Cold Springs
- Veronica Springs
- Buena Vista Creek
- Sycamore Creek
- Painted Cave

***Onsite Wastewater Management Plan.*** Development and implementation of an onsite Wastewater Management Plan is recommended for certain areas of the County where soil-geologic conditions are reasonably suitable for continued use of septic systems for significant portions of the area, but where other factors (e.g., total number of systems, localized problems, age of systems, water quality threats) dictate that special management efforts be made to improve and maintain long-term effectiveness of onsite wastewater systems and avoid serious environmental problems. In essence an Onsite Wastewater Management Plan is a customized septic system plan for a specific area that could include, for example, a mix of different types of septic system designs, sewerage of certain areas, and special maintenance activities. Areas where this is recommended include:

- Toro Canyon
- Hope Ranch
- Santa Ynez
- Mission Canyon
- Ballard

Extension of sewers to portions of Santa Ynez and Mission Canyon should be considered where feasible.

***Public Sewerage.*** Conversion from septic systems to public sewers is recommended for several Focus Areas where significant problems or threat to public health have been identified in this study and where public sewers are reasonably available and represent the probable best long-term wastewater management approach for the area. The areas warranting consideration for conversion to public sewers include:

- Rincon Point
- Padaro Lane
- Vista Vallejo
- Janin Acres
- Sand Point Road
- Sunset Rd/Carol Ave
- Santa Ynez (selected areas)

***Community Wastewater Facility.*** It is recommended that feasibility and environmental studies be undertaken to develop and implement a community wastewater facility for the town of Los Olivos. The need for a community wastewater solution in Los Olivos stems from the very high density of development in the town, combined with the inherent soil and groundwater conditions that force homeowners and businesses to utilize drywell systems that discharge directly into the groundwater strata in the area. The study of alternatives for the town can and should consider various service area configurations, the possibility of maintaining septic systems in limited areas of town, the possibility of a

joint community facility with Ballard, an interceptor sewer connection to the City of Solvang, and various locations and technologies for a community wastewater treatment and disposal facility.

# SECTION 3

# GEOLOGY, SOILS, AND WATER RESOURCES OF SANTA BARBARA COUNTY

This section presents an overview of the geology, soils and groundwater resources of Santa Barbara County. This information provides an important starting point to help understand the basic physical environmental factors that influence the suitability, constraints, and potential impacts associated with septic systems usage in different parts of the county.

## GEOLOGY

The geology of Santa Barbara County is related to the tectonic and depositional history of the area. The San Andreas Fault crosses the region as close as 4 miles northeast from the northeast corner of the county. Other subsidiary faults including active (surface fault rupture within the last 11,000 years), potentially active (surface fault rupture within the last 1.6 million years) and inactive (no surface rupture within the last 1.6 million years) faults occur within the limits of the county.

Topographic trends mimic the structural alignment of these faults. The northeast portion of the county is mountainous with a northeast to southwest structural trend paralleling the San Andreas Fault. The southeast and south coast portions of the county have a structural trend of east-west which includes the Santa Ynez Mountains, and parallel to faults such as the Big Pine fault, Pine Mountain fault, the Santa Ynez fault and the offshore Santa Barbara Basin and Channel. The western coast and adjacent low-lying valleys and hills in the north-central region have structural trends that reflect both of the dominant structural regimes, with faults, valleys and hills trending west-northwest to east-southeast, for the most part. The geology of the county is controlled by the structural trends as described above.

### South Coast Region

The South Cost Region is characterized by a folded stratigraphic sequence, which includes the Santa Barbara Monterey, Rincon, Vaqueros and Sespe formations. These formations and the more recent Quaternary alluvium support the majority of the development on the South Coast. The sequence from the south includes the Santa Barbara, Monterey, Rincon, Vaqueros, Sespe, Alegria, Gaviota, Sacate, Cozy Dell, Matilija, Jalama, Espada and Franciscan Formations. Quaternary alluvial deposits are present along the coast and in stream valleys and include alluvium and alluvial fan deposits of silt, sand and gravel, and boulder-cobble fanglomerate and conglomerate.

Bedrock types include shale, siliceous shale, siltstone, and sandstone. Soils associated with these bedrock types range from moderately well drained sands to very poorly

drained clays, depending upon the nature of the parent bedrock material and the reworking during sediment deposition. The younger surficial sediments and overlying soils tend to have low to moderate permeability. Older alluvial deposits and overlying soil generally have low permeability. Most of the bedrock of the area has low permeability and low percolation rates. Shale, mudstone, and claystone have very low permeability. Bedrock formations posing the most difficult constraints for septic systems include the Rincon, Monterey and Sespe formations due to very low or highly variable permeability. Surficial alluvial deposits and soils, which have a high proportion of materials derived from these units, may also exhibit poor wastewater disposal capability. Surficial sedimentary deposits are generally favorable for septic system, but may have constraints locally due to excessively fast percolation rates, steep slopes, drainage, flooding, and high groundwater conditions.

**West Coast and North-Central Region**

The North-Central Region is characterized by east-west trending alluvial filled valleys separated by hills of exposed bedrock. The older Tertiary bedrock units include the Monterey, Sisquoc, Careaga, Foxen and Paso Robles formations. The geologic units that comprise surficial deposits in the valleys include the Orcutt Formation (primarily ancient sand dune deposits), older and recent alluvium.

The younger surficial deposits are generally suitable for wastewater disposal. However, locally high clay content or high groundwater conditions may preclude the use of septic systems. Of the older units, the Paso Robles and Careaga formations are generally suitable for wastewater disposal. The Monterey, Sisquoc and Foxen formations are commonly seriously constrained for wastewater disposal due to poor permeability.

**Northeastern Region**

The northeastern portion of the county consists of the San Rafael and Sierra Madre Mountains. This part of the county is very sparsely developed, with very few septic systems. The San Rafael Mountains are dominated by a sequence of folded Tertiary and Cretaceous (65 to 140-millions old) age sedimentary deposits. Rock types include sandstone, siltstone and conglomerate. Limestone (Sierra Blanca Limestone), shale and claystone (Monterey Shale) are also present locally. Quaternary stream deposits consisting of silt, sand and gravel are present in the narrow creek and river valleys of the region. Soils derived from the fine-grained bedrock such as shale and claystone are poorly drained and the majority of soils which are derived from the coarser grained bedrock are well drained.

The geology of the Sierra Madre Mountains is also dominated by Tertiary age sedimentary rock formations. These formations include the rock types such as sandstone, siltstone, claystone and shale.

**Table 3-1** presents a summary of the major geologic formations within Santa Barbara County and the associated rock types and properties. Formations of most importance

TABLE 3-1
SUMMARY OF THE MAJOR GEOLOGICAL FORMATIONS OF SANTA BARBARA COUNTY

| Formation | Deposition | Age | Description | Characteristics |
|---|---|---|---|---|
| **Surficial Sediments** | Non-Marine | Holocene | Stream Channel Deposits, valley and floodplain alluvium, dune sand, beach sand, landslide debris, and colluvium | Low to moderate permeability. |
| **Older Dissected Surficial Sediments** | Non-Marine | Holocene - Pleistocene | Remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel | Low permeability. |
| **Casitas Formation** | Non-Marine | Pleistocene | Weakly consolidated alluvial deposits of cobble-boulder gravel, sand and clay | Moderate to high permeability. Occurs near Rincon Creek and west of Loon Point. |
| **Orcutt Sand** | Non-Marine | Pleistocene | Unconsolidated wind-deposited sand, pebbly at base | Moderate to high permeability. Occurs only in the Orcutt area, Lompoc Valley and eastern Santa Maria Valley. Includes clay layers that may cause perched groundwater conditions. |
| **Santa Barbara Formation** | Shallow Marine | Plio-Pleistocene | Fossiliferous sand and silt, massive to bedded, poorly consolidated | Low permeability. Occurs in the Santa Barbara area. |
| **Paso Robles Formation** | Non-Marine | Plio-Pleistocene | Alluvial conglomerate, sandstone and claystone, weakly consolidated | Generally low to moderate permeability. |
| **Careaga Sandstone** | Shallow marine, regressive | Late Pliocene | Friable sandstone, massive grayish-yellow locally pebbly, fossiliferous calcareous reef at base | Moderate to high permeability. Primarily occurs north of the Santa Ynez River. |
| **Foxen Mudstone** | Marine | Pliocene | Massive claystone and mudstone | Very low infiltration rates |
| **Sisquoc Shale** | Marine | Late Miocene | Clay shale and diatomaceous shale along the south coast, and diatomite north of the Santa Ynez fault | Low infiltration rates. Overlying soils have low permeability. |
| **Tequepis Sandstone** | Marine | Late Miocene | Fine grained tuffaceous sandstone, occurs north of the Santa Ynez fault | Occurs in exposures north of Lake Cachuma. Unknown permeability. |
| **Monterey Shale** | Marine | Early to late Miocene | Siliceous cherty shale, laminated diatomite, and semi-siliceous shale, and dolomite (carbonate) unit at the base | Soils derived from these rock have low permeability. The bedrock can be massive to thinly bedded and generally has very low permeability. |
| **Tranquillon Volcanic Formation** | Non-Marine | Early Miocene | Black basaltic breccia or brown tuff breccia and bentonitic sandstone with minor algal limestone | Overlying soil has low permeability. Low infiltration rates are expected for this unit. |
| **Rincon Shale** | Marine | Late Miocene | Poorly bedded gray clay shale or claystone | This unit has very low infiltration rates. Overlying soil has low permeability. |
| **Vaqueros Sandstone** | Shallow marine, regressive | Early Miocene-Oligocene | North of the Santa Ynez fault, the formation is a greenish-tan sandstone and interbedded massive siltstone. In other areas, it is dominated by sandstone and pebble conglomerate composed mostly of Franciscan detritus | Consolidated and locally cemented. Fossiliferous marine sandstone. Generally moderate permeability. |

TABLE 3-1
SUMMARY OF THE MAJOR GEOLOGICAL FORMATIONS OF SANTA BARBARA COUNTY

| Formation | Deposition | Age | Description | Characteristics |
|---|---|---|---|---|
| **Sespe Formation** | Non-Marine | Oligocene | Sandstone, siltstone and claystone with pebble conglomerate of Franciscan detritus at the base. | Generally low permeability in the Sespe claystone. Sandstone beds may have moderate permeability. |
| **Alegria Formation** | Shallow marine, regressive | Oligocene | Arkosic sandstone and siltstone, locally fossiliferous | Low infiltration rates. |
| **Gaviota Formation** | Shallow marine | Early Oligocene | Arkosic sandstone, with siltstone and claystone in some areas | Overlying soils have low permeability. Low infiltration rates. |
| **Coldwater Sandstone** | Marine | Late Eocene | Arkosic sandstone with minor interbedded siltstone and shale or siltstone and shale with minor interbedded Arkosic sandstone | Overlying soils have low permeability. Low infiltration rates. |
| **Sacate Formation** | Marine | Late Eocene | Micaceous clay shale and siltstone interbedded with arkosic sandstone | This unit generally has low infiltration rates |
| **Cozy Dell Shale** | Marine | Eocene | Gray micaceous shale with arkosic sandstone | This unit generally has low infiltration rates |
| **Matilija Sandstone** | Marine | Eocene | Tan arkosic sandstone with thin partings of gray micaceous shale | Low infiltration rates. |
| **Anita Shale** | Marine | Eocene | Micaceous clay shale with rare thin sandstone, includes a bed of red to green foramineferal claystone | Low infiltration rates. |
| **Juncal Formation** | Marine | Eocene | Micaceous shale with minor thin interbedded arkosic sandstone | Low infiltration rates |
| **Sierra Blanca Formation** | Shallow Marine | Eocene | Massive hard algal sandy limestone, white when weathered. | Overlying soils have low permeability. |
| **Jalama Formation** | Marine | Late Cretaceous | Tan arkosic sandstone, dark gray micaceous shale, and conglomerate of black chert pebbles | Overlying soils have low permeability. Weathered rock generally has low infiltration rates. |
| **Espada Formation** | Marine | Late Jurassic to Cretaceous | Fractures micaceous shale with thin interbeds of arkosic sandstone, minor pebble conglomerate and dark gray carbonate strata | Overlying soils have low permeability. Weathered rock has low infiltration rates. |
| **Serpentinite** | Intrusive/ metamorphic | Mesozoic | Severely sheared bluish-green to black serpentinite and serpentinized peridotite. Silica-carbonate rock, altered serpentinite and peridotite. | Overlying soils have low permeability. Weathered rock has low infiltration rates. |
| **Franciscan Complex** | Marine Sedimentary Igneous and metamorphic | Jurassic-Cretaceous | Greenstone, chert, greywacke sandstone, siltstone, shale, mélange, blueschist | Overlying soils generally have low permeability. Infiltration rates in bedrock depend upon rock type, fracturing and clay continent Greywacke sandstone generally has moderate infiltration rates, whereas greenstone, siltstone and shale have low rates. |

from the standpoint of septic system usage and suitability are highlighted in the table. There formations underlie portions of the County where there is significant use and, in some cases, heavy concentrations of septic systems.

## SOILS

Following is a description of the general soil associations found in Santa Barbara County. Information presented here was obtained from the U.S. Department of Agriculture (USDA), Soil Conservation Service soils surveys of North and South Santa Barbara County (Shipman, 1964; 1981). The discussion includes the general location, slopes, depth to bedrock, permeability and drainage conditions, which are the key soil factors that affect the suitability for septic system use. Also included are USDA generalized ratings and limitations of the soils for septic tank-leachfield systems. According to the USDA criteria, slightly limited soils are favorable for leachfield use, and any associated limitations are considered minor and easily overcome. Those soils that are moderately limited are unfavorable for leachfields, but the limitations may be overcome through special planning and design. Severely limited soils are so unfavorable that site modifications, special "alternative" designs, and/or intensive maintenance are usually required to overcome the limitations. **Table 3-2** summarizes the main characteristics and septic limitations of the soil associations, along with an general indication of where they occur in the County.

In reviewing this information, it is important to recognize that the USDA soil survey information and ratings are generalized and suitable for planning level evaluations. They do not always reflect the soil conditions on a given parcel of land, which should be determined through site specific exploration and testing. It should also be understood that the general soils information presented here is not used as the basis for siting individual septic systems in Santa Barbara County. However, the information can be a useful reference tool for any investigation or evaluation of septic system suitability, and for that reason it is included in this report.

### South County Soils

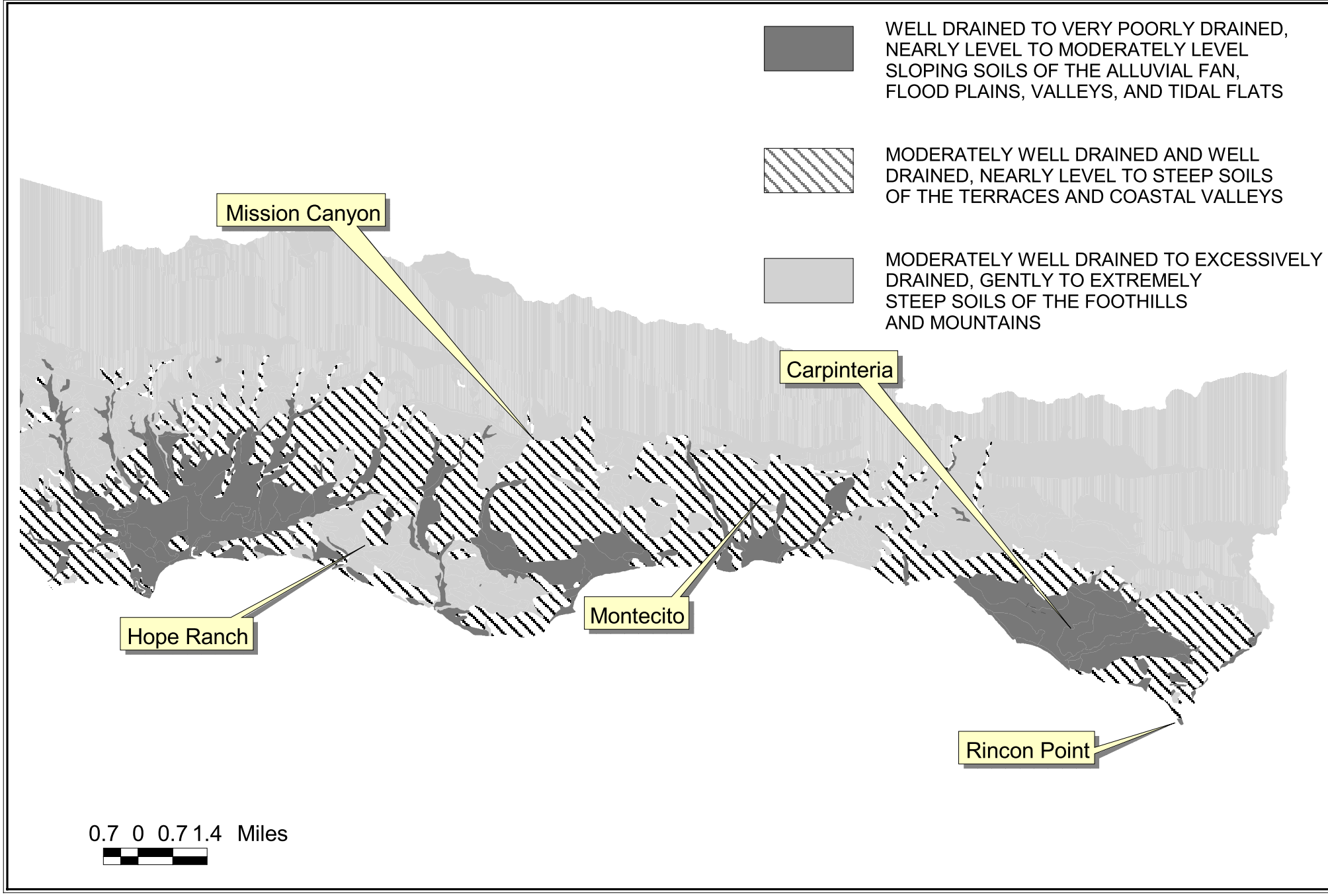
The South County soil survey covers an area of approximately 340 square miles extending from the Ventura County border on the east to Vandenberg Air Force Base (AFB) on the west, and from the crest of the Santa Ynez Mountains on the north and the Pacific Ocean on the south. Some of the survey extends into the Santa Ynez River Watershed, although it is mostly limited to the southern slopes of the Santa Ynez Mountains. The soils are divided into three main categories, based on location: (1) Alluvial Fans, Flood Plains, Valleys, and Tidal Flats; (2) Terraces and Coastal Valleys; and (3) Foothills and Mountains. Soil mapping for the South County is available in a GIS format and has been used to create **Figure 3-1,** which displays the three main soil categories found in the eastern portion of the South Coast area.

**TABLE 3-2**
**SOIL ASSOCIATIONS OF SANTA BARBARA COUNTY**
**(Source: Shipman, 1981)**

| SOUTH COUNTY | | | | | | |
|---|---|---|---|---|---|---|
| **Soil Association** | **Slope (%)** | **Depth to Bedrock (inches)** | **Permeability** | **Septic Rating** | **Septic Limitations** | **Areas of Occurence** |
| ***Alluvial Fans, Flood Plains and Valleys*** | | | | | | |
| Goleta-Elder-Agueda | 0-9 | >60 | Moderate | Moderately to severely | Flooding, slope, wetness | Carpenteria Valley, lower portions of Montecito, western parts of City of Santa Barbara |
| ***Flood Plains and Tidal Flats*** | | | | | | |
| Camarillo-Aquepts, Flooded | <1 | >60 | Moderate to moderately rapid | Severely | Flooding, slow percolation rate, wetness | Portions of Carpenteria Valley, western portion of City of Santa Barbara, lower Goleta Valley |
| ***Terraces and Coastal Valleys*** | | | | | | |
| Milpitas-Positas-Concepcion | 0-50 | >60 | Slow to rapid | Severely | Slope, slow percolation rate | Rincon Creek to Gaviota |
| Concepcion-Botella | 0-40 | | Slow | | | Coastal areas near Point Conception |
| ***Foothills and Mountains*** | | | | | | |
| Ayar-Diablo-Zaca | 2-75 | 40-70 | Slow to rapid | Severely | Slope, slow percolation rate, depth to bedrock | Summerland to Gaviota |
| Arnold-Ayar-San Andreas | 9-75 | 24-60 | | Moderately to severely | Slope, slow percolation rate, depth to bedrock | Southwestern portion of City of Santa Barbara, Hope Ranch |
| Lodo-Sespe-Todos | | 6-60 | Slow to moderate | Severely | Slope, slow percolation rate, depth to bedrock | Rincon Creek to Gaviota |
| Los Osos-Gaviota-Maymen | | 10-40 | | | | West of Gaviota |
| Naciemiento-Linne-Capitan | | 4-50 | | | | Gaviota to Point Conception |
| Santa Lucia-Lopez-Crow Hill | 9-100 | 6-40 | | | | Vicinity of Miguelito and Jalama Creek |
| Los Osos-San Andreas-Tierra | 9-75 | 20 to >60 | Slow to moderately rapid | | | West of Gaviota |
| Capitan-Linne | 15-75 | 4-50 | | | | Vicinity of Refugio Creek |
| Maymen-Rock Outcrop | 15 to >100 | 10-20 (Maymen) | Moderate (Maymen) | | | Rincon Creek to Gaviota |

**TABLE 3-2**
**SOIL ASSOCIATIONS OF SANTA BARBARA COUNTY**
**(Source: Shipman, 1981)**

| NORTH COUNTY | | | | | | |
|---|---|---|---|---|---|---|
| **Soil Association** | **Slope (%)** | **Depth to Bedrock (inches)** | **Permeability** | **Septic Rating** | **Septic Limitations** | **Areas of Occurence** |
| ***Alluvial Fans, Flood Plains, and Valleys*** | | | | | | |
| Sorrento-Mocho-Camarillo | 0-9 | >60 | Slow to rapid | Slightly to severely | Slope, moderate to slow percolation rate, shallow groundwater, drainage, overflow | Santa Maria and Lompoc Valleys and western part of Cuyama Valley |
| ***Valleys and Terraces*** | | | | | | |
| Pleasanton-Botella-Elder | 0-30 | >60 | Slow to rapid | Slightly to severely | Slope, moderateate to slow percolation rate | Santa Maria Mesa and terraces in southwestern part of Cuyama Valley |
| ***Valleys and Terraces*** | | | | | | |
| Panoche-Metz-Stutzville | 0-9 | >60 | Slow to rapid | Slightly to severely | Slope, moderate to slow percolation rate, drainage, overflow | Cuyama Valley |
| ***Terraces and Adjacent Uplands*** | | | | | | |
| Betteravia-Garey | 0-30 | >60 | Slow to moderate | Severely | Drainage, slow percolation rate | Marine terraces south of Santa Maria |
| Tangair-Narlon | 0-15 | >48 | | | Somewhat poor drainage, very slow percolation rate | Vandenburg Air Force Base |
| Positas-Ballard-Santa Ynez | 0-30 | >60 | Slow to moderately rapid | Slightly to severely | Slope, very slow percolation rate | Near Santa Ynez, Los Olivos, Lake Cachuma |
| Kettleman-Wasioja | 2-75 | 6 to >60 | | Severeley | Slope, depth to bedrock, moderately slow percolation rate | Uplands and terraces in Cuyuma Valley |
| Marina-Oceano | 0-30 | >60 | Moderate to rapid | Slightly to severely | Slope | Steep mesas and dunes north and east of Lompoc, and coast in southwest corner of the North County |
| ***Uplands and High Terraces*** | | | | | | |
| Chamise-Arnold-Crow Hill | 2-75 | 6 to 60 | Slow to rapid | Moderately to severely | Slope, moderately slow percolation rate | Uplands of Solomon and Purisima Hills |
| Shedd-Santa Lucia-Diablo | 9-75 | 18-54 | Slow to moderate | Severely | Slope, depth to shale, slow percolation rate | On coast north of Casmalia, San Rafael Mountains northeast of Sisquoc, western part of Cuyama Valley, northeast of Cachuma Dam, South of Lompoc |
| Toomes-Climara | 15-75 | 12-60 | | | Slope, depth to bedrock, slow percolation rate | On south slopes of Figueroa Mountain |
| Los Osos-Gaviota | 5-75 | 12-42 | | | | Santa Ynez Mountains |
| ***Miscellaneous Land Types*** | | | | | | |
| Sedimentary rock land-Rough broken land | 30 to >75 | NA | NA | NA | NA | Santa Ynez, San Rafael, Caliente, and Sierra Madre Mountains |
| Coastal sand dunes and sandy beaches | NA | | | | | Coastal areas |

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GENERAL SOILS MAPPING
SOUTH COAST
SANTA BARBARA COUNTY

FIGURE
3-1

***Alluvial Fans, Flood Plains, Valleys, and Tidal Flats.*** Alluvial fans, flood plains, valleys, and tidal flats are mostly located along the coast and adjacent drainage ways; they account for approximately seven percent of the South County area. The soils are formed from sedimentary-derived alluvium, and are well drained to very poorly drained. The soils are generally moderately to severely limited for leachfield use due to flooding, wetness, moderately sloping ground, and slow permeability. In some cases, the soils are poorly drained, with a depth to groundwater between 3 and 6 feet. Soil permeability is moderate to moderately rapid.

***Terraces and Coastal Valleys.*** The terraces and coastal valleys cover about 13 percent of the South County, and are located within four miles of the Pacific Ocean and along the coastline. In these areas the soils tend to be relatively deep, formed in alluvium derived from sedimentary rock, and are moderately well drained to well drained. In general, these areas tend to be suitable for leachfield systems; however, there are some sections within this area where steep slopes and slow permeability present moderate to severe limitations for leachfield use.

***Foothills and Mountains.*** Nine soil associations are found on the foothills and mountains, and make up most (80 percent) of the South County area. Some associations are very localized, and others extend over broad portions of the South County. The soils are loamy sands and clays derived from shale, sandstone sediments, and some igneous rock. Leachfield suitability ranges from moderately to severely limited, although most associations are severely limited according to USDA criteria. The limitations are due to slow percolation rates, steep slopes, and shallow depths to bedrock.

**North County Soils**

The North County soil survey covers an area of about 1,300 square miles north of the Santa Ynez Mountains. Roughly 20 percent of the area is valley and low terraces, while the remaining area consists of high terraces, rolling hills, and mountainous uplands. The soils are divided into four categories, based upon land type: (1) Alluvial Fans, Flood Plains, Valleys, and Terraces; (2) Terraces and Adjacent Uplands; (3) Uplands and High Terraces; and (4) Miscellaneous Land Types. A brief description of the soil associations within each category follows.

***Alluvial Fans, Flood Plains, Valleys, and Terraces.*** The three soil associations of the alluvial fans, flood plains, and valleys, account for approximately 20 percent of the North County. They are primarily found in the Lompoc, Santa Maria, and Cuyama Valleys. The soils of these associations are deep and range from somewhat excessively well drained to somewhat poorly well drained and occur on nearly level to moderately steep (0 to 30 percent) slopes. The soils are formed in alluvium derived mostly from sedimentary rock. All of the associations have a broad range in permeability, from slow to rapid depending upon the amount the relative percentage of sands, silts and clays in the sedimentary deposits. Consequently, all three associations include soil types and areas that range from slightly to severely limited for leachfield use.

***Terraces and Adjacent Uplands.*** The terraces and adjacent upland soil associations cover about 20 percent of the survey area. The five soil associations are somewhat excessively drained to somewhat poorly drained sands to clay loams. Slow permeability, slopes, and poor drainage slightly to severely limit leachfield use according to USDA criteria.

***Uplands and High Terraces***. Four soil associations are found on the uplands and high terraces, and make up nearly half of the North County area. The soils are sands to clays derived from sedimentary and igneous rock. Leachfield suitability ranges from moderately to severely limited, though most associations are severely limited. The limitations are due to slow percolation rates, steep slopes, and shallow depths to bedrock.

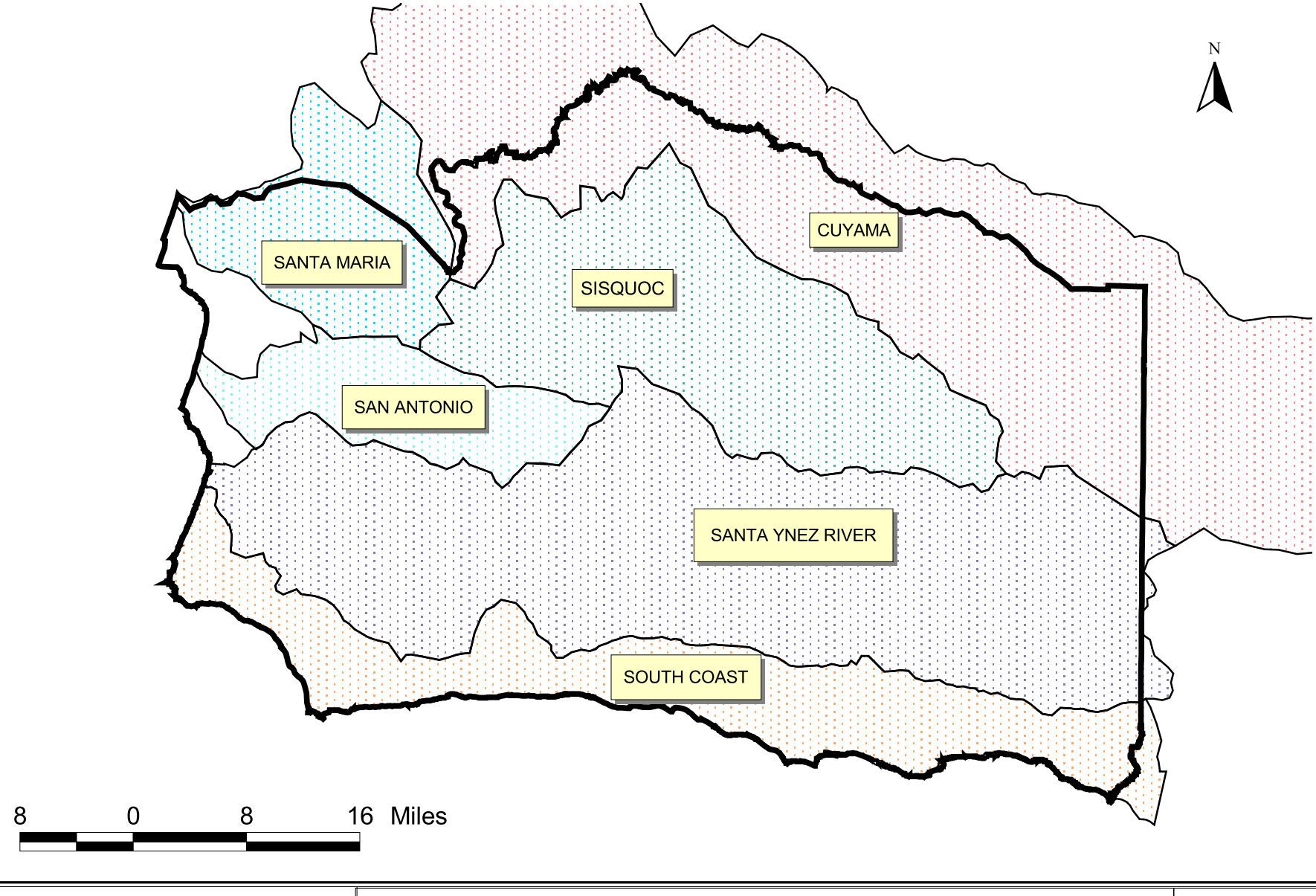
***Miscellaneous Land Types.*** The two soil associations are in the category of "Miscellaneous Land Types" are Sedimentary Rock Land-Rough Broken Land association, and Coastal Sand Dunes and Sandy Beaches. These associations are generally unsuitable for development and used for watershed or recreation. They have relatively little significance or impact on the use and effects septic systems in Santa Barbara County. The Sedimentary Rock Land-Rough Broken Land association is in the steep to extremely steep Santa Ynez, San Rafael, Caliente, and Sierra Madre Mountains. It consists of very shallow soils over hard sedimentary rock, soft sandstone, or semi-consolidated gravelly sediments. The land is only used for watershed. The Coastal Sand Dunes and Sandy Beaches are used only for recreation.

## SURFACE WATERS

Santa Barbara County contains six principal watersheds: South Coast, Santa Ynez, San Antonio, Santa Maria, Cuyama and Sisquoc River (see **Figure 3-2)**. The South Coast Watershed is unique in that it consists of north-south drainages, flowing from their headwaters in the Santa Ynez Mountains to the Pacific Ocean. The other principal watersheds generally drain from east to west. In all watersheds, flow is highly dependent upon seasonal rainfall, with no significant contribution from snowmelt. Perennial streams on the South Coast are maintained by groundwater discharge (i.e., baseflow). Substantial groundwater discharge also occurs in the western part of the San Antonio Basin. Average annual rainfall in the County ranges from 9 inches in New Cuyama to 24 inches in the Santa Ynez Mountains; annual rainfall along the coast is in the range of 16 to 18 inches. Unless otherwise noted, information presented here regarding the surface waters of Santa Barbara County was obtained from the July 2000 Santa Barbara County Water Agency publication, *Water Resources of Santa Barbara County*.

### South Coast Watershed

The South Coast Watershed covers a 416-square mile area between the Santa Ynez Mountains and the Pacific Ocean, in southern Santa Barbara County. The numerous creeks of the South Coast Watershed primarily drain from north to south, with their headwaters located in the upper slopes and foothills of the Santa Ynez Mountains.

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WATERSHED BOUNDARIES
SANTA BARBARA COUNTY, CALIFORNIA

FIGURE
3-2

**TABLE 3-2**
**SOIL ASSOCIATIONS OF SANTA BARBARA COUNTY**
**(Source: Shipman, 1981)**

| SOUTH COUNTY | | | | | | |
|---|---|---|---|---|---|---|
| **Soil Association** | **Slope (%)** | **Depth to Bedrock (inches)** | **Permeability** | **Septic Rating** | **Septic Limitations** | **Areas of Occurence** |
| ***Alluvial Fans, Flood Plains and Valleys*** | | | | | | |
| Goleta-Elder-Agueda | 0-9 | >60 | Moderate | Moderately to severely | Flooding, slope, wetness | Carpenteria Valley, lower portions of Montecito, western parts of City of Santa Barbara |
| ***Flood Plains and Tidal Flats*** | | | | | | |
| Camarillo-Aquepts, Flooded | <1 | >60 | Moderate to moderately rapid | Severely | Flooding, slow percolation rate, wetness | Portions of Carpenteria Valley, western portion of City of Santa Barbara, lower Goleta Valley |
| ***Terraces and Coastal Valleys*** | | | | | | |
| Milpitas-Positas-Concepcion | 0-50 | >60 | Slow to rapid | Severely | Slope, slow percolation rate | Rincon Creek to Gaviota |
| Concepcion-Botella | 0-40 | | Slow | | | Coastal areas near Point Conception |
| ***Foothills and Mountains*** | | | | | | |
| Ayar-Diablo-Zaca | 2-75 | 40-70 | Slow to rapid | Severely | Slope, slow percolation rate, depth to bedrock | Summerland to Gaviota |
| Arnold-Ayar-San Andreas | 9-75 | 24-60 | | Moderately to severely | Slope, slow percolation rate, depth to bedrock | Southwestern portion of City of Santa Barbara, Hope Ranch |
| Lodo-Sespe-Todos | | 6-60 | Slow to moderate | Severely | Slope, slow percolation rate, depth to bedrock | Rincon Creek to Gaviota |
| Los Osos-Gaviota-Maymen | | 10-40 | | | | West of Gaviota |
| Naciemiento-Linne-Capitan | | 4-50 | | | | Gaviota to Point Conception |
| Santa Lucia-Lopez-Crow Hill | 9-100 | 6-40 | | | | Vicinity of Miguelito and Jalama Creek |
| Los Osos-San Andreas-Tierra | 9-75 | 20 to >60 | Slow to moderately rapid | | | West of Gaviota |
| Capitan-Linne | 15-75 | 4-50 | | | | Vicinity of Refugio Creek |
| Maymen-Rock Outcrop | 15 to >100 | 10-20 (Maymen) | Moderate (Maymen) | | | Rincon Creek to Gaviota |

**TABLE 3-2**
**SOIL ASSOCIATIONS OF SANTA BARBARA COUNTY**
**(Source: Shipman, 1981)**

| NORTH COUNTY | | | | | | |
|---|---|---|---|---|---|---|
| **Soil Association** | **Slope (%)** | **Depth to Bedrock (inches)** | **Permeability** | **Septic Rating** | **Septic Limitations** | **Areas of Occurence** |
| ***Alluvial Fans, Flood Plains, and Valleys*** | | | | | | |
| Sorrento-Mocho-Camarillo | 0-9 | >60 | Slow to rapid | Slightly to severely | Slope, moderate to slow percolation rate, shallow groundwater, drainage, overflow | Santa Maria and Lompoc Valleys and western part of Cuyama Valley |
| ***Valleys and Terraces*** | | | | | | |
| Pleasanton-Botella-Elder | 0-30 | >60 | Slow to rapid | Slightly to severely | Slope, moderateate to slow percolation rate | Santa Maria Mesa and terraces in southwestern part of Cuyama Valley |
| ***Valleys and Terraces*** | | | | | | |
| Panoche-Metz-Stutzville | 0-9 | >60 | Slow to rapid | Slightly to severely | Slope, moderate to slow percolation rate, drainage, overflow | Cuyama Valley |
| ***Terraces and Adjacent Uplands*** | | | | | | |
| Betteravia-Garey | 0-30 | >60 | Slow to moderate | Severely | Drainage, slow percolation rate | Marine terraces south of Santa Maria |
| Tangair-Narlon | 0-15 | >48 | | | Somewhat poor drainage, very slow percolation rate | Vandenburg Air Force Base |
| Positas-Ballard-Santa Ynez | 0-30 | >60 | Slow to moderately rapid | Slightly to severely | Slope, very slow percolation rate | Near Santa Ynez, Los Olivos, Lake Cachuma |
| Kettleman-Wasioja | 2-75 | 6 to >60 | | Severeley | Slope, depth to bedrock, moderately slow percolation rate | Uplands and terraces in Cuyuma Valley |
| Marina-Oceano | 0-30 | >60 | Moderate to rapid | Slightly to severely | Slope | Steep mesas and dunes north and east of Lompoc, and coast in southwest corner of the North County |
| ***Uplands and High Terraces*** | | | | | | |
| Chamise-Arnold-Crow Hill | 2-75 | 6 to 60 | Slow to rapid | Moderately to severely | Slope, moderately slow percolation rate | Uplands of Solomon and Purisima Hills |
| Shedd-Santa Lucia-Diablo | 9-75 | 18-54 | Slow to moderate | Severely | Slope, depth to shale, slow percolation rate | On coast north of Casmalia, San Rafael Mountains northeast of Sisquoc, western part of Cuyama Valley, northeast of Cachuma Dam, South of Lompoc |
| Toomes-Climara | 15-75 | 12-60 | | | Slope, depth to bedrock, slow percolation rate | On south slopes of Figueroa Mountain |
| Los Osos-Gaviota | 5-75 | 12-42 | | | | Santa Ynez Mountains |
| ***Miscellaneous Land Types*** | | | | | | |
| Sedimentary rock land-Rough broken land | 30 to >75 | NA | NA | NA | NA | Santa Ynez, San Rafael, Caliente, and Sierra Madre Mountains |
| Coastal sand dunes and sandy beaches | NA | | | | | Coastal areas |

Substantial agriculture and urban development exist in the area. The majority of the population of Santa Barbara County, and about two-thirds of the total number of septic systems in the County, are located in the South Coast Watershed.

**Santa Ynez Watershed**

The Santa Ynez Watershed covers an area of approximately 900 square miles in central Santa Barbara County. The headwaters of the Santa Ynez River are located in the Los Padres National Forest (San Rafael Mountains). The watershed is bounded to the South by the Santa Ynez Mountains and to the north by the Purisima Hills and San Rafael Mountains. The Santa Ynez River derives most of its streamflow from surface runoff following storm events. Groundwater also discharges into the Santa Ynez River from the Adjacent Santa Ynez Uplands groundwater basin. The basin experiences rapid runoff conditions, with stream flow rising and falling quickly in response to storm events. The upper Santa Ynez Watershed contains three storage reservoirs: Lake Cachuma, Gibraltar Reservoir, and Jameson Lake. These reservoirs primarily provide water to users along the South Coast of Santa Barbara County. Land uses within the watershed include extensive agriculture, rural residential development, unincorporated communities and the Cities of Solvang Buellton and Lompoc.

**San Antonio Watershed**

The San Antonio Watershed is a 165-square mile watershed located in north-central Santa Barbara County. San Antonio Creek is fed by tributaries that flow from the surrounding hills. East of Barka Slough, flow is intermittent as it is mainly runoff-derived; west of the Slough, where the creek is groundwater-influenced, streamflow is perennial (Hutchinson, 1980). Land use within the watershed is primarily municipal, military (Vandenberg Air Force Base), and agricultural, including grazing (Hutchinson, 1980).

**Santa Maria Watershed**

The Santa Maria River begins 20 miles inland from the Pacific Ocean at the confluence of the Cuyuma and Sisquoc Rivers. The Santa Maria Watershed covers an area of 260 square miles downstream of the confluence. The watershed boundary is formed by the Sierra Madre Mountains to the northeast and the Solomon and Casmalia Hills to the southwest. The Santa Maria River flows seasonally, with no surface flows approximately 83 percent of the time. Levees to the north and south control flooding along the river. Stream meander of the Santa Maria River has resulted in eroded banks and undercut portions of flood control levees downstream of the Cuyuma-Sisquoc confluence. Principal land uses include oil development, agriculture, recreational uses, rural residential and urban development in the Santa Maria-Orcutt area. The area near the mouth of the Santa Maria River is designated as a National Natural Landmark because of the large presence of sand dunes, dune uplands, lakes and wetlands. Surface flow from the Cuyama River is controlled by Twitchell Reservoir. Water from Twitchell Reservoir is released for groundwater recharge purposes.

### Cuyama Watershed

The Cuyama Watershed covers an area of 1,140 square miles in northeastern Santa Barbara County. The watershed extends into San Luis Obispo County and into small portions of Ventura and Kern Counties. The watershed boundaries are formed by the arid Caliente Mountains to the north and the Sierra Madre Mountains to the south. The Cuyama River has two major tributaries: Huasna River and Alamos Creek. Like other river systems within the North County, the Cuyama River responds rapidly to rainfall events, with flows rising and falling quickly in response to precipitation. Little or no flow is present in the river during the summer months. Outflow from the Cuyama River is controlled by Twitchell Reservoir. This facility is located directly upstream of the Cuyama Sisquoc confluence. Twitchell Reservoir is used only for flood control and water conservation. Water from the reservoir is released into the Santa Maria River during dry months to provide flow for the recharge of the Santa Maria Groundwater Basin. Land use in the sparsely populated Cuyuma Watershed is primarily agricultural, with a small amount of residential development concentrated around the towns of Cuyama and New Cuyama.

### Sisquoc River Watershed

The Sisquoc River drains a 470-square mile watershed bounded by the Sierra Madre and San Rafael Mountains. Most of the drainage area is within the Los Padres National Forest. The lowermost segment of the river is commonly dry for long periods during the year. Perennial flow is present in the upper reaches of the river. High rainfall events occasionally result in short-duration flooding of the river with a high peak runoff volume. The steep slopes, shallow erodible soils, and high rainfall within the watershed create conditions for destructive flood flows when the vegetative cover is reduced in density. Land uses in the Sisquoc River Watershed include relatively pristine wilderness and recreational use in the upper watershed, and intensively cultivated lands along the lower reaches of the river.

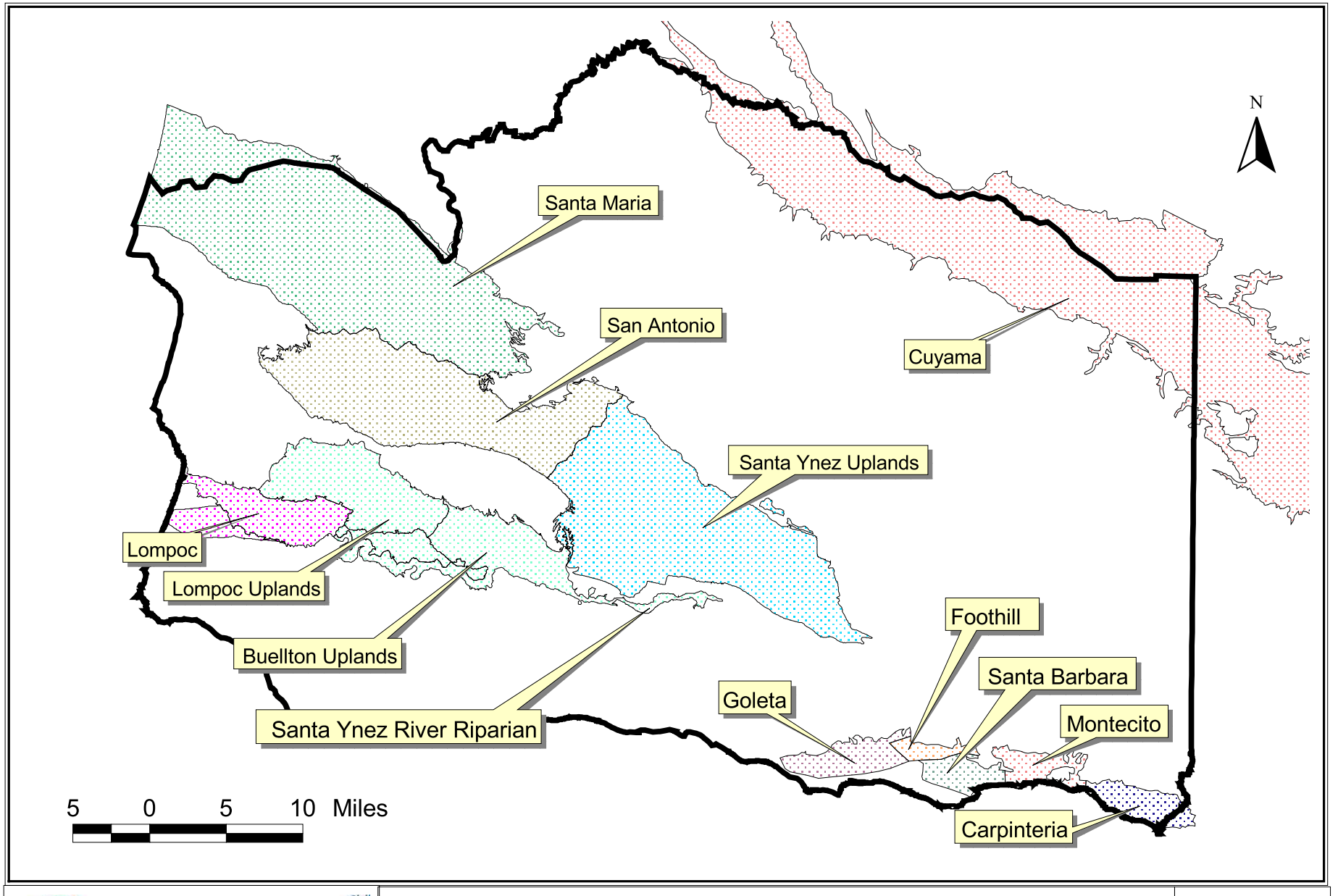
## GROUNDWATERS

Groundwater supplies an estimated 75-85% of Santa Barbara County's commercial, industrial, and agricultural water (Santa Barbara County Planning and Development Department, 1994; Gibbs, 2001; Rodriguez and Lang, 2000). The groundwater supply is also heavily relied upon during periodic droughts within the County. There are eleven major groundwater basins, located in four geographically distinct regions of the County. There are also four relatively small and/or undeveloped groundwater basins in the County. **Figure 3-3** is a map of the major groundwater basin areas. **Table 3-3** details the characteristics, groundwater and land use for each of the major groundwater basins.

**TABLE 3-3**
**GROUNDWATER RESOURCES**
**(Source: Santa Barbara County Water Agency, 2000-2001)**

| Region | Groundwater Basin | Area (acres) | Groundwater Uses | Land Uses | Number of Septic Systems* |
|---|---|---|---|---|---|
| **South County Groundwater Basins** | Carpinteria | 6,700 | Agricultural | Agricultural | 655 |
| | Montecito | 4,300 | Agricultural, residential | Agricultural, residential | 876 |
| | Santa Barbara | 4,500 | Municipal | Urban residential, industrial, commercial | 146 |
| | Foothill | 3,000 | Municipal | Residential | 261 |
| | Goleta (North/Central and West) | 9,200 | Agricultural | Urban residential, commercial, some agricultural | 305 |
| **Santa Ynez River Groundwater Basins** | Santa Ynez Uplands | 83,200 | Agriculture, some residential | | 2,245 |
| | Buellton Uplands | 16,400 | Agricultural, municipal, and domestic | Agricultural, rural residential | 526 |
| | Lompoc | 48,600 | Agricultural, mining and processing, municipal | Agricultural, oil development, mining, sanitary landfill | 121 |
| **North County Groundwater Basins** | San Antonio | 70,400 | Agricultural, military, municipal | Agricultural (mostly vineyards), ranching, limited urban development | 126 |
| | Santa Maria Valley | 110,000 | Petroleum operations, agriculture, municipal | Agricultural, oil development, sanitary landfill, limited urban development | 826 |
| **Cuyama Groundwater Basins** | Cuyama | 441,600 | Agriculture, petroleum operations, commercial and domestic | Agricultural, oil development, sanitary landfill, limited urban development | 159 |
| **Other Groundwater Basins and Extraction Areas** | More Ranch | 502 | NA | Open space, limited residential and greenhouse agriculture | included in Goleta total |
| | Ellwood to Gaviota | 67,200 | Petroleum operations, agricultural, residential | Oil development, agricultural, residential, open space, sanitary landfill | included in Goleta total |
| | Gaviota to Point Conception | 23,040 | Ranching, limited agricultural, domestic | NA | |
| | Santa Ynez River Riparian Groundwater Basin | 12,000 | NA | Urban development, ranching, agricultural | included in Buellton Uplands total |

* Compiled using GIS database

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MAJOR GROUNDWATER BASINS
SANTA BARBARA COUNTY, CALIFORNIA

FIGURE
3-3

**South County Groundwater Basins**

Five major groundwater basins are located between the Santa Ynez Mountains and the Pacific Ocean: Carpinteria, Montecito, Santa Barbara, Foothill and Goleta. The basins are generally composed of unconsolidated material from uplift and erosion of the mountains.

***Carpinteria Groundwater Basin.*** This groundwater basin underlies approximately 6,700 acres in the Carpinteria Valley, occupying an area approximately seven miles long and up to two miles wide between the Santa Ynez Mountains and the Pacific Ocean. The groundwater basin includes the Toro Canyon sub-basin to the west, and consists of two storage units (#1 and #2), with the Rincon Creek Fault forming a hydrologic barrier between the two units. Storage Unit #1 is in a downdropped area north of the fault composed of marine and non-marine sediments up to 4,000 feet thick, while Storage Unit #2 is located in a thin section, approximately 500 feet, of sedimentary rock south of the fault. Groundwater is found in the Older and Younger alluvium Terrace Deposits, Carpinteria Formation, Casitas Formation, and Santa Barbara Formation. The primary source of groundwater comes from the Casitas Formation. Five primary drainages overlie the Carpinteria Groundwater Basin: Rincon Creek, Carpinteria Creek, Franklin Creek, Santa Monica Creek, and Toro Creek. The dominant land use in the valley is agriculture (orchards, nurseries, irrigated crops and greenhouses), the City of Carpinteria and outlying rural residential development. Agricultural water demand is primarily met by groundwater. Urban demand is met primarily by surface water from the Cachuma Reservoir and State Water Project.

***Montecito Groundwater Basin.*** This 4,300-acre groundwater basin, which is comprised of unconsolidated non-marine deposits of the Casitas Formation, is located along a narrow strip between the Santa Ynez Mountains and the Pacific Ocean. The Cold Springs, Hot Springs, Oak, San Ysidro, Buena Vista and Romero/Picay Creeks are major streams that flow across the basin. The Arroyo Parida and Montecito Faults separate the groundwater basin into three storage units, with the thickest sections of water-bearing sediments located north of the Arroyo Parida Fault and south of the Montecito Fault. Groundwater from the basin supplies private residences, several small water systems and a small amount of agricultural uses within the Montecito area. Surface waters from the Cachuma Reservoir and the State Water Project supply most of the demand, with groundwater supplying roughly 10 percent.

***Santa Barbara Groundwater Basin.*** This 4,500-acre groundwater basin is situated in the Santa Barbara area. The Santa Barbara Formation, comprised mainly of marine sands, silts and clays, is the primary aquifer for this basin. Dominant land uses include urban residential, industrial and commercial uses. The City of Santa Barbara uses groundwater from this basin to supply approximately ten percent of their total demand. Agricultural uses account for a small amount of groundwater use. The City manages the use of this basin in conjunction with deliveries of surface water from the Cachuma Reservoir and State Water Project.

***Foothill Groundwater Basin.*** This 3,000-acre groundwater basin is bound on the south by faults (Modoc, Mesa and Mission Ridge Faults) and on the north by the exposed bedrock of the Santa Ynez Mountain. The basin is situated within the northern part of the City of Santa Barbara and in the northeastern part of the unincorporated Goleta area. The Santa Barbara Formation, which is the primary aquifer of the basin and 400-feet thick, is comprised of unconsolidated marine sand, silt and clay. Land uses within the basin boundaries are primarily residential with orchards along the northern edge of the basin. Nearly all the pumpage is by the City of Santa Barbara and the La Cumbre Mutual Water Company. Due to an agreement between the City of Santa Barbara and the La Cumbre Mutual Water Company regulating the conveyance of State Water Project supplies, the City effectively manages this basin in conjunction with surface water supplies. (Note: This basin was formerly designated the Goleta East Subbasin.)

***Goleta Groundwater Basin.*** The Goleta Groundwater Basin is divided into two subbasins: Goleta North/Central Subbasin and Goleta West Subbasin. Collectively, the subbasins underlie an area of 9,200 acres between the Pacific Ocean and the base of the Santa Ynez Mountains. The More Ranch Fault forms the southern boundary of the basin. The southern portion of this basin has a confined aquifer, which is overlain by poor quality brackish water of the Goleta Slough. The unconfined recharge area is to the north. The Goleta West Subbasin has poor quality water that requires treatment prior to use. This basin has been adjudicated with the Wright Judgment. The Santa Barbara Formation and the older and younger alluvium, which have a combined thickness of 2,000 feet, are the three water-bearing sediments in the basin. The Goleta Valley is mainly an urbanized area with some interspersed agricultural uses (orchards, truck crops, and cut flowers).

