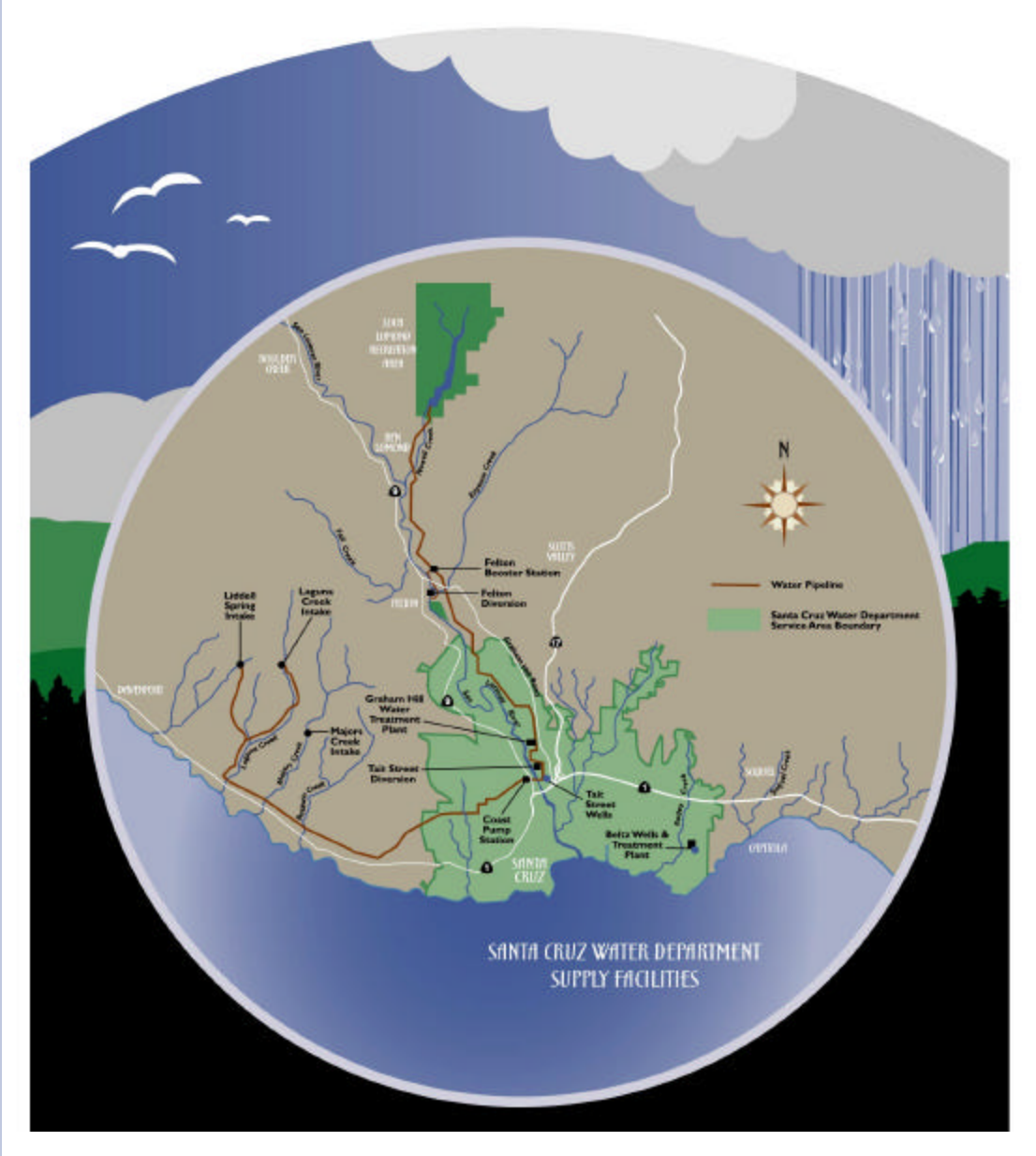
City of Santa Cruz

2005 URBAN WATER MANAGEMENT PLAN



Prepared by:
City of Santa Cruz
Water Department

February 2006

CITY OF SANTA CRUZ WATER DEPARTMENT

2005 URBAN WATER MANAGEMENT PLAN

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February 2006

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CHAPTER 1

INTRODUCTION

Urban Water Management Planning Act

This report has been prepared by the City of Santa Cruz Water Department in response to the Urban Water Management Planning Act. The Act, which became part of the California Water Code with the passage of Assembly Bill 797 in 1983, requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt an urban water management plan, and to update it every five years.

The Act requires water agencies to evaluate and describe their water resource supplies and projected needs over a twenty-year planning horizon, and to address a number of related subjects including water conservation, water service reliability, water recycling, opportunities for water transfers, and contingency plans for drought events.

The Act recognizes that water is a limited and renewable resource subject to ever-increasing demands and that conservation and efficient use of urban water supplies is a statewide concern. The Act also states that a long-term reliable supply of water is essential to protect the productivity of California's businesses and economic climate and, as part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years.

The purpose, required contents, and process for preparing and adopting Urban Water Management Plans are specified in California Water Code sections 10610 – 10656. The overall goal is to provide water suppliers throughout the state a framework for carrying out their long-term planning responsibilities and for reporting their strategies to meet future water challenges to both state government and the communities they serve.

Legislation, 2000 to Present

The Act has been amended numerous times by the Legislature since the City last updated its plan in 2001. New provisions require water suppliers to:

- Provide a description of any groundwater basin(s) from which the

agency pumps, and analyze the amount, location, and sufficiency of groundwater pumped, in past and future years,

- Include information on water quality of existing sources, and the manner in which water quality affects water management and supply reliability,

- Describe the opportunities for development of desalinated water as a long-term supply, and

- Describe management strategies to maximize resources and minimize the need to import water from other regions.

Urban Water Management Plans have taken on a new significance in recent years under related legislation enacted in 2001 that changes the way land use decisions are linked to water supply availability. Senate Bills 610 and 221 require water agencies to provide detailed assessments of their long-term water supplies to city and county decision makers prior to the approval of certain development projects. The bills also require cities and counties to make findings to verify that adequate water supplies are available before development can proceed. These statutes cite Urban Water Management Plans as a key source of information for preparing assessments and verifications of water supply.

City of Santa Cruz' 2005 Urban Water Management Plan

This document constitutes the fourth update of the City's Urban Water Management Plan. The first version was adopted by City Council in 1986. The plan was most recently updated in 2001.

The most significant development in the 5-year period since the City's last Urban Water Management Plan was updated is the development of an Integrated Water Plan, or "IWP". The IWP identifies the preferred strategy for addressing both the City's existing water supply deficiency and projected water service needs through the year 2030. On November 8, 2005, the City Council certified a Program Environmental Impact Report and unanimously adopted the IWP as the City's long-term water resource strategy. A full description of the IWP and the public process by which it was developed is presented in Chapter 5.

The City has also begun the process of updating its General Plan. Over the next few years, a new General Plan will be developed covering the years 2005 to 2020. This update of the Urban Water Management Plan will serve as a main source of information on the issue of water supply and help guide public deliberation and debate about land use and development policies during the City's General plan update process.

Development Process of the 2005 Plan

Early in 2005, the City participated in a planning workshop sponsored by the California Department of Water Resources (DWR) and the California Urban Water Conservation Council (CUWCC). In July 2005, the City held a coordination meeting with other water agencies and land use agencies in Santa Cruz County. The meeting was attended by representatives of DWR and the Association of Monterey bay Area Governments (AMBAG).

Water Department staff prepared the draft water management plan in summer and fall of 2005. Development of the plan was coordinated with neighboring water agencies, city and county land use agencies within the service area, as well as the staff from the City's wastewater treatment facilities, City of Scotts Valley, and the Santa Cruz County Sanitation District. Written notice regarding the plan review and update was sent to both the City of Capitola and the County of Santa Cruz, in accordance with Section 10621(b) of the Act.

The City Water Commission reviewed the plan on February 6, 2006 and the document was made available for public review and comment. The draft plan was circulated to all major public water utilities in Santa Cruz County, including the following:

- Soquel Creek Water District
- San Lorenzo Valley Water District
- Scotts Valley Water District
- City of Watsonville

The draft plan was also transmitted to the County of Santa Cruz and the City of Capitola.

The City Council held a public hearing on the plan on February 14, 2006. Notice of the time and place of the hearing was published pursuant to Section 6066 of the Government Code prior to the hearing.

City Council adopted the plan on February 28, 2006. The resolution adopting the plan is included in Appendix A. The final plan was then submitted to the California Department of Water Resources and the California State library, and transmitted to all jurisdictions receiving water service from the City of Santa Cruz in March 2006.

Report Format

The report is organized in accordance with the specific provisions of the Act as follows:

Chapter 2 – Profile of Service Area and Water Department: 10631(a) describes the City's water service area including population, climate, and other demographic factors affecting the City's water management planning.

Chapter 3 – Water Supply System: 10631(b) describes the City's water supply system, explains how the system is operated, and presents information on water production levels. It also presents information about the groundwater basin that the City relies on for part of its supply, and the current conditions, trends, and concerns related to ongoing groundwater production in the basin.

Chapter 4 – Past, Current and Projected Water Use: 10631(e) explains the City's customer classification system, discusses the water use characteristics of the different customer groups, and discusses past, current, and projected water use by category of use.

Chapter 5 – Water Supply Reliability: 10635(a) and 10631(c) characterizes the reliability of the City water supply system, provides an assessment of the system reliability under average water years, single dry years, and multiple dry years, and describes the Integrated Water Plan recently adopted by the City to ensure adequate water resources are available to meet the area's water service needs through the year 2030.

Chapter 6 – Water Demand Management Program: 10631(f) describes the City's water conservation plan and ongoing and planned water conservation programs.

Chapter 7 – Water Recycling: 10633(a)–(g) describes the City's wastewater collection, treatment, and disposal system, and provides information on recycled water and its potential for use as a supplemental source of water supply in the service area.

Chapter 8 – Water Shortage Contingency Plan: 10632(a)-(i) presents information about how the City manages the water system in a water shortage emergency that arises as a result of drought. It also describes actions that would be undertaken in response to a catastrophic interruption of water supplies, including a regional power outage, earthquake, or other emergency situation.

CHAPTER 2

PROFILE OF SERVICE AREA AND WATER DEPARTMENT

The City of Santa Cruz is located on the central coast of California where the San Lorenzo River flows into Monterey Bay. The City is situated on the northern end of the state's Central Coast hydrologic region (Figure 2-1).[1]

Water service is provided to an area approximately 30 square miles in size, including the entire City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, and coastal agricultural lands north of the city. The location of Santa Cruz and geographic area served by the City water system (not including the north coast) are shown in Figures 2-2 and 2-3.

