Future Water Quality

PROTECTION OF THE WATER RESOURCE

The key to the long-term reliability and usability of a water supply source is water quality. The quality of a water supply, whether its end beneficial use is municipal, agricultural, or environmental, will dictate if and how that water is used. There are numerous potential end users of a particular water supply source, and the water quality requirements for each use vary. Often, in fact, different water uses may have conflicting water quality stipulations.

There are two primary perspectives in water quality control. The first perspective is maintaining quality in the management and control of natural and recycled water, that is, the quality of the source water. The second perspective is the control of water quality at its end use, such as the quality of water served by local purveyors to their paying customers. Each primary perspective has distinct problems and barriers to overcome to meet standards required of it by the end user. Furthermore, each perspective is governed by complex, but separate, sets of regulatory control.

The establishment and enforcement of water quality standards for the discharge into and maintenance of water throughout California is managed by the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCB). The County of San Luis Obispo lies entirely within Region 3 - Central Coast Regional Water Quality Control Board. The Central Coast RWQCB prepared a Water Quality Control Plan for the Region in September, 1994. The purpose of the plan is to develop management objectives to maintain the highest reasonable water quality possible. In general, water quality control plans designate beneficial uses of water, then establish water quality objectives designed to protect them.

From the perspective of water quality protection, objectives are the limits or levels of water quality characteristics which are established to protect beneficial uses. Complicating the issue is the requirement that water quality objectives must protect all designated uses. Thus, when more than one water quality limit exists for a water quality characteristic, the more restrictive limit is used as the water quality objective. The water quality constituents or characteristics identified by the RWQCB for which objectives are established include:

Water Quality Characteristics for which Water Quality Objectives are Established

Chemical Constituents	Tastes and Odors	Human Health and Ecological Toxicity
Bacteria	Biostimulatory Substances	Color
Dissolved Oxygen	Floating Material	Oil and Grease
Pesticides	pH	Radioactivity
Salinity	Sediment	Settleable Material
Suspended Material	Temperature	Turbidity

WATER QUALITY OBJECTIVES

The mandate of the SWRCB and its regional Boards is to establish water quality objectives to protect present and future beneficial uses of water in the State of California. Achievement of that mandate is accomplished primarily by imposing waste discharge requirements and through enforcement of the Water Quality Control Plan (Basin Plan). The objectives for each water source, whether surface water streams, estuaries, shallow ground water (underflow), or large ground water basins, represent the average water quality for that defined source, and thus varies as a function of the average water quality of the natural water. The SWRCB enforces the federal Clean Water Act on behalf of the U.S. EPA. Most of the quantitative objectives are based on the California Code of Regulations (CCR), Title 22 - State Drinking Water Standards. Other considerations include the University of California Agricultural Extension Guidelines for Agricultural Irrigation Use, the Porter-Cologne Water Quality Control Act, and the Water Quality Control Board's Nondegradation Policy.

Surface Water Quality Objectives

The municipal and agricultural water quality objectives for all surface waters in the County are based generally on the CCR, Title 22 requirements. Specific objectives are discussed in detail in the Basin Plan. The RWQCB has established specific water quality objectives for selected surface waters, which are intended to serve as a baseline for evaluating future water quality management. The objectives established by the Board for specific creeks or watersheds in the Water Planning Areas include

Surface Water Quality Objectives (mg/L) (1)

WATER PLANNING AREA SUB AREA	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	BORON	SODIUM
Maximum Contaminant Level CCR, Title 22	**500/1000/1500(2)**	**250/500/600(2)**	**250/500/600(2)**	**NS(3)**	**270(4)**
WPA 1 - North Coast Santa Rosa Creek	500	50	80	0.2	50
WPA 3 – Los Osos/Morro Bay Chorro Creek	500	50	50	0.2	50
WPA 4 - San Luis Obispo/Avila San Luis Obispo Creek	650	100	100	0.2	50
WPA 5 - Five Cities Arroyo Grande Creek	800	50	200	0.2	50
WPA 9a – Salinas Salinas River	250	20	100	0.2	20

(1) Adapted from Water Quality Control Plan, CRWQCB, Central Coast Region, 1994, Table 3-7, p. III-13. Objectives shown are annual mean values. Objectives are based on preservation of existing quality or water quality enhancement believed attainable following control of point sources.