**Santa Ynez River Groundwater Basins**

Three major groundwater basins lie within the drainage area of the Santa Ynez River: the Santa Ynez Uplands, Buellton Uplands, and the Lompoc Groundwater Basin.

***Santa Ynez Uplands Groundwater Basin.*** The Santa Ynez Upland groundwater basin is located 25 miles east of the Pacific Ocean and encompasses approximately 83,000 acres (130 square miles). Impermeable rocks from the San Rafael Mountains to the northeast and a nearly continuous barrier of impermeable rocks to the south form the basin's boundary. Land uses within the basin are agriculture, cattle grazing and rural residences. The unincorporated townships of Santa Ynez, Los Olivos, Ballard and the City of Solvang are located within the basin. Private agricultural and domestic users, the City of Solvang, and the Santa Ynez River Water Conservation District Improvement District #1 pump from the basin. Groundwater accounts for about 75% of the water supply in the area. About 90% of the demand is for agricultural uses; the remaining 10% is municipal and industrial uses.

***Buellton Uplands Groundwater Basin.*** The Buellton Uplands Groundwater Basin is located roughly 18 miles east of the Pacific Ocean, and underlies an area of 16,400 acres (29 square miles). The basin is bounded by impermeable bedrock to the north, the Santa

Ynez River Fault to the south, a topographic divide with the Lompoc Groundwater Basin to the west, and a limited connection to the Santa Ynez Upland Groundwater Basin to the east. It is likely that this basin discharges into the Santa Ynez River Riparian Basin (discussed later). Agricultural is the dominant land use in the groundwater basin, although the City of Buellton and scattered rural residential development are also located within the basin's boundaries. Agricultural irrigation accounts for roughly 80% of the groundwater demand, while the remaining 20% is used for municipal and industrial purposes.

***Lompoc Groundwater Basin.*** The Purisima, Santa Rita and Lompoc Hills border this 48,600-acre (76 square miles) groundwater basin. The seven-mile long basin is divided into three major storage units: the Lompoc Plain (14,800 acres), the Lompoc Uplands (29,000 acres) and the Lompoc Terrace (4,800 acres). Agriculture is the main land use in the valley. Oil fields have been developed along the northern margin of the basin. Groundwater is the only source of water within the basin, with agricultural irrigation accounting for approximately 70% of the total demand. Municipal water needs of the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District account for the remaining demand.

**North County Groundwater Basins**

The North County Groundwater Basins include the San Antonio and Santa Maria Valley Groundwater Basins. Land use is dominated by agriculture, though ranching, urban development, and oil development are also distributed through the basins

***San Antonio Groundwater Basin.*** This basin covers an area of 70,400 acres (110 square miles), between the Solomon and Casmalia Hills to the north and Purisima Hills to the south. Land use within in the basin includes agriculture (mostly vineyards), ranching, and a limited amount of urban development within the town of Los Alamos. Most of the groundwater use (97%) is attributed to vineyard irrigation and other agricultural use. The remaining demand is from the Los Alamos Community Services District.

***Santa Maria Valley Groundwater Basin.*** Encompassing over 100,000 acres (170 square miles), the Santa Maria Valley Groundwater Basin is an alluvial basin that is located in northwestern Santa Barbara County and extends into portions of southwestern San Luis Obispo County. The major population centers are the City of Santa Maria, the unincorporated township of Orcutt and the City of Guadalupe. Oil development in the foothills and mountains is extensive and there is an operating landfill east of the city of Santa Maria (SBCPDD, 1994). The basin supplies groundwater to the oil operations, private agriculture, the City of Santa Maria, California Cities Water Company, the City of Guadalupe, and Casmalia Community Services District. Historically, groundwater was the only source of water within the Santa Maria Valley until 1997, when the importation of State Water Project supplies began. Approximately 80% of groundwater use is for irrigated agriculture.

**Cuyama Groundwater Basin**

Encompassing 255 square miles, the Cuyama Groundwater Basin is located between the Caliente Range to the north and the San Rafael Mountains to the south. Roughly twenty percent of the basin's area underlies northeastern Santa Barbara County, with most of the basin extending into Ventura, Kern, and San Luis Obispo Counties. Three small communities are located in the basin: Cuyama, New Cuyama and Ventucopa. Agriculture is the dominant land use in this area and accounts for 95% of the water use. Two large oil fields are located within the basin (SBCPDD, 1994).

**Other Groundwater Basins and Extraction Areas**

Four other relatively small groundwater basins and/or extraction areas are present in Santa Barbara County. Some of the basins are undeveloped or lacking in groundwater data. A brief summary of the available information of each of the basins follows.

***More Ranch Groundwater Basin.*** The small More Ranch Groundwater Basin underlies roughly 500 acres between the More Ranch Fault and the Pacific Ocean in southern Goleta. Much of the basin area is open space, with some residential and greenhouse agriculture present in the developed areas.

***Ellwood to Gaviota Groundwater Area.*** This groundwater extraction area is located west of Goleta and encompasses approximately 105 square miles between the crest of the Santa Ynez Mountains and the Pacific Ocean in Southern Santa Barbara County. Groundwater is produced from sandstone aquifers that are exposed on the flanks of the Santa Ynez Mountains. Groundwater discharge supports perennial flows in numerous south-flowing creeks. Land uses in the area include oil facilities associated with offshore platforms, agriculture, residential use and the Tajiguas Municipal Landfill. Groundwater is the only source of water in this area.

***Gaviota to Point Conception Groundwater Area.*** This groundwater area underlies a 36-square mile area west of the Ellwood to Gaviota Groundwater Area. Groundwater supplies all water to the ranching, limited agriculture, and ranch homes present in the area.

***Santa Ynez River Riparian Groundwater Basin.*** This 36-mile long curving riparian basin follows the Santa Ynez River from Bradbury Dam to the southeastern edge of the Lompoc plain. The groundwater basin receives inflow from the Santa Ynez Uplands Basin, the Buellton Uplands Basin, runoff from watershed located below Bradbury Dam, controlled releases required by agreement from Lake Cachuma, and rainfall. Demands on this basin include the Santa Ynez River Water Conservation District Improvement District #1, the cities of Solvang and Buellton and agriculture downstream of the City of Buellton.

# SECTION 4

# EXISTING SEPTIC SYSTEM PRACTICES

This section describes the existing septic system practices in Santa Barbara County in terms of regulatory requirements, typical designs and construction practices, and the extent and usage of septic systems in different parts of the County.

## REGULATORY FRAMEWORK

### General

In California, all wastewater treatment and disposal systems, including individual septic systems, fall under the overall regulatory authority of the State Water Resources Control Board and the nine California Regional Water Quality Control Boards (Regional Boards). The Regional Boards are charged with the responsibility of protecting beneficial uses of State waters (ground and surface) from a variety of waste discharges including septic systems (also commonly termed onsite sewage disposal systems or, simply, onsite systems). The Regional Board's involvement in regulation of onsite systems most often involves the formation and implementation of basic water protection policies. These are reflected in the individual Regional Board's Basin Plan, generally in the form of guidelines, criteria and/or prohibitions related to the siting, design, construction and maintenance of onsite systems. The State Water Board's role has historically been one of providing overall policy direction, organizational and technical assistance, and communications link to the State legislature. However, with the passage of AB 885 in the fall of 2000, the State Water Board has been thrust into the important role of developing uniform statewide standards for onsite systems that are required to be incorporated into all Regional Board Basin Plans and become effective by July 2004.

The Regional Boards may waive or delegate regulatory authority for onsite systems to counties, cities or special districts. This is not mandatory; however, it is normally done and has proven to be administratively efficient. In some cases this is accomplished through a Memorandum of Understanding (MOU), whereby the local agency commits to enforcing the Basin Plan requirements or other specified standards that may be more restrictive. The Regional Boards generally elect to retain permitting authority over large and/or commercial or industrial onsite systems, depending on the volume and character of the wastewater.

Counties typically regulate septic systems via their environmental health and/or building or planning departments. Local septic system ordinances often incorporate portions of the Uniform Plumbing Code (Appendix K) and other specific requirements deemed appropriate for local circumstances. Most counties focus their local ordinances on new system installations and typically do not have specific repair standards or requirements for ongoing system maintenance. However, a growing number of local jurisdictions in

California, including Santa Barbara County, have become very involved in septic system management, including implementation of programs related to on-going inspections, maintenance and monitoring of individual systems and/or the receiving environment.

**Water Quality Control Plan for Central Coast Basin ("Basin Plan")**

Santa Barbara County falls within the jurisdiction of the Central Coast Regional Water Quality Control Board (Regional Board). The Regional Board has adopted policies and requirements pertaining to onsite systems that are contained within the Water Quality Control Plan for the Central Coast Basin, more commonly referred to as the "Basin Plan". The Basin Plan can be obtained from the Regional Board's website, at www.swrcb.ca.gov/rwqcb3/BasinPlan The onsite systems element of the Basin Plan sets forth various objectives, guidelines, general principles and recommendations for the use of onsite systems that cover the following major topics:

1. Corrective Actions for Existing Systems
2. Local Governing Jurisdiction Actions
    a. Disclosure and Compliance of Existing Wastewater Disposal Systems
    b. Onsite Wastewater Management Plans
    c. Septic Tank Maintenance Districts
3. Criteria for New Systems
    a. Site Suitability
    b. System Design
    c. Design for Engineered Systems
    d. Construction
    e. Individual System Maintenance
    f. Community System Design
    g. Local Agencies
    h. Additional Considerations
    i. Individual, Alternative and Community System Prohibitions
    j. Subsurface Disposal Exemptions

Mandatory requirements for the siting and design of onsite systems are reflected in sub-section 3(i) of the Basin Plan titled "Individual, Alternative and Community System Prohibitions". Included for all onsite systems are specific criteria related to such things as soil conditions, percolation rates, separation distances to groundwater, slope limitations, setbacks to water features, and leachfield replacement area. Further discussion of these criteria is provided later in this section.

Additional requirements for discharges from community subsurface disposal systems (i.e., those serving more than five parcels or five dwelling units) are also included in the Basin Plan "Prohibitions" sub-section, as are requirements and prohibitions for specific geographical areas of the Central Coast Region. The Basin Plan does not include specific discharge prohibition(s) for any particular geographical area located in Santa Barbara County. However, under the sub-section titled "Local Agencies", the Basin Plan recommends that "Wastewater Management Plans" be prepared and implemented for

urbanizing and high density areas within the Central Coast Region, and identifies several specific areas where this applies. Included in the list are two specific areas in Santa Barbara County: (1) Upper Santa Ynez Valley; and (2) Los Olivos/Ballard.

**Santa Barbara County Regulations**

Since 1991, onsite sewage disposal systems in Santa Barbara County have been regulated by the County Public Health Department, Environmental Health Services Division. Prior to that, permitting of onsite systems came under the administrative authority of the County Building Department.

Santa Barbara County regulations for onsite sewage disposal systems are contained in Chapter 29, Article II of the County Code, which was most recently updated in 1999 (copy provided in **Appendix A**). This is commonly referred to as the "County Wastewater Ordinance". These regulations set forth specific requirements related to: (a) permitting and inspection of onsite systems; (b) septic tank design and construction; (c) drywell and disposal field requirements; and (c) servicing, inspection, reporting and upgrade requirements. Notable elements and changes contained in the 1999 update of the County regulations include the following:

1. **Water Quality Standards.** The "Individual, Alternative, and Community Systems Prohibitions" contained in the Basin Plan are adopted by reference into the County Code.

2. **Septic Tanks.** All septic tanks are required to have access ports/risers within one foot of finished grade to facilitate servicing.

3. **Seepage Pits.** Hollow seepage pits are prohibited and are required to be abandoned or converted to gravel-filled drywells upon discovery.

4. **Leachfields/Drywells.** Leachfields are the preferred method for sewage disposal, and drywells may only be considered upon determining that a leachfield option is infeasible.

5. **Onsite System Servicing and Reporting.** Whenever an onsite sewage disposal system is serviced the tank is required to be pumped, the system inspected and evaluated for deficiencies, and the results reported to the County Health Department for documentation and corrective action, as needed.

Santa Barbara County is currently in the process of reviewing and updating the existing regulations, with specific focus on system management issues, provisions for use of enhanced treatment-disposal technologies and other improvements in design practices. The County is closely following the progress of the AB 885 efforts to develop state standards for onsite systems, and may defer action on any significant changes to County regulations until the state recommendations are more fully developed and can be considered for application in Santa Barbara County.

**Policies, Community Plans, and Special Problem Areas**

In addition to the above-noted provisions of the County Code, additional requirements for onsite systems in Santa Barbara County may be adopted as part of General Land Use Policies, Community Plans or as project-specific mitigation measures or conditions applied to development proposals lying within a designated Special Problem Area of the County.]

***Coastal Land Use Policy.*** A general policy related to septic systems and community sewerage applicable to coastal areas of the County is Coastal Land Use Policy 2-10, which states "Annexation of a rural area(s) to a sanitary district or extension of sewer lines into rural area(s) as defined on the land use maps shall not be permitted unless required to prevent adverse impacts on environmentally sensitive habitat, to protect public health, or as a logical extension of services."

***Community Plans.*** Community Plans are prepared and updated from time-to-time for unincorporated communities in the County, in accordance with provisions of California State Law. Community Plans serve to address general planning issues for specific geographical areas, to help guide development and to provide implementation policies and standards for various development activities, public facilities and environmental protection. Specific standards and policies relative to onsite sewage disposal systems may be adopted through the Community Plan, depending on the significance of onsite system usage and impacts in the particular plan area. In Santa Barbara County, specific requirements for onsite systems were incorporated in the recently adopted Toro Canyon Community Plan, and are also important topics in the current community planning effort that is underway for the Santa Ynez area.

1. **Toro Canyon Plan.** Effective March 27, 2002, the Toro Canyon Plan adopted several requirements for onsite systems that apply specifically to development activities in the Toro Planning area. These requirements appear as Development Standards in the Wastewater and Water Section of the Plan (see copy in Appendix B). Briefly, these local area septic system requirements include the following key provisions:

    - *Pumps.* The use of pumping systems is discouraged. Creation of new parcels requires that a gravity flow disposal system be provided.

    - *Dual Disposal Systems.* For new construction, dual (200%) disposal systems are required, with an additional (third) disposal field area identified and reserved for future use. Dual disposal systems are required for repairs and remodels, if feasible.

    - *Nitrate Loading Reduction.* Planting of shallow-rooted vegetation over leachfields is encouraged and paving over leachfields is prohibited in order to enhance nitrate uptake in the soil. Use of advanced treatment systems for

nitrogen removal is required for new construction and repair systems where drywells are used for disposal.

2. **Santa Ynez Community Plan.** The County is currently working with the residents and businesses in the Santa Ynez area to develop a community plan. Portions of the area are served by public sewers, but large portions still utilize onsite sewage disposal systems. No specific goals or development standards relative to septic system practices or requirements have yet been proposed. However, septic system usage and community sewerage are critical issues under review for Los Olivos and Ballard that are important to the growth and development plans for the area.

***Special Problem Areas.*** Santa Barbara County Ordinance No. 3665, Section 10-21, provides for the delineation of "Special Problem Areas" for certain areas of the County where there are recognized to be inherent physical constraints affecting development and building activity. The conditions that may be cause for delineation of a Special Problem Area (SPA) include flooding, drainage, grading, soils, geology, road width, access, sewage disposal, water supply, location and elevation problems. Delineation of an SPA requires additional discretionary review of development proposals by a committee of representatives of Division of County Roads, County Flood Control, County Building and Development, County Health and Fire Departments. This committee may impose any and all reasonable and necessary conditions to prevent or mitigate present or potential problems that might result from the development proposal, for the protection of property damage, public health and safety. Several areas of Santa Barbara County have been designated SPAs due to constraints and historic problems with the use of onsite sewage disposal systems. These include:

1. Ballard
2. Los Olivos
3. Mission Canyon Area
4. Adjacent to the Town of Santa Ynez
5. Janin Acres
6. Shepard Mesa

To date, no specific septic system policies or additional requirements have been adopted for development proposals in these SPAs. However, each project undergoes case-by-case review, which may result in the imposition of "higher" or different treatment and disposal standards than would apply to a similar building project not located within the SPA.

## SEPTIC SYSTEM DESIGN AND SITING REQUIREMENTS

Following is a description and overview of the components and workings of a typical septic system and key requirements related to siting, design, construction, operation and

maintenance. The discussion is related specifically to practices and conditions in Santa Barbara County.

**Conventional Septic System**

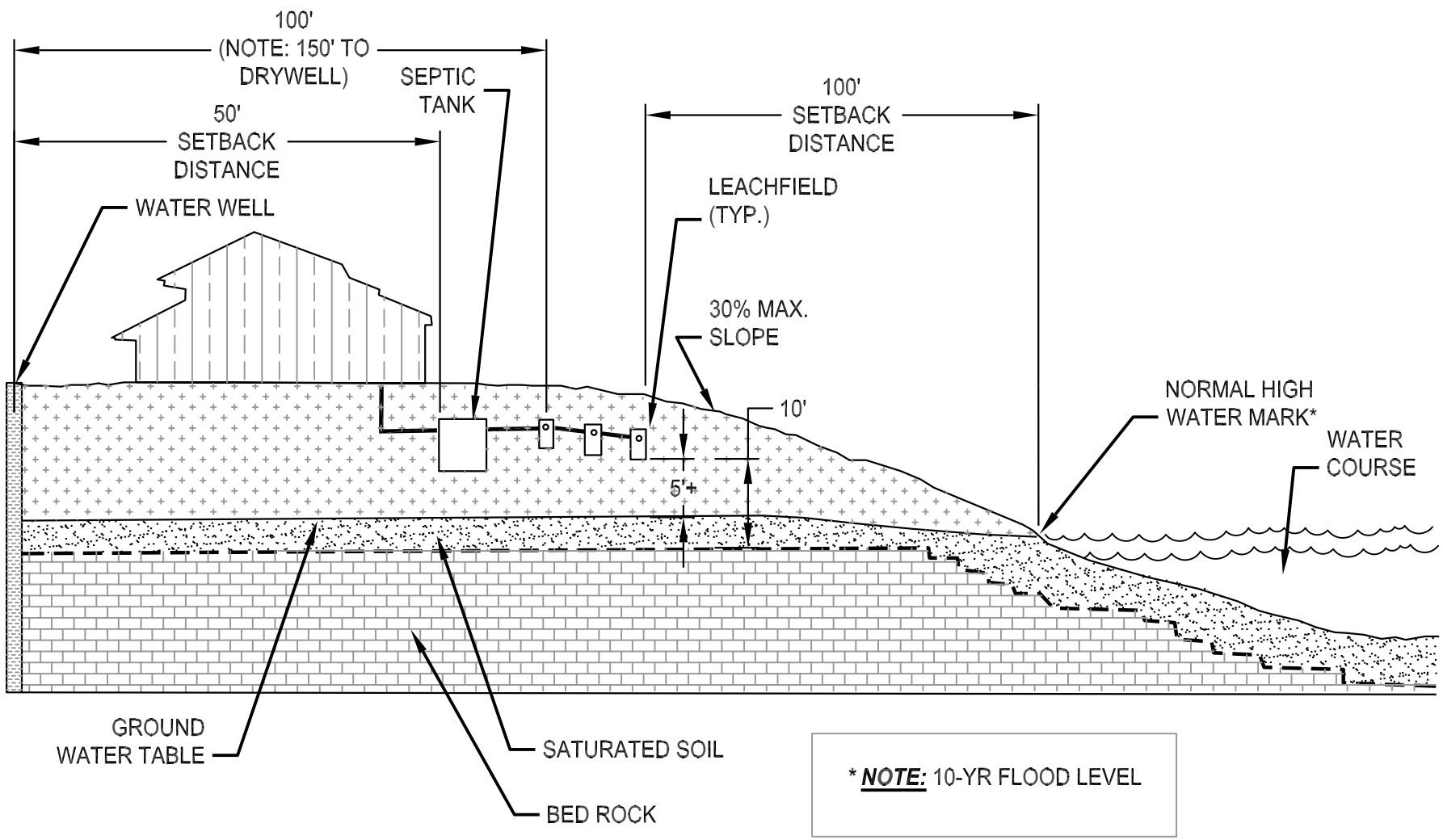
A typical septic system has two major component: (1) septic tank for collection, settling and digestion of sewage wastes from the building; and (2) disposal system (leachfield or drywell) for dispersal and absorption of septic tank effluent into the soil or geologic strata (see **Figure 4-1**).

***Septic Tank.*** The septic tank provides primary treatment of wastewater. Anaerobic bacteria consume the solids that settle to the bottom of the tank (sludge layer). The scum layer consists of grease, soap film and other materials that float to the surface of the tank.

Modern septic tanks are typically constructed of concrete, fiberglass or plastic with two compartments as illustrated in **Figure 4-2**. Septic tank sizes vary; however, for most single-family residences a 1,200-gallon tank is typical. The septic tank operates in a "full" condition, with the liquid level normally about three (3) inches below the inlet pipe (from the house plumbing). The septic tank provides several days of detention time for settling and digestion of sewage solids. The inlet and outlet ends of the tank have a "sanitary tee" to maintain a clear pathway for flow into and out of the tank, and to prevent floating material and other solids in the tank from passing into the disposal field where they can created obstructions or damage the absorption capacity of the soil. The outlet of the septic tank may be fitted with a plastic effluent filter that provides further straining or filtering of suspended particles (1/8-inch and larger).

The clarified effluent passes by gravity from the septic tank into a 4-inch diameter "tightline" that runs directly to the disposal field, or to a "distribution box" that spreads the effluent to different parts of the disposal field. Sewage odors and gases generated in the septic tank are vented back through the house plumbing system to the roof vent pipes. The septic tank is provided with an access port on the inlet and outlet end of the tank, over which manhole "risers" are installed from the top of the tank to (or near) ground surface to facilitate access for inspection and maintenance. Santa Barbara County requires all new and repaired/upgraded septic tanks to have access ports/risers within one foot of finished grade to facilitate servicing.

The septic tank is an entirely passive system and requires no special operational management other than maintaining acceptable household disposal practices. Santa Barbara County Public Health Department provides homeowners with a simple septic system reference guide, including a list of Dos and Don'ts (see **Appendix C**). Septic tanks require periodic inspection to check the tank conditions and clean the effluent filter on the outlet end of the tank, and occasional pump-out of the solids and scum that accumulate over time. Depending upon use, the recommended pump-out frequency for septic systems is every two to five years.

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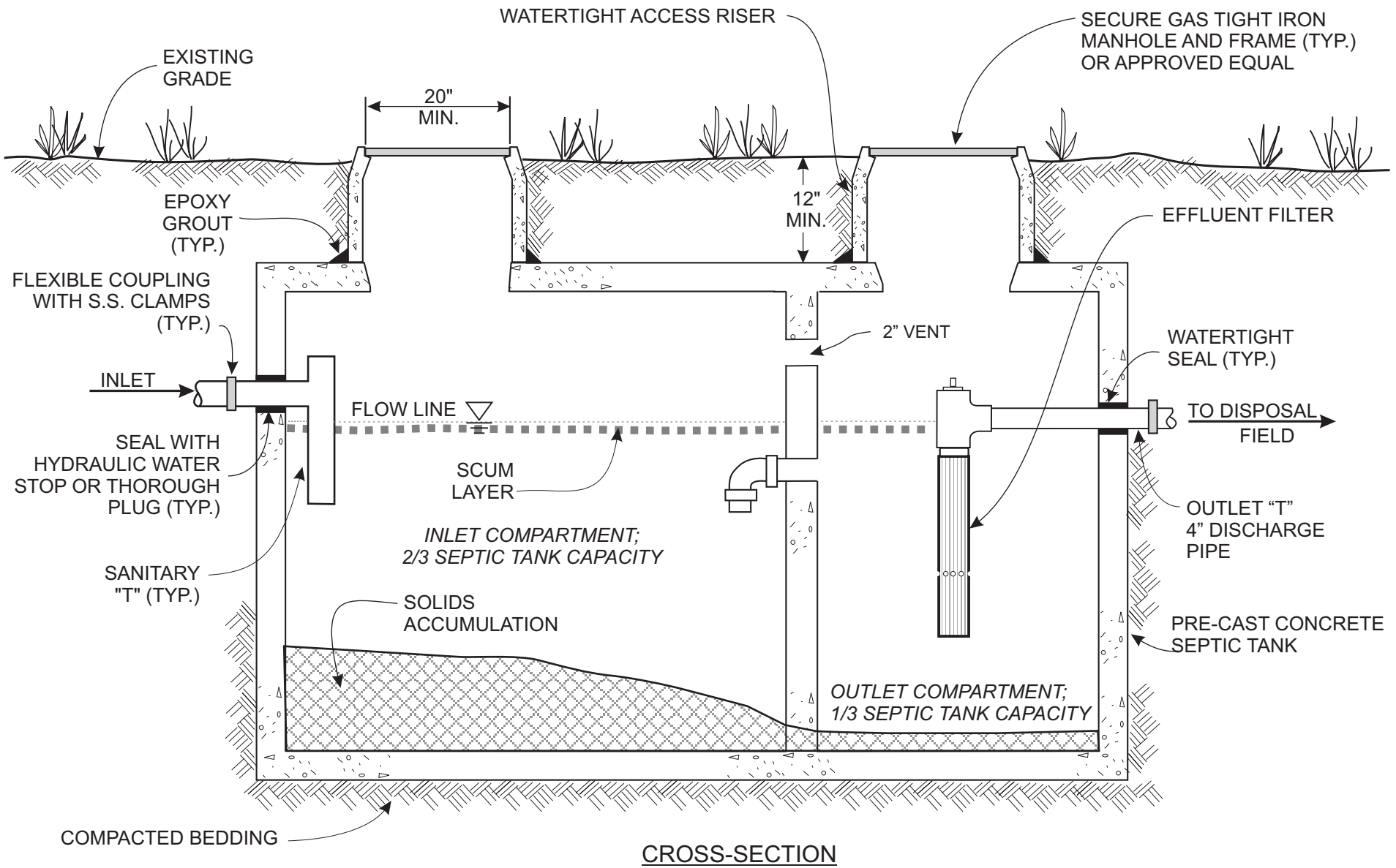
# TYPICAL SITING CONSIDERATION FOR ON-SITE SEWAGE DISPOSAL SYSTEMS

SANTA BARBARA COUNTY

FIGURE

4-1




CROSS-SECTION

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# TYPICAL SEPTIC TANK

SEPTIC SYSTEM SANITARY SURVEY
SANTA BARBARA COUNTY

FIGURE
4-2

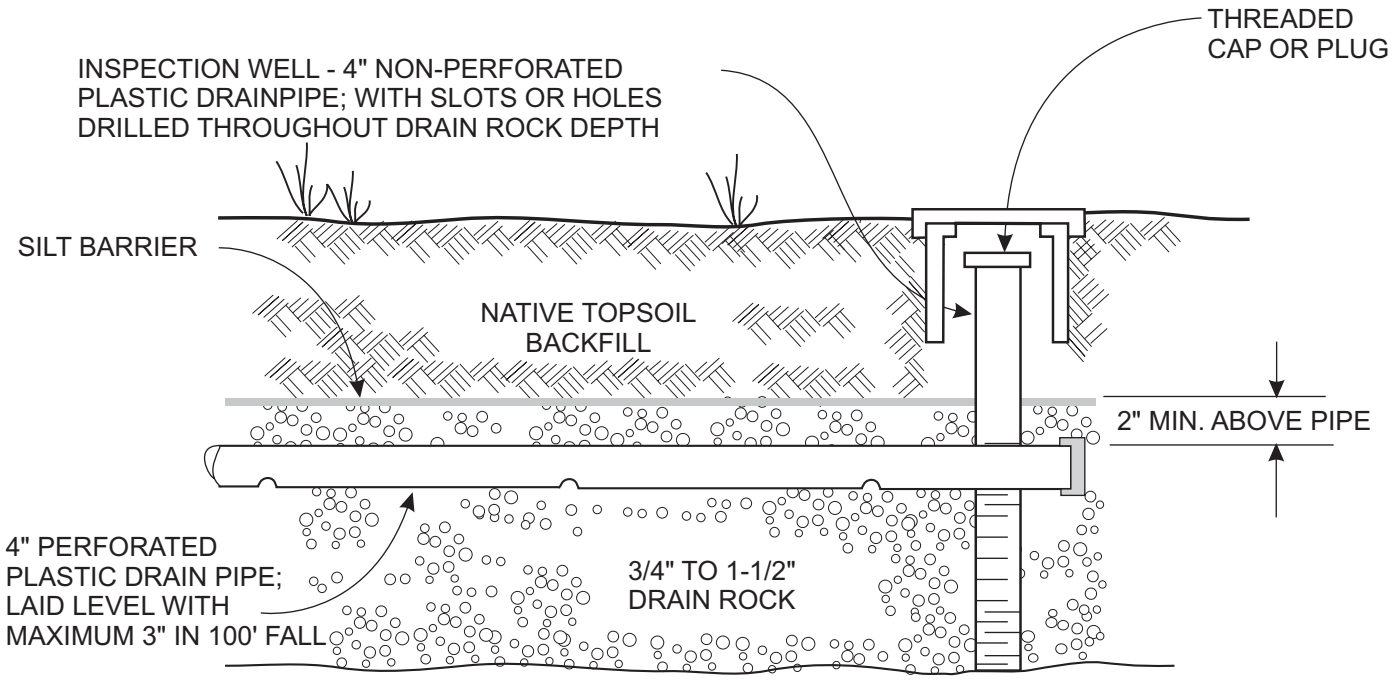
***Disposal System*.** Two types of conventional disposal systems are approved for use in Santa Barbara County: (1) leachfield and (2) drywell.

1. **Leachfield.** A leachfield (also termed "drainfield", "soil absorption field") consists of a series or network of perforated pipes installed in shallow rock-filled trenches. This is the preferred method of disposal in Santa Barbara County. A cross-section of a typical leaching trench is illustrated in **Figure 4-3**. The amount of trench length depends upon the soil permeability (i.e., percolation capacity) and the size of the house or building being served. Leachfield total lengths may range from 50 feet to several hundred feet. The effluent from the septic tank flows by gravity through the perforated pipes, exits through the holes in the pipe, and trickles through the rock or gravel where it is stored until absorbed by the soil. The leachfield is located in the unsaturated zone of the soil where the wastewater is absorbed and treated through physical, chemical and biological processes as it moves through the soil. The soil also acts as a natural buffer to filter out many of the harmful bacteria, viruses, and excessive nutrients, effectively treating the wastewater as it percolates through the unsaturated zone before it reaches the groundwater or nearby watercourses.

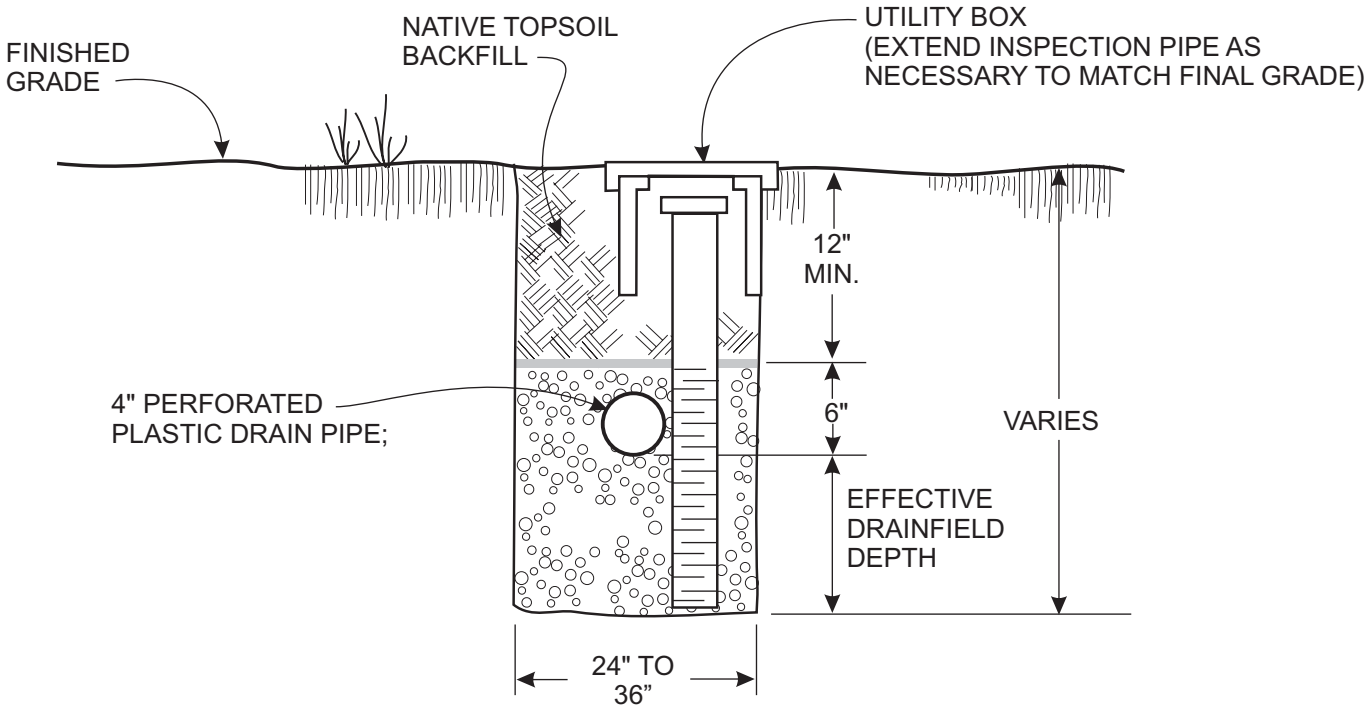
2. **Drywell.** In contrast with leachfields that spread the wastewater into the shallow soil horizons in a horizontal manner, drywells provide for discharge into the deep soils and geologic strata through vertical, rock-filled boreholes. A typical drywell is illustrated in **Figure 4-4**. It consists of a 4 to 6-foot diameter borehole, filled with drain rock, and provided with a 4-inch diameter perforated pipe in the center that extends from ground surface to the bottom. The typical depth of drywells is 30 to 40 feet; however, they may be as shallow as 10 to 12 feet, and there are some as much as 60 to 90-feet deep. The depth for each system is dependent upon the nature of the soil/geologic conditions and the required system capacity.

   Historically, hollow "seepage pits" were used in Santa Barbara County, and continue to be used in other areas of California, particularly in the southern part of the state. Hollow seepage pits are similar to drywells, except that instead of being backfilled with drain rock, they are constructed with brick or perforated concrete liners around the perimeter walls, and have a concrete "cap" near the surface. In response to a fatal accident involving the collapse of a deteriorated cap, seepage pits were banned by Santa Barbara County with the 1999 changes to the wastewater code. They are now required to be abandoned or converted to rock filled drywells upon discovery.

   In terms of effluent treatment, drywells are not as effective as leachfields. This is due to the fact that they discharge the wastewater to the deep soils zones and geologic strata where there is less oxygen and biological activity for chemical and biological breakdown/uptake of organic matter, bacteria and other wastewater constituents. Consequently, they rely primarily on physical filtering of the wastewater and they tend to have a shorter effective life. The clear advantage of




SIDE VIEW




END VIEW

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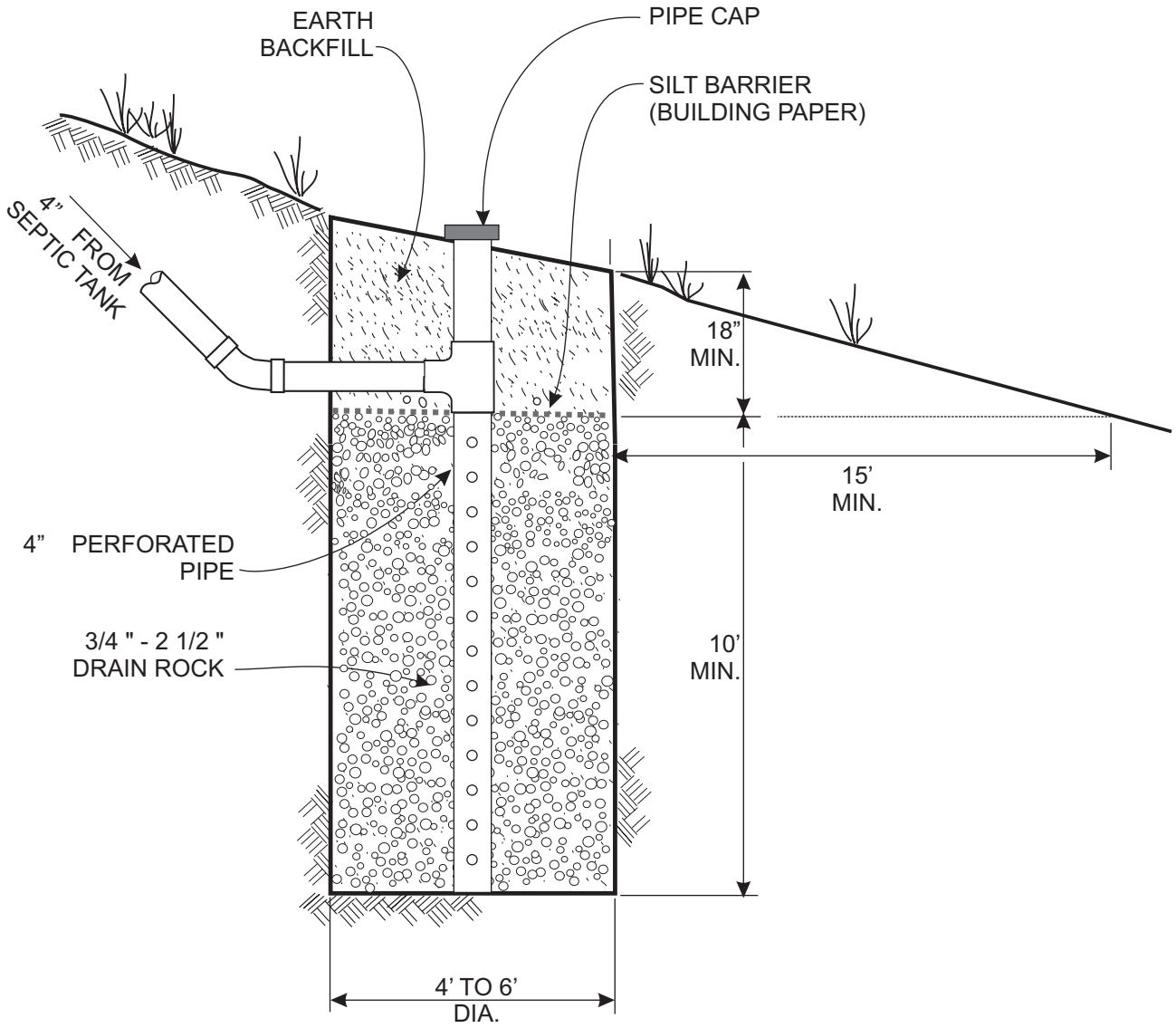
# TYPICAL LEACHING TRENCH

SEPTIC SYSTEM SANITARY SURVEY
SANTA BARBARA COUNTY

FIGURE
4-3

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# TYPICAL DRYWELL

SEPTIC SYSTEM SANITARY SURVEY
SANTA BARBARA COUNTY

FIGURE
4-4

drywells is that they take up relatively little area, allowing them to be used for small lots and steeper terrain. They cannot be used in high groundwater areas.

**Alternative Systems**

Beginning in the 1970s considerable attention has been given in the U.S. to the study and improvement of onsite sewage disposal system practices. In addition to fostering a better understanding of how conventional soil absorption systems function, this attention has led to the evolution of numerous "alternatives" to the conventional septic system. Technology advancements have also played an important part in the development or refinement of alternative designs. Many "alternative systems" are in use in different parts of California, particularly in northern parts of the state. There are only a small number of alternative systems (less than 10) in use in Santa Barbara County. However, with the recent enactment of enhanced nitrogen-removal treatment standards for the Toro Canyon Plan area, as well as expected elements of the AB 885 state standards process, greater use of alternative systems can be expected in Santa Barbara County in the near future.

Following is a brief review of some of the common alternative technologies in current use or that may have applicability in different parts of Santa Barbara County. Additional information on these technologies can be obtained from the National Small Flows Clearinghouse website at www.nsfc.edu.

***Pressure-Distribution Leachfield.*** This is a variation of a conventional leachfield system that uses a pump and small diameter pressure piping to achieve broad, uniform distribution of wastewater in the shallow soil zones for improved soil absorption and better treatment.

***Mound System***. This consists of an elevated sand bed with a gravel distribution bed covered by soil fill. It utilizes the shallow surface soils for broad distribution of effluent, and is used to overcome high water table and shallow soil conditions on flat or gently sloping terrain.

***At-Grade System.*** This system is similar to a mound system, except that it does not include the sand bed; the gravel distribution bed is placed directly on the scarified (i.e., plowed) soil surface. It is often used in conjunction with an enhanced or advanced treatment system (see below).

***Subsurface Drip Irrigation-Disposal***. This is a proprietary system for subsurface disposal of treated wastewater that uses special drip tubing designed especially for use with wastewater. The dripline is placed 6 to 12 inches below ground surface and makes use of the most biologically active soil zone for distribution, nutrient uptake and evapotranspiration of the wastewater.

***Evapotranspiration Systems***. These systems are sand/rock-filled beds that rely on evapotranspiration of the wastewater where percolation into the soil is not possible. They have applicability only in very dry (low rainfall) areas.

***Sand Filters***. Intermittent (single pass) and recirculating sand filters are used to provide additional or advanced treatment of septic tank effluent prior to discharge to the disposal system. They are used to improve or restore the capacity of the disposal field, reduce pathogenic bacteria and may provide additional nitrogen removal.

***Other Packed Bed Filters.*** This includes proprietary designs that function similar to sand filters. One type of system uses natural peat for the treatment media; another uses synthetic "textile" media. Subsurface flow wetlands are another variation that use a combination of rock media and wetland plants to treat the wastewater to a secondary level before discharge to the disposal system.

***Aerobic Treatment Units.*** This includes various proprietary designs that utilize forced air to oxidize the wastewater, promoting aerobic decomposition of the wastewater solids. These systems produce secondary quality wastewater for improvement in leachfield performance; they also provide varying degrees of nitrogen removal.

**Siting Requirements for Onsite Sewage Disposal Systems**

Following is a review of the key factors that affect the siting and functioning of onsite sewage disposal systems, including the applicable standards contained in the Basin Plan and/or Santa Barbara County regulations.

***Soils and Geology***

1. **Soils.** Soil suitability is the single most critical aspect of onsite sewage disposal. The soil provides the medium for the dispersal and treatment of wastewater discharged through sub-surface leachfield systems. This is accomplished mainly through a combination of physical filtering, biological and chemical processes, and dilution. In order to be effective, the soil must have reasonable permeability for water movement, sufficient amount of fine soil particles (i.e., silt, clay, and fine sand) for filtering and support of biological activity, adequate depth of soil above the water table (zone of aeration) for treatment to occur, and suitable drainage to prevent saturation or flooding. Septic system failures can occur as a result of: (a) the inability of soil to absorb the wastewater at a rate that matches the flow from the house; (b) inadequate treatment due to shallow soils and/or rapid percolation to the water table; or (c) seepage along a drainage course or cut slope due to inadequate lateral setback, shallow soils, and/or poor percolation. Soil conditions can vary within short distances. Detailed investigation of the soil is generally needed to determine the septic system suitability of any given site. At a minimum, proper investigation includes soil profile analysis to determine soil texture, structure and depth, percolation/permeability characteristics, and drainage of groundwater occurrence.

The Basin Plan recommends the evaluation of soil conditions to a depth of at least 4 to 5 feet below the bottom of the drainfield. The Basin Plan also requires that there be a minimum of 10 feet between the bottom of the leachfield or drywell and bedrock or other impervious layer.

2. **Geology.** The geology of an area is important to the suitability and performance of onsite sewage disposal systems by the way it influences topography and landforms, the type and characteristics of soils that develop at the surface, the occurrence and movement of sub-surface water, and slope stability. For example, more resistant rocks generally are associated with steep terrain, ridges and knolls, where the soils tend to be relatively shallow and, thus, limited for subsurface sewage disposal systems. Softer rock types, such as sandstones and shales, will weather to form deeper soil layers and deposits of eroded materials. However, soil permeability can vary widely, depending upon the degree of weathering that takes place (i.e., to form clays) and the mineralogy of the rock.

   The type and structure of the bedrock has a strong influence on groundwater conditions, which, in turn, affects the suitability and potential impacts of onsite sewage disposal. In hard rock areas, water movement is generally restricted to fracture zones, often referred to as the "secondary" permeability, which may offer little in the way of treatment and the potential for wastewater effects to be transported significant distances. Some rock types, such as sandstones, conglomerates, and limestones, have significant "primary" permeability, which provides for transmission of water through the interstices in the rock itself, where additional filtering and treatment can occur. Contacts between different rock types or layers are often avenues for the movement of sub-surface waters; and springs and seeps are often found where fractures and geologic contacts come to the surface. Where the underlying rock lacks significant primary or secondary permeability, a water table may form near the ground surface that interferes with the suitability and use of septic systems. Areas of steep slopes and weak rock types generally pose the greatest slope stability concerns and severe limitation for subsurface sewage disposal.

   The Basin Plan prohibits the use of onsite sewage disposal systems in soils or formations that contain continuous channels, cracks or fractures, unless a setback distance of at least 250 feet to any domestic water supply well or surface water is assured.

***Percolation.*** The percolation test is a commonly used method of evaluating hydraulic conductivity in soils and determining the suitability and proper sizing for an onsite sewage disposal system. Although criticized because of variability in results related to technique and weather conditions, it can be useful if used together with the soil profile data.

The Basin Plan requires, for conventional leachfield systems, that the percolation rate be within the range of 1 to 120 minutes per inch (MPI), unless the lot size is two acres or greater. For percolation rates faster than 1 MPI greater separation distances to groundwater and/or water wells is required as listed below under the groundwater discussion. Also, for percolation rates slower than 60 MPI, leachfields are required to be sized larger based on a very conservative (safe) design factor of 0.1 gpd/ft$^2$ or less.

***Groundwater.*** High groundwater is another factor that affects the ability of the soils to absorb and provide treatment for the effluent. A high water table can reduce the effectiveness of the soil treatment zone, can be a conduit for groundwater or surface water contamination, and can also cause the effluent to backup and rise to the surface.

The Basin Plan groundwater separation requirements for leachfields vary according to the soil percolation rate as listed below, with faster percolation rates requiring greater groundwater separation distances.

| Percolation rate (MPI) | Vertical separation to groundwater (ft) |
|---|---|
| < 1 | 50[1] |
| 1 – 4 | 20[1] |
| 5 – 29 | 8 |
| > 30 | 5 |

For drywells (seepage pits) the required depth to groundwater varies from 10 feet to 50 feet, depending on the coarseness of the soils; i.e., coarser soils require greater separation distances. For community systems[2], the Basin Plan requires a minimum drywell-groundwater separation distance of 15 feet.

***Slope***. Slope stability, erosion hazards and the potential for downslope seepage or breakout of effluent pose limitations on the steepness of the slope where onsite systems can be located. There are also practical limits for construction on steep slopes.

The Basin Plan slope limitation for onsite sewage disposal systems is 30 percent.

***Setbacks***. Per the Basin Plan, minimum horizontal setback distances between onsite sewage disposal systems and various water features are as follows:

1. Domestic Water Wells 100 feet
2. Watercourse 100 feet
3. Reservoir 200 feet
4. Springs 100 feet

[1] Unless a setback distance of at least 250 feet to any domestic water supply well or surface water is assured.

[2] Community systems are defined as: (1) residential wastewater treatment systems for more than 5 units or more than 5 parcels; or, (2) commercial, institutional or industrial systems to treat sanitary wastewater equal to or greater than 2,500 gallons per day (average daily flow).

***Disposal System Reserve Capacity.*** At a minimum, the Basin Plan requires that a 100-percent reserve disposal area be identified and set aside for future use. For community systems, a dual (200%) system is required to be installed, with an additional third disposal field area identified and reserved for future use. This latter requirement was also adopted by the County for all new development in the Toro Canyon Plan area. Dual systems allow each field to "rest" while the other is in use. This has the benefit of extending the life of the system, assuring that no damage is done to the "reserve" area, and providing the ability to have a failsafe area immediately available in the event of a problem with one of the two disposal fields.

***Density Considerations and Cumulative Impacts.*** High-density development using onsite systems can contribute to elevated nitrogen concentrations in the groundwater and/or a general rise or mounding of the water table, both of which are undesirable. Such problems are generally avoided by planning for sufficiently large lots sizes where onsite sewage disposal systems are used. The Basin Plan recommends a minimum lot size of one acre for creation of new lots served by onsite sewage disposal systems. As noted in the preceding paragraphs, the Basin Plan also incorporates lot size limitations into various individual septic system siting criteria (e.g., soil and percolation). For community systems the Basin Plan sets a discharge limit of 40 grams per day of total nitrogen, on average, per ½-acre of total development area overlying groundwater recharge areas, except where a local wastewater management plan has been adopted that includes other standards. To date, no local wastewater management plans have been adopted for any septic system areas within Santa Barbara County.

***Alternative Systems.*** The Basin Plan recognizes and allows for the use of alternative systems provided they are properly designed, operated and maintained. Although a formal program to oversee alternative systems has not yet been instituted in Santa Barbara County, alternative system programs utilizing "operating permits" have been established in several other counties in the state. Under these programs, alternative systems are generally required to conduct routine monitoring or "checks" on system operations, and to file periodic reports with the county and/or Regional Board. The monitoring is intended to keep track of such things as wastewater flow rate and volumes, treatment effectiveness, disposal field performance and conditions, and, in some cases, downstream/downgradient water quality conditions. Monthly, quarterly and annual monitoring and reporting requirements are typical, depending on the type, size and location of the system.

## SEPTIC SYSTEM USAGE IN SANTA BARBARA COUNTY

### GIS Mapping

In California it is estimated that approximately 1.2 million households are served by onsite sewage disposal systems. However, many of the systems are very old; and good records are not available regarding the location or nature of many, if not most, of these

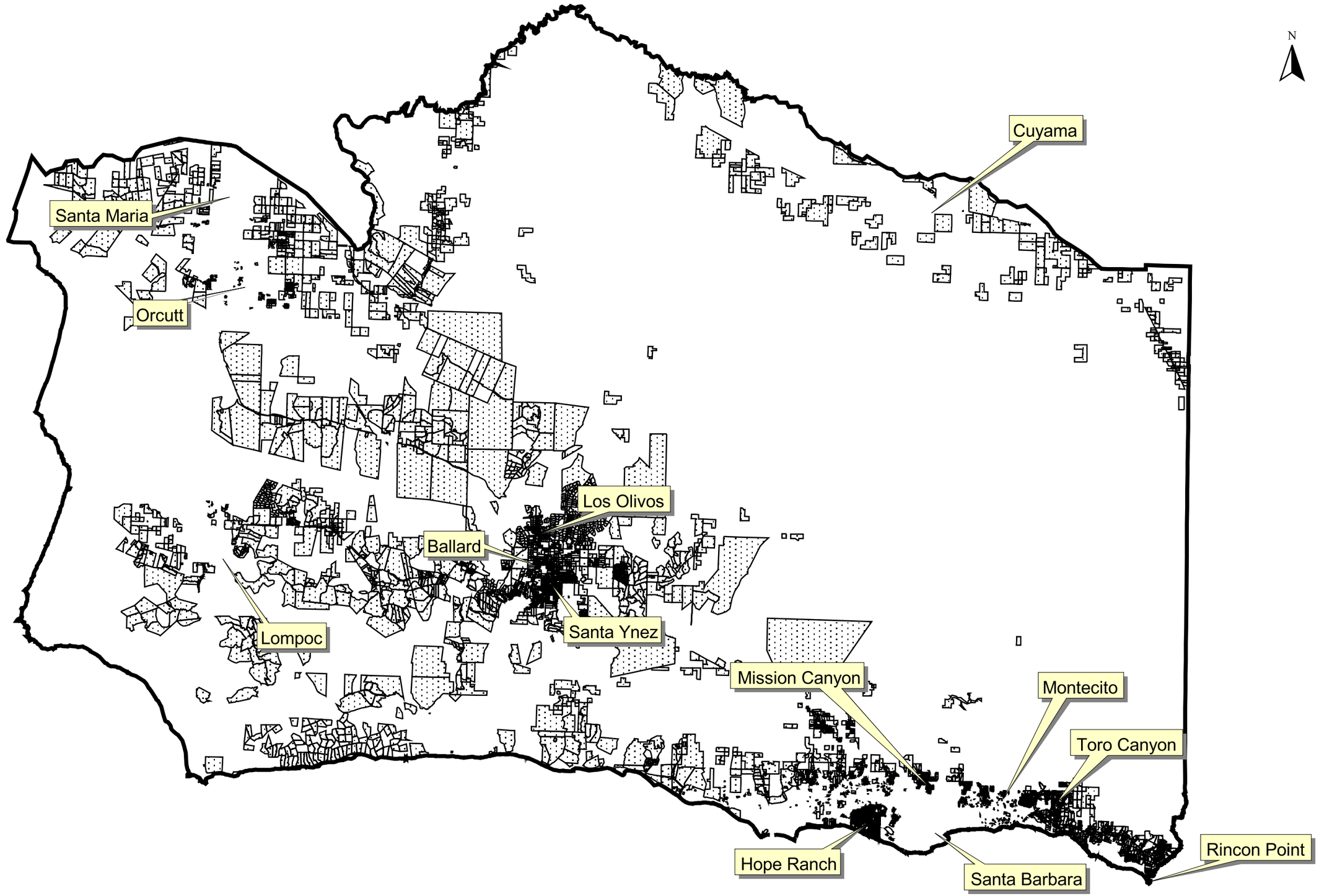
systems. This was the case in Santa Barbara County in early 2000, when the County undertook a project using Geographic Information System (GIS) analysis to begin the process of locating, characterizing and tracking the septic systems in the unincorporated area of the County. The work was conducted by GeoDigital Mapping Incorporated under contract and working with the Santa Barbara County Health Department. Largely by process of elimination, and with the assistance of various sanitary districts and the County Assessor's data, the study was able to identify developed parcels within the unincorporated areas of the County that are not presently connected to public sewers. From this, it was inferred that these represent parcels that currently (at the time of the study) are served by onsite sewage disposal systems of some type.

