State of California
Regional Water Quality Control Board
Santa Ana Region

STAFF REPORT
BASIN PLAN AMENDMENT
AMENDING THE WATER QUALITY CONTROL PLAN FOR THE SANTA ANA RIVER BASIN TO INCLUDE A WASTE DISCHARGE PROHIBITION ON THE USE OF ONSITE SEPTIC TANK-SUBSURFACE DISPOSAL SYSTEMS IN THE QUAIL VALLEY AREA OF RIVERSIDE COUNTY

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EXECUTIVE SUMMARY

The State Water Resources Control Board (State Board) and the nine regional water quality control boards (regional boards) are responsible for implementing state and federal laws to protect the quality of California's waters. The State Board sets statewide policy and each of the nine regional boards adopts its own water quality control plan (Basin Plan) in accordance with the California Water Code and the Federal Clean Water Act.

The Santa Ana Regional Water Quality Control Board (Regional Board) is responsible for the protection of water quality within the Santa Ana River Basin, including its tributary areas. The Basin Plan for the Santa Ana River Basin is the basis for the Regional Board's regulatory programs. The Basin Plan specifies beneficial uses and water quality objectives (jointly referred to as "water quality standards" in the Clean Water Act) for surface and ground waters within the region. The Basin Plan also includes an implementation plan (Chapter 5 of the Basin Plan) that describes various permitting options, waste discharge prohibitions, monitoring and enforcement, salt and nutrient controls, and other control measures necessary to protect water quality and beneficial uses. The Basin Plan includes prohibitions on the use of septic tank-subsurface disposal systems (septic systems) in certain areas of the region.

Board staff proposes an amendment to Chapter 5 of the Basin Plan to include a prohibition on the use of septic systems within the Quail Valley area of Riverside County. Most residents in Quail Valley use septic systems for disposal of domestic wastewater[1]. The septic systems in the area have been failing at an alarming rate, adversely impacting water resources and posing a significant threat to public health. Currently, most of the area is not served by sanitary sewer systems. However, Eastern Municipal Water District (EMWD) and Elsinore Valley Municipal Water District (EVMWD) are exploring the feasibility of extending sanitary sewers to this area. In its "Quail Valley Sewer Improvements Alternatives Study", EMWD subdivided the area into 9 sub-areas (see Figure M). Of these sub-areas, 4 and 9 have the highest density of septic systems. Riverside County is proposing to prohibit any new septic systems in these two sub-areas. Consistent with the County proposals, the proposed Basin Plan amendment would prohibit new septic systems in areas 4 and 9. The proposed Basin Plan amendment would prohibit the use of septic systems in all areas of Quail Valley once sewer systems are available.

[1] There is one new development at the border of Quail Valley and Canyon Lake where the developer has installed sanitary sewer systems. However, this system has not yet been connected to a trunk-line.

I. INTRODUCTION

Each regional board is required to develop a water quality control plan, or Basin Plan, for the waters within its jurisdiction (California Water Code § 13240). The Basin Plan implements relevant provisions of the federal Clean Water Act and the California Water Code (CWC). The Basin Plan includes water quality objectives and beneficial uses for ground and surface waters within the region. The Basin Plan also identifies an implementation plan for achieving water quality objectives (CWC § 13242). The implementation plan may specify certain areas where the discharge of waste will not be permitted (CWC § 13243). A prohibition on the use of septic systems must be supported by substantial evidence that the discharge of waste from such disposal systems will result in violation of water quality objectives, will impair present or future beneficial uses of water, will cause pollution, nuisance or contamination[2], or will unreasonably degrade the quality of waters of the state (CWC § 13280).

The current (1995) Basin Plan for the Santa Ana River Basin includes prohibitions on the use of septic systems in Grand Terrace, Yucaipa-Calimesa, Lytle Creek, Mill Creek, Bear Valley, Homeland-Green acres and Romoland. These prohibitions were adopted in 1973 and 1982. Board staff now proposes an amendment to the Basin Plan to include a prohibition on the use of septic systems in the Quail Valley area, based on evidence of adverse water quality and public health and nuisance problems caused by failing septic systems in the area. As discussed below, substantial evidence exists to indicate that septic system use in Quail Valley is causing a violation of water quality standards and causing or threatening to cause conditions of pollution, contamination and nuisance.

II. BACKGROUND

1. QUAIL VALLEY – AREA DESCRIPTION

Quail Valley is an unincorporated area of Riverside County located northeast of the City of Canyon Lake (Figure A).

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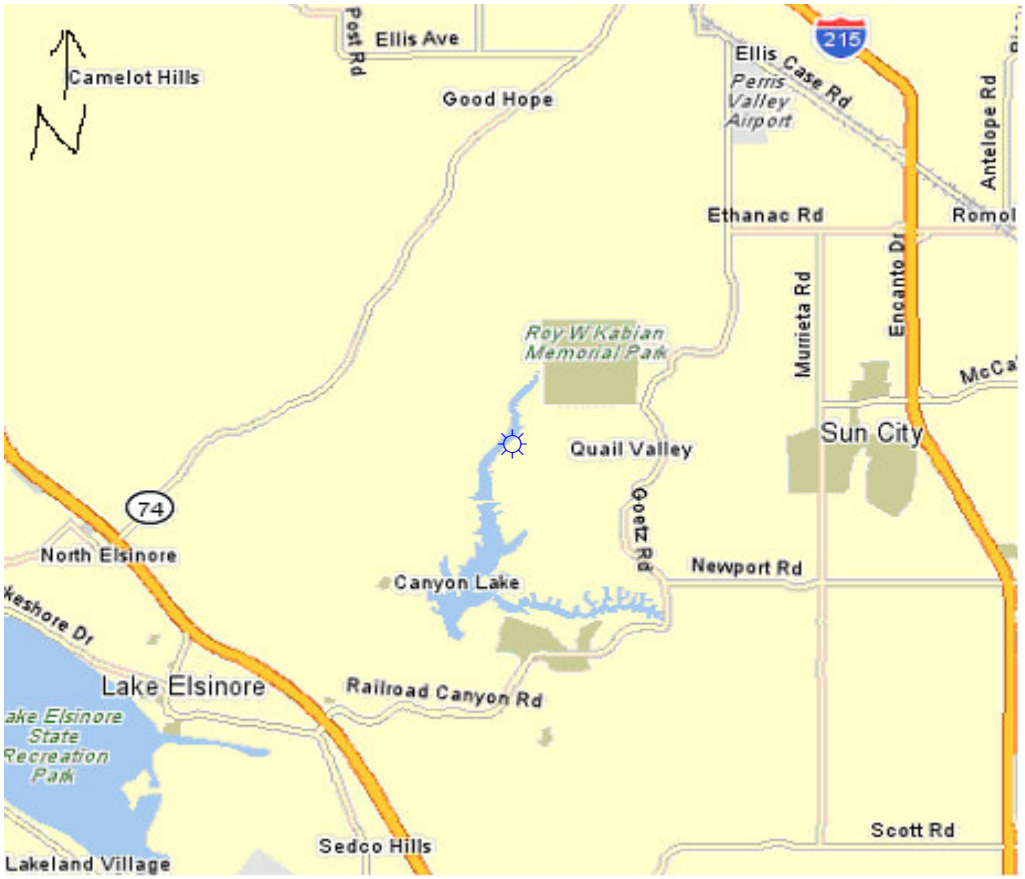
[2]"Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (1) The waters for beneficial uses. (2) Facilities which serve these beneficial uses. Pollution may include contamination.
"Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. Contamination includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.
"Nuisance" means anything which meets all the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes. (CWC Section 13050)

Figure A
Quail Valley Location Map



The area generally slopes to the southwest, and the drainages from Quail Valley are tributary to Canyon Lake, also known as Railroad Canyon Reservoir (Figure B). This area is located within the San Jacinto watershed. The San Jacinto River originates in the San Jacinto Mountains and terminates in Lake Elsinore. The San Jacinto River drains to the north part of Canyon Lake, and Salt Creek, the other major tributary, drains to the east part of the Lake (Figure C). Canyon Lake is a municipal water supply source for EVMWD.

Section 303(d) of the Federal Clean Water Act requires each state to develop a list of waterbodies that do not meet water quality standards. Canyon Lake is listed on the Regional Board's Section 303(d) list of impaired waters (SWRCB, 2002) due, in part, to high bacteria levels in the lake. Due to these high bacteria levels, Canyon Lake was closed to water contact recreation for several months (145 days) during 2004 and 2005. Federal law and regulations also require the states to develop control measures (total maximum daily loads, or TMDLs) for pollutants causing the water quality impairment. One of the sources of bacteria in Canyon Lake appears to be the failing septic systems in the Quail Valley area. This and other sources of bacterial input will be addressed in a TMDL now being developed.

Nutrients are also a cause of impairment of water quality and beneficial uses in Canyon Lake. As discussed in Section IV, below, septic system use and failing systems are likely contributors to nutrient problems in both ground and surface waters. Nutrient load allocations for septic systems are specified in the Lake Elsinore and Canyon Lake Nutrient TMDLs (Regional Board Resolution No. R8-2004-0037).