(2) Recommended Concentration/Upper Maximum Concentration/Short Term Concentration

(3) No Standard

(4) U.S. EPA Water Quality Criteria for Water, recommended sodium level for those with moderately restricted salt diets.

Ground Water Quality Objectives

The Basin Plan outlines several ground water quality objectives that pertain to all ground waters in the County. Primary among these objectives are that ground water shall not contain taste or odors that adversely affect beneficial uses, and that radionuclides shall not be present in concentrations that are harmful to human, plant, animal, or aquatic life.

For the most part, water quality objectives for municipal and domestic ground water supplies require that the various constituents shall not exceed limits specified in the California Code of Regulations, Title 22. In addition to the general guidelines and objectives, certain specific objectives have been established for selected ground water basins, as shown in the table below:

Ground Water Quality Objectives (mg/L)[1]

WATER PLANNING AREA GROUND WATER BASIN	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	BORON	SODIUM	NITRATE (as nitrogen) (NO_3-N)
Maximum Contaminant Level CCR, Title 22	**500/1000/1500[2]**	**250/500/600[2]**	**250/500/600[2]**	**NS[3]**	**270[4]**	**10**
WPA 1 - North Coast Santa Rosa	700	100	80	0.2	50	5
WPA 3 – Los Osos/Morro Bay Chorro	1000	250	100	0.2	50	5
WPA 4 - San Luis Obispo/Avila San Luis Obispo	900	200	100	0.2	50	5
WPA 5 - Five Cities Arroyo Grande	800	100	200	0.2	50	10
WPA 6 - Nipomo Mesa Nipomo Sub-basin	710	95	250	0.15	90	5.7[5]
WPA 7 – Cuyama Cuyama Valley	1500	80	--	0.4	--	5
WPA 8 – California Valley Soda Lake	Ground water basin currently exceeds usable mineral quality					
WPA 9a – Salinas San Miguel Paso Robles Templeton Atascadero	 750 1050 730 550	 100 270 100 70	 175 200 120 85	 0.5 2.0 0.3 0.3	 105 225 75 65	 4.5 2.3 2.7 2.3
WPA 9b – Creston Central	400	60	45	0.3	80	3.4
WPA 9c – Shandon Estrella Shandon	 925 1390	 130 430	 240 1025[6]	 0.75 2.8	 170 730	 3.2 2.3

(1) Adapted from Water Quality Control Plan, CRWQCB, Central Coast Region, 1994, Table 3-8, p. III-16. Objectives shown are median values based on data averages. Objectives are based on preservation of existing quality or water quality enhancement believed attainable following control of point sources.
(2) Recommended Concentration/Upper Maximum Concentration/Short Term Concentration
(3) No Standard
(4) U.S. EPA Water Quality Criteria for Water, recommended sodium level for those with moderately restricted salt diets.
(5) Ground water basin currently exceeds usable mineral quality.
(6) Standard exceeds California Secondary Drinking Water Standards, CCR, Title 22. Water quality standard is based upon existing water quality. If water quality degradation occurs, the Regional Board may consider salt limits on appropriate discharges.

THREATS TO ATTAINING OBJECTIVES

Potential threats to water quality fall into two main categories, including point sources and nonpoint sources of discharge.

Point Sources

Point sources are waste discharges or waste loads from a single identifiable source, or from an identifiable geographical area. These include municipal discharges from wastewater treatment plants, industrial discharges, transportation spills, controllable storm runoff, discharge from agricultural products processors such as wineries, solid waste landfills, and confined animal operations such as feedlots and dairies.

