This annual report has been prepared to inform the City of Santa Cruz water customers about their 2002 water quality. Included are details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. We are committed to providing our customers with accurate information about the quality of the drinking water that we provide. Last year, your tap water met all United States Environmental Protection Agency (EPA) and California State Department of Health Services drinking water health standards. The City of Santa Cruz Water Department vigilantly safeguards its water supplies. Once again, we are proud to assure our customers that they can have confidence in our on-going efforts to provide drinking water of the highest possible quality.

WHERE DOES OUR WATER COME FROM?

To provide water for our service area, the City of Santa Cruz depends on supplies from four locales: the North Coast Sources, the San Lorenzo River, Loch Lomond Reservoir and the Live Oak Wells. Except for the Live Oak Wells, these are all surface water sources dependent on rainfall and runoff.

Water from three North Coast Sources, the San Lorenzo River and Loch Lomond Reservoir is pumped to the Graham Hill Water Treatment Plant where it is treated to remove impurities and disinfected with chlorine. Thereafter, the water is distributed to the entire service area. During the dry season our supply is supplemented by groundwater that comes from the Live Oak wells near Pleasure Point. This water is treated at the Live Oak Water Treatment Plant to remove naturally occurring iron and manganese and then disinfected with chlorine. All sources are critical for meeting the water needs of the community.

WHY ARE THERE CONTAMINANTS IN DRINKING WATER?

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline, at (800) 426-4791. Information is also available at the EPA's drinking water website at www.epa.gov/safewater.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic Contaminants, such as salts and metals that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and Herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive Contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the EPA and the California Department of Health Services prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Regulations set by the Food and Drug Administration (FDA) and the Department of Health Services establish limits for contaminants in bottled water that must provide the same protection for public health.

DO I NEED TO TAKE SPECIAL PRECAUTIONS?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline, at (800) 426-4791.

WATER QUALITY DATA TABLE

The Table of Detected Contaminants lists all of the drinking water contaminants that we detected during the 2002 calendar year. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. The EPA or the California State Department of Health Services requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Contaminants not monitored in 2002 were not detected the last time that they were monitored.

WHAT ELSE IS KNOWN ABOUT OUR WATER?

There are a few water contaminants that have received particular attention in the news last year. Four of these are arsenic, hexavalent chromium, MTBE and perchlorate. You may be aware of issues with these contaminants from news reports on drinking water in areas outside of the City, around the State and the country. We have good news regarding these potential contaminants and our drinking water.

CONTINUES ON PAGE 4

Important Drinking Water Definitions

PHG Public Health Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

AL Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCLG Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

MCL Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

MRDL Maximum Residual Disinfectant Level: The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

PDWS Primary Drinking Water Standard: MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Data Table Units Description

n/m: Not Measured

NA: Not Applicable

ND: Not Detected

ppm: parts per million, or milligrams per liter (mg/L)

ppb: parts per billion, or micrograms per liter (µg/L)

TON: Threshold Odor Number

NTU: Nephelometric Turbidity Units. Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

<: less than

Inorganic Contaminants

CONTAMINANTS (units)	PHG MCLG	PDWS MCL	TREATED WATER[2]	SOURCE WATER RANGE[1] LOW	AVERAGE	HIGH	SAMPLE DATE	VIOLATION	TYPICAL SOURCE OF CONTAMINATION
Arsenic (ppb)	NA	50	<2	<2	<2	3.1	2002	No	Erosion of natural deposits; runoff from orchards, glass and electronics production wastes
Aluminum (ppm)	600	1000	35	<50	65	390	2002	No	Erosion of natural deposits; residue from some surface water treatment processes
Fluoride (ppm)	1.0	2.0	0.2	<0.1	<0.1	0.3	2001	No	Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Nitrate (ppm)	45	45	1.3	<2	1.2	4.2	2002	No	Runoff and leaching fromfertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Gross Alpha (pCi/L)	NA	15	n/m	<1	<1	1.5±1.2	2002	No	Erosion of natural deposits

Microbiological Contaminants

CONTAMINANTS (units)	PHG	PDWS MCL	TREATED WATER[3]	TREATED WATER RANGE[3] LOW	HIGH	SAMPLE DATE	VIOLATION	TYPICAL SOURCE OF CONTAMINATION
Total Coliform (Highest % of positive samples in one month)	0	5	0	0	0	2002	No	Coliform are bacteria that are naturally found in the environment and are used as an indicator that other, potentially harmful bacteria may be present