Figure B
Surface Drainage from Quail Valley

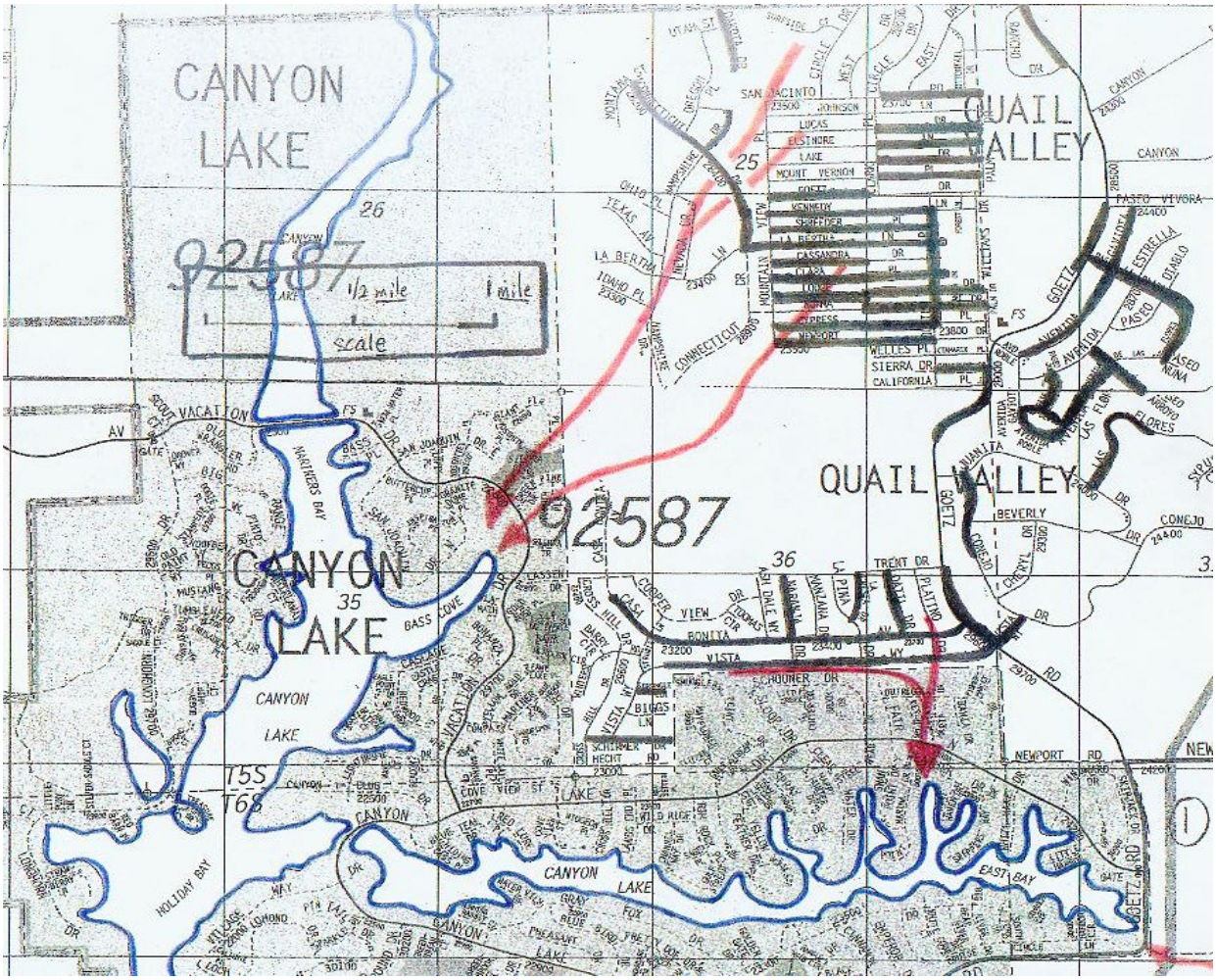
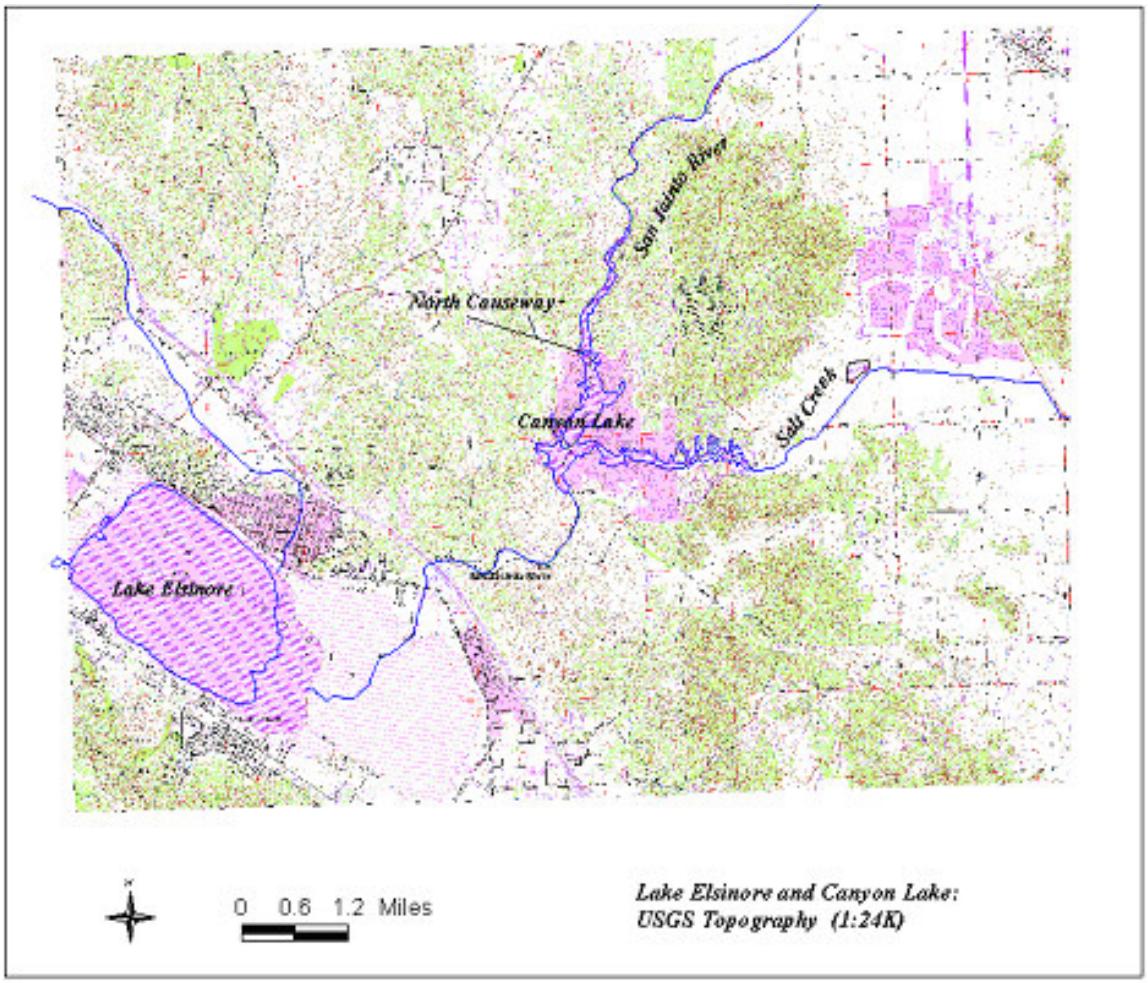


Figure C
Major Tributaries to Canyon Lake



2. QUAIL VALLEY HYDRO-GEOLOGICAL SETTING

During the 2005 rainy season, natural springs were noted at a number of locations within Quail Valley, indicating that groundwater levels were high. The high groundwater levels cause septic tank effluent to surface and may inundate septic tanks with groundwater.

There are no producing water supply wells in the area. However, there is at least one monitoring well in the area and a number of wells nearby.

The soils in the area are not generally suitable for septic system use. A review of a number of soil percolation test reports and other relevant information for the area indicate that high groundwater, shallow impermeable strata and poor soil conditions are pervasive problems in the area[3]. The following information is from one of the soil percolation reports submitted for septic system use in the area (Earth Technics, 2004):

"The trench exposed 1-2 feet of fill with an underlying 2-2.5 foot of soil/colluvium interval of dark brown silty sands and sandy silts with 15% angular rock to 8 inches. This colluvial mantle is underlain by a moderately hard, weathered shale bedrock (90%) that is intensely fractured with silty sand infilling."

Similar observations were noted in most of the percolation test reports for the area (Advanced Geotechnical, 2004):

"The trench exposed a 2.5-3.5 foot soil/colluvium interval of dark yellowish brown to brown silty gravely sands. This colluvial mantle is underlain by a an intensely fractured metamorphic bedrock (75-80%) interbedded with weathered soft coarse-grained granitics."

"The top layer consisting of colluvium, sandy silt with traces of clay and some decomposed granite; middle layer with intrusive rock, with shale bedrock that is hard with silty sand and soft decomposed granite; and the bottom layers of hard to very hard shale bedrock with hard decomposed granite."

As indicated in these reports, the bottom layer is mostly impermeable hard shale bedrock. If the septic system effluent cannot percolate due to the presence of shallow bedrock, it is likely to surface, causing a system failure. If the vadose zone (unsaturated soil strata) does not provide a suitable soil type (soil containing at least 10% fines) for filtration of septic system effluent, groundwater

[3] The statement that the soil and groundwater conditions in the Quail Valley area are generally not suitable for septic system use obviously begs the question of why the use of such systems has been approved. It appears that some, if not many, percolation reports relied on inaccurate information and/or that repeated percolation tests on given sites were performed until the minimum requirements were satisfied. Such an approach would not provide an accurate representation of the site as a whole. The County has increased its presence during percolation testing to prevent these inaccurate representations.

could be adversely impacted since pollutants in the effluent are not reduced or removed.

The geology of the area consists primarily of cenezoic, quaternary and Pleistocene formations consisting of very old alluvial fan and alluvial-channel deposits, as well as some Holocene artificial fill deposits. The early Pleistocene alluvial deposits consist of reddish-brown gravel, sand, silt and clay-bearing alluvium. In places, there are thin, discontinuous alluvial deposits of Holocene age. Deposits in Quail Valley and Canyon Lake area also contain rounded cobbles.

Quail Valley is located within the Perris Block. The Perris Block is the mass between the San Jacinto and Elsinore-Chino fault zones, bounded on the north by the Cucamonga fault, and on the south by Temecula. This area is primarily composed of crystalline bedrock and also metamorphosed siliceous sedimentary rocks, metavolcanic rocks, and intrusive mid-Cretaceous Plutons. Also, the area contains slightly consolidated valley-filling continental sediments from the Pleistocene. The most abundant bedrocks are quartz bearing plutonites, mostly quartz diorite and some slate, metasandstone and gabbro. (Geologic Society of America Bulletin, 1971)

The area of north-east Canyon Lake is imported soil placed over native soils, and southern Quail Valley is composed of Paloma Surface, alluvial sediments, thoroughly weathered red-brown late Pleistoscene soil underlain by bedrock and the Lake Mathews Formation.

The Perris Block is underlain by lithologically diverse prebatholithic metasedimentary rocks intruded by plutons of the Cretaceous Peninsular Ranges batholith. The area also has Pleistocene alluvial fan deposits with intervening valley and channel fluvial deposits (USGS, 1999).

The hydro-geology of the area, including the soil conditions for the area, indicates that the hydro-geological conditions are not amenable for septic system use, and these conditions warrant a prohibition on septic system use.

3. SEPTIC SYSTEM USE IN QUAIL VALLEY

According to the US Census Bureau 2000 report, there were 1,649 residents in Quail Valley (US Census, 2000). Based on the number of water meters installed in the area, EMWD estimates that there are 1,175 septic systems in the area (EMWD, 2005a). However, an aerial count of dwelling units revealed there are 1,390 units (EMWD, 2005a). It is likely that some of these units are not permitted. EMWD estimates that there are 3,585 lots approved for residential structures, compared to a total of 3,918 lots that can be built upon. Approximately 3,196 of the approved lots are smaller than one acre. Most of the residences in the area are manufactured homes on small lots and are tightly clustered in an area commonly referred to as the “Grid Area”. All residents in

the Grid Area of Quail Valley use septic systems.

Forecast Homes has installed a sewer system at a new housing development at the border of Quail Valley and Canyon Lake. However, this sewer system is not connected to any trunk sewer line at this time and is approximately two miles from the Grid Area. Some of the new homes are occupied, and sanitary wastes are collected in Baker tanks and trucked to a wastewater treatment plant on an interim basis until EMWD sewer infrastructure is completed to serve these homes.

Septic systems can be an effective method for wastewater management when their use is balanced against a number of environmental factors such as septic system density, beneficial uses of the waters into which they discharge, depth to groundwater, and soil type. The septic systems must be properly engineered, installed and maintained, and the soil characteristics must be appropriate. As indicated above, in Quail Valley, generally the soils have high percolation rates, and the groundwater in the area is high, making the conditions unsuitable for septic system use. These conditions, combined with the high density of septic systems in the area, are causing violations of the Basin Plan water quality objectives and impairment of beneficial uses, and are causing or contributing to conditions of pollution, contamination and nuisance. Relevant water quality standards and other requirements are discussed in Section III, Regulatory Basis, below.

III. REGULATORY BASIS

1. BASIN PLAN – BENEFICIAL USES

The groundwater in Quail Valley is tributary to Canyon Lake and the Elsinore Groundwater Management Zone, the beneficial uses of which include:

a. Municipal and domestic supply.
b. Agricultural supply
c. Industrial process supply

Surface runoff from the area is tributary to Canyon Lake, the beneficial uses of which include:

a. Municipal and domestic supply
b. Agricultural supply
c. Groundwater recharge
d. Water contact recreation
e. Non-contact water recreation
f. Warm freshwater habitat
g. Wildlife habitat

2. BACTERIA OBJECTIVES AND GUIDELINES

a. Basin Plan Objectives

The Basin Plan specifies water quality objectives for a number of constituents. The constituents of concern in septic system effluent are mostly bacteria and nutrients (nitrogen and phosphorus compounds). Bacteria objectives are currently expressed in the Basin Plan as total and fecal coliform bacteria. Fecal bacteria are part of the intestinal flora of warm-blooded animals. Their presence in surface waters is an indicator of the presence of pathogens, such as viruses. The bacteria water quality objectives specified in the 1995 Basin Plan are shown in Table 1.