**Table 4-1** summarizes the basic data obtained from this study regarding wastewater treatment methods (by sanitary district area) for all parcels in the unincorporated areas of the County, including both public sewerage and septic system usage. As indicated, the study determined that there are an estimated 8,749 properties in unincorporated areas served by septic systems, plus an additional 581 parcels within sewer districts that also have septic systems, despite the availability of sewers. **Figure 4-5** shows the geographic distribution of the septic system parcels in the County based on these data.

In addition to developing the basic GIS mapping of septic system locations, the study by GeoDigital Mapping Incorporated, also entailed a preliminary "risk analysis", which involved comparing septic system usage to various sensitive environmental features such as stream corridors, floodplains, and wetlands, as well as identified or suspected problem areas in the County. The results of this work are presented in the final report of the project titled *"Implementation of a GIS for the Assessment of Septic System Risks in Santa Barbara* County" (April 2000). The Health Department has used this work as a springboard to begin the "hard file" conversion of years of septic system permit history into the Department's permit software program and the GIS database. The Septic System Sanitary Survey helped advance this effort and also was able to take advantage of some of the first "batches" of information converted to the GIS database system.

**Identification of Focus Areas**

In viewing **Figure 4-5** it can be seen that septic system usage in Santa Barbara County includes a large number of systems scattered widely throughout the County, with heavy concentrations around the main population areas of the South Coast and the Santa Ynez Valley and, to lesser extent, the Orcutt and Santa Maria areas. A key part of the Sanitary Survey was to review the distribution of septic systems throughout the County and identify particular areas on which to focus the study effort. This was done through various reconnaissance surveys, interviews with Health Department and Regional Water Board staff, and review of extensive background file information and basic physical data. This process resulted in the identification of 24 "Focus Areas", which encompass the heaviest concentrations of septic systems and the areas of potentially greatest concern from a public health and water quality perspective. Selection of the Focus Areas does not suggest that septic system problems and issues don't exist elsewhere in the County; every individual septic system in the County requires care in siting, design and maintenance.




PARCELS ON SEPTIC SYSTEMS

1 0 1 2 Miles

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SEPTIC SYSTEM USAGE
IN SANTA BARBARA COUNTY

FIGURE
4-5

**TABLE 4-1**
**SUMMARY OF WASTEWATER TREATMENT METHODS BY SANITARY DISTRICT IN UNINCORPORATED AREAS OF SANTA BARBARA COUNTY**
**(Source: Geodigital Mapping Incorporated, April 2000)**

| Sanitary District | Properties with Sewer Service | Properties with Septic Service | Septic Properties with Available sewer service* |
|---|---|---|---|
| Carpinteria (unincorporated services area) | 394 | 144 | 144 |
| Goleta | 10,686 | 168 | 166 |
| Goleta West/Embarcadero | 4,907 | 25 | 23 |
| Laguna | 9,577 | 113 | 71 |
| Lompoc (unincorporated service area) | 1 | 0 | 0 |
| Los Alamos | 374 | 4 | 4 |
| Montecito | 2,849 | 605 | 138 |
| Mission Canyon | 813 | 231 | 0 |
| Mission Hills | 1,184 | 17 | 0 |
| New Cuyama | 241 | 0 | 0 |
| Santa Barbara (unincorporated service area) | 225 | 0 | 0 |
| Santa Ynez | 740 | 34 | 34 |
| Summerland | 443 | 5 | 1 |
| Vandenberg Village | 2,264 | | 0 |
| No District | 5 | 7,403 | 0 |
| **TOTAL** | **34,703** | **8,749** | **581** |

* defined as having sewer main in street adjacent to parcel

The Focus Areas encompass defined neighborhoods or geographical areas warranting special attention; they also provide the basis for presenting the full range of conditions and problems that need to be addressed in regard to septic system usage in the County.

The locations of the selected Focus Areas are indicated in the overall County map shown in **Figure 4-5**. They are also showed in somewhat greater detail in **Figures 4-6, 4-7, 4-8** and **4-9**. Detailed 8 ½ x 11 GIS maps of each Focus Area are provided in **Appendix D**, showing individual parcel boundaries, septic system information, and other pertinent geographic data. **Tables 4-2** and **4-3** provide a listing and summary of key characteristics of each Focus Area, including land area, number of parcels, median lot size, system age categories, and a brief description of the key factors for inclusion of the area on the list. **Table 4-3** provides additional facts about each area related to the type of septic system (leachlines vs. drywells) and more detailed information on lot size distribution. The data included in these tables were obtained mainly from County permit files, augmented with data collected from Septic System Inspection Reports and Homeowner Surveys (see **Section 5**).

As indicated in **Tables 4-2** and **4-3**, the Focus Areas encompass approximately 4,300 septic systems, or approximately 45% of the total number of systems in the County. This includes roughly 2,850 parcels in the South Coast and about 1,450 parcels in the Santa Ynez Valley and North County. The largest numbers of systems covered in the list are in Hope Ranch, Montecito Area, Santa Ynez and Los Olivos. The smallest Focus Areas identified are Rincon Point, several small subdivisions in the Goleta foothills area and near Orcutt.

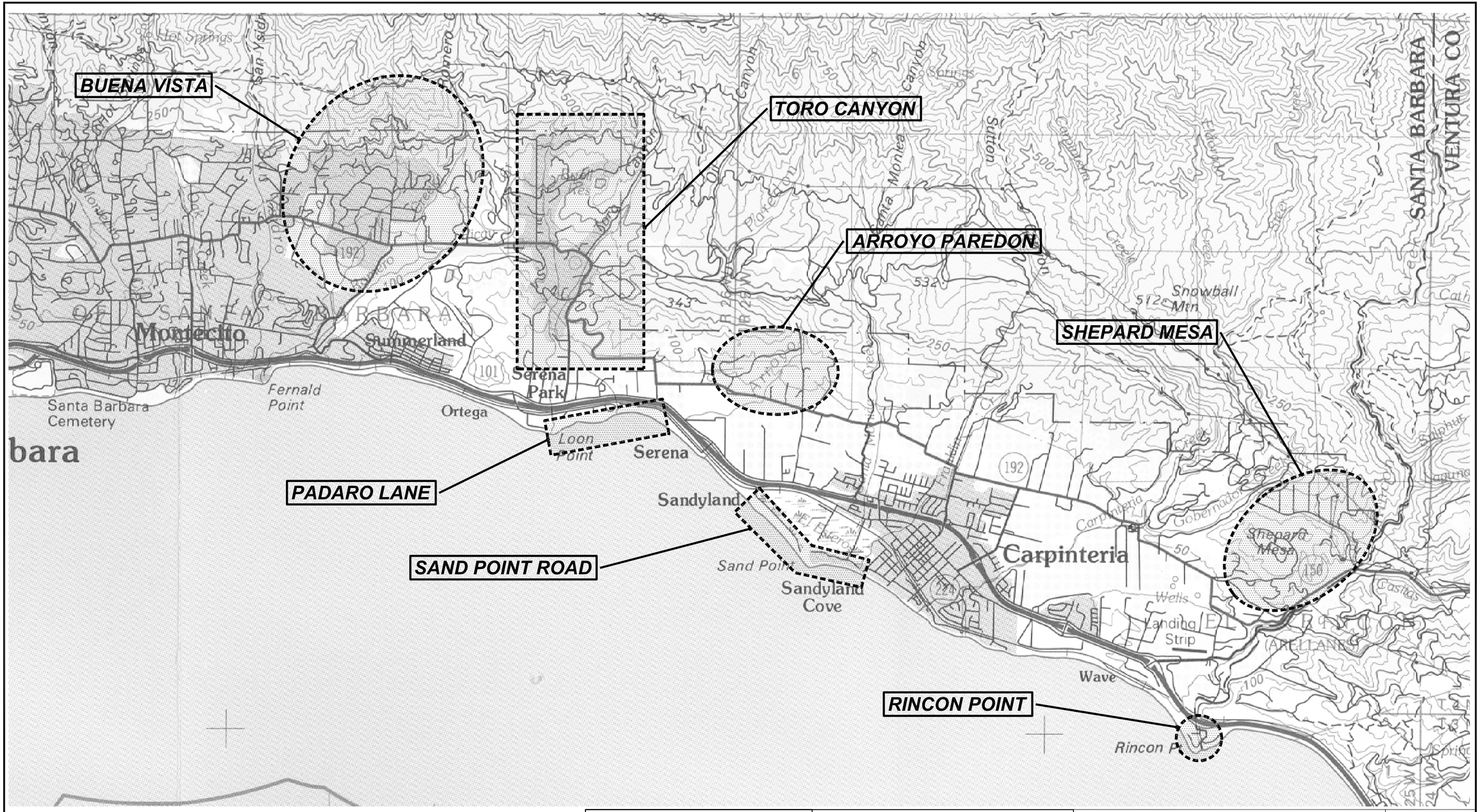
Special Problem areas on the list of Focus Areas include:

1. Ballard
2. Los Olivos
3. Mission Canyon Area
4. Adjacent to the Town of Santa Ynez
5. Janin Acres
6. Shepard Mesa

Average lot sizes range from less than 0.5 acres, for Rincon Point and several small remaining pockets of septic systems in Santa Barbara in the Sunset St./Carol Ave. Area and Vista Vallejo, to more than 3.5 acres for several rural residential areas, including Shepard Mesa, Arroyo Paredon, Toro Canyon and Upper Fairview near Goleta. The typical lot size in most areas is about one acre.

Generally, the vast majority of septic systems in the Focus Areas are more than 10 years old and do not have septic system permit records on file with the Health Department.

From available information (including permit files, inspection reports and survey forms) there appears, on the whole, to be generally an even split between the use of leachlines and drywells for properties within the Focus Areas, in spite of the fact that the County

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| Proj. No: | 21029 |

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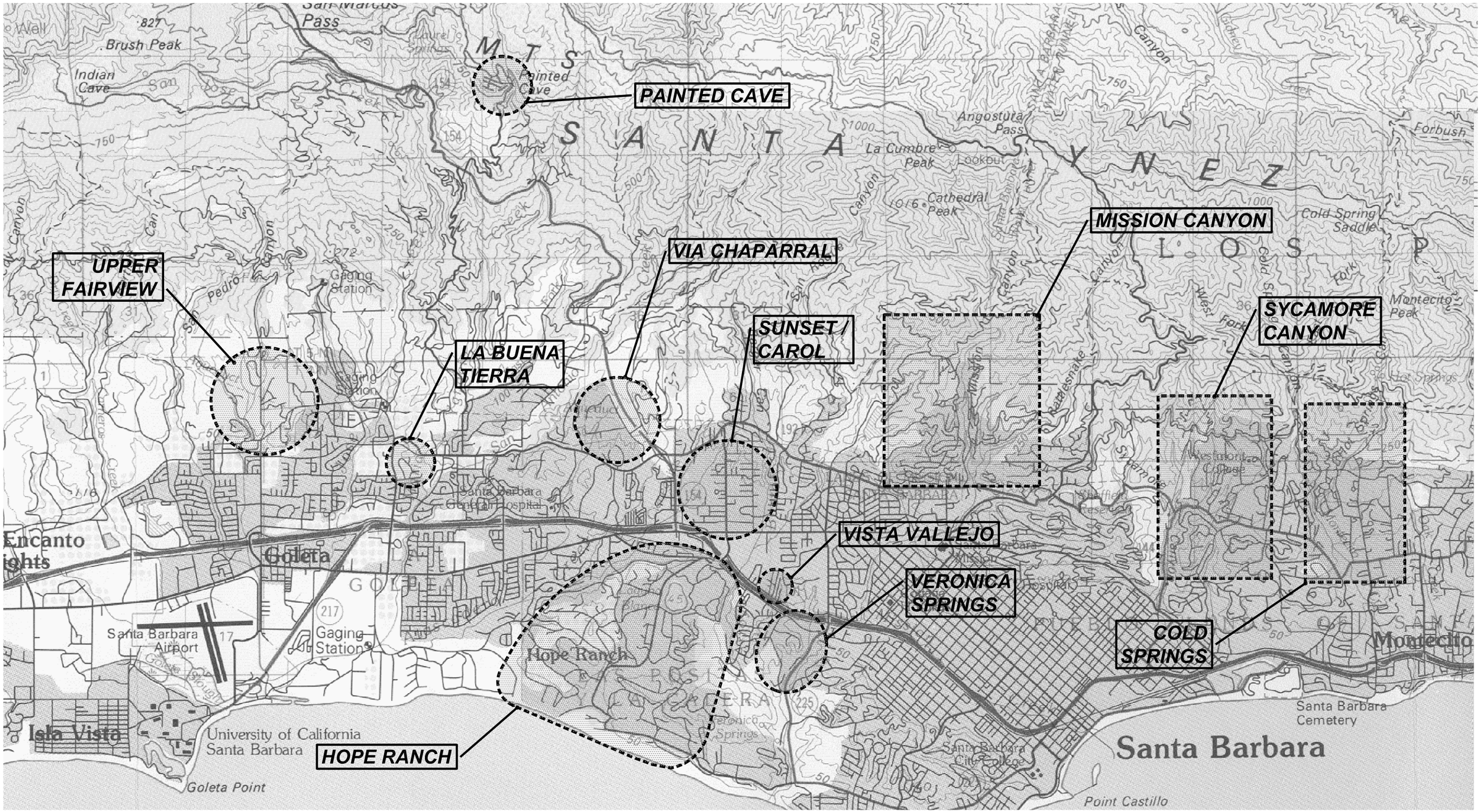
# FOCUS AREAS
## SEPTIC SYSTEM SANITARY SURVEY
## SANTA BARBARA COUNTY
SANTA BARBARA, CALIFORNIA

FIGURE
4-6

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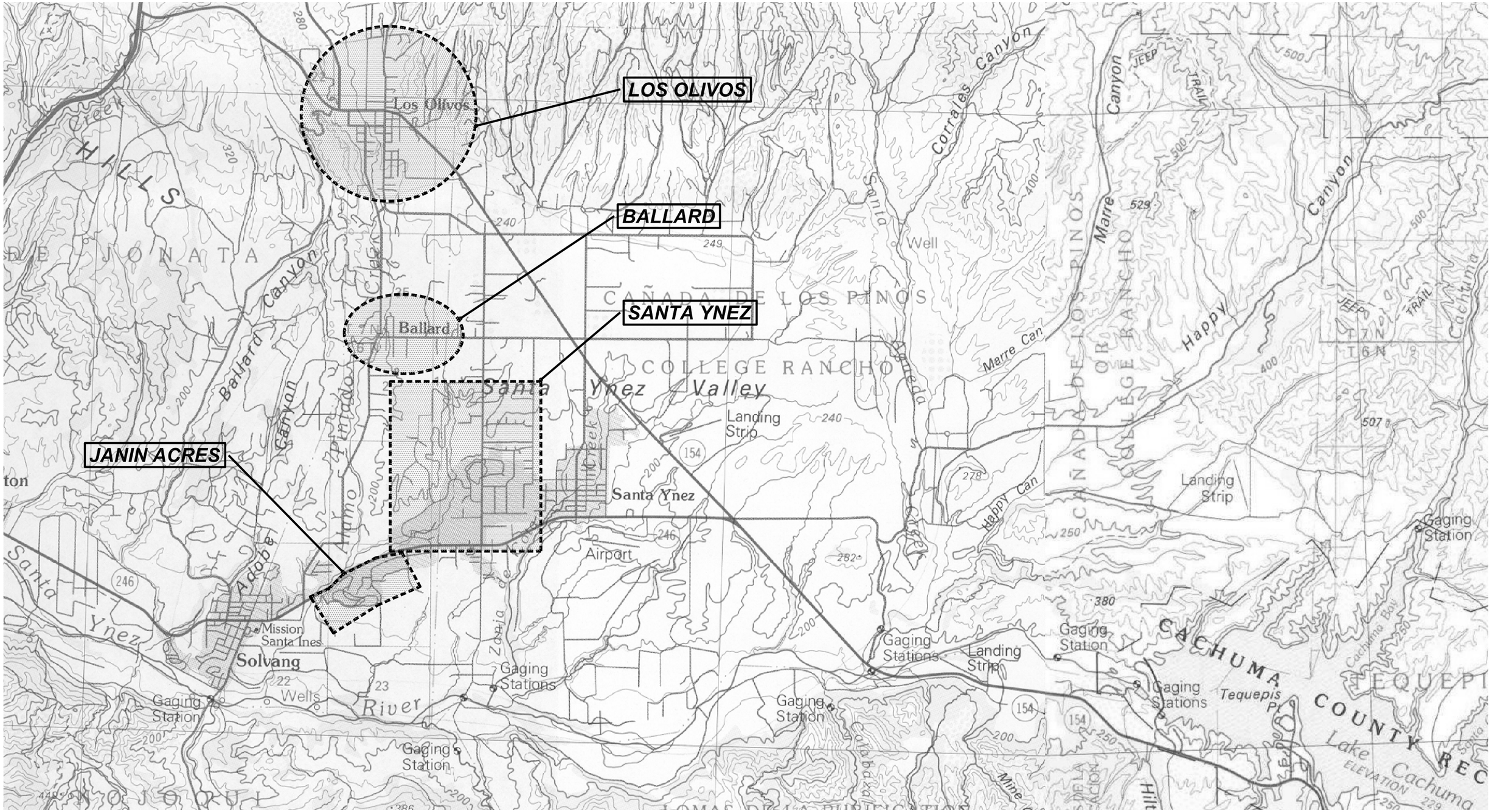
# FOCUS AREAS
## SEPTIC SYSTEM SANITARY SURVEY
## SANTA BARBARA COUNTY
SANTA BARBARA, CALIFORNIA

FIGURE
4-7

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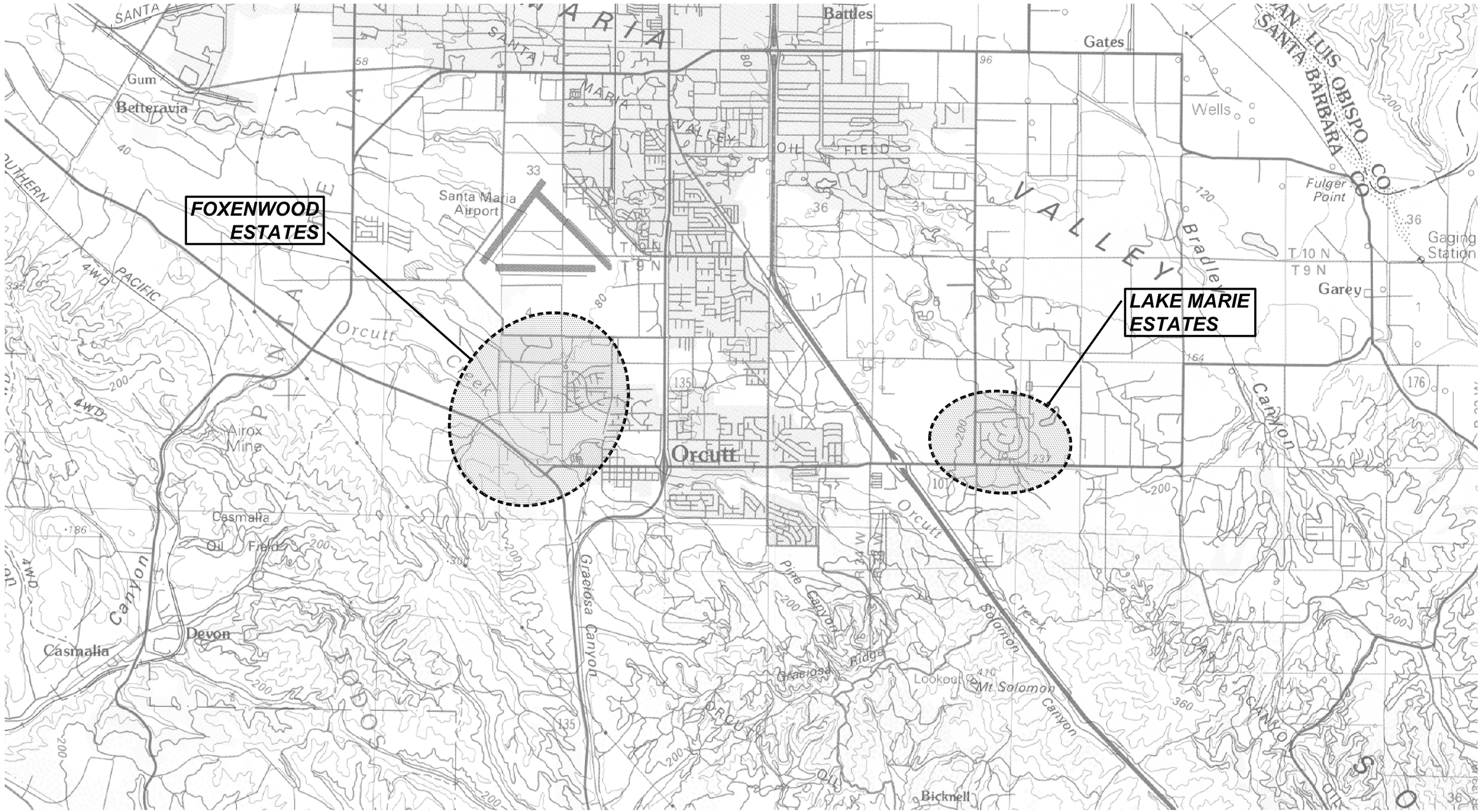
# FOCUS AREAS
## SEPTIC SYSTEM SANITARY SURVEY
## SANTA BARBARA COUNTY
SANTA BARBARA, CALIFORNIA

FIGURE
4-8

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# FOCUS AREAS
## SEPTIC SYSTEM SANITARY SURVEY
## SANTA BARBARA COUNTY
SANTA BARBARA, CALIFORNIA

FIGURE
**4-9**

**TABLE 4-2**
**FOCUS AREA DESCRIPTION**

| Focus Area | Area (Acres) | Number of Septic Systems | | | Description |
|---|---|---|---|---|---|
| | | Total | < 10 years old | Median Lot Size | |
| **CARPINTERIA AREA** | | | | | |
| **Rincon Point** | 10 | 36 | 10 | 0.3 | Beachfront development area at Santa Barbara-Ventura County line; high groundwater conditions, small lots abutting Rincon Creek and ocean. Nearshore ocean waters listed as 303(d) impaired water body for pathogens; prior water quality studies Lower Rincon Creek Watershed Study (DNA study) and South Coast Characterization Study. Sewer study in progress. |
| **Shepard Mesa** | 448 | 119 | 26 | 3.8 | Special Problem Area; large-lot rural residential area; Rincon Creek and Carpinteria Creek watershed |
| **Arroyo Paredon** | 303 | 84 | 14 | 3.6 | Semi-rural area near Carpinteria in area of orchards and greenhouses near Foothill Road. Drains via Arroyo Paredon Creek to ocean at Serena area. |
| **Sand Point Rd** | 85 | 70 | 23 | 1.2 | Beachfront area between Carpinteria Marsh and Pacific Ocean along Sand Point Road and Avenue Del Mar; small lots on dune sands with high groundwater conditions; preliminary sewer feasibility study completed by Carpinteria Sanitary District. |
| **Padaro Lane** | 47 | 53 | 19 | 0.9 | Beachside area east of Loon Point (Summerland); many beachfront lots on dune sands with high groundwater conditions; preliminary sewer feasibility study completed by Carpinteria Sanitary District. |
| **Toro Canyon** | 1,058 | 297 | 57 | 3.6 | Toro Canyon Plan Area; medium to large lot rural residential area; difficult soil and topographic constraints and close proximity to East and West Toro Creek. Special septic system requirements adopted for area in Toro Canyon Plan. |
| **MONTECITO AREA** | | | | | |
| **Buena Vista Creek Area** | 544 | 340 | 77 | 1.6 | Large semi-rural residential area located above E. Valley Road in Romero Creek and Buena Vista Creek drainage basins. Very high density of septic systems on small lots in vicinity of Orchard Avenue and Tabor Lane; difficult terrain and soil conditions in higher elevations; located in Montecito Sanitary District. |
| **Cold Springs Area** | 379 | 141 | 30 | 2.7 | Semi-rural residential area located above E. Valley Road in Cold Springs-Montecito Creek drainage basins. Difficult terrain and soil conditions in higher elevations; located in Montecito Sanitary District. |
| **Sycamore Creek Area** | 340 | 175 | 27 | 1.9 | Semi-rural residential area located above Sycamore Canyon Road adjacent to Santa Barbara; medium to large lots; difficult terrain and soil conditions in higher elevations; creek encroachment-setback problems; located in Montecito Sanitary District. |

**TABLE 4-2**
**FOCUS AREA DESCRIPTION**

| Focus Area | Area (Acres) | Number of Septic Systems | | | Description |
|---|---|---|---|---|---|
| | | Total | < 10 years old | Median Lot Size | |
| **SANTA BARBARA AREA** | | | | | |
| **Mission Canyon** | 485 | 253 | 43 | 1.9 | Special Problem Area; large semi-rural residential area adjacent to Santa Barbara in generally steep terrain with difficult soil and geologic conditions for septic systems; several alternative septic system designs (evapotranspiration systems) used to overcome constraints; drains to Mission Creek through Botanical Gardens, which is listed as 3030(d) impaired water body for pathogens; prior water quality sampling data from South Coast Characterization Study and Project Clean Water. |
| **Vista Vallejo** | 12 | 49 | 4 | 0.2 | Pocket of small residential lots surrounded by Santa Barbara urban area near Santa Barbara Golf Club; many old septic systems 40+ years old; located in Arroyo Burro Creek watershed. |
| **Veronica Springs** | 82 | 77 | 21 | 1.1 | Semi-rural residential area on hilly terrain near mouth of Arroyo Burro Creek; some parcels border tributary stream; variable to difficult soil and geologic conditions for septic systems; Arroyo Burro Creek listed as 303(d) impaired water body for pathogens. |
| **Sunset St/Carol Av Area** | 25 | 84 | 11 | 0.3 | Pocket of small residential lots surrounded by Santa Barbara urban area near La Cumbre Road; many very small lots with limited septic system repair options; local water supply wells potentially at risk. |
| **Hope Ranch** | 1,947 | 809 | 190 | 2.4 | Medium to large-lot semi-rural residential community on rolling hills and coastal terraces west of Santa Barbara; drains via local tributary stream to ocean, Arroyo Burro Creek and Goleta area to west; mix of older and new homes with significant equestrian uses. |
| **GOLETA AREA** | | | | | |
| **La Buena Tierra Area** | 31 | 27 | 2 | 1.2 | Small pocket of semi-rural residences at north edge of Goleta; drains through orchards and urban area to San Jose and Maria Ygnacio Creek; moderate to good conditions for septic systems. |
| **Via Chapparal/La Paloma Ave** | 102 | 59 | 13 | 1.7 | Rural residential area in foothills north of Goleta near Highway 154; rolling hills with numerous small seasonal drainage channels; moderate to difficult conditions for septic systems. |
| **Upper Fairview Area** | 397 | 97 | 8 | 4.1 | Rolling foothills and creekside area at north edge of Goleta on Vegas Creek; includes Holliday Hills subdivision and La Goleta Road area. Moderate to poor soil and geologic conditions for septic systems; includes some multi-family residential properties and commercial business (Infogenesis). |
| **Painted Cave Area** | 44 | 78 | 0 | 0.6 | Small parcels located in steep, rugged terrain near Painted Cave area and San Marcos Trout Club; older systems for homes built on National Forest; very poor/difficult conditions for septic systems. |
| **SOUTH COUNTY TOTAL** | | **2,848** | **575** | | |

**TABLE 4-2**
**FOCUS AREA DESCRIPTION**

| Focus Area | Area (Acres) | Number of Septic Systems | | | Description |
|---|---|---|---|---|---|
| | | Total | < 10 years old | Median Lot Size | |
| **SANTA YNEZ AREA** | | | | | |
| **Los Olivos** | 280 | 343 | 105* | 0.8 | Special Problem Area; large number of small to very small lots in densely developed septic town setting; shallow groundwater in large portions of town; drywells discharge directly to water table; groundwater nitrate impacts documented; recommended for wastewater management plan by Regional Water Quality Control Board; prior septic tank maintenance study; dissected by Alamo Pintado Creek, tributary to Santa Ynez River. |
| **Ballard** | 173 | 129 | 2 | 1.3 | Special Problem Area; medium to large-lot rural town; medium to high density of septic systems; fair to good conditions for septic systems; many older developed properties with possible code compliance problems; adjacent to Alamo Pintado Creek, tributary to Santa Ynez River. |
| **Santa Ynez Area** | 1,610 | 669 | 16 | 2.4 | Large number and density of semi-rural and rural residential development on east side of Santa Ynez; soil conditions range from good to very poor due to undulating topography and high (perched) groundwater conditions caused by deposition from old stream meanders. |
| **Janin Acres** | 207 | 98 | 3 | 2.1 | Special Problem Area; rural residential subdivision and some commercial properties, located between Santa Ynez and Solvang; shallow restrictive soils favoring deep trenches and drywells have apparently contributed to elevated nitrate levels in groundwater/local water supply wells (Rancho Marcelino Water Company). |
| **NORTH COUNTY** | | | | | |
| **Lake Marie Estates** | 134 | 181 | 4 | 0.7 | Large semi-rural subdivision located east of Orcutt; relatively small lots in fair to good soil conditions; many older systems and some localized problems due to restrictive (slowly permeable) subsoils. |
| **Orcutt** | 98 | 38 | 0 | 2.6 | Large rural residential lots located west of Orcutt; fair to good soil conditions; older systems and possible localized problems due to restrictive (slowly permeable) subsoils. |
| **NORTH COUNTY TOTAL** | | **1,458** | **130** | | |
| **GRAND TOTAL** | | **4,306** | **705** | | |

# TABLE 4-3
# FOCUS AREA SEPTIC SYSTEM DETAILS

| FOCUS AREA | Types of Septic Systems* | | | | | Septic System Lot Sizes (Acres) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Leachlines | Drywells | | | | | | | |
| | Total Systems | Total Systems | Depth of drywell | | | Average | ≤0.5 | >0.5 and ≤1 | >1 |
| | | | Min | Max | Ave | | | | |
| **CARPINTERIA AREA** | | | | | | | | | |
| **Rincon Point** | 9 | 1 | 40 | 40 | 40 | 0.3 | 35 | 0 | 1 |
| **Shepard Mesa** | 13 | 13 | 20 | 40 | 21 | 3.8 | 6 | 36 | 77 |
| **Arroyo Paredon** | 10 | 6 | - | - | - | 3.6 | 4 | 43 | 38 |
| **Sand Point Rd** | 21 | 2 | - | - | - | 1.2 | 18 | 19 | 33 |
| **Padaro Lane** | 14 | 9 | 5 | 12 | 18 | 0.9 | 34 | 5 | 13 |
| **Toro Canyon** | 53 | 29 | 16 | 60 | 42 | 3.6 | 38 | 67 | 192 |
| **MONTECITO AREA** | | | | | | | | | |
| **Buena Vista Creek Area** | 81 | 41 | 10 | 72 | 34 | 1.9 | 76 | 92 | 172 |
| **Cold Springs Area** | 35 | 10 | 30 | 47 | 39 | 2.7 | 1 | 20 | 120 |
| **Sycamore Creek Area** | 19 | 20 | 30 | 55 | 42 | 1.9 | 4 | 65 | 106 |
| **SANTA BARBARA AREA** | | | | | | | | | |
| **Mission Canyon** | 40 | 34 | 20 | 85 | 42 | 1.9 | 8 | 98 | 147 |
| **Hope Ranch** | 105 | 148 | 12 | 65 | 32.5 | 2.4 | 9 | 87 | 707 |
| **Veronica Springs** | 9 | 18 | 35 | 40 | 37.8 | 1.1 | 12 | 38 | 27 |
| **Sunset St/ Carol Av Area** | 11 | 12 | 30 | 60 | 41 | 0.3 | 79 | 4 | 1 |
| **Vista Vallejo** | 3 | 4 | 22 | 40 | 30.6 | 0.2 | 46 | 3 | 0 |
| **GOLETA AREA** | | | | | | | | | |
| **La Buena Tierra Area** | 6 | 5 | - | - | - | 1.2 | 1 | 19 | 7 |
| **Via Chapparal/ La Paloma Ave** | 8 | 11 | 21 | 55 | 36 | 1.7 | 4 | 27 | 28 |
| **Upper Fairview Area** | 3 | 5 | - | - | - | 4.1 | 10 | 28 | 59 |
| **Painted Cave Area** | - | - | - | - | - | 0.6 | 67 | 5 | 6 |
| **SANTA YNEZ AREA** | | | | | | | | | |
| **Los Olivos** | 34** | 71** | - | - | - | 0.8 | 217 | 66 | 60 |
| **Ballard** | 7 | 1 | - | - | - | 1.3 | 58 | 36 | 35 |
| **Santa Ynez Area** | 37 | 37 | - | - | - | 2.4 | 3 | 337 | 329 |
| **Janin Acres** | 8 | 6 | - | - | - | 2.1 | 0 | 56 | 42 |
| **NORTH COUNTY** | | | | | | | | | |
| **Lake Marie Estates** | 1 | 3 | - | - | - | 0.7 | 18 | 150 | 13 |
| **Orcutt** | - | - | - | - | - | 2.6 | 2 | 8 | 28 |

*** limited to data from permit files, inspection reports and homeowner surveys**

**** 1975 Sanitary Survey conducted by Santa Barbara County Environmental Health Services**

requires that leachlines are the preferred and required disposal method unless found to be infeasible. However, several individual areas report a significantly greater use of leachlines (e.g., Sand Point Road, Toro Canyon, and Montecito). Also, Hope Ranch and Janin Acres (in Santa Ynez area) show a substantially greater use of drywells as compared with leachlines. Because of the age of the systems, permit information on the type and construction details are missing for many of the properties.

**Large Flow and Community Systems**

This Sanitary Survey focused principally on individual septic systems serving residences and small businesses. There are also a number of "large flow" or "community-type" septic systems in use in Santa Barbara County at campgrounds, schools and other similar facilities located where public sewers are not available. Larger flow systems such as these are normally referred to the Regional Board for permitting and monitoring under individual "Waste Discharge Requirements". Because of the size of the facility or other wastewater characteristics, these systems often include additional or "alternative" treatment and disposal components that vary from the traditional septic system designs permitted and used for individual residential systems. **Table 4-4** provides a list and brief set of facts about the large flow systems in Santa Barbara County currently operating under permits from the Central Coast Regional Water Quality Control Board. Since these facilities are subject to monitoring and inspections by the Regional Board, no work was done as part of this Sanitary Survey to assess the performance or impacts of these onsite wastewater systems. However, they are noted here and need to be recognized in the overall survey of septic system practices in the County.

**Septage Disposal**

Septage consists of the liquid and solids removed from a septic tank during servicing or cleaning of the tank. Pumping, hauling and proper disposal of septage is an important part of the long-term maintenance of septic systems in any area. Having suitable and affordable septage receiving/disposal facilities is a growing concern and potential problem in many areas of California. A brief review of septage disposal practices in Santa Barbara County is provided here because of the need for the County and others to be aware of the current status of septage receiving facilities available for use by septic tank pumping companies in the area and possible changes in the future.

All septage haulers (also "liquid waste haulers") operating within Santa Barbara County are required to be licensed by the County. Historically, septage haulers were required to maintain records and file reports with the County Health Department indicating their waste hauling activities, including locations, dates, and volumes pumped, and the receiving facility where each load was taken. This is the typical requirement for most counties in California. As discussed earlier in this section, with the adoption of the County Wastewater Ordinance in 1999, the inspection and reporting requirements were increased for septage haulers by mandating that the septic system be evaluated for deficiencies each time a tank is serviced (i.e., pumped). This is a fairly unique program; Santa Cruz County is the only other jurisdiction in California with a similar requirement.

**TABLE 4-4**
**SYSTEMS OPERATING UNDER**
**REGIONAL WATER QUALITY CONTROL BOARD**
**WASTE DISCHARGE PERMITS**

| FACILITY NAME | LOCATION | DAILY/DESIGN SEWAGE FLOW | COMMENTS |
|---|---|---|---|
| Dunn School | 2555 State Highway 154, Los Olivos | 33,450 gpd | Currently: 30,000 gpd, 36 septic tanks, 28 dry wells. Proposed expansion: 6,000 gallon septic tank, recirculating sand filter and pressure dosed disposal field. Depth to groundwater greater than 60 feet. Highest documented level is 56 feet. |
| Laguna Blanca School | 4125 Paloma Drive, Santa Barbara | 15,000 gpd | Currently: 12,500 gpd, 6 septic tanks, drywell/ leachfield systems. Proposed expansion: 2,000 gallon septic tank, 1200 sq ft leachfields to accommodate 610 gpd. Depth to groundwater 40 feet. |
| Pacifica Graduate Institute | 5200 Hollister Avenue, Santa Barbara | 4,500 gpd | 4500 gallon septic tank, 4 seepage pits from 29 to 32 feet deep. Additional septic tank and leachfield system to serve existing offices. Depth to groundwater greater than 42 feet. Records of MWD well located on adjoining property at 50 to 55 feet. |
| Refugio Beach | Gaviota State Park | 6,000 gpd | 900 gpd to 2,000 gpd, septic tank to dual, alternatively dosed leachfields . Ocean salinity likely renders groundwater beneath or just downgradient from the disposal site non-potable |
| Elks Recreation | 1309 N. Bradley Road, Santa Maria | 4,000 gpd | Disposal fields. Distance to groundwater is greater than 100 feet. |
| Jalama Beach | County Park | 2,700 gpd | Seven septic tanks, a pump station, and over 1,500 feet of leachline. Treatment facilities consists of septic tanks with a total capacity of 6,500 gallons. Wastewater will be discharged to dual leachfield systems with a disposal capacity of approximately 5,600 gpd. Groundwater encountered at 13' in area "2". A water sample taken in March 1981 from the Jalama Park Well, located 8,000 feet from the disposal area, was found to be not potable. |

Discussion of the results of the first few years of the pumper-inspection program requirement is covered in **Section 5**.

There are two septage receiving facilities in Santa Barbara County and one other nearby facility in Ventura County that are used by septage haulers servicing systems in the County.

***Santa Maria.*** The City of Santa Maria Sewage Treatment Plant currently accepts septage, pumpings from grease interceptors, and portable toilet wastes. This facility serves the North County area (Gaviota north). Santa Maria has had problems with their treatment operation due to septage wastes. However, they have recently made improvements to the receiving facilities, and plan to continue accepting septage for another year on a trial basis before making a decision on a long-term septage policy.

***Santa Barbara.*** The City of Santa Barbara Sewage Treatment Plant currently accepts septage from liquid waste haulers who are licensed with the City. They do not accept pumpings from grease interceptors. The City's fees disposal fees are considerably higher than other septage receiving facilities, which limits the volume that comes into the treatment plant. The City has not indicated any particular problems or impending plans to change their septage receiving facilities or policies.

***City of Oxnard.*** The City of Oxnard Sewage Treatment Plant has limited septage receiving capacity. From outside the City they accept septage from Santa Clara Waste, a private waste receiving facility that provides primary processing of the septage before discharge to the City's facility. Waste haulers operating in the South Coast area of Santa Barbara County haul and dispose their waste at Santa Clara Waste. Oxnard does not accept pumpings from grease interceptors, except from within the City limits. They also do not accept portable toilet wastes.

Until recently, there was a fourth local septage disposal option – the Ventura Regional Sanitation District facility at Montalvo. However, this was closed due to odor problems and excessive costs that would have been required to replace the pipeline across the Santa Clarita River.

# SECTION 5

# SEPTIC SYSTEM INFORMATION SURVEYS

## INTRODUCTION

Information concerning the location, type, and condition and functioning status of septic systems in Santa Barbara County is available from many different sources. These include, for instance: (a) prior septic system surveys; (b) personal experience and permit and complaint files maintained by the County Health Department and the Regional Water Board; (c) Septic Tank Pumper reports; (d) personal knowledge and experience of septic tank contractors and consultants; and (e) individual homeowners. This information forms a large part of the basis for assessing the status of septic system practices in the County. Therefore, a major part of the Septic System Sanitary Survey was devoted to researching, compiling and reviewing information from these various sources. The results of this effort are presented in this section of the report. It is important to realize that, while the survey was intended to be as thorough as possible in researching available sources, the information obtained is limited to that which could be compiled during the time frame of the study.

## PRIOR STUDIES

The only significant prior septic system survey in Santa Barbara County was conducted for the Santa Ynez area in the early 1990s. The work arose out of mounting concerns about the large number of substandard septic systems in the area coupled with the continuing pressures for growth. Responding to these concerns, in May of 1992 the Santa Ynez Community Services District (SYCSD) hired Lawrance, Fisk & McFarland, Inc. (LFM) to conduct a *Septic Tank Maintenance District Study* for the Santa Ynez area. The study was finalized in 1995. The study's objectives were to: review historical data from relevant regulatory agencies and private parties; describe existing and future individual sewage disposal systems conditions, problems and issues within the selected study areas; conduct field reconnaissance and interview contractors, consultants, and regulatory agency personnel; appraise the degree of public health concerns posed in the study area; determine justification for the Septic Tank Maintenance District (STMD); and to assess the overall feasibility of SYCSD establishing a Septic Tank Maintenance District. The information from this study continues to be relevant, since no significant changes have been made in onsite sewage disposal practices in the Santa Ynez area in the past 10 years. The findings from the study LFM study are summarized here.

According to the final project report, the Santa Ynez Valley has had a history of substandard sewage disposal systems. Prior to the installation of the sewer system in the town of Santa Ynez, building moratoriums had been imposed due to numerous septic system failures. The Santa Barbara County Board of Supervisors designated Janin Acres, Los Olivos and Ballard as Special Problem Areas based on the difficulties in the siting of

individual sewage disposal systems in these areas. Santa Barbara County also adopted into County regulations the provisions of California Regional Water Quality Control Board Resolution 83-12, addressing individual, alternative and community disposal systems. This resolution, along with other provisions of the State Health and Safety Code, allows local governments to create special districts that would be responsible for the proper construction, installation, operation and maintenance of individual septic systems. Other responsibilities of these special districts include establishing septic tank surveillance, maintenance and pumping programs, providing repairs to plumbing of leachfields and encouraging water conservation measures. The study by LFM focused on assessing whether or not septic tank maintenance districts would be a viable mechanism to address the septic system issues in the Santa Ynez area.

File searches and interviews were conducted with Santa Barbara County Environmental Health Services (EHS), Regional Water Quality Control Board Central Coast Region, Santa Barbara County Water Agency (SBCWA) and a few local contractors and consultants. The final report was completed in August of 1995. The study reached the following conclusions regarding the implementation of the STMD and some of the main geographical areas of concern in the Santa Ynez area:

1. Los Olivos, whose common problems were judged to be groundwater-nitrate impacts and shallow, perched groundwater, would benefit from a STMD approach through the provision of improved guidance in the proper design, operation and maintenance of septic systems.

2. Ballard, whose common problem was judged to be high groundwater, would benefit from a STMD, through education of homeowners concerning septic systems and greater attention regarding proper operation and maintenance.

3. Santa Ynez would only have a moderate benefit from a STMD. Specific findings and recommendations included:

    (a) **Northwesterly area** – there was a greater need to connect to sewer in this area due to perched groundwater and limited area for expansion of onsite systems;

    (b) Westerly area – poor drainage and perched water problems would require greater improvements, which an STMD could achieve through improved septic system maintenance. The undulating terrain and layout of existing SYCSD sewers limits the number of parcels that could connect to the sewer in this area, therefore, sewer relief or onsite sewage disposal alternatives are considered;

    (c) **Southwesterly area** - (Janin Acres) connection to sewers would alleviate concerns about pollutants (nitrate in particular) contaminating the potable water supply of the Rancho Marcelino Water and Services Company.

Property owners would benefit from an STMD providing systemic servicing of septic systems.

The study also found that the SYCSD is willing to work with Santa Barbara County Health Department to help resolve septic system issues outside of its District boundaries if supported by the Board of Supervisors. The study recommended that SYCSD pursue the performance phase of the STMD study if results from investigating legal aspects for the formation and operation of the STMD and response from the affected residents and appropriate regulating agencies (i.e., the Health Department and the Regional Water Board) are positive and supportive.

## COUNTY RECORDS

### Permit Files

One of the main sources of septic system information are County permit files. Since 1991 septic system permit files have been maintained by the Public Health Department, in the Main Office (Santa Barbara) and North County Office (Santa Maria). Before that septic system permitting was the responsibility of the Building Department. Building Department septic system records are scattered and sketchy, and were not researched and compiled as part of this study. It is estimated that there is permit information on file with the Health Department for about 25 to 30 percent of the septic systems in Santa Barbara County.

Currently, the Health Department maintains permit files for all properties where there is a record of work performed on the septic system. This includes permits for new house construction, expansion or remodeling projects, voluntary upgrades/replacement of septic systems, and repairs or corrective work for failing or malfunctioning systems.

Permit files typically include a variety of information relative to the property and septic system, including: (a) basic geographical, legal and ownership information; (b) permits and related correspondence; (c) data and reports relative to soils, percolation testing; (d) septic system sizing and design details; (d) maps and construction plans or "as-builts"; and (e) corrective action correspondence, as applicable.

Traditionally, all permit files have been maintained simply in "hard copy" format. In 2001 the Health Department began a process of converting selected hard copy permit information to an electronic format for integration with the County's GIS database. At the time the Septic System Sanitary Survey was initiated, approximately 800 to 900 permit files had already been converted to electronic format by the Health Department. A copy of the data form developed and used by the County for file conversion is provided in **Appendix E**. As part of the Sanitary Survey, an extensive review of permit files was undertaken by Questa at both the Main Office and the North County Office. In conjunction with this work effort, an abbreviated form, similar to the Health Department's permit conversion form, was developed by Questa to document pertinent

file information for the Study. A copy of this form is also included in **Appendix E**. Working together with County staff, the file information collected by Questa was assembled in an excel spreadsheet, which was then linked to the GIS database for use along with the 800 to 900 permit files already compiled by the Health Department staff. At the conclusion of this effort, essentially all of the current hard copy permit files were converted to electronic (GIS-compatible) format.

At the conclusion of the search, approximately 2,500 permit files were added to the Envision database[3]. The number of different types of permits issued over the 10-year period includes 376 new construction, 173 modifications, 607 repairs, 251 abandonment, 288 certification of existing systems. The table below reflects information obtained from County files and the homeowner surveys (discussed later in this section) and shows the breakdown in the number between leachlines and dry wells/seepage pits and by slope. It indicates a nearly 50-50 split between leachlines and dry wells (seepage pits), which also shows up in some of the other survey information as the approximate distribution in Santa Barbara County between these different disposal system methods.

| Disposal Site Ground Slope (%) | Leachlines | Dry Wells & Seepage Pits |
|---|---|---|
| **Not Specified** | 661 | 756 |
| **< 10** | 263 | 193 |
| **10 - 20** | 30 | 44 |
| **20 - 30** | 3 | 16 |
| **> 30** | 0 | 5 |
| **Total** | **957** | **1,014** |

**Complaint Files**

In addition to permit files, the Health Department maintains records of complaints that are received in regard to various public health or sanitation matters. Complaints are filed with the Health Department for a variety of problems. Septic system surfacing and nuisance odor problems are a common compliant issue. However, the Complaint Files also encompass such things as food service problems, vectors, garbage and water quality.

As a matter of policy, complaints filed with the Health Department require follow-up action and resolution of the matter. The information contained in the files typically includes a letter or notation documenting the time, date and nature of the original complaint, along with an investigation report and related correspondence explaining the findings and resolution of the matter.

As part of the Septic System Sanitary Survey, Questa reviewed individual complaint files at both the Main Office and North County Office. The primary effort was directed

[3] Proprietary software database designed for environmental health programs.

toward complaint information for the various defined Focus Areas. We noted there to be scattered septic system complaints for other areas of the County; however, there were no noticeable concentrations of complaints in any particular area warranting further detailed review. Complaint information for properties located within the Focus Areas was compiled, entered into excel spreadsheets, and made available for integration into the GIS database. The information was reviewed and described according to location, date, type of problem and the Health Department findings. This is presented in summary form, according to geographical Focus Area, in **Table 5-1**. More detailed complaint information is provided in **Appendix F**.

As shown, in **Table 5-1** during the period of 1993 through 2001, there were a total of 88 septic system-related complaints in the 24 Focus Areas examined in this study. Of the complaints that were filed, approximately one-third were confirmed to be a problem that the Health Department was able to trace to a malfunctioning septic system or greywater discharge. The Focus Areas recording the greatest number of complaints (six or more) were Hope Ranch, Mission Canyon, Sunset/Carol Avenue Area (Santa Barbara), Toro Canyon and Veronica Springs. The greatest numbers of confirmed problems (three or more) were in Sunset/Carol Avenue Area, Painted Cave Area, and Santa Ynez.

Also provided for reference in **Table 5-1** are complaint information compiled as part of the preliminary findings from the 1995 *Septic Tank Maintenance District Study* for the Santa Ynez Area.

## SEPTIC TANK INSPECTION REPORTS

As previously explained in **Section 4**, in 1999 Santa Barbara County enacted various changes to County septic system regulations. One of the significant changes was the institution of a mandatory requirement for inspection, evaluation and reporting of the condition and noted deficiencies whenever a septic system is serviced. These required inspections and reporting occur primarily at the time when homeowners call to have their septic tank pumped out and cleaned. The information from these inspections is filed with the County and referred to as "Septic Tank Inspection Reports", or sometimes "Pumper Reports" or "Inspection Reports".

The required inspection and evaluation requirements are detailed on a standard inspection/reporting form, a copy of which is provided in **Appendix E**. Briefly, the inspection requires: (a) identification of the type of onsite disposal system; (b) septic tank/cesspool information, including structural condition of tank and components, capacity, materials, effluent level; (c) observations for evidence of drainage problems or surfacing effluent; (d) a diagram/sketch of the location of the system; (e) notation of maintenance performed; and (f) cost estimates for correction of noted deficiencies.

As part of this Sanitary Survey, data from the first three years of Septic Tank Inspection Reports were compiled and reviewed. Concurrent with the Sanitary Survey, the Health Department staff converted the hard copy Inspection Reports into an electronic format

**TABLE 5-1**
**SUMMARY OF SEPTIC SYSTEM COMPLAINT FILES**

| Studies | | TYPE OF COMPLAINT | | | | | |
|---|---|---|---|---|---|---|---|
| | | Surfacing Effluent | Deliberate Septic Discharge | Deliberate Sink Drain Discharge | Plumbing Problems Cause Backup or Surfacing | Suspicious Odors | False Alarms* |
| **Septic Tank Maintenance District Study (1979-1988) - Santa Ynez** | | 23 | 17 | 4 | 4 | 8 | 14 |
| **Santa Barbara Septic System Survey (1983 - 2002)** | | | | | | | |
| **South Coast** | **Arroyo Paredon** | | | | | 1 | |
| | **Goleta - La Buena Tierra** | | | | | | 1 |
| | **Goleta - Upper Fairview** | 2 | | | | | |
| | **Hope Ranch** | 2 | | | | | 8 |
| | **Mission Canyon** | 1 | | 1 | | | 7 |
| | **Montecito - Cold Springs** | 2 | | | | 1 | 2 |
| | **Montecito - Buena Vista Creek** | | | | | | 1 |
| | **Montecito - Sycamore Canyon** | | | | | 1 | 2 |
| | **More Mesa** | | | | | 1 | 1 |
| | **Painted Cave** | 2 | | 1 | | | 1 |
| | **Rincon** | | | | | | 2 |
| | **San Antonio** | 2 | | | | | 1 |
| | **Santa Barbara - Sunset/Carol** | 4 | | | | 1 | 3 |
| | **Santa Barbara - Vista Vallejo** | 1 | | | | | |
| | **Toro Canyon** | 1 | | | | | 3 |
| | **Veronica Springs** | 1 | | 1 | | 1 | 8 |
| **North County** | **Ballard** | 1 | | | | | 2 |
| | **Janin Acres** | | | | | | 1 |
| | **Santa Ynez** | 4 | | | | | |
| **TOTAL** | | 23 | | 3 | | 6 | 43 |

* Unable to confirm complaint

linked to the GIS database. The data reviewed included inspections for a total of 1,820 parcels, completed through December 2001. The Health Department data files include coding that is keyed to a number of different administrative requirements and corrective actions, many of which are not directly useful to the Sanitary Survey. Therefore, Questa reviewed and reorganized the data into several general groupings as follows:

1. **System Failures** – This includes findings of surfacing effluent, absorption field not accepting effluent, or discharge of groundwater to surface/drainage (possible failure).

2. **Maintenance Issues** - This includes such things as severely damaged or deteriorated septic tank, replacement of cesspool, conversion from seepage pit to dry well, inadequate access to both compartments, access ports deeper than 24 inches, deteriorated access lids, deteriorated top of tank, deteriorated baffle between compartments, tank wall missing bricks, defective pump, septic tank constructed of metal or wood, inadequate tank capacity, missing inlet/outlet tee, recommended improvements to or replacement of tank or risers.

3. **No Violations.**

Overall, the Inspection Reports for the first three years of this mandatory inspection program revealed 75 dry well/seepage pit failures, 59 leachline failures, and 223 unspecified failures. This amounts to a total of 357 system failures (Countywide) that were identified in a 3-year period (roughly 120 per year) and have been (or will be) addressed with appropriate corrective action. These represent significant septic system problems that may have not been identified and addressed, except for the County's mandatory inspection and reporting program. Additionally, the Inspection Reports show that a significant number of maintenance issues were identified through the septic system evaluations. In some cases these reflect routine maintenance items or work required to upgrade the system to comply with new regulations (e.g., addition of septic tank risers). However, in many cases the identification and attention to maintenance issues (e.g., defective sanitary tee) likely reflects preventative items that, except for the mandatory inspection requirements, might otherwise have gone unnoticed and contributed eventually to a failure condition.

The information from the Inspection Reports pertaining to the 24 identified Focus Areas are summarized in **Table 5-2**. These represent about 60% of the total number of septic system inspection performed in the County during this reporting period. Displayed in the table are the total number of parcels in each Focus Area, the number of total inspections during the 3-year reporting period, and the number of maintenance and failure conditions reported. The maintenance and failure counts are also shown as a percentage of the total systems in the respective area and as a percentage of the number of inspections performed.