Volatile Organic Contaminants

CONTAMINANTS (units)	PHG MCLG	PDWS MCL	TREATED WATER[3]	TREATED WATER RANGE[3] LOW	HIGH	SAMPLE DATE	VIOLATION	TYPICAL SOURCE OF CONTAMINATION
TTHMs (ppb) [Total Trihalomethanes]	NA	80	45	1.7	72	2002	No	By-product of drinking water chlorination
HAA5 [Total Haloacetic Acids]	NA	60	28	<1.0	60	2002	No	By-product of drinking water chlorination

Inorganic Contaminants with Action Levels

CONTAMINANTS (units)	PHG	AL	TAP WATER 90TH PERCENTILE[4]	# OF SAMPLES EXCEEDING AL[4]	SAMPLE DATE	EXCEEDS AL	TYPICAL SOURCE OF CONTAMINATION
Copper (ppm)	0.17	1.3	0.66	0	2002	No	Corrosion of household plumbing systems
Lead (ppb)	2	15	<5	0	2002	No	Corrosion of household plumbing systems

Secondary Standards and Other Monitoring Results

Secondary Standards are MCLs applied to contaminants based solely on aesthetic considerations because they do not present any threat to public health.

CONSTITUENTS (units)	PHG	MCL	TREATED WATER[3]	SOURCE[1] OR TREATED[3] WATER RANGE LOW	AVERAGE	HIGH	SAMPLE DATE	EXCEEDS MCL	TYPICAL SOURCE OF CONTAMINATION AND ADDITIONAL INFORMATION
Chloride (ppm)	NA	500	n/m	11	30[1]	67	2002	No	Runoff/leaching from natural deposits: seawater influence
Color (CU)	NA	15	1	1	1[3]	4	2002	No	Naturally-occurring organic materials
Conductivity (micromhos)	NA	1600	372	235	372[3]	730	2002	No	Substances that form ions when in water: seawater influence.
Hardness (ppm)	NA	NA	158	112	158[3]	278	2002	NA	A measure of the major cations, primarily calcium and magnesium
Odor (TON)	NA	3	1	1	1[3]	2	2002	No	Naturally occurring organic material
Sodium (ppm)	NA	NA	22	11	28[1]	60	2002	No	Runoff/leaching from natural deposits. EPA regulations require us to monitor this contaminant while EPA considers setting a limit on it.
Sulfate (ppm)	NA	500	n/m	17	78[1]	239	2002	No	Runoff/leaching from natural deposits; industrial wastes
Turbidity (NTU)	NA	5 NTU and 95% <0.5 NTU	0.09	0.04	0.09[3]	1.33	2002	No	Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. High turbidity can hinder the effectiveness of disinfectants

[1] Source Water [2] Treated Water at Water Treatment Plant [3] Treated Water in Water Distribution System [4] Customer Tap Water

WATER QUALITY REPORT FROM PAGE 2

Currently the Maximum Contaminant Level allowable for arsenic is 50 ppb. The U.S. Environmental Protection Agency (USEPA) has adopted a revised arsenic standard of 10 ppb scheduled to take effect in January 2006. Arsenic can come from erosion of natural deposits, runoff from orchards, and glass and electronics production wastes. The Water Quality Data Table shows that we do detect very small amounts of arsenic, well below the 2006 standard, at some of our sources. However, arsenic is not detected in the treated water delivered to our customers.

Hexavalent chromium, the chemical contaminant of *Erin Brockovich* fame, is limited under the total chromium MCL of 50 ppb. Sources for hexavalent chromium are both industrial activity and natural deposits. The Office of Environmental Health Hazard Assessment is performing a health risk assessment, which will lead to a specific hexavalent chromium public health goal. All of our water sources are below the 1 ppb hexavalent chromium Detection Limit for Reporting (DLR).

MTBE is a gasoline additive that has contaminated sites all over the State as a result of leaks from underground gasoline storage tanks. We have done extensive MTBE monitoring in 2002. No MTBE has been detected.

Perchlorate is another water contaminant that has gotten a lot of recent publicity. Sources of perchlorate include rocket fuel and road flare manufacturing. There are a few significant contaminations in the State. Our water has been tested for perchlorate. Perchlorate has not been detected.

These four newsworthy water contaminants, arsenic, hexavalent chromium, MTBE and perchlorate are all being monitored and are not issues for our drinking water. We are fortunate to have excellent water sources!