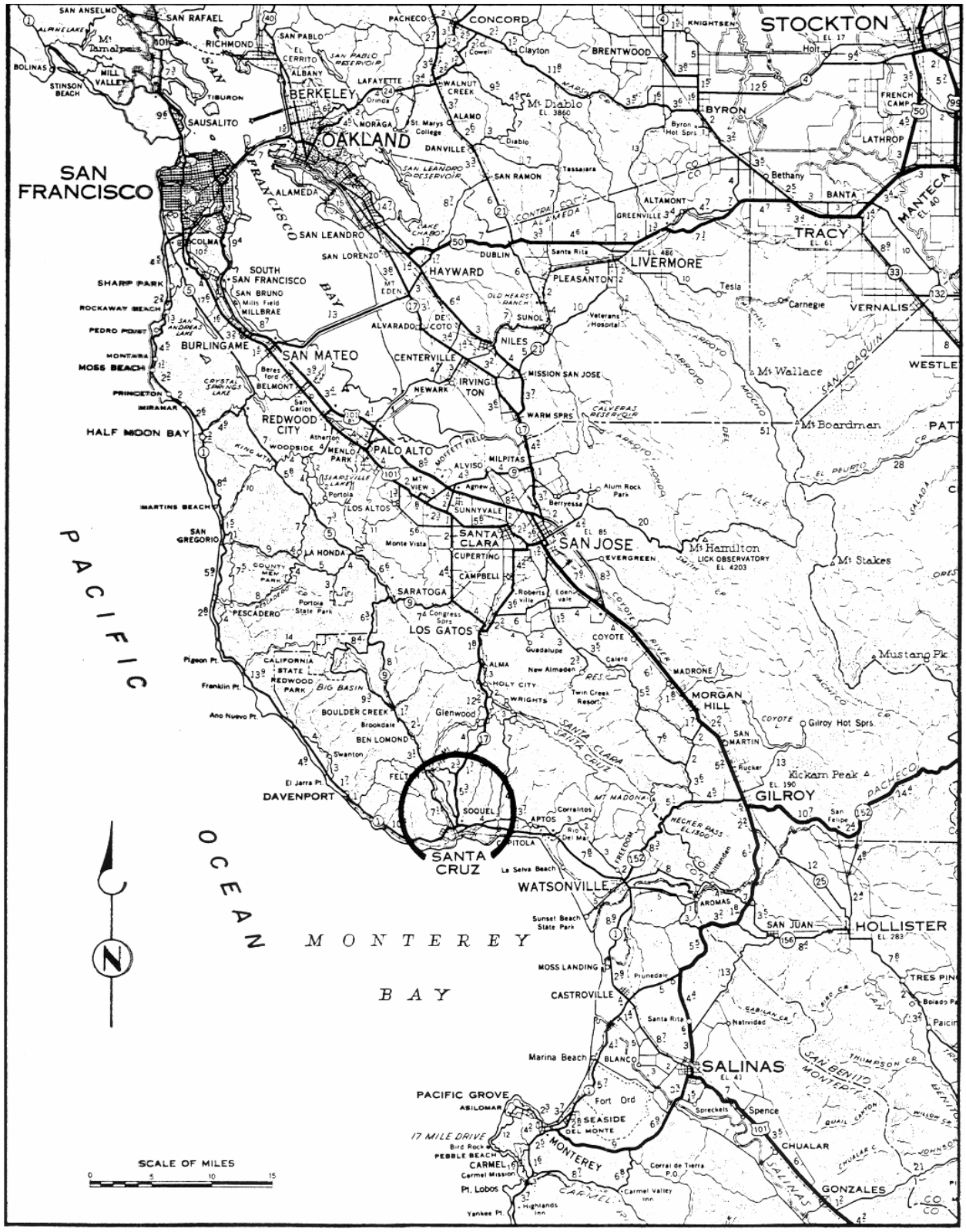
People are drawn to the Santa Cruz area for its recreational attractions, its small town ambiance and sense of community, its pleasant weather, its natural beauty and scenic coastline, and its higher education facilities. The sandy beaches and nearby mountains attract a large number of visitors to the region every year. The City is bounded by several State Parks and open-space lands that provide facilities for bicycling, hiking and other outdoor activities. The seashore and ocean waters of the Monterey Bay National Marine Sanctuary serve as a prime destination in the summer months for sunbathers, surfers, and tourists. Other visitor attractions include the Boardwalk, Municipal Pier, and Pacific Avenue Mall.

The University of California at Santa Cruz is situated atop the upper west side of the City overlooking the downtown area and Monterey Bay. The campus provides a wide variety of undergraduate and graduate programs

Figure 2-1. Hydrologic Regions of California

[1] *The California Department of Water Resources divides the state into 10 hydrologic regions corresponding to the state's major drainage basins for water supply planning purposes.*

Figure 2-2. City of Santa Cruz Vicinity Map



and currently accommodates an enrollment of about 15,000 students during the academic year.

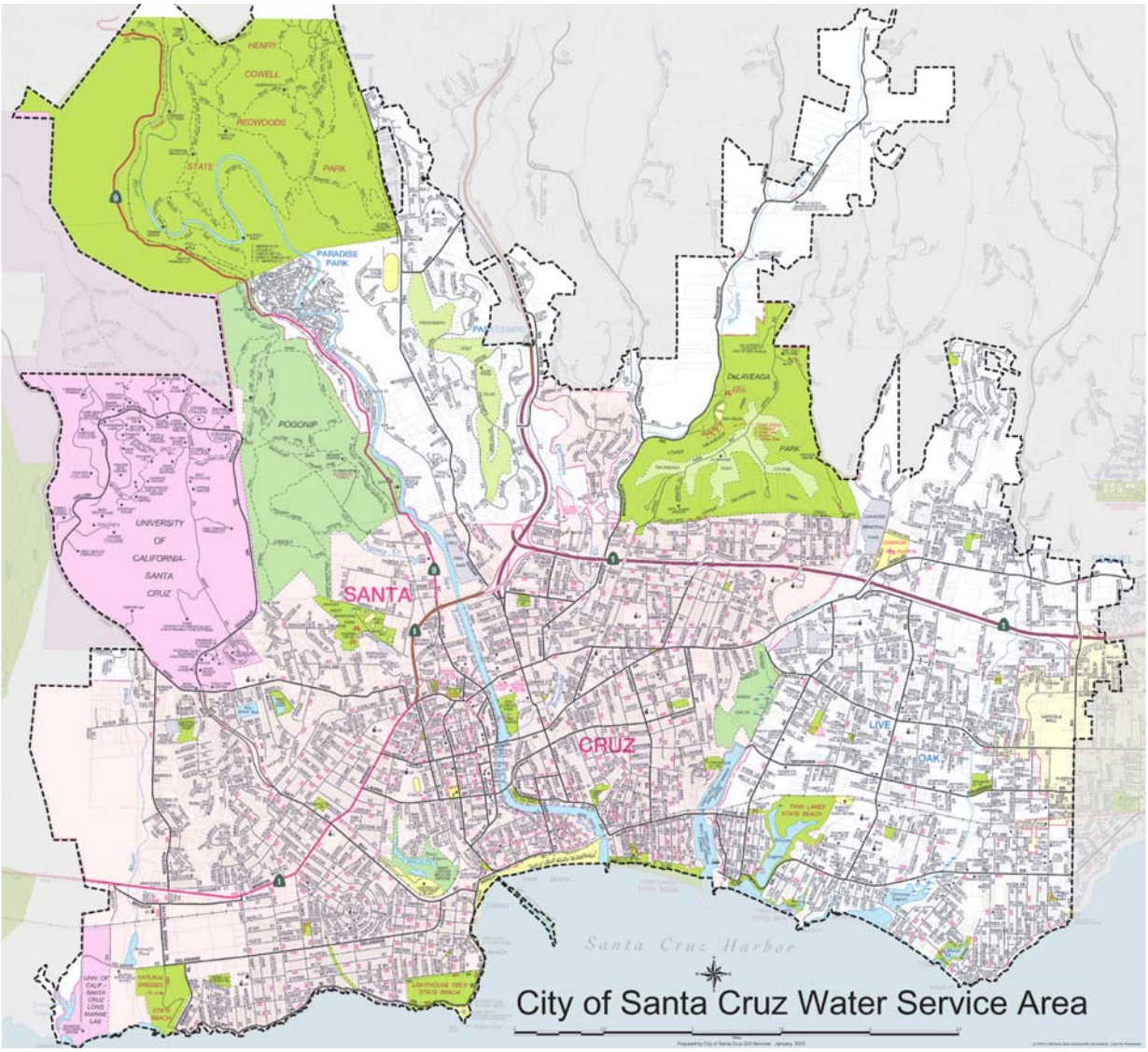
Climate

Santa Cruz enjoys a pleasant climate year round due to its location adjacent to the Pacific Ocean. The climate is characterized by warm, dry summers and mild, wet winters.

Average monthly temperatures range between 50 and 64 degrees, with the warmest weather usually occurring during August and September. Extreme temperatures are rare and short-lived, with weather conditions being moderated by the oceanic influence and presence of summer fog.

Rainfall in Santa Cruz averages 30.7 inches annually, but varies considerably

Figure 2-3. City of Santa Cruz Water Service Area



from year to year. The bulk of seasonal rainfall occurs between November and March. Rainfall amounts over the last 25 years are shown in Figure 2-4. During this time, annual precipitation ranged from a minimum of 17.5 inches in 1990 to a maximum of 60.2 inches in 1998. In the watershed above the City's reservoir in the Santa Cruz Mountains, rainfall averages nearly 50 inches per year. Mean monthly rainfall amounts for Santa Cruz and Ben Lomond in the Santa Cruz Mountains is shown in Figure 2-5.

Figure 2-4. Annual Rainfall (inches)

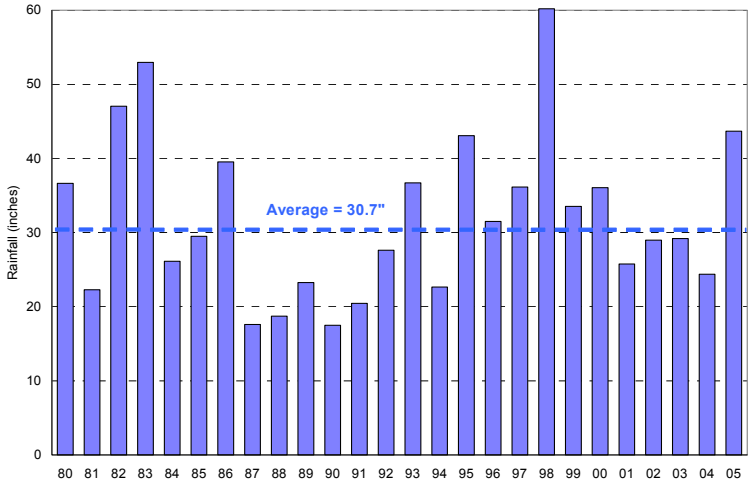
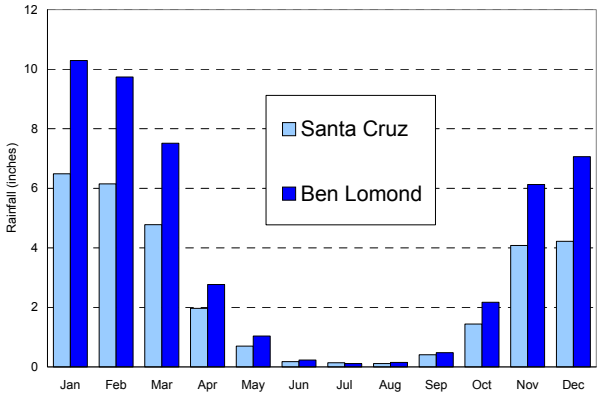


Figure 2-5. Mean Monthly Rainfall



Reference evapotranspiration - a standard measurement of environmental parameters including temperature and wind velocity used for determining irrigation needs - averages 36.8 inches in Santa Cruz. Average monthly evapotranspiration varies seasonally from a low of 1.2 inches in December to a high of 4.8 inches in July.

Population

The current population residing in the Santa Cruz water service area is estimated to be between 89,000 and 90,000 people. Of this total, nearly 57,000, or 63 percent live inside the City limits and some 32,500, or 37 percent, live outside.

Table 2-1 shows the projected population in the City's water service area by jurisdiction to the year 2030, in five-year increments. These figures were derived from a regional population forecast prepared by the Association of Monterey Bay Area Governments, based on the 2000 census (AMBAG, 2004)[2]. According to the forecast, the

[2] As the Metropolitan Planning Organization (MPO) for Monterey, Santa Cruz and San Benito Counties, it is the responsibility of the Association of Monterey Bay Area Governments (AMBAG) to have population and employment forecasts for the three county area. These

Table 2-1. Population Forecast for the Santa Cruz Water Service Area

Year:	2000	2005	2010	2015	2020	2025	2030
City of Santa Cruz	54,593	56,953	57,768	58,846	59,924	61,956	63,987
Santa Cruz County	30,841	31,556	32,257	32,997	33,728	34,508	35,289
City of Capitola	950	1,002	1,004	1,013	1,023	1,023	1,023
Service Area Total	86,384	89,551	91,029	92,856	94,675	97,487	100,299

total number of people receiving water service is expected to grow by 10,000 to about 100,000 in 2030.

Comparison of the 2004 population forecast with the previous AMBAG forecast developed in 1997 shows a lower annual population growth rate equal to about 0.5 percent per year, with the service area expected to reach the 100,000 population benchmark ten years later than was previously forecast. It should be noted, however, that the 2004 population forecast was prepared prior to adoption of the University's 2005-2020 long-range development plan, which is currently in draft form. As a result, the forecast does not factor in the increase in enrollment and population growth that is anticipated to occur at the University of California over the next fifteen years. The adopted figures for University-related growth should be available the next time AMBAG updates its population forecast for the three-county region.

Housing

The current estimate of the number of housing units in the City's water service area is 35,300. Approximately 18,350, or a little over half of all households in the service area are classified as single family accounts[3]. The other 16,950 homes are multiple family units including duplexes, condominium and townhouse complexes, apartments, mobile homes and alternative housing types such as live/work units, mixed use development, single room occupancy, and accessory dwelling units.

According to water billing records, there are about 21,000 housing units located within the Santa Cruz City limits. The

forecasts provide a common planning base for the regional Air Quality Management Plan, regional transportation plans, regional water quality improvement plans, and other planning documents.

[3] Water account categories are not the same as housing type. A single family account has one dwelling unit per meter, but may be any type of residence. A multifamily account has two or more dwelling units per meter.

remaining 14,300 homes are located in unincorporated Santa Cruz County and in the City of Capitola.