**TABLE 5-2**
**Septic Tank Inspection Report Summary**
**1999-2001**

| FOCUS AREA | Total Parcels | Inspection Reports Submitted to County | | | Percent Calculations | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Total Parcels[1] | | Inspections Conducted[2] | |
| | | # of Reports | # Requiring Maintenance Work | # of Failures | % Maintenance | % Failure | % Maintenance | % Failure |
| Rincon Point | 36 | 7 | 3 | 0 | 8 | 0 | 43 | 0 |
| Shepard Mesa | 119 | 23 | 5 | 2 | 4 | 2 | 22 | 9 |
| Arroyo Paredon | 84 | 18 | 1 | 7 | 1 | 8 | 6 | 39 |
| Sand Point Road | 70 | 17 | 7 | 5 | 10 | 7 | 41 | 29 |
| Padaro Lane | 53 | 19 | 3 | 4 | 6 | 8 | 16 | 21 |
| Toro Canyon | 297 | 74 | 17 | 14 | 6 | 5 | 23 | 19 |
| Buena Vista Creek | 340 | 97 | 18 | 13 | 5 | 4 | 19 | 13 |
| Cold Springs | 141 | 36 | 7 | 6 | 5 | 4 | 19 | 17 |
| Sycamore Creek | 175 | 46 | 13 | 10 | 7 | 6 | 28 | 22 |
| Mission Canyon | 253 | 65 | 17 | 2 | 7 | 1 | 26 | 3 |
| Vista Vallejo | 49 | 12 | 3 | 2 | 6 | 4 | 25 | 17 |
| Veronica springs | 77 | 25 | 2 | 5 | 3 | 6 | 8 | 20 |
| Hope Ranch | 809 | 274 | 63 | 51 | 8 | 6 | 23 | 19 |
| Sunset/Carol | 84 | 15 | 4 | 3 | 5 | 4 | 27 | 20 |
| La Buena Tierra | 27 | 5 | 0 | 2 | 0 | 7 | 0 | 40 |
| Via Chapparal | 59 | 13 | 1 | 4 | 2 | 7 | 8 | 31 |
| Upper Fairview | 97 | 25 | 6 | 2 | 6 | 2 | 24 | 8 |
| Painted Cave | 78 | 10 | 1 | 1 | 1 | 1 | 10 | 10 |
| Los Olivos | 343 | 62 | 10 | 11 | 3 | 3 | 16 | 18 |
| Ballard | 129 | 26 | 8 | 1 | 6 | 1 | 31 | 4 |
| Santa Ynez | 669 | 135 | 36 | 33 | 5 | 5 | 27 | 24 |
| Janin Acres | 98 | 24 | 4 | 4 | 4 | 4 | 17 | 17 |
| Lake Marie Estates | 181 | 24 | 3 | 3 | 2 | 2 | 13 | 13 |
| Orcutt | 38 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] Maintenance/failure as a percentage of total parcels in focus area

[2] Maintenance/failure as a percentage of inspection conducted during 1999-2001

The data summaries in **Table 5-2** show the following:

1. **Inspection Rate.** Overall, about 25% of the septic systems in these Focus Areas were serviced during the first three years of the Inspection Reporting Program. The areas having the greatest inspection activity, as a percentage of the number of systems, were Padaro Lane, Hope Ranch, Veronica Springs, Buena Vista Creek, Cold Springs, Sycamore Creek, Mission Creek, Upper Fairview and Toro Canyon. In these areas, the rate of inspection ranged from 25 to 33%. The areas with the lowest rate of inspection (less than 15% of the systems) were Painted Cave, Lake Marie Estates and Orcutt area.

2. **Maintenance Rate**. Overall, system maintenance work was required on approximately 5.3 % of the systems in these Focus Areas during the 3-year reporting period. The areas reporting the greatest maintenance activity, as a percentage of total systems, were Sand Point Road, Hope Ranch, Rincon Point, Sycamore Creek and Mission Canyon. As a percentage of inspections performed, the greatest amount of required maintenance was reported to be in Rincon Point, Sand Point Road, Ballard, Santa Ynez, and Sunset/Carol Ave. Area.

3. **Failure Rate.** Overall, system failures were observed in about 4.3% of the total systems in these Focus Areas areas during this 3-year reporting period. The greatest number of failures were observed in Hope Ranch, Santa Ynez, Toro Canyon, Buena Vista Creek, Los Olivos and Sycamore Creek areas. Based on the total number of systems in the area, Arroyo Paredon and Padaro Lane had the highest rate of failure (8%). The areas reporting the lowest number and rate of failures were Rincon Point, Orcutt area, Ballard, Painted Cave, and Mission Canyon.

Summarized in **Table 5-3** are the reported system failures in each of the 24 Focus Areas, including a breakdown according to whether the failure was associated with leachline disposal fields, dry well/seepage pits and "unspecified" type of disposal field. Overall, the reported system failures (185 total) in these Focus Areas accounted for about two-thirds of the total number of failures for the County as a whole. As shown, several of the Focus Areas had no reported system failures during the first three years of the mandatory inspection program. The greatest number and percentage of failures were reported for Hope Ranch and the Santa Ynez area. There was a greater rate of failure for dry wells/seepage pits as compared with leachlines in these Focus Areas.

## CONTRACTOR-CONSULTANT QUESTIONNAIRE SURVEY

A questionnaire was developed and distributed to contractors and consultants that provide septic system services within Santa Barbara County. The purpose of the questionnaire was to determine: (a) consultant/contractor's area of expertise and general area of business; (b) the types of septic system problems frequently encountered; (c) areas of concern; (d) problem ratings; (e) opinion on long-term septic system management needs;

**TABLE 5-3**
**INSPECTION REPORT FAILURES**
**1999-2001**

| | FOCUS AREA | Total number of systems in area | Total number of reports per focus area | Leachline failures | Drywell, Seepage Pit Failures | Unspecified failures | Total # of Failures |
|---|---|---|---|---|---|---|---|
| CARPINTERIA AREA | Rincon Point | 36 | 7 | 0 | 0 | 0 | 0 |
| | Shepard Mesa | 119 | 23 | 2 | 0 | 0 | 2 |
| | Arroyo Paredon | 84 | 18 | 2 | 3 | 2 | 7 |
| | Sand Point Rd | 70 | 17 | 2 | 0 | 3 | 5 |
| | Padaro Lane | 53 | 19 | 2 | 2 | 0 | 4 |
| | Toro Canyon | 297 | 74 | 7 | 2 | 5 | 14 |
| MONTECITO AREA | Buena Vista Creek | 340 | 97 | 4 | 1 | 8 | 13 |
| | Cold Springs | 141 | 36 | 2 | 2 | 2 | 6 |
| | Sycamore Creek | 175 | 46 | 4 | 2 | 4 | 10 |
| SANTA BARBARA AREA | Mission Canyon | 253 | 65 | 0 | 2 | 0 | 2 |
| | Vista Vallejo | 49 | 12 | 0 | 0 | 2 | 2 |
| | Veronica Springs | 77 | 25 | 0 | 4 | 1 | 5 |
| | Hope Ranch | 809 | 274 | 8 | 21 | 22 | 51 |
| | Sunset/ Carol | 84 | 15 | 0 | 0 | 3 | 3 |
| GOLETA AREA | La Buena Tierra | 27 | 5 | 1 | 1 | 0 | 2 |
| | Via Chapparal | 59 | 13 | 0 | 2 | 2 | 4 |
| | Upper Fairview | 97 | 25 | 0 | 0 | 2 | 2 |
| | Painted Cave | 78 | 10 | 0 | 0 | 1 | 1 |
| SANTA YNEZ AREA | Los Olivos | 343 | 62 | 2 | 1 | 8 | 11 |
| | Ballard | 129 | 26 | 0 | 0 | 1 | 1 |
| | Santa Ynez Area | 669 | 135 | 2 | 5 | 26 | 33 |
| | Janin Acres | 98 | 24 | 2 | 0 | 2 | 4 |
| NORTH COUNTY | Lake Marie Estates | 181 | 24 | 0 | 1 | 2 | 3 |
| | Orcutt | 38 | 4 | 0 | 0 | 0 | 0 |
| | **TOTAL** | **4,306** | **1,056** | **40** | **49** | **96** | **185** |

and (f) comments or recommendations on standards, regulations, pumper inspection report requirements, monitoring needs, or any comments in general. A summary of the comments and recommendations are summarized in **Table 5-4.** A list of contractors and consultants who participated in the survey is provided in **Table 5-5**.

Out of approximately 108 questionnaire survey forms that were mailed, 13 were completed and returned by contractors/consultants. Twelve forms were returned because of faulty/outdated address information or respondents did not work with septic systems. The following is a brief discussion of information generated and results are tabulated in **Appendix G.**

***Septic Tank Problems Observed.*** For the county in general, undersized tanks were not considered a common problem. Tank access and excessive solids, scum and grease accumulation were the most prevalent problems encountered by respondents. Access difficulties, root intrusion, groundwater infiltration, and sub-standard materials/design were problems noted in Montecito, Hope Ranch, Santa Barbara, Santa Ynez, and at Paradise Road and Highway154.

Septic tank problems queried included: (a) undersized tanks; (b) sub-standard materials/design; (c) structural damage/deterioration; (d) defective/missing tees, baffle, pipe connections; (e) difficult or obstructed access to tank; (f) excessive tank depth; (g) root intrusion/blockage; (h) groundwater infiltration or flooding; (i) excessive water use/flow from house; (j) excessive solids, scum, grease accumulation; and (k) close proximity to wells.

***Disposal System Problems.*** In general, most of the respondents did not consider physical damage a *common* disposal system problem; other disposal system issues (i.e., steep slopes, slides, erosion, seepage/breakout at cut slopes or embankments, and proximity to wells) were *rarely or never encountered*. *Occasional* area specific problems noted in Montecito, Santa Barbara Foothills, and Hope Ranch area encompassed issues with water (overirrigation, groundwater infiltration and proximity to wells and stream drainages), slope (steep slopes, slides, erosion, and seepage breakout at cut banks), and undocumented systems

Disposal system problems queried included: (a) old, undocumented, non-permitted; (b) excessive water use or over irrigation; (c) physical damage (e.g. from landscaping, paving, livestock, grading, etc.); (d) root intrusion, blockage, or piping problems; (e) solids carryover from septic tank; (f) soil percolation/drainage problem; (g) high groundwater/infiltration; (h) surface drainage/flooding; (i) steep slopes, slides, erosion; (j) seepage/breakout at cut slopes or embankments; (k) close proximity to wells; (l) close proximity to streams/drainages; and (m) inadequate land area.

***Pump System Problems.*** The most prevalent problems encountered with pump systems were due to homeowner abuse. Occurrences of septic system failures due to power outages were rare. Pump problems queried related to: (a) faulty installation or design; (b)

**TABLE 5-4**
**CONTRACTOR-CONSULTANT COMMENTS AND RECOMMENDATIONS**

■ Design Standards and Regulations

- ◊ Recycler Systems.
- ◊ Efforts to update ordinance is good.
- ◊ Encourage sewer connections.
- ◊ Recommend minimum depth under 4" perforated pipe to be no less than 36".
- ◊ Old systems are typically undersized
- ◊ Require grease traps where needed.
- ◊ Install diverter valve instead of distribution box
- ◊ Upgrade septic system, as needed, when house is remodeled.
- ◊ Seasonal saturation is a problem
- ◊ Old drywells are not gravel filled

■ Septic system pumper/inspection reporting requirements

- ◊ Enforce codes to repair or replace failed systems.
- ◊ Require mandatory pumping every 2-3 years.
- ◊ Drywells on pumper's maps should be checked for rock.
- ◊ Properly pumping the septic tank and making sure invert is properly installed in the tank would solve most leachfield failures.

■ Other monitoring/inspection needs

- ◊ Safety.
- ◊ Pumpers completing inspection reports must be knowledgeable in the installation and maintenance of the systems that they inspect.

■ Other

- ◊ Montecito, Hope Ranch, and Padaro Lanes are good candidates for sewer because of poor percolation rates and/or high groundwater makes sites unsuitable for septic systems.
- ◊ Poor design of the septic system is the rule rather than the exception.
- ◊ Mainly old septic systems experiencing failure.
- ◊ Eliminate use of septic systems.

**TABLE 5-5**
**Contractors/Consultants that Participated in the Survey**

| CONTRACTOR/CONSULTANT | TYPE OF WORK | | AREA |
|---|---|---|---|
| Bark's Plumbing and Appliance, Inc. | Contractor/Pumper | Pumping/Repairs/Installations | South Coast and North County |
| Bob Traulz Land Development co., Inc. | Contractor | System repairs/Installations, Site Evaluation (soils) | South Coast |
| Clay Septic | Contractor/Pumper | Pumping/Repairs/Installations/Percolation testing | South Coast and North County |
| Coast Valley Testing, Inc. | Designers | Site Investigation/Evaluations / Engineering/Design | South Coast and North County |
| County Sanitation Company, Inc. | Contractor/Pumper | Pumping/Repairs/Installations/Percolation testing/Soils | South Coast and North County |
| Crockett Drilling Service, Inc. | Drilling | Dry Well Drilling | |
| Cunningham Parvis Construction | Contractor | Repairs/Installations | South Coast and North County |
| Eldon H. Smith & Son, Inc | Contractor/Pumper | Pumping/Repairs/Installations | South Coast and North County |
| Jon's Equipment & Construction, Inc. | Contractor/Pumper | Pumping/Repairs/Installations | North County |
| Metzher Backhoe Service | Contractor | Repairs/Installations | South Coast |
| Mr. Rooter Plumbing | Contractor/Pumper | Pumping/Repairs/Installations | South Coast |
| Penfield & Smith Engineers | Designers | Engineering/Design | South Coast and North County |
| Soares Vacuum Service | Pumper | Pumping | Santa Maria/Orcutt |
| Wayne Andrach Backhoe & Dump truck Service | Contractor/Designer | Engineering/Design/Repair/Installation | South Coast and North County |
| | | | |

mechanical failure; (c) homeowner abuse; and (d) sewage overflow during power outages.

***Septic System Problem – Area Assessment.*** In general, the South Coast was given a medium overall problem rating. Specific focus areas that were assigned a high problem rating include Rincon Point, Padaro Lane, Sand Point Road, and Cold Springs area. Improved practices, which include routine system inspection, alternative design, community system, and sewers, were recommended for Rincon Point, Padaro Lane, Sand Point Road, Toro Canyon and Hope Ranch. In the North County, the overall problem rating was ranked as medium to low. Routine system inspections and allowing alternative designs were recommended for the Santa Ynez area. A minority of the respondents either had no opinion or felt the program is OK as is. Only one respondent recommended a change in design standards.

## HOMEOWNER QUESTIONNAIRE SURVEY AND MEETINGS

A septic system questionnaire was developed and distributed to residents in the watershed areas that were selected for water quality sampling and for focused evaluation. In conjunction with the mail-out survey, five public meetings were held in the South Coast and North County areas during the first and third weeks in April 2002, toward the end of the water quality sampling effort. The purpose of the questionnaire survey and meetings was three-fold: (1) to inform the residents in the study area about the Sanitary Survey and share some of the preliminary findings; (2) to allow homeowners to provide direct input to the Sanitary Survey regarding their own personal knowledge and experience with the septic system on their property; and (3) to provide a forum for discussion of septic system issues in general as a matter of public outreach and education.

A copy of the questionnaire is provided in **Appendix H**. The purpose of the questionnaire was to gather specific information from the user regarding such factors as:

1. Occupancy;
2. Type and age of wastewater disposal system;
3. Method of handling greywater;
4. Observed septic system problems; and
5. Septic tank pumping and repairs.

Approximately 3,860 questionnaire survey forms were mailed to property owners located in the various focus areas. About 200 forms were returned because of faulty or outdated address information. A total of 576 (15%) questionnaires were completed and returned by homeowners. About two-thirds of the survey forms were sent to South Coast residents and about one-third to North County residents. The response rate was very similar from both areas of the County. The survey response rate for individual Focus Areas ranged from 7% to 20%, with the greatest response rate from Sandpoint Road (33%), Mission Canyon (20%), Goleta-La Buena Tierra (19%) and Montecito-Orchard

Lane area (18%). A complete breakdown of the numbers and percentage of responses by Focus Area is provided in **Table 5-6**, along with other survey information.

A brief summary of the information generated from the homeowner questionnaire survey is presented below and tabulated in **Table 5-6**.

***Type of Disposal System.*** Approximately two-thirds of the respondents indicated that their system include leachlines for disposal; a little less than one third reported dry wells/seepage pits. In some cases, homeowners reported having both leachlines and dry wells/seepage pits. Approximately 6% of the respondents were unsure of the type of disposal system on their property. The responses on this question were very similar for the South Coast and North County areas.

***Greywater Systems.*** Approximately 7% of the respondents reported having greywater systems. The survey did not question whether or not these were "officially permitted" greywater systems or not. There was a significantly higher percentage of greywater systems reported for the South Coast (9%) than for the North County.

***Age of System***. About 16% of the respondents indicated their system to be less than 10 years old. Nearly 60% stated that their system was more than 10 years old, indicating that there very likely were no records on file with the Health Department for these systems. The remaining people (about one-quarter of the respondents) reported not knowing the age of their septic system.

***Pumping of System***. About half of the people indicated that they have their septic tank pumped out about once every 2 to 5 years, which is the normally recommended frequency. Nearly as many indicated that they have their tank pumped less frequently. A fair number (6%) indicated pumping once a year and, in Hope Ranch, about 2% of the respondents indicated more than one pumping per year. Higher pump-out frequencies are generally indicative of more frequent system problems that prompt service calls. The lower pump-out frequencies (i.e., more than 5 years between pumpings) may indicate lack of maintenance attention by the homeowner (perhaps due to lack of education about system needs). However, limited usage of the system (i.e., due to low occupancy) in the house can also be a legitimate reason for long times between pump-outs.

***Repairs.*** Roughly 40% of the respondents indicated that the septic system had been repaired at some point in time; and virtually all indicated that the repair was effective.

***Problems Observed.*** About 12% of the homeowners indicated that they had observed problems with their system, including: (a) slow drainage of plumbing fixtures and backup into the house; (b) wet areas and/or odors in the leachfield area; and (c) surfacing sewage (i.e., liquid on the ground surface). The predominant response for all problems was that the conditions occurred in response to heavy rainfall or for "unexplained reasons".

**TABLE 5-6**
**Homeowner Survey Results**

| Focus Area | SURVEYS | | | TYPE OF SYSTEM | | | |
|---|---|---|---|---|---|---|---|
| | Surveys Mailed | Surveys Completed | % Response by area | Septic tank with leachfield (%) | septic tank with seepage pit (%) | other (%) | unknown (%) |
| **South Coast** | | | | | | | |
| Arroyo Paredon | 133 | 9 | 7 | 78 | 22 | | |
| Padaro Lane | 34 | 3 | 9 | 100 | | | |
| Sandpoint Road | 18 | 6 | 33 | 22 | 11 | | |
| Toro Canyon | 323 | 47 | 15* | 69 | 31 | | 2 |
| Montecito - Cold Springs | 121 | 19 | 16* | 84 | 16 | | 5 |
| Montecito - Orchard Ln | 341 | 61 | 18* | 77 | 18 | 2 | 7 |
| Montecito - Sycamore Creek | 186 | 20 | 11 | 60 | 35 | | 5 |
| Mission Canyon Area | 229 | 46 | 20 | 70 | 30 | | 4 |
| Hope Ranch | 744 | 110 | 15 | 65 | 40 | | 2 |
| Veronica Springs | 100 | 8 | 8 | 63 | 38 | | |
| Goleta - La Buena Tierra | 62 | 12 | 19 | 58 | 58 | | 8 |
| Goleta - Via Chaparral | 63 | 8 | 13 | 75 | 38 | | |
| Santa Barbara - Sunset/Carol | 106 | 15 | 14 | 53 | 40 | | 7 |
| Santa Barbara - Via Clarice | 89 | 7 | 8 | 57 | 43 | | |
| Santa Barbara - Vista Vallejo | 49 | 4 | 8 | 75 | 25 | | |
| ***TOTAL*** | ***2,598*** | ***375*** | ***14%*** | ***67*** | ***32*** | ***2*** | ***5*** |
| **North County** | | | | | | | |
| Los Olivos | 405 | 62 | 15* | 82 | 22 | | 3 |
| Ballard | 121 | 12 | 10 | 75 | 8 | | 17 |
| Santa Ynez | 636 | 75 | 12 | 62 | 42 | | 1 |
| Janin Acres | 101 | 13 | 13 | 54 | 46 | | |
| ***TOTAL*** | ***858*** | ***100*** | ***12%*** | ***64*** | ***32*** | | ***9*** |
| ***GRAND TOTAL*** | ***3,456*** | ***475*** | ***14%*** | ***65*** | ***32*** | | ***7*** |

****Partime occupancy ranged from 2% to 8%***

**TABLE 5-6**
**Homeowner Survey Results**

| Area of Concern | Surveys Completed | % separate greywater system | How old is the waste water system | | | How often in the septic tank pumped | | | | Has the onsite system ever been repaired? (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Years | | Unknown | More than once a year (%) | Once a year (%) | Every 2 to 5 years (%) | Less frequently (%) | |
| | | | <10 | ≥10 | | | | | | |
| **South Coast** | | | | | | | | | | |
| Arroyo Paredon | 9 | | | 6 | 3 | | | 56 | 44 | 33 |
| Padaro Lane | 3 | 0 | 1 | 1 | 1 | | | 67 | 33 | 67 |
| Sand Point Road | 6 | 6 | 1 | 5 | | | 6 | 17 | 11 | 22 |
| Toro Canyon | 47 | 4 | 9 | 24 | 15 | | 4 | 67 | 31 | 48 |
| Montecito - Cold Springs | 19 | 21 | 1 | 15 | 3 | | 5 | 58 | 37 | 53 |
| Montecito - Orchard Ln | 61 | 7 | 16 | 27 | 19 | | 2 | 77 | 18 | |
| Montecito - Sycamore Creek | 20 | 1 | 5 | 11 | 4 | | 10 | 60 | 25 | 50 |
| Mission Canyon Area | 46 | 11 | 3 | 33 | 11 | | 4 | 70 | 26 | 33 |
| Hope Ranch | 110 | 5 | 19 | 63 | 29 | 2 | 5 | 78 | 15 | 57 |
| Veronica Springs | 8 | 13 | 2 | 2 | 4 | | 25 | 38 | 38 | 50 |
| Goleta - La Buena Tierra | 12 | 17 | | 12 | | | 8 | 50 | 42 | 33 |
| Goleta - Via Chaparral | 8 | 13 | 2 | 5 | 1 | | | 50 | 50 | 50 |
| Santa Barbara - Sunset/Carol | 15 | 7 | 2 | 4 | 9 | | 7 | 67 | 27 | 47 |
| Santa Barbara - Via Clarice | 7 | | 1 | 5 | 1 | | | 57 | 43 | 57 |
| Santa Barbara - Vista Vallejo | 4 | | | 2 | 2 | | | 75 | 25 | 100 |
| ***AVERAGE*** | ***25*** | ***9*** | ***5*** | ***215*** | ***102*** | | ***8*** | ***59*** | ***31*** | ***50*** |
| **North County** | | | | | | | | | | |
| Los Olivos | 62 | 2 | 9 | 44 | 8 | | 5 | 60 | 70 | 35 |
| Ballard | 12 | 8 | 3 | 6 | 3 | | | 17 | 83 | 8 |
| Santa Ynez | 75 | 3 | 11 | 45 | 19 | | 1 | 54 | 46 | 49 |
| Janin Acres | 13 | | | 11 | 2 | | 8 | 31 | 62 | 38 |
| ***AVERAGE*** | ***33*** | ***6*** | ***14*** | ***62*** | ***24*** | | ***5*** | ***34*** | ***64*** | ***32*** |
| ***GRAND TOTAL*** | ***29*** | ***7*** | ***19*** | ***277*** | ***126*** | | ***6*** | ***47*** | ***47*** | ***41*** |

**TABLE 5-6**
**Homeowner Survey Results**

| Area of Concern | Surveys Completed | Have any of the following problems been observed with the wastewater system? | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Slow drainage of plumbing fixtures/ backup into house | | | | Wet areas in leachfield area and/or odors | | | | Liquid on ground surface | | | |
| | | Year Round | Seasonal | After Heavy Rainfall | Occasional for unexplained reason | Year Round | Seasonal | After Heavy Rainfall | Occasional for unexplained reason | Year Round | Seasonal | After Heavy Rainfall | Occasional for unexplained reason |
| **South Coast** | | | | | | | | | | | | | |
| Arroyo Paredon | 9 | | | 1 | 1 | | | | | | | | |
| Padaro Lane | 3 | | | | | | | | | | | | |
| Sandpoint Road | 6 | | | | | | | | | | | | |
| Toro Canyon | 47 | | | | | | | | 3 | | | | 2 |
| Montecito - Cold Springs | 19 | | | | | | | 1 | 1 | | | | 1 |
| Montecito - Orchard Ln | 61 | | | | 4 | | | | 2 | | | | |
| Montecito - Sycamore Creek | 20 | | | | 3 | | 1 | | 1 | | | | 1 |
| Mission Canyon Area | 46 | 1 | | | | | | 1 | 2 | | | | 1 |
| Hope Ranch | 110 | | | 2 | 5 | | | 1 | 2 | | | | 1 |
| Veronica Springs | 8 | | | | 2 | | 1 | 1 | 1 | | | | |
| Goleta - La Buena Tierra | 12 | 1 | | 1 | | | | 1 | 1 | | 1 | 1 | |
| Goleta - Via Chaparral | 8 | | | | 1 | | | 1 | | | | | |
| Santa Barbara - Sunset/Carol | 15 | | | 1 | 1 | | 1 | 1 | 4 | | | 1 | 3 |
| Santa Barbara - Via Clarice | 7 | | | | | | | | | | | | |
| Santa Barbara - Vista Vallejo | 4 | | | 1 | 1 | | | 1 | | | | 1 | |
| ***TOTAL*** | ***375*** | ***2*** | | ***6*** | ***18*** | | ***3*** | ***8*** | ***17*** | | ***1*** | ***3*** | ***9*** |
| **North County** | | | | | | | | | | | | | |
| Los Olivos | 62 | | | 3 | 2 | | | 1 | | | | | |
| Ballard | 12 | 1 | 1 | 1 | 2 | | | | | | | | |
| Santa Ynez | 75 | | | 7 | 6 | 1 | 1 | 2 | 1 | | | 5 | 1 |
| Janin Acres | 13 | | | 1 | 1 | | | | 2 | | | 1 | |
| ***TOTAL*** | ***100*** | ***1*** | ***1*** | ***9*** | ***9*** | ***1*** | ***1*** | ***2*** | ***3*** | | | ***6*** | ***1*** |
| ***GRAND TOTAL*** | ***475*** | ***3*** | ***1*** | ***15*** | ***27*** | ***1*** | ***4*** | ***10*** | ***20*** | | ***1*** | ***9*** | ***10*** |

***Other Homeowner Comments***. About 5% of the homeowners entered other comments on the survey form in the space provided. Most of the individual comments fell into three main categories: (1) expressing frustration with the operation of their septic system and urging the extension of sewers to their area; (2) emphasizing that septic systems can be effective as long as they are maintained properly; and (3) complaints about failures of neighboring septic systems.

# SECTION 6

# SURFACE WATER QUALITY IMPACTS

Septic systems have the potential to impact surface water quality (a) directly, via surfacing effluent from failing systems, and (b) indirectly, from percolation and commingling with groundwater that eventually reaches, streams, lakes and ocean waters. The greatest, but not necessarily the only, water quality concern from septic systems is possible contamination from pathogens (e.g., bacteria and viruses) associated with human waste products. This represents a potential avenue for transmission of various diseases, including dysentery, hepatitis, typhoid, cholera and gastro-intestinal disorders as well as skin rashes and sinus infections. Septic system effluent also contains nutrients (e.g., nitrogen and phosphorus) that can contribute to excessive algal growth in surface waters, and potentially other chemical constituents (e.g., salts, heavy metals, toxic compounds) that may degrade water supplies or be harmful to aquatic organisms. Additionally, surfacing sewage effluent is most commonly recognized and noted for the nuisance ("septic") odors associated with putrescent organic matter still undergoing biodegradation.

A major impetus for this Septic System Sanitary Survey was the chronic observation of high bacteriological readings in the ocean waters along the South Coast of Santa Barbara County. Discharges from septic systems located near the ocean or in the contributing watershed areas were identified as one possible source for these high readings. Various water quality sampling efforts have been conducted in the past, and there are other on-going studies and sampling programs that provide information on surface water quality conditions in Santa Barbara County. However, there have been no comprehensive water quality sampling studies directed specifically at septic system areas in the County. To address this "data gap", a surface water quality sampling effort was conducted as part of the Sanitary Survey, focusing specifically on areas having a relatively large concentration of septic systems. This section of the report reviews information from various prior and related surface water quality sampling studies and describes and presents the results of the water quality sampling program conducted as part of this Sanitary Survey.

## PRIOR AND RELATED WATER QUALITY STUDIES

Following is a brief summary of other prior and on-going surface water quality sampling studies and programs in Santa Barbara County.

### Ocean Water Monitoring

Due to heavy rains in 1995 and requests from the community and Surfrider Foundation, the Santa Barbara County Health Department conducted water quality testing for bacterial contamination in ocean waters at several local beaches in the Santa Barbara area. The testing revealed very high counts for both total and fecal coliform bacteria,

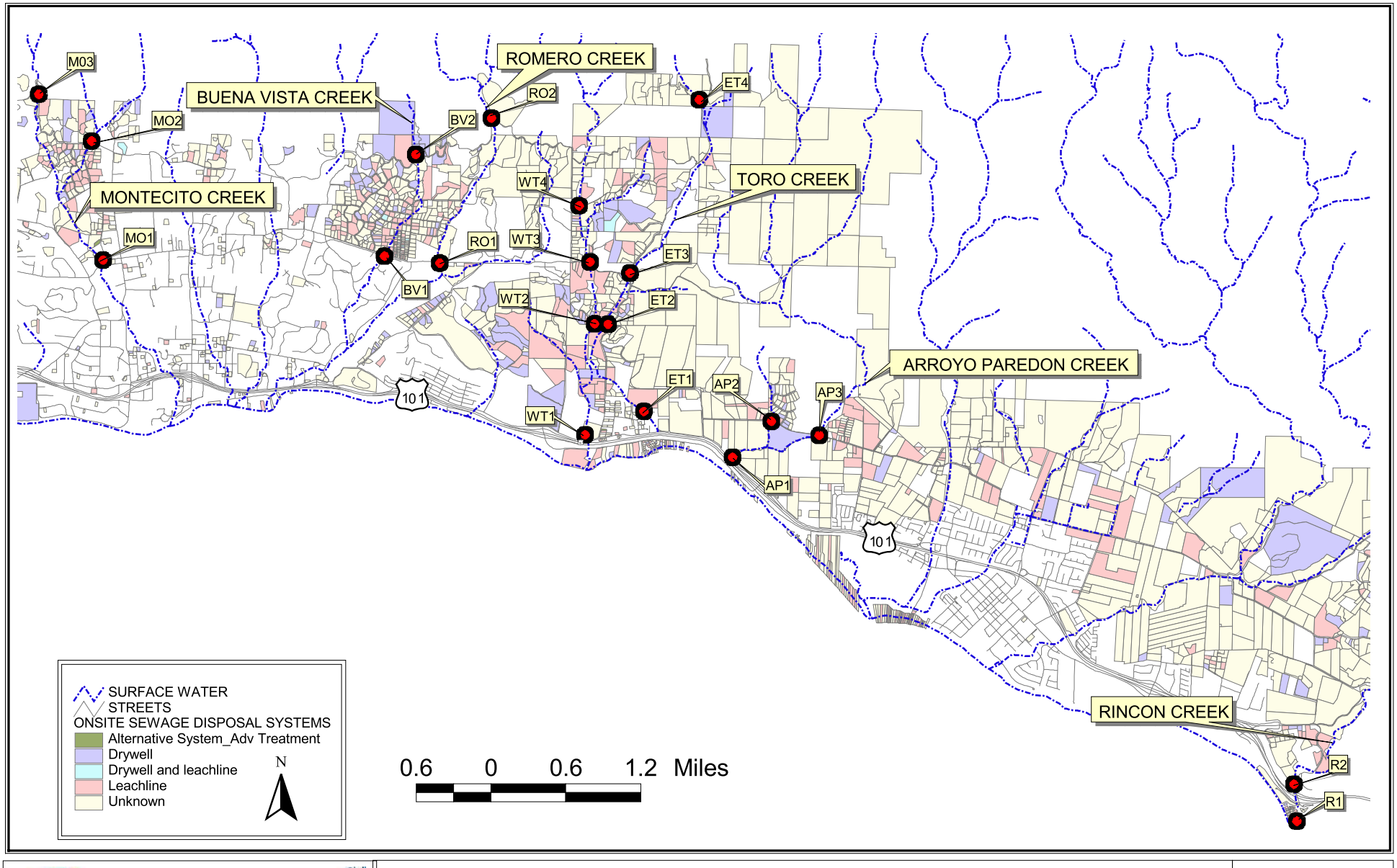
generating significant concern about public health impacts. In response to these initial findings, the Board of Supervisors supported the establishment of routine testing of County beaches, which commenced in September of 1996. Subsequently, Assembly Bill 411, which was implemented in July of 1999, mandated local jurisdictions throughout California to: (a) conduct, at a minimum, bacteriological testing of public beach waters; (b) establish, based on public health risks, monitoring parameters; (c) notify the public of health hazards; and (d) require microbiological testing, if needed, on a weekly basis from April 1st to October 31st. Currently, 19 beaches in Santa Barbara County are sampled routinely by the Health Department and results are publicized on a weekly basis. The Health Department maintains a website where results of the water quality testing can be reviewed (www.sbcphd.org/ehs/ocean.htm).

**Project Clean Water**

Project Clean Water was established in 1998 as a coalition of government agencies, community groups, and individuals whose objective is to identify and implement solutions to creek and ocean water pollution. Participants in the program include the Cities of Santa Barbara and Carpinteria, County Water Agency and Public Health Department, various community groups (Urban Creeks Council, Audubon Society, Surfrider Foundation, Heal the Ocean, C.U.R.E., Coalition of Labor, Agriculture & Business, and the Community Environmental Council), and individuals. The Project Clean Water staff conduct reconnaissance field surveys and collect water samples for storm runoff events, which are tested for various water quality constituents, including bacteria, pesticides, metals, hydrocarbons, sediments and other common runoff pollutants. The Project Clean Water sampling stations include locations on several South Coast streams where there are septic systems in the contributing watershed area, although the main focus of the program is urban runoff effects. Some of the same streams sampled for Project Clean Water were monitored as part of the surface water quality sampling program for the Septic System Sanitary Survey, as shown on the maps (**Figures 6-1, -2** and **-3**) later in this section. Project Clean Water sampling results for the 2001-2002 winter season have been published and are available to the public. In the 2001-2002 runoff season, water quality sampling was conducted by Project Clean Water staff on October 30th, November 24th and February 17th. Project Clean Water releases reports of their findings on their website, which is located at www.countyofsb.org/project_cleanwater.

**South Coast Watershed Characterization Study**

URS Greiner Woodward-Clyde completed the South Coast Watershed Characterization Study in 1999. This water quality investigation, which was funded by Santa Barbara County, City of Santa Barbara, City of Carpinteria, and the County of Ventura, encompassed the Arroyo Burro, Mission, Carpinteria, and Rincon Creeks. The objectives of the study included describing water quality under spring and winter conditions, identifying elevated concentrations of pollutants and extent of bacterial pollution, identifying best management practices for pollutant control and providing recommendations for future studies.

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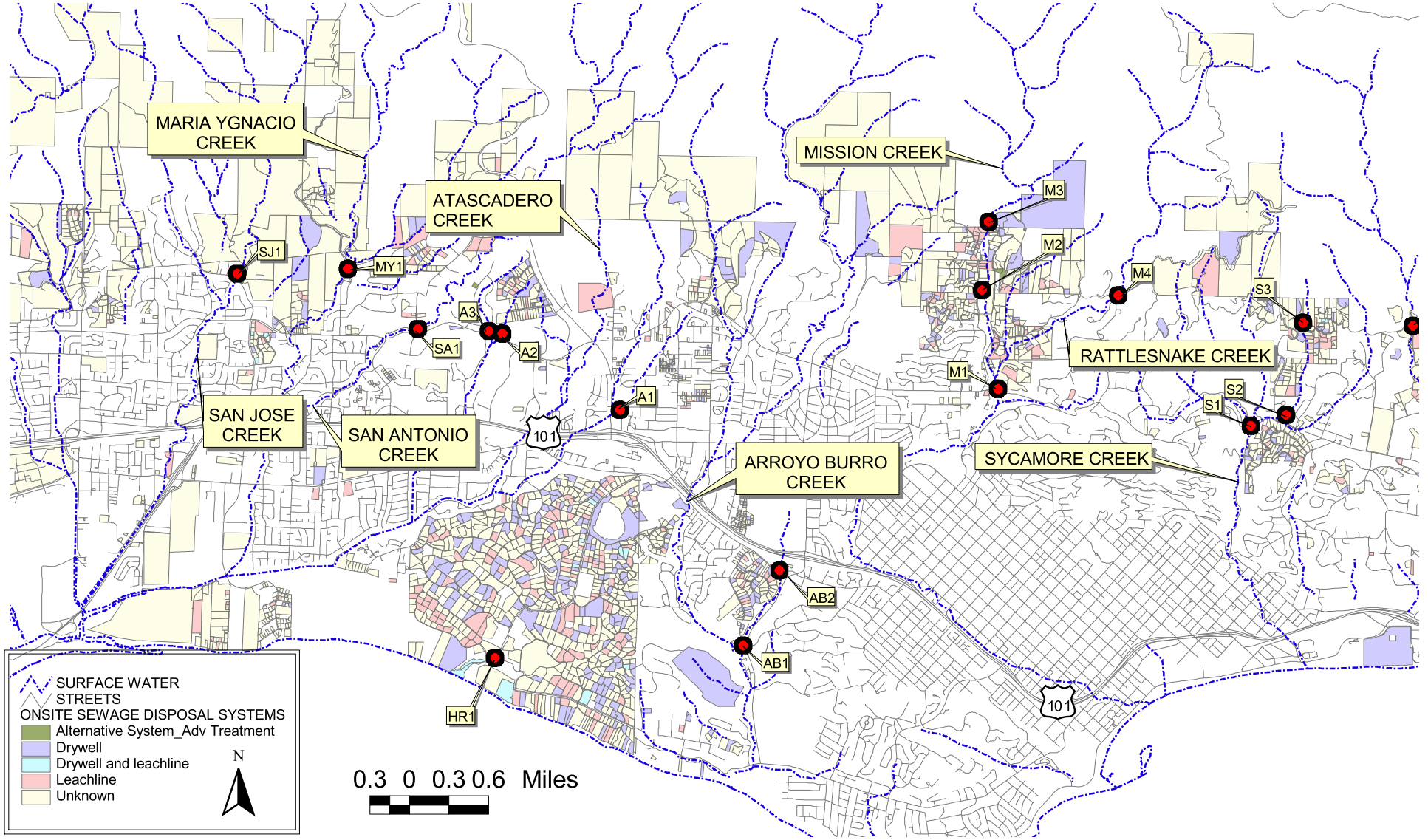
SOUTH COAST SAMPLING POINTS
RINCON POINT TO MONTECITO

FIGURE
6-1

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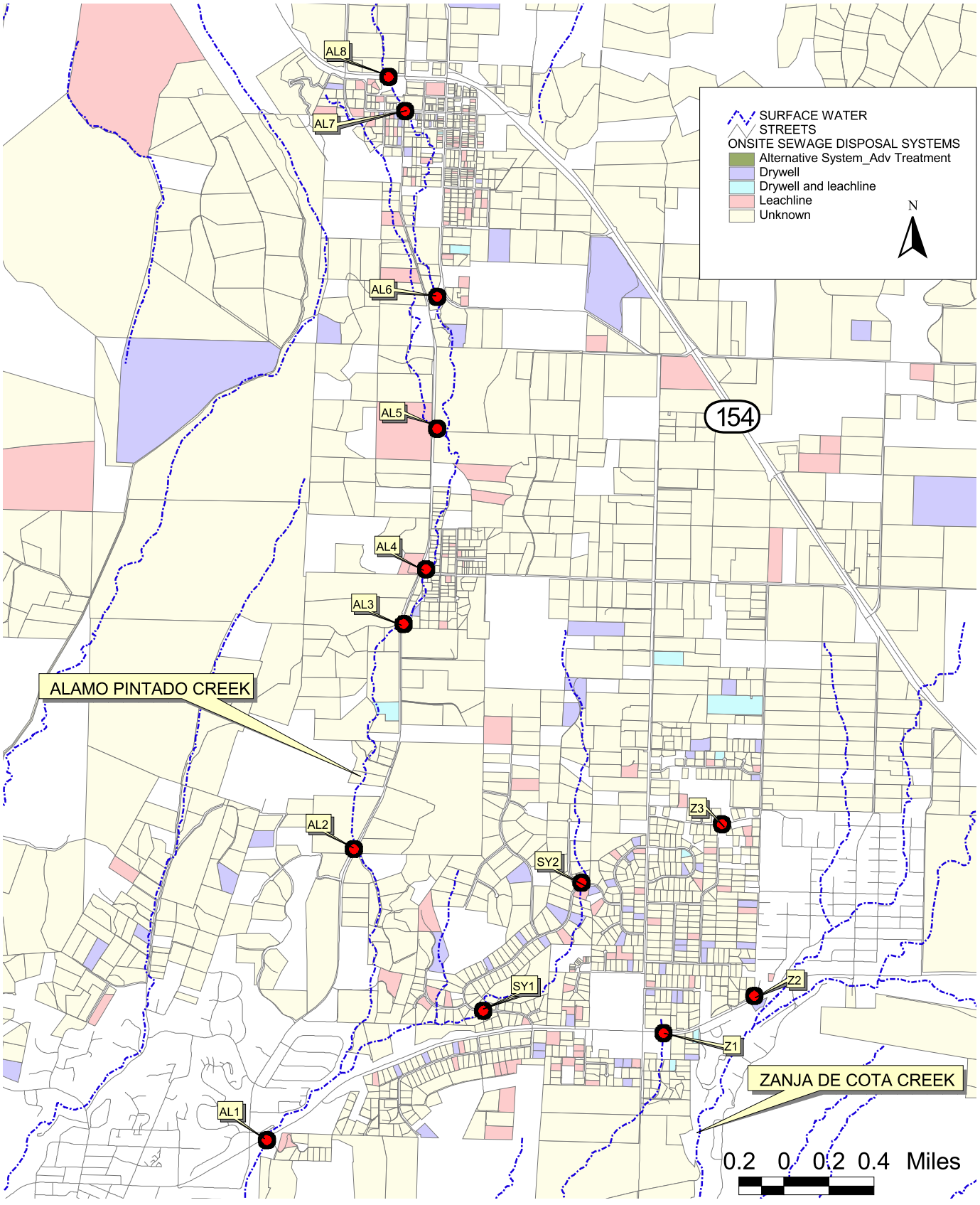
SOUTH COAST SAMPLING POINTS
SYCAMORE CANYON TO SAN JOSE CREEK

FIGURE
6-2

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NORTH COUNTY SAMPLING POINTS
SANTA YNEZ AREA

FIGURE
6-3

Water samples were collected for four sampling events, including, dry weather, "first flush" runoff, and mid-winter conditions. Ten sampling locations were monitored along each creek, for bacteriological parameters (total coliform, fecal coliform and enterococcus); three of the stations were monitored for other general water quality parameters. Sampling points were located at the midpoint of the watershed to the mouth of the creek, centered around the urbanized areas. The study also described storm water pollution and pollutants associated with different land uses and presented recommendations for future water quality management efforts. The study also confirmed the Environmental Protection Agency's designation of all four creeks as "impaired waters".

Results of the general and mineral water quality analysis found the four streams to be typical of other coastal streams in the region. Water quality was generally within acceptable receiving water limits with the notable exception of depressed dissolved oxygen levels in Arroyo Burro Creek, and numerous high bacteriological readings in all four of the creeks. **Table 6-1** summarizes the findings of the study in regard to bacterial pollution. As indicated, significant sources of bacterial pollution were found in each watershed, but septic systems were not identified as being responsible for the high bacteria counts.

**Lower Rincon Watershed Study**

In 1999 a study of the Lower Rincon Creek Watershed was conducted to attempt to identify the source(s) of chronic high bacteriological readings in the creek and near shore ocean waters adjacent to Rincon Point. There are 74 residences in the Rincon Point area, all served by onsite sewage disposal systems that were believed to be contributing to the high bacterial counts in the waters. This study utilized a technique, developed by Dr. Mansour Samadpour (University of Washington Department of Environmental Health), which identifies the genetic fingerprint of the fecal coliforms found in the water samples. Dr. Samadpour's DNA library was reported to contain over 24,000 DNA fingerprints for thousands of source species. The study was a joint effort between Santa Barbara County Health Department, Santa Barbara County Water Agency and Heal the Ocean.

Three sampling stations were identified at the surf zone, lagoon, and upstream of the lagoon. Water samples were collected and analyzed at the University of Washington Laboratory, for DNA fingerprinting, and at the Santa Barbara County Public Health Department Laboratory, for concentration of fecal coliform and *E. coli*. The sampling was done during the dry season, in May and June of 1999. Approximately 150 water samples were collected, of which 108 were analyzed for DNA species matches.

The study found matches occurring in 82 of the 108 samples analyzed. The majority of matches were associated with wild animal sources. However, 46% of the matches were attributed to domestic sources. Individually, the greatest numbers of matches in the lagoon and surf zone sampling locations were for the human coliform species. Overall, human species accounted for 20% of the total number of matches found; duck and dog

**TABLE 6-1**
**SUMMARY OF BACTERIA POLLUTION FINDINGS**
**(Source: 1998-1999 South Coast Watershed Characterization Study)**

**Arroyo Burro Creek**

- ► Numerous sources of bacteria occurs throughout the watershed.
- ► Much of the uppermost watershed has acceptable levels of bacteria.
- ► Storm drains and creek encampments are probable sources of high levels in the middle portions of the watershed.
- ► Storm drains and lagoon fauna, such as birds, are probable sources of high levels in the lower watershed.
- ► No direct link between septic systems and beach closures has yet been established.
- ► Storm water carries several times the low flow levels of bacteria.

**Mission Creek**

- ► Bacteria are the principal pollutants of concern
- ► Much of the uppermost watershed has acceptable levels of bacteria
- ► Storm drains, creek encampments, and lagoon fauna, such as birds, are probable sources of high levels in the lower watershed.
- ► No direct link between septic systems and beach closures has yet been established.
- ► Storm water carries several times the low flow levels of bacteria

**Carpinteria Creek**

- ► Bacteria are the principal pollutants of concern
- ► Much of the upper watershed has acceptable levels of bacteria
- ► Storm drains and lagoon fauna, such as birds, are probable sources of high levels in the lower watershed.
- ► Storm water carries several times the low flow levels of bacteria.

**Rincon Creek**

- ► Bacteria are the principal pollutants of concern.
- ► Numerous sources of bacteria occur throughout the watershed
- ► No direct link between septic systems and beach closures has yet been established
- ► Storm water carries several times the low flow levels of bacteria.

**SUMMARY**

**1.** The study results indicate elevated levels of bacteria in all watersheds that exceed state health standards for water contact beaches in 30 to 90 percent of the samples. Arroyo Burro Creek exhibited the greatest frequency of exceedances, while Carpinteria Creek exhibited the lowest relative frequency. The frequency of exceedances along Mission and Rincon creeks was intermediate.

**2.** There was a notable increase in bacteria concentrations after the first flush rainfall of the winter. Concentrations of total coliform, fecal coliform, and enterococcus increased several orders of magnitude for all watersheds.

**3.** The concentration of bacteria varied considerably from station to station within each watershed due to site-specific variability in bacteria sources, creek conditions, and possible sampling error or contamination. Arroyo Burro Creek exhibits a distinct pattern of high bacteria concentrations, possibly indicating specific sources of contamination. Mission Creek exhibits increasing bacteria concentration from the top to the bottom of the watershed.

species were next at 11% and 10%, respectively. The study found 11human matches in the surf zone, 14 in the lagoon, and no matches at the upstream sampling station, above the residential-septic system area. The full listing of DNA matches by species and sample location are displayed in **Table 6-2**.

Tests for the pathogenic form of *E. coli* (0157:H7) yielded negative results; and the bacteriological readings in the surf zone were generally within acceptable limits for water contact recreation during the study. The study was not able to determine specifically how human coliform species were entering the lagoon and ocean waters. At the time of the sampling there was no evidence of sewage surfacing or discharges to creek; it was postulated that subsurface flow of septic system effluent to the creek was the most likely route. The study results supported the on-going efforts of the Rincon Point Homeowners to obtain sewer extension from the Carpinteria Sanitary District to replace the onsite systems in the area. However, it also highlighted the significant bacteriological contribution to water quality from natural or wild animal sources.

**Central Coast Ambient Monitoring Program (CCAMP)**

The Central Coast Ambient Monitoring Program (CCAMP) is a surface water monitoring program of the Central Coast Regional Water Quality Control Board (Regional Board). The purpose of the program is to collect comprehensive baseline water quality data for several different focus areas in the Central Coast Region, including several watersheds in Santa Barbara County. The monitoring program is not directed at any particular source of water quality pollution. Instead, the data collected are intended to be made available as a general source of information regarding the health of the waters of the region, and for use by various decision makers and the public in efforts to maintain, restore, and enhance water quality and associated beneficial uses.

For this the program, the Regional Board divided the Central Coast Region into five Watershed Characterization Areas. Each area is intended to be monitored and evaluated over the course of a full year. Monitoring of the entire region will be accomplished over a span of five years. Watershed Characterization Areas 3 and 4 cover Santa Barbara County. Presently, data and draft reports are available only for Areas 1 and 2. Water quality sampling for Area 3 (including Santa Maria and Carrizo Plain) has been completed, but the data were not available for review and inclusion in this report. Water quality sampling for Santa Barbara South Coast, Channel Islands, San Antonio and Santa Ynez is being is scheduled for the coming year.

Conventional water quality parameters (chemical, physical and bacteriological), as well as sediment chemistry, bioaccumulation, and benthic invertebrate assemblages will be monitored. Water quality sampling results from coastal confluences, nearshore waters, and groundwater will be used to identify impaired water in accordance with provisions of the Clean Water Act, development of Total Maximum Daily Loads (TMDLs) and numeric objectives for impaired water bodies, track trends in water quality, and identify areas in need of more detailed focused studies.

**TABLE 6-2**
**SUMMARY OF FECAL COLIFORM SOURCE MATCHING**
**(Source: Lower Rincon Creek Watershed Study)**

| Species | Number of Matches | Percent of Total Matches (%) | Ocean | Lagoon | Culvert |
|---|---|---|---|---|---|
| Human | 25 | 20 | 11 | 14 | 0 |
| Duck | 14 | 11 | 3 | 6 | 3 |
| Dog | 12 | 10 | 3 | 7 | 2 |
| Seagull | 11 | 9 | 2 | 5 | 4 |
| Raccoon | 8 | 6 | 1 | 4 | 3 |
| Opossum | 8 | 6 | 3 | 2 | 3 |
| Horse | 7 | 6 | 2 | 0 | 5 |
| Cat | 7 | 6 | 1 | 3 | 3 |
| Coyote | 6 | 5 | 1 | 0 | 5 |
| Cow | 5 | 4 | 1 | 0 | 4 |
| Bobcat | 3 | 2 | 0 | 2 | 1 |
| Raven | 3 | 2 | 0 | 0 | 3 |
| Rodent | 3 | 2 | 1 | 0 | 2 |
| Pelican/Seagull | 3 | 2 | 1 | 2 | 0 |
| Otter | 3 | 2 | 0 | 0 | 3 |
| Skunk | 2 | 2 | 0 | 2 | 0 |
| Sheep | 1 | 2 | 0 | 1 | 0 |
| Fox | 1 | 1 | 0 | 0 | 1 |
| Beaver | 1 | 1 | 0 | 0 | 1 |
| Swallow | 1 | 1 | 1 | 0 | 0 |
| **TOTAL** | **124** | **100** | **31** | **48** | **43** |

Additional information about the program is available on their website at www.ccamp.org/ccamp.

## WATER QUALITY SAMPLING

Surface water quality sampling was a key element of the Santa Barbara County Septic System Survey. The purpose of the sampling program was to document the water quality conditions in surface streams in areas of the County where there are large concentrations of septic systems, to aid in assessing whether or not (and where) surface water contamination may be occurring as a result of existing septic system practices. Provided here is a description of the sampling that was conducted, a summary of the results and discussion of the significant findings. Additional sampling program details, including sampling methodology and detailed maps are contained in **Appendix I**.

### Sampling Locations

Surface water sampling stations were selected to isolate, as much as possible, surface waters in areas having a relatively large number or heavy concentration of septic systems or where there have been historic problems or special concerns regarding septic system usage. Various factors and resources were used to select the sampling sites, including:

1. GIS mapping was used to identify the specific location, number and density of septic systems.
2. USGS topographic maps and Soil Survey maps were used to help understand hydrologic, soil/geologic and topographic conditions in areas of potential concern.
3. Reconnaissance field surveys were made to observe stream/drainage conditions, land use activities, locations for sampling access and other special considerations.
4. Water quality data from other prior and on-going sampling programs (e.g. South Coast Watershed Characterization Study, Lower Rincon Creek Watershed Study, and Project Clean Water) were reviewed.

Initially, 53 sampling stations were identified for sampling on 20 different streams that flow through areas of the County served by septic systems. Approximately two-thirds of the sampling stations were on streams in the South Coast area, a few in the Orcutt area, and the remainder in the Santa Ynez area. **Table 6-3** lists the stream segments included in the sampling program. **Figures 6-1** and **6-2** show the specific sampling locations for the South Coast streams; **Figure 6-3** shows the sampling locations for the Santa Ynez area. Additional maps of each area are provided in **Appendix I**. The sampling locations in the Orcutt area included an unnamed drainage in the Lake Marie Estates area and Orcutt Creek near Foxenwood Estates; however these stations were unable to be sampled because of insufficient streamflow. Because of unusually low rainfall-runoff conditions during the period of the study, several of the proposed sampling stations in Santa Ynez and for some of the South Coast streams were also dry throughout the sampling period. Out of the original 53 identified sampling stations, only 33 had sufficient streamflow and were able to be sampled during the study.