2002 City Drinking Water Source Assessments Program (DWSAP)

Water purveyors were required in 2002, under the Safe Drinking Water Act, to conduct assessments of their drinking water sources. These assessments include a delineation of the areas around drinking water sources through which contaminants might move and reach drinking water supplies. In addition, they include an inventory of activities that might lead to the release of microbiological or chemical contaminants within the delineated areas. This enables determinations to be made as to whether the drinking water source might be vulnerable to contamination.

The City's 2002 assessments did not reveal any potentially contaminating activities which were previously unknown. Additionally, while the City's drinking water sources — like most water sources — are vulnerable to potential contamination, it should be noted that routine analysis of sources has never revealed any contaminants in excess of the maximum contaminant levels (MCLs) defined by the California Department of Health Services.

As many of the sources were characterized in a similar manner by the Drinking Water Source Assessments, the vulnerability summary below is broken out geographically and by the sources' respective general vulnerability.

Complete assessments can be viewed in their entirety by contacting Water Resources Management at (831) 420-5483 or wrm@ci.santa-cruz.ca.us

TAIT WELLS

Source water assessments for the Tait wells were conducted in January 2003. The Tait wells include Tait wells 1 and 4. These sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply:

- Fertilizer, pesticide/herbicide application
- Septic systems (low density)
- Sewer collection systems
- Surface water: streams, lakes, rivers

These sources are considered most vulnerable to the following activities not associated with any detected contaminants:

- Fleet/truck/bus terminals
- Photo processing and printing
- Plastics/synthetics producers

DISCUSSION OF VULNERABILITY

Nitrate is a contaminant of concern for the Tait wells. The wells' water quality records contain occasional nitrate spikes. Elevated nitrate concentrations may result from the more than 100 septic systems serving rural residential areas north of the City's river intake. Other portions of the well's protection zone are served by the City's sewer collection system, which could leak wastewater into the alluvial aquifer. Nitrogen in wastewater is converted to nitrates, which are highly soluble and readily transported through soil and groundwater.

A principal source of recharge to the Tait wells is leakage from the San Lorenzo River. The river is also a source of elevated nitrate, although at lower concentrations than the highest nitrate spikes observed in the well water. Routine identification, repair, and replacement of septic systems throughout the upstream watershed under the County's direction have helped control river nitrate levels. The nitrate concern is also addressed by the City's continued monitoring of surface and groundwater quality at Tait Street.

Given that the aquifer supplying the Tait wells receives recharge from river leakage, the DWSAP for the San Lorenzo River sources should be considered an essential appendix to this summary.

The Tait wells are also vulnerable to commercial, municipal, and industrial activities within their delineated protection zone. Numerous groundwater contamination sites exist near the Tait wells. However, these sites are downgradient of the estimated protection zone of the wells. All of these sites are currently undergoing remediation as well. Several facilities that have hazardous materials onsite are in the estimated protection zone. These sites have registered underground tanks and/or permits for onsite hazardous materials. Each is required to inventory and manage their permitted hazardous materials. Known or suspected inactive water supply wells, monitoring wells, and test holes are potential conduits for shallow or surface contaminants to reach the aquifer zone that supplies water to the Tait wells.

LIVE OAK WELLS

Source water assessments were conducted for the Live Oak wells in January 2003. These sources are considered most vulnerable to the following activities not associated with any detected contaminants:

- Automobile (gas stations)
- Known contaminant plumes
- Underground storage tanks — confirmed leaking tanks

DISCUSSION OF VULNERABILITY

Groundwater produced from the Live Oak wells contains excessive concentrations of iron and manganese that require treatment. These substances are considered naturally occurring and have fluctuated within a consistent range. The total mineral concentration in groundwater produced from Live Oak well 7, as indicated by measurements of electrical conductivity, experienced a stepped increase during the mid to late 1980s, rising from about 800 to more than 1,000 mS/cm, and thus exceeding the recommended limit (900 mS/cm), but not the maximum contaminant level (MCL) for drinking water (1,600 mS/cm). This increase appears to coincide with heavy pumping during the initial years of the 1987–1992 drought, and suggests that zones of poor quality groundwater are hydraulically connected with one or both of the aquifer units tapped by well 7. The high mineral concentrations persisted following the drought until appearing to diminish in the past couple of years. The water quality record for the wells indicates that these sources are potentially vulnerable to the migration of poor quality water into the production zone.