The average number of persons per single family household in the City's service area is estimated to be 2.9. In multifamily households, the number of persons per housing unit averages 2.2.

Over the past five years, the number of housing units in the service area has grown by about 1,100, about half of which were single family residential homes and the other half consisting of multi-family residential units.

Each of the three jurisdictions served by the City has recently updated their housing elements to address its required regional fair share housing needs established by AMBAG. These documents set forth goals and objectives for housing production, rehabilitation, and conservation for the period 2000 - 2007. The plans identify generally where sites are available for housing to be built and describe programs to facilitate new housing opportunities, but this does not necessarily mean such housing actually will be constructed. Also unknown is what type of housing will actually be built over the next few years.

For this housing element cycle, the City is planning for an additional 2,167 units, a fair amount of which already has been approved and is under construction. The County is planning for a total of 3,441 units to be built Countywide through 2007, of which perhaps 1,400 units would be located within the City water service area. Capitola is projecting 337 units by 2007 in its housing element, but only a small number of these are expected to fall into the City's water service area. Together, these housing plans represent a total residential development potential of about 3,600 new homes.

Community Growth and Development

All three jurisdictions served by the Santa Cruz water system have general plans, local coastal programs, zoning regulations, and development standards that determine the location, type, and density of growth allowed in the region. The decisions and policies regarding land use and housing affect not only how land is used or preserved; they also influence demand for water in the service area. Among the primary factors that currently affect physical and economic growth in the community are the following:

Service Area Limits. The size of the City water service area has remained constant over time due to a policy prohibiting water main extensions to unserved areas and the acquisition of open space lands which creates a greenbelt around the City and serves to inhibit urban sprawl. Accordingly, any growth and redevelopment that does happen going forward is expected to be

concentrated within the confines of the existing service area boundary.

Diminishing Vacant Land. Within the City of Santa Cruz, only a small amount of land remains undeveloped. The same is true in the parts of the County and City of Capitola served by the City. Because of the relative scarcity of raw land, the majority of future growth in the area is likely to be achieved through redevelopment, remodeling, infill, and increased density on underutilized land, along with new construction on the little amount of vacant land remaining.

University of California. The University is planning for a substantial increase in student enrollment, faculty, and academic facilities to meet the projected higher education needs of California's population over the next 15 years. The University's proposed Long Range Development Plan calls for an increase in student enrollment of 6,000 to approximately 21,000 by 2020, and increase of 1,800 in the number of faculty and staff to 5,900, and proposed building program and a land use plan that would nearly double the current amount of academic and support space and housing (UCSC, 2005). Because a major portion of the area planned for future development is outside and beyond the current City limits and water service area boundary, a question exists over the City's responsibility and obligation to provide water service for campus growth that is proposed on the unincorporated portion of the University property. Any expansion of the municipal water service area or boundary to accommodate university growth will also require the approval by the Santa Cruz Local Agency Formation Commission.

Employment

The State Employment Development Department estimates employment within the City's water service area to be about 44,100. The three largest commercial sectors are retail trade, health care, education services. The University is the city's largest employer, and a key component of the area's economic future. The number of people employed in the City's service area account for about half of all jobs in Santa Cruz County. Since 2000, the City has experienced the loss of several long-established manufacturing and technology employers, such as Texas Instruments, Lipton, Salz Leather and others.

Water Department

The Santa Cruz Water Department is a municipal utility that is owned and operated by the City of Santa Cruz. It is led by a Director who is appointed by the City Manager. The governing body for the Water Department is the City Council. A seven-member Water Commission advises Council on policy matters involving the operations and

management of the water system. The Commission is composed of six members who reside within the City limits and one member who resides in the unincorporated portion of the water service area.

The Department is organized into nine sections. These include Administration, Engineering, Customer Service, Water Conservation, Water Resources, Production, Water Quality, Distribution, and Recreation. There is currently the equivalent of 88 full-time staff positions in the Water Department. An organization chart of the Water Department is shown in Figure 2-6

The Water Department's adopted mission statement is as follows:

"To provide a safe, clean, and continuous supply of water for municipal and fire protection purposes that meets or exceeds local, State, and Federal standards for public health and environmental quality, and to provide courteous, responsive, and efficient service in the most cost-effective manner to our customers".

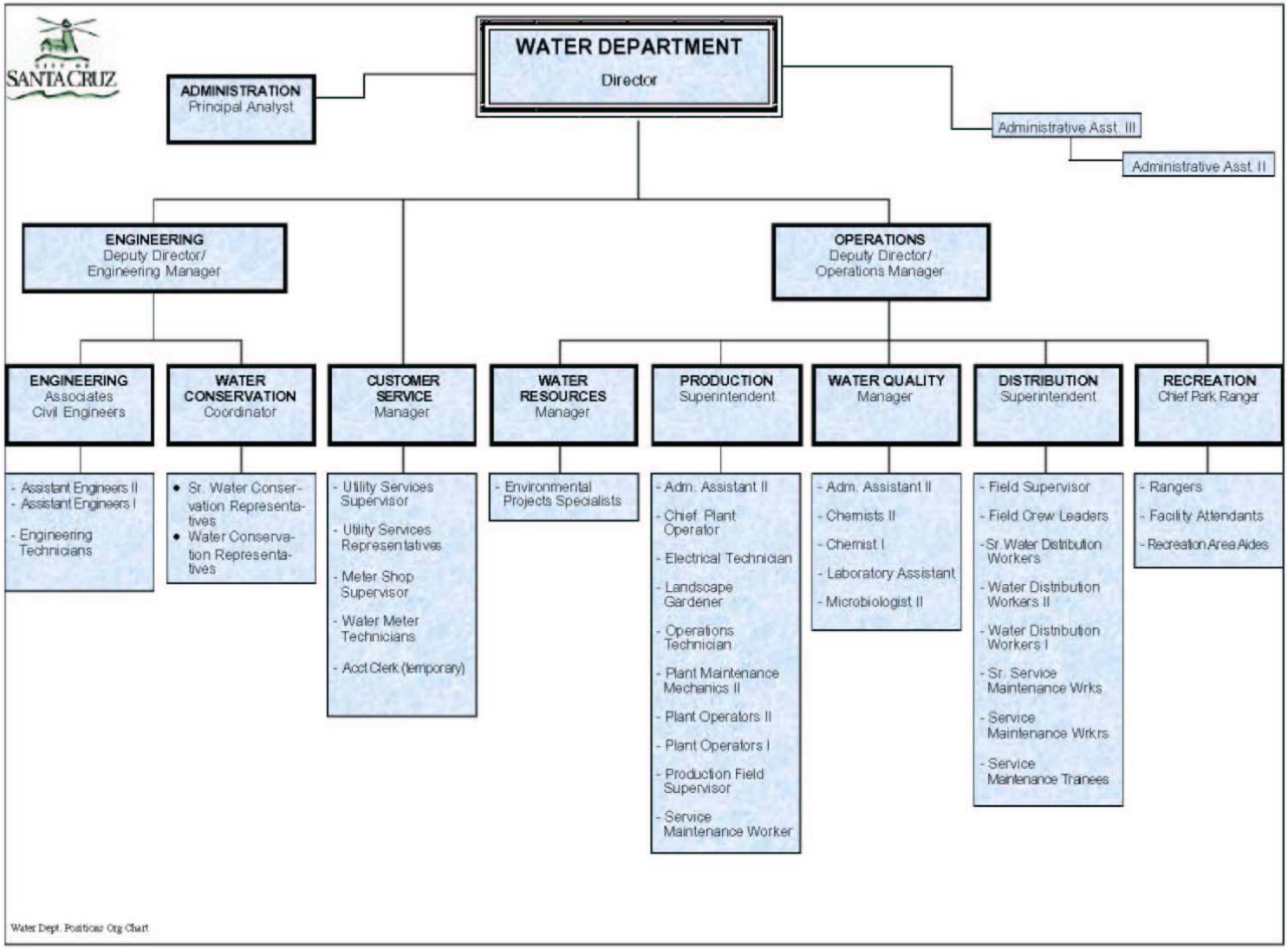
The water supply system operated by the Department consists of several surface water diversions, Loch Lomond reservoir, and a small well field. Major facilities include a 24 million-gallon per day (mgd) water treatment plant, several pump stations and 16 distribution reservoirs storing almost 50 million gallons of treated water. There are also about 300 miles of pipe and nearly 24,000 water meters in service.

The Department operates financially as an enterprise in which all the costs of running the system are paid by water rates, service charges, and related revenues. The Water Fund receives no tax or general fund revenues.

The Water Department's annual operation and maintenance budget is approximately $13 million. The capital improvement budget has increased dramatically in the past few years from $2-4 million annually to over $11 million budgeted for capital improvements in FY 06. The reason for this large increase is that a number of critical components, including major pipelines, pumps, and water treatment facilities are approaching or have exceeded their useful life and must be modernized to continue delivering a safe, clean, and reliable supply of drinking water. In all, over $100 million in capital improvements are needed within the next decade to maintain and enhance the integrity of the water system.

In addition to providing water service, the Department has responsibility for billing and customer service functions related to sewer and refuse service inside the Santa Cruz City limits.

Figure 2-6. Water Department Organization Chart



CHAPTER 3

WATER SUPPLY SYSTEM

This chapter describes the City's water supply system, explains how the system is operated, and presents information on water production volumes. This chapter also presents information about the groundwater basin that the City relies on for part of its supply, and the current conditions, trends, and concerns related to ongoing groundwater production in the basin, as required by section 10631(b) of the Water Code.

Existing Sources of Water Supply

The Santa Cruz water system is comprised of four main production elements: 1) the North Coast sources, 2) the San Lorenzo River, 3) Loch Lomond Reservoir, and 4) the Live Oak Wells. The system relies entirely on rainfall, surface runoff, and groundwater infiltration occurring within watersheds located in Santa Cruz County. No water is purchased from State or Federal sources or imported to the region from outside the Santa Cruz area.

The North Coast sources consist of surface diversions from three coastal streams and a natural spring located approximately six to eight miles northwest of downtown Santa Cruz. These sources are Liddell Spring, Laguna Creek, Reggiardo Creek, and Majors Creek. The use of these sources by the City dates back as far as 1890.

The San Lorenzo River is the City's largest source of water supply. The main surface water diversion is located at Tait Street near the City limits just north of Highway 1 and dates back to the 1920s. The Tait Street Diversion is supplemented by two shallow, auxiliary wells located across the river. These wells are hydraulically connected to the river and tied to the City's appropriative rights for surface diversion. The drainage area above the Tait Street Diversion is 115 square miles.

The other diversion on the San Lorenzo River is the Felton Diversion Station, which is an inflatable dam and intake structure built in 1974, located about six miles upstream from the Tait Street Diversion. Water is pumped from this diversion through the Felton Booster Station to Loch Lomond Reservoir. The facility is used to augment storage in the reservoir during dry years when natural inflow from Newell Creek is low.

Loch Lomond Reservoir is located near the town of Ben Lomond in the Santa Cruz Mountains. The reservoir was constructed in 1960 and has a maximum capacity of 2,810 million

gallons (mg). In addition to providing surface water storage, the reservoir and surrounding watershed are used for no body contact public recreation purposes, including fishing, boating, hiking, and picnicking. The Newell Creek watershed above the reservoir is about eight square miles. In addition to the City, the San Lorenzo Valley Water District is entitled to receive a portion of the water stored in Loch Lomond.

The Live Oak Well system consists of three production wells located in the southeast portion of the City water service area.

A map of the San Lorenzo River watershed is provided in Figure 3-1.

While the City is the largest user of water from the San Lorenzo River basin, three other water districts, several private water companies and numerous individual property owners share the San Lorenzo River watershed as their primary source for drinking water supply. A diagram showing the City's existing water sources is provided in Figure 3-2.