**TABLE 6-3**
**WATER QUALITY SAMPLING LOCATIONS**

| CREEK - WATERSHED | NOTES |
|---|---|
| **South Coast Area Streams** | |
| Rincon Creek | Rincon Creek has been sampled extensively in prior studies; sampling will be limited to up and downstream of Rincon Point septic systems to provide continuity with prior work. Upper watershed area is predominated by large parcels and extensive agricultural uses. |
| Arroyo Paredon | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 75-100 septic systems in drainage area; drains through agricultural and greenhouse area; discharges directly to ocean east of Loon Point |
| East Toro Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 100 septic systems in watershed; many systems close to creek in upper reaches. Agricultural uses in lower reaches. No urban area influence. Drains to Ocean immediately east of Loon Point |
| West Toro Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 100 septic systems in watershed; many systems close to creek in upper reaches. Agricultural uses in lower reaches. No urban area influence. Drains to Ocean at Loon Point. |
| Romero Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 50 septic systems in watershed, mostly medium to large lots. Drains through Valley Golf Club and urban-suburban area west of Summerland; joins with Picay and Buena Vista Creek; discharge to Ocean at Fernald Point. |
| Buena Vista Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 150 septic systems, with high density of small lots near East Valley Road. Drains through Valley Golf club and urban-suburban area west of Summerland; joins with Picay and Romero Creek; discharge to Ocean at Fernald Point |
| Montecito Creek | Sampling stations overlap/supplement Project Clean Water Sampling. Approximately 100 septic systems in watershed on medium to large lots. Drains through urban area. |
| Sycamore Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 175-200 septic systems in watershed on 1+ acre lots. Drains through urban area. |
| Mission Creek | Special Problem Area. Prior monitoring data from South Coastal Characterization Study and Project Clean Water. Sampling data will provide continuity with prior work. Rattlesnake Creek tributary added. Approximately 200 septic systems in watershed on 1+ acre lots. Drains through urban area. |
| Arroyo Burro Creek | Upstream and downstream sampling at Veronica Springs unincorporated area. Nearby sampling data from prior studies and Project Clean Water. Approximately 75 septic systems on 2+ acre lots. Drains, with urban area, to Arroyo Burro Beach. |
| Hope Ranch | Downstream outlet from majority of Hope Ranch Area. Approximately 300 septic system on 2+acre lots, some livestock. Drains directly to Ocean with minimal urban/agricultural influence. |

**TABLE 6-3**
**WATER QUALITY SAMPLING LOCATIONS**

| CREEK - WATERSHED | NOTES |
|---|---|
| **South Coast Area Streams** | |
| Atascadero Creek (& Cieneguitas Creek) | Atascadero Creek sampling stations overlap/supplement some Project Clean Water sampling stations. Stations selected to focus on pockets of septic systems at upland edge of Goleta urban area, including some small lot neighborhoods noted as areas of potential concern. Approximately 150 septic systems in drainage area. Drains though urban area. |
| San Antonio Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 50 septic systems in immediate drainage area. |
| Maria Ygnacio Creek | Sampling stations overlap/supplement Project Clean Water sampling. Approximately 50 septic systems in immediate drainage area; also collects drainage from development along San Marcos Pass Road, including Painted Cave Area. |
| San Jose Creek | Sampling station overlap/supplement Project Clean Water sampling. Generally large-lot septic systems in immediate upstream area; also drain development from upper National Forest watershed, including San Marcos Trout Club, where there are many older septic system on small lots located adjacent to the creek. |
| | |
| **Santa Ynez Area Streams** | |
| Alamo Pintado Creek | Multiple sampling stations along Alamo Pintado creek, encompassing Ballard and Los Olivos Special Problem Areas. Approximately 400 septic systems on relatively small lots in Ballard and Los Olivos, plus 50 to 100 medium - large agricultural parcels bordering/surrounding the two towns. |
| Santa Ynez Area Drainages | Sampling stations include small tributary drainages to Alamo Pintado creek from Santa Ynez, north and west of High School. Drainage area encompasses 100+ older systems, including Stadium Place/Stadium Drive. |
| Zanja de Cota Creek | Sampling stations include small tributary drainages to Zanja de Cota Creek from Santa Ynez, north and east of High School. Drainage area encompasses 200+ older systems, including Horizon Drive and Refugio Road. |
| | |
| **Orcutt Area Streams** | |
| Unnamed Creek at Lake Marie Estates | Lake Marie Estates. Known problem area. Cluster of 40-60 larger homes on older septic systems. |
| Orcutt Creek | Sampling stations overlap/supplement Project Clean Water sampling near Foxenwood estates. Smaller lots on old septic systems. |

In addition to the baseline sampling stations, several "spot" sample locations were identified in the course of the study to follow-up and provide additional details on locally observed conditions. This included: (a) two samples on Alamo Pintado Creek in the Los Olivos area, one in the vicinity of a local storm drain and the other where there was evidence of lateral seepage from the streambank; and (b) eight samples on Arroyo Burro Tributary, where there were several small lateral drains entering the creek.

The sampling points were located in areas where public access was available, mostly at bridges, road crossings and public parks. As much as possible, sampling stations were selected to include: (a) an upstream "control" location above the focus area; (b) one or more sampling stations within the septic system focus area; and (c) a sampling point downstream or below the area of septic system usage.

**Water Quality Constituents**

The sampling program focused strictly on bacteriological impacts, which is the primary public health consideration relative to septic system practices and, generally, the best indicator of septic system influence. Microbiological examinations of water samples are frequently used to determine sanitary quality. However, tests for detection and enumeration of indicator organisms rather than direct testing for pathogens are used. Bacteria in the coliform group are the principal indicator used to determine the suitability of water for domestic, industrial and other uses.

Each sample was analyzed for the following bacteria indicators:

1. **Total Coliform.** The presence of coliform bacteria (expressed as total coliforms) is used to indicate water quality with respect to turbidity and organic matter content, as well as to indicate the possible presence of the fecal coliform group of bacteria. Total coliforms are a group of bacteria that are widespread in nature and are not a good means to identify a particular contamination source (i.e., human, animal, and soil); however, total coliform is a standard test and used widely to characterize the presence and magnitude of a contamination condition, especially with respect to water supply impacts.

2. ***Escherichia coli.*** *E. coli* is a species of fecal coliform specific to fecal matter from humans and other warm-blooded animals. *E. coli* is used to indicate the possible presence of pathogens because they are normally associated with the gut and are present in the feces of human and other warm-blooded animals, a potential source of pathogenic viruses, protozoa, and bacteria. EPA recommends *E. coli* as the best indicator of health risk from water contact in recreational waters.

3. ***Enterococcus.*** *Enterococci* are a subgroup within the fecal streptococcus group, distinguished by their ability to survive in salt water and tend to mimic the behavior of many pathogens better than other indicators. They are typically more

human-specific than the larger fecal streptococcus group and are recommended by EPA as the best indictor organism for health risk in salt water used for recreation, and also useful for fresh water.

Other water quality parameters, such as nitrogen, phosphorous, chloride and surfactants, were not proposed to be included for routine sampling and analysis. The significant amount of livestock and farming activity in most of the watershed areas interfere with the ability to use nitrogen, phosphorous or chloride levels as indicators of septic system impacts on surface waters. Additionally, past experience with sampling for surfactants (MBAS) has rarely yielded any meaningful information.

Colilert and Enterolert methodology was used for all samples. Procedures for analyses are detailed in **Appendix I**. While there is no "fool-proof" indicator organism or test that can be used to unequivocally identify human sewage impacts in surface waters, these bacteriological analyses are considered by most professionals in the field to be the best indicators presently available. These are the same analyses that are completed for storm water samples under the Project Clean Water program, such that the results will be compatible and useful between the two separate sampling efforts. Santa Barbara County Public Health Laboratory conducted all analyses of water samples.

**Sampling Period and Methods**

The water quality sampling was conducted over an approximate 14-week period in the winter and spring of 2002, starting the last week of January and extending into the first week of May. Six full sampling runs were conducted during the study period.

In contrast with Project Clean Water, the sampling program was designed to avoid sampling during rainfall-runoff periods, in order to avoid collection of stormwater runoff pollutants from other sources (e.g., animal wastes). Sampling was planned to be conducted in the days following rainfall events to check for any lingering effects that might be associated with poorly draining septic systems. However, since there were no major storms during the sampling period; all samples were taken during what would be considered non-rainy periods.

Surface water samples were collected at various fixed points across surveyed streams. At each station, a bacterial sample was collected using a sterile plastic bottle with sterility seals. To collect the bacterial sample, a sterile open bottle was dipped below the surface of the stream, allowed to fill, and then recapped with the sterile lid. Immediately after collection, all sample bottles from the station were placed on ice in a cooler for storage and transported to the Santa Barbara County Public Health Laboratory within six hours of taking the sample. One sample was obtained at each station.

Detailed description of field sampling procedures are provided in **Appendix I**.

**Water Quality Sampling Results and Discussion**

***Results.*** Sampling results are listed in **Table 6-4** by stream-sampling station, sampling date and bacteria indicator organism. **Table 6-5** provides a summary of the data showing, for each sampling station, the minimum, maximum and log mean values obtained during the six sampling runs. As noted, five streams were dry, or had insufficient streamflow for sample collection, during the entire 14-week sampling period. In each table, the values have been highlighted where they are in excess of the water quality objectives (i.e., standards), which are presented below.

***Water Quality Objectives.*** Bacteriological objectives for surface waters are established by the Regional Board in the Basin Plan based on criteria for protection of beneficial uses of the water. Additionally, as a result of state legislation passed in 1999 (AB 411), minimum bacteriological standards for the protection of ocean water adjacent to public beaches or areas of public water contact sports (Designated REC-1 per Basin Plan) are listed below:

1. Based on a single sample, the density of bacteria in water from each sampling shall not exceed:

   (a) Total coliform: 1,000 MPN/100 ml, if the ratio of fecal/total coliform exceeds 0.1; or
   10,000 MPN/100 ml; or
   (b) Fecal Coliform: 400 MPN/100 ml; or
   (c) Enterococcus: 104 MPN/100 ml

2. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day period, the density of bacteria in water from any sampling station shall not exceed:

   (a) Total Coliform: 1,000 MPN/100 ml; or
   (b) Fecal Coliform: 200 MPN/100 ml; or
   (c) Enterococcus: 35 MPN/100 ml

The above standards for total coliform and enterococcus apply specifically to public beaches, where creek waters mix with ocean waters in the surf zone. They do not apply directly to the creek waters that were sampled in this study; however, they provide a reasonable point of reference for judging the condition of the streams and potential threat to downstream receiving waters.

The fecal coliform objectives apply to all waters (and tributaries) designated for water contact recreation uses. No specific numeric standard has been established for *E. coli.* However, because of its close relationship to fecal coliform as an indicator organism, the standards for fecal coliform (400 maximum, 200 log mean) are currently considered by many public health professionals to be suitable criteria until such time as more specific standards are established.

**TABLE 6-4**
**BACTERIOLOGICAL SAMPLING RESULTS**

| Creeks | 1st SAMPLING RUN (01/29/02 - 01/31/02) | | | 2nd SAMPLING RUN (02/19/02 - 02/21/02) | | | 3rd SAMPLING RUN (02/26/02 - 02/28/02) | | | 4th SAMPLING RUN (03/12/02 - 03/14/02) | | | 5th SAMPLING RUN (04/02/02 - 04/04/02) | | | 6th SAMPLING RUN (04/30/02 - 05/2/02) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus |
| **Rincon** | | | | | | | | | | | | | | | | | | |
| ***R1*** | 46,110 | 2,870 | 98 | 1,376 | 41 | 108 | 24,192 | 432 | 2,282 | 2,359 | 41 | 98 | 4,352 | 1,607 | 246 | 3,448 | 135 | 278 |
| ***R2*** | 26,130 | 2,280 | 20 | 697 | 52 | 10 | 1,364 | 450 | <10 | 1,334 | 10 | 30 | 1,723 | 31 | 86 | 1,989 | 41 | 52 |
| **Arroyo Paredon** | | | | | | | | | | | | | | | | | | |
| ***AP1*** | >241,920 | 5,040 | 650 | 17,329 | 143 | 226 | >24,192 | 98 | 74 | >24192 | 1,935 | 187 | 24,192 | 556 | 148 | >24,192 | 74 | 228 |
| ***AP2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***AP3*** | 64,880 | 22,470 | 2,046 | 2,755 | 41 | 98 | 2,909 | 189 | 41 | 3,448 | 31 | 160 | 3,448 | 98 | 52 | 9,804 | 6,488 | 816 |
| **East Toro** | | | | | | | | | | | | | | | | | | |
| ***ET1*** | 19,863 | 6,867 | 4,352 | - | - | - | 8,164 | 1,396 | 7,270 | 10,462 | 6,867 | 1,439 | - | - | - | - | - | - |
| ***ET2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***ET3*** | 1,081 | 52 | 30 | 3,076 | 84 | 10 | 2,613 | 135 | <10 | 4,611 | 295 | 110 | 4,352 | 20 | 52 | 24,192 | 4,884 | 657 |
| ***ET4*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **West Toro** | | | | | | | | | | | | | | | | | | |
| ***WT1*** | >241,920 | 3,050 | 226 | 17,329 | 528 | 594 | >24192 | 1,050 | 368 | >24,192 | 561 | 2,613 | 17,329 | 677 | 305 | >24,192 | 5,172 | 437 |
| ***WT2*** | 9,590 | 310 | 10 | 2,481 | 109 | 31 | 2,755 | 20 | 30 | >24,192 | 41 | 98 | 4,884 | 10 | 52 | 4,611 | 52 | 110 |
| ***WT3*** | 862 | 171 | 72 | 3,076 | 185 | 10 | - | - | - | - | - | - | - | - | - | - | - | - |
| ***WT4*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Romero** | | | | | | | | | | | | | | | | | | |
| ***RO1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***RO2*** | 594 | 20 | <10 | 548 | <10 | 41 | - | - | - | - | - | - | - | - | - | - | - | - |
| **Buena Vista** | | | | | | | | | | | | | | | | | | |
| ***BV1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***BV2*** | 336 | <10 | 10 | 878 | <10 | <10 | 1,354 | 10 | <10 | 2,014 | <10 | <10 | 2,098 | 364 | 419 | - | - | - |
| **Montecito** | | | | | | | | | | | | | | | | | | |
| ***MO1*** | 857 | 31 | 20 | 1,396 | 52 | 20 | 1,201 | <10 | 30 | 1,670 | <10 | 10 | 2,064 | 31 | 41 | 2,142 | 20 | 20 |
| ***MO2*** | 717 | <10 | <10 | 272 | 20 | 295 | 211 | <10 | 10 | 2,187 | 10 | <10 | 31 | 10 | <10 | - | - | - |
| ***MO3*** | 262 | 20 | 52 | 373 | <10 | 10 | 422 | <10 | 20 | 605 | 10 | 135 | 663 | <10 | <10 | 1,119 | 10 | 20 |
| **Sycamore** | | | | | | | | | | | | | | | | | | |
| ***S1*** | 1,793 | 108 | 259 | 1,276 | 161 | 83 | 2,613 | 209 | 171 | 1,860 | 345 | 213 | 4,611 | 85 | 487 | 2,481 | 135 | 107 |
| ***S2*** | 3,448 | 84 | 96 | 2,282 | 73 | 52 | 4,106 | 257 | 52 | 6,131 | 496 | 373 | 6,131 | 160 | 1,223 | 2,755 | 31 | 41 |
| ***S3*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

*** Shaded values indicate exceedance of water quality objectives**

**TABLE 6-4**
**BACTERIOLOGICAL SAMPLING RESULTS**

| Creeks | 1st SAMPLING RUN (1/29/02 - 1/31/02) | | | 2nd SAMPLING RUN (2/19/02 - 2/21/02) | | | 3rd SAMPLING RUN (2/26/02 - 2/28/02) | | | 4th SAMPLING RUN (3/12/02 - 3/14/02) | | | 5th SAMPLING RUN (4/2/02 - 4/4/02) | | | 6th SAMPLING RUN (4/30/02 - 5/2/02) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus |
| **Arroyo Burro** | | | | | | | | | | | | | | | | | | |
| ***AB1*** | >24,192 | 1,191 | 888 | 9,208 | 4,352 | 2,613 | 9,804 | 4,611 | 5,794 | 9,804 | 3,130 | 717 | 9,804 | 1,050 | 1,376 | 4,611 | 132 | 63 |
| ***AB2*** | >24,192 | 3,873 | 2,187 | 2,481 | 41 | 10 | 3,448 | 10 | 86 | 7,701 | 74 | 10 | >24,192 | 1,515 | 464 | 17,329 | 2,359 | 52 |
| **Mission** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***M1*** | 520 | 20 | 20 | 1,439 | 20 | 41 | 1,674 | 31 | 63 | 2,187 | <10 | 63 | 2,755 | 31 | 31 | 2,613 | 41 | 121 |
| ***M2*** | 620 | 74 | 187 | 816 | <10 | 63 | 1,860 | 20 | <10 | 1,658 | <10 | 10 | 1,850 | <10 | 10 | 1,918 | 31 | 228 |
| ***M3*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***M4*** | 960 | <10 | 30 | 1,246 | <10 | <10 | 748 | 20 | 10 | 1,333 | 10 | 301 | 738 | 10 | 10 | 1,333 | 31 | 10 |
| **Hope Ranch** | | | | | | | | | | | | | | | | | | |
| ***HR1*** | 10,462 | 106 | 171 | 1,658 | 110 | 145 | 5,794 | 110 | 1,223 | 24,192 | 171 | 520 | 3,873 | 187 | 175 | 3,609 | 1,081 | 404 |
| **Atascadero** | | | | | | | | | | | | | | | | | | |
| ***A1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***A2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***A3*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **San Antonio** | | | | | | | | | | | | | | | | | | |
| ***SA1*** | 317 | 52 | 20 | 988 | <10 | <10 | 1,145 | 10 | 31 | 833 | 10 | 20 | 8,164 | 10 | 52 | 839 | 10 | 455 |
| **Maria Ygnacio** | | | | | | | | | | | | | | | | | | |
| ***MY1*** | 1,956 | 121 | 110 | 1,860 | 95 | 41 | 3,873 | 109 | 63 | 5,475 | 41 | 74 | 3,255 | 41 | 86 | 3,609 | 52 | 10 |
| **San Jose** | | | | | | | | | | | | | | | | | | |
| ***SJ1*** | 1,145 | 336 | 52 | 1,334 | 71 | 142 | 2,489 | 63 | 73 | 2,613 | 134 | 318 | 1,860 | 41 | 31 | 3,076 | 193 | 187 |
| **Alamo Pintado** | | | | | | | | | | | | | | | | | | |
| ***AL1*** | 1,500 | 63 | 120 | 4,611 | 345 | 74 | 2,613 | 211 | 110 | 6,131 | 110 | 233 | 24,192 | 110 | 327 | 4,611 | 573 | 359 |
| ***AL2*** | 4,106 | 377 | 256 | 2,987 | 121 | 185 | 6,488 | 288 | 906 | 5,794 | 169 | 233 | 5,247 | 233 | 520 | 6,131 | 520 | 583 |
| ***AL3*** | 3,255 | 1,106 | 441 | 3,873 | 504 | 379 | 4,352 | 933 | 638 | 4,884 | 1,112 | 538 | 5,475 | 1,296 | 882 | 6,867 | 816 | 712 |
| ***AL4*** | 4,106 | 419 | 158 | 3,076 | 613 | 368 | 5,475 | 487 | 571 | 3,282 | 565 | 556 | 3,448 | 240 | 548 | 5,172 | 907 | 784 |
| ***AL5*** | - | - | - | 404 | 10 | <10 | - | - | - | 1,354 | <10 | <10 | 3,448 | <10 | 20 | 2,723 | <10 | 52 |
| ***AL6*** | 2,909 | 689 | 670 | 3,873 | 1,017 | 529 | 3,873 | 933 | 583 | 3,448 | 231 | 588 | 3,448 | 253 | 520 | 3,255 | 364 | 379 |
| ***AL7*** | 2,400 | 183 | 292 | 3,076 | 512 | 213 | 3,654 | 369 | 504 | 3,448 | 218 | 168 | 9,804 | 120 | 197 | 6,488 | 161 | 134 |
| ***AL8*** | 3,654 | 393 | 959 | 3,873 | 763 | 290 | 11,199 | 805 | 1,334 | 6,131 | 1,565 | 682 | 6,867 | 2,282 | 250 | 6,867 | 627 | 135 |

*** Shaded values indicate exceedance of water quality objectives**

**TABLE 6-4**
**BACTERIOLOGICAL SAMPLING RESULTS**

| Creeks | 1st SAMPLING RUN (1/29/02 - 1/31/02) | | | 2nd SAMPLING RUN (2/19/02 - 2/21/02) | | | 3rd SAMPLING RUN (2/26/02 - 2/28/02) | | | 4th SAMPLING RUN (3/12/02 - 3/14/02) | | | 5th SAMPLING RUN (4/2/02 - 4/4/02) | | | 6th SAMPLING RUN (4/30/02 - 5/2/02) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus | Total Coliform | E. coli | Entero-coccus |
| **Alamo Pintado Tributary** | | | | | | | | | | | | | | | | | | |
| ***SY1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***SY2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Zanja De Cota** | | | | | | | | | | | | | | | | | | |
| ***Z1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***Z2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***Z3*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Orcutt** | | | | | | | | | | | | | | | | | | |
| ***O1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***O2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Lake Marie** | | | | | | | | | | | | | | | | | | |
| ***U1*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ***U2*** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

*** Shaded values indicate exceedance of water quality objectives**

**TABLE 6-5**
**BACTERIOLOGICAL DATA SUMMARY**

| | Sampling Points | Total Coliform | | | E. coli | | | Enterococcus | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Range | | Log Mean | Range | | Log Mean | Range | | Log Mean |
| | | Min | Max | | Min | Max | | Min | Max | |
| Rincon | *R1* | 1,376 | 46,110 | 6,154 | 41 | 2,870 | 277 | 98 | 2,282 | 233 |
| | *R2* | 697 | 26,130 | 2,201 | 10 | 2,280 | 94 | 10 | 86 | 25 |
| Arroyo Paredon | *AP1* | 17,329 | 241,920 | 33,588 | 74 | 5,040 | 422 | 74 | 226 | 202 |
| | *AP2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *AP3* | 2,755 | 64,880 | 6,267 | 31 | 22,470 | 388 | 41 | 816 | 195 |
| East Toro | *ET1* | 8,164 | 19,863 | 11,927 | 1,396 | 6,867 | 4,038 | 1,439 | 7,270 | 3,571 |
| | *ET2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *ET3* | 1,081 | 24,192 | 4,020 | 20 | 4,884 | 160 | 10 | 657 | 47 |
| | *ET4* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| West Toro | *WT1* | 17,329 | 241,920 | 31,772 | 528 | 5,172 | 1,221 | 226 | 2,613 | 508 |
| | *WT2* | 2,481 | 24,192 | 5,739 | 10 | 310 | 49 | 10 | 110 | 42 |
| | *WT3* | 862 | 3,076 | 1,628 | 171 | 185 | 178 | 10 | 72 | 27 |
| | *WT4* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| Romero | *RO1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *RO2* | 548 | 594 | 571 | 10 | 20 | 14 | 10 | 41 | 20 |
| Buena Vista | *BV1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *BV2* | 336 | 2,098 | 1,110 | 10 | 364 | 21 | 10 | 419 | 21 |
| Montecito | *MO1* | 857 | 2,142 | 1,482 | 10 | 52 | 22 | 10 | 41 | 21 |
| | *MO2* | 31 | 2,187 | 308 | 10 | 20 | 12 | 10 | 295 | 20 |
| | *MO3* | 262 | 1,119 | 514 | 10 | 20 | 11 | 10 | 135 | 26 |
| Sycamore | *S1* | 1,276 | 4,611 | 2,243 | 85 | 345 | 156 | 83 | 487 | 186 |
| | *S2* | 2,282 | 6,131 | 2,867 | 31 | 496 | 125 | 41 | 1,223 | 130 |
| | *S3* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| Arroyo Burro | *AB1* | 4,611 | 24,192 | 9,059 | 20 | 4,611 | 799 | 63 | 5,794 | 876 |
| | *AB2* | 2,481 | 24,192 | 9,094 | 10 | 3,873 | 262 | 10 | 2,187 | 103 |
| | *** Spot Sampling April 25 and April 30** | | | | | | | | | |
| | *AB1a mix* | | 24,192 | | | 63 | | | 108 | |
| | *AB1a pipe* | 24,192 | 24,192 | 24,192 | 10 | 62 | 25 | 146 | 211 | 176 |
| | *AB1b mix* | | 2,613 | | | 10 | | | 10 | |
| | *AB1b pipe* | 19,863 | 24,192 | 21,921 | 10 | 10 | 10 | 272 | 275 | 273 |
| | *AB1c mix* | | 4,611 | | | 1,081 | | | 231 | |
| | *AB1c pipe* | 12,997 | 15,531 | 14,208 | 10 | 10 | 10 | 10 | 10 | 10 |
| | *AB1d mix* | | 4,611 | | | 52 | | | 10 | |
| | *AB1d pipe* | 546 | 1,259 | 829 | 10 | 10 | 10 | 10 | 10 | 10 |

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*** Shaded values indicate exceedance of water qulaity objectives**

**TABLE 6-5**
**BACTERIOLOGICAL DATA SUMMARY**

| | Sampling Points | Total Coliform | | | E. coli | | | Enterococcus | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Range | | Log Mean | Range | | Log Mean | Range | | Log Mean |
| | | Min | Max | | Min | Max | | Min | Max | |
| Mission | *M1* | 520 | 2,755 | 1,644 | 10 | 41 | 23 | 20 | 121 | 48 |
| | *M2* | 620 | 1,918 | 1,330 | 10 | 74 | 19 | 10 | 228 | 37 |
| | *M3* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *M4* | 738 | 1,333 | 1,027 | 10 | 31 | 14 | 10 | 301 | 21 |
| Hope Ranch | *HR1* | 1,658 | 24,192 | 5,691 | 106 | 1,081 | 188 | 145 | 1,223 | 322 |
| Atascadero | *A1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *A2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *A3* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| San Antonio | *SA1* | 317 | 8,164 | 1,127 | 10 | 52 | 13 | 10 | 455 | 38 |
| Maria Ygnacio | *MY1* | 1,860 | 5,475 | 3,111 | 41 | 121 | 69 | 10 | 110 | 51 |
| San Jose | *SJ1* | 1,145 | 3,076 | 1,961 | 41 | 336 | 108 | 31 | 318 | 100 |
| Alamo Pintado | *AL1* | 1,500 | 24,192 | 4,808 | 63 | 573 | 178 | 74 | 359 | 173 |
| | *AL2* | 2,987 | 6,488 | 4,957 | 121 | 520 | 254 | 185 | 906 | 380 |
| | *AL3* | 3,255 | 6,867 | 4,647 | 504 | 1,296 | 921 | 379 | 882 | 575 |
| | *AL4* | 3,076 | 5,475 | 3,992 | 240 | 907 | 499 | 158 | 784 | 447 |
| | *AL5* | 404 | 3,448 | 1,505 | 10 | 10 | 10 | 10 | 52 | 18 |
| | *AL6* | 2,909 | 3,873 | 3,451 | 231 | 1,017 | 490 | 379 | 670 | 537 |
| | *AL7* | 2,400 | 9,804 | 4,253 | 120 | 512 | 229 | 134 | 504 | 228 |
| | *AL8* | 3,654 | 11,199 | 5,982 | 393 | 2,282 | 902 | 135 | 1,334 | 452 |
| Santa Ynez | *SY1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *SY2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| Zanja de Cota | *Z1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *Z2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *Z3* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| Orcutt | *O1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *O2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| Lake Marie Estates | *U1* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |
| | *U2* | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry | Dry |

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*** Shaded values indicate exceedance of water qulaity objectives**

**General Findings**

Following is a brief summary of general findings and observations from the sampling data. A tabulation of the number of sampling events where there were "exceedances" of single value recreation water criteria is presented in **Table 6-6** and referenced in the discussion below.

1. As can be seen from the highlighting in **Tables 6-4 and 6-5**, a large percentage of the sample results were in excess of water contact recreation criteria for all bacteria indicator organisms; and this was common to most of the streams sampled.

2. Streams showing the lowest bacteriological readings and fewest incidents of exceedances included:
    - Romero Creek
    - Buena Vista Creek
    - Montecito Creek
    - Mission Creek
    - San Antonio Creek
    - Maria Ygnacio Creek
    - San Jose Creek

3. Streams showing the highest bacteriological readings and the most incidents of exceedances included:
    - Rincon Creek
    - Arroyo Paredon
    - East Toro Creek
    - West Toro Creek
    - Sycamore Creek
    - Arroyo Burro Tributary
    - Hope Ranch (unnamed creek)
    - Alamo Pintado Creek

4. The percentage of all values found to be in excess of bacteriological water quality objectives for each indicator organism were as follows:

| Parameter | Log Mean | Single Sample Maximum |
|---|---|---|
| Total Coliform | 91% | 35% |
| *E. coli* | 39% | 28% |
| Enterococcus | 73% | 53% |

It needs to be understood that the above exceedance percentages are in reference to criteria for the surf-mixing zone at public beaches, and not to the specific creek locations where the sampling was conducted. Also, the log mean values were

**TABLE 6-6**
**SAMPLING EVENTS HAVING EXCEEDANCES**
**OF SINGLE VALUE MAXIMUM WATER QUALITY CRITERION**
**FOR RECREATIONAL WATERS**

| Creek | Upstream of Focus Area(s) | | | Downstream or Within Focus Area(s)* | | |
|---|---|---|---|---|---|---|
| | Total Coliform | E. coli | Enterococcus | Total Coliform | E. coli | Enterococcus |
| **Rincon** | 2 | 2 | 0 | 3 | 3 | 4 |
| **Arroyo Paredon** | ◊ | ◊ | ◊ | 6 | 4 | 5 |
| **East Toro** | - | - | - | 4 | 4 | 4 |
| **West Toro** | - | - | - | 6 | 6 | 6 |
| **Romero** | 0 | 0 | 0 | - | - | - |
| **Buena Vista** | 1 | 0 | 1 | - | - | - |
| **Montecito** | 0 | 0 | 1 | 0 | 0 | 1 |
| **Sycamore** | - | - | - | 2 | 1 | 5 |
| **Arroyo Burro** | 3 | 3 | 2 | 5 | 5 | 5 |
| **Mission** | 0 | 0 | 1 | 0 | 0 | 2 |
| **Hope Ranch Drainage** | ◊ | ◊ | ◊ | 3 | 1 | 6 |
| **Atascadero** | - | - | - | - | - | - |
| **San Antonio** | ◊ | ◊ | ◊ | 1 | 0 | 1 |
| **Maria Ygnacio** | ◊ | ◊ | ◊ | 0 | 0 | 1 |
| **San Jose** | ◊ | ◊ | ◊ | 1 | 0 | 3 |
| **Alamo Pintado** | 5 | 5 | 6 | 6 | 6 | 6 |
| **Santa Ynez** | - | - | - | - | - | - |
| **Zanja de Cota** | - | - | - | - | - | - |
| **Orcutt** | - | - | - | - | - | - |
| **Lake Marie Estates Drainage** | - | - | - | - | - | - |

* ***One or More Stations***
\- ***Dry or Stagnant***
◊ ***No Upstream Control***

determined based on the total number of samples taken over the 14-week sampling period; the bathing water standard is based on the log mean value of five samples taken over a 30-day period.

5. The percentage of values exceeding the State Health Department standards and Basin Plan objectives for water contact recreation (28 to 91 percent) was similar to the findings from the 1999 South Coast Watershed Characterization Study, which reported exceedance percentages of 30 to 90 percent for the four streams investigated in that study.

## INDIVIDUAL STREAM SAMPLING SUMMARIES

Following is a discussion of the sampling results for each stream, including additional observations of factors noted during the course of the sampling program. A ranking of the steams according to the degree of bacteriological impact observed from the sampling results is provided in **Table 6-7** and referenced in the following discussion.

### Rincon Creek

Rincon Creek has been studied extensively in the past as part of the *South Coast Watershed Characterization Study* and the *Lower Rincon Watershed Study*. The sampling during the Sanitary Survey was limited to an upstream and downstream station at Rincon Point. The results showed the upstream sampling station to have consistently lower bacteriological readings than the downstream station, which is consistent with prior sampling of Rincon Creek. Although there were relatively low bacteria levels during some of the sampling events, overall Rincon Creek showed exceedance of log mean and single value recreation criteria for all indicator organisms at the downstream station (R1). Because of this, the creek was given a "High" rating for bacteriological impact during the study. The downstream sampling point (R1) showed, during several of the sampling runs, significant algal growth, ducks, and sea birds present.

### Arroyo Paredon Creek

This stream drains residential areas that are bordered by orchards, nurseries and greenhouses. The upstream sampling points (AP2 and AP3) are immediately adjacent to residential-septic system areas. However during the study AP2 was dry at the time of all sampling events. AP3 registered consistently high readings for total coliform during all sampling events, and also had high readings for *E. coli* and Enterococcus during a few sampling runs. The downstream sampling point (AP1) showed some of the highest readings for total coliform and *E. coli* for any sampling stations in the entire study. The agricultural operations or other activities in and around the creek near this sampling point may explain the high readings. This stream was assigned a "High" ranking for bacteriological impacts during the study period.

**TABLE 6-7**
**RANKING OF SURFACE WATER BACTERIOLOGICAL IMPACTS**
**January to May 2002 Sampling Period**

| HIGH | MODERATE | LOW | DRY OR NO IMPACT |
|---|---|---|---|
| Alamo Pintado | Hope Ranch | Maria Ygnacio | Atascadero |
| Arroyo Burro | Sycamore | Mission Canyon | Buena vista |
| Arroyo Paredon | | Montecito | Lake Marie Estates |
| East Toro | | San Antonio | Orcutt |
| Rincon | | San Jose | Romero |
| West Toro | | | Santa Ynez |
| | | | Zanja de Cota |

**East and West Toro Creeks**

East and West Toro Creeks run parallel to one another and have similar characteristics. They also produced very similar bacteriological sampling results during the study. The upper sampling stations are located within the Toro Canyon residential area, in hilly terrain and where there are a number of parcels relatively close to the creeks. The upstream control points for both creeks were dry during the entire sampling period; other sampling points were also dry during all or portions of the sampling program. Sample results for stations within the developed area showed sporadically high readings for all indicators. The lowest sampling station, at Padaro Lane, had consistently high readings for all indicator organisms throughout the study. The sampling stations may be influenced by other creek activity at these downstream locations, which are a substantial distance from septic systems at this point. These streams were both rated as exhibiting "High" bacteriological impacts during the study.

**Romero Creek**

Sampling points are located within residential areas. This creek is an ephemeral stream. The downstream sampling point (RO1) was dry for the entire sampling period. The upstream (control) sampling point (RO2) could only be sampled during the first two sampling events, in late January and mid-February. The results at the upstream station showed no exceedance of bacteriological criteria for any of the indicator organisms.

**Buena Vista Creek**

Sampling points were located within residential areas. Buena Vista Creek is also an ephemeral stream. The downstream sampling point (BV1) was dry for the entire sampling period. The upstream station (BV2) was able to be sampled for five of the six events. The bacteriological readings were within water quality objectives except for the one exceedance of the criterion for total coliform Enterococcus during the fifth sampling event, in early April. This stream was rated as showing "Low" bacteriological impacts during the study period.

**Montecito Creek**

Montecito Creek sampling stations capture flow from a primarily residential area where there are approximately 100 septic systems on medium to large lots. It then flows through an urban area that is included in the Project Clean Water sampling program. The sampling results indicated relatively good conditions, with only two exceedances of the criterion for Enterococcus – one at the upstream station and one at the intermediate station. However, the total coliform log mean value at the most downstream station (MO1) was also determined to exceed the recreation criterion. This stream was rated as having "Low" evidence of bacteriological impact during the study period.

**Sycamore Creek**

Sycamore Creek also drains residential areas in the western portions of the Montecito area. The sampling stations were located in areas with relatively hilly terrain, and the upstream control station (S3) was dry for the entire sampling period. The downstream sampling points (S1 and S2) both showed several exceedances for Enterococcus criteria, including the log mean value for the entire sampling period. There was one high reading for *E. coli* and two exceedances of the total coliform single sample maximum value at the downstream station. The log mean value for total coliform exceeded the recreation criterion at both station S1 and S2. Overall, this stream was assigned a "Moderate" ranking for bacteriological impact during the study period.

**Mission Creek**

Mission Creek drains the Mission Canyon Special Problems area. Four sampling stations were established to test the water in two branches of Mission Creek. Stations M3 and M4 were upstream controls, but M3 (located near #7 Falls trail) was dry during the entire sampling period. Sampling point M4 is located along a tributary to Mission Creek (along Rattlesnake Canyon). Station M2 was located within the Botanical Garden, and M1 was downstream of the confluence of Mission Creek and Rattlesnake Canyon. The sampling results showed no exceedance of *E. coli* criteria at any time; there were three exceedances of the single value criterion for Enterococcus – one at M1 and two at M2. Also, the log mean values for Enterococcus and total coliform exceeded recreation criteria. Overall, Mission Creek was assigned a "Low" rating for bacteriological impacts during the study period.

**Arroyo Burro Tributary**

Two sampling points were initially identified for the Arroyo Burro Tributary, located, respectively, upstream and downstream of the Veronica Springs area. The sample results showed consistently very high readings for all bacteriological indicators at both stations, with somewhat higher readings at the downstream station. During the last month of sampling, several additional "spot" samples were taken at intermediate points between AB1 and AB2 to investigate possible local inputs from side drains. These spot samples of side local drains all showed high total coliform readings, and several moderately high exceedance values for Enterococcus. There were no high readings for *E. coli* from the lateral drains. These data are inconclusive as to pinpointing any local source of bacteriological contamination in this reach of Arroyo Burro Tributary. Overall, the baseline sample results for the creek exceeded all single value and log mean values for recreation waters for all indicator organisms. This stream was assigned a "High" ranking for bacteriological impacts during the period of the study.

**Hope Ranch**

Only one sampling point was established in the Hope Ranch area, located in the most downstream accessible area. The stream at this point had continuous streamflow during

the study, but it was not possible to find a suitable upstream control location. The stream originates within the Hope Ranch area and is also fed partially by outflow from a large lake at the golf course in the center of the area. There is a fair amount of horse activity as well as residential development in the area immediately tributary to the sampling station. At times, during the sampling run, there was a strong urine odor and other evidence of horses in the area. The sampling results at this station showed exceedance of all bacterial indicators during different sampling runs. There was consistent exceedance of Enterococcus throughout the study, and three exceedances for total coliform. *E. coli* remained within the recreation criteria until the last sampling run in early May. Overall, the data showed exceedance of log mean criteria for total coliform and Enterococcus, and compliance with *E. coli* criteria except for the one previously noted individual value. This stream was rated as exhibiting "Moderate" bacteriological impacts during the study.

**Atascadero Creek**

Atascadero Creek was dry for the entire sampling period at the location originally proposed for sampling. Therefore, no samples were taken for bacteriological analysis during the study.

**Maria Ygnacio Creek; San Jose Creek and San Jose Creek**

All of these three creeks drain similar terrain in the foothills along the north edge of Goleta. The results for all three were similar. None of the streams showed exceedances for *E. coli*; however, they all had a few high readings for Enterococcus that exceeded the recreation criterion for single values, and one exceedance of the total coliform criterion for San Jose Creek. Also, the log mean values for Enterococcus and total coliform exceeded the criterion during the sampling period. These streams were all rated as exhibiting "Low" bacteriological impacts during the study.

**Alamo Pintado Creek**

The sampling program for Alamo Pintado Creek in the Santa Ynez area was the most extensive. Multiple sampling points were established along the creek, beginning near Solvang and extending upstream along reaches of the creek that pass through the Ballard and Los Olivos Special Problem Areas. The last station (AL8) was located just upstream of Los Olivos at Highway 154. Stations were selected to bracket both Los Olivos and Ballard with upstream and downstream samples along the creek. One of the sampling stations (AL5) was established on a tributary stream that enters the main stem of the creek between Los Olivos and Ballard. Additionally, two "spot" samples were taken toward the end of the sampling program near a storm drain outfall in Los Olivos and farther downsteam where lateral seepage inflow from the creek bank was observed.

The sample results for Alamo Pintado Creek showed consistently high bacteriological readings at nearly every sampling station except the side tributary (AL5), which showed no exceedances for *E. coli* or Enterococcus, and only a moderately high log mean value for total coliform (1,505 MPN/100 ml). The other sampling stations all showed single

value and log mean exceedances for *E. coli* and Enterococcus, with the exception of log mean *E. coli* value for AL1 (178 MPN/100 ml) which fell below the recreation water standard of 200 MPN /100 ml. Log mean values for total coliform were above 3,000 MPN/100 ml for all stations; and there were also numerous exceedances of the single value criterion at most stations. During the sampling period there was noted to be significant human activity in the creek at the upper station (AL8), which is believed to explain the consistently high bacterial counts at this station. The spot samples taken in proximity to the storm drain showed results consistent with other stations. The sample taken near the creek bank seepage showed somewhat lower bacteriological levels than other stream samples. Overall, Alamo Pintado Creek was assigned a "High" ranking for evidence of bacteriological impacts during the sampling period.

With respect to trends in the immediate area of Los Olivos and Ballard, both the log mean data and the single sample maximum values appear to increase in *E. coli* and Enterococcus readings between the upper and lower sampling stations adjacent to both communities. This can be seen by comparing the results for AL7 and AL6 at Los Olivos, and the results for AL4 and AL3 for Ballard (see **Figure 6-4**). There was no evidence of surface discharges to the creek during the sampling in these areas. However, given the relatively close proximity of the residences (and septic systems) to the creek, the chronic high groundwater levels, and large number of old (mostly drywell/seepage pit) systems in these communities, it is not unreasonable to expect that the bacterial readings in the creek are the result of lateral inflow from impacted groundwater beneath the two towns. Additional study including a network of groundwater monitoring wells would be needed to verify if and to what extent this is the explanation for the high bacteriological readings.

**Santa Ynez Drainage and Zanja de Cota Creek**

These ephemeral streams were dry for the entire sampling period. Therefore, no samples were taken at any of the proposed sampling locations for bacteriological analysis.

**Orcutt Creek**

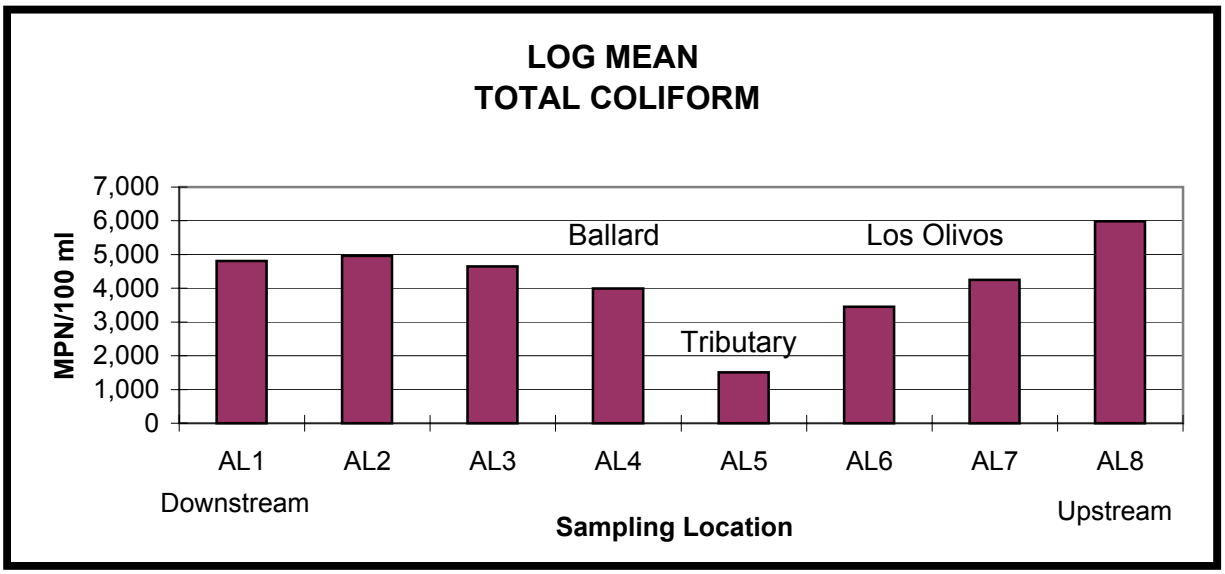
Orcutt Creek, located in the area of the Foxenwood Estates subdivision, was stagnant for the entire sampling period. Therefore, no samples were taken at any of the proposed sampling locations for bacteriological analysis.

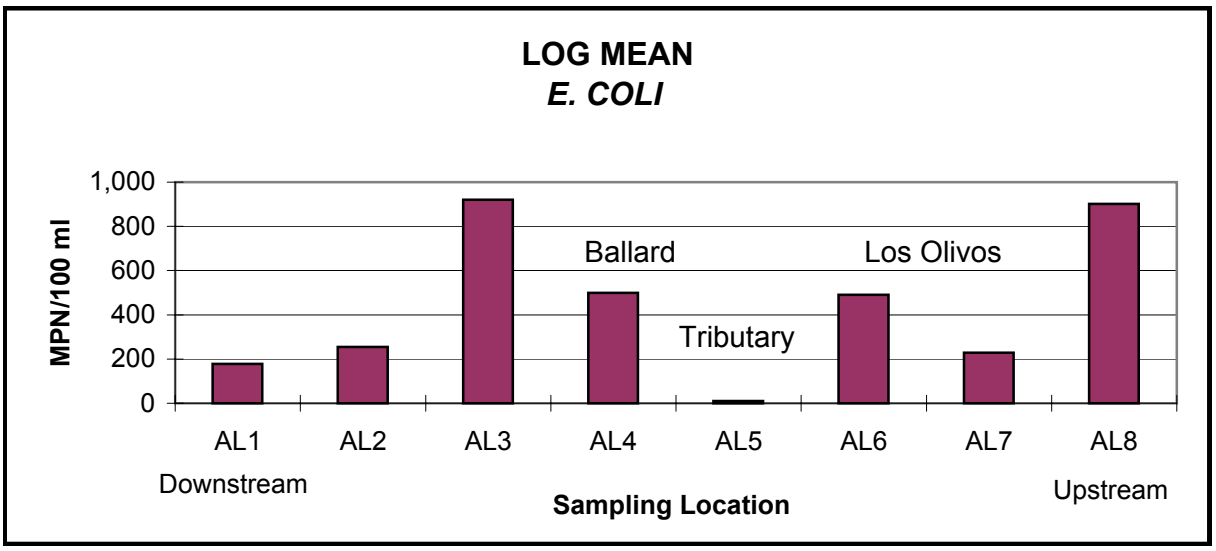
**Lake Marie Estates**

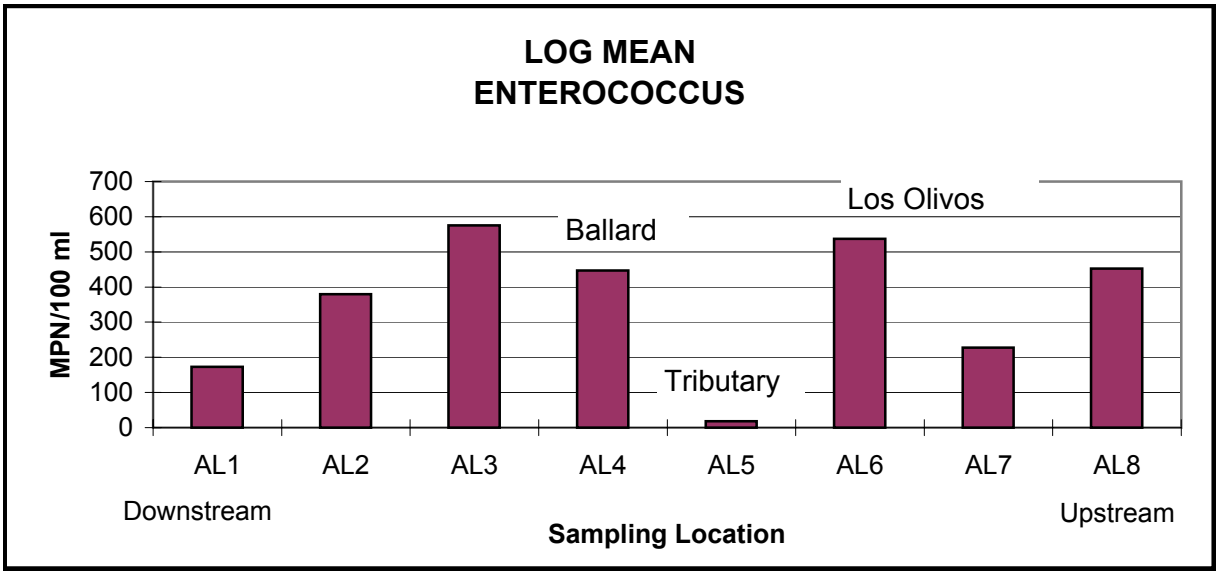
The ephemeral stream draining the Lake Marie Estates area was dry during the entire sampling period. Therefore, no samples were taken at any of the proposed sampling locations for bacteriological analysis.

**FIGURE 6-4**

**ALAMO PINTADO CREEK**
**Bacteriological Sample Results**



# SECTION 7

# GROUNDWATER QUALITY IMPACTS

Standard criteria for siting and design are intended to prevent adverse impacts on groundwaters from onsite sewage disposal systems. The most important factors are the provision of sufficient depth of unsaturated soil below the leachfield (or drywell) where filtering and breakdown of wastewater constituents can take place. Without adequate separation distance to the water table, groundwater becomes vulnerable to contamination with pathogenic bacteria and viruses, as well as other wastewater constituents (e.g., nitrogen). Highly permeable soils (e.g., sands and gravels) also provide minimal treatment of the percolating wastewater and normally require greater separation distances to afford proper groundwater protection. Additionally, where there is a high concentration or density of septic systems in a given area (i.e., small lot sizes), groundwater can be degraded from the accumulation of nitrate, chloride and other salts that are not filtered or otherwise removed to a significant extent by percolation through the soil. Adverse effects on groundwater quality from septic systems can show up in the form of degraded or contaminated well water supplies, or potentially as subsurface seepage into streams, lakes, lagoons or ocean waters.

The Septic System Sanitary Survey for Santa Barbara County did not include any field investigation or testing of groundwater quality. Instead, a review was made of available groundwater quality information to help in identifying areas of existing or threatened impacts from onsite sewage disposal systems. The information was obtained from published reports, County and Regional Water Board studies, and monitoring data from selected water supply wells in the County.

## GROUNDWATER BASIN INFORMATION

As described in **Section 3** of this report, groundwater from 15 major basins is estimated to supply approximately 85% of the total water needs in Santa Barbara County. Most of the water is used for irrigated agriculture; however, a large percentage of the population relies on groundwater for domestic and municipal uses. This is particularly so in the rural areas of the County where there are a large number of individual and small community water wells, along with larger municipal water systems that derive their supplies from groundwater sources.

In general, because of the relatively low rainfall conditions, geology and land uses in the County, the key water quality concerns in the major groundwater basins relate to mineral quality and nitrate concentrations. Mineral quality influences the suitability of the water for agricultural uses, and also affects the desirability of the water for domestic supplies. Nitrate at high concentrations limits the suitability of the water for human consumption. The maximum contaminant limit (MCL) for nitrate is 45 mg/L (according to the Basin

Plan), due to the potential for concentrations above this level to cause a blood affliction in infants known as methemoglobenemia, or "Blue Baby Syndrome".

**Table 7-1** summarizes groundwater quality conditions for the major groundwater basins in the County. The table was developed from published information contained in several documents, including:

1. *Santa Barbara County Comprehensive Plan, Conservation Element – Groundwater Resources Section*, November 8, 1994.

2. *Santa Barbara County Groundwater Report 2000*, Santa Barbara County Public Works – Water Agency Division.

3. *Assessment of Nitrate Contamination in Ground Water Basins of the Central Coast Region, Preliminary Working Draft*, December 1995, Central Coast Regional Water Quality Control Board.

As indicated in the table, groundwater quality is generally adequate for existing and potential uses in most of the groundwater basins in the County. However, there are local problems in several groundwater basins associated with salt accumulation from natural and cultural sources. While wastewater disposal to land contributes salts to the groundwater (i.e., from human waste products), septic systems are not implicated as a major source of salt accumulation in ground waters of the County. The data also indicate evidence of increasing nitrate levels in several of the major groundwater basins, namely, Santa Maria, Cuyama and Santa Ynez. The Regional Board has identified these groundwater basins for further investigation to determine the specific sources and develop appropriate measures to arrest, control or manage the nitrate problems. Agricultural operations are believed to be responsible for most of the observed increases in groundwater-nitrate concentrations. However, in the Santa Ynez Valley, the large concentrations of septic systems are also considered to be a contributing factor.

## WATER SYSTEM INFORMATION

Records from the State Department of Health Services and Santa Barbara County Health Department indicate that there are 166 large water systems (>200 connections) in the County and 161 small water systems. Due to post-September 11$^{th}$ security reasons, maps showing the locations of all of the water wells associated with these water systems were not available for use and publication as part of this study. However, hard file information for the County-regulated small water systems was available for review. Files for the water wells located in and around the defined Focus Areas were researched for information regarding water well depth and nitrate concentrations. These data are summarized in **Table 7-2**.