Other than these naturally occurring minerals, there have been no contaminants detected in the Live Oak well water supply. These sources are still considered vulnerable to activities located near the drinking water source, however. This area is densely developed with residential housing and commercial/industrial enterprises and several groundwater remediation sites exist in the general area. Numerous small manufacturing enterprises, a dry cleaner, repair shops, and hardware-parts stores are clustered in the area. These activities may use, handle, and dispose of chemicals that could impact soil and groundwater. Four municipal wells within the zones are inactive. These wells provide potential groundwater monitoring points and possible sources of emergency water supply. They also present potential conduits for contaminants to reach the aquifer. The City must weigh the potential benefits and risks posed by these wells to ensure that each is either adequately secured and properly sealed or abandoned. Well logs indicate that several private wells constructed since the 1950s may still exist in the area.

Groundwater modeling consistent with the hydrogeologic conditions and hydraulic properties of the aquifer supplying the Live Oak wells indicates a potential capture zone extending along the coast. Production wells near the coast raise concerns of seawater intrusion, i.e., that salt water may be drawn inland and into the pumping well, resulting in water too saline for use. The interface between fresh and saline groundwater has yet to be observed, and probably remains offshore. A continued and expanded monitoring program is needed to ensure the earliest possible detection of any signs of intrusion. Since constructing Live Oak wells 8 and 9, the City has formulated an expanded monitoring plan and begun steps for its implementation. Modeling also indicates that the aquifer supplying the Live Oak wells may receive direct recharge from two coastal surface water bodies in the vicinity. These

water bodies may contain brackish water and may be impacted by urban runoff, wastewater, and wildlife. The location of the proposed monitoring wells in the City's planned monitoring program appears to address this potential source of contamination.

LOCH LOMOND

A source water assessment was conducted for the Loch Lomond Reservoir in December 2002.

DISCUSSION OF VULNERABILITY

Contaminants have not been detected in the Loch Lomond Reservoir water supply. However, the source remains vulnerable to various potentially contaminating activities, including:

- Managed Forests (erosion potential and fire hazard)
- Illegal and unauthorized activities

The reservoir is vulnerable to all potentially contaminating activities within the San Lorenzo River watershed upstream of Felton, though coliform and nitrate levels decrease with residence time in the reservoir. The water quality of runoff from upper Newell Creek is representative of undeveloped, relatively natural, conditions characteristic of the most upstream and remote portions of the City's San Lorenzo River water supply. There are very few septic systems near the reservoir and Newell Creek. Timberland accounts for about one third of the Newell Creek watershed. Unimproved private roads and unused logging roads are sources of erosion. Unauthorized land grading activities are also sources of erosion. Fire could result in erosion. One identified illegal dumping site was associated with a drug lab within the watershed. This site has been remediated.

NORTH COAST SPRING

A source water assessment was conducted for the spring in January 2003. This source is considered most vulnerable to the following activities associated with contaminants detected in the water supply:

- Mining operations at the marble (i.e., limestone) quarry
- Septic systems- low density (<1/acre), rural, individual systems
- Animal feeding operations (individual horse paddocks and stables)

The source is considered most vulnerable to the following activities not associated with any detected contaminants:

- Surface water: streams, springs, ditches, and sinkholes that convey surface water and storm runoff in areas that feed underground karst deposits
- Wells: poorly sealed wells; test holes that have not been properly abandoned

DISCUSSION OF VULNERABILITY

As a groundwater source, the vulnerability of this spring is defined in terms of the estimated travel time of groundwater flow through the aquifer to the spring. However, because it is a karst aquifer with the potential for rapid groundwater flow through dissolution channels, it's protection zone is more analogous to that of a surface water source. Contaminants of concern for the City's spring water source are particulate matter and nitrate. Both contaminants, and particularly turbidity, have been of concern to the City Water Department for over 40 years. A marble quarry occupies 240 acres just north of the spring. Due to it's proximity and scale of operations (rock blasting, mining, and crushing), numerous studies have been undertaken to understand the mine's impacts on the spring. Particulate matter interferes with water treatment processes and is quantified by measuring turbidity. Elevated turbidity more often occurs in the wet winter months in response to surface water runoff and groundwater recharge containing suspended material. Water with suspended material can be introduced into the aquifer via surface runoff to sink holes, recharge from streams, surface runoff into poorly sealed wells or test holes, and recharge along fractures that provide minimal filtering. Surface water runoff from the immediate upgradient area (including the quarry) has been observed to percolate or otherwise drain into local karst features. Surface water capture by more distant karst sinks, such as swallow holes along Reggiardo Creek, is discussed in Drinking Water Source Assessment — Delineation of Surface Water Protection Zones.