Table 1
Coliform Water Quality Objectives[4]

BENEFICIAL USE	WATER QUALITY OBJECTIVES
MUN (Municipal and domestic supply)	Total coliform for streams and lakes: less than 100 organisms/100 mL[5]
REC-1 (Water contact recreation)	Fecal coliform: logarithmic mean less than 200 organisms/100 mL based on 5 or more samples / 30 day period, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period.
REC-2 (Non-contact water recreation)	Fecal coliform: average less than 2,000 organisms per 100 mL and not more than 10% of samples exceed 4,000 organisms/100 mL for any 30-day period.

b. USEPA Criteria

The USEPA's national criteria for bacteria are based on E. *coli* and Enterococcus bacteria as indicator organisms. The freshwater national criteria for body contact recreation are 126/100 mL and 33/100 mL (geometric mean) for *E. coli* and Enterococcus, respectively (USEPA 2004)[6]. The USEPA recommends that states adopt revised bacterial objectives that are based on the national criteria. The Regional Board is in the process of considering revised bacterial objectives.

c. Department of Health Services Guidelines

[4] For Inland Surface Waters
[5] mL=milli liters
[6] Different values may be established based on the health risk level that is deemed acceptable. The values shown roughly correspond to the health risk level assumed in the established coliform objectives.

Assembly Bill 411 (California Assembly, 1997) required the State Department of Health Services (DHS) to establish water quality standards for recreational activities. DHS has established draft guidelines for posting and closure of public beaches (DHS, 2001). These guidelines recommended beach posting to warn against water contact recreation when indicator organisms exceed any of the following levels in a single sample:

- Total coliforms: 10,000 per 100 mL
- Fecal coliforms: 400 per 100 mL
- Either Enterococcus: 61 per 100 mL, or *E. coli*: 235 per 100 mL

Table 2
DHS Posting Levels for Bacteria

Indicator Bacteria Posting Requirements	TOTAL COLIFORM (Per 100 mL)	E. COLI (Per 100 mL)	Enterococcus (Per 100 mL)	FECAL COLIFORM (Per 100 mL)
DHS Guidance For Fresh Water Beaches	10,000	235	61	400

These guidelines also recommend immediate beach closure whenever sewage releases or spills occur.

3. BASIN PLAN – NUTRIENT OBJECTIVES

The primary drinking water standard for nitrate is 10 mg/L (milligrams per liter as NO_3-N). The Basin Plan also specifies a numeric total inorganic nitrogen (TIN) objective of 8 mg/L for Canyon Lake (RWQCB, 1995). Review of this objective is required as part of the Lake Elsinore and Canyon Lake Nutrient TMDLs implementation plan (Regional Board Resolution No. R8-2004-0037). This is based on evidence that the objective is not sufficiently stringent to protect beneficial uses. The Basin Plan also specifies narrative objectives to control excessive algae growth and low dissolved oxygen levels that result from nutrient inputs. The Lake Elsinore and Canyon Lake Nutrient TMDLs were developed to address violations of these narrative objectives and the adverse impacts on beneficial uses that have resulted therefrom (see Resolution No. R8-2004-0037).

4. GUIDELINES FOR DESIGN OF SEPTIC SYSTEMS

On January 24, 1979, the Board adopted "Guidelines for Sewage Disposal from Land Developments" (RWQCB, 1979), which established minimum criteria for the use of septic systems in the region to protect the beneficial uses and to meet the water quality objectives for all waters within the region. These guidelines prescribe acceptable percolation rates, required soil characteristics, required depth to groundwater, and acceptable ground slope.

Any septic system installed in Quail Valley must also meet the requirements of the Riverside County Health Department as prescribed in "Waste Disposal for Individual Homes, Commercial and Industrial" (County Health, 1981).

In accordance with Water Code § 13291, the State Board recently issued draft regulations for septic system use throughout the State. These regulations are not expected to address the septic system failures in Quail Valley because of the fundamentally unsuitable hydro-geological conditions that prevail in the area.

IV. PROBLEM STATEMENT

1. WATER QUALITY AND PUBLIC HEALTH PROBLEMS ASSOCIATED WITH SEPTIC SYSTEM USE

A conventional septic system consists of a septic tank and a leach field or a seepage pit. The function of the septic tank is to remove solids and floatables, and the leach field or the seepage pit provides for percolation of the clarified wastewater into the underlying soils. Where soil conditions are appropriate, filtering of the wastewater through the vadose zone (unsaturated soil strata) reduces nutrient loading and removes most of the bacteria and other pathogens present in the wastewater.

Constituents typically found in domestic wastewater are listed in Table 3, below (USEPA, 2002).

Table 3
Typical Constituents in Residential Wastewater

Constituent	Concentration[7] In milligrams/liter
Total Solids	500-880
Volatile Solids	280-375
Total Suspended Solids	155-330
Volatile Suspended Solids	110-265
Biochemical Oxygen Demand	155-286

[7] Based on assumed water use of 60gallons/person/day

Chemical Oxygen Demand	500-660
Total Nitrogen (TN)	26-75
Ammonia (NH_4)	4-13
Nitrites and Nitrates (NO_2-N; NO_3-N)	<1
Total Phosphorus (TP)	6-12
Fats, Oils, and Grease	70-105
Volatile Organic Compounds	0.1-0.3
Surfactants	9-18
Total Coliforms (TC)[8]	10^8-10^{10}
Fecal Coliforms (FC)[9]	10^6-10^8

The use of septic systems is generally recognized as a potentially viable, low-cost, long-term, decentralized approach to wastewater treatment in low population density areas (USEPA, 1997). These areas can assimilate the waste within the soil, provide filtration by percolation through adequate soils and limit the potential for exposure to inadequately treated waste and resultant public health threats.

Properly designed and well-maintained septic systems in low density areas should not cause any serious environmental problems. However, septic systems can fail and cause severe short-term and long-term adverse impacts. Septic system malfunctions can result from a number of factors, including, but not limited to, the following:

a. Poor soil conditions: Lack of fine soil will cause fast percolation and poor filtration; too much fine soil will prevent the wastewater from percolating and may cause surfacing; shallow bedrock or other impermeable surface may also cause surfacing.
b. High groundwater levels: The Regional Board's Guidelines for Septic Systems (RWQCB, 1979) require a 10 foot separation between the ground surface and anticipated high groundwater and a 5 foot separation between the bottom of the disposal facilities and anticipated high groundwater. If the groundwater is high, the septic system effluent may surface and/or contaminate the groundwater.
c. Hydraulic overloads caused by high density of septic systems and population: Septic systems on small lots and more people in a household than can be accommodated by the septic system design capacity can exacerbate the septic system failure rates.
d. Lack of septic system maintenance: If the systems are not properly designed and regularly maintained, failures can occur. Regular pumping of septic systems inundated by groundwater may not help significantly. If residents dispose of hazardous

[8] Most probable number of organisms per 100 milliliters.
[9] Most probable number of organisms per 100 milliliters.

chemicals, toxic substances, pesticides or other chemicals into the septic systems, surface and/or groundwater quality can be adversely impacted.

In summary, where septic systems are not properly designed, installed and maintained, where hydro-geologic conditions are not suitable or where there is high density septic system use, septic system failures are more likely to occur. Discharges from these septic systems can adversely affect public health and surface and groundwater quality. Table 4 describes the typical domestic wastewater pollutants and their potential impacts on the environment (USEPA, 2002).

Table 4
Typical Wastewater Pollutants of Concern

POLLUTANTS	REASON FOR CONCERN
Total Suspended Solids (TSS) and turbidity (NTU)	TSS may result in the development of sludge deposits in surface waters, which may smother benthic microinvertebrates and fish eggs. Can also contribute to benthic enrichment, toxicity, and sediment oxygen demand. Solids can harbor bacteria. Turbidity can increase with TSS and block sunlight, impacting vegetation and the aquatic life.
Biological Oxygen Demand (BOD)	Biological stabilization of organics in the water column can deplete dissolved oxygen in surface waters, which creates anoxic conditions harmful to aquatic life.
Pathogens	Parasites, bacteria, and virus can cause diseases through direct or indirect body contact, or ingestion of contaminated water. It is a concern when septic wastes accumulate and pool on the ground or migrate to recreation waters. Pathogens can travel or survive traveling significant distances in groundwater plumes and surface waters.
Nitrogen	Nitrogen is an aquatic plant nutrient that can contribute to eutrophication and dissolved oxygen loss in surface waters, lakes, and other waterbodies.
Phosphorus	Phosphorus is an aquatic plant nutrient that can contribute to eutrophication and dissolved oxygen loss in surface waters, lakes, and other waterbodies.
Toxic Organic Compounds	Organic compounds are present in household chemicals and cleaning agents. They can be toxic to humans and aquatic life. They can be persistent in groundwater and contaminate down-gradient sources of drinking water. Some organic compounds accumulate and concentrate in ecosystem food chains.
Heavy Metals	Heavy metals can be toxic to aquatic life and cause human health problems.

POLLUTANTS	REASON FOR CONCERN
Dissolved Inorganic Compounds	Sodium and potassium can be deleterious to soil structure and septic system leach field performance. Salts and some dissolved compounds are resistant to degradation and can reach groundwater.
Endocrine Disruptor Compounds	Personal care products, including, but not limited to, shampoo, cleaners, pharmaceuticals, in wastewaters are an emerging water quality problem and public health issue.

As shown in Table 4, failing septic systems can be a source of bacteria and other pathogens in surface and ground waters. Contaminated surface runoff can contain a variety of bacteria, viruses and protozoa. Exposure to these contaminants can cause the following health problems (Table 5, SWRCB, 2005).

Table 5[10]
Health Problems Related to Pathogens

ORGANISM	DISEASE	SYMPTOMS
BACTERIA		
E. coli	Gastroenteritis	diarrhea, stomach cramps, fever
Salmonella species	Salmonellosis	diarrhea, stomach cramps, abdominal pain, nausea, fever, anorexia
Shigella	Shigellosis	diarrhea, fever, stomach cramps, nausea
VIRUS		
Rotavirus	Gastroenteritis	diarrhea, stomach cramps, nausea
Norwalk virus	Gastroenteritis	diarrhea, stomach cramps, nausea
Coxackievirus	Respiratory illnesses, meningitis, myocarditis	sore throat, cough, sinus infection, fever, earache
Adenovirus	Gastroenteritis and respiratory illness	diarrhea, stomach cramps, ear/nose/throat infections
Echovirus	Respiratory illnesses, meningitis, myocarditis	sore throat, cough, sinus infection, fever, earache
Hepatitis A	Infectious hepatitis	fever, anorexia, nausea, jaundice
PROTOZOA		
Giardia lamblia	Giardiasis	diarrhea, cramps, weight loss, fatigue

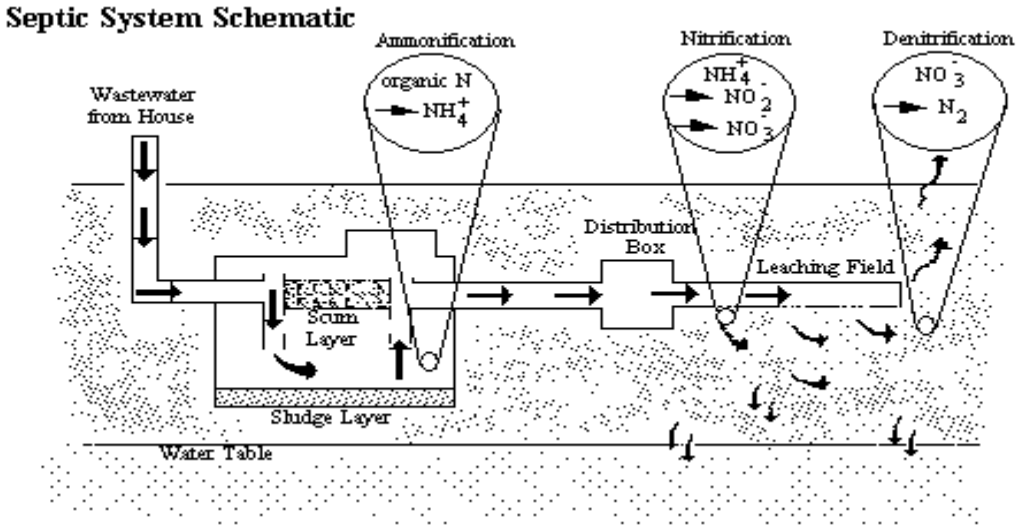
[10] Please note that the focus of this study was not domestic wastewater. Nonetheless, the organisms, diseases and symptoms are similar.