Review of the data show reasonably good groundwater quality, with respect to nitrate concentrations, for most of the small water systems in the County. There are noticeably

**TABLE 7-1**
**GENERAL WATER QUALITY SUMMARY FOR MAJOR GROUNDWATER BASINS OF SANTA BARBARA COUNTY**

| | GROUNDWATER BASIN | NITRATES* | MINERALS | COMMENTS |
|---|---|---|---|---|
| SOUTH COUNTY REGION | **Carpinteria** | less than 45 mg/L | Cl generally low (<100 mg/L)<br>TDS ranges from 436 to 980 mg/L | Degradation of near surface aquifers likely caused by infiltration of irrigation water and septic wastewater into |
| | **Montecito** | levels can reach 30 mg/L | Cl up to 2,190 mg/L in SW corner of basin<br>TDS up to 3,630 mg/L in SW corner of basin | High TDS and Cl concentrations indicate salt water intrusion is occurring in shallow areas of the aquifer. |
| | **Santa Barbara** | - | Cl levels high (>1,000 mg/L)<br>TDS ranges from 405 to 974 mg/L | Overdrafting in coastal areas has resulted in salt water intrusion and degradation of water quality. |
| | **Foothill** | - | TDS range from 610 to 1,100 mg/L<br>Cl range 44 to 130 mg/L | Groundwater quality threatened by the migration of poor water quality from deep zones to upper producing zones. |
| | **Goleta** | averages 15 to 30 mg/L | Cl ranges from 42 to 319 mg/L<br>TDS ranges from 728 to 1,300 mg/L<br>Hardness ranges from 402 to 590 mg/L | Three possible sources of contamination include ocean water, saline waters native to the Santa Barbara Formation, and saline waters native to Tertiary rocks that are associated with petroleum deposits. |
| SANTA YNEZ RIVER REGION | **Santa Ynez Uplands** | less than 45 mg/L | TDS ranges from 400 to 700 mg/L<br>Hardness ranges from 200 to 500 mg/L | Nitrate contamination has been attributed to septic systems. |
| | **Buellton Uplands** | less than 45 mg/L | TDS ranges from 300 to 700 mg/L high concentrations of Fe and Mn | |
| | **Lompoc**<br>*Lompoc Plain, Shallow Zone* | average is 45 mg/L | TDS ranges from 850 to 8,000 mg/L | High TDS attributed to salt water intrusion and irrigation return flow. |
| | *Lompoc Plain, Middle Zone* | | TDS ranges from 650 to 6,100 mg/L | High TDS attributed to downward leakage from shallow zone. |
| | *Lompoc Plain, Main Zone* | | TDS ranges from 720 to 4,500 mg/L | Poor water quality attributed to downward leakage of saltwater from an overlying estuary. |
| | *Lompoc Terrace, Lower Aquifer* | | TDS ranges from 300 to 500 mg/L S relatively low (<200 mg/L) | |
| | *Lompoc Upland, Lower Aquifer* | | DS averages 500 mg/L | Perched groundwater of good to excellent water quality occurs at shallow depths in much of the Lompoc Upland. |
| | **San Antonio** | - | TDS averages 710 mg/L | Degradation could result from both increased mineralization by irrigation return and from the upward and lateral migration of deep groundwater. |

* State MCL for Nitrages is 45 mg/L for public water systems

**TABLE 7-1**
**GENERAL WATER QUALITY SUMMARY FOR MAJOR GROUNDWATER BASINS OF SANTA BARBARA COUNTY**

| | GROUNDWATER BASIN | NITRATES* | MINERALS | COMMENTS |
|---|---|---|---|---|
| NORTH COUNTY REGION | **Santa Maria** | generally over 100 mg/L, indicating a nitrate contamination problem | | Water quality varies significantly throughout the basin, reflecting the types of activities in a local area. Generally, water quality declines from east to west. Most significant degradation of water quality caused by irrigation return flow. |
| CUYAMA REGION | **Cuyama Valley** | generally over 45 mg/L, and up to 400 mg/L, indicating a nitrate contamination problem | TDS levels range up to 1,750 mg/L | This basin generally produces poor quality water. Extremely high salinity results from seepage out of basement marine rocks. |
| OTHER GROUNDWATER BASINS AND EXTRACTION AREAS | **More Ranch** | - | TDS ranges from 822 to 2,300 mg/L<br>moderate levels of $H_2S$ gas<br>high levels of TDS, Mn, and Cl | Water treatment required to bring constituent concentrations of State of California Drinking Water Standards. |
| | **Ellwood to Gaviota** | - | TDS averages 1,000 mg/L<br>Hardness generally high<br>B generally <1 mg/L | - |
| | **Gaviota to Point Conception** | - | - | Water quality data for this area is not readily available. However, the hydrogeologic setting of this area is similar to that of the Ellwood-Gaviota area, making it likely that the water quality is also similar. |
| | **Santa Ynez River** | generally <45 mg/L | TDS ranges from 550 to 950 mg/L<br>Hardness ranges from 380 to 650 mg/L | Significant increases in water quality parameters were noted west of Buellton. These increases were attributed to the underflow of Nojoqui and Zaca Creeks and seepage of wastewater effluent from Buellton, Solvang, and Santa Ynez. |

* State MCL for Nitrages is 45 mg/L for public water systems

**TABLE 7-2**
**NITRATE RESULTS FROM COMMUNITY WATER WELLS**

| Area | Water Company | Water Well Depth | Period of Record | Reported Nitrate | | | Groundwater Level |
|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Ave | |
| Santa Ynez | Oak Trails Ranch Mutual Water Company | 300' and 375' | 4/18/69 to 8/23/95 | ND | 43 | 11.5 | 195 |
| | High Sky/Starlight Farms Water System | 75' | 7/15/1992 | | 8.4 | | 53 |
| | Magness Racing Ventures | 540' | 8/30/1983 | | 9 | | |
| | Meadowlark Mutual Water Company | 50' and 47' | 11/24/97 to 2/7/01 | ND | 36.5 | | |
| | Skyline Park Water and Service | 520' and 250' | 3/25/81 to 8/16/00 | 1.3 | 37 | 20 | 130 |
| | Santa Barbara Thoroughbred Mutual Water Company | 300' | 6/4/85 to 8/30/96 | < 0.4 | 28.8 | 9.3 | |
| | Rancho Oneonta Mobile Home Park | 285' | 3/16/76 to 6/23/80 | ND | 7.1 | 3.6 | 156 |
| | Oak Trails Estates Mutual Water Company | 400', 560', 580', and 900 | 2/17/82 to 7/4/01 | < 0.4 | 35 | 7.86 | 98',170',302' and 302' |
| Los Olivos | Bridlewood Winery | 785 | 9/16/1998 | 8.9 | 10 | 9.45 | 269 |
| | Koehler Winery | 550 | 6/15/1999 | | 21.7 | | |
| | Rancho Ynecito Mutual Water Company | 700' | 1/18/83 and 6/27/01 | 0.2 | 28.8 | 10.3 | 368 |
| | Refugio Water Company | 280' | 3/12/1968 | | 3 | | |
| | Roblar Farms Mutual Water Company | | 2/12/74 to 4/4/92 | trace | 0.4 | | 269 |
| | Midland School Domestic Water System | 250' | 11/10/80 to 3/15/96 | ND | 2.6 | 1.2 | |
| | Zaca Mesa Winery | 625' | 11/28/72 to 3/16/94 | 1 | 11.1 | 7.4 | |
| | Evergreen Arabians | 218 | 1/16/93 to 5/28/97 | 19.4 | 29.2 | 24.3 | |
| | Firestone gallery winery | 640 | 3/18/1998 | ND | < 0.4 | 0.2 | 342 |
| Veronica Springs | Las Positas Mutual Water company | 300' and 400' | 7/25/79 to 6/18/96 | ND | 44 | 11.3 | 33 |

**TABLE 7-2**
**NITRATE RESULTS FROM COMMUNITY WATER WELLS**

| Area | Water Company | Water Well Depth | Period of Record | Reported Nitrate | | | Groundwater Level |
|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Ave | |
| **Toro** | Toro Canyon Park Water System | 430' | 12/16/77 to 1/03/96 | ND | < 0.4 | 0.2 | |
| | Toro Canyon Estates Mutual Water Company | 600' | 5/10/79 to 10/22/87 | ND | 5.9 | 2.3 | 78'11" |
| **Mission** | Mullin, Douglas, Huffard, Fredman Water System | 330' | 7/10/1990 | | 9.7 | | 140 |
| | Tunnel Road Development Trust Water System | 262' and 600' | 4/14/80 and 3/2/87 | < 0.4 | 12 | 6.2 | |
| | Rancho Cielo Water System | 138' | 2/26/65 to 11/3/91 | ND | 8 | 4 | 60 |
| **Painted Cave** | Painted cave Mutual Water Company | 95', 118' and 700' | 3/17/91 to 9/20/99 | < 0.4 | < 2.0 | 1.5 | 15 |
| **La Goleta (near Hope Ranch)** | Vista La cumbre- Zonex Corporation | 420' | 10/07/86 | | 0.22 | | 7 |
| **La Buena Tierra** | Community Christian School | 340' | 05/24/00 | | 17.7 | | |
| **Sunset/carol** | Amber Gardens water system | 450' | 10/16/79 to 6/5/98 | 15.1 | 44 | 32.2 | 70 |
| **Sunset/Carol** | Lincolnwood Subdivision Water System | 450 and 500 | 11/15/77 to 12/01/99 | 10 | 38.6 | 22.1 | 91 |
| **1/2 mi west of Coyote Dr** | Coyote Spring Mutual Water Company | 550' | 1/26/82 to 10/22/89 | < 0.4 | 0.22 | 0.34 | |
| | Haney Tract #2 Homeowners Association | 430' | 12/27/79 to 1/30/95 | ND | < 1 | | 210 |
| | Cielo Store and Cafe | 350' | 5/22/79 to 3/7/96 | ND | 3.5 | 0.58 | 68 |
| | Romaldo Community water System | 300' | 10/03/80 to 2/22/88 | 0.35 | 3.5 | 1.92 | |
| | Madrone Water Company | 390 | 9/30/80 to 10/11/90 | 0.9 | 0.9 | 0.9 | 350 |

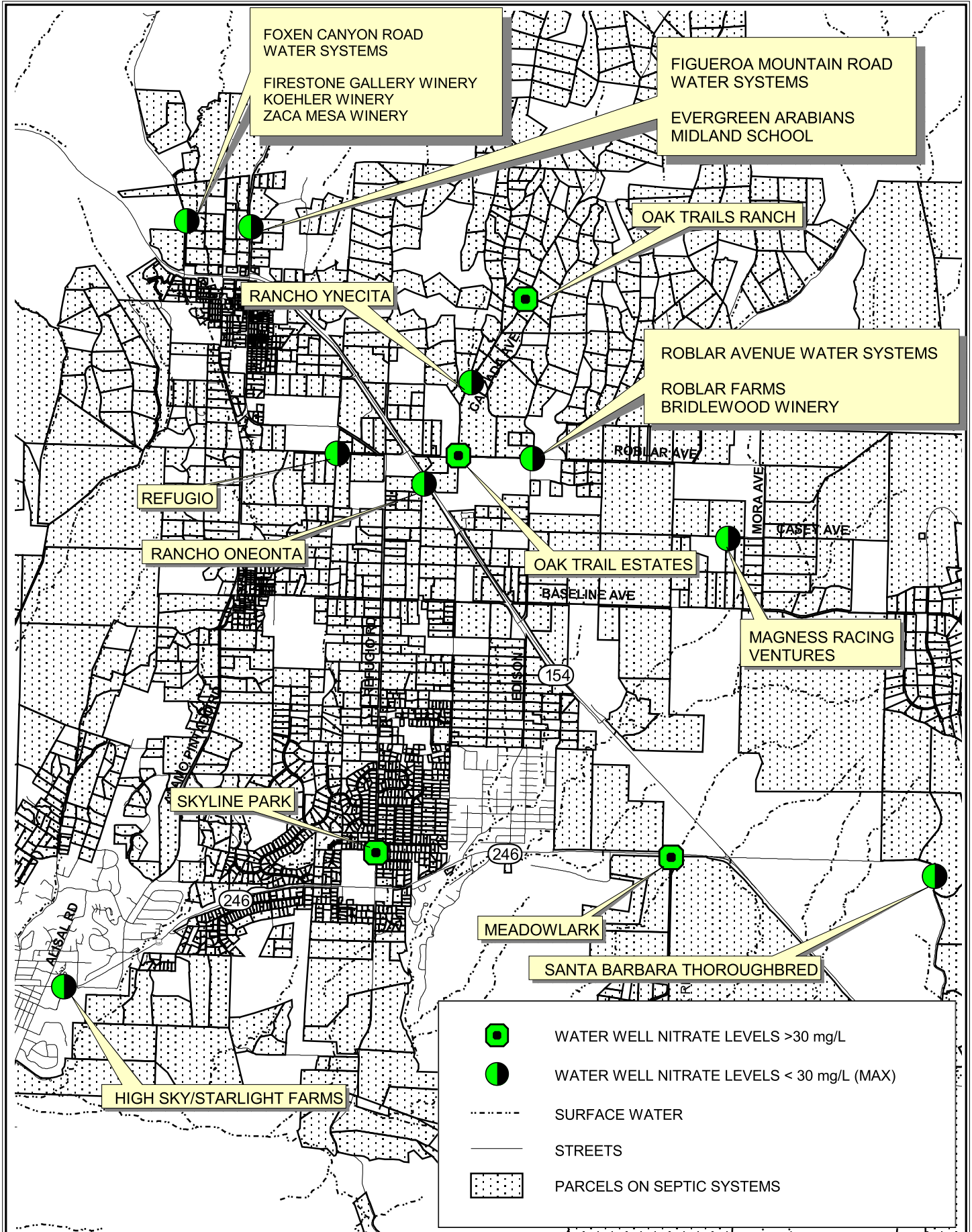
higher nitrate concentrations in the several of the wells in the Santa Ynez and Los Olivos area, corresponding with previously discussed findings of the Regional Board's groundwater-nitrate assessment study (see **Figure 7-1**). None of the systems reported nitrate levels in excess of the MCL of 45 mg/L; however, there were several showing results approaching the limit.

Groundwater quality reported for small water systems in the South Coast area is generally lower in nitrate levels than in the Santa Ynez Valley; however, there were three notable exceptions: (1) Las Positas Mutual Water Company (Veronica Springs-Vista Vallejo Area); (2) Amber Gardens Water System (Sunset Road/Carol Avenue Area); and (3) Lincolnwood Subdivision Water System (Sunset Road/Carol Avenue Area).

1. **Veronica Springs – Vista Vallejo Area.** The Las Positas Mutual Water Company has one well (#1) that has shown a consistently high nitrate concentration virtually at the MCL (44 mg/L). This well draws its supply beginning at a depth of 75 feet and may be influenced by discharges from septic systems in the Veronica Springs area or, more likely, the Vista Vallejo area, which is located immediately to the north of the well (see **Figure 7-2**). The Vista Vallejo area is a pocket of older septic systems within the urban area of Santa Barbara located on fairly small lots. The Water Company has another newer, deeper well (#4) that generally shows very low nitrate concentrations.

2. **Sunset Road/Carol Avenue Area**. Nitrate data for the Amber Gardens and Lincolnwood Subdivision water wells in the Sunset Road/Carol Avenue area of Santa Barbara show an increasing trend in nitrate concentration over the past 20 years, as displayed graphically in **Figure 7-3**. A map showing the location of these wells in relation to the septic systems in the Sunset Road/Carol Avenue area is provided in **Figure 7-4**. Also shown are the approximate groundwater flow directions in the area. As can be seen, the Amber Gardens well lies downgradient of the main concentration of septic systems in this area, which is otherwise primarily an urbanized sewered area. The Lincolnwood well lies approximately at the groundwater divide (between the Goleta and Santa Barbara Basins) according to a 1982 U.S. Geological Survey study; and the recharge influence of septic systems is not as clear for this well. However, there may be localized drawdown effects from the well that are not reflected in the 1982 USGS study.

   According to available record, many of the systems in this remaining "pocket" of septic systems utilize drywells. The water depth reported in the supply wells ranges from about 70 to 90 feet. Given the dense concentration of septic systems on relatively small lots so close by, there is a reasonable likelihood that the elevated nitrate concentrations in these wells is due mainly to septic system discharges.

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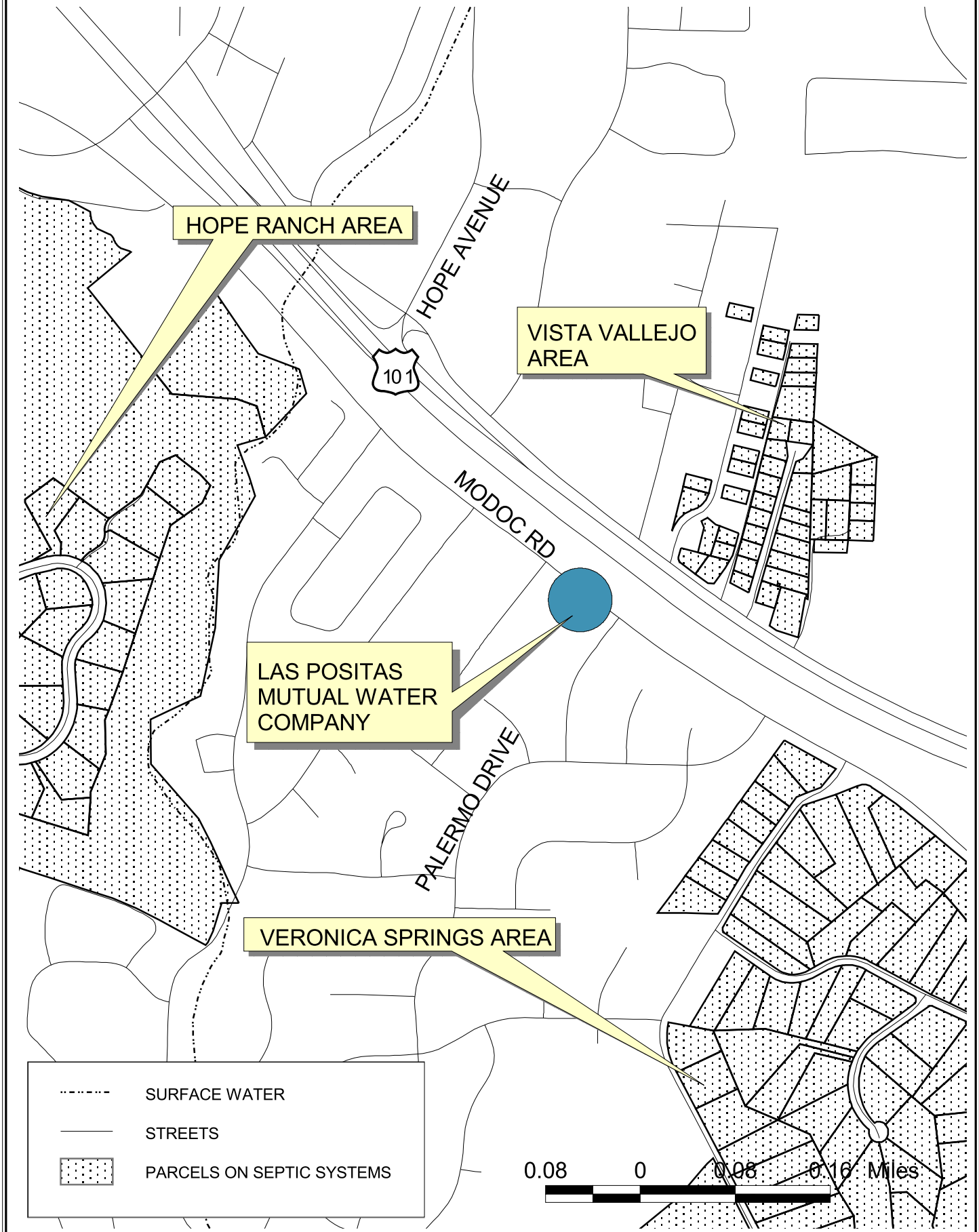
# SANTA YNEZ AND LOS OLIVOS COMMUNITY WATER SYSTEM LOCATIONS

FIGURE
7-1

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LAS POSITAS MUTUAL WATER COMPANY
LOCATION

FIGURE
7-2

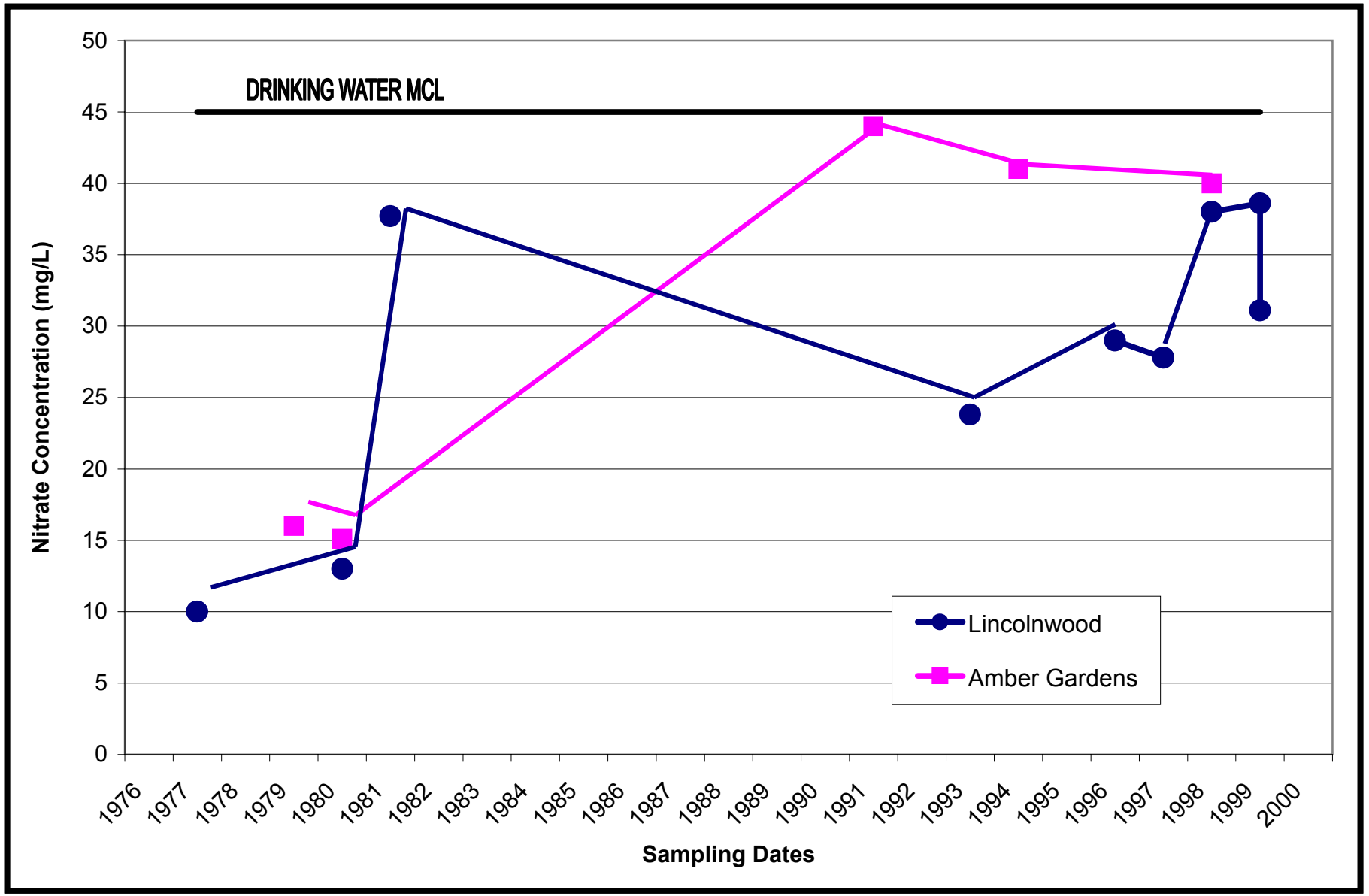
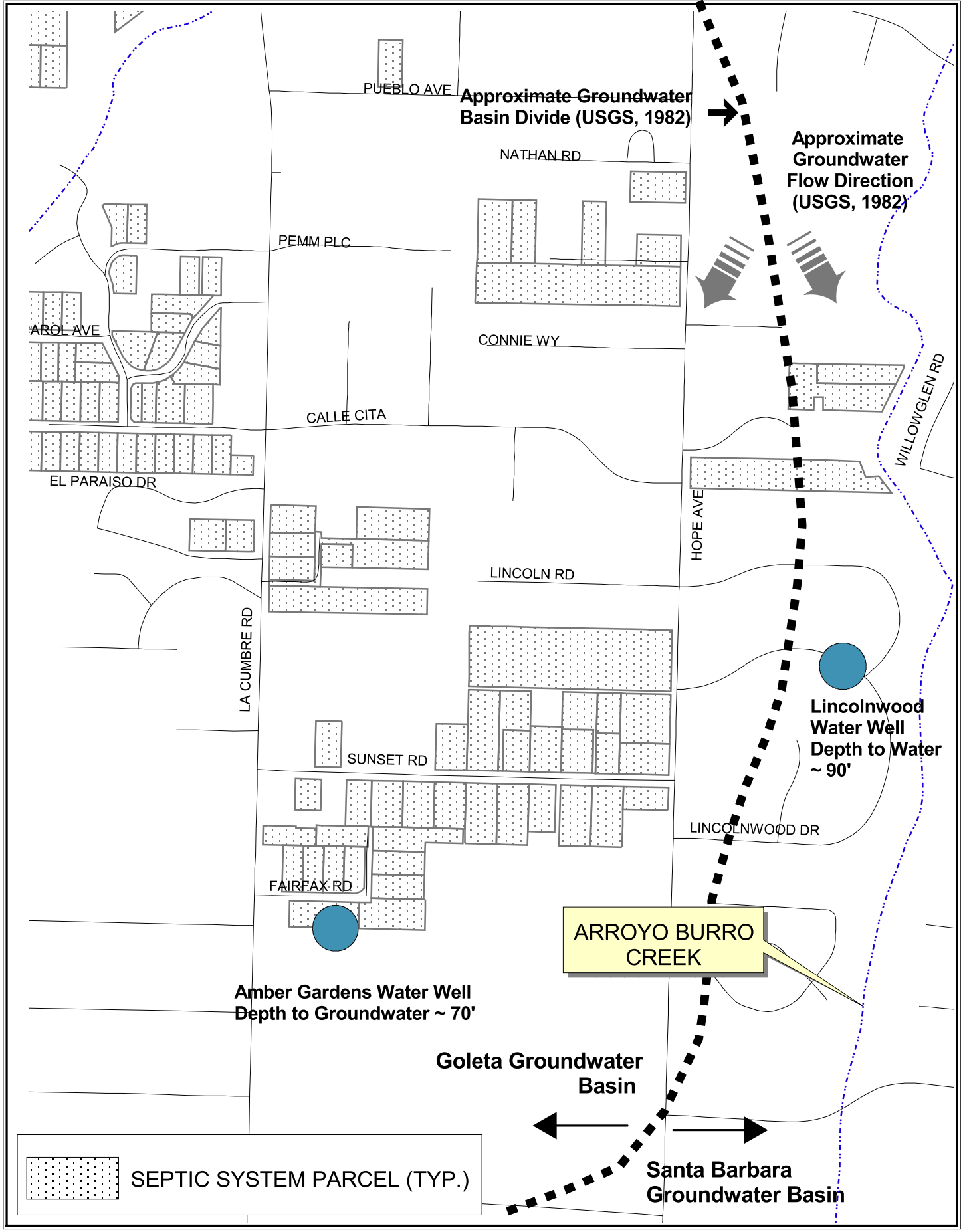



**FIGURE 7-3**

**GROUNDWATER NITRATE CONCENTRATION (as $NO_3$)**
**Amber Gardens and Lincolnwood Water Systems**

***Questa Engineering Corporation***

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AMBER GARDEN AND LINCOLNWOOD WATER WELLS AT SUNSET RD/CAROL AVE AREA

FIGURE 7-4

## LOCAL PROBLEM AREAS

Two specific groundwater pollution problem areas have been documented in septic system areas in Santa Barbara County. These are Los Olivos and Janin Acres in the Santa Ynez Valley. The finding of elevated groundwater-nitrate problems in both of these areas was a significant factor in the Board of Supervisors' designation of these two areas as Special Problem Areas.

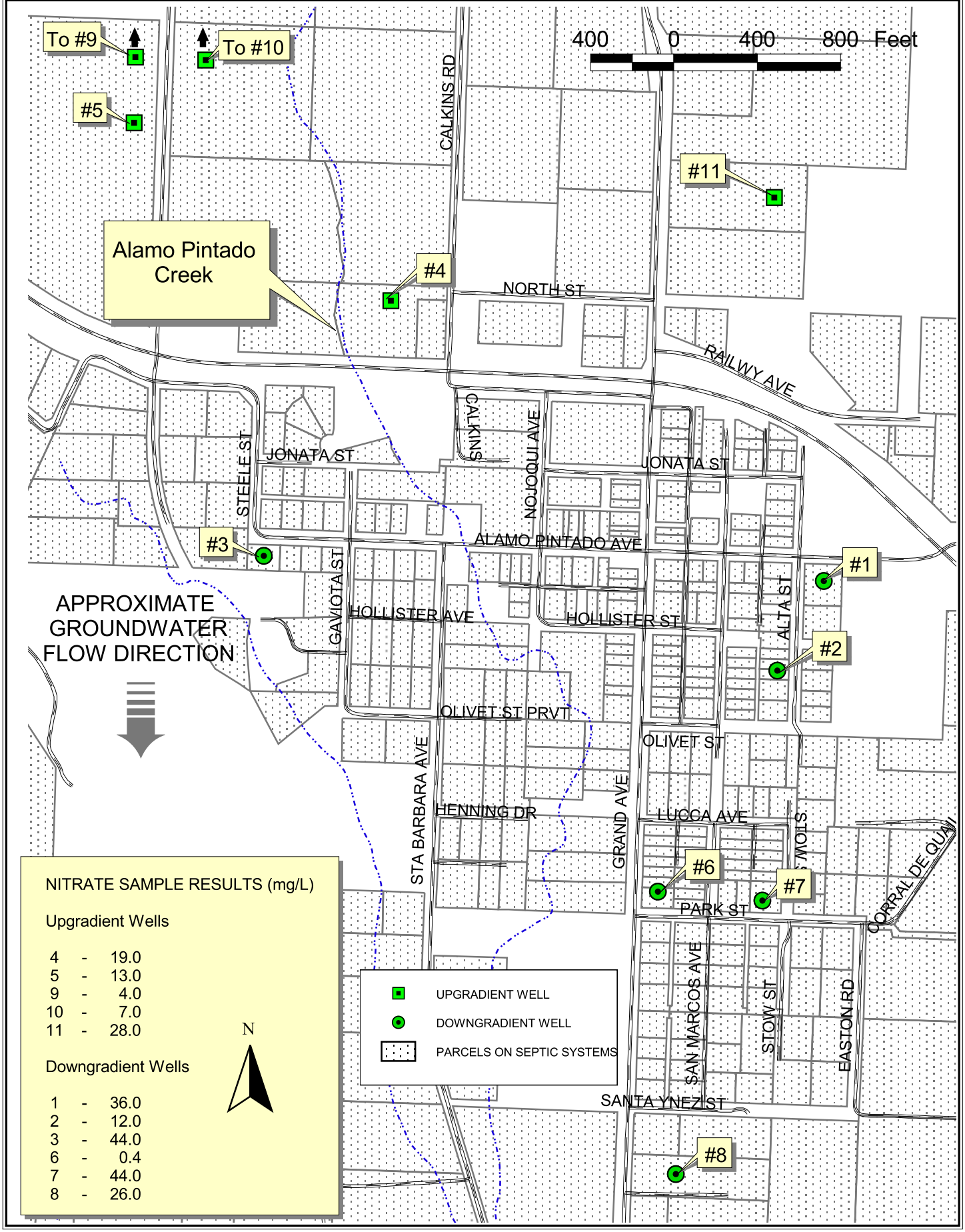
### Los Olivos

In 1975 the Santa Barbara County Health Department conducted a door-to-door sanitary survey of residences and businesses in Los Olivos to assess the status of septic system conditions. The study included approximately 100 properties and revealed that nearly all of the systems were functioning (i.e., draining) satisfactorily. However, the study also determined that about 60% of the properties were served by drywells that generally extend into permeable alluvial deposits. Groundwater level determinations from local water wells and monitoring wells showed evidence of perched groundwater levels (during the wet season) at depths of 5 to 15 feet in areas of the town. The indication from this is that many of the drywells discharge septic tank effluent directly into the perched groundwater zones.

In 1977 the Health Department and the Regional Board obtained water samples from a series of wells located in and around the town of Los Olivos. A detailed map of the Los Olivos area is shown in **Figure 7-5**, including the location of the wells sampled in the 1977 study. The samples were analyzed for standard mineral content, including nitrate concentration. In the five wells located upgradient (north) of the town, the nitrate concentration was found to range from 4.0 to 28.0 mg/L, with an average of about 14 mg/L (as $NO_3$). In the six wells within the town, the nitrate concentration was found to range from 0.4 mg/l to 44 mg/L, with an average of about 27 mg/L. The depth of water in the sampled wells was not reported. The data appear to show fairly conclusively that, as might be expected, the high density of septic systems in Los Olivos is contributing to a significant increase locally in the groundwater-nitrate concentration. The average concentration found in 1977 was still safely within the drinking water limit of 45 mg/L; however, two of the wells sampled reported a nitrate concentration of 44 mg/L, essentially at the drinking water MCL. No subsequent sampling has been conducted to determine any trends in the groundwater since this work in 1977.

### Janin Acres

The Janin Acres subdivision, located between Solvang and Santa Ynez, was developed in the late 1960s. The subdivision consists of 77 residences, three churches and a motel on approximately 94 acres. The water supply is obtained from two local wells, owned and operated by the Rancho Marcelino Water Company, that draw water from a depth of about 50+ feet. Nearly 80 percent of the properties in the subdivision utilize drywells for wastewater disposal. Soils testing in the area indicate that there are lenses of very coarse permeable soils at depths penetrated by or immediately below the drywells. Groundwater

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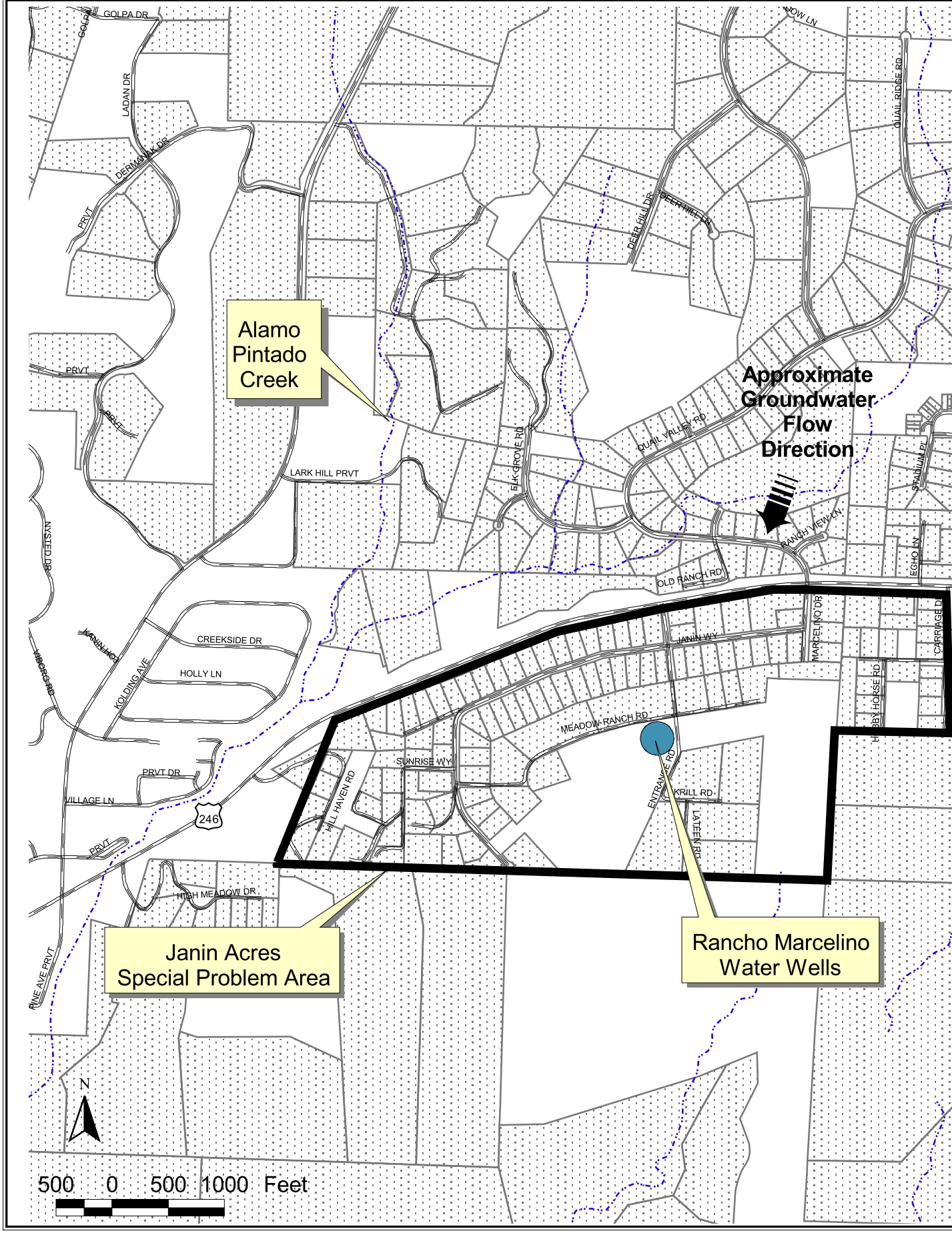
# LOS OLIVOS AREA 1977 GROUNDWATER SAMPLING STATIONS AND NITRATE RESULTS

FIGURE 7-5

contour maps for the area indicate a general northeast to southwest flow direction in the area. Most of the parcels within the subdivision lie in areas upgradient and in close proximity to the Rancho Marcelino water wells. A number of unsewered parcels near Santa Ynez also lie in upgradient areas that potentially contribute to recharge of the Rancho Marcelino wells; these parcels (and their associated septic systems) are more distant from the wells than those in the immediate Janin Acres area. A map of the area showing the proximity of the septic systems to the water supply wells and the general direction of groundwater flow is provided in **Figure 7-6**.

Sampling of the Rancho Marcelino water wells has indicated a dramatic increase in nitrate concentration that coincides with the development of the subdivision and the use of onsite sewage disposal systems in the area. The groundwater-nitrate readings in the water supply wells from 1960 to the present are shown graphically in **Figure 7-7**. As indicated, the nitrate concentrations found in the wells has increased from less than 10 mg/l to over 50 mg/L (i.e., exceeding the drinking water MCL). The data show a strong correlation between groundwater quality degradation and the installation and use of septic systems in the Janin Acres Subdivision and neighboring areas in Santa Ynez (to the north). All septic systems contribute nitrate to the soil and groundwater environment. Deep trench and drywell disposal systems, which are used extensively in Janin Acres, are more problematic because they allow less opportunity for nitrate removal/uptake by soil and vegetation, as compared with shallow leachline designs. In this case the impact on the water wells is further exacerbated by the relatively high density of deep trench and dry well disposal system in such close proximity to the wells.

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JANIN ACRES
SPECIAL PROBLEM AREA
AND
RANCHO MARCELINO
WATER WELLS

FIGURE
7-6

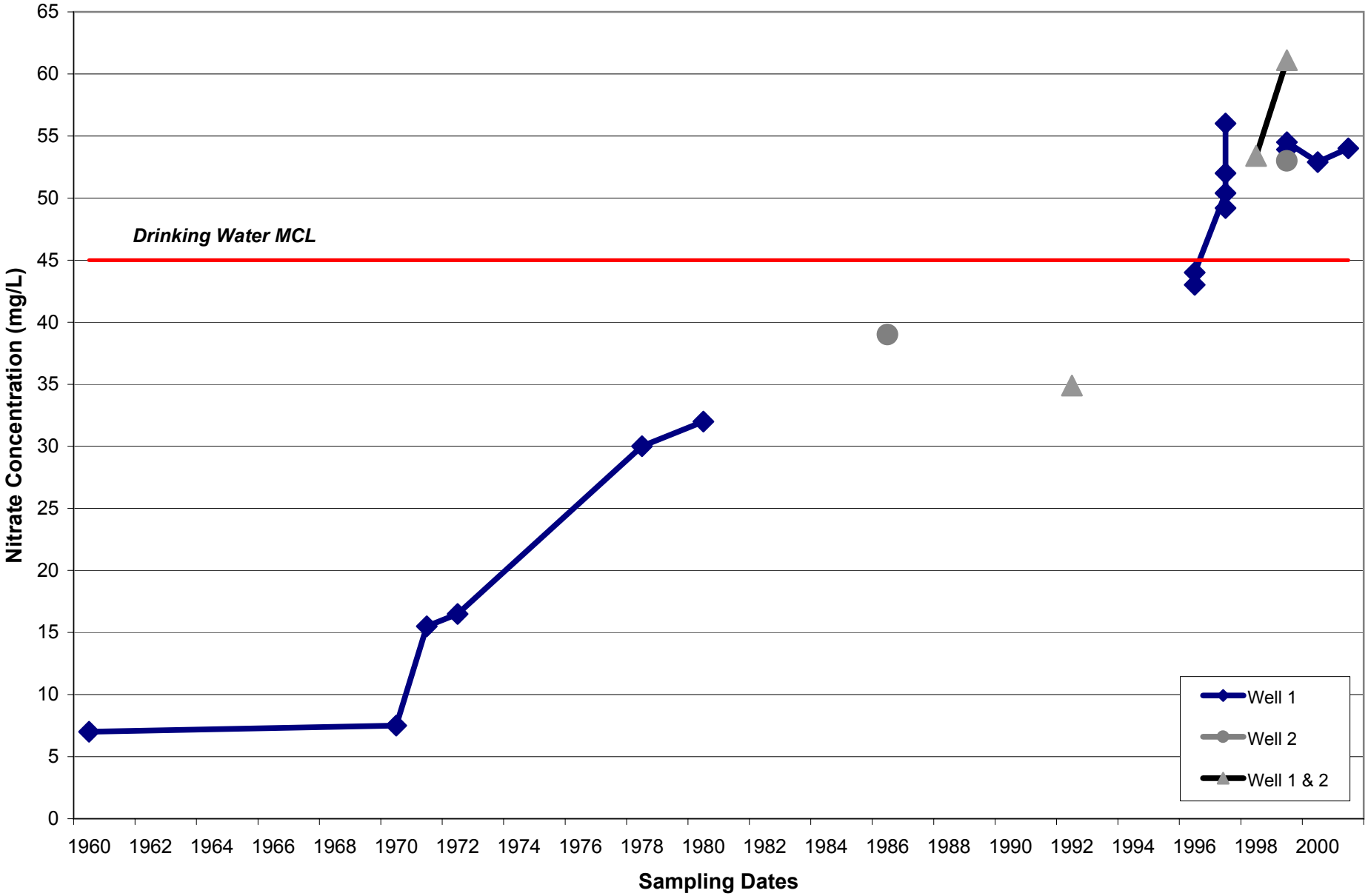


**Figure 7-7**
**Groundwater Nitrate Concentration (as $NO_3$)**
**Janin Acres Water Supply Wells**

# SECTION 8

# PROBLEM ASSESSMENT

## APPROACH OVERVIEW

This section of the report presents an overall assessment of the various data collected for the identified septic system Focus Areas in Santa Barbara County. The purpose of this assessment is to define or rate the degree of the septic system problems in each of the Focus Areas related to environmental effects and provision of basic sanitation requirements. Septic system performance is affected by numerous factors that cannot be reduced to simple calculations; and evidence of system performance often changes over time and is not easily discerned from a one-time inspection or survey. Accordingly, the analysis presented here incorporates a combination of factual (scientific) data, anecdotal information obtained from files, surveys and interviews, and professional judgment exercised by the project team based on many years of experience in this field. Where problems are suggested, the assessment should not necessarily be interpreted to represent definitive findings of a public health or water quality emergency in all cases. Rather, the results are intended to establish, as much as possible, an objective picture of the septic system operational and environmental conditions in each area so that proper steps can be taken for on-going use and management of these systems or, as necessary, their eventual replacement with more appropriate methods of sanitary waste treatment and disposal.

## ASSESSMENT FACTORS

A series of assessment factors or criteria were established as the basis for judging the suitability and performance of septic systems in each Focus Area. Following is a review of the various factors, including how the particular factors relate to the overall evaluation and what considerations went into the rating of conditions/problems in each area relative to these factors.

### Geology/Soils/Groundwater Constraints

As described in **Section 4**, the basic physical suitability of an area for the use of onsite sewage disposal systems is dictated more than anything else by the geology, soils and groundwater conditions. Where conditions are good, properly designed septic systems can operate effectively and safely for long periods of time. However, many areas are inherently unsuitable for onsite systems for a variety of reasons. Also, there are areas considered to have marginal or variable conditions for septic systems; this means generally that, in these areas, great care is needed to site and design the appropriate system to overcome or accommodate various physical constraints. The geology, soils and groundwater characteristics for each Focus Area were reviewed in a general perspective for this part of the problem assessment. Various reports, soils and geologic maps, and file information were researched and general field reconnaissance surveys

were made. But, no individual (original) site inspection or exploration work was conducted. Geology maps covering each of the Focus Areas are provided in Appendix J for further reference in reviewing the site conditions and septic system constraints. The gologic maps are from two sources: (1) Dibblee Foundation (copied with permission of the Dibblee Foundation); (2) U.S. Geological Survey Open-File Report 02-0136 (GIS format).

For this factor, a "High" rating was assigned to areas where siting constraints were judged to be significant because of the geology, soils or known high groundwater conditions. A "Medium" rating was assigned where there was found to be evidence of probable or variable, site-specific constraints. A "Low" rating was assigned to areas where the conditions appear, from all available evidence, to be generally suitable for septic system use with few or no serious inherent geologic, soils or groundwater constraints.

**Lot Size and Density of Systems**

Generally, the larger the lot size, the greater the ability for septic systems to be located and operated safely and effectively. Small lot sizes limit the physical ability to install, replace and maintain septic systems while still allowing enjoyment of the property for normal residential uses. Small lot sizes tend to favor the use of deeper drywells, which generally have a shorter service life and are environmentally more problematic in providing effective and safe treatment and dispersal of sewage effluent. High-density development with septic systems also increases the overall intensity of nitrate and salt loading to the groundwater system.

For this factor, a "High" rating was assigned to areas having a high percentage of lot sizes less than 0.5 acres. A "Medium" rating was assigned for areas with lot sizes predominantly 0.5 to 1.0 acre or larger; and a "Low" rating was assigned for areas with lot sizes generally greater than 1.0 acres.

**Total Number of Septic Systems**

The number of septic systems in a given area is important from the standpoint of judging the total population that may be exposed to public health hazards or nuisances from malfunctioning systems. The total number of systems in a given area is somewhat a function of how the boundaries of the particular area were established. However, in general the boundaries of the various Focus Areas were drawn simply to define given neighborhoods where septic systems are used.

For this factor, a "High" rating was assigned to areas having generally 100 or more properties served by septic systems. However, there were also a few areas with a relatively small number of systems ("pockets") surrounded by urban development on public sewers that were also assigned a "High" rating. In these few instances the potential impacts on the surrounding (urban area) population were taken into account. A

"Medium" rating was assigned generally for areas with 50 to 100 septic systems; and a "Low" rating was assigned to areas with about 50 or fewer septic systems.

**Type and Age of Systems**

This factor was included to give consideration to the age of the septic systems, which are an indicator of the likely technology and design standards in use; this, in turn, can be a reflection on the probable compliance with current codes and industry standards. Also, the age of the system is a good indicator of the likelihood of the need for system maintenance, repair or replacement in the foreseeable future. In this part of the assessment, the degree of reliance on drywells for effluent disposal was also considered, since this design is not preferred and generally has a shorter service life and greater potential to create environmental problems than shallow (leachline) designs.

For this factor, a "High" rating was assigned to virtually all Focus Areas. The only areas receiving a "Medium" rating were those judged to have reasonably suitable soil/site conditions in areas well removed from surface waters and groundwater impact areas. The basis for this distinction was that the potential for finding code compliance problems or system failure problems in these areas is lower, despite the system age. No areas were believed to warrant a "Low" rating with respect to system type and age.

**Survey Information**

This factor provided for the consideration of a wide variety of background information and input regarding the general condition, suitability and performance of septic systems in each area. This was done by taking information from the various sources of information described and presented in **Section 5** of this report, including County permit data, Septic Tank Inspection Reports, Contractor/Consultant Surveys, and the Homeowner Questionnaire Survey.

Considerable professional judgment was used to interpret and apply the survey information. In general, the information was reviewed to look for an indication of chronic or repeated problems and other comments indicative of the level of septic system problems or concerns in each area. Based on this review, each area was rated, qualitatively, as "High", "Medium" or "Low", depending on the preponderance of the evidence available.

**Proximity/Threat to Surface Water Uses**

Avoiding impacts to coastal waters as well as streams, lakes and lagoons are an important aspect of septic system use and management. Protection of surface water resources is normally achieved through adherence to appropriate lateral setback distances. However, where the soils are rapidly permeable or high groundwater conditions exist, the normal setback criteria may not be sufficient. This factor also provided an opportunity to gauge the impact to surface waters according to the type of uses that might occur based on the type of water body, public access and seasonality of the streamflow.

For this factor, a "High" rating was assigned where septic systems immediately adjoin coastal waters, perennial streams or other significant seasonal watercourses. A "Medium" rating was assigned where the watercourses in the area were judged to be primarily seasonal in nature. A "Low" rating was assigned where there were few if any identifiable watercourses judged to be at risk of impact from septic systems in the area.

**Proximity/Threat to Groundwater Uses**

Properly sited and operated septic systems can generally be relied upon to provide suitable protection to groundwaters from the standpoint of bacteriological contamination. However, in virtually all areas of Santa Barbara County there are numerous septic systems installed prior to the establishment of modern codes. Therefore, it is reasonable to expect that many septic systems do not provide the normal separation distances to safeguard groundwater quality, such that the proximity to groundwater resources constitutes a potential threat of impact in the absence of documentation to the contrary.

For this factor a "High" rating was assigned to areas overlying major groundwater basins of the County. A "Medium" rating was assigned where only portions of the Focus Area overly a groundwater basin. A "Low" rating was assigned where the area is located outside any active or known groundwater basins, such as in the upper foothill areas north of Goleta or immediately along the coast.

**Evidence of Water Quality Impact**

Impacts on both surface water quality and groundwater quality were a major impetus for the funding and authorization of this Septic System Sanitary Survey. The results from the surface water bacteriological sampling program conducted as part of this study, as well as results from other prior water quality investigations, were considered in judging each area.

Generally, where water quality impacts have been documented which have caused or threaten to cause exceedance of water quality criteria (i.e., standards), a "High" rating was assigned. A "Medium" rating was assigned where water quality results are suggestive of a possible impact from septic systems; and a "Low" rating was assigned where, to date, there is little evidence of water quality impact that would implicate septic systems in the area.

## RESULTS AND DISCUSSION

**Table 8-1** displays, in matrix format, our assessment of each of the 24 Septic System Focus Areas according to the various factors adopted for the analysis. Notations are provided for each rating assigned. In the far right-hand column an overall rating for the area is suggested based on collective consideration of the various individual factors. A detailed summary sheet for each Focus Area is provided in **Table 8-2**.