Control of these point sources of pollution falls under the jurisdiction of the RWQCB. To legally discharge any significant volume to an area overlying a ground water basin, the discharger must obtain a waste discharge permit from the RWQCB. All waste discharge facilities with permits are monitored monthly for discharge volume, discharge concentrations, and increased salt load.

Nonpoint Sources

Nonpoint source pollution has been identified as one of the most significant sources of ground water pollution in the United States. Nonpoint sources of pollution are typically defined as waste discharges from land use practices where the waste is not collected and disposed of in a controlled manner. Nonpoint source pollution is also the discharge of water over a diffuse area where the specific source cannot be defined or located. Pollution caused by a nonpoint source can be either chemical, that is, contamination of a water source by uncontrolled runoff of contaminated runoff water, or non-chemical, such as sediment loading and other erosional effects of uncontrolled runoff. Some typical nonpoint sources include urban drainage and storm runoff, runoff from agricultural fields (both erosional and chemical), large area septic tank effluent disposal, water softening brine disposal, road construction and other grading, mining, and some grassland management.

Because nonpoint source pollution is not usually traceable to discrete sources and may vary with time, control and mitigation is more difficult than with point sources. It is usually most effectively achieved through the use of best management practices, which are developed and enforced by the RWQCB and various federal and state legislation, and implemented by property owners. There have been numerous examples of successful implementation of voluntary land stewardship programs that have reduced nonpoint source discharges.

Water Quality Threats at the Source

Mineralization

As discussed above, when water percolates through soils, it reacts with minerals and compounds present in the soil. Naturally present minerals and salts are dissolved and carried with the water, and as the water is used and recycled through various processes, salt and mineral concentrations in the water increase. The Soda Lake area of WPA 8 -- California Valley is a prime example of natural salt loading through mineralization. Many of the ground water basins throughout the County, particularly the Paso Robles Basin and some of the coastal streams and basins, are the subject of concern because of long histories of agricultural practices that have resulted in increased salt loading. Overdrafted ground water basins often demonstrate gradual or incremental water quality degradation. In areas of sea water intrusion, the presence of bromides in the sea water is a cause of concern because of the potential formation of bromate disinfection by-products when treated for drinking water, as discussed above.

Abandoned Mines

Runoff from abandoned mines often results in heavy mineral loading of surface water bodies. Abandoned mines in the North Coast area, the Pozo and La Panza regions of the Salinas area, and most significantly, the Nacimiento area including Adelaida, have all contributed to the introduction of chromium, lead, zinc, mercury, and arsenic in streams and surface water bodies. Heavy metal loading has not as yet been a significant health threat in County water supplies. In Lake Nacimiento, concentrations of mercury (below levels of concern to humans) have contributed to accumulation in the fish population.

Agricultural and Urban Runoff

Most runoff pollution is nonpoint, which means that it is typically difficult to identify and even more difficult to control and mitigate. Agricultural runoff may contain chemical residues, salts, nutrients, and a variety of chemicals or minerals that can contribute to the formation of disinfection by-products. Concentrated agricultural activities, such as dairies and feedlots, have contributed to the introduction of organic materials to the ecosystem, and poor erosion control has led to sediment loading of stream and surface water systems.

Pollutants are contained in urban runoff from both point and nonpoint sources. Urban runoff also contributes heavy metals, toxic organics, oils, and other pollutants. The EPA regulates storm water runoff, generally considered one of the most significant sources of nonpoint pollution. Increased runoff from development contributes to erosive stream velocities and can cause stream erosion with associated sediment loads.

Wastewater discharge, whether through municipal treatment plants with direct discharge to the ocean or to local streams, or nonpoint discharge from individual septic disposal in rural settings, is a major source of surface and ground water pollution. The potential for increased impacts on water quality will increase as additional wastewater treatment plants are brought on-line with direct discharge into surface waters. And, as the rural population of the County grows, the impacts of diffuse individual septic systems will also increase the nitrate and salt loading into the underlying ground water basins.