Cryptosporidium	Cryptospordiasis	diarrhea, stomach cramps, nausea, weight loss
Amebiasis	Amebiasis	bloody diarrhea, fever, chills

Another major constituent of concern in septic system effluent is nitrogen. Most nitrogen compounds in septic tank effluent are eventually converted to nitrate in the soil. See Figure D.

Some of this nitrate escapes into the atmosphere through a denitrification process and the remaining nitrate percolates into the groundwater. In the case of septic system failures, nitrogen in various forms in the wastewater is discharged to surface waters. The percolation of nitrate into groundwater can cause a violation of water quality objectives for nitrate. High nitrate concentrations in ground or surface water used for domestic water supplies can be toxic to humans and can cause methemoglobinemia ("blue baby syndrome") (Klasse, 1986). The discharge of nitrogen to surface waters can cause eutrophication, leading to excessive algae growth and adverse impacts on beneficial uses, including recreation and wildlife.

Figure D
Schematic of Septic System Nitrification/Denitrification



N=nitrogen; NH_4^+=ammonium ion; NO_3-=nitrate; N_2=nitrogen (gas)

Septic system discharges have contributed to an overabundance of nutrients in ponds, lakes, and coastal estuaries, leading to the excessive growth of algae and other nuisance aquatic plants (USEPA, 1996b). Malfunctioning septic systems have been identified as one potential source of groundwater contamination (USEPA, 2000). Indeed, according to USEPA, discharges from septic tanks are

the third leading cause of groundwater pollution in the United States (USEPA, 2002). Poorly performing septic systems have resulted in public health threats, degradation of surface and groundwaters, and property value declines (USEPA, 2002).

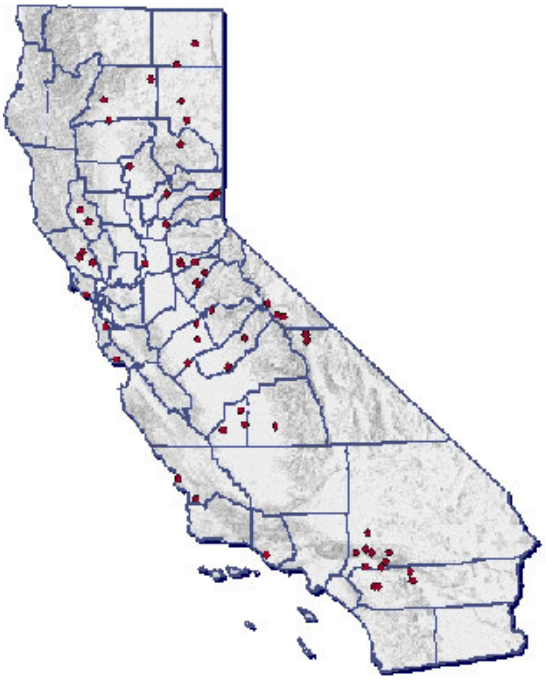
Septic systems are not considered as a viable wastewater disposal option for high-density areas. Septic systems on high-density developments (residences on small lots) may not provide sufficient dilution of the percolating septic tank effluent, causing or contributing to nutrient problems in the groundwater. High density septic system use may also cause mounding and surfacing of wastewater, resulting in public exposure to inadequately treated waste and surface water contamination. The Regional Board recognized the problems associated with high density septic system use and adopted Resolution No. 89-157, amending the Basin Plan to add a one-half acre minimum lot size requirement for new developments using on-site septic systems (RWQCB, 1989). Resolution No. 89-157 (and subsequent amendments) exempted lots for which local approvals were granted prior to September 7, 1989.

In addition to the one-half acre minimum lot size requirement that is applicable throughout the region, the Regional Board also adopted waste discharge prohibitions for the following areas:

a. Grand Terrace
b. Yucaipa-Calimesa Area
c. Lytle Creek above 2600 foot elevation
d. Mill Creek above 2,600 foot elevation
e. Bear Valley including Baldwin Lake drainage area
f. Homeland-Green Acres, and
g. Romoland.

The use of septic systems is prohibited in these areas due to poor soil conditions, high groundwater or other adverse hydro-geological conditions. Some exemptions are granted for limited use of septic systems in these areas based on specified criteria. Other regional boards have also adopted such prohibitions for areas that are deemed to be not suitable for septic system use (see Figure E for locations of these prohibition areas throughout the State) (SWRCB, 2005).

Figure E
Septic System Prohibition Areas in California



2. WATER QUALITY AND PUBLIC HEALTH IMPACTS OF SEPTIC SYSTEM USE IN QUAIL VALLEY

As discussed in Section II.3, above, virtually all of the residents of the Quail Valley area use septic systems for disposal of domestic wastewater. Currently, the exact number of septic systems in Quail Valley is unknown, but thought to be more than 1,100. If septic systems were to be installed on all the buildable lots in Quail Valley, the total number of septic systems in the area could reach approximately 3,900. The existing septic systems in Quail Valley are failing at a significant rate. A March 2005 survey of the residents in the area by Riverside County Health indicated that 37% of the residents were experiencing problems with their septic systems (County Health, 2005). These problems included surfacing of septic system effluent, inundation of septic tanks with groundwater, and other malfunctions such as systems backing up and releasing wastewater into the residences.

In repeated visits to the area during 2004 and 2005, County Health and Board staff noted ponded septic system effluent and surfacing of septic tank effluent at a number of locations in Quail Valley. During the June 3, 2005 visit, at least 6 residents in the area were using portable toilets because their septic systems had completely failed and replacement systems could not be installed due to space limitations and/or soil and groundwater conditions. A few of the residents (37 were noted by County Health staff on March 15, 2005) were discharging grey-water (wastewater from washers, kitchen sink, etc.) to the street. Seven of the residents in the area indicated that they had to get their septic tanks pumped on a monthly basis or even more frequently. Many of the backyards and some of the front yards were flooded with septic system effluent. Children were observed walking through this water.

The ponded water, surfacing septic tank effluent, and surface runoff from the area all contained high levels of bacteria (see Subsections a & b, below). County Health and Board staff also noted serious odor problems from failing septic systems in the Quail Valley area. Surface runoff from the area is tributary to Canyon Lake, a drinking water source. The bacterial levels at a number of locations in Canyon Lake, where surface flows from Quail Valley reach the Lake, have exceeded applicable Basin Plan objectives, US EPA criteria and the levels prescribed by DHS, forcing closure of the Lake to water contact recreation for 145 days during 2004 and 2005.

This high rate of septic system failures in Quail Valley is due to poor soil conditions and high groundwater levels in the area (see Section II. 2, above and Subsection c., below). In addition, most of the lots in Quail Valley are smaller than one-half acre, so that the density of septic system use is high. (Most of the lots were approved prior to the Regional Board's adoption of the one-half acre minimum lot size requirement for subsurface disposal system use.)

a. Bacterial Problems in Surface and Ground Waters in Quail Valley

The Grid Area of Quail Valley does not have storm drain systems. Therefore, surface runoff from the area either ponds in land depressions or flows into ephemeral streams in the area and ultimately into Canyon Lake. Surface and groundwater samples collected from the Quail Valley area by County Health and Board staff indicated high bacteria levels in the surface runoff and in groundwater. The results of surface and groundwater samples collected during May/June 2005 from the Quail Valley area are included in Tables 6 and 7, below.

Table 6
Bacteria Levels in Surface and Groundwater Samples from Quail Valley
(See Figure F for Sample Locations)

Sample #	Date	Location	Type of Sample	Fecal Coliform	E. Coli	Enterococcus	Total Coliform
1.	May 23, 2005	Johnson Lane	Surface water	1,300	1,300	500	30,000
2.	May 23, 2005	La Cresta Dr.	Surface water	500	500	30,000	1,400
3.	June 13, 2005	Schooner Dr.	Surface water	2,300	500	2,300	1,100
4.	May 23, 2005	Mt. Vernon/Clark Place	Groundwater (from a pit)	80	130	N/A[11]	30,000
5.	June 14, 2005	Hampshire Dr.	Groundwater (well)	20	2,200	N/A[12]	50,000