**TABLE 8-1**
**SEPTIC SYSTEM PROBLEM ASSESSMENT SUMMARY**

| FOCUS AREA | GEOLOGY/SOILS/ GROUNDWATER CONSTRAINTS | LOT SIZES/DENSITY OF SYSTEMS | TOTAL # OF SYSTEMS | SYSTEM TYPE AND AGE | SURVEY FINDINGS | PROXIMITY/THREAT TO SURFACE WATER USES | PROXIMITY/THREAT TO GROUNDWATER USES | EVIDENCE OF WATER QUALITY IMPACT | OVERALL PROBLEM RATING |
|---|---|---|---|---|---|---|---|---|---|
| **Rincon Point** | **HIGH** | **HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** | **LOW** | **HIGH** | **HIGH** |
| | Over 90 % alluvial deposits with good permeability. Less than 10% siltstone, mudstone and sandstone of questionable suitability; high groundwater at < 5 feet. | < 0.5 acres | 76 systems combined with Ventura County; near public beach | Older systems with encroachment on groundwater | Acknowledged problems; active plan to provide sewers | Immediately adjacent to lagoon and beach areas | No groundwater uses | Ocean water sampling; DNA study of creek, monitoring results | |
| **Shepard Mesa** | **LOW** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **LOW** | **LOW** | **LOW** | **LOW** | **LOW/MEDIUM** |
| | Primarily materials of good permeability including gravel, fanglomerate and sand. Less than 5% silt and clay. Groundwater at > 100' | Some < 0.5 acres; mostly > 1 acre | 120 parcels; rural area | mostly older; 50-50 mix of leachline and drywells | Low failure from inspection reports | No significant surface waters | High/dry topographic location; deep groundwater | No impacts found downstream in Rincon Creek | |
| **Arroyo Paredon** | **LOW - MEDIUM** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **MEDIUM - HIGH** | **MEDIUM - HIGH** | **MEDIUM** | **MEDIUM - HIGH** | **MEDIUM/HIGH** |
| | Mostly well drained alluvial deposits of good permeability; small areas of shale/siltstone bedrock. | Mostly 0.5 to 1 acre | 84 parcels in semi-rural area | Many older systems; but good conditions for leachlines | High failure rate from 1999-2001 inspection reports | Limited local surface water uses; discharges to ocean 0.75 miles downstream | Overlies Carpinteria Groundwater Basin | High bacteriological impacts downstream; possibly due to other land use sources | |
| **Padaro Lane** | **MEDIUM - HIGH** | **HIGH** | **MEDIUM** | **MEDIUM** | **MEDIUM - HIGH** | **HIGH** | **LOW** | **LOW*** | **MEDIUM/HIGH** |
| | Sands of high permeability; high groundwater in some areas | Mostly < 0.5 acre | 50 ± systems near ocean | mostly older; some code compliance issues; high groundwater | Acknowledged failure/problems; preliminary sewer study completed | Drains to ocean at mouth of East and West Toro Creek | No groundwater uses; ocean front area | * No sampling data | |
| **Sand Point** | **HIGH** | **HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** | **LOW** | **LOW*** | **HIGH** |
| | Sands of high permeability; high groundwater at < 5' throughout | Some lots < 0.5 acres; most with limited area due to ocean/marsh setbacks. | < 100 systems | mostly older; code compliance issues; high groundwater throughout | Acknowledged failures/problems; preliminary sewer study completed | Immediately adjacent to ocean and salt marsh | no groundwater uses; ocean front area | * No sampling data | |
| **Toro Canyon** | **MEDIUM** | **MEDIUM** | **HIGH** | **MEDIUM - HIGH** | **MEDIUM - HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **MEDIUM/HIGH** |
| | Mixture of alluvial deposits of good permeability and bedrock which includes claystone, siltstone, shale and sandstone, primarily of poor permeability. | Mostly > 0.5 to 1 acre | > 300 systems in urban fringe area | Mostly older systems; some code compliance issues | Medium to high reported concerns and failures during past 3 years | Drained by East and West Toro Creek; steep, incised channels | Most of area overlies Toro Canyon Sub-basin with local water supply wells | Chronic/high bacteriological readings downstream | |
| **Buena Vista Creek (Montecito)** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** | **MEDIUM - HIGH** | **MEDIUM** | **MEDIUM - HIGH** | **LOW*** | **MEDIUM/HIGH** |
| | Alluvial deposits of gravel, sand and silt of good permeability in lowlands, and bedrock of the Sespe Formation (shale, claystone and sandstone) and Coldwater Sandstone (sandstone and minor siltstone) with variable/poor permeability in upland areas. | Many small, < 0.25 acre lots | > 300 systems in urban fringe area | Mostly older systems, code compliance issues | Medium to high reported failures/concerns | Drains to Buena Vista Creek through urban area | Overlies Montecito groundwater basin with local water supply wells | * No evidence of bacterial contamination (dry creek conditions) | |

**TABLE 8-1**
**SEPTIC SYSTEM PROBLEM ASSESSMENT SUMMARY**

| FOCUS AREA | GEOLOGY/SOILS/ GROUNDWATER CONSTRAINTS | LOT SIZES/DENSITY OF SYSTEMS | TOTAL # OF SYSTEMS | SYSTEM TYPE AND AGE | SURVEY FINDINGS | PROXIMITY/THREAT TO SURFACE WATER USES | PROXIMITY/THREAT TO GROUNDWATER USES | EVIDENCE OF WATER QUALITY IMPACT | OVERALL PROBLEM RATING |
|---|---|---|---|---|---|---|---|---|---|
| **Cold Springs (Montecito)** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **HIGH** | **MEDIUM** | **MEDIUM** | **MEDIUM - HIGH** | **LOW** | **MEDIUM** |
| | Alluvial deposits of gravel, sand and silt of good permeability in lowlands, and bedrock of the Sespe Formation (shale, claystone and sandstone) and Coldwater Sandstone (sandstone and minor siltstone) with variable permeability in upland areas. | Mostly > 0.5 to 1 acre | 100± systems at urban fringe | Mostly older systems, code compliance issues | medium level of reported failures/concerns. | Drains to Montecito Creek and through urban area; deeply incised channels | Overlies Montecito groundwater basin with local water supply wells | No evidence of bacteriological impacts on Montecito Creek | |
| **Sycamore Creek (Montecito)** | **MEDIUM** | **MEDIUM** | **MEDIUM - HIGH** | **HIGH** | **MEDIUM - HIGH** | **MEDIUM** | **MEDIUM - HIGH** | **MEDIUM** | **MEDIUM/HIGH** |
| | Alluvial deposits of gravel, sand and silt of good permeability in lowlands, and bedrock of the Sespe Formation (shale, claystone and sandstone) and Coldwater Sandstone (sandstone and minor siltstone) with variable permeability in upland areas. | Mostly > 0.5 to 1 acre | 100 systems at urban fringe | Mostly older systems, code compliance issues | Medium to high reported failures/concerns | Drains to Sycamore Creek and through urban area | Partially overlies Montecito groundwater basins with local water supply wells | Possible evidence of bacterial impact found in Sycamore Creek | |
| **Mission Canyon** | **MEDIUM - HIGH** | **MEDIUM - HIGH** | **HIGH** | **HIGH** | **MEDIUM** | **HIGH** | **MEDIUM** | **LOW** | **MEDIUM/ HIGH** |
| | Alluvial deposits of gravel, sand, silt and cobble conglomerate of good permeability in lowlands, and bedrock of the Sespe Formation (shale, claystone and sandstone), Vaqueros Sandstone and Rincon Shale with variable/poor permeability in uplands areas. | Most lots > 0.5 acres on steep terrain | 250 systems adjacent to urban area | Mostly older systems; many types of designs/repairs | Few to some failures/concerns reported | Dissected by Mission Creek and Rattlesnake Canyon; public access areas; 303(d) listed water body | Partially overlies foothill groundwater basin | No significant bacteriological impacts found | |
| **Hope Ranch** | **MEDIUM** | **LOW** | **HIGH** | **MEDIUM - HIGH** | **HIGH** | **MEDIUM** | **LOW** | **MEDIUM** | **MEDIUM/HIGH** |
| | Diverse soils/geology; Primarily materials of good permeability including deposits of sand, gravel, conglomerate and sandstone. Some Monterey Shale. Low permeability and shallow soil areas. Several faults cross the Hope Ranch area. Several areas of shallow groundwater, some older systems encounter groundwater. | 1 to 2+ acre lots | > 800 systems | Many, older drywell systems | High failure rate from inspection reports and contractor input | Few surface waters; good distance to ocean | Partially overlies groundwater basin; no significant local uses | Possible contribution to high bacterial levels in stream | |
| **Veronica Springs** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **MEDIUM** | **MEDIUM/HIGH** |
| | Alluvium, colluvium and older alluvium with moderate permeabilities and sandstone and pebble sandstone of the Santa Barbara Formation; moderate to slow permeability; Mesa fault crosses the north edge and the Lavigia fault crosses the south edge of Veronica Springs. | Mostly > 0.5 to 1 acre | < 100 systems; adjacent to urban-public areas | Mostly older drywell systems | Few/some reported problems | Adjacent to Arroyo Burro Creek tributary near ocean confluence | Overlies groundwater basin with local wells | Possible contribution to high bacterial levels in Arroyo Burro Creek tributary and local groundwater-nitrate contamination | |
| **Sunset/Carol** | **LOW** | **HIGH** | **MEDIUM - HIGH** | **HIGH** | **HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** |
| | Older and more recent alluvial deposits with moderate permeability. | Nearly all < 0.5 acres; many < 0.25 acres | < 100 systems; urban area | old systems; limited options | confirmed surface failures | Drains to urban storm drains | Small community wells in immediate area | Elevated nitrate in local groundwater wells | |

**TABLE 8-1**
**SEPTIC SYSTEM PROBLEM ASSESSMENT SUMMARY**

| FOCUS AREA | GEOLOGY/SOILS/ GROUNDWATER CONSTRAINTS | LOT SIZES/DENSITY OF SYSTEMS | TOTAL # OF SYSTEMS | SYSTEM TYPE AND AGE | SURVEY FINDINGS | PROXIMITY/THREAT TO SURFACE WATER USES | PROXIMITY/THREAT TO GROUNDWATER USES | EVIDENCE OF WATER QUALITY IMPACT | OVERALL PROBLEM RATING |
|---|---|---|---|---|---|---|---|---|---|
| **Vista Vallejo** | **LOW** | **HIGH** | **MEDIUM** | **HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** | **MEDIUM/HIGH** |
| | Alluvial deposits of good permeability. The Mesa fault crosses near the south edge of Vista Vallejo. | Nearly all < 0.5 acres | 50± system; urban area | Few records; very old systems; code compliance issues | Few/some reported problems/concerns | Drains to urban storm drain and Arroyo Burro Creek | Small community water well in immediate area | Possible contribution to elevated nitrate in local groundwater | |
| **Upper Fairview** | **MEDIUM - HIGH** | **LOW** | **LOW - MEDIUM** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **LOW - MEDIUM** | **LOW*** | **MEDIUM** |
| | Area is divided between Vaqueros Sandstone and Rincon Shale, low permeabilities. The San Pedro fault and an unnamed fault both cross through Holiday Hill. Primary older alluvial deposits and Santa Barbara Formation, materials with moderate permeability on La Goleta Road. Site specific problem areas. Many properties in this area have been found to have slow percolation and perched groundwater. | Mostly > 0.5 to 1 acre | 100± systems; rural area | Older systems; multi-family and commercial system near creek; code compliance questions; poor records | Few/some reported problems, complaints | Generally high topographic relief; drains to Vegas Creek; some creekside properties | Overlies edge of Foothill groundwater basin | * No sampling data | |
| **La Buena Tierra** | **LOW** | **MEDIUM** | **LOW** | **MEDIUM** | **LOW** | **LOW - MEDIUM** | **LOW - MEDIUM** | **LOW*** | **LOW** |
| | Older alluvial deposits of moderate permeability. Fault at upslope (north) margin of area. | Mostly 0.5 to 1 acre | < 50 systems; suburban area | Mostly older; very limited records; mostly drywells | no/few reported problems | Drains to urban storm drains and San Jose Creek | Overlies Foothill groundwater basin | * No sampling data | |
| **Via Chaparral** | **MEDIUM** | **MEDIUM** | **LOW** | **MEDIUM - HIGH** | **MEDIUM** | **LOW - MEDIUM** | **LOW - MEDIUM** | **LOW*** | **LOW/MEDIUM** |
| | Older alluvial deposits of moderate permeability; | Mostly > 0.5 acre | < 100 systems; rural area | Mostly older; code compliance issues | Few/some reported problems/failures | Several small drainages through area; tributary to Atascadero Creek (Dry) | Overlies Foothill groundwater basin | * No sampling data | |
| **Painted Cave** | **MEDIUM - HIGH** | **HIGH** | **LOW** | **HIGH** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **LOW*** | **MEDIUM/HIGH** |
| | Steep slopes; coldwater sandstone and older alluvium; highly variable, generally poor suitability. | Mostly < 0.5 acre in steep terrain | < 100; remote area | Old systems; no records; code compliance issues | Few/some reported problems/concerns | Drains to seasonal tributaries of San Jose and Maria Ygnacio Creeks | Outside of major groundwater basins ;and local bedrock wells | * No sampling data | |
| **Los Olivos** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** | **MEDIUM - HIGH** | **HIGH** | **HIGH** | **HIGH** | **HIGH** |
| | Primarily recent and older alluvial deposits with low to moderate permeabilities. Paso Robles Formation composed of Monterey Shale detritus may be a problem in some locations; clay soils and perched water conditions in large part of town. | Very small lots, many <0.25 acres | > 350 systems in town setting | Old systems extending into groundwater; code compliance problems | Medium failure rate; acknowledged problems with limited options | Immediately adjacent to Alamo Pintado Creek; tributary to Santa Ynez River, 303(d) listed. | Overlies major groundwater basin with documented groundwater-nitrate problems; discharges directly into groundwater | Elevated nitrate-nitrate found in 1977; Chronic high bacteria levels in Alamo Pintado Creek | |
| **Ballard** | **MEDIUM** | **HIGH** | **MEDIUM** | **MEDIUM - HIGH** | **MEDIUM** | **HIGH** | **MEDIUM** | **MEDIUM - HIGH** | **MEDIUM/HIGH** |
| | Recent and older alluvial deposits of gravel, sand and clay. Primarily good materials, localized problems with clay; perched water conditions | Many lots < 0.5 acres | 120± systems; rural - town setting | Old systems with poor records; possible code compliance - groundwater issues | Low failure rate; acknowledged problems by contractors | Adjacent to Alamo Pintado Creek; tributary to Santa Ynez River, 303(d) listed | Overlies major groundwater basin with documented nitrate-nitrate problems | Chronic high bacteria levels in Alamo Pintado Creek | |

**TABLE 8-1**
**SEPTIC SYSTEM PROBLEM ASSESSMENT SUMMARY**

| FOCUS AREA | GEOLOGY/SOILS/ GROUNDWATER CONSTRAINTS | LOT SIZES/DENSITY OF SYSTEMS | TOTAL # OF SYSTEMS | SYSTEM TYPE AND AGE | SURVEY FINDINGS | PROXIMITY/THREAT TO SURFACE WATER USES | PROXIMITY/THREAT TO GROUNDWATER USES | EVIDENCE OF WATER QUALITY IMPACT | OVERALL PROBLEM RATING |
|---|---|---|---|---|---|---|---|---|---|
| **Santa Ynez Area** | **MEDIUM - HIGH** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** | **MEDIUM - HIGH** | **MEDIUM - HIGH** | **MEDIUM - HIGH** | **HIGH** |
| | Older alluvial deposits of silt, sand and gravel with moderate permeabilities; undulating topography and drainage swales; mixture of good/well drained soils and poorly drained "valleys". Discontinuous, compact clay subsoil layer and resulting perched groundwater, which is a major constraint in this area. | Mostly > 0.5 acre | > 600 systems; semi-rural | Many older systems; code compliance issues with respect to groundwater | Numerous scattered problem systems related to soil/groundwater constraints; limited options for many lots. | No significant surface waters; problems localized | Overlies major groundwater basin with documented nitrate-nitrate problems | General contribution to nitrate problems in Santa Ynez Valley | |
| **Janin Acres** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **HIGH** | **MEDIUM** | **MEDIUM** | **HIGH** | **HIGH** | **HIGH** |
| | Older alluvial deposits of silt, sand and gravel with moderate permeabilities. Shallow clay subsoils favor deep trench/drywell designs. | Mostly 0.5 to 1 acre; rural area | 100± systems, rural area | Mainly older dry wells and deep trenches; limited soil treatment above aquifer. | Some failures and acknowledged problems | No significant surface waters locally; drains to Santa Ynez River, 303(d) listed. | Overlies major groundwater basin with local domestic water supply wells | Documented nitrate-nitrate contamination of local water supply wells. | |
| **Lake Marie Estates** | **LOW - MEDIUM** | **MEDIUM** | **MEDIUM** | **MEDIUM** | **LOW** | **LOW** | **MEDIUM** | **LOW*** | **LOW/MEDIUM** |
| | Wind blown dune sands and older alluvium with good permeabilities; some areas restricted by compact/cobbly subsoils. | Mostly 0.5 - 1 acre; rural area | > 100 systems; rural area | Older system; few records | No/few reported problems/concerns | No significant surface waters; rural area | Overlies Santa Maria groundwater basin; possible localized groundwater nitrate impact from high density. | * No sampling data | |
| **Orcutt** | **LOW** | **LOW** | **LOW** | **MEDIUM** | **LOW** | **LOW** | **MEDIUM** | **LOW** | **LOW** |
| | Wind blown dune sands and older alluvium, high permeability | Mostly > 1 acre rural area | < 50 system, rural area | Older systems, few records | No/few reported problems/concerns | No significant surface waters; rural area | Overlies Santa Maria groundwater basin | * No sampling data | |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Rincon Point | |
|---|---|
| **Site Conditions** | Soils in the Rincon Point area are principally well-drained alluvium underlain by siltstone, mudstone and sandstone of the Pico Formation. The Dibblee geologic map shows Rincon Point to lie almost entirely within an area of recent floodplain and stream channel alluvium, with minor inclusions of Pico Formation. Because of the low topographic position at the mouth of the creek and adjacent to the ocean, much of the area experiences high groundwater conditions, with the seasonal water table rising to within 5 feet or less of ground surface. The high groundwater conditions, in combination with limited area and close proximity to the creek and ocean pose serious (high) constraints for effective siting and operation of septic systems. |
| **Septic System Practices** | Rincon Point area is a relatively high-density, oceanfront development, with parcel sizes all less than 0.5 acres, and generally less than 0.25 acres. The area spans the Santa Barbara-Ventura County line, with 35 parcels in Santa Barbara County and 39 parcels in Ventura County. Septic system permit information is on file at the County for about a third of the parcels, all but one of which are leachline designs. One system is reported to be served by a 40-foot deep drywell which likely discharges directly into groundwater, in violation of current standards. Very few, if any, of the septic systems are believed to conform to the current Regional Board Basin Plan standard for vertical separation to groundwater (minimum of 5 feet below trench bottom). However, at least one residential subdivision at Rincon Point has been reviewed by the Regional Board. Suitable area for replacement and/or repair of existing septic systems is extremely limited due to the small lot sizes, setback requirements, and shallow groundwater conditions. |
| **Survey Findings** | According to reports on file with the County, no septic systems were serviced in the Rincon Point area during the last three years. There were also found to be no confirmed septic systems complaints on file. However, contractors and consultants responding to the survey questionnaire rated the Rincon Point area as a medium to high septic system problem area. Also, the area is acknowledged by the County and local residents as being a problematic area for septic systems. There is an active effort to extend public sewers to the area from Carpinteria Sanitary District. Local support for sewers is substantial, but it is not unanimous. |
| **Water Quality Issues** | Rincon Point is immediately adjacent to Rincon Creek and the Pacific Ocean which supports significant public recreational uses as well as aquatic and wildlife habitat. Prior studies of Rincon Creek and the ocean waters and water quality sampling conducted in this Sanitary Survey have documented bacteriological impacts that show strong evidence of septic system influence, most likely indirectly via groundwater flow. Waterfowl and other animals are also acknowledged to contribute to high bacteriological levels in the creek and ocean waters.<br><br>There is no existing or potential use of groundwaters in the Rincon Point area. The groundwater that occurs in this area is largely perched water that is effectively an extension of, and a source of seepage to, the Rincon Creek lagoon and the ocean. |
| **Overall Assessment** | Because of the relatively poor site conditions and evidence of actual or threatened bacteriological impacts to Rincon Creek and the recreational uses of the adjacent ocean waters, Rincon Point was given a High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Shepard Mesa | |
|---|---|
| **Site Conditions** | Soils/geologic conditions in the area consist primarily materials of good permeability, including sand, gravel and cobbles, with small fractions of silt and clay. The Dibblee geologic map shows the mesa area as older cobble-boulder fanglomerate deposits composed largely of sandstone detritus. The lower elevations to the south and east are mapped Older Alluvial deposits; the area along Gobernador Canyon, to the west, is mapped as Younger Alluvial floodplain deposits. Because of the high topographic position of Shepard Mesa, groundwater is generally deep (greater than 100 feet) and presents no particular constraints for the siting or operation of septic systems. Steep slopes and relatively heavy (clayey) surface soils characterize much of the area. Some areas near the top of the mesa drain very well; but portions of the area are limited by clay and rocky soils. Red clay is visible in some of the road cuts. |
| **Septic System Practices** | Shepard Mesa is a rural area of relatively low-density development, having some parcels smaller than an acre, but with lot sizes generally in the range of 1.0 to 3.0 acres or more. There are about 120 parcels in the focus area. County files include permit information for about 20 percent of the parcels, indicating that most of the systems are more than 10 years old and may not comply with all current siting and design standards. However, the combination of the relatively good site conditions and recent permitting of systems under current standards provides reasonable evidence that septic systems are viable in the area. Available records for recent installations indicate about half leachline and half drywell design, typically about 20 to 40 feet deep. Most of the systems in this area were constructed in the 1950s and 60s. According to County Health Department staff, there have been a significant number of repairs in the area. |
| **Survey Findings** | Survey findings indicate a low rate of problems encountered in Shepard Mesa area. There are no records of complaints and it had one of the lowest reported system failure rates over the past three years based on Septic Tank Inspection Reports. |
| **Water Quality Issues** | Shepard Mesa lies partially in the Rincon Creek watershed and partially in the Gobernador-Carpinteria Creek watershed. However, the development and septic systems in the area are located at relatively high elevations well above and away from these streams. There are no significant local tributary streams; surface water is limited mainly to storm runoff channeled to Rincon Creek (to the south and east) or to Gobenador Creek (to the north and west) in small gullies and roadside ditches. Water quality sampling of Rincon Creek during this study and in prior investigations has not detected any significant bacteriological impacts originating in this area.<br><br>The area overlies the Carpinteria Groundwater Basin, which is used extensively as a source of agricultural water supply, but has no significant uses for domestic or municipal supply. The depth to groundwater is estimated to be greater than 100 feet in most of the area, limiting the potential for impacts to groundwater quality. |
| **Overall Assessment** | Because of the relatively good site conditions, minor reported evidence of problems, and limited threat to surface and groundwater resources, Shepard Mesa was given a Low to Medium Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Arroyo Paredon | |
|---|---|
| **Site Conditions** | Soil conditions in the Arroyo Paredon area consist primarily of sandy loam of the Ballard and Milpitas-Positas soil series. These soils, formed on terraces, are generally well drained, moderately permeable and underlain by gravelly loam and sandy clay loam subsoils, making them reasonably suitable for conventional septic tank-leachline systems. The Dibblee geologic map shows most of the area to be undelain by older cobble-boulder fan gravel and fanglomerate of sandstone detritus, with some area of Younger Alluvium, having good permeability. A portion of the Focus Area along the northern and western sides is mapped as claystone, silty shale and sandstone of the Sespe Formation, with generally very low permeabilty in the claystone beds, and more favorable conditions where sandstone is encountered (see Toro Canyon discussion). |
| **Septic System Practices** | The Arroyo Paredon area consists of about 80 parcels in a semi-rural area of relatively low-density development, with about half of the parcels between 0.5 and one acre in size. The area is surrounded by agricultural properties, including orchards and a number of greenhouses. County files include permit information for about 15 percent of the parcels, indicating that most of the systems are more than 10 years old and may not comply with all current siting and design standards. However, the combination of the relatively good site conditions and recent permitting of systems under current standards provides reasonable evidence that septic systems are viable in the area. Available records for recent installations indicate about two-thirds leachline and one-third drywell design (depth unknown). |
| **Survey Findings** | Survey findings indicate medium to high evidence of problems. Records indicate one septic system complaint for the area but a relatively high rate of failure (7 failures out of 18 inspections) over the past three years based on Septic Tank Inspection Reports. |
| **Water Quality Issues** | The area drains to the main stem of Arroyo Paredon Creek and to a small local tributary stream. Approximately 20 properties in the area either border or span these creeks. Arroyo Paredon Creek drains through a largely agricultural area (with numerous greenhouses) before crossing under Highway 101 and entering the ocean in the Serena area. The creek is accessible, but appears to have limited recreational uses. The main stem of the creek had continuous flow throughout the Sanitary Survey sampling period; but the tributary stream was dry. Water quality sampling showed consistently high bacteriological readings at the downstream station (near Highway 101) and sporadic high readings at the sampling station immediately adjacent to the septic system area (near Foothill Road).<br><br>The area overlies the Carpinteria Groundwater Basin, which is used extensively as a source of agricultural water supply, but has no significant uses for domestic or municipal supply. The depth to groundwater is estimated to be less than 50 feet in most of the area. There is no evidence of local impacts on groundwater quality from septic systems in the Arroyo Paredon area. |
| **Overall Assessment** | While this area has relatively good site conditions, a Medium-High Problem Rating was assigned due to recent evidence of system failures/corrective action, the existence of many older systems, and water quality test results for Arroyo Paredon Creek indicating sporadic high bacteriological impacts in the area. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Padaro Lane | |
|---|---|
| **Site Conditions** | The Padaro Lane area, including Beach Club Road, consists of beach sands in the lower elevations and sandy loam (Ballard series) alluvial fan deposits. The Dibblee geologic map shows the area as beach sand deposits and Younger Alluvium. The Ballard soils are well drained and generally suitable for conventional septic tank– leachline systems, as long as adequate separation can be maintained from groundwater and adjacent watercourses. Beach sand deposits are rapidly permeable and lack the necessary fine soil particles and microbial activity to effect suitable treatment of septic system effluent. Problems are compounded by high groundwater conditions. The Basin Plan requires a watercourse setback of 250 feet in areas having rapid permeability and limited separation to groundwater. Such setbacks cannot be met for beachfront properties in the Beach Club Road area. |
| **Septic System Practices** | Padaro Lane consists of approximately 50 oceanfront homes near Loon Point, including properties along Beach Club Road. Lots there are small, typically less than ½ acre; and a substantial portion of the lots extend into the beach and tidal areas. Septic system permit information is on file at the County for about a third of the parcels, all but two of which are leachline designs. Drywells, to the extent they are used, likely discharge directly into the shallow groundwater. |
| **Survey Findings** | Survey findings indicate a moderate to high amount of septic system problems encountered in the Padaro Lane area. There are no records of complaints, but there were four reported failures over the past three years based on Septic Tank Inspection Reports. Also, contractors and consultants responding to the survey questionnaire rated the Padaro Lane area as a medium to high septic system problem area. A preliminary sewer system feasibility study was recently completed by the Carpinteria Sanitary District for the area. |
| **Water Quality Issues** | Padaro Lane is located immediately adjacent to the mouth of East and West Toro Creeks and the Pacific Ocean, which support significant public recreational uses as well as aquatic and wildlife habitat. The use of septic systems in this area poses a significant threat to surface water quality and beneficial uses because of the high groundwater conditions, excessively drained soils (i.e., beach sands) and close proximity to surface waters. No water quality sampling was conducted during this Sanitary Survey or in prior studies to document the local water quality impacts in the Padaro Lane area.<br><br>There is no existing or potential use of groundwaters in the Padaro Lane area. The groundwater that occurs in this area is essentially an extension of, and a source of seepage to, the ocean. |
| **Overall Assessment** | Because of the lack of suitable soil and groundwater conditions for proper operation of septic systems in a significant portion of the area, combined with the close proximity and threatened bacteriological impact to surface waters of the adjacent creeks and the ocean, Padaro Lane was given a Medium-High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Sand Point Road | |
|---|---|
| **Site Conditions** | The Sand Point Road area is a sand spit, with some imported fill, separating the Pacific Ocean and Carpinteria Marsh. The Dibblee geologic map shows the entire area as beach sand deposits. The ground elevation is typically about 10 feet above sea level. Groundwater levels are controlled largely by the ocean, and are typically about 3 to 6 feet from ground surface. Beach sand deposits are rapidly permeable and lack the necessary fine soil particles and microbial populations to effect suitable treatment of septic system effluent. Problems are compounded by the high groundwater conditions. The Basin Plan requires a watercourse setback of 250 feet in areas having rapid permeability and limited separation to groundwater. Such setbacks cannot be met in the Sand Point Road area. |
| **Septic System Practices** | Sand Point Road area consists of approximately 70 beachfront homes (including Avenue del Mar) situated on a sand spit between Carpinteria Marsh and the Pacific Ocean, immediately west of Carpinteria, including Sandyland Cove. Lots are small, typically less than ½ acre; and a substantial portion of the lots extend into the beach and tidal areas. Septic system permit information is on file at the County for about a third of the parcels, all but two of which are leachline designs. Most of the systems were built in the 1950s or 60s and do not meet current standards. Drywells, to the extent they are used, likely discharge directly into the shallow groundwater. Many original leachline systems are also believed to discharge into groundwater. |
| **Survey Findings** | Survey findings indicate a moderate to high amount of septic system problems encountered in the Sand Point Road area. There are no records of complaints, but there were six reported failures over the past three years based on Septic Tank Inspection Reports. Also, contractors and consultants responding to the survey questionnaire rated the Sand Point Road area as a medium to high septic system problem area. A preliminary sewer system feasibility study was recently completed by the Carpinteria Sanitary District for the area. |
| **Water Quality Issues** | Sand Point Road is located immediately adjacent to the Carpinteria Marsh and the Pacific Ocean which support significant public recreational uses as well as aquatic and wildlife habitat. The use of septic systems in this area poses a significant threat to surface water quality and beneficial uses because of the high groundwater conditions, excessively drained soils (i.e., beach sands) and close proximity to surface waters. No water quality sampling was conducted during this Sanitary Survey or in prior studies to document the local water quality impacts in the Sand Point Road area.<br><br>There is no existing or potential use of groundwaters in the Sand Point Road area. The groundwater that occurs in this area is essentially an extension of, and a source of seepage to, the Carpinteria Marsh and the ocean. |
| **Overall Assessment** | Because of the lack of suitable soil and groundwater conditions for proper operation of septic systems throughout virtually the entire area, combined with the close proximity and threatened bacteriological impact to surface waters of the adjacent marsh and ocean, the Sand Point Road was given a High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Toro Canyon | |
|---|---|
| **Site Conditions** | The Toro Canyon area encompasses approximately 1,800 acres and extends from the southern flank of the Santa Ynez Mountains to the coastal plain along the U.S. 101 freeway. Except for the 300 acres located within the coastal plain, the Toro Canyon area is characterized by steep slopes upon which Tertiary sedimentary bedrock is exposed or present immediately below the surface beneath a thin veneer of soil. The coastal plain area is underlain by an accumulation of alluvial sediments eroded from the older bedrock formations.<br><br>The Dibblee geologic map shows much of the area underlain by the Sespe Formation, which is composed of alternating beds of sandstone and claystone. The claystone beds are generally of low permeability and unsuitable for wastewater disposal. The Sespe sandstone beds offer more favorable conditions, but can be complicated by the hydrologic effects of the intervening claystone layers. Soils overlying the Sespe bedrock are thin and generally of low permeability. Drywells are the most common wastewater disposal facility in areas underlain by Sespe.<br><br>The northernmost portion of the Toro Canyon Focus Area is characterized by very steep slopes underlain by the Coldwater Formation, composed primarily of cemented sandstone with minor interbeds of shale and claystone. The sandstones and shales in this formation are commonly fractured, making wastewater disposal viable. Where fractures are absent, slow permeability of this formation poses severe constraints. A small block of Coldwater Formation sandstone is exposed just south of the Arroyo Parida Fault in the central part of the focus area.<br><br>Surficial sediments identified on the Dibblee map as Older Alluvium are present in the northwestern and southwestern portions of the focus area. Except where adjacent to and derived from Sespe Formation bedrock, these materials are generally suitable for wastewater disposal, as are younger alluvial sediments.<br><br>Several branches of Toro Canyon Creek, as well as numerous tributary drainages, flow across the area and limit the areas available for the siting of septic systems. High groundwater is present in low-lying, alluvial-filled valleys. The thickness of soil available for wastewater disposal is limited in these areas. |
| **Septic System Practices** | There are approximately 315 rural residential parcels served by septic systems in the Toro Canyon area. The lots are typically more than two acres in size. Permit information is available for less than 20 percent of the systems; the rest are more than 10 years old. Available file and inspection information indicates that most of the recent installations have used leachlines rather than drywells; this may not be the case for the many older systems in the Toro Canyon area. Because of the large number of older systems and the difficult terrain, there are likely many non-conforming septic system installations in this area. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| | |
|---|---|
| **Survey Findings** | Survey findings indicate a moderate to high rate of problems encountered in the Toro Canyon area. There was one confirmed and three unconfirmed complaints on record with the Health Department for the area. Roughly 25% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 20 percent were reported to have system failure problems requiring corrective action. Contractors/consultants responding to the survey generally rated the Toro Canyon area as a medium to high septic system problem area. |
| **Water Quality Issues** | Toro Canyon is drained by East Toro Creek and West Toro Creek, which are deeply incised perennial streams that parallel one anther and discharge to the ocean near Loon Point and Beach Club Road. Approximately 100 properties in Toro Canyon either border or span these creeks.<br><br>Toro Canyon overlies the Toro Groundwater Subbasin, at the west edge of the Carpinteria Groundwater Basin. The groundwater is used for domestic-municipal water supply as well as for agriculture. To date, there is no evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Toro Canyon area.<br><br>Bacteriological sampling results for East and West Toro Creeks during the Sanitary Survey showed sporadically high readings at sampling stations within upper reaches of the creek, and consistently high readings near the mouth of the creek, which could be due to septic systems as well as other sources. Overall, both creeks draining Toro Canyon were rated as having evidence of high bacteriological impacts. |
| **Overall Assessment** | Because of the generally difficult site and soil conditions for septic systems, the close proximity of many systems to East and West Toro Creek, survey findings indicating a relatively high rate of system failure, and the evidence of possible bacteriological impacts in downstream reaches of Toro Creek, the Toro Canyon area was given a Medium-High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Buena Vista Creek (Montecito) | |
|---|---|
| **Site Conditions** | The Buena Vista Creek area extends from areas of relatively moderately sloping terrain along East Valley Road into the steep hills at the base of the San Ysidro Mountains. In the lower elevations soils consist mainly of alluvial deposits (loamy sand and sandy loam) of the Ballard and Cortina soil series. These soils are generally well to very well-drained and moderately to highly permeable. The Dibblee geologic map shows this area as dissected Younger and Older Alluviual deposits of silt, sand and gravel, having moderate to good permeability. These areas have relatively few constraints for septic systems as long as there is sufficient land area. In the higher elevations the soils include the Milpitas-Positas sandy loam, Todos clay loam and Maymen sandy loam. These soils tend to be very shallow over bedrock or compacted subsoils which severely limits their suitability for use of conventional leachline systems. In these areas the Dibblee geologic map shows a band of Sespe Formation above Romero Canyon Road, and Coldwater Sandstone in the higher elevations above Bella Vista Drive. These formations consist of claystone, siltstone, shale and sandstone with relatively poor permeability (See Toro Canyon discussion). |
| **Septic System Practices** | There are approximately 340 residential parcels served by septic systems in the Buena Vista Creek area. More than ¾ of the lots are greater than one-half acre in size, and more than half are larger than one acre. However, there are about 75 very small parcels in the Orchard Lane area that are less than ¼-acre in size. Permit information is available for a little more than 20 percent of the systems; the rest are more than 10 years old. Available file and inspection information indicates that most of the recent installations have used leachlines rather than drywells. Because of the steep terrain and difficult geology in some areas and the very small parcels (e.g., Orchard Lane) in other areas, there are likely many non-conforming septic systems in this area. |
| **Survey Findings** | Survey findings indicate a moderate to high rate of problems encountered in the Buena Vista Creek area. There was one confirmed complaint on record with the Health Department for the area. Roughly 30% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 13% were reported to have system failure problems requiring corrective action. Contractors/consultants responding to the survey generally rated the Buena Vista Creek area as a medium to high septic system problem area. |
| **Water Quality Issues** | This area lies within the watershed of Buena Vista Creek which drains to and is bordered by Romero Creek on the east side. These streams flow through the Valley Club Golf Course and residential areas of Montecito before discharging to the ocean at Fernald Point. Approximately 50 properties in the area either border or span these creeks. Buena Vista and Romero Creeks run seasonally in this area; both were dry the lower sampling stations throughout the sampling period for the Sanitary Survey. Sampling results for the upper stations indicated very low evidence of bacteriological impact, except for the last sampling run for Romero Creek. The observed impacts to water quality during the survey were found to be low.<br><br>The area overlies the northeastern portion of the Montecito Groundwater Basin. The groundwater is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Buena Vista Creek area. |
| **Overall Assessment** | This area was given a Medium-High Problem Rating due to the combination of difficult soil-geologic conditions, very high density of septic systems in certain areas, the large number of older systems, and the moderate to high number of failures reported from recent inspections. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Cold Springs (Montecito) | |
|---|---|
| **Site Conditions** | Site conditions in the Cold Springs area of Montecito are very similar to those in the Buena Vista Creek area to the east. The lowlands near East Valley Road and Sycamore Canyon Road are generally characterized by well drained sandy alluvial soils of the Ballard and Cortina soil series, underlain by well drained deposits of good permeability. These areas are reasonably suitable for conventional septic systems where there is sufficient land area. In the uplands the soils are generally moderately to slowly permeable and have relatively shallow depth over bedrock or slowly permeable subsoils. The Milpitas-Positas, Todos and Maymen soil series dominate the upland areas. The Todos and Maymen soils are formed over bedrock and are generally shallow and poorly suited for the use of conventional leachline systems. The Dibblee geologic map shows the Cold Springs area to consist primarily of Older Alluvial deposits of silt, sand and gravel, with sand and gravelly stream channel deposits along the major drainageways (Cold Creek, Hot Springs Creek and Montecito Creek). In the upper elevations, north of East Mountain Drive, the underlying materials consist of bedrock of the Sespe Formation and Coldwater Sandstone, which tend to have relatively poor permeability (see Toro Canyon discussion). Steep slopes and creek setbacks also pose limitations for the siting and proper functioning of septic systems in the upland areas. |
| **Septic System Practices** | There are approximately 140 residential parcels served by septic systems in the Cold Springs area. Most of the lots area larger than one acre in size, with a small percentage between ½ and one acre. The average parcel size is over 2.5 acres. Permit information is available for a little more than 20 percent of the systems; the rest are more than 10 years old. Available file and inspection information indicates that most of the recent installations have used leachlines rather than drywells. Because of the steep terrain and difficult geology in some areas, there are likely many non-conforming older septic system installations in this area. |
| **Survey Findings** | Survey findings indicate a medium rate of problems encountered in the Cold Springs area. There were three confirmed septic system complaints on record with the Health Department for the area. Roughly 25% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 17% were reported to have system failure problems requiring corrective action. Contractors/consultants responding to the survey generally rated the Cold Springs area as a medium septic system problem area. |
| **Water Quality Issues** | This area lies within the watershed of Cold Springs and Hot Springs Creeks which join to become Montecito Creek, which then drains through Montecito residential areas and enters the Pacific Ocean just east of Butterfly Beach. Approximately 40 properties in the area either border or span these creeks. These creeks were flowing throughout the Sanitary Survey sampling period at the three stations selected for testing. Sampling results indicated very low evidence of bacteriological impact at all stations, with only two readings for enterococcus above the single sample maximum criterion. The observed impacts to water quality during the survey were found to be low in this area.<br>The area overlies the north-central portion of the Montecito Groundwater Basin. The groundwater is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Cold Springs area. |
| **Overall Assessment** | This area was given a Medium Problem Rating due to the combination of difficult soil-geologic conditions, the large number of older systems, and the moderate number of failures reported from recent inspections. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Sycamore Creek (Montecito) | |
|---|---|
| **Site Conditions** | The Sycamore Creek area is similar to the upland portions of the Cold Springs and Buena Vista Creek areas, with the predominant soils being relatively shallow and moderately to slowly permeable loams of the Milpitas-Positas, Todos, and Maymen series. The Dibblee geologic map shows the area to have complex geolgy, including a large area of older alluvium (low to moderate permeabilty) between Sycamore Canyon Road and Westmont College, Sespe Formation in the higher elevations to the west and north, and an area of Rincon Shale on the south side of Sycamore Canyon Road. These formations include claystone, siltstone, shale and sandstone with low to very low permeability. There are also small landslide areas mapped in the southern portion of the Focus Area, which pose additional constraints for septic systems and development, in general. Overall, the soil and geologic conditions combined with steep slopes and creek setback constraints pose significant limitations for the siting and proper functioning of septic systems in the upland areas. A small portion of the area consists of well drained alluvial deposits and sandy loam soils of the Ballard series, which are generally suitable for conventional septic systems where sufficient land area is available. these areas are generally associated with recent alluvial deposits. |
| **Septic System Practices** | There are approximately 175 residential parcels served by septic systems in the Sycamore Creek area. Nearly all of the lots are greater than one-half acre in size, and more than 60% are larger than one acre. The average lot size is about 2 acres. Permit information is available for about 15 percent of the systems; the rest are more than 10 years old. Available file and inspection information indicates that most of the recent installations are split about 50-50 between the use of leachlines and drywells; older systems may include a greater number of drywells, especially in the areas of steeper terrain. Because of the steep terrain and difficult geology in a large portion of this area, there are likely many non-conforming older septic system installations in this area. |
| **Survey Findings** | Survey findings indicate a moderate to high rate of problems encountered in the Sycamore Creek area. There was one confirmed complaint on record with the Health Department for the area. Roughly 25% of the properties in the area had their septic system serviced over the past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 22% were reported to have system failure problems requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated the Sycamore Creek area as a medium to high septic system problem area. |
| **Water Quality Issues** | This area lies within the watershed of Sycamore Creek which drains through Montecito and Santa Barbara residential areas and enters the Pacific Ocean in the vicinity of Dwight Murphy Park and Cabrillo Pavillion (East Beach). Approximately 30 properties in the area either border or span the creek. Sycamore Creek was flowing throughout the Sanitary Survey sampling period in the two lower stations, but was dry at the upstream control station. Sampling results indicated a medium level of bacteriological impact, with the highest readings for total coliform and enterococcus observed at the most downstream station.<br><br>The area overlies the northwestern portion of the Montecito Groundwater Basin. The groundwater is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Sycamore Creek area. |
| **Overall Assessment** | This area was given a Medium-High Problem Rating due to the combination of difficult soil-geologic conditions throughout most of the area, the large number of older systems, the moderate to high number of failures reported from recent inspections, and the medium level of bacteriological impact observed in Sycamore Creek. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Mission Canyon | |
|---|---|
| **Site Conditions** | The Mission Canyon area has significant variations in terrain and a wide variety of soil and geologic conditions. According to the Dibblee geologic map, the geology in the western and northern portions is dominated by shale, claystone and sandstone bedrock of the Rincon Shale, Sespe Formation, Coldwater Sandstone, with a small area of Vaqueros Sandstone. Permeability of these materials generally ranges from poor to very poor, although there may be inclusions or beds of more permeable materials that are suitable for wastewater disposal. Overlying soils are generally very shallow and range from sandy loam to clays. These conditions pose significant constraints for septic system siting and operation. In some areas the uplands are underlain by soft shale and mudstone that are also potentially susceptible to landslides. In the lower elevations, along the major drainage channels (Mission Creek and Rattlesnake) the area is mapped as recent alluvial deposits, with well drained sandy loam soils of the Milpitas series; these areas tend to be reasonably suitable for leachlines. The uplands in the central and eastern portions of the Misison Canyon area are mapped as older alluvium and cobble-boulder fan gravel and fanglomerate deposits, composed largely of sandstone detritus and having generally moderate to good permeability. |
| **Septic System Practices** | There are approximately 250 residential parcels served by septic systems in the Mission Canyon area. Nearly all of the lots are greater than one-half acre in size, and nearly 60% are larger than one acre. The average lot size is about 2 acres. Permit information is available for about 17 % of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations are split about 50-50 between the use of leachlines and drywells. Because of the steep terrain and very difficult geology in most of this area, there may likely a large number of non-conforming older septic system installations in this area. Several "Alternative" designs have also been used in this area to overcome difficult site conditions. |
| **Survey Findings** | Survey findings indicate a medium level of septic system problems encountered in the Mission Canyon area. There were two confirmed complaints on record with the Health Department for the area. Roughly 25% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, only about 3% were reported to have system failure problems requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated the Mission Canyon area as a medium septic system problem area. |
| **Water Quality Issues** | The Mission Canyon area lies in the watershed of Mission Creek and Rattlesnake Canyon tributary to the east. Downstream Mission Creek flows through the central downtown area of Santa Barbara and discharges to the ocean just east of Stearns Wharf. Approximately 50 properties in Mission Canyon either border or span these creeks. There is public access to the creek at the Botanical Gardens and at the #7 Falls trailhead.<br><br>Mission Creek and Rattlesnake Canyon were flowing throughout the Sanitary Survey sampling period except at the upstream control station at #7 Falls trailhead. Sampling results indicated very low evidence of bacteriological impact at all stations, with only two readings for enterococcus above the single sample maximum criterion. Prior sampling of Mission Creek during the South Coast Watershed Characterization Study also found low levels of bacteria in this area of Mission Creek. However, Mission Creek has been listed as a 303(d) impaired water body due to pathogens; and septic systems are identified as a possible contributing source.<br><br>The area partially overlies the Santa Barbara Groundwater Basin. The groundwater is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Mission Canyon area. |
| **Overall Assessment** | This area was given a Medium-High Problem Rating due to the combination of very difficult soil-geologic conditions in most of the area, the large number of older systems, the moderate number of failures and problems reported, and proximity to a 303(d) listed water body. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Hope Ranch | |
|---|---|
| **Site Conditions** | Hope Ranch encompasses an area of approximately 3 square miles (1,950 acres) having diverse geologic and soil conditions that range from excellent to poor in regard to septic system suitability. The underlying geology of the area consists primarily of deposits of sand, gravel, conglomerate and sandstone having relatively good permeability, mapped as Older Alluvium on the Dibblee geologic map. However, there are minor amounts of Monterey Shale (slowly permeable), and several faults cross the area which may influence groundwater flow and permeabilities locally. The western portions of Hope Ranch contain large areas of deep, well drained loamy sands (Arnold and Baywood series) that are generally very well suited for septic tank-leachline systems. Through the center of the area there is an east-west band of clay and shaly clay soils that have developed over the Monterey Shale bedrock. On the eastern half of the site, the upland soils are predominantly shallow sandy loams over sandstone bedrock of the Santa Barbara formation. This is a fossiliferous sandstone and siltstone, poorly consolidated with low to moderate permeability.<br><br>The lower areas (i.e., in the vicinity of Laguna Blanca) are mapped as Milpitas-Positas sandy loam, which are underlain by a restrictive clay or sandy clay loam layer that restricts drainage from leachline systems. The Dibblee geologic map shows this area as Younger Alluvium. Per County staff, the western portion of Hope Ranch, particularly in the Via Roblada area, is characterized by perched groundwater. Shallow groundwater has also been noted by the County on lots in the lower areas near Laguna Blanca. |
| **Septic System Practices** | There are a little over 800 rural residential parcels served by septic systems in Hope Ranch. Nearly all of the lots are greater than one-half acre in size, and nearly 90% are larger than one acre. The average lot size is about 2.5 acres. Permit information is available for about 23 % of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations are split about 40-60% between the use of leachlines and drywells; older systems may include a greater number of drywells, especially in the areas of steeper terrain. |
| **Survey Findings** | Survey findings indicate a high rate of problems encountered in Hope Ranch. There were two confirmed septic system complaints on record with the Health Department for the area. Nearly 35% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 19% were reported to have system failure problems requiring corrective action; most of these were associated with drywells. Contractors/consultants responding to the survey generally rated the Hope Ranch area as a medium to high septic system problem area. |
| **Water Quality Issues** | The Hope Ranch area lies within three separate local watersheds. The majority of area drains internally to an unnamed stream that runs from Laguna Blanca to the ocean at the western end of Las Palmas Drive; this stream is generally dry over much of its length. The northeastern portion of Hope Ranch drains to Atascadero Creek which flows east to west, and discharges to the ocean near the Goleta Pier. A small portion of Hope Ranch in the southeastern corner drains directly to the ocean bluffs and east toward Arroyo Burro Beach Park. None of these drainages have significant recreational uses; however, they all discharge to the Pacific Ocean within a relatively short distance from Hope Ranch.<br><br>The unnamed stream was flowing throughout the Sanitary Survey sampling period. The sampling results indicated periodically high bacteriological readings for total coliform, E. coli, and enterococcus and overall was given a medium rating in terms of observed water quality impacts.<br><br>There are no defined groundwater basins or groundwater uses in the Hope Ranch area. |
| **Overall Assessment** | Hope Ranch was given a Medium-High Problem Rating due to the combination of diverse and difficult soil-geologic conditions throughout a significant portion of the area, the high number of failures and corrective work reported from recent inspections, the overall large number of systems in the area, and the medium-high level of bacteriological impact observed in the local tributary stream that drains through the area to the ocean. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Veronica Springs | |
|---|---|
| **Site Conditions** | Soils in the Veronica Springs area consist of sandy loams of the Milpitas-Positas series, which are moderately permeable and underlain by clay and sandy clay loam subsoils, which pose restrictions for vertical permeability beneath leachline systems. The Dibblee geologic map shows the upland portions of the area to consist of Older Alluvium (low permeability), with massive fissiliferous sand and silt of the Santa Barbara Formation (moderate to low permeability) occurring in the mid-elevations, primarily on the south, west and eastern sides. In the lower elevations near Arroyo Burro Creek and its tributary drainages, the area is mapped as younger channel alluvial deposits of sand, silt and gravel, having good permeability. |
| **Septic System Practices** | There are approximately 80 rural residential parcels served by septic systems in the Veronica Springs area. Nearly 90% of the lots are greater than one-half acre in size; the average lot size is just over 1 acre. Permit information is available for about 27 % of the systems; the rest are more than 10 years old. Available file and inspection information indicates that about two-thirds of the recent installations include drywells for disposal, typically about 30 to 40-feet deep. |
| **Survey Findings** | Survey findings indicate a medium rate of problems encountered in the Veronica Springs area. There were three confirmed septic system complaints on record with the Health Department for the area. Roughly one-third of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 20% were reported to have system failure problems requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated the Veronica Springs area as a low to medium septic system problem area. |
| **Water Quality Issues** | Veronica Springs drains to an unnamed tributary of Arroyo Burro Creek which is contained in a concrete channel over a large portion of this reach; a few parcels immediately border the creek. Arroyo Burro Creek discharges to the ocean at Arroyo Burro Beach about one mile downstream of Veronica Springs which is a popular and heavily used public access area. Arroyo Burro Creek is listed as a 303(d) impaired water body due to pathogens; however, septic systems have not been identified as contributing source of contamination.<br><br>The creek was flowing throughout the Sanitary Survey sampling period. Sampling results indicated generally high bacteriological readings at both the upstream and downstream sampling stations, with the downstream station generally showing an increase over the upstream station. Additional "spot" sampling within the study reach were inclusive as to the source of the elevated bacteriological readings.<br><br>The area lies near the edge of the Santa Barbara and Goleta Groundwater Basins. Locally, groundwater has been developed as a source of domestic supply by the Las Positas Mutual Water Company. One of their shallow wells located northwest of Veronica Springs has been impacted by high nitrated concentrations but is not in active use. |
| **Overall Assessment** | This area was given a Medium-High Problem Rating due to the combination of difficult soil-geologic conditions throughout most of the area, the large number of older systems and reliance on drywells, the moderate rate of failures/problems reported from recent inspections, and the high level of bacteriological impact observed in the adjacent tributary to Arroyo Burro Creek, which is listed as a 303(d) impaired water body. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Sunset Rd./Carol Ave. | |
|---|---|
| **Site Conditions** | Soil conditions in the Sunset Rd/Carol Ave. area consist primarily of sandy loams of the Milpitas-Positas soil series, locally eroded and altered by urban development. These soils, formed on terraces, are generally well drained, moderately permeable and underlain by sandy clay loam subsoils, making them reasonably suitable for conventional septic tank-leachline systems. The Dibblee geologic map shows the underlying geologic materials to consist of Older Alluvial deposits and cobble-boulder fan gravel and fanglomerate of sandstone detritus having good permeability. Groundwater in the area occurs at depths of about 70 to 90 feet. |
| **Septic System Practices** | The Sunset Rd/Carol Ave. area consists of a "pocket" of about 75 residences still using septic systems, surrounded by urban development. Most of the homes, and septic systems, are estimated to be more than 40 years old. The County records contain permit information for only 11 systems in the area. The lot sizes are nearly all less than 0.5 acres; most are less than 0.25 acres with very little room for septic system repair and expansion. Some property owners have indicated a possible need to seek expansion areas within the street right of way. The limited permit information and inspection data indicates that a mix of both leachlines and drywells are used. The reported depth of drywells is 30 to 60 feet, indicating probable compliance with the vertical groundwater separation requirement. |
| **Survey Findings** | Survey findings indicate a relatively high rate of problems encountered in the Sunset Rd/Carol Ave. area. There were five confirmed and three unconfirmed complaints on record with the Health Department for the area; but it had a relatively low rate of reported system failures over the past three years based on Septic Tank Inspection Reports (3 failures out of 77 systems). Contractors/consultants responding to the survey gave widely differing opinions on the Sunset Rd/Carol Ave. area, rating it from low to high as septic a system problem area. |
| **Water Quality Issues** | There are no significant surface water resources in the immediate area of Sunset Rd/Carol Ave.; however, the area drains to the City of Santa Barbara urban storm drainage system, ultimately joining Arroyo Burro Creek. Many properties encroach on local drainage channels and pose a relatively high risk of impact in the event of septic system surface failure. An unnamed tributary of Arroyo Burro Creek was sampled as part of the Sanitary Survey and in other studies in downstream areas. But no water quality sampling was conducted in the immediate area of Sunset Rd/Carol Ave.<br><br>Two local community water supply wells in the Sunset Rd/Carol Ave. area have reported elevated nitrate concentrations in the well water approaching the drinking water limit. One of the wells (Amber Gardens Water System) is directly downgradient and at the edge of the Sunset Rd/Carol Ave. area. The common use of drywells and the relatively permeable alluvial materials make the septic systems in the area the likely source of the high nitrate concentrations found in these wells. There are no other likely sources of nitrate contamination in the surrounding area, which is mostly urban housing. |
| **Overall Assessment** | Despite the relatively good soil/geologic conditions, the extremely small lot sizes, high population density in the area, combined with the clear threat and strong evidence of elevated nitrate concentrations in the community water wells in the immediate vicinity, the Sunset Rd/Carol Ave. area was given a High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Vista Vallejo | |
|---|---|
| **Site Conditions** | Soil conditions in the Vista Vallejo area consist primarily of sandy loams of the Goleta and Milpitas-Positas soil series, locally eroded and altered by urban development. These soils, formed on floodplains and terraces, are generally well drained, moderately permeable and underlain by loam and sandy clay loam subsoils, making them reasonably suitable for conventional septic tank-leachline systems. At depth the underlying geologic materials consist of alluvial deposits of moderate to low permeability. The Dibblee geologic map shows the area to be underlain primarily by Younger Alluvium and colluvium, with Older Alluvial deposits (low to moderate permeability) forming the higher topographic areas on the east side of the Focus Area. Groundwater occurs at depths as shallow as about 30 to 40 feet in portions of this Focus Area. |
| **Septic System Practices** | The Vista Vallejo area consists of a "pocket" of about 50 suburban-type residences surrounded by urban development. Most of the homes, and septic systems, are estimated to be more than 40 years old. The County records contain permit information for only four systems in the area. The lots are generally all less than 0.5 acres. The limited permit information and inspection data indicates that both leachlines and drywells are used. The reported depth of drywells is 22 to 40 feet, indicating possible encroachment on the vertical groundwater separation requirement. |
| **Survey Findings** | Survey findings indicate a medium rate of problems encountered in the Vista Vallejo area. There was one confirmed complaint of surfacing sewage on file with the Health Department; but the area had a relatively low rate of reported system failures over the past three years based on Septic Tank Inspection Reports (2 failures out of 50 systems). Contractors/consultants responding to the survey gave widely differing opinions on the Vista Vallejo area, rating it from low to high as a septic system problem area. |
| **Water Quality Issues** | There are no significant surface water resources in the immediate area of Vista Vallejo area; however, the area drains to the City of Santa Barbara urban storm drainage system, ultimately joining a tributary to Arroyo Burro Creek. The Arroyo Burro Creek Tributary downstream was sampled as part of the Sanitary Survey and in other prior studies prior in downstream areas, showing significant bacteria levels in the creek. No water quality sampling was conducted in the immediate Vista Vallejo area. Arroyo Burro Creek is listed as a 303(d) impaired water body due to pathogens; however, septic systems have not been identified as a contributing source of contamination.<br><br>One (inactive) local community water supply well (Las Positas Mutual Water Company) in the vicinity of Vista Vallejo has reported elevated nitrate concentrations in the well water approaching the drinking water limit. The common use of use of drywells, encroachment upon the normal groundwater separation requirements, the age of systems, and the relatively permeable alluvial materials make the septic systems in the Vista Vallejo area a likely contributing source of the high nitrate concentrations found in the nearby well. There may be other sources; however, the close proximity and upgradient location of Vista Vallejo are strong indicators of septic system influence. |
| **Overall Assessment** | Because of the relatively small lot sizes, age and nonconforming status of septic systems, common use of drywell designs, and the threat and documented evidence of elevated groundwater nitrate levels in the immediate vicinity, Vista Vallejo was given a Medium-High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Upper Fairview | |
|---|---|
| **Site Conditions** | Soils in the Upper Fairview area are mostly moderately to slowly permeable clays and clay loams of the Ayar and Todos series. There is an area of Milpitas-Positas soils in the La Goleta Road area to the east of Fairview. Along Las Vegas Creek, the soils tend to be relatively deep silty loams of the Botella and Agueda series. According to the Dibblee geologic maps, the underlying geology of the area is primarily the very slowly permeable Rincon Shale, which predominates in the Holiday Hills area. La Goleta Road area includes a mixture of Older Alluvial deposits, Santa Barbara Formation (sandstone) and a small amount of Monterey Formation shale, which have a wide range of permeabilities, but generally tend to be low. The areas along Las Vegas Creek and its tributaries are mapped as intermediate alluvial deposits of low to moderate permeability. Groundwater in the vicinity, along Las Vegas Creek, is typically found at a depth of about 20 to 30 feet below ground surface. |
| **Septic System Practices** | There are approximately 100 rural residential parcels served by septic systems in the Upper Fairview area. There is also one commercial operation (on Holliday Hill Road) and a multi-family residential property (cluster of cabins) on La Goleta Road, east of Fairview. Nearly 90% of the lots are greater than one-half acre in size, and about 60% are larger than 1 acre. Permit information is available for only about 8 % of the systems; the rest are more than 10 years old. The limited available file and inspection information indicates a slightly greater use of drywells than leachlines in the area; drywell depths are not documented. |
| **Survey Findings** | Survey findings indicate a medium rate of problems encountered in the Upper Fairview area. There were two confirmed septic system complaints on record with the Health Department for the area. About 25% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, 2 systems were reported to have system failure problems requiring corrective action; both of these were associated with drywells.<br><br>Contractors/consultants responding to the survey generally rated the Upper Fairview area as a medium septic system problem area. |
| **Water Quality Issues** | The Upper Fairview area is located in the Las Vegas Creek watershed, a seasonal stream which flows through agricultural land and residential-commercial-light industrial areas of Goleta before discharging to the ocean near the Goleta pier. Approximately 25 properties in the area either border or span the creek. No water quality sampling was conducted on Las Vegas Creek during the Sanitary Survey.<br><br>The area overlies the Goleta Groundwater Basin which is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Upper Fairview area. |
| **Overall Assessment** | This area was given a Medium Problem Rating due to the combination of difficult soil-geologic conditions in certain portions of the area, a large number of older systems, including multi-family and commercial systems, and the moderate number of failures/problems reported from recent inspections. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| La Buena Tierra | |
|---|---|
| **Site Conditions** | Soils in La Buena Tierra area are primarily well drained sandy loams of the Milpitas-Positas series, locally eroded, and with a relatively shallow depth over clay and sandy clay subsoils. The Dibblee geologic map shows the underlying geologic materials to consist of Older Alluvial deposits and cobble-boulder fan gravel and fanglomerate of sandstone detritus having good permeability. In the portion of the area along Patterson Ave., soils consist of Goleta loam, which are relatively deep, well drained alluvial deposits at the edge of the historic floodplain of San Jose Creek. These soils are generally suitable for conventional septic tank-leachline systems as long as there is sufficient land area available. Groundwater in the area occurs generally at depths of about 40 to 50 feet below ground surface, at Patterson Drive. |
| **Septic System Practices** | La Buena Tierra area consists of a small "pocket" of 30 residences on the urban fringe of Goleta. Nearly all of the lots are greater than one-half acre in size; the average lot size is just over 1 acre. Permit information is available for less than 10% of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations are split roughly 50-50 between the use of leachlines and drywells for disposal. The depth of drywells is not documented. |
| **Survey Findings** | Survey findings indicate a low rate of problems encountered in La Buena Tierra area. There were no septic system complaints on record with the Health Department for the area. About 20% of the properties (5 total) in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, 2 systems were reported to have system failure problems requiring corrective action; both of these were associated with drywells.<br><br>Contractors/consultants responding to the survey generally rated La Buena Tierra area as a medium septic system problem area. |
| **Water Quality Issues** | La Buena Tierra area lies between San Jose Creek (west) and Maria Ygnacio Creek (east), and drains partially to each creek through urban residential areas. These creeks flow through agricultural and residential-commercial areas of Goleta, before they join Atascadero Creek and discharge to the ocean near the Goleta pier. Because of the interfering urban uses, no sampling locations were located downstream of this focus area. Upstream samples were taken on both San Jose and Maria Ygnacio Creek; the results showed low bacteriological impacts.<br><br>The area overlies the Goleta Groundwater Basin which is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the area. |
| **Overall Assessment** | This area was given a Low Problem Rating due to the relatively small number of systems, large lot sizes, generally good soil conditions, low rate of reported failures/problems and low risk to surface and groundwater resources. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Via Chaparral | |
|---|---|
| **Site Conditions** | Soils in the Via Chapparal area consist of sandy loams of the Milpitas-Positas series. These soils are generally well drained, moderately permeable and underlain by sandy clay loam subsoils, making them reasonably suitable for conventional septic tank-leachline systems. However, they are eroded locally, and may be restricted for septic system suitability because of limited depth and subsoil permeability. The Dibblee geologic map shows the underlying geologic materials to consist of Older Alluvial deposits and cobble-boulder fan gravel and fanglomerate of sandstone detritus having good permeability. Several intermittent drainages cross through the area and pose constraints for siting of septic systems. |
| **Septic System Practices** | There are approximately 60 rural residential parcels served by septic systems in the Via Chapparal area. Over 90% of the lots are greater than one-half acre in size; the average lot size is about 1.7 acres. Permit information is available for about 22 % of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations include roughly a 50-50 split between the use of leachlines and drywells for disposal; drywell depths range from about 20 to 60 feet. |
| **Survey Findings** | Survey findings indicate a medium rate of problems encountered in the Via Chapparal area. There were no septic system complaints on record with the Health Department for the area. About 20% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, 4 systems were reported to have system failure problems requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated the Via Chapparal area as a medium septic system problem area. |
| **Water Quality Issues** | The Via Chapparal area is located in the Atascadero Creek watershed, a seasonal stream which flows through agricultural land and residential-commercial areas of Goleta before discharging to the ocean near the Goleta pier. Approximately 20 properties in the area either border or span local drainages that feed into Atascadero Creek. Atascadero Creek was dry at the sampling stations selected for the Sanitary Survey.<br><br>The area overlies the northern border of the Goleta Groundwater Basin which is used for domestic-municipal water supply as well as for agriculture. To date, there is no reported evidence of elevated nitrate levels or other impacts to groundwater quality from septic systems in the Via Chapparal area. |
| **Overall Assessment** | This area was given a Low-Medium Problem Rating due to the relatively low-density rural setting, generally good soil conditions, medium rate of reported failures/problems and low to moderate risk to surface and groundwater resources. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Painted Cave | |
|---|---|
| **Site Conditions** | The Painted Cave area is characterized by steep to very steep terrain, with very shallow soils, typically 12 inches or less, over sandstone bedrock and older alluvium. The Dibblee geologic map shows the entire area to be Coldwater Sandstone. Conventional septic tank-leachline systems are generally infeasible in this area; dry wells dependent upon absorption by the sandstone bedrock are typically the only viable alternative. The sandstone is interbedded with minor inclusions of siltstone and shale, which tend to make permeabilities slow and problematic for septic systems. Where the sandstone and shalte/siltstone are fractured (which is common), wastewater disposal systems are viable. Because of the terrain and high runoff rates, groundwater is very deep or non-existent; however, there may be localized perched water. The steep slopes, cut banks and limited land area pose severe constraints for septic systems in the Painted Cave area. |
| **Septic System Practices** | There are approximately 80 residential parcels served by septic systems in the San Marcos Pass area concentrated in the San Marcos Trout Club area and Painted Cave. These are all older systems on small lots located in the Los Padres National Forest. The lots are typically very small, less than ½ acre and the County Health Department has no permit information on any of the septic systems. Most of the systems are believed to consist of drywells, but there is little or no documentation. |
| **Survey Findings** | Survey findings indicate a medium rate of problems encountered in the San Marcos Pass area. There were three confirmed septic system complaints on record with the Health Department for the area. Ten (10) of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, 1 system was reported with a system failure problem requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated the San Marcos Pass area as a medium septic system problem area. |
| **Water Quality Issues** | Development in the San Marcos Pass area is concentrated mainly in the Painted Cave and San Marcos Trout Club, which lie, respectively, in the upper watersheds of Maria Ygnacio Creek and San Jose Creek. These creeks generally have year-round, spring-fed streamflow, but little if any significant recreational uses. Both streams were sampled during the Sanitary Survey at locations farther downstream in the watershed (near Goleta) just above the point where they enter the urban area. The sampling results indicated low bacteriological impacts in the watershed.<br><br>There are no identified groundwater basins in the San Marcos Pass area. Groundwater in the area is scarce, and occurs principally in the bedrock fracture zones. |
| **Overall Assessment** | This area was given a Medium-High Problem Rating due to the small lot sizes and very difficult site conditions for septic systems, the age and lack of any reasonable documentation for these systems, the moderate rate of reported failures/problems in the area, and the relatively low to moderate risk to surface and groundwater resources. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Los Olivos | |
|---|---|
| **Site Conditions** | The community of Los Olivos is located alongside and dissected by Alamo Pintado Creek. The topography is flat to gently sloping. The soils consist mostly of Salinas silty clay loam and Cropley silty clay (on the west side of the creek). These soils are slowly permeable and generally pose significant drainage restrictions for conventional septic tank-leachline systems. There is a small portion of Ballard sandy loam on the eastern edge of the town, which is well drained, permeable and better suited for conventional septic systems. Alamo Pintado Creek is deeply incised and soils along the creek are characterized as gullied land. At depth the area is underlain by alluvial deposits of sands, silts and gravels. The Dibblee geologic map shows the majority of the town to be in an area characterized as Younger Alluvium, except for the northeastern area where Older Alluvial deposits form the higher topographic relief. Depth to groundwater in the vicinity is reported to be as high as 5 to 15 feet below ground surface in the winter months, which may represent a perched condition. |
| **Septic System Practices** | There are about 340 residential and commercial parcels served by septic systems in the town of Los Olivos. Nearly two-thirds of the lots are less than ½-acre in size, and a large number of these are smaller than ¼-acre. This poses a significant constraint for septic system usage, because of the limited effective soil depth over perched groundwater conditions in parts of the town. Also, the town has a small commercial district with lodging and restaurants that pose greater difficulties than typical residences for septic systems operation. Permit information is available for only about 2% of the systems. Information from a 1975 Health Department survey of the area indicated that about two-thirds of the systems are drywells, and the rest are leachlines. The drywells are used mainly due to the limited available land area and the limitations on the use of leachlines posed by slowly permeable (clayey) soils. |
| **Survey Findings** | Survey findings indicate a medium level of septic system problems encountered in Los Olivos. There were no septic system complaints on record with the Health Department for the area. Roughly 20% of the properties in Los Olivos had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, 18% were reported to have system failure problems requiring corrective action. Contractors/consultants responding to the survey generally rated the Los Olivos as a medium to high septic system problem area. |
| **Water Quality Issues** | Los Olivos lies in the watershed of Alamo Pintado Creek, a perennial stream, which flows through the west side of the town. The creek is accessible and there is evidence that children play in the creek; however, there is are no other significant recreational uses. Alamo Pintado Creek is tributary to the Santa Ynez River (at Solvang). The Santa Ynez River is listed as a 303(d) impaired water body for nutrients, salinity and sedimentation. Septic systems are not specifically identified as a contributing source, except under the broad category of "nonpoint source" pollution. Sampling results from the Sanitary Survey indicated consistently high levels of bacteria in Alamo Pintado Creek within and downstream of Los Olivos.<br><br>Los Olivos overlies the Santa Ynez Uplands Groundwater Basin, which is used extensively as a source of agricultural and domestic-municipal water supply. The groundwater basin has been identified by the Regional Water Board as one of three basins in Santa Barbara County experiencing increases in groundwater-nitrate concentrations; and has been recommended for further investigation of the sources and corrective strategies. The majority of the septic systems in Los Olivos use drywells that discharge directly into or close to the water table. Groundwater sampling in 1977 indicated elevated groundwater-nitrate levels in Los Olivos that, in some cases, were at the drinking water limit. |
| **Overall Assessment** | Los Olivos was given a High Problem Rating, due to the large number and very high density of systems, the lack of suitable soil and groundwater conditions for septic systems throughout a large portion of the town, the age and non-conforming design of the systems, and the existence and continuing threat of impacts to both surface and groundwater resources in the area. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Ballard | |
|---|---|
| **Site Conditions** | The community of Ballard is located adjacent to and partly dissected by Alamo Pintado Creek, with the most of the town situated on the east side of the creek. The topography is flat to gently sloping. The soils consist mostly of Salinas loams and with a smaller amount of Ballard sandy loam on the eastern edge of the town. Alamo Pintado Creek is deeply incised and soils along the creek are characterized as gullied land. The Salinas loams are moderately slowly permeable and underlain by silty clay loam below about 2 to 3 feet, which may locally pose drainage restrictions for conventional leachline systems. The Ballard sandy loams are generally well drained and permeable to depths of 5 feet or more and are typically suitable for conventional septic tank-leachline systems where sufficient land area is available. At depth the area is underlain by alluvial deposits of sands, silts and gravels. The Diblee geologic map shows most of Ballard to be underlain by Younger Alluvial deposits. Older Alluvium is mapped in the higher elevations along the eastern side of the town. Depth to groundwater in the vicinity is reported to be generally in the range of about 25 to 35 feet below ground surface. |
| **Septic System Practices** | The town of Ballard has about 130 parcels (mostly rural residential) that are served by septic systems. About half the parcels are less than ½ acre in size; about a quarter are ½ to 1 acre, and the remainder are larger than an acre. The average lot size is 1.3 acres. Permit information is available for only 2% of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations are primarily leachline designs. |
| **Survey Findings** | Survey findings indicate a medium level of septic system problems encountered in Ballard. There was one septic system complaint on record with the Health Department for the area. Roughly 20% of the properties in Ballard had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, only one system was reported to have a system failure problem requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated Ballard as a medium to high septic system problem area. |
| **Water Quality Issues** | Ballard lies in the watershed of Alamo Pintado Creek, a perennial stream, which flows through the west side of the town. The creek is accessible and there is evidence that children play in the creek; however, there is are no other significant recreational uses. Alamo Pintado Creek is tributary to the Santa Ynez River (at Solvang). The Santa Ynez River is listed as a 303(d) impaired water body for nutrients, salinity and sedimentation. Septic systems are not specifically identified as a contributing source, except under the broad category of "nonpoint source" pollution. Water quality sampling results from the Sanitary Survey indicated consistently high levels of bacteria in Alamo Pintado Creek within and downstream of Ballard.<br><br>Ballard overlies the Santa Ynez Uplands Groundwater Basin, which is used extensively as a source of agricultural and domestic-municipal water supply. The groundwater basin has been identified by the Regional Water Board as one of three basins in Santa Barbara County experiencing increases in groundwater-nitrate concentrations; and has been recommended for further investigation of the sources and corrective strategies. Drywells are believed to be used to a lesser extent in Ballard than in Los Olivos; however, the extent of drywell usage in Ballard is not known. Some older systems may discharge directly to the water table without maintaining the required vertical separation distance. No groundwater sampling has been conducted to document the effects of septic systems in the Ballard area. |
| **Overall Assessment** | Despite the relatively good soil conditions for septic systems throughout most of the area, Ballard was given a Medium-High Problem Rating, due to the relatively large number and high density of systems, the age and lack of records for a large percentage of the systems, the moderate level of reported failures/problems in the area, and the existence and continuing threat of impacts to both surface and groundwater resources in the area. |