Water Treatment Facilities

The City operates two water treatment facilities. All surface water is treated at the Graham Hill Water Treatment Plant, (GHWTP) which currently has a capacity of about 20 mgd. The Live Oak Water Treatment Plant treats

Figure 3-1. San Lorenzo Valley Watershed

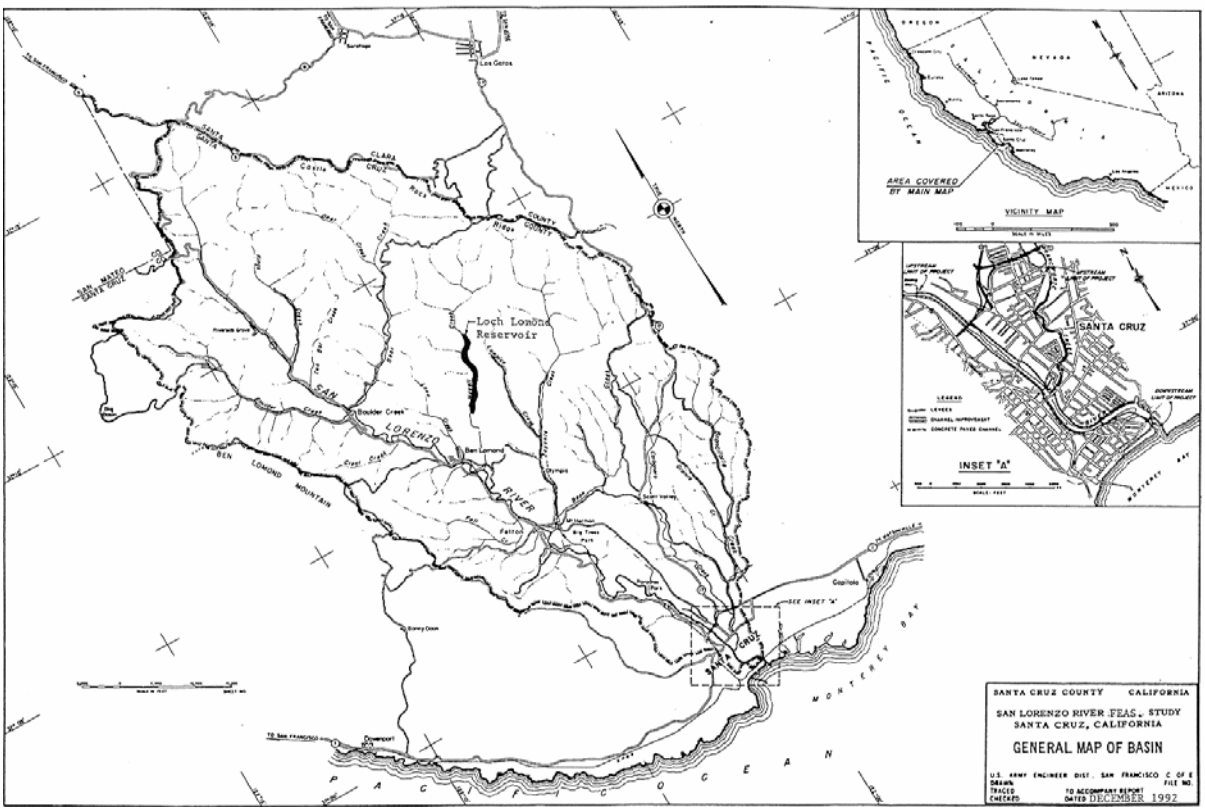
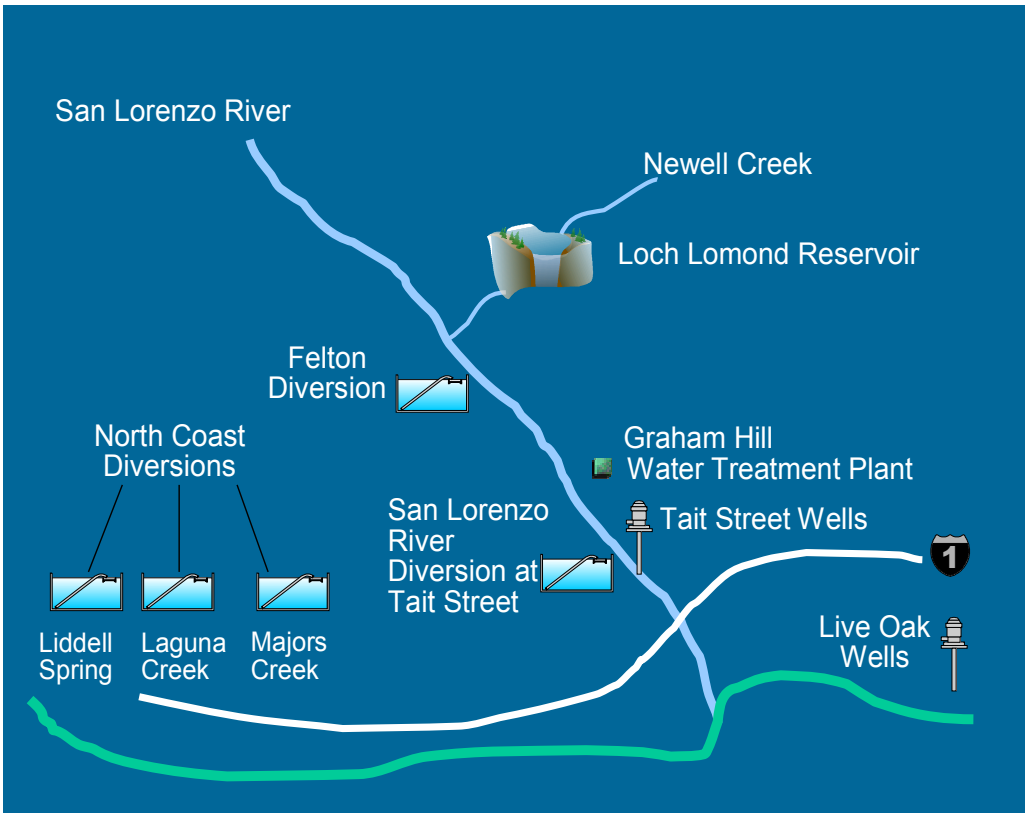


Figure 3-2. City of Santa Cruz Water Supply System



groundwater to remove iron and manganese. It has a capacity of 2 mgd.

Finished water from the GHWTP flows to the Bay Street Reservoir and into the distribution system, some of which is pumped to various elevated pressure zones situated throughout the service area. Treated water from the Live Oak plant is pumped directly into the distribution system.

Other Key Facilities

Coast Transmission Main. The Coast main brings water diverted at the north Coast sources to the Coast Pump Station, where it is pumped to the GHWTP. The City is beginning a repair and replacement project for the entire 16-mile length of this raw water pipeline system to restore its integrity and reduce transmission losses.

Newell Creek Pipeline. This 9-mile pipeline carries water from Loch Lomond Reservoir to the GHWTP.

Coast Pump Station. The Coast pump station is located next to the Tait Street Diversion and pumps raw water from the North Coast and San Lorenzo River sources up to the GHWTP.

Felton Booster Pump Station. This facility is used to move water into and out of Loch Lomond Reservoir. A project to rehabilitate and upgrade this facility is currently nearing completion.

Treated Water Storage Facilities. The City has 16 treated water storage reservoirs scattered throughout the service area. The largest is the Bay Street Reservoir, which was constructed in 1924 and has a capacity of 35 million gallons.

Water System Operations

The Water Department follows a variety of policies, procedures, and legal restrictions in operating the water supply system. In general, the system is managed to take advantage of the better quality and least expensive sources as a first priority, and to retain the maximum amount of water possible in Loch Lomond Reservoir to safeguard against future droughts. In addition to considerations for cost, water quality, and storage, legal constraints on the diversion of surface waters contained in the City's water rights govern the operation of the water system. A summary of these water rights is presented below in Table 3-1.

Water supplies are generally dispatched to meet daily demands in the following order:

1. North Coast
2. San Lorenzo River
3. Live Oak Wells
4. Loch Lomond Reservoir

Due to the excellent water quality and the lowest production cost, the North Coast sources are used to the greatest extent possible. As pre-1914 sources, the City's North Coast diversions are least affected by water rights limitations. Diversion from these sources is therefore limited primarily by flows. Daily production varies seasonally from 5 mgd in spring to 2 mgd in fall.

Additional water needed to meet daily demands is pumped from the San Lorenzo River at Tait Street. Under normal operating conditions, about 7.5 mgd will be produced from the Tait Street Diversion and wells throughout the dry season.

During the summer and fall, when the City's flowing sources are inadequate to meet peak season daily demands, supplemental water is brought in from the Live Oak Wells and from Loch Lomond Reservoir.

On a typical summer day the Live Oak Wells contribute about 1.0 mgd. Withdrawals from the reservoir vary between 2 and 4 mgd depending on weather, customer demand, and the amount of treated water held in storage at the Bay Street Reservoir.

Table 3-1. Summary of Water Rights Held by the City of Santa Cruz

Source	License/ Permit Number	Period	Maximum Diversion Rate (cfs)	Fish Flow Requirement (cfs)	Annual Diversion Limit (mil gal)
North Coast	Pre-1914	Year-round	No limit	None	None
San Lorenzo River					
Tait Street Diversion and Wells	001553 007200	Year-round	12.2	None	None
Felton Diversion to Loch Lomond	016601 016123	September October November-May June-August	7.8 20.0 20.0 0.0	10 25 20 --	977
Loch Lomond Reservoir:	009847				
Collection to Storage (max amount/year)		Sept-June	No limit	--	1,825
Withdrawal		Year-round	--	1	1,042

Withdrawals are also made from Loch Lomond during the winter season when the North Coast and San Lorenzo River sources become untreatable due to excessive turbidity from storm runoff.

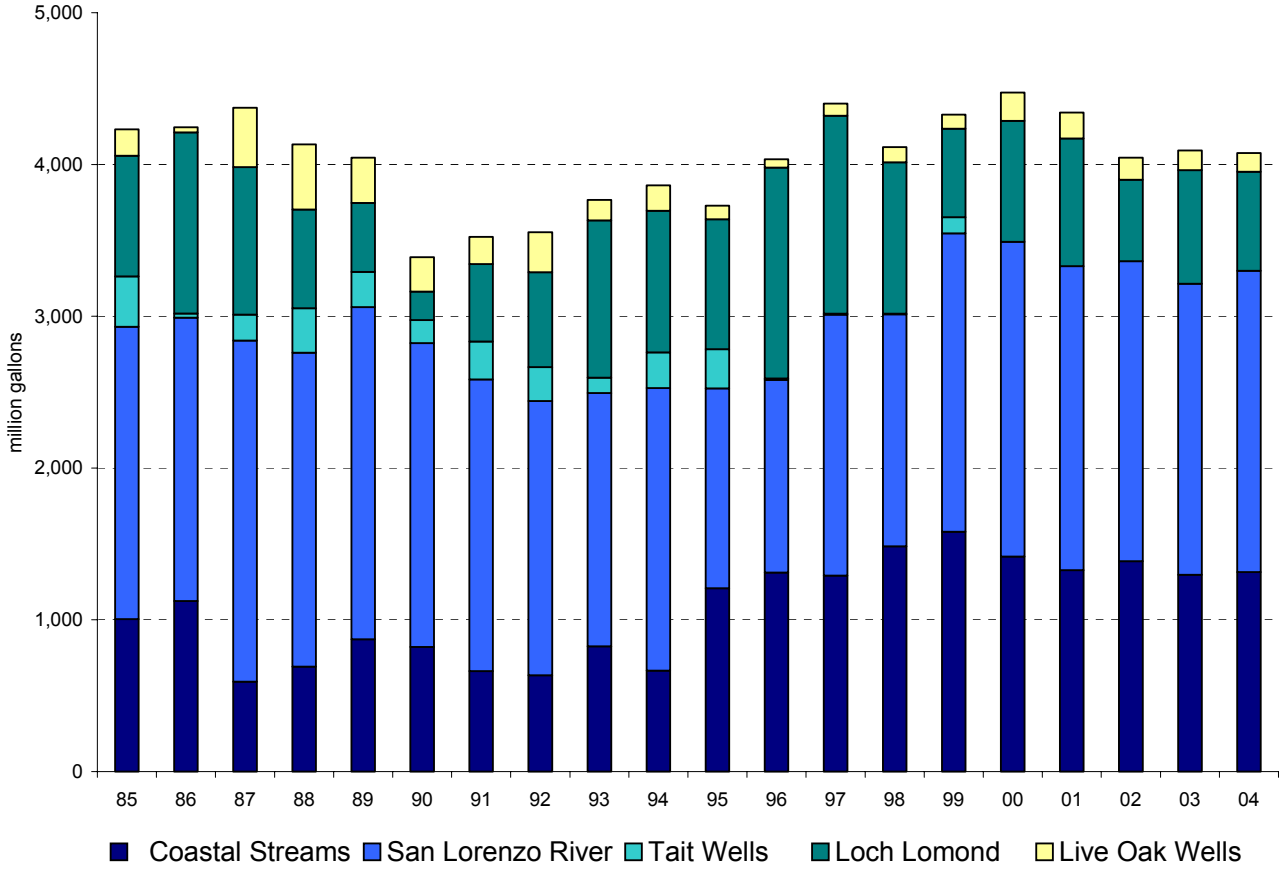
The Felton Diversion is operated intermittently as needed. It is normally used in the winter months of dry years, but the diversion dam is inflated every year for maintenance purposes and to facilitate fisheries research.