[11] N/A = not analyzed
[12] N/A = not analyzed

Figure F
Sampling Locations for Samples Identified in Table 6

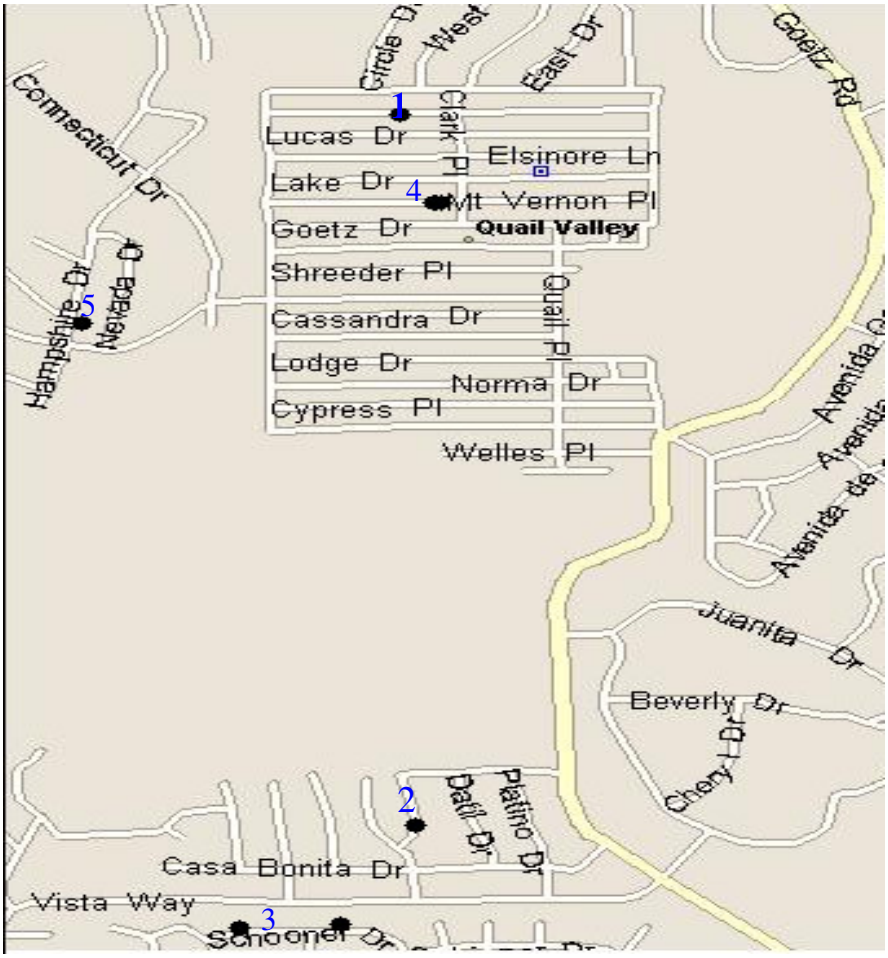
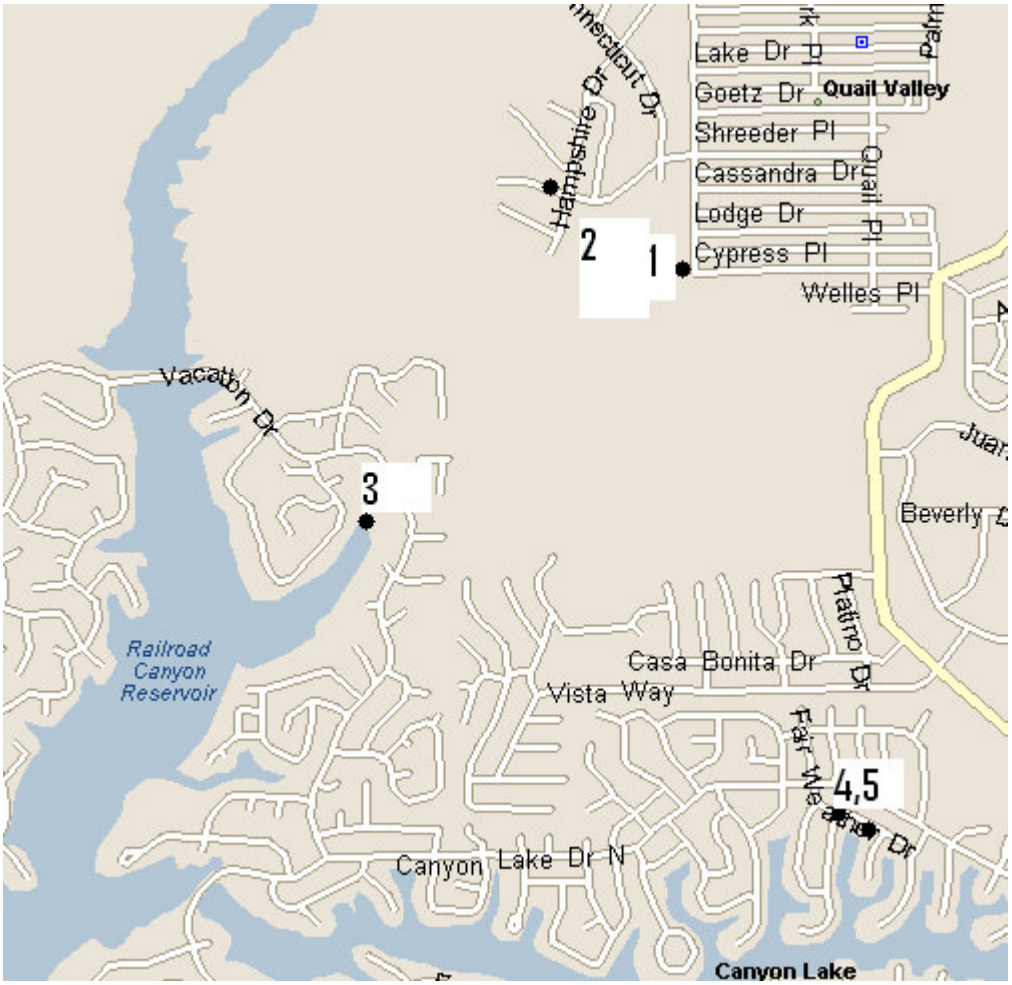


Table 7
E. Coli Levels (See Figure G for Sample Locations)

	1	2	3	4	5
E-coli	**50,000**	**1,100**	**30,000**	**1,600**	**1,600**

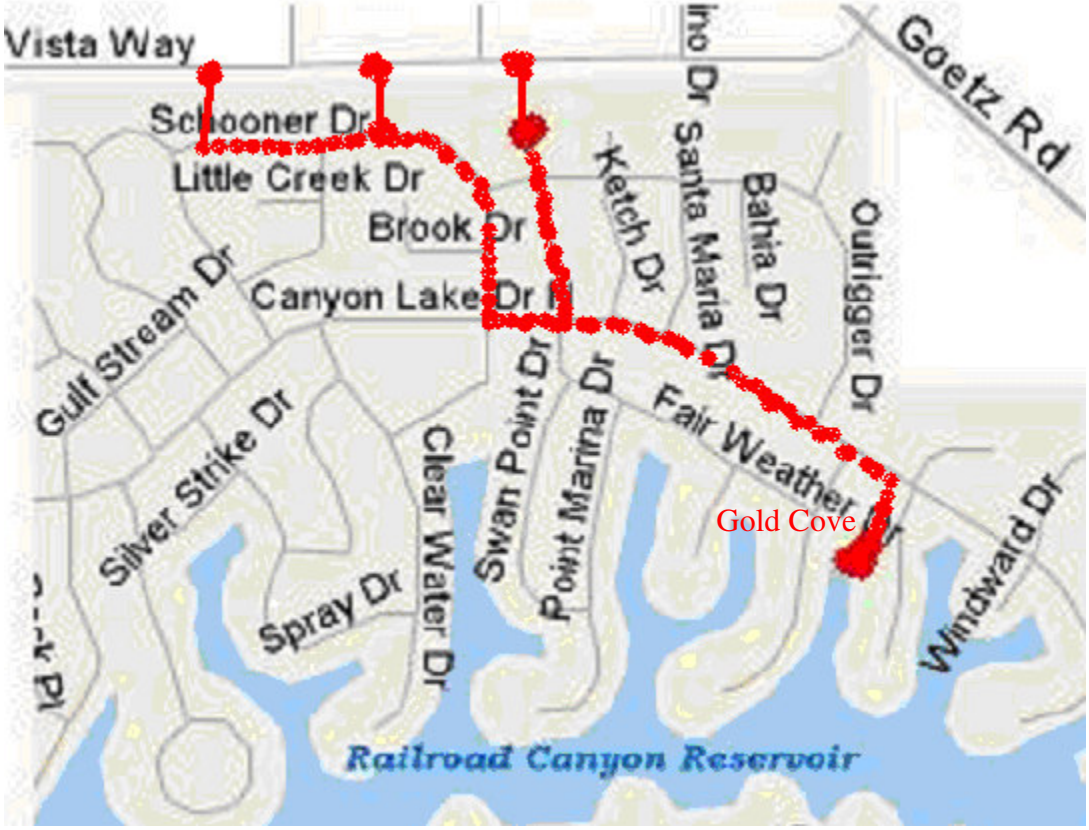
Figure G
E. Coli Sample Locations (See Table 7)



b. Bacterial Problems in Canyon Lake

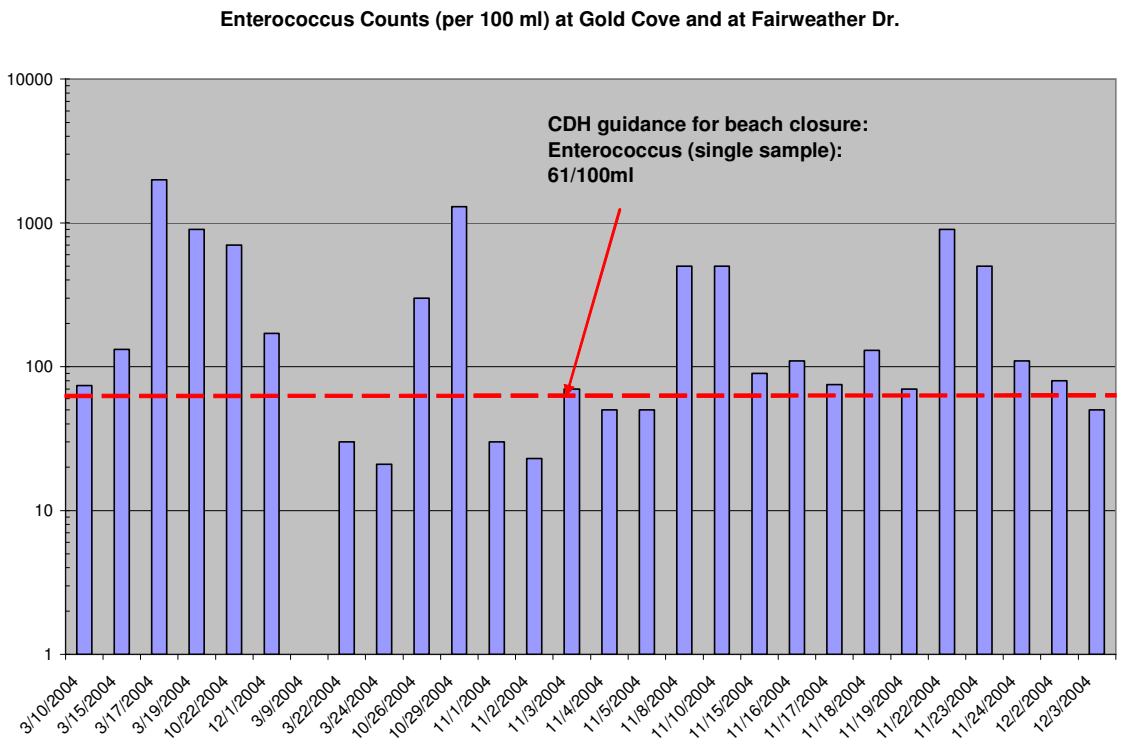
Canyon Lake was posted to prohibit body contact during the 2004-2005 rainy season for 145 days due to high bacteria levels. These postings are due to bacteria from diverse sources, including bacteria from septic system failures in Quail Valley. City of Canyon Lake and Board staff conducted a surveillance of the bacteria laden surface runoff from Quail Valley downhill and discharging into Canyon Lake. In March 2004, staff walked along these discharges from their discharge point into Gold Cove area of Canyon Lake (see Figure H) to their origination point in Quail Valley and noted the discharges into these streams came from failing septic systems in Quail Valley. On January 4, 2005, County Health staff collected samples from these streams in Quail Valley area and confirmed high bacteria levels in these streams. These investigations determined that the runoff in drainage channels from Quail Valley to Canyon Lake contained high levels of Enterococcus bacteria. Other sources of bacteria into Canyon Lake include runoff into the Lake from San Jacinto River and Salt Creek.

Figure H
Bacteria Laden Surface Runoff's Path into Canyon Lake



EVMWD and the City of Canyon Lake routinely monitor water quality in Canyon Lake. These monitoring results indicated that the bacteria levels in the Lake have exceeded the DHS guidelines for body contact recreation a number of times during the last few years (see Figure I). As indicated above, some of these exceedances were traced back to runoff resulting from septic system failures in the Quail Valley area. However, while the causes of all the exceedances could not be fully established, a number of them have been directly linked to septic system failures in Quail Valley.

Figure I
Enterococcus Sample Results



c. High Groundwater Problems in Quail Valley

During inspections of the Quail Valley area by County Health and Board staff from March 2004 to June 2005, it was noted that there were several locations with natural springs and surfacing groundwater. At a few locations, septic tank effluent surfaced and grey-water discharges occurred (during a one day survey on March 15, 2005 by County Health staff, at least 37 sites had domestic wastewater discharges to the ground surface). Some of these findings are evident from the following photographs, which are noted as Figures J and K, below. It had not rained for a few days, and staff traced most of these discharges to failing septic systems.