## TABLE 8-2
## INDIVIDUAL STUDY AREA ASSESSMENT

| Santa Ynez Area | |
|---|---|
| **Site Conditions** | The Santa Ynez focus area encompasses an approximately one square mile area on the west side of the town of Santa Ynez. The area consists of rolling topography formed by ancient stream channel meanders. The soils include a contrasting mix of (a) deep well drained, permeable sandy loams (Ballard series) in the locally higher areas, and (b) shallow, slowly permeable soils, underlain by a clay subsoil, in the lower "valleys" (Santa Ynez and Positas series). The Santa Ynez and Positas soils developed on old water-laid terraces and consist of a very shallow (less than 2-feet deep) layer of sandy loam underlain by a restrictive clay subsoil. The clayey subsoils are essentially impermeable, act as a perching layer in the wet season, and pose a serious limitation for the operation of conventional septic tank-leachline systems. The Diblee geologic map shows the area to be underlain primarliy by Older stream terrace and alluvial deposits of sand, silt and gravel which have moderate permeabilities, but significant local variations. The area generally aligned with Quail Valley Road is mapped as Younger Alluvium valley and floodplain deposits. Groundwater in the vicinity occurs at depths of 40 to 60 feet. |
| **Septic System Practices** | There are about 670 rural residential parcels served by septic systems in the Santa Ynez area. Nearly all of the lots are greater than one-half acre in size, and about one-third are larger than one acre. The average lot size is about 2.5 acres. Permit information is available for less than 3% of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations are split about 50-50 between the use of leachlines and drywells, reflecting the even mix of contrasting soil conditions that exist in the area – i.e., the "high" areas where soils are deep and well drained and conducive to leachline designs; and the "valley" areas where soils are poorly drained and favor drywell designs. |
| **Survey Findings** | Survey findings indicate a medium to high rate of problems encountered in the Santa Ynez area. There were four confirmed septic system complaints on record with the Health Department for the area. About 20% of the properties in the area had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, about 24% were reported to have system failure problems requiring corrective action. There is one particular area with severe septic system failure problems, Stadium-Horizon Drive, where efforts have been made to provide public sewers, but have stalled because of insufficient local support. Contractors/consultants responding to the survey generally rated the Santa Ynez area as a low to medium septic system problem area. |
| **Water Quality Issues** | The Santa Ynez area drains via shallow seasonal tributary streams partly toward Alamo Pintado Creek (to the west) and partly to Zanja de Cota Creek (to the south). Both of these creeks are tributary to the Santa Ynez River (near Solvang). The drainages are easily accessible; however, they carry very little flow (except during storm events) and support little, if any, recreational uses. Approximately 50 parcels either border or span these streams. The tributary streams within the focus area were dry throughout the Sanitary Survey sampling period; therefore, no water quality samples were taken.<br><br>Santa Ynez overlies the Santa Ynez Uplands Groundwater Basin, which is used extensively as a source of agricultural and domestic-municipal water supply. The groundwater basin has been identified by the Regional Water Board as one of three basins in Santa Barbara County experiencing increases in groundwater-nitrate concentrations, and has been recommended for further investigation of the sources and corrective strategies. No groundwater sampling has been conducted to document the effects of septic systems in the area. |
| **Overall Assessment** | The Santa Ynez area was given a High Problem Rating, due to the large number and relatively high density of systems, the highly restrictive soil-site conditions for a large portion of the area, age and lack of records for a large percentage of the systems, the moderate to high level of reported failures/problems in the area, and the threat of impacts to both surface and groundwater resources in the area. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Janin Acres | |
|---|---|
| **Site Conditions** | Soil conditions in the Janin Acres area consist primarily of sandy loam of the Ballard, Positas and Santa Ynez soil series. The Ballard soils are well drained, moderately permeable and underlain by gravelly loam subsoils, making them reasonably suitable for conventional septic tank-leachline systems. However, the Positas and Santa Ynez soils typically have slowly permeable clay subsoils and seasonal perched groundwater conditions that pose severe restrictions for shallow leachline systems, requiring the use of deeper trench and drywell designs that penetrate the better-drained gravelly terrace deposits beneath the perching clay layers. The Dibblee geologic map shows the entire Jannin Acres area to be underlain by Older Alluvium and stream terrace deposits. |
| **Septic System Practices** | There are about 100 rural residential parcels served by septic systems in the Janin Acres area, as well as several churches and a motel. All of the lots are greater than one-half acre in size, and about 40% are larger than one acre. The average lot size is about 2 acres. Permit information is available for less than 5% of the systems; the rest are more than 10 years old. Available file and inspection information indicates that recent installations are split about 50-50 between the use of leachlines and drywells. Because of the restrictive subsoils in most of the area, many leachline designs tend to include deep trenches. The drywells, where used, often extend to depths of 40 to 50 feet, intersecting the top of the permeable alluvium which is a water bearing strata and used locally as a source of domestic water supply. |
| **Survey Findings** | Survey findings indicate a medium level of septic system problems encountered in Janin acres. There were no septic system complaints on record with the Health Department for the area. Roughly 25% of the properties in Janin Acres had their septic system serviced over past three years based on Septic Tank Inspection Reports. Of those that were serviced, 4 systems were reported to have a system failure problem requiring corrective action.<br><br>Contractors/consultants responding to the survey generally rated Janin Acres as a medium septic system problem area. |
| **Water Quality Issues** | There are no significant surface water resources within Janin Acres. The area drains primarily in a south-southwesterly direction toward Zanja de Cota Creek and the Santa Ynez River; a small portion of the area drains north toward Alamo Pintado Creek. Zanja de Cota Creek was targeted for bacteriological sampling during the Sanitary Survey; but the sampling locations were throughout the study/sampling period. Both creeks are tributary to the Santa Ynez River, which is listed as a 303(d) impaired water body for nutrients, salinity and sediments.<br><br>Janin Acres obtains its water supply from Rancho Marcelino Water Company which has wells located in the immediate vicinity of the subdivision. The wells have been contaminated by nitrate, reaching levels that exceed the drinking water standard of 45 mg/L. The use of deep trench and drywell systems for septic systems in Janin Acres is both a continuing threat to the continued viability of these wells and the probable main source of the documented nitrate contamination. |
| **Overall Assessment** | Because of the site conditions and historic septic system practices that favor deep trench and drywell designs, combined with the clear threat and documented evidence of nitrate contamination of the water wells in the immediate vicinity, Janin Acres was given a High Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Lake Marie Estates (Orcutt Area) | |
|---|---|
| **Site Conditions** | Soil conditions in the Lake Marie Estates area consist primarily of sands and sandy loams of the Oceana, Pleasanton and Garey soils series. The Dibblee geologic map shows the entire area as older dissected dune sand deposits. The soils are generally well drained and reasonably permeable; however, they are locally underlain by more compact and cobbly subsoils that may restrict drainage and functioning of septic system drainfields. |
| **Septic System Practices** | The Lake Marie Estates is a suburban-style subdivision located immediately east of Orcutt and surrounded by farmland. The subdivision consists of about 180 parcels, averaging about 0.7 acres in size. Permit file information was located for only four (4) parcels. The limited file information for recent septic system installations indicates greater use of drywells than leachlines for disposal. |
| **Survey Findings** | Survey findings indicate a low rate of problems encountered in the Lake Marie Estates area. There is no record of any complaints and it had one of the lowest reported system failure rates over the past three years based on Septic Tank Inspection Reports (3 failures out of 188 systems). Contractors/consultants responding to the survey rated the Orcutt area as a low to medium septic system problem area. |
| **Water Quality Issues** | There are no significant surface water resources in the Lake Marie Estates area. There is one main (unnamed) seasonal drainage channel on the northeastern side of the development area that drains toward Santa Maria through farmland. This drainage channel was targeted for bacteriological sampling during the Sanitary Survey, but no samples were taken because of dry or stagnant conditions during the January-April 2002 sampling period.<br><br>Lake Marie Estates is supplied water from California Cities Water Company; however, there are also scattered domestic water supply wells and irrigation wells on surrounding agricultural parcels in the immediate area. Groundwater generally occurs at depths of greater than 100 feet in the area, which limits its susceptibility to impacts from septic systems. The Santa Maria Groundwater Basin has shown evidence of elevated nitrate concentrations, but not in the vicinity of Orcutt and Lake Marie Estates. The density of septic systems (average lot size of 0.7 acres) conforms with the Basin Plan nitrogen limitation (40 gms/day per ½ acre). However, given the large concentration of septic systems and the common use of drywells in the subdivision, there is a reasonable likelihood that elevated nitrate concentrations have or will develop locally in the groundwater beneath the subdivision; but such effects would be isolated. |
| **Overall Assessment** | Because of the relatively good site conditions, minor reported evidence of problems, and limited threat to surface and groundwater resources, the Lake Marie Area was given a Low-Medium Problem Rating. |

**TABLE 8-2**
**INDIVIDUAL STUDY AREA ASSESSMENT**

| Orcutt Area | |
|---|---|
| **Site Conditions** | Soil conditions in the Orcutt area consist primarily of sands and sandy loams of the Marina, Corralitos, and Garey soils series. The Dibblee geologic map shows the area to be primarily older dissected dune deposits, with areas of Younger Alluvium valley and floodplain deposits along Orcutt Creek. The soils are generally well drained and reasonably permeable; however, the Garey soils are locally underlain by more compact soils that may restrict drainage and functioning of septic system drainfields. |
| **Septic System Practices** | This focus area consists of relatively large rural residential lots on the outskirts of the town of Orcutt. There are approximately 40 parcels in the Focus Area, with nearly all lots greater than ½-acre in size, and averaging about 2.5 acres. The systems are generally all relatively old; no permit file information (from the last 10 years) was located any system in the area. |
| **Survey Findings** | Survey findings indicated no record of complaints and no servicing of septic systems (or any failures) during the last three years. Contractors/consultants responding to the survey rated the Orcutt area as a low to medium septic system problem area. |
| **Water Quality Issues** | A seasonal tributary of Orcutt Creek flows through the area which drains through farmland to the Betteravia area. This drainage was targeted for bacteriological sampling during the Sanitary Survey, but no samples were taken because dry or stagnant conditions during the January-April 2002 sampling period.<br><br>The Orcutt area is supplied water from California Cities Water Company; however, there are also scattered domestic water supply wells and irrigation wells on surrounding agricultural parcels in the immediate area. Groundwater is estimated to occur at depths of less than 30 feet the focus area. This does not present problems for shallow, leachline designs, but may be impacted if drywells are used. The Santa Maria Groundwater Basin has shown evidence of elevated nitrate concentrations, but not in the vicinity of Orcutt. The density of septic systems (average lot size of >3.0 acres) conforms with the Basin Plan nitrogen limitation (40 gms/day per ½ acre) and is not likely a source of any localized groundwater-nitrate impacts. |
| **Overall Assessment** | Because of the relatively good site conditions, no reported evidence of problems, and limited threat to surface and groundwater resources, the Orcutt area was given a Low Problem Rating. |

# SECTION 9

# MANAGEMENT RECOMMENDATIONS

This final section of the report presents a series of recommendations to address septic system problems in Santa Barbara County identified through this Sanitary Survey. Included are general management measures that can be implemented by the County Environmental Health Services to address certain types of problems or situations, as well as more specific measures applicable to the individual Focus Areas examined in this study. The management measures have been reviewed and developed in consultation with Environmental Health Services staff to assure that they are reasonably feasible and consistent with overall program objectives and capabilities. However, no timetable or priorities for implementation of the recommendations have been identified.

## U.S. EPA MANAGEMENT GUIDELINES

In formulating and discussing onsite system management recommendations for Santa Barbara County, a useful resource and point of reference is information developed by the U.S. Environmental Protection Agency (EPA). In September 2000, the EPA published *Draft - EPA Guidelines for Management of Onsite/Decentralized Wastewater Systems*. These guidelines, which are voluntary, were developed by the EPA to help raise the performance of onsite wastewater systems through improved management programs. The guidelines recognize that onsite wastewater systems play a vital role in meeting basic public health and sanitation needs while conserving and protecting natural resources throughout the rural and semi-rural areas of the U.S. It is noted, for example, that onsite/decentralized wastewater systems serve approximately 25 percent of existing households and about 40 percent of new development in the U.S. However, as found in some areas of Santa Barbara County, problems exist due to the age of the systems, improper siting or design, or poor maintenance. The aim of the EPA national guidelines is to help address these problems by raising the quality of management programs, establish minimum levels of activity, and institutionalize the concept of onsite system management.

The basic approach of the EPA Management Guidelines is the definition of a progressive series of five separate model programs in which the management requirements become more rigorous as the system technologies become more complex and/or the sensitivity of or risk to the environment increases. **Table 9-1** presents a summary of the EPA Management Guidelines, including objectives, types of systems/applications covered, benefits and limitations for each management program level. Additional information regarding the EPA Management Guidelines can be found by accessing the EPA website at www.epa.gov/ow-owm.html/mtb/decent/downloads/guidelines/pdf.

In Santa Barbara County, as in much of California, the septic system management program is, for the most part, a Level 1 program, where the primary activity consists of

**TABLE 9-1**
**EPA GUIDELINES FOR MANAGEMENT OF ONSITE/DECENTRALIZED WASTEWATER SYSTEMS**

| Level | Management Objectives | Typical Application | Benefits | Limitations |
|---|---|---|---|---|
| **1** | ***System Inventory and Awareness of Maintenance Needs***<br>To ensure traditional onsite/decentralized systems are sited and installed properly in accordance with appropriate state/local regulations and codes; and are periodically inspected and repaired as necessary. Regulatory agency is aware of the location of systems and periodically provides owners with operation and maintenance information | For programs that are based upon traditional, prescriptive system designs that rely upon minimum site criteria and system design requirements promulgated in codes. | Relatively easy and inexpensive to implement and maintain. | No mechanism to ensure operating compliance of systems.<br><br>No mechanism to identify failures when they occur.<br><br>Limits building sites to those meeting prescriptive requirements. |
| **2** | ***Prescriptive Management For More Complex Systems***<br>To allow the use of more complex mechanical treatment options through the requirement that maintenance contracts be maintained between the owner and equipment manufacturer/supplier or service provider over the life of the system. | For programs that allow enhanced treatment systems as an alternative to traditional systems on sites that are marginally suited for traditional systems. | Reduces the risk of failure through the requirement for routine maintenance of mechanical components by skilled personnel. | State/local agency may have difficulty tracking and enforcing compliance with the maintenance requirements and/or contract. |
| **3** | ***Management Through Operating Permits***<br>To allow the use of onsite/decentralized treatment on sites with a greater range of characteristics than allowed by prescriptive codes through the establishment of specific and measurable performance requirements, renewable operating permits, and regular compliance monitoring reports | For programs that rely upon engineered designs to meet specific performance requirements base on site characteristics. | Increases the range of sites suitable for onsite/decentralized treatment.<br><br>Reduces the risk of performance failures by requiring that performance requirements be met to renew limit term operating permit. | Owner may not manage system adequately and choose to continue to operate a non compliant system<br><br>Needs a higher level of technical/engineering expertise to implement. |
| **4** | ***Utility Operation and Maintenance***<br>To ensure the onsite/decentralized treatment systems consistently meet their performance requirements through the creation of public/<br>private utilities that are responsible for the performance of systems within the service area. | For areas where the environment and technology concerns are such that greater assurance of adequate O&M is needed. | Responsibility for operation and maintenance is transferred from the owner to a professional utility that has an economic incentive to comply with the operating permit.<br><br>Routine inspections may identify obvious structural problems before system failure occurs. | Additional regulatory oversight needed to evaluate and ensure that the utility is technically and financially viable. |
| **5** | ***Utility Ownership and Management***<br>To provide professional management of the siting, design, construction, operation and maintenance of onsite/decentralized systems through the creation of public/private utilities that own and operate individual systems within the service area. | For highly sensitive areas, (e.g., sole source aquifer) that require central management to ensure adequate O&M. | Simulates the municipal model of central sewerage by transferring all responsibility from the property owner to a professional entity, reducing risk of non-compliance to lowest level.<br><br>Allows effective area-wide wastewater planning through integration of onsite/decentralized systems with conventional sewerage.<br><br>Reduced no. of permits requiring oversight by regulatory agency. | Property owner may oppose utility's easement to property for the system.<br><br>Additional regulatory oversight needed to evaluate and ensure that the utility is technically and financially viable. |

reviewing and permitting new and repair septic system installations, responding to complaints, maintaining records and educating homeowners about proper maintenance practices. However, one aspect of the program that sets Santa Barbara County apart from other Level 1 programs is the institution of the mandatory Inspection and Reporting requirement in connection with servicing of septic systems. This program activity is not specifically identified in the EPA Management Guidelines. However, in concept, it represents a more rigorous level of oversight than covered in the basic Level 1 program model. Additionally, it is fair to say that the completion of this Septic System Sanitary Survey also falls into a higher level of management oversight than included in the Level 1 program.

Several counties in California (mostly in Northern California) have progressed to EPA Level 3 programs through the adoption of ordinances and regulations that provide for the issuance of annual "operating permits" for certain types of systems. In general these programs have been implemented to go along with the permitting of alternative treatment and disposal technologies for use in areas poorly suited for conventional septic systems. Under most of the programs, system inspection and reporting is required (typically on an annual basis); and in some cases monitoring of system performance (e.g., wastewater flow, water quality) is also specified.

In California there are also several examples of local maintenance programs that are equivalent to EPA management Level 4. Examples include Stinson Beach (Marin County), Georgetown Divide Community Services District (El Dorado County), The Sea Ranch (Sonoma County) and the Town of Paradise (Butte County). Some of these onsite management districts have been in existence since the 1970s and actually provide much of the basis for the EPA guidelines. In all of these programs the local district or municipality has assumed the responsibility for management, routine inspection and, as required, monitoring of onsite systems in their jurisdiction. In all cases, the maintenance programs were instituted because of existing problems, sensitive environmental conditions, and the need to utilize more complex technologies to overcome difficult site conditions.

## GENERAL RECOMMENDATIONS

Based partly on the results of this Sanitary Survey and partly on a broader overview of current septic system practices in Santa Barbara County, the following general management recommendations are made.

### Water Quality Monitoring

***The water quality monitoring program developed and conducted during this Sanitary Survey should be continued.***

The bacteriological sampling of streams conducted as part of the Sanitary Survey was limited in scope and duration. Many of the stations were dry because of low rainfall

conditions in 2001-2002; consequently, there may be problem areas that were not revealed from this one-time sampling. The scope and focus of a continuing water quality sampling program may include additional stations from those covered in the Sanitary Survey; alternatively, some stations used in the Sanitary Survey can probably be eliminated. In general, the aim should be to maintain a minimum baseline level of sampling in areas of special concern that can be used to track any trends or isolated anomalies that arise. This will be useful to help recognize localized problems and assist in future/continuing assessment of the overall effectiveness of onsite systems in the County.

**Septic System Information Review**

***A periodic review and evaluation of septic system information compiled in the County's permit and GIS database system should be made.***

The Environmental Health Service has made significant progress in improving the County's information database on septic systems. Additional data is created each month with new permit activity and the submission of Septic Tank Inspection Reports. Periodically in the future (e.g., every few years) the County should schedule to review these data along the lines followed in this Sanitary Survey. This will help to identify developing problems before they become severe and give guidance on changes in policies, practices or other measures as they become needed.

**Education and Training**

***Measures should be taken to provide or encourage training and education of septic system installers and pumping contractors.***

Presently, the Environmental Health Services provides educational information and workshops for homeowners. As regulations change and different technologies come into more common use, installers and septic tank pumping contractors also require continuing education. This is needed to assure consistent understanding and application of practices and better performance and quality of onsite systems. There are a variety of efforts at the national and state level to provide improved education and training for all individuals involved in different aspects of onsite wastewater treatment and disposal. At a minimum the County's role should be to make contractors aware of educational needs and opportunities and facilitate or sponsor local training activities whenever possible. In the near future, additional training and accreditation may be required for contractors involved with the installation or maintenance of more advanced systems.

**Operating Permits**

***The County Wastewater Ordinance should be amended to provide a mechanism for the issuance of operating permits for systems employing alternative or enhanced treatment and disposal technologies, or for other special circumstances.***

There are many individual properties and areas in Santa Barbara County where long-term operation and effectiveness of onsite systems would benefit from the use of alternative or enhanced treatment and disposal technologies. This includes, for instance, the use of enhanced treatment ahead of drywells in slowly permeable formations, and pre-treatment followed by pressure-dosed or subsurface drip systems in areas of shallow soils and steeper slopes. To date there has been relatively little use of alternative technologies in the County. If they are to be used in the future a higher level of maintenance oversight will be necessary, which would be facilitated by the use of operating permits. Under an operating permit program, the County could specify an appropriate frequency of inspection and reporting (e.g., annual) to provide assurance that the system components are checked and remain functional. The inspection work can be done by properly qualified maintenance/service contractors.

Special circumstances that should also be considered for the issuance of operating permits include, for example, onsite systems serving commercial facilities and multi-family residential developments.

**Drywell Design Requirements**

***The County regulations for drywells should be revised to require the installation of dual (200%) capacity fields in all new installations, and enhanced treatment systems in problematic or sensitive locations.***

The County Wastewater Ordinance allows for but does not favor the use of drywells. This is because they are not designed to take advantage of the most biologically active soil zones, which are within the top few feet of ground surface. Rather, drywells simply provide a means for drainage and physical filtering of wastewater in deep soil-geologic formations where oxygen transfer and biological activity is minimal. They also act to concentrate, rather than spread, the discharge of wastewater, which can lead to localized "mounding" (i.e., rise) of the water table, further reducing the effective soil treatment zone. Where groundwater is deep and soil materials are permeable, drywells can function reasonably well as a means of "getting rid of" wastewater effluent. However, their effective lifespan is generally shorter and, consequently, they require more frequent replacement than a comparable leachline design. The Sanitary Survey documented a higher rate of failure from drywells than from leachlines.

For these various reasons, where they are used, drywell designs requirements should be modified to improve their performance and useful life. One effective approach is to install a dual, 200% system, where one drywell "field" is active and one is resting at all times. In the event of a problem with the active field, the alternate field can be brought online immediately to reduce the threat of a system overflow or backup. Also, in many situations it may also be advisable to incorporate enhanced treatment ahead of the drywell(s) to promote better soil absorption, a longer life, and improved protection of groundwater or surface waters that might be affected by the discharge. Enhanced treatment would be beneficial for any drywell disposal system and should be encouraged as much as possible. Mandatory requirements for enhanced treatment should be

determined on a site-specific basis, and may include certain geographic areas. No recommendations are made here as to specific areas or circumstances where enhanced treatment should be specified. However, the types of conditions where it would be warranted generally include sites where soil, geologic and groundwater conditions are marginal, there is a history of problems, land area is limited, or where there is otherwise a high risk of impacting sensitive receiving waters.

## FOCUS AREA RECOMMENDATIONS

**Table 9-2** summarizes specific recommendations for the management of septic systems in the various Focus Areas examined in this Sanitary Survey of Santa Barbara County. The recommendations are intended to provide guidance to the Environmental Health Services and local communities on the direction of future efforts relative to septic systems in different areas of the County. The recommendations fall into several categories, ranging from case-by-case management of septic systems (i.e., status quo) to public sewer conversion projects. The recommendations for each area are based upon consideration of all information collected as part of this study and application of best professional judgment. In most cases, additional study will be required to assess the economic feasibility and develop specific plans to implement the recommendations made here. A discussion of each of the major categories follows.

### Case-by-Case System Management

This recommendation essentially reflects the current management program for septic systems in the County, where permitting of new systems, repairs and upgrades to existing systems, and response to complaints are dealt with on a system-by-system or "case-by-case" basis. This recommendation assumes that the various General Recommendations outlined earlier in this section are also implemented. This may mean, in come cases, that treatment/disposal system upgrades will be required for individual properties using alternative or enhanced technologies; but this is anticipated to be a lot-by-lot determination and not necessarily applied as an area-wide requirement. This is an appropriate level of management for the majority of the County, including the following Focus Areas examined in this study:

- Shepard Mesa
- Upper Fairview
- La Buena Tierra
- Via Chaparral
- Lake Marie Estates
- Orcutt Area

Per the General Recommendations, periodic review of the status of septic systems in these areas should also be made, say, every three to five years. Changes in local development patterns/plans or new findings could be the basis for revising the management strategy in these areas.

**TABLE 9-2**
**MANAGEMENT RECOMMENDATIONS**

| FOCUS AREA | RECOMMENDATION | COMMENTS |
|---|---|---|
| **Rincon Point** | ► Continue efforts to connect to public sewers | ► **High Problem Rating**<br>► High groundwater conditions and small lots not amenable to correction with onsite technologies<br>► Sewer studies in progress<br>► General community support for sewers |
| **Shepard Mesa** | ► Case-by-Case upgrades and management | ► **Low/Medium Problem Rating**<br>► Large lots, good soil conditions, distant from water resources |
| **Arroyo Paredon** | ► Mandatory inspection and upgrades<br>► Review status in 3 years | ► **Medium/High Problem Rating**<br>► Man older systems, recent reported deficiencies, sporadic evidence of water quality impact in Arroyo Paredon Creek<br>► |
| **Padaro Lane** | ► Continue efforts to connect to public sewers<br>► Consider pressure sewer alternative | ► **Medium/High Problem Rating**<br>► High groundwater conditions on many lots not amenable to correction using on-site technologies; some lots may be suitable for individual upgrades<br>► Preliminary sewer feasibility study completed by Carpinteria Sanitary District |
| **Sand Point Road** | ► Continue efforts to connect to public sewers<br>► Consider pressure sewer alternative | ► **High Problem Rating**<br>► High groundwater conditions not amenable to correction using on-site technologies<br>► Preliminary sewer feasibility study completed by Carpinteria Sanitary District |
| **Toro Canyon** | ► Develop/implement Onsite Wastewater Management Plan | ► **Medium/High Problem Rating**<br>► Difficult soil/geologic conditions, close proximity to East and West Toro Creek with evidence of bacteriological impact.<br>► Recently-adopted local septic system upgrade requirements (Toro Canyon Plan) |
| **Buena Vista (Montecito)** | ► Mandatory inspection and upgrades<br>► Encourage public sewer connection<br>► Review status in 3 years | ► **Medium/High Problem Rating**<br>► Many very small lots with limited on-site upgrade options<br>► Public sewers available - Montecito Sanitary District |
| **Cold Springs (Montecito)** | ► Mandatory inspection and upgrades<br>► Encourage public sewer connection<br>► Review status in 3 years | ► **Medium/High Problem Rating**<br>► Difficult conditions for on-site upgrades<br>► Public sewers available - Montecito Sanitary District |

**TABLE 9-2**
**MANAGEMENT RECOMMENDATIONS**

| FOCUS AREA | RECOMMENDATION | COMMENTS |
|---|---|---|
| **Sycamore Creek (Montecito)** | ► Mandatory inspection and upgrades<br>► Encourage public sewer connection<br>► Review status in 3 years | ► **Medium/High Problem Rating**<br>► Difficult conditions for on-site upgrades<br>► Public sewers available - Montecito Sanitary District |
| **Mission Canyon** | ► Develop/Implement Onsite Wastewater Management Plan | ► **Medium/High Problem Rating**<br>► Difficult conditions for on-site upgrade; tributary to listed 303(d) impaired water body; |
| **Hope Ranch Area** | ► Develop/Implement Onsite Wastewater Management Plan | ► **Medium/High Problem Rating**<br>► Large concentration of septic systems, high reported deficiencies/repair rate; reasonable options for onsite upgrades & management |
| **Veronica Springs** | ► Mandatory inspection and upgrades<br>► Encourage public sewer connection<br>► Review status in 3 years | ► **Medium/High Problem Rating**<br>► Mixed conditions for on-site upgrades; sporadic bacteriological impacts in Arroyo Burro Tributary, 303(d) impaired water body.<br>► Public sewers available |
| **Sunset/Carol** | ► Initiate efforts to provide public sewers | ► **High Problem Rating**<br>► Small lots and groundwater nitrate contamination not amenable to correction/long-term management with on-site technologies<br>► Sewers available in surrounding urban area |
| **Vista Vallejo** | ► Initiate efforts to provide public sewers | ► **Medium/High Problem Rating**<br>► Old systems, small lots and possible groundwater nitrate contamination not amenable to correction with on-site technologies; tributary to Arroyo Burro Creek, 303(d) impaired water body.<br>► Sewer available in surrounding urban area |
| **Upper Fairview** | ► Case-by-Case upgrades and management<br>► Mandatory inspection and upgrade for commercial, multi-residential systems in area<br>► Review status in 3 years | ► **Medium Problem Rating**<br>► Relatively large lots with reasonable options for on-site upgrades<br>► Status of commercial system unknown (higher risk, adjoins Vegas Creek)<br>► Status of multi-residential system unknown (higher risk) |
| **La Buena Tierra** | ► Case-by-Case upgrades and management<br>► Review status in 3 years | ► **Low Problem Rating**<br>► Good conditions, reasonable options for on-site upgrades |

**TABLE 9-2**
**MANAGEMENT RECOMMENDATIONS**

| FOCUS AREA | RECOMMENDATION | COMMENTS |
|---|---|---|
| **Via Chaparral** | ► Implement treatment upgrades, case-by-case<br>► Review status in 3 years | ► **Low/Medium Problem Rating**<br>Relatively large lots with reasonable options for on-site upgrades |
| **Painted Cave** | ► Mandatory inspection and upgrades<br>► Review status in 3 years | ► **Medium/High Problem Rating**<br>► Old systems; difficult site conditions; small lots, steep slopes, no system documentation |
| **Los Olivos** | ► Develop/Implement Community Wastewater Facilities Plan<br>► Consider sewer connection to Solvang, partial onsite upgrades, joint system with Ballard, alternative collection/treatment/disposal technologies | ► **High Problem Rating**<br>► Small lots, high groundwater, nitrate loading not amenable to correction with on-site technologies<br>► Sufficient size and density to support community project |
| **Ballard** | ► Develop/Implement Onsite Wastewater Management Plan<br>► Consider full range of options, including onsite management with mixed/multiple solutions, sewerage project with Los Olivos, | ► **Medium/High Problem Rating**<br>► Mixed feasibility for on-site upgrades related to lot sizes and site specific soils conditions |
| **Santa Ynez** | ► Develop/implement Onsite Wastewater Management Plan<br>► Consider combination of sewers, pressure/STEP sewers, and onsite maintenance/upgrades | ► **High Problem Rating**<br>► Mixed feasibility for on-site systems due to soil-topographic-drainage variability; reasonably good to very poor.<br>► Ongoing sewer planning efforts for Stadium-Horizon Dr area. |
| **Janin Acres** | ► Initiate efforts to provide public sewers | ► **High Problem Rating**<br>► Groundwater nitrate contamination not amenable to correction easily with on-site systems<br>► Public sewers available - Santa Ynez/Solvang |
| **Lake Marie Estates** | ► Case-by-Case upgrades and management<br>► Review status in 3 years | ► **Low/Medium Problem Rating**<br>► Relatively small lots in generally good soil conditions, distant from sensitive water resources |
| **Orcutt** | ► Case-by-Case upgrades and management<br>► Review status in 3 years | ► **Low Problem Rating**<br>► Large lots, good soil conditions, distant from sensitive water resources |

**Mandatory Inspection-Upgrade Program**

Presently, the County's Septic System Inspection and Reporting requirements are essentially a voluntary-type program, since they are linked to septic tank servicing activity. This is an excellent program element and has helped identify and correct a large number of septic system deficiencies in the County. However, some areas of the County are in need of a more rigorous inspection program due to the age and density of the systems, difficult site constraints, and general lack of information about septic system conditions and actual or potential threat to public health and water quality. These areas are recommended to be included in a mandatory inspection and (as needed) upgrade program. The Focus Areas recommended to be included for mandatory inspection and upgrading encompass a total of about 800 systems and were all rated as medium or medium-high problem areas in the Sanitary Survey problem assessment; they include following:

- Arroyo Paredon
- Buena Vista Creek
- Cold Springs
- Sycamore Creek
- Veronica Springs
- Painted Cave

The scope and details of a mandatory inspection and upgrade program are not defined here. However, the general objective would be to require an inspection and servicing of each septic system similar to that performed under the existing Septic Tank Inspection requirements. Some modifications or additions to the inspection work may be appropriate. One addition would be to require that the inspector conduct an abbreviated performance test of the system (sometimes referred to as a "hydraulic load test") to verify flow conditions and proper functioning of the system. Also, identification of additional details regarding the system components and layout may be warranted, since 80 to 90 percent of the properties in these identified Focus Areas have no septic system permit information on file with the County. A time frame for completion of the inspection work should be set (e.g., 3 to 5 years). It would be reasonable to exempt systems recently inspected and upgraded.

At the end of the inspection time frame a review should be made to determine the course of action for each area – i.e., whether or not to continue or disband the mandatory inspection program, adopt different requirements, encourage public sewerage or other measures. Three of the areas identified for mandatory inspection are located in Montecito within the boundaries of the Montecito Sanitary District. The Sanitary District is willing and able to extend sewers into all or portions of these areas if warranted. The results of this Sanitary Survey are insufficient to make a strong recommendation for extending sewers into these areas; however, this could change over time as additional information is acquired from site-by-site inspection of the many older systems in these areas.

**Onsite Wastewater Management Plan**

For several Focus Areas it is recommended that an Onsite Wastewater Management Plan be developed specifically for the area. This applies to areas where soil-geologic conditions and lot sizes (i.e., density) are judged to be reasonably suitable for continued use of septic systems, at least in a significant portion of the area. However, other factors such as the number of systems, record of problems or failures, and the proximity and threat to impaired water bodies or groundwater basins dictates that special management efforts be made in these particular areas to improve long-term effectiveness of onsite wastewater systems to avoid serious environmental problems. The Focus Areas where this management approach is recommended include:

- Toro Canyon
- Mission Canyon
- Hope Ranch
- Ballard
- Santa Ynez

An Onsite Wastewater Management Plan is intended to examine the area in detail and define appropriate standards and solutions for the types of problems or issues that are particular to the area. In other words, it is a customized septic system plan for the area. This may include a common set of requirements for the entire area, or it may include sub-areas where special maintenance or design standards are applied. For instance, it could be determined that portions of an area require sewers while the remainder can be served effectively by conventional or upgraded onsite treatment/disposal systems with routine inspections and maintenance. This is likely the case in the Santa Ynez area, where the rolling topography and variable soil conditions have created contrasting suitability constraints for septic systems over very short distances in the community. A possible solution that could be considered within an Onsite Wastewater Management Plan might include selective sewerage using small-diameter pressure sewers or STEP (septic tank effluent pump) systems. For this reason Santa Ynez is also listed below in recommendations for consideration of public sewers. Similarly, portions of upper Mission Canyon should also be for considered for connection to public sewers where feasible.

The provisions for development of Onsite Wastewater Management Plans are included in California Health and Safety Code, beginning with Section 6950. The enabling legislation became law in 1978, and provides specifically for the establishment of "Onsite Wastewater Disposal Zones", where, under specified conditions, public agencies can provide for the collection, treatment, reclamation or disposal of wastewater without the use of community-wide sanitary sewers or sewerage systems. The Sea Ranch in Sonoma County is an example of Onsite Wastewater Disposal Zone formed under the provisions of Section 6950 of the Health and Safety Code. The Sea Ranch onsite wastewater management program (encompassing 1,600 parcels) operates as a Zone of Benefit within a County Service Area. Under the program, the local homeowners association carries out

routine inspection and monitoring functions under contract with Sonoma County. The County retains all permitting functions.

**Public Sewerage**

It is recommended that conversion from septic systems to public sewers be considered for several of the Focus Areas. This recommendation does not mean that continued use and upgrading of onsite systems in the identified areas is infeasible or should be prohibited. Rather it means that, based upon our investigation, public sewerage is reasonably available, it is warranted, and it appears from preliminary analysis and our experience and judgment to be the probable best long-term wastewater management approach for the area. The particular Focus Areas recommended for consideration of public sewerage include the following:

- Rincon Point
- Sand Point Road
- Padaro Lane
- Sunset Rd/Carol Ave
- Vista Vallejo
- Santa Ynez (selected areas)
- Janin Acres

In some of these areas, preliminary sewerage studies have already been completed and in others (i.e., Rincon Point) implementation planning is underway. Other areas will require feasibility studies, environmental documentation and engineering work to accomplish the conversion from septic systems to sewers. In the course of such work, it will be necessary to define more specifically the extent of the "sewer service area" boundaries for each area. It may also be appropriate or necessary to consider, in detail, the requirements, costs and benefits of upgrading individual septic systems with enhanced treatment and disposal technologies as an alternative to public sewerage for each area.

As noted before in regard to the Santa Ynez area, small diameter pressure sewer or STEP sewers should also be considered in the analysis of sewerage alternatives. These types of sewers, utilizing individual grinder pumps or septic tanks with effluent pumps that pump into a common collection main, may provide significant cost savings in the rolling terrain of the Santa Ynez area and also in the low-lying sand spit areas at Sand Point Road and Padaro Lane. The preliminary feasibility studies by Carpinteria Sanitary District for Sand Point Road, Sandyland Cove and Padaro Lane-Beach Club Road were limited to conventional gravity sewers with lift stations. The studies determined that the majority (up to 75%) of the homes in each area would require grinder pumps to connect to the gravity sewers. Under these circumstances, significant cost savings could potentially be achieved from a pressure sewer system that would eliminate costly lift stations and gravity collection mains in favor of a single small-diameter force main into which all grinder pump units would be connected. Infiltration-inflow from the high groundwater conditions would also be reduced or eliminated. The use of alternative (pressure) sewers in the Santa Ynez area could potentially help overcome cost constraints and provide more

flexibility (and the needed support) for sewer extension projects in the case where the property owners have very different physical limitations and perceptions of the needs for sewers.

**Community Wastewater Facility**

It is recommended that feasibility and environmental studies be undertaken to develop and implement a community wastewater facility for the town of Los Olivos. The community is sufficiently distant and isolated from the City of Solvang to justify the development of a standalone facility to serve the town. The need for a community system stems from the very high density of development in the town combined with the inherent soil and groundwater conditions that force homeowners and businesses to utilize drywell systems that discharge directly into the groundwater strata in the area. Onsite system upgrades using alternative or enhanced treatment and disposal technologies may be feasible for some parts of the town, but not for the majority of the area. In studying the community wastewater facility alternatives for the town, more detailed consideration can and should be given to various options, including: (1) defining areas of the town where septic system upgrades may continue to be feasible; (2) sewerage connection to Solvang; (3) joint sewerage project with Ballard; and (4) various locations and technologies for collection, treatment and disposal and/or wastewater reuse for the town. A memorandum providing a preliminary overview of community wastewater collection, treatment and disposal options for Los Olivos was completed in the course of this Sanitary Survey for reference in the ongoing community planning efforts for the area.

## SECTION 10

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