Water Production

Total annual water production over the last twenty years is illustrated in Figure 3-4 and is listed in Table 3-2. These numbers reflect gross water production, which refers to the total amount of raw water diverted at the souce. The figures vary from year to year depending on hydrologic conditions, operations and maintenance, customer demand, and other factors. During this period, gross water production ranged from a low of 3.3 billion gallons per year in 1990 to over 4.4 billion gallons per year in 2000. Over the last five years, gross water production has averaged about 4.2 billion gallons per year.

The percentage of total water supply derived from each source between 2000 and 2004 is illustrated in Figure 3-5. Over the last five years, gross production from the North Coast sources has averaged 1,348 mg, or 32

Figure 3-4. Gross Annual Water Production, 1985-2004



percent, while the San Lorenzo River supplies (including Tait wells) has averaged 1,990 mg, or about 47 percent of the total annual supply. Together, these flowing sources provided nearly 80 percent of the City's yearly water needs. Water supplied from Loch Lomond Reservoir averaged 716 million gallons or 17 percent. Groundwater from the Live Oak Wells provided an average of 151 mg or about 4 percent of the City's total annual supply.

Net water production, which refers to the amount of treated water produced at the City's two treatment plants entering the distribution system, averages about 6% less than gross production. The difference between gross and net production is due to raw water sales, turnouts, maintenance, and losses from leakage on the north coast transmission main. Over the last five years, net water production has averaged 3.9 billion gallons per year.

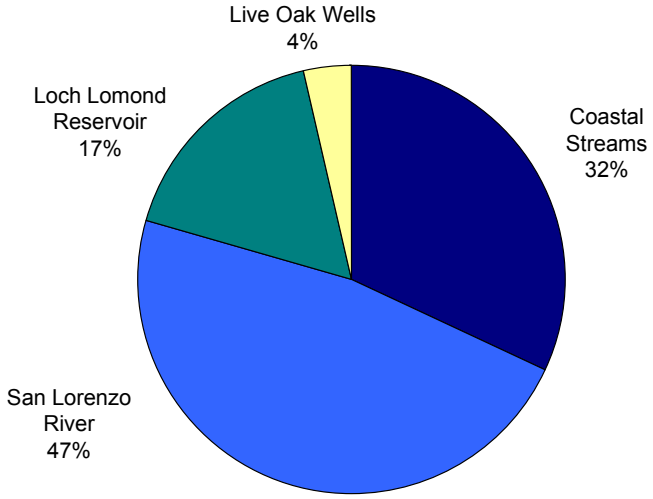
Treated water production varies seasonally from a low of mid-200 mg per month in winter to a high of mid-400 mg in summer. Average daily water demand ranges from about 8.5 mgd during the winter season to 14.5 mgd in summer months, with peak days reaching up to 16 mgd.

Table 3-2. Gross Annual Water Production by Source of Supply (million gallons)

Year	Source: North Coast Streams	San Lorenzo River	Tait Wells	Loch Lomond Reservoir	Live Oak Wells	TOTAL
1985	1,004.4	1,926.7	331.5	793.9	174.7	4,231.2
1986	1,123.3	1,867.5	27.6	1,192.7	33.6	4,244.7
1987	592.5	2,246.5	172.5	971.8	389.6	4,372.9
1988	692.1	2,066.5	294.1	650.4	429.8	4,132.9
1989	872.3	2,187.2	232.3	455.0	298.6	4,045.4
1990	820.6	2,001.2	152.8	187.0	227.4	3,389.0
1991	661.9	1,921.0	251.1	510.1	178.7	3,522.8
1992	633.7	1,807.6	223.1	625.2	264.4	3,554.0
1993	826.1	1,667.2	102.3	1,035.7	135.5	3,766.8
1994	665.6	1,861.0	235.5	931.8	169.1	3,862.9
1995	1,207.7	1,317.2	256.8	857.2	90.0	3,728.9
1996	1,312.5	1,267.3	9.9	1,389.8	54.7	4,034.2
1997	1,291.6	1,719.6	5.3	1,304.5	79.9	4,400.9
1998	1,484.8	1,527.7	4.8	996.8	99.6	4,113.7
1999	1,580.0	1,966.0	106.1	583.7	92.4	4,328.2
2000	1,417.3	2,073.2	--	797.0	187.0	4,474.5
2001	1,326.5	2,003.0	--	842.4	171.4	4,343.2
2002	1,386.2	1,976.2	--	538.0	143.8	4,044.2
2003	1,297.0	1,917.9	--	748.5	129.7	4,093.0
2004	1,315.4	1,984.5	--	652.6	123.6	4,076.1
Average 2000-04	**1,348.5**	**1,990.9**	**--**	**715.7**	**151.1**	**4,206.2**
Percent	**32.1**	**47.3**	**--**	**17.0**	**3.6**	**100.0**

Tait well production included with San Lorenzo River beginning 2000.

Figure 3-5. Percent of Total Water Supply by Source, 2000-2004

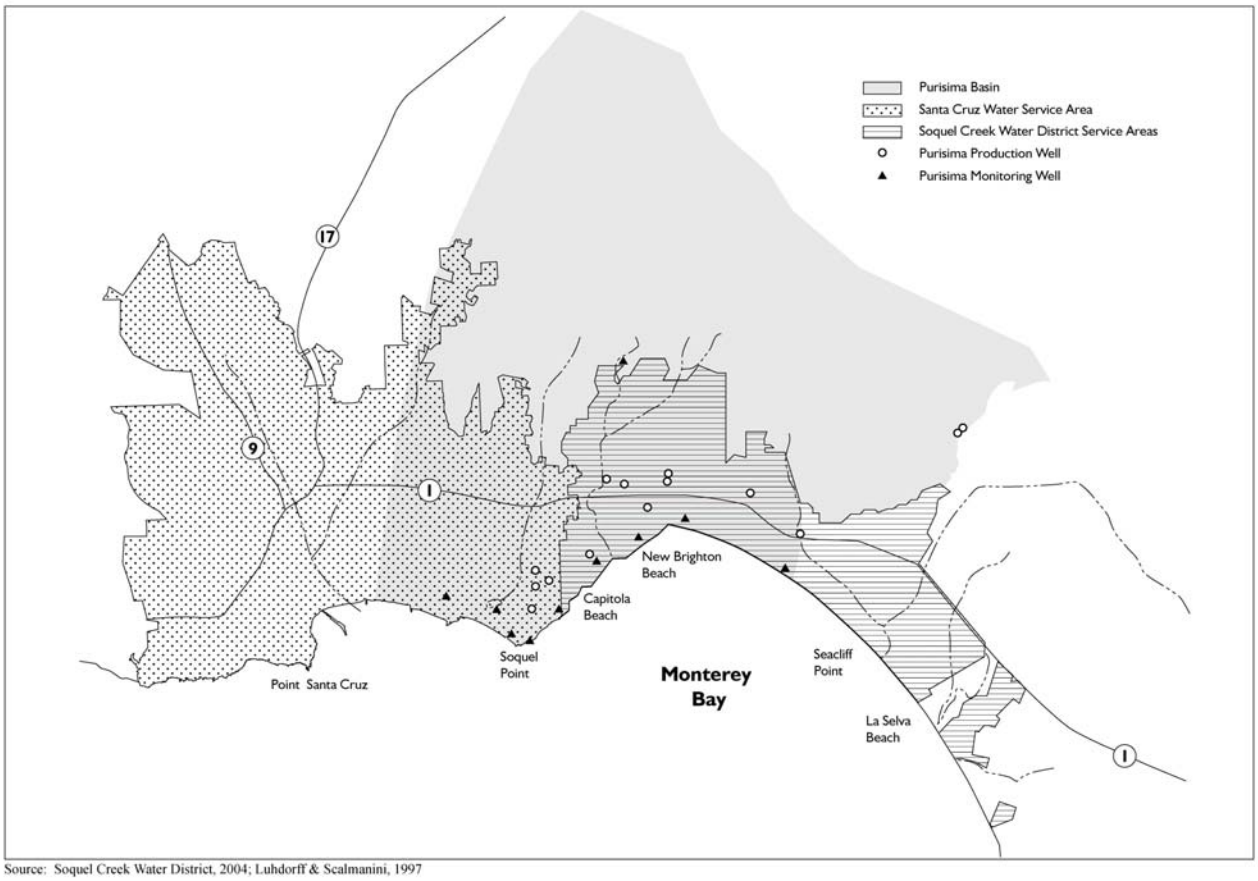


Groundwater

Even though groundwater constitutes only 4 to 5 percent of the entire City water supply on an annual basis, it has been a crucial component of the water system for meeting peak season demands and for weathering periods of drought since the facilities were acquired from the Beltz Water Company in 1964.

The entire production of the City's Live Oak well field is derived from the Purisima Formation, which is the primary source of groundwater in the mid-Santa Cruz County region. The geographic boundaries of the Purisima Formation are shown in Figure 3-6. The Purisima aquifer is relatively shallow under the City of Santa Cruz water service area, but dips southeast, becoming deeper and thicker towards Capitola and Aptos. The formation outcrops at the cliffs along the Monterey Bay shoreline. Recharge is thought to occur from deep percolation of rainfall in the upper watersheds and along streambeds of Branciforte Creek, Arana Gulch, Rodeo Creek and Soquel Creek.

Figure 3-6. Purisima Groundwater Basin



Source: Soquel Creek Water District, 2004; Luhdorff & Scalmanini, 1997

Groundwater from the Purisima Formation is used by the City of Santa Cruz, the Soquel Creek Water District, Central Water District and numerous private wells. Estimates of water production from the aquifer vary, depending on the averaging period and source. Current total annual extraction from the Purisima aquifer by all pumpers is estimated to be 1,988 mgy. Of this total, the City currently produces about 167 mgy (8%), Soquel Creek Water District produces approximately 1,075 mgy (54%), Central Water District pumps 18 mgy (1%) and private well production is estimated at about 728 mgy (37%) (EDAW, 2005).

Well Operations

Currently the City has three active wells, still referenced as the "Beltz" wells. Wells 8 and 9 were installed in 1998 as replacement wells for Wells 1 and 2, which were damaged in the 1989 Loma Prieta earthquake, and began producing water in 1999. Well 7 has been in operation since 1974 and is currently being replaced. A summary of the active production wells is presented Table 3-3.

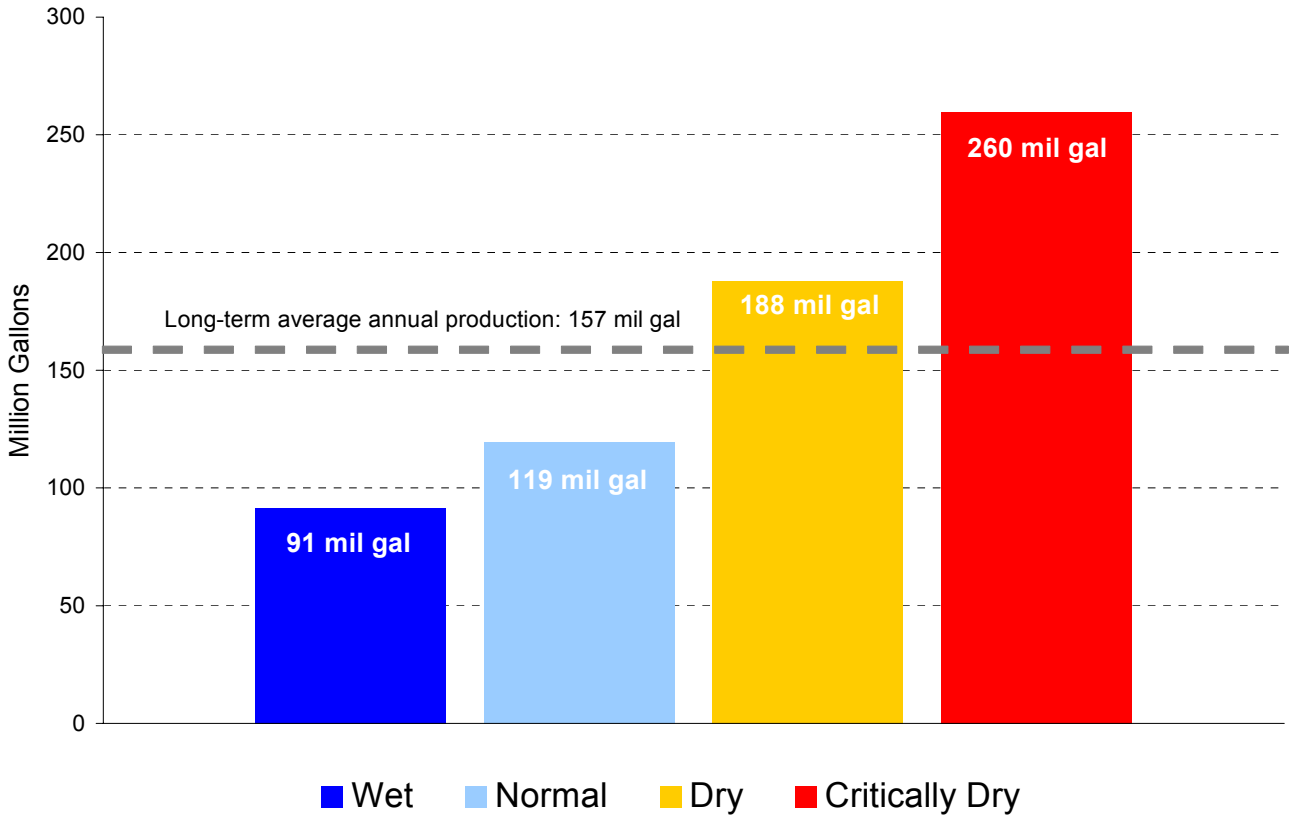
In 1986, the Live Oak Treatment Plant was expanded from its original capacity of 1 mgd to 2 mgd. The facility is scheduled to be modernized again in 2007-08 to maintain the 2 mgd treatment capacity and assure reliable water delivery in future years.

The wells are normally operated 150 to 200 days of the year during the dry season at a combined rated of about 1.0 mgd. The total annual production, however, varies considerably from year to year, depending on hydrologic conditions and availability of water from the City's other sources. In general, groundwater production decreases in wet years and increases in dry years. Figure 3-7 shows the average annual production amounts at the live Oak wells over a thirty-year period from 1972 to 2002 corresponding to each of the four water year types designated in the City's water year classification system. The facility was operated at its full 2 mgd capacity at times during the 1987-92 drought. During that event, annual production from the Live Oak Wells reached as high as 430 mgy.

Table 3-3. Summary of City Production Wells in Live Oak

Source	Year Installed	Depth (ft)	Capacity (gpm)	
			Rated	Operating
Well 7	1974	274	550	275
Well 8	1998	210	800	450
Well 9	1998	230	700	330

Figure 3-7. Annual Groundwater Production by Water Year Type



The future operation of the Live Oak well field is expected to be consistent with historical use of approximately 1 mgd during the dry season of normal years, or about 187 mgy, and operating at 2 mgd only during drought conditions or in critically dry years when surface water supplies fall short.

Groundwater Conditions

The Purisima Formation is a collection of distinct geologic units, designated as AA through FF, with AA being the deepest and oldest unit. The gradual uplift of the California coast has caused the units of the Purisima Formation to tilt from the west to the east. This easterly dip has limited the productive units in the western portion of the Formation to the AA and A.

Water levels in the aquifer are indicative of the amount of groundwater stored inland and moving down through the aquifer system. The water level at any given location is a balance of the local and regional dynamics of recharge to, and extraction or outflow from, the aquifer.

Being a coastal system, the Purisima Formation is vulnerable to seawater contamination. All units extend offshore, however the Purisima A layer outcrops the nearest to shore in the vicinity of

Pleasure Point, which is in close proximity to the Live Oak well field. The well field's coastal location makes it the area of groundwater extraction closest to the offshore outcrop of the Purisima A aquifer. While pumping at the City facilities constitutes a relatively small proportion of the total groundwater basin extractions, the City is the last in line to capture groundwater that would otherwise become offshore flow through the ocean floor outcrop. If the natural hydraulic gradient that flows offshore is reversed due to sustained depression of water levels elsewhere in the basin, there is the potential for saltwater intrusion to jeopardize the safe production by the City of groundwater from the Purisima aquifer.

Groundwater level data collected over the past 15 years indicate that water levels across the Purisima Formation have been lowered by a combination of changes in recharge and the gradual increase in overall groundwater production from the aquifer. The cumulative impact is particularly apparent in the Purisima A aquifer and has likely impaired the City's ability to maintain production and favorable coastal groundwater conditions.

Under normal operations (approximately 1 mgd) there appears to be no imminent threat of seawater intrusion. However, if all users continue to pump groundwater at the present rate, then the City's future use of the Live Oak wells at 2 mgd (as it has operated during past drought conditions) may not be possible without exacerbating conditions that could lead to seawater intusion.

At this time, no court or board has adjudicated the right to pump groundwater from the Purisima aquifer, nor has the California Department of Water Resources identified the basin as overdrafted, or projected that the basin will be overdrafted if present management practices continue.

Monitoring Well Network

To address this risk, the City in 2003-04 expanded its coastal and inland monitoring well network. There is now a total of 20 wells at 10 sites which are monitored at regular intervals for water level and water quality, including chlorides, pH, TDS, general mineral, and other constituents. The monitoring well network is designed to help understand how the aquifer responds to pumping stresses and to provide an early warning system to detect conditions that could signify the presence of seawater intrusion.

Cooperative Agreement for Ground-water Management

The Water Department performs a number of groundwater management activities, but has not yet determined the need to adopt a formal AB 3030 Groundwater Management Plan as

allowed under California Water Code section 10750. Instead, the City recently entered into a cooperative agreement with the Soquel Creek and Central Water Districts and the County of Santa Cruz. The purposes of this agreement are to establish common basin management objectives, undertake joint research projects, and improve interagency coordination to assure the safe production and protect the quality of the underground resource. A copy of the agreement is provided in Appendix D.

Projected Water Sources

Section 10631 (b) of the Water Code requires water suppliers to identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier, in five-year increments, to 20 years or as far as data is available.

Projections of water supply are presented in Table 3-4. The figures represent net water production of each of the four major sources, assuming

Table 3-4. Current and Planned Water Supplies

Water Supply Sources	2005	2010	2015	2020	2025	2030
Purchased from USBR						
Purchased from DWR						
Purchased from wholesaler						
Supplier produced groundwater	187	187	187	187	187	187
Supplier surface diversions:						
- North Coast sources	1,077	1,077	1,077	1,077	1,077	1,077
- San Lorenzo River	2,008	2,008	2,008	2,008	2,008	2,008
- Loch Lomond Reservoir	1,042	1,042	1,042	1,042	1,042	1,042
Transfers in or out		Potential transfer of up to 456 mgy out to Soquel Creek Water District.				
Exchanges in or out						
Recycled Water						
Desalination		Potential production of 456 mgy in normal water years for transfer to Soquel Creek Water District				
Other						
Total	4,314	4,314	4,314	4,314	4,314	4,314

Units in million gallons per year

normal water conditions in future years and no change to current operations or water rights. The basis for these projections is as follows.

Live Oak Wells: The 187 mgy figure is based on the average annual production since 1986, when the treatment plant was expanded. This amount is considered to be representative of future extraction rates.

North Coast: The 1,077 mgy figure in 2005 is based on an analysis of actual water production measured at the Coast pumping station between 1999 and 2003. This source is presently used at maximum capacity for most of the year. Water production is expected to remain constant at this level in future years under normal water conditions.

San Lorenzo River. The 2,008 mgy figure is based on a similar analysis of actual production measured at the Coast pumping station over the same five years. This source is also used at maximum capacity for a significant portion of the year. No significant changes in production are expected over the next 25-year period.

Loch Lomond Reservoir. The 1,042 mgy figure represents the maximum amount of water that the City may withdraw annually under its current water rights. Of this amount, 104 mgy or 10% is technically available to the San Lorenzo Valley Water District, but it has taken no action in recent years and has no current plan to exercise its entitlement.

Transfers/Desalination: As explained more fully in Chapter 5, the City is planning to construct a 2.5 mgd seawater desalination plant as a backup water supply in times of drought, which would become available beginning around the year 2010. In the near term, the plant would be operated only in drought conditions. Thus no production volumes are shown in Table 4-3. After 2015, however, up to 1.25 mgd of water from the desalination plant may be needed on a regular basis as a supplemental water supply for the City, depending on the actual water demands at that time stemming from the physical expansion and enrollment growth at the University and the amount of growth allowed in the City and County of Santa Cruz and the City of Capitola under future General Plans.

The City's Integrated Water Plan envisions operating the desalination plant in a cooperative arrangement with the Soquel Creek Water District, which also is looking to secure a supplemental source of water to reduce its reliance on well water and avert the threat of seawater intrusion in local groundwater aquifers. This would mean the City may potentially become a future water wholesaler or transferor to the neighboring water district. Otherwise, the City will continue to rely mainly on its existing sources, which total about 4.3

billion gallons per year, into the foreseeable future.

CHAPTER 4

PAST, CURRENT, AND PROJECTED WATER USE

This chapter describes the City's customer classification system, discusses the water use characteristics of the different customer groups and discusses past, current, and projected water use.

Customer Classification System

The City divides its water customers into eight major classes and one miscellaneous category, as follows:

Single Family Residential: Individually metered residential units (regardless of housing type).

Multiple Family Residential: Any residential account with more than one dwelling unit served by one water meter.

Business: Commercial establishments including restaurants, hotel/motel, retail, medical, schools, offices, churches and mixed-use buildings.

Industrial: This class includes the University of California, Santa Cruz and manufacturing facilities.

Municipal: City-owned facilities such as city offices, parks, police and fire stations, wastewater treatment plant, street medians, and parking lots.

Irrigation: Dedicated water services for landscape irrigation associated with large multiple residential complexes and homeowners associations, or with commercial, industrial, and institutional sites, including schools, churches, parks, etc.

Golf Irrigation: Accounts serving the two golf courses in the service area.

Coast Irrigation: Agricultural accounts receiving untreated water on the north coast.

Other: Miscellaneous uses such as temporary construction accounts, hydrant meters, and bulk water sales.

No water is presently sold to other agencies, or used for groundwater recharge, saline water intrusion barriers, conjunctive use, or any combination thereof.

Water Use by Customer Category

A breakdown of the number of service connections, average consumption and percent of total use by customer category is provided in Table 4-1. There are currently 23,799 active, metered service connections on the City water system.

Table 4-1. Current Water Use by Customer Class

Customer Class	Number of Accounts	Average Annual Usage (mil gal)[1]	Percent of Total Usage
Single Residential	18,352	1,509	42%
Multiple Residential	2,636	821	23%
Business	1,886	680	19%
Industrial	56	243	7%
Municipal	230	63	2%
Irrigation	412	133	4%
Golf Irrigation	6	111	3%
Coast Irrigation	36	63	2%
Other	185	4	--
Total	**23,799**	**3,626**	**100%**

1. Average for 2002-2004

The single family residential class is the largest customer category in terms of both the number of accounts and total amount of water consumed. This group of customers uses 1.5 billion gallons annually, representing 42 per cent of system water use. At the end of 2004, single family accounts numbered 18,352. The majority of water used in this category is for interior domestic purposes such as showering, bathing, flushing, cooking, and clothes washing, as well as for outdoor uses including landscape and garden irrigation, swimming, and car washing.

The average single family home uses 226 gallons of water per day, or about 82,500 gallons per year. Of this daily amount, 168 gallons per day or 74 percent is consumed indoors, with the remaining 58 gallons or 26 percent used outdoors. On a per-person basis, daily indoor usage is about 58 gallons.

The multiple family residential class uses just above 0.8 billion gallons annually representing 23 percent of system use. The number of households per account ranges from 2 to 400. In total, there are about 17,000 separate dwelling units in the multiple family class.

The average multi-family household uses 138 gallons of water per day, or about 50,000 gallons per year, of which 108 gallons per day or 78 percent is used indoors and the remaining 33 gallons or 22 percent is used outdoors. Per-person daily indoor usage is about 49 gallons.

Together, single family and multiple residential water use represents sixty-five percent of the water supplied by the Santa Cruz water system.

The business category includes hospitals, restaurants, motels, office buildings, retail stores, schools, laundries, health spas, and an array of other commercial enterprises. Chaminade Conference Center and Dominican Hospital are the two largest customers in the business category. Water use in this category varies greatly among individual accounts, depending on the type and size of establishment being operated. This group makes up 19 percent of the total consumption, and averages just under 0.7 billion gallons per year.

The industrial category is now comprised of one primary customer - the University of California, Santa Cruz - and a small number of manufacturing businesses. As mentioned in Chapter 2, the City experienced the loss of several long-established manufacturing and technology employers since 2000, most notably the Texas Instruments plant. The industrial category now accounts for 7 percent of total annual water use, or 0.24 billion gallons per year, the majority of which is used by the University of California.

The municipal category consists of City-owned and operated facilities, including the wastewater treatment plant, City parks, public buildings, parking lots, and landscaping. This category uses about 2 percent of the City water supply.

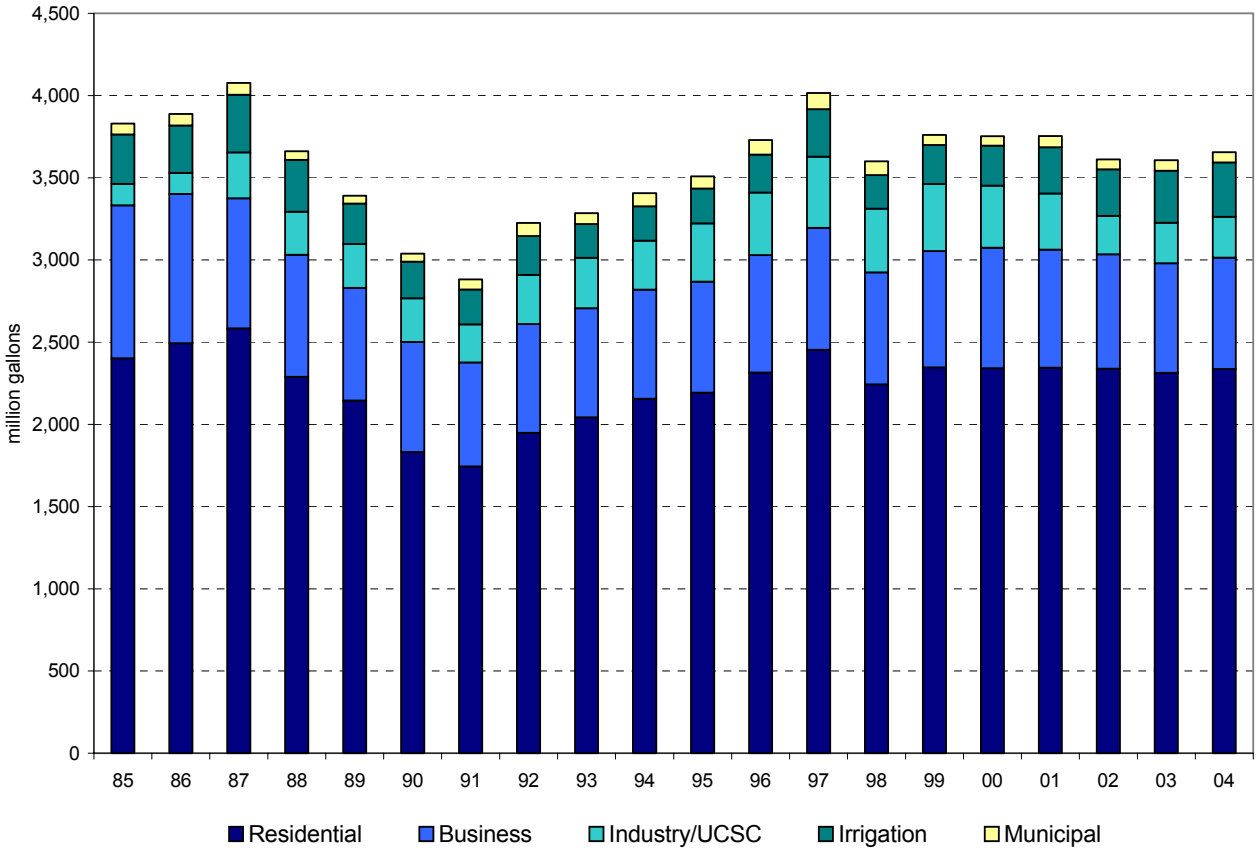
The landscape irrigation category uses about 4 percent of the total water delivered in the service area. The two golf courses combined account for 3 percent. The coast irrigation category is exclusively commercial agriculture, in which the predominant use of water is for cultivation of Brussels sprouts. Other crops grown on the agricultural lands west of town include organic herbs and vegetables, pumpkins, artichokes and miscellaneous truck crops. This group uses 2 percent of the total water supply.

All together, the three irrigation categories account for about 9 percent of the water supplied by the City water system.

Annual Trends in Water Consumption

Figure 4-1 shows the annual trends in metered water use over the last twenty years, by customer category. Peak annual use during this period occurred in 1987. Consumption declined through 1990 due to water use restrictions and rationing imposed during the 1987-92 drought. Water use recovered after the drought through 1997, and then declined abruptly due to the unusually wet weather accompanying El Nino in 1998. Since 1999, total water consumption has remained remarkably stable. The small drop that occurred in

Figure 4-1. Annual Water Consumption by Customer Category, 1985-2004



2002 is attributable to the closure of the Texas Instrument plant.

Unmetered Water Use and System Losses

Total system water demand includes not only metered water sales but also authorized, unmetered uses from fire hydrants such as main flushing, fire fighting, street sweeping, and sewer flushing, as well as losses due to underground leaks. The difference between the amount of water produced at the City's two water treatment plants entering the distribution system and the amount of water consumed, including both metered and unmetered uses, is referred to as system water losses. System losses have two components: physical losses from leaking service lines and water mains, and apparent losses in which actual consumption is underreported due to sales meter inaccuracies, accounting errors, and other factors.

The City has conducted audits of the distribution system annually since 1997 to account for unmetered water uses and to track how much water is physically lost to leakage over time. Results over the last five years indicate the City's system water losses varies

between five and eight percent. On average, system losses amount to seven percent of production or about 262 million gallons per year. Of this amount, two percent or 72 million gallons annually is attributable to sales meter underregistration and five percent or about 192 million gallons annually is attributable to physical losses from underground leakage in service lines, water mains, valves and distribution system controls. This level of leakage is considered to be low compared with normal system water losses for other urban water utilities located elsewhere in California.

Projected Water Demand

The City contracted with Maddaus Water Management, in association with the Weber Group, in 1997 to prepare a long-range water demand forecast for the City service area. The forecast used information on local population and employment trends, published by the Association of Monterey Bay Area Governments in 1997. Demographic data and land use information from the Santa Cruz City, County and Capitola general plans were used to project future growth in customer accounts, summarized in Table 4-2 below. Water use was then analyzed for each major customer category to produce separate projections for each class. The figures were adjusted downward to account for the impact of recent plumbing code changes, but did not include water savings from active water conservation programs, which are described in Chapter 6. (Maddaus & Weber, 1998)

The demand forecast is presented in Table 4-3. It indicated that the City's total annual water supply requirements

Table 4-2. Projected Number of Service Connections by Customer Class

Customer Class	2005	2010	2015	2020	2025[1]	2030[1]
Single family residential	17,926	18,182	18,494	18,823	19,087	19,351
Multi-family residential	2,719	2,791	2,865	2,942	3,017	3,092
Business	2,314	2,469	2,593	2,693	2,820	2,947
Industrial	50	52	54	56	58	60
Municipal	215	224	232	238	248	258
Irrigation	356	373	387	400	415	430
Golf Irrigation	6	6	6	6	6	6
Coast Irrigation	29	29	29	29	29	29
Other	263	293	304	310	320	330
Total	**23,872**	**24,411**	**24,958**	**25,490**	**26,000**	**26,503**

1. Number of connections for these years interpolated from Water Demand Investigation.

Table 4-3. Water Demand Projections (million gallons)

Customer Class	2005	2010	2015	2020	2025[1]	2030[1]
Single family residential	1,592	1,581	1,579	1,583	1,588	1,594
Multi-family residential	952	960	970	983	998	1,014
Business	880	930	970	1,001	1,044	1,087
Industrial: UC Santa Cruz	321	408	408	408	408	408
Industrial: Texas Instruments	219	219	219	219	219	219
Industrial: Other	32	34	35	37	38	40
Municipal	54	57	59	60	62	65
Wastewater Plant	22	23	23	23	24	25
Irrigation	143	150	155	161	167	173
Golf Irrigation	118	118	118	118	118	118
Coast Irrigation	31	31	31	31	31	31
Other	15	17	18	18	18	19
Metered Water Consumption	**4,380**	**4,526**	**4,584**	**4,641**	**4,715**	**4,793**
Water Losses	487	503	509	516	524	533
Total System Demand	**4,867**	**5,029**	**5,094**	**5,157**	**5,239**	**5,326**

1. Demand projections for these years interpolated from Water Demand Investigation

would reach about 4.8 billion gallons in 2005 and increase to about 5.3 billion gallons in 2030.

Actual water use in recent years has been substantially lower than was predicted in the study. As indicated in Table 4-4, metered water consumption between 2002 and 2004 is averaging 3.6 billion gallons per year, 17 percent less than the 4.4 bgy level forecast for 2005. Total system demand is currently about 3.9 bgy, 20 percent less than the predicted level of 4.9 bgy. As shown in Table 4-4, most customer categories are using considerably to somewhat less water than predicted.

The reasons for this large discrepancy differ among customer categories. The two residential classes are thought to be down mainly as a positive result of water conservation programs reducing indoor household use. The difference in business use is thought to be a combination reflecting local economic conditions, business closures, and forecast error. University use remains low relative to the level predicted primarily due to the assumptions about the student population housed on campus that were used in the demand study but proved not to be true. The closure of the Texas Instruments plant accounts for the single largest difference

Table 4-4. Comparison of Actual and Predicted Water Use

Customer Class	Water Use (mil gal)		Difference	
	Actual	Predicted	Mil gal	Percent
Single Residential	1,509	1,592	-83	-5
Multiple Residential	821	952	-131	-14
Business	680	880	-200	-23
Industrial: UC Santa Cruz	205	321	-116	-36
Industrial: Texas Instruments	2	219	-217	-99
Industrial: Other	36	32	+4	+12
Municipal	58	54	+4	+7
Wastewater Plant	5	22	-17	-77
Irrigation	133	143	-10	-7
Golf Irrigation	111	118	-7	-6
Coast Irrigation	63	31	+32	+103
Other	4	15	-11	-73
Metered Water Consumption	**3,626**	**4,380**	**-754**	**-17**
Water Losses	289	487	-198	-40
Total System Demand	**3,915**	**4,867**	**-952**	**-20**

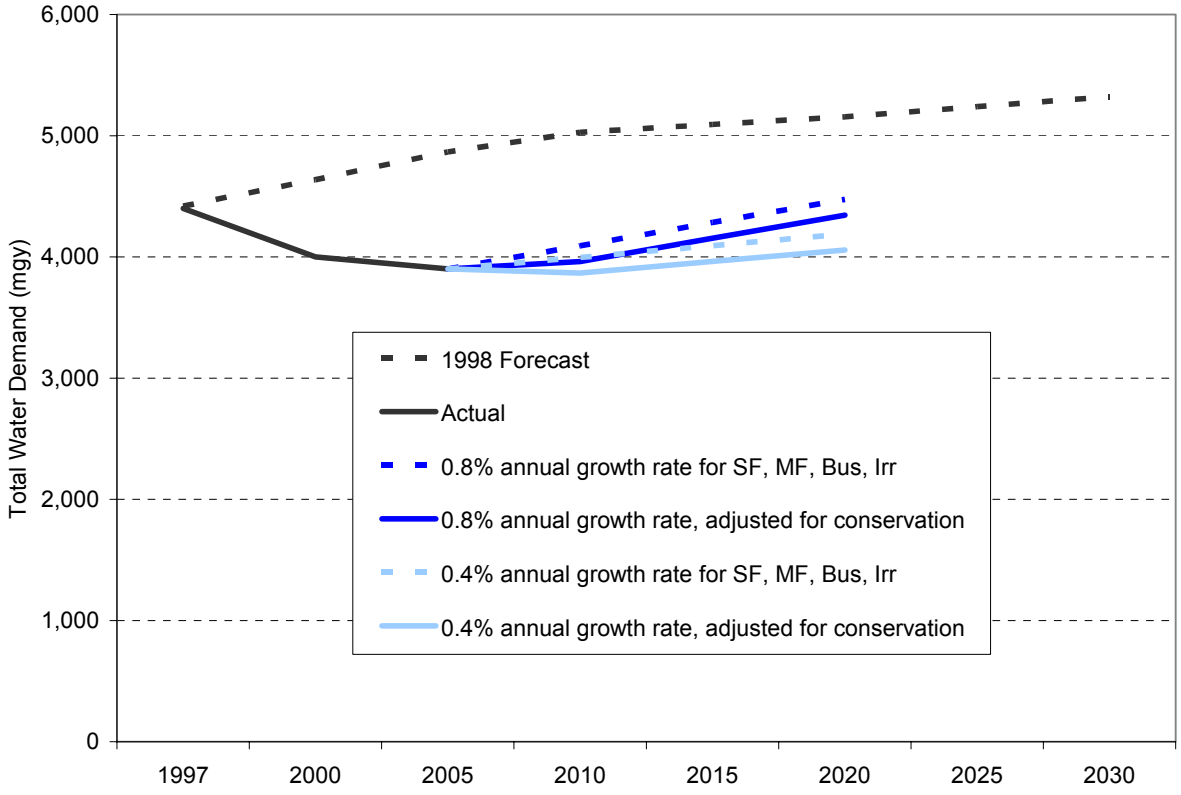
between actual and predicted water use. Only one customer class, coast agriculture, was up by a significant percentage relative to the forecast amount.

Another reason that total demand is much lower than predicted is that actual water losses are significantly less than the 10 percent they were assumed to be in the demand investigation, which was prepared before any firm data about system losses was available.

These discrepancies signify that the City's demand forecast should be revisited again to examine the timing and level associated with future account growth. Looking forward, the customer with the largest growth potential is the University of California. Between the main campus, the marine science campus and its other facilities in town, water use is predicted by the University to increase to nearly 400 mgy by 2020 under the next long range development plan.

Figure 4-2 shows two plausible scenarios in water demand going forward from 2005 through 2020. The first scenario assumes that the City's three largest customer classes, single residential, multi-residential and

Figure 4-2. Future Water Demand Scenarios



business, and irrigation accounts grow at an annual rate of 0.8%, and that water use at the University increases as predicted in its LRDP by 2020. The second scenario assumes a lower annual growth rate of 0.4% and the increase in water use at the University that is half that predicted. The first scenario reflects residential and business use increasing in proportion to the amount of growth envisioned in existing housing elements, spread out over the next fifteen years. The second scenario is based on actual residential growth rates experienced since 1997, continuing through 2020. In both scenarios, water use in all other customer classes was assumed to be constant at current levels. Both scenarios were then adjusted downward to account for 130 million gallons per year of remaining conservation savings. Both scenarios assume normal water conditions, understanding that changes in weather patterns can have a considerable impact on total water use, up or down, in any individual year.

These scenarios suggest that total water demand could either increase slightly or climb beyond the 4.3 billion gallon per year capacity of the existing water system by 2020, after taking into account conservation, depending on the

amount of growth that takes place at the University and throughout the community at large. The scenarios were not carried beyond 2020, as it was considered to be too speculative. Either way, it is unlikely that demand will reach the level predicted in the 1998 forecast within the time frame covered by the city's next General Plan unless unforeseen changes occur. Once updates to the Santa Cruz City, County and Capitola General Plans have been completed, it is recommended that the water demand projections for the service area be reviewed and updated.

Future Sales to Other Agencies

As described in Chapter 3, the City's Integrated Water Plan envisions building and operating a new desalination plant in a cooperative arrangement with the Soquel Creek Water District. This would mean the City may potentially become a future water wholesaler to the water district. Although no formal agreement has been reached between the City and the district, the plan assumes that the City would sell 1.25 mgd or 456 million gallons per year beginning in 2010 on an ongoing basis.

CHAPTER 5

WATER SUPPLY RELIABILITY

This chapter characterizes the reliability of the City water supply system, provides an assessment of the system reliability under average water years, single dry years, and multiple dry years, and describes the Integrated Water Plan recently adopted by the City to ensure adequate water resources are available to meet the area's water service needs through the year 2030.

Overview of Water Supply Problem

The primary water management problem currently facing the City of Santa Cruz is the lack of adequate water supply during droughts. As explained in Chapter 3, the City of Santa Cruz relies on surface flows in coastal streams and the San Lorenzo River for most of its annual water supply needs. The yield of these sources in any given year is directly related to the amount of rainfall received and runoff generated during the winter season. Water stored in Loch Lomond Reservoir is used mainly in the summer and fall seasons when the flows in the coast and river sources decline and additional supply is needed to meet dry season demands.

The problem of supply reliability stems primarily from two factors: the wide range in the yield of surface water sources from year to year and limited storage capacity. In normal and wet years when rainfall and runoff are abundant, base flows in the coast and river sources are restored by winter rains and Loch Lomond Reservoir is typically replenished to full capacity with runoff from the Newell Creek watershed. Under these conditions, the water supply system of the City of Santa Cruz is currently able to meet the community's total annual water requirements.

The water system, however, is highly vulnerable to shortage in drought years when the San Lorenzo River and coast sources run low. In single dry years, the system relies more heavily on water stored in Loch Lomond to satisfy demand, which draws down the reservoir level lower than usual and depletes available storage. In multi-year or critical drought conditions, the combination of very low surface flows in the coast and river sources and depleted storage in Loch Lomond reservoir reduces available supply to a level which cannot support average dry season demands. Compounding the situation is the need to reserve some amount of storage in Loch Lomond in the event drought conditions continue into the following year.

Past Water Supply Deficiencies

The City experienced severe water supply deficiencies in both the 1976-77 and 1987-92 droughts. In 1977, the City imposed severe water rationing in response to a critical shortage of water. During the 1987-92 drought, a water supply emergency was declared and either usage restrictions or rationing was imposed each year for five consecutive years. The 1976-77 event has since been established as the most severe drought of record, and is used by the City as a benchmark for assessing system reliability.

Water Year Classification System

The City uses a water year classification system as an index of water supply conditions for operations studies, to forecast river flows, and to communicate its water supply status to the public. The system is based on total annual runoff in the San Lorenzo River, the City's most important source, measured at the Big Trees gage in Henry Cowell Redwoods State Park.

Under this classification system, the water year (October 1- September 30) is designated as one of four types: wet, normal, dry, or critically dry, depending on the total annual river discharge (Table 5-1).

Figure 5-1 shows the total annual runoff for the San Lorenzo River over the 84 year period from 1921 to 2005 and the classification for each water year[1]. The graph illustrates the dramatic variation in discharge from year to year. Average runoff during this period is about 93,000 acre-feet or 30 billion gallons[2]. The least amount of runoff, 9,500 ac-ft, occurred in the drought of 1977. The maximum recorded discharge was over 280,000 ac-ft in 1983, one of the wettest years on record in California.

Table 5-1. Water Year Classification System

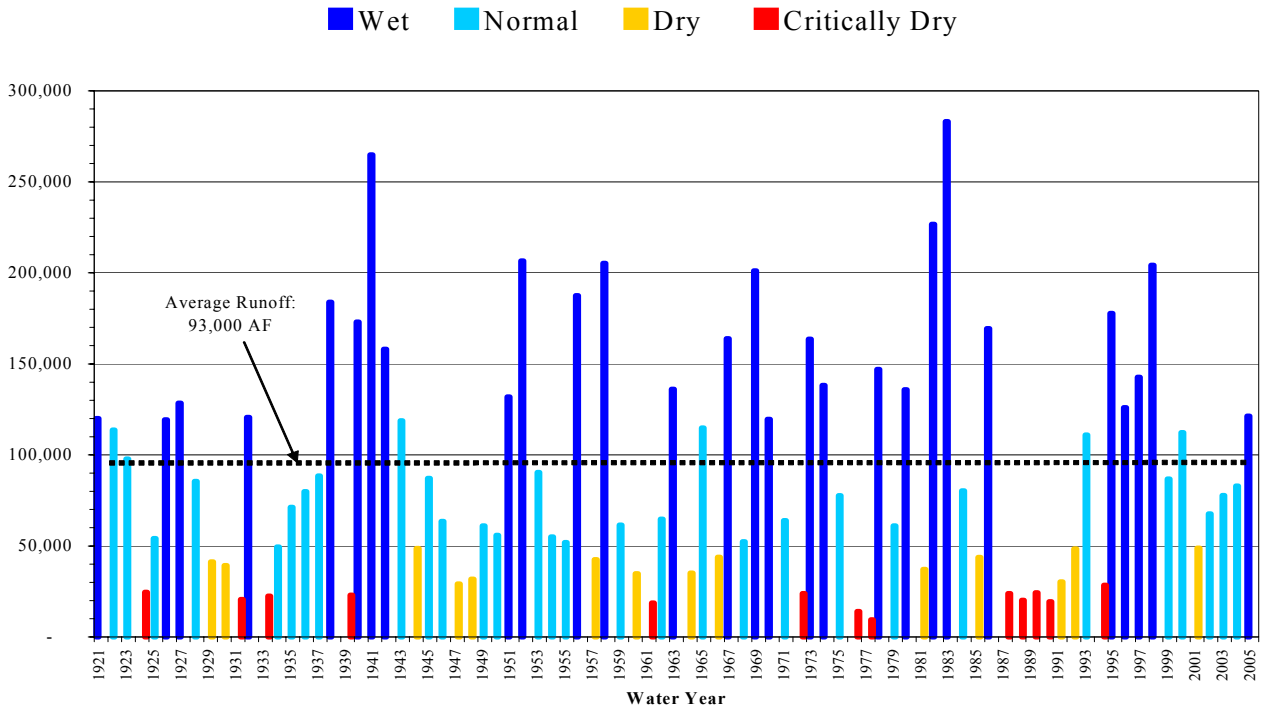
Classification	Runoff (ac-ft)
Wet	> 119,000
Normal	49,000 - 119,000
Dry	29,000 – 49,000
Critically Dry	<29,000

Over this relatively brief hydrologic record, about two-thirds of all years are classified as wet or normal and the other one-third is classified as dry or critically dry. Since 1995, water conditions have been mostly normal or wet, with only one year out of the last eleven classified as dry and none classified as critically dry. No shortage of water has been experienced over this period.

[1] The actual period of record for the gage on the San Lorenzo River began in 1936, but synthesized flow records generated for earlier modeling studies were used to extend the period of record back to 1921.

[2] One ac-ft equals 325,851 gallons; 3.07 ac-ft equals one million gallons.

Figure 5-1. Total Annual Runoff in the San Lorenzo River (ac-ft)



Average, Single Dry, and Multiple Dry Years

Section 10631 (c) of the Water Code requires water suppliers to provide estimates of supply volumes for average, single dry, and multiple dry water years, and to describe the factors resulting in any inconsistency of supply. The data are given in Table 5-2. The basis for supply calculations is as follows:

Average Water Year: Average annual water supply available from each of the City's four sources calculated over the 5-year period from 1999 through 2003, which is considered to be representative of normal water conditions. Note that, for Loch Lomond Reservoir, more water technically is available than is currently being used.

Single Dry Water Year: Estimated water supply available in water year 1994, the most recent single dry year on record.

Multiple Dry Water Years: Estimated water supply available during the two-year drought sequence from 1976-1977, which is the most critical drought on record and one that is used by the City as a worst-case drought sequence for supply planning purposes.

The major factor that results in an inconsistent level of water supply from year to year is the natural variation in the level of runoff available in local streams and rivers, from which the City

Table 5-2. Water Supply Reliability for Average, Single Dry, and Multiple Dry Years (millions of gallons)

Source	Average Water Year	Single Dry Water Year	Multiple Dry Water Years	
			Year 1	Year 2
North Coast	1,077	500	400	300
San Lorenzo River	2,008	2,100	2,100	1,800
Live Oak Wells	187	300	300	400
Loch Lomond Reservoir	1,042	900	700	200
Total	**4,314**	**3,800**	**3,500**	**2,700**
Percent of Average	**100%**	**88%**	**81%**	**63%**

draws the majority of its supply. At this time, there are no legal, water quality or environmental factors that presently affect the City's water supply reliability, but the City is faced with uncertainties regarding both its water rights and implementation of state and federal endangered species legislation that could lead to some loss of its existing supply in the future. These challenges are described in more detail later in this chapter.

Water Supply and Demand Assessment

Section 10635 (a) of the Water code requires water suppliers to compare the total water supply sources available to the water supplier with the total projected water use over the next twenty years, in five year increments, for a normal water year, a single dry water year, and multiple dry water years.

Normal Water Year: This assessment uses net water production figures referenced in Table 3-4 as being representative of the total amount of water the City could supply in normal years, measured at its two treatment plants. These supply figures assume no changes to current operations or water rights over the next 25 years. The available water supply is compared to the higher of the two future scenarios for water demand presented in Chapter 4 in which projected water use is assumed to rise at a rate of 0.8 percent annually and is then adjusted downward to factor in the effect of long-term water conservation. The results are presented in Table 5-3.

This comparison shows the water supply system of the City of Santa Cruz is capable of meeting the community's total annual water requirements under normal water conditions through the

Table 5-3. Normal Water Year Supply and Demand Assessment (million gallons)

	2005	2010	2015	2020	2025	2030
Supply Totals	4,314	4,314	4,314	4,314	4,314	4,314
Demand Totals	3,900	3,952	4,154	4,345	n/a	n/a
Difference	414	362	160	(31)	--	--

year 2015. At some time between 2015 and 2020, demand is seen to exceed the system capacity in average water years, such that by the year 2020 a deficit condition is expected. The implication of this assessment is that sufficient water supplies are presently not available to meet all the growth in demand that can be anticipated over the next fifteen years, and that a new supply would need to be developed. It remains too speculative at this time to project water demand beyond the 2020 time frame.

Single Dry Year: The total water supply estimated to be available to the City in single dry years like 1994 is 3,800 mg or about 12% less than is available in normal years. Table 5-4 shows that there would be a relatively small supply deficit in single dry years under current demand conditions, which will increase as demand increases over time.

Multiple Dry