Suspended material from the quarry is managed using conventional measures including controlling erosion near exposed rock and mine spoils, water diversion ditches and conveyance pipes, and stormwater detention ponds. Road maintenance aims to prevent erosion and prevent sediment-laden runoff from entering streams and groundwater.

Difficulties in establishing clear cause-and-effect relationships between the quarry operations and turbidity arise from the numerous mechanisms by which water and suspended material can enter the subsurface, as well as the complex nature of groundwater and suspended-material transport through the karst formation feeding the spring. Landsliding is another process, whether natural or quarry-induced, suspected to increase spring turbidity. Potential nitrate sources include septic systems and animal feeding operations within the overall recharge area. Septic systems are also located within the overall protection zone. Nitrogen in domestic wastewater and from animal operations is converted to nitrate, which is highly soluble and readily transported through soil and groundwater. Efforts to assess, control, and reduce nitrate levels include routine identification, repair, and replacement of septic systems throughout the source watersheds by Santa Cruz County, combined with ongoing monitoring of the spring and at nearby wells and streams by the City and County. Measures to improve waste management at animal facilities are being undertaken by County Environmental Health Services, including watershed surveys to identify, inspect, and communicate best management practices to owners of confined animal facilities. Another possible source of nitrate is residual ammonia nitrate from explosives used in marble quarry

operations. Limited sampling data from the quarry indicate nitrate in soil samples. Similar to issues regarding the quarry and turbidity, a definitive understanding of the potential cause-and-effect relationship between this source and elevated nitrate in the spring's discharge has been elusive.

NORTH COAST CREEKS

The North Coast surface sources include three creeks. Source water assessments were conducted for these sources in December 2002. These sources are considered most vulnerable to the following activities not associated with any detected contaminants:

- Animal feeding operations (individual horse paddocks)
- Septic systems: low density (<1/acre) rural individual systems
- Parks (trails that come close to the creek and allow horse access)
- Managed forests (erosion potential)
- Unauthorized activities associated with land grading and erosion control ordinances

DISCUSSION OF VULNERABILITY

Contaminants have never been detected in the North Coast creeks. However, the sources remain vulnerable to activities located near the creek corridors and intakes. Contaminants of concern include nitrate and total coliform bacteria (an indicator of potential pathogens). These contaminants are associated with animal wastes and may derive from animal feeding operations located near or on the creek banks, and animal contact via trails that cross or come near the creek. Animal operations are primarily rural, individual, horse paddocks. A combination of factors, such as poor manure management, bare ground, and periods of heavy rainfall, result in runoff from paddocks and stables to surface water and shallow groundwater. Animal operations such as horse paddocks, horse stables, poultry, and other domestic animals also occur on rural residential parcels. Santa Cruz County Health Services Agency is conducting watershed surveys to identify animal operations relative to the creek. Rural residential development and associated septic systems are found in these source watersheds within the protection zones delineated by the DWSAP. Nitrate and coliform bacteria also are associated with human wastewaters via discharges from poorly operating septic systems. Failing septic systems could result in incompletely treated wastewater and pathogens entering streams via surface runoff. Land erosion and storm-season runoff associated with unimproved roads, trails, and unapproved land grading practices also have the potential to degrade water quality.

SAN LORENZO RIVER SOURCES

The San Lorenzo River sources include two diversions, one in the lower portion of the watershed, north of the City of Santa Cruz and another in the upper portion. Assessments were conducted for these sources in January 2003.

These sources are considered most vulnerable to the following activities associated with contaminants detected in the water supply:

- Septic systems, both high density (>1/acre) and low density (<1/acre) individual systems, trailer park leachfields, and wastewater treatment plant leachfields
- Animal feeding operations (horse farms and paddocks)
- Managed forests (erosion potential)
- Illegal or unauthorized activities
- Transportation corridors: roads and streets
- Campgrounds and recreational areas
- Dry cleaners (PCE at the Upper San Lorenzo River diversion)[1]

These sources are considered most vulnerable to the following activities not associated with any detected contaminants:

- Automobile gas stations and repair shops
- Known contaminant plumes
- Registered underground storage tanks
- Historic waste dumps/landfills
- Mining: sand and gravel

DISCUSSION OF VULNERABILITY

Contaminants of concern for the City's San Lorenzo sources are coliform bacteria, nitrate, particulate matter, and perchloroethylene (PCE). Coliform bacteria are indicators of potential pathogens associated with animal wastes (e.g., animal feeding operations located near or on stream banks) and human wastewaters (e.g., poorly operating septic systems).