Figure J
Surfacing Groundwater

Figure K
Grey-water Discharges to the Street

Board staff monitored groundwater levels at a number of locations (see Figure L for locations) and the results are indicated in the Table 8 below.

Table 8
Groundwater Levels in Quail Valley Area (see Figure L below for locations)

Location Number	Date	Location	Groundwater Level, ft BGS[13]
1.		Circle Drive	15
2.		Cypress Place	14.3
3.		Idaho Place	14
4.		Hecht Road	7.1
5.		La Bertha Lane	12.7
6.		Mt. Vernon @ Clark	1
7.		Johnson Lane	3-5
8.		Hampshire Drive	15

Figure L
Groundwater Level Monitoring Locations (see Table 8)

[13] BGS=below ground surface

SOME NOTED
GW LEVELS

As indicated above, the high groundwater levels in Quail Valley are not suitable for septic system use.

d. Nitrogen Loading to Ground and Surface Waters as the Result of Septic System Use in Quail Valley.

Total nitrogen in septic system effluent typically ranges from 40 to 60 mg/l (RWQCB, 1989). Taking the average of 50 mg/l N, and the calculated average wastewater flow rate (EMWD, 2004) of 239.4 gpd/residence, the annual nitrogen loading from the existing residences in Quail Valley is estimated at over 52,000 pounds. Groundwater in the Quail Valley area is tributary to the Elsinore Groundwater Management Zone, which lacks assimilative capacity for nitrate-nitrogen inputs (i.e., the established nitrate-nitrogen objective for this Management Zone is being exceeded, RWQCB 1995).

Groundwater also surfaces in the Quail Valley area and contributes to surface water flows that are tributary to Canyon Lake. Septic system failures also result in surface water discharges of wastewater that affect Canyon Lake. As discussed in Section I, Canyon Lake is on the Clean Water Act Section 303(d) list of impaired waters. The Lake is listed for nutrients as well as bacteria. A nutrient TMDL has been established for Canyon Lake (Regional Board Resolution No. R8-2004-0037). This TMDL identifies septic systems as a source of nitrogen to the lake and, accordingly, includes load allocations for septic systems that require reductions in nutrient inputs.

e. Riverside County Health Findings

Riverside County Health monitored the number of complaints they responded to from October 1, 2004 to February 15, 2005. The County received 106 complaints regarding sewage and grey-water discharges, and 49 of those complaints were from the Quail Valley area. County Health noted that 37 of the residences in Quail Valley had recurring septic system problems, and 4 of them continued to discharge septic system wastewater to the ground surface (County Health, 2005c).

According to a March 15, 2005 County Health survey of 413 homes in the area, approximately 37% of the households surveyed had either grey-water or sewage discharges or discharges of both grey-water and sewage to the ground surface (County Health, 2005c). This clearly indicates that a significant number of the septic systems in Quail Valley area are failing and substantiates the basis for the proposed discharge prohibition.

f. Pollution, Contamination and Nuisance Conditions Resulting from Failing Septic Systems in Quail Valley

As documented in the preceding sections of this report, septic system failures in the Quail Valley area are causing conditions of pollution, contamination and nuisance. Discharges to surface waters resulting from the failed systems have caused violations of water quality objectives and unreasonably affected beneficial

uses in Canyon Lake; in particular, violations of bacterial objectives in certain areas of the Lake that can be attributed to discharges from Quail Valley septic systems have necessitated closures to prevent water contact recreational use (see Subsection b., above). Septic system discharges also contribute to eutrophication of the lake and adverse impacts on its domestic water supply, recreational and wildlife uses. Because the surface discharges from failed systems are comprised of sanitary wastes, they create a hazard to public health. Surface discharges of sanitary waste due to septic system failures also result in odors and aesthetic conditions that are offensive to the community as a whole and that interfere with the comfortable use of property in the area. Because of problems with the use of their septic systems, many homeowners in Quail Valley have been forced to resort to alternative means of wastewater disposal, including portable toilets. Again, this constrains the comfortable enjoyment of their property.

The continued use of septic systems in the area will continue to cause pollution, contamination or nuisance and will unreasonably degrade the quality of waters of the State.

3. CONCLUSIONS

In summary, violations of water quality standards and conditions of pollution, contamination and nuisance are resulting from septic system failures in the Quail Valley area. The area is currently experiencing a building boom that will exacerbate the problems associated with septic systems in the area, including the bacterial and nutrient problems in Canyon Lake.

In January 2005, Board staff, in collaboration with representatives from Riverside County Health, EMWD, EVMWD, the City of Canyon Lake, the Canyon Lake Property Owner's Association and the County Board of Supervisors office, formed an Ad Hoc committee to discuss septic system problems in Quail Valley and to explore short and long-term solutions. After a series of meetings in early 2005, this committee made recommendations for short and long-term solutions to address the problem. The short-term solutions included increased surveillance and enforcement by County Health and financial assistance for pumping septic tanks. Both EMWD and EVMWD agreed to conduct a feasibility study of extending sewers to the area as a long-term solution. Subsequently in January 2006, Riverside County proposed to enact regulations to prohibit the use of new septic systems in sub-areas 4 and 9.

On March 24, 2005, the Board of Directors for EVMWD adopted Resolution No. 05-03-07, encouraging the Riverside County Board of Supervisors to declare a potential public health emergency in Quail Valley and to employ all enforcement authority available to cease the pollution of the watershed caused by the discharge of septic tank effluent. On April 6, 2005, the City Council of the City of Canyon Lake adopted a similar resolution, Resolution No. 05-11, requesting the Regional Board to declare a potential public health emergency in Quail Valley

and to employ its enforcement authority to stop the discharge of wastes from the septic systems adversely impacting ground and surface waters.

On April 15, 2005, Board staff made a brief presentation to the Regional Board regarding problems with the septic systems in Quail Valley. The Board directed staff to take all necessary measures to address this problem.

In response to these requests and directives, Board staff is proposing a Basin Plan amendment prohibiting the use of septic systems in the Quail Valley area.

V. REGULATORY APPROACHES TO ADDRESS THE SEPTIC SYSTEM PROBLEMS IN QUAIL VALLEY

1. APPROVALS OF SEPTIC SYSTEM USE

Riverside County Health, in accordance with a memorandum of agreement with the Regional Board, reviews, approves and oversees the installation and maintenance of septic systems. In certain cases, County Health requires additional review and approval by Board staff.

Generally, County Health requires that an onsite percolation test be done by a State certified engineer or geologist and that a test report be submitted to the County for its review and approval. A review of a few of the percolation test reports submitted to the County for the Quail Valley area indicates that the test results meet the minimum criteria established by the County/Regional Board. However, the fact that these systems are failing at an unusually high rate indicates that the test reports may not be a good indicator of the hydro-geologic conditions of the area (the test reporting may be erroneous, the test may be done at a selected location within the lot not representative of the site conditions, etc.). To minimize erroneous reporting, the County is now overseeing some of the percolation tests and vigorously enforcing its regulations. The County has drafted regulations to prohibit the use of new septic systems in the densely populated areas of Quail Valley, namely sub-areas 4 and 9.

The State Board, as directed by CWC §13291, is developing uniform criteria for septic system use in California. As stated above, the proposed regulations are not expected to address the septic system failures in Quail Valley because of the unique hydro-geological conditions that exist in the area.

Increased County oversight of percolation testing should reduce or eliminate approvals based on erroneous reporting. However, this will not address the significant rate of failure of septic systems already in place. Other regulatory controls are needed to address this problem.

2. SEPTIC SYSTEM PROHIBITION

Water Code § 13280 provides that septic system use may be prohibited if substantial evidence exists that such systems will result in violation of water quality objectives, will impair present or future beneficial uses of water, will cause pollution, nuisance, or contamination, or will unreasonably degrade the quality of any waters of the State.

As indicated in Section IV, above, Board staff and other entities have collected substantial evidence to indicate that septic system use in Quail Valley has caused and continues to cause violations of water quality objectives, has impaired the beneficial uses of water, has resulted in conditions of pollution, nuisance, and/or contamination and has unreasonably degraded the quality of waters of the State. The evidence justifies a waste discharge prohibition, and an amendment to the Basin Plan to incorporate such a prohibition is recommended by staff.

a. Basin Plan Amendment

Board staff proposes to prohibit new septic systems in all areas of Quail Valley contingent upon the availability of a sewer system to serve a given lot. In additions, for sub-areas 4 and 9 (see Figure M), the installation of all new septic systems will be prohibited from the effective date of this Basin Plan amendment. The proposed prohibition recognizes the unavoidable time required to design, finance and construct a sanitary sewer system and the absence of feasible alternatives in the interim. Board staff recommends a three-step process to implement this prohibition.

i. Regional Board adopts a Basin Plan amendment prohibiting the use of septic systems in Quail Valley area. No new septic systems will be permitted in sub-areas 4 and 9 (see Figure M). The County may continue to permit new septic systems in other sub-areas provided the soil conditions meet the County and Regional Board guidance for septic system use. Once a sewer system is constructed to serve a lot, the septic system on that lot must be eliminated. A date for compliance with the prohibition would be specified in the Basin Plan amendment. This date would correspond with the estimated time necessary to design, construct and connect to a public sewer system. The amendment would take effect, once approved by the State Water Resources Control Board and the Office of Administrative Law.

ii. EMWD extends sanitary sewer service to the Quail Valley area. This will clearly be the most difficult step from both a financial and technical basis.

iii. Residents in the area connect to the sewer system in accordance with the time schedule prescribed in the

Basin Plan amendment.

b. Septic System Prohibition Alternatives

EMWD completed a Quail Valley Sewer Improvements Alternatives Study and determined that it may not be feasible to sewer certain outlying areas of Quail Valley. The areas that are infeasible to sewer are mostly low-density developments (houses on large lots). The proposed Basin Plan amendment contemplates an adaptive approach to address this problem. As discussed above, the hydrogeologic conditions in the Quail Valley area are very complex, given the shallow and fractured nature of the underlying rock strata, the hilly topography and the wide variations in septic system densities throughout the proposed prohibition area. In the professional judgment of staff, the water quality and public health problems previously discussed herein are the result of the septic system discharges from the high density (small lots) areas, combined with the discharges from the septic systems in the lower density (larger lot) developments. Further, given the hydrogeologic conditions in the subject area, it is likely that, even without the discharges from the large lot septic systems, the septic systems in the portions of Quail Valley with small, high-density lots would not function properly. However, it is entirely possible that the septic systems on the large lots might function properly without causing a downgradient public health threat or water quality problem, in the absence of septic system discharges from the small-lot, high-density areas. (An exception to this might certainly be in limited locations within the Quail Valley low-density areas where soil conditions are such that septic systems simply cannot reliably operate, and septic system failures have been documented.)

The current proposal is to prohibit the discharge of septic system effluent from the high-density areas, as well as certain specified low-density areas where septic system failures have been documented, upon construction of a sanitary sewer system designed to serve these lots. It is expected that the elimination of the discharges from the high-density lots will allow for the proper operation of septic systems on the low-density lots by lowering stress on the subsurface system by removing much of the subsurface flow contributions. Under this expected scenario, the low-density lot property owners will clearly benefit from the installation of sewers to serve the high-density lots. It is therefore appropriate that low-density lots be assessed for sanitary sewer system infrastructure, upon which the long-term continued proper functioning of their septic systems depends, even though that infrastructure may not immediately serve those low-density lots.