A particularly widespread and complex problem in local ground water basins is the problem of nitrates. Nitrates are nitrogen-containing compounds required to support plant life. Elevated nitrate concentrations usually appear as a result of fertilizer applications, animal waste, septic tanks, and wastewater treatment plant sludge disposal, and the natural conversion of nitrogen by nitrogen fixating plants. Throughout California, the most important source of nitrates in soils is from agricultural practices. There are local occurrences of elevated nitrates, however, that can be attributed to intensive septic tank usage in relatively small areas.

Nitrates move through the soil with percolating water, and can present a significant public health problem once it reaches the ground water. The most serious problem with nitrates in most situations is that treatment to remove them is sufficiently expensive that it is impractical for most community systems to afford it. Typically, wells with nitrates are taken out of service and replaced by other wells, or with new wells with deeper sanitary seals and/or perforations that tap deeper producing zones. In instances where this is not feasible, mitigation of nitrate contamination is generally accomplished by blending the nitrate-rich water with other water sources.

The Nipomo Mesa, Los Osos Valley, Chorro Valley, and portions of the Paso Robles ground water basin, as well as localized areas in coastal canyons, have all experienced increased, and still increasing, concentrations of nitrates. Because of the difficulty and expense of treatment, efforts to control nitrates must go to the pollution source.

One of the more recent pollution concerns is the contamination of drinking water with methyl tertiary butyl ether (MTBE). MTBE is used as a gasoline additive to reduce emissions and aid combustion, and was first used in recent years to meet federal Clean Air Act requirements. It is an extremely mobile compound, and is being found throughout California in water supply wells (from leaking underground storage tanks) and surface reservoirs (from recreational activities and surface runoff). The EPA has classified it as a possible carcinogen, so the State of California has imposed an interim action level concentration of 35 mg/L in drinking water. Although MTBE has as yet not been found to be a significant problem in San Luis Obispo County, its presence has significantly impacted water supplies in portions of southern California and in the Central Valley. Recent legislation required the State Department of Health Services to adopt drinking water standards for MTBE. The secondary standard will be established by July 1, 1998, with the establishment of a primary standard by July 1, 1999. Implementation of the standards, coupled with the increased likelihood of detection, will likely present a significant localized problem for the County in the near future.

Current Water Quality Threats - San Luis Obispo County

The water quality of most public supply sources in San Luis Obispo County is generally fair to good, and typically suitable for most beneficial uses. There are areas throughout the County, however, where some low flow surface waters and some ground waters are less suitable because of the presence of unacceptable concentrations of certain minerals or constituents. Some of the causes of water quality degradation in the County’s waters include, as described above, natural contamination, agricultural runoff, mine discharge, landfill leakage and runoff, urban runoff, waste water, and sea water intrusion. Local petroleum spills and discharges, including Avila Beach, Guadalupe, and San Luis Obispo’s Tank Farm Road have resulted in significant current and future contamination and cleanup problems. The following table identifies many of the water quality problems, by Water Planning Area, facing San Luis Obispo County today.

Potential Water Quality Problems -- Water Planning Areas of San Luis Obispo County

Water Planning Area	Ground Water Basin	Natural Contami-nation	Pathogens	Agricultural Runoff	Petroleum/ Mine/Land-fill	Urban Runoff	Waste Water	Sea Water Intrusion
1. North Coast	San Carpoforo		X		X			
	Arroyo de la Cruz		X	X				
	Pico		X		X			X
	San Simeon		X	X	X		X	X
	Santa Rosa		X	X	X	X		X
	Villa	X	X	X				X
2. Cayucos	Cayucos	X	X	X				X
	Old		X					X
	Toro	X	X	X				X
	Whale Rock Res.		X					
3. Morro Bay/Los Osos	Morro	X	X	X		X		X
	Chorro	X	X	X		X		X
	Los Osos		X	X		X	X	
4. San Luis Obispo	San Luis Obispo	X	X		X	X	X	
5. Five Cities	Pismo Creek-Edna Valley	X		X	X		X	
	A.G. Plain & Tri Cities Mesa	X			X	X		?
	Lopez Reservoir.		X					
6. Nipomo Mesa	Nipomo Mesa subbasin	X		X			X	?
	Santa Maria	X		X				?
7. Cuyama	Cuyama	X	X	X	X			
8. Calif. Valley	Carrizo	X		X				
9a. Salinas	Paso Robles	X	X	X	X	X	X	
	Salinas Reservoir		X					
9b. Creston	Paso Robles	X	X	X	X			
9c. Shandon	Paso Robles	X	X	X	X			
10. Nacimiento	Nacimiento Reservoir	X	X		X		X	

WATER QUALITY REGULATORY CONTROL

Water Treatment Considerations

Disinfection By-Products

As water percolates through soils, it dissolves organic compounds present in the soil. Certain soils high in organic materials, or soils from forested or heavily vegetated areas, often contain very high concentrations of these organic compounds. When these organic compounds are exposed to chlorine, which has been the primary disinfectant in drinking water treatment, the reaction forms carcinogenic disinfection by-products such as trihalomethanes and haloacetic acids.

Maximum contaminant levels (MCL) of trihalomethanes for drinking water has been established by the U.S. Environmental Protection Agency and by the State Department of Health Services, according to the Safe Drinking Water regulations. Currently, no standards exist for haloacetic acids, and the MCL for trihalomethanes in drinking water is 0.10 mg/L. Of potential significance to all water purveyors that currently use chlorine as the primary disinfectant in drinking water treatment is the expected upcoming revision of drinking water standards by the EPA. According to the California Water Plan Update (DWR Bulletin 160-98), the new MCL for trihalomethanes is expected to be 0.08 mg/L by late 1998, along with a new MCL of 0.06 mg/L for haloacetic acids.

Many water treatment plants have recently switched over to chloramines or ozone as the primary disinfecting agent in response to rising concerns over trihalomethanes and haloacetic acids. The advantages of ozone are that it effectively kills pathogens, reduces taste and odor problems, and significantly reduces production of trihalomethanes and other by-products. However, some waters containing bromide compounds have been found to form bromate during ozone treatment, which has been found to be more carcinogenic than trihalomethanes and haloacetic acids. When the EPA reports new drinking water standards in late 1998, a new MCL of 0.01 mg/L for bromate is expected. Further, ozone does not provide disinfection residual needed in distribution systems.

Pathogens

Federal and state urface water treatment rules require that all drinking water received from a surface water source be filtered and disinfected to remove or kill viruses, bacteria, and protozoans. Although *Giardia lamblia* and *Cryptosporidium* are the best known and are responsible for most of the serious outbreaks nationally in the past several years, the following table lists several of the waterborne diseases of concern.

Some Known Waterborne Diseases in the U.S. (1)

Disease	Microbial Agent
Amebiasis	Protozoan (*Entamoeba histolytica*)
Campylobacteriosis	Bacterium (*Campylobacter jejuni*)
Cholera	Bacterium (*Vibrio cholera*)
Cryptosporidiosis	Protozoan (*Cryptosporidium parvum*)
Giardiasis	Protozoan (*Giardia lamblia*)
Hepatitis	Virus (hepatitis A)
Shigellosis	Bacterium (*Shigella* species)
Typhoid fever	Bacterium (*Salmonella typhi*)
Viral Gastroenteritis	Viruses (Norwalk, rotavirus, and other types)

(1) Source: *The California Water Plan Update*, Public Review Draft, DWR, Bulletin 160-98

There have been several documented cases recently of widespread illnesses and even deaths caused by *Cryptosporidium* outbreaks. Usually, the outbreak is linked to an operational failure in the water treatment plant, although there are many other means by which a water supply can be infected with disease-causing organisms. The prevalence of treatment plant failures as the cause of a *Cryptosporidium* outbreak, however, points out the significance of maintaining high quality water at the source without depending on end-use treatment.

The concern about waterborne diseases will likely result in regulatory control of disinfection requirements for ground water throughout California. Currently, the California Department of Health Services (DHS) combats the presence of pathogens in ground water supplies through enforcement of the Surface Water Treatment Rule, whereby public ground water supply wells must be located more than 150 feet from a surface water body. Furthermore, local offices of the State DHS have the power and ability to require ground water disinfection through well head chlorination.

TREATMENT REGULATIONS

Safe Drinking Water Act

The Safe Drinking Water Act is the primary federal regulation controlling drinking water quality. Originally implemented in 1974 with significant revisions in 1986, the SDWA originally set standards for 83 individual constituents, including pesticides, trihalomethanes, arsenic, selenium, radionuclides, nitrates, toxic metals, bacteria, viruses, and pathogens. The 1996 amendment to the Act made some significant changes, most of which resulted in more stringent application of controls. One of the new amendments to the Act requires the EPA to publish and update the list of contaminants not subject to current control, and to annually review regulations of at least five contaminants from that list, selected on the basis of risk assessment. The amended Act also adopted a more rigorous schedule for amending the Disinfectants/Disinfection By-Products Rule and the Enhanced Surface Water Treatment Rule, both of which are now due to take effect in late 1998.

The current Surface Water Treatment Rule stipulates that all water systems using surface water or ground water under the influence of surface water must provide treatment, typically through disinfection and filtration, to protect against biological contamination. Since 1993 when the SWTR came into effect, many water users have had to either remove some water sources from their distribution system, or add expensive disinfectant treatment processes. The additional treatment, however, has in many cases resulted in even higher levels of trihalomethane production, which then makes it difficult to meet the requirements of the Disinfectants/ Disinfection By-Products Rule.

The conflict described above is just one example of the problems that water treatment agencies face in meeting the burgeoning volume of regulations and standards. The rising problem with pathogens has resulted in standards requiring additional disinfection. The need to reduce trihalomethane and haloacetic acids resulting from disinfecting water with chlorine had resulted in additional regulation of disinfection. However, if the disinfection demands are increased to reduce pathogen outbreaks, disinfection by-products are increased. Similar problems exist for surface water treatment with elevated organic compounds and/or bromides. Thus, the conflict will continue to develop while the purveyors and general public weigh the risks, costs, and benefits of higher and higher standards of water quality.

A further 1996 amendment to the SDWA requires each state to develop a Source Water Protection Plan to identify the water sheds of all drinking water sources, identify sources of contamination, the evaluate the risk of each supply to the occurrence of each contaminant. This comprehensive and ambitious program is intended to address all the sources and causes of pollution within any single watershed. For the County of San Luis Obispo, some of the potential sources and causes of water quality problems are shown on the following table (as adapted from the California Department of Health Services, Office of Drinking Water, January 1993).

Sources, Causes, and Areas of Concern of Water Quality Degradation

Source of Contamination	Pollutant	Source	Local Water Planning Area of Concern
Natural Processes	Mineralization	Mineral deposits, mineral-rich soils, hot springs, sea water intrusion	Entire County
	Asbestos	Serpentinite formation (Franciscan Fm)	North Coast, Cayucos, Morro Bay, SLO/Avila, Five Cities, Nipomo Mesa, Nacimiento
	Hydrogen sulfide	Organic-rich ground water	Nipomo Mesa, Salinas, Creston, Shandon, North Coast
	Metals	Mine tailings	Nacimiento, North Coast
	Radon	Geologic formations	Salinas
Commercial Business	Gasoline	Underground storage tanks	All WPA's with urban population
	Solvents	Dry cleaners, industry	All WPA's with urban population
Municipal	Viral & Microbial agents	Sewage discharge, storm runoff	All WPA's with urban population
	Pesticides	Storm runoff, golf courses, agricultural practices	Entire County
	Nutrients	Storm runoff	Entire County
	Liquid wastes	Household waste, septic tanks, industrial discharge	Entire County
Industrial	VOCs, metals, solvents, acids	Electronics manufacturing, hazardous waste disposal, transporters	SLO/Avila, Five Cities, Salinas
Solid Waste Disposal	Solvents, pesticides, organics, petroleum waste	Disposal sites	Five Cities, California Valley, Salinas
Agricultural	Pesticides, petroleum, microbial agents, other hazardous matls	Fertilizer usage, chemical storage, feed lots, pastures, field runoff, chemical applications	Entire County
Accidental Spills	Various hazardous materials	Earthquakes, pipeline failures, tank failures, mechanical failure, flood damage, accidental releases, traffic	Entire County

SDWA Amendments to Ground Water Quality Protection

As discussed earlier, one of the growing concerns with ground water production and the use of ground water as a drinking water supply has the problem and threat of pathogens. To date, the County of San Luis Obispo, and California in general, has been free of serious outbreaks of *Giardia*, *Cryptosporidium*, bacteria, and viruses being found in water from wells. However, the threat is real and very serious, and regulatory action to combat it will likely lead to State-mandated statewide disinfection requirements for ground water (currently, all public water supply wells in San Luis Obispo County are required by the local office of the DHS to be disinfected). Current estimates from the EPA are that the Groundwater Disinfection Rule will be developed sometime in 1999, most likely to become effective sometime in 2002.

SDWA Amendments to Well Head Protection Program (WHPP)

Both the 1986 and 1996 amendments to the SDWA requires states to implement well head protection programs to prevent contamination of ground water in areas near drinking water supply wells. Many land uses discussed above compete directly with drinking water purveyors for their ground water supplies, and some of the uses threaten the quality of the water. California has been very slow to implement the WHPP, and is not expected to enforce the standards for several years. However, community purveyors should give consideration to implementing their own program. The EPA has recommended five steps towards implementation of a WHPP:

- Determine the area of protection for each well based on hydrogeologic information.
- Identify the potential sources of contamination or pollution that may have an adverse impact on the well.
- Form a community-based planning organization to plan, design, and implement the program.
- Develop and implement the plan.
- Plan for emergencies and contingencies for the location and use of alternate drinking water supplies.

Impact of Regulations on Cost of Future Supplies

The last 20 years has seen significant technological advances in the water treatment process, in response to advances in the ability to analyze water for ever increasing numbers and decreasing levels of concentrations of constituents. As new water quality concerns are realized, such as pathogens, the trend towards more drinking water regulations will also increase. As water treatment facilities balance the need for disinfection while minimizing or reducing disinfection by-products, the opportunity for major upset is increased dramatically with mechanical failure at the plant or with variation in the source water quality.

The City of San Luis Obispo recently completed a major overhaul to the water treatment plant, at capital costs greater than $10 million, to switch from chlorine to ozone as the primary disinfecting agent, as well as an increase in treatment capacity and other process upgrades. As other facilities contemplate pending regulations, or as North County municipalities plan for eventual treatment of Nacimiento water, the trend towards more severe drinking water regulations will be a large factor in the cost of developing new facilities. Municipal agencies and public purveyors will face implementation of potentially considerable rate increases to recover the capital costs of upgrading and/or building new treatment facilities. As an example, estimates from the Metropolitan Water District of Southern California indicate that the treatment costs to meet just the new Disinfection By-Products Rule may rise 100% to 150%. According the Department of Health Services, Office of Drinking Water, the added costs to implement the new regulations already passed, will range from 10% to 65%. The additional proposed regulations may increase these costs by 45% to 140%.

For the majority of San Luis Obispo County purveyors that depend on ground water for their drinking supplies, the pending implementation of the proposed Ground Water Treatment Rule will have far-reaching consequences.

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