[1] Perchloroethylene or PCE, has been occasionally detected at the upper San Lorenzo River diversion. PCE is associated with a former drycleaner in Felton that is undergoing remediation. Levels measured at the diversion between August 1989 and June 2002 have never exceeded the 5 ug/L maximum contaminant level for PCE and it has not been detected when the diversion is active. PCE has not been detected at the lower diversion.

Also, human and animal water contact at parks and streams may contribute to coliform bacteria. Animal operations are primarily horse farms and individual horse paddocks. A combination of factors, such as poor manure management, bare ground, and periods of heavy rainfall, result in runoff from paddocks and stables to surface water and shallow groundwater. Santa Cruz County Health Services Agency is undertaking mitigation measures to reduce pathogens from animal facilities, including a watershed survey to identify, inspect, and communicate best management practices to owners of confined animal facilities. Failing septic systems could result in incompletely treated wastewater and pathogens entering streams via surface runoff. Although human waste is not considered a primary source of fecal coliform in the San Lorenzo River, the County and the Regional Water Quality Control Board inspect septic systems on a routine basis to identify and repair failing systems. Failure rates continue to improve as systems are upgraded.

Particulate matter interferes with water treatment processes and is quantified by measuring turbidity. Elevated turbidity occurs in the wet winter months from erosive soils loosened by natural and human-induced processes. Sources of turbidity are numerous and include unimproved roads (i.e., private roads and unused logging roads), drainage and erosion along improved roads, unauthorized land grading activities, trail use in recreation areas, animal operations, and debris and runoff from sand and gravel operations. Urban runoff from roads and streets passing over and near streams, particularly during the wet season's first storms, is a potential source of coliform bacteria and particulate matter. Natural processes that have potential to significantly increase turbidity within the watershed include landslides and fire.

Perchloroethylene or PCE, has been occasionally detected at the upper San Lorenzo River diversion. PCE is associated with a former dry cleaner in Felton that is undergoing remediation. Levels measured at the diversion between August 1989 and June 2002 have never exceeded the 5 ug/L maximum contaminant level for PCE and it has not been detected when the diversion is active. PCE has not been detected at the lower diversion.

Some potentially contaminating activities not associated with detected contamination at the upper San Lorenzo River diversion include gas stations and automobile repair shops, known contaminant plumes, registered underground storage tanks, sand and gravel quarries, the closed Ben Lomond landfill, and the active waste-transfer station. Activities such as gas stations and auto repair shops occur in the urbanized areas of this watershed, however, their impact on the overall drinking water source at the upper diversion is insignificant.

Upstream of the lower diversion, the drainage area of the River is characterized by relatively pristine parkland. A comparison of water quality data collected at the upper and at the lower diversions show that nitrate and turbidity levels decrease, and coliform levels may be lower as well. Additionally, some activities with the highest vulnerability ranking are not as prevalent in this reach. Thus, the vulnerability of the lower diversion is buffered by its location downstream of this area of the watershed.

For More Information

We hope these reports are valuable to you. Should you desire more information contact one of the City of Santa Cruz staff listed below.

Water Department Administration
Bill Kocher, Director
809 Center Street, Room 102
Santa Cruz, CA 95060
phone: (831) 420-5200
fax: (831) 420-5201
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e-mail: wrm@ci.santa-cruz.ca.us

Water Quality Division
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715 Graham Hill Road
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fax: (831) 420-5481
e-mail: wtlab@ci.santa-cruz.ca.us

City of Santa Cruz Web address:
www.ci.santa-cruz.ca.us

Meetings of the City Council and Water Commission provide excellent opportunities for you to get involved in issues related to drinking water. Their agendas are posted on the website listed above, at City Hall, or you can call the Water Department to find out more. We welcome your attendance and input.

Santa Cruz City Council
809 Center Street, Room 10
Santa Cruz, CA 95060
phone: (831) 420-5020
e-mail: citycouncil@ci.santa-cruz.ca.us

Water Commission
Contact the Water Commission through the Water Department number, (831)420-5200. Water Commission meetings are scheduled for the first Monday of each month at 7:00 PM.

OTHER SOURCES OF INFORMATION

California Department of Health Services, Division of Drinking Water
Monterey District Office
(831) 655-6939
http://www.dhs.ca.gov/ps/ddwem

Association of California Water Agencies
910 K Street, Suite 100
Sacramento, CA 95814
(916) 441-4545
http://www.acwanet.com

American Water Works Association
666 West Quincy Avenue
Denver, CO 80235
http://awwa.org