However, if this proposed approach is not effective in addressing the water quality problems discussed earlier in this staff report, and if it is found that septic system effluent continues to surface in the community, even though the remaining septic system discharges are from large lots only, then a modified approach will be required. The discharge prohibition would then be modified to prohibit discharges from septic systems anywhere within the study area.

It is believed that this adaptive approach will result in the timeliest correction of water quality problems in this community, while reducing the hardships to the residents that would result from a blanket prohibition for both small and large lots.

It is staff's opinion, based on site conditions and the current state of the profession, that a septic system prohibition is necessary to protect public health and water quality in Quail Valley. Further, based on the engineering feasibility report prepared by EMWD, the realistic sewering alternatives are somewhat limited. As a result of feedback to staff during two evening town hall meetings, attended by hundreds of community residents and other interested individuals, it seems likely that there will be significant community support for the construction of a sanitary sewer system. It is with this optimism that the adaptive septic system prohibition is being proposed for board consideration.

However, in the event that the community does not support a sanitary sewer system, and EMWD cannot, as a result, proceed with design and construction of the system, then staff will recommend a discharge prohibition with a near-term effective date, in order to address this very serious public health and water quality threat. Alternatives that would then be available to the community would be alternative systems, such as mound or evapotranspiration systems (if approved by the County), or the installation of holding tanks. Such an approach is Draconian, but would be the only method of eliminating the threat to public health and water quality from failing septic systems, in the event that a sanitary sewer system is not provided for sewage disposal within the community.

c. Economic Analysis

California Environmental Quality Act (CEQA) regulations (Public Resources Code Section 21159) require that economics be considered when evaluating methods of compliance with the proposed Basin Plan amendment. Water Code § 13280 requires the Regional Board to consider those factors set forth in § 13241, which includes economic considerations and the need for housing within the region.

Many of the residences in the area are manufactured homes, and this area is considered as an area where affordable housing is still available. According to the United States Census Bureau 2000 report, the median household income for a household in Quail Valley is $32,344 (U. S. Census Bureau, 2000). This is slightly lower than the nationwide median household income of $35,441. The 2000 Census report also estimated a population of 1,649 people, in 539 housing units. A recent aerial count by EMWD puts the number of housing units at 1,390.

On March 15, 2005, Riverside County Environmental Health (RCEH) staff conducted a survey of 413 homes in Quail Valley. Of those surveyed, 347 (84%) stated they would be willing to connect to a sewer if a sewer system was installed in the area. The estimated cost of connecting to a sewer system was not provided to those surveyed.

Clearly, the proposed Basin Plan amendment has the potential to materially affect property values in the area. Converting a property on individual septic system to a public sewer system typically increases the market value of the property. Due to real estate disclosure requirements, a failing septic system decreases the marketability of the property.

EMWD has jurisdiction over sewer systems in Quail Valley area and commissioned a feasibility study for sewer improvements in the area (EMWD, 2005). The study indicates that it is feasible to provide sewers to Quail Valley. For the overall Quail Valley community, the capital cost for sewer system installation is approximately $89 million. This translates to approximately $23,000 per lot if all buildable lots in Quail Valley are considered. In addition to this cost, each parcel owner will have to spend an additional $3,000 to $6,000 for construction of lateral sewer lines, connection to the main sewer and proper abandonment of the existing septic systems (see Table 9, below).

The lateral sewer line construction may cost $80-150 per foot, depending on the terrain, need to acquire easements, amount of engineering work required, pipe and backfill materials specified, methods of construction employed, and surface restoration requirements. Septic system abandonment involves obtaining a permit (approximately $300), having the tank pumped for the last time, removing and disposing of the lid, and filling of the empty septic tank with compacted dirt or sand ($600-1600). There are specific local agency requirements for abandonment of septic tanks. Once sewers are constructed in the area, the process can take 4-6 months to complete.

Table 9
Approximate Cost of Connecting to Sewer

Item	Unit Cost	# of Units	Total Cost
Sewer Connection Fee	$23,000/dwelling	1	$23,000
Septic Abandonment Fee	$300/tank	1	$300
Pump & Fill Septic Tank	$1,200/tank	1	$1,200
Lateral Construction	$115/foot	30 feet[14]	$3,450
Total Cost/dwelling			$27,950

The total cost indicated in Table 9, above, is the average cost, and it could be a significant burden for most property owners. Receipt of grants and funding from other sources may defray some of the economic impacts. Another way to spread the expenses over a number of years is to form an assessment district for the Quail Valley area. By forming an assessment district, EMWD and/or EVMWD can address the environmental and public health problems in Quail Valley through centralized authority and establish a mechanism for assessment of costs

[14] This is an average distance for typical calculation purposes only; actual distances will vary.

over a given service area. Some of the costs indicated in Table 9 could be amortized over a number of years, and the immediate costs to the residents could be minimized.

Water Code § 13291.5 states, "It is the intent of the Legislature to assist private property owners with existing systems who incur costs as a result of the implementation of the regulations established under this section by encouraging the state board to make loans under Chapter 6.5 (commencing with Section 13475) to local agencies to assist private property owners whose cost of compliance with these regulations exceeds one-half of one percent of the current assessed value of the property on which the onsite sewage system is located." EMWD is exploring this and other options to obtain financial assistance for the Quail Valley sewer project and to provide assistance to the residents in the area.

Board staff is committed to working with EMWD, EVMWD, the municipalities and other entities to try to locate and procure funding so that the burden on the Quail Valley residents will be minimized.

d. Other Considerations

In addition, Water Code § 13280 requires the Regional Board to consider Health and Safety Code § 117435 for possible adverse impacts if the discharge is permitted, failure rates of any existing individual disposal systems, or any other criteria. As previously discussed, a March 2005 field survey of Quail Valley residents conducted by County Health indicated that 37% of the residents surveyed were experiencing problems with their septic systems (County Health, 2005). Many of the residents in the area complained that their systems were failing despite repeated pumping of the septic tanks. A number of residents were using portable toilets, as their septic systems had completely failed and were not functional. During this survey, County Health staff also observed sewage discharges from at least 10% of the households either to the streets or to other neighboring properties. The presence of sewage in the streets and other locations in the community causes conditions of pollution, contamination and nuisance. Approximately 37% of the households surveyed had either grey-water or sewage discharges or discharges of both grey-water and sewage to the ground surface. As indicated in Section IV, above and elsewhere in this Staff Report, there is strong evidence that the area is being adversely impacted by septic system failures.

3. PROHIBITION OF NEW DISCHARGES

The proposed Basin Plan amendment includes a provision for an immediate prohibition of new discharges in the most densely populated areas (Areas 4 and 9 on Figure M) of Quail Valley. A prohibition of new discharges is not a moratorium on new construction, since construction can proceed, if a developer opts for use of a holding tank or other alternatives, and if the County would consider such an option for approval. In fact, this option is being implemented for

a new housing development in the Quail Valley community on an interim basis as sewer infrastructure is being constructed by EMWD (Area 7 on Figure M).

At this time, staff believes that the significant efforts of EMWD, with the assistance of EVMWD (feasibility of providing sewer service near Canyon Lake), working towards providing sanitary sewer service to the critical areas within Quail Valley, along with the generally positive community response to the sewering proposal, obviates the need for an immediate discharge prohibition, except in the most densely populated areas, sub-areas 4 and 9 (see Figure M).

However, this may all change if the sewering program fails to make significant progress or stalls. In that event, staff would ask that the Board amend the Basin Plan amendment to include an immediate prohibition on all new discharges, and as discussed above, include a time schedule for elimination of all septic system discharges from existing systems within the community. The long-term threat to the public health and to water quality would require this type of response in the event that it did not appear that solution to the problem could be expected within the near future.

VI. COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT AND CONSIDERATION OF ALTERNATIVES

The Secretary of Resources has certified the Basin Planning process as functionally equivalent to the preparation of an Environmental Impact Report (EIR) or a Negative Declaration pursuant to the California Environmental Quality Act (CEQA). However, as part of the Basin Planning process, the Regional Board is required to prepare the following: the Basin Plan amendment; an Environmental Checklist that identifies potentially significant adverse environmental impacts of the Basin Plan amendment; and, a staff report that describes the proposed amendment, reasonable alternatives, and mitigation measures to minimize any significant adverse environmental impacts identified in the Checklist. The Basin Plan amendment, Environmental Checklist, and the staff report together are functionally equivalent to an EIR or a Negative Declaration.

The proposed Basin Plan amendment is shown in the draft Resolution No. R8-2006-0024. Regional Board staff prepared and distributed a staff report and the proposed amendment to all interested parties, including residents in the Quail Valley area and conducted two public meetings (on June 6 and December 8, 2005) to solicit public comments. The Regional Board conducted a public workshop on May 8, 2006. A public hearing to consider the Basin Amendment is scheduled for August 14, 2006.

An Environmental Checklist has been prepared and is distributed with this staff report and response to comments in advance of the Regional Board's public hearing to consider adoption of the proposed Basin Plan amendment.

This staff report will be followed by another report that includes any further comments received on the proposed amendment, staff responses to those comments, and a discussion of any changes made to the proposed amendment as a result of the comments or further deliberation by the Board, Board staff and/or other entities. This follow-up report will address any additional CEQA considerations, including economics, which may arise as a result of any changes to the proposed amendment.

Board staff is proposing a septic system prohibition in Quail Valley. However, before the Regional Board considers this proposal, it must evaluate other alternatives. Some of the possible alternatives are discussed below.

1. PROHIBITION ON NEW DISCHARGES

This alternative was discussed above (Section V.3, above).

2. EXTENSION OF SEWER BY DEVELOPERS

Most of the lots in the area are individually owned. It is not economically feasible for individual lot owners to pay for extension of the sewer as each lot is being developed. However, large developments in the nearby areas have cooperated with the sewering agencies in extending the sewer lines for their new developments and this may reduce the overall cost of extending sewers to the area.

3. LOT SIZE RESTRICTIONS

The minimum lot size requirements (Regional Board Resolution No. 89-57 and its amendments) are not applicable to most lots in Quail Valley area as these lots were approved by the County prior to the effective date of Resolution No. 89-57. Any new lot size restrictions for the area will create a significant economic hardship for the individual lot owners. More importantly, the existing septic system problems cannot be addressed through any lot size restrictions.

4. CLUSTERED ON-SITE SYSTEMS

A clustered on-site system would collect domestic wastes from a number of residences and treat it at a centralized on-site system. For such a system to function properly, a centralized location with suitable hydrogeology must be available, some entity has to take responsibility for the maintenance of the system and a collection system must be built and maintained. The soil conditions and the groundwater levels in the area are not suitable for such a centralized system. Several small-centralized collection systems may prove to be more expensive than a master planned, centralized sewer system.

5. STRICTER ENFORCEMENT OF EXISTING REQUIREMENTS FOR SEPTIC SYSTEM USE

As discussed above, the County has increased its oversight of percolation testing to assure compliance with relevant County and Regional Board septic system requirements. As noted, there is a significant concern that erroneous testing and/or reporting may have led to inappropriate approvals. This increased oversight will be a necessary part of actions to address the septic system problems in Quail Valley until sewer systems become available. The County is also proposing to prohibit new septic systems in the most densely populated areas where chronic problems with septic systems were identified.

To the extent that the existing requirements themselves are not adequate to address the soil and hydrologic conditions in areas such as Quail Valley, revisions may be necessary in future. However, revisions to the requirements would likely require substantial time; delayed action to complete such revisions, if appropriate, would not address the immediate water quality and public health threat posed by the use of the existing systems.

6. CREATION OF SEPTIC SYSTEM MANAGEMENT ZONE

The creation of a septic system management zone and an entity to manage it is essentially a combination of Alternatives 4 and 5, above. Management of septic systems in the area will not address septic system failures, given the inherent problems of poor soils and high groundwater.

7. REQUIRE MONITORING OF THE EXISTING SYSTEMS

All septic system users may be required to provide technical and monitoring reports in accordance with Water Code Section 13267. For Quail Valley, sufficient evidence has been collected to indicate that there is a serious water quality, public health and public nuisance problem resulting from the failure of septic systems in the area. Further monitoring and reporting will not solve the problem.

8. PERFORMANCE-BASED SYSTEMS AND/OR HYBRID MANAGEMENT PROGRAMS

This is a combination of prescriptive design requirements with performance-based requirements. Prescriptive design requirements already exist and performance-based systems will not function under the hydrogeologic conditions that exist in Quail Valley.

9. LOCAL COLLECTION AND TREATMENT SYSTEMS

This is a scaled down version of the sewering agency proposals to extend the sewer to the area to provide centralized treatment. Any local collection and treatment involves installation of sewer lines and construction and operation of

package or other treatment systems. Given discharge requirements for surface discharge, this alternative would clearly not be cost-effective.

10. ALTERNATE ON-SITE TREATMENT SYSTEMS

There are other engineered systems, such as mound or evapotranspiration systems, that might function where the groundwater is high and the soil is unsuitable for septic system use. Since many of the existing systems are failing, those systems would have to be reengineered and retrofitted. Since some of the septic systems are already below the high groundwater levels, it would be difficult and expensive to reengineer such systems. Retrofitting the existing systems with engineered systems would likely not be feasible due to space limitations. Even new alternative systems may not be feasible because of small lot sizes. Mound and other engineered systems are expensive and difficult to maintain.

11. SEPTIC SYSTEM PROHIBITION THROUGH BASIN PLAN AMENDMENT

If septic systems are prohibited in the area, other alternatives for domestic wastewater disposal must be made available. The most viable alternative to septic system use for the Quail Valley area is to extend sewer service to the area. As indicated above, EMWD has completed its preliminary assessment of the feasibility of extending sewers to the area and concluded that it is a feasible alternative. If septic system prohibition is linked to the extension of sewers to the area, this alternative may be the most feasible alternative to protect public health and water quality.

12. NO ACTION ALTERNATIVE

If no further action is taken to address the serious septic system issues in Quail Valley, public health and water quality impacts from failing systems will continue and grow worse as development of the area proceeds. The failing septic systems will cause conditions of pollution, contamination and nuisance. The Regional Board would fail to administer its responsibilities pursuant to the Water Code. The No Action alternative is not an acceptable option.

VII. RECOMMENDED ALTERNATIVE – SEPTIC SYSTEM PROHIBITION

Board staff recommends that a waste discharge prohibition on the continued use of septic systems in the Quail Valley area be adopted as an amendment to the Basin Plan. Compliance with the prohibition would be required once sewers are made available to the area.

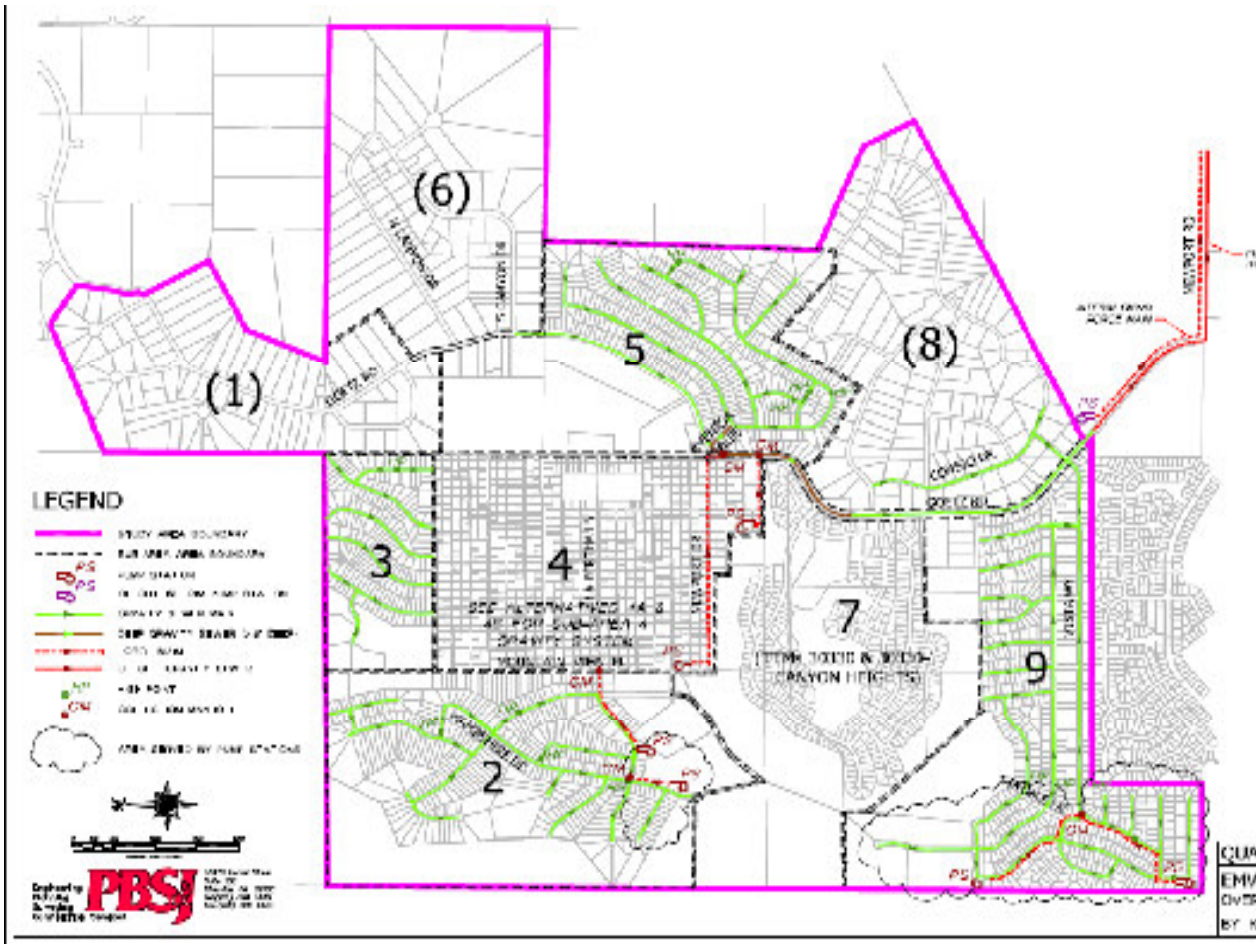
Figure M shows the area of the EMWD Quail Valley Sewer Improvements Alternatives Study. The study indicates that sewering the areas identified as 2, 3, 4, 5, 9, and a portion of 8 would be feasible. Area 7 is already being sewered

as part of a current development project, and it is not recommended that Areas 1, 6, and the remainder of 8 be sewered at this time.

Staff agrees that the project identified in the EMWD Quail Valley Sewer Improvements Alternatives Study should be pursued for the area (sewering within Areas 2, 3, 4, 5, 9, and a portion of area 8, with the continued use of septic systems within Areas 1, 6, and the remainder of 8). As discussed earlier in this staff report, we believe that the public health and water quality impacts within and downgradient of the community of Quail Valley are the result of the combined discharges from septic systems in Areas 1 through 9, excluding the newly developing Area 7. Further, the prohibition on new septic systems in areas 4 and 9, the elimination of septic system discharges from the developed lots in Areas 2, 3, 4, 5, 9, and a portion of 8, as well as an ongoing prohibition of discharge from any lots within these Areas developed after the availability of sewers, will likely eliminate the public health and water quality problems that currently result from the use of septic systems within the Quail Valley community. Again, it is expected that the elimination of septic system discharges from the areas proposed for sewering will reduce the stresses on the subsurface hydrologic flow regime. This reduction will directly benefit the Areas with low-density lots; septic systems in these Areas (Areas 1, 6, and the remainder of 8) are expected to function properly in the absence of the discharges from the high-density lots. However, following implementation of the recommended project, if it is later determined that the septic system discharges from the lots in areas 1, 6, and the unsewered portion of 8 continue to cause public health and water quality problems, staff recommends that the Basin Plan amendment be re-opened to require the elimination of discharges from these systems.

Staff also recommends that if, the sewering program fails to make significant progress or stalls, the Board direct that staff bring for Board consideration an amended Basin Plan amendment, including an immediate prohibition on all new discharges, and as discussed above, a time schedule for elimination of all other septic system discharges from all existing systems within the community. The long-term threat to the public health and to water quality would require this type of response in the event that it did not appear that a solution to the problem could be expected within the near future.

Figure M
Approximate Boundaries of Proposed Septic System Prohibition in Quail Valley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VIII. PUBLIC PARTICIPATION

Public participation is an important and requisite part of the Basin Plan amendment process. On June 6, 2005, Board staff, along with staff of Riverside County Health, EMWD and EVMWD and representatives from the County Supervisor's office and the City of Canyon Lake, conducted a town hall meeting in Quail Valley to discuss septic system problems and potential solutions. Comments received at this meeting and responses are posted on the Regional Board's webpage at:

http://www.waterboards.ca.gov/santaana/html/quail_valley.html

On December 8, 2005, Board staff held a public workshop and CEQA Scoping Meeting in Lake Elsinore at the Canyon Lake Middle School Multi-purpose Room. Board staff presented the draft environmental checklist and an overview of the proposed Basin Plan amendment. EMWD staff presented its sewer feasibility study findings. Other representatives from local governmental agencies and sewer district were also present. Then other interested parties, community representatives, and residents from the area provided comments. Comments received at this meeting and responses are posted on the Regional Board's webpage.

The Regional Board held a Public Workshop concerning this matter on May 8, 2006. Board staff discussed the problems associated with septic system use in Quail Valley and briefly described the proposed Basin Plan amendment to prohibit the use of septic systems in the area. EMWD staff presented information from its Quail Valley Sewer Improvements Alternatives Study, including cost estimates to construct a sewer system. The Board also received comments from interested persons. Comments received from this meeting, along with responses to those comments, are posted on the Board's webpage.

The Regional Board at a public hearing will consider adoption of the proposed Basin Plan amendment, which may be revised in response to comments. The public hearing will be held as follows:

DATE and TIME: August 14, 2006, 6:00 p.m.

PLACE: Canyon Lake Middle School's Multi-Purpose Room
33005 Canyon Hills Road
Lake Elsinore, CA 92532

Notices of public workshops and public hearing will be published in the local newspapers and mailed to residents in the impacted area and other interested parties. The Notices and all relevant documents will also be posted on the Regional Board's webpage.

IX. REGIONAL BOARD CONTACT

All enquiries regarding the proposed Basin Plan should be directed to:

Steve Mayville, Section Chief
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Phone: 951-782-4992
Email: Smayville@Waterboards.ca.gov

References:

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2. USEPA, Onsite Wastewater Treatment Systems Manual, February 2002.

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7. Quail Valley Sewer Improvements Alternatives Study, Eastern Municipal Water District, prepared by PBSJ, August 2005 (Draft)

8. Klassen, C. D. M. O. Amdur, and J. Doull (1986), Casarett and Doull'd Toxicology, New York, New York: McMillan Publishing Company

9. Water Quality Standards for Coastal and Great Lakes Recreation Waters, US EPA, 2004, 40CFR Part 131

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13. Geologic Society of America Bulletin, v.82, p.3421-3448, December 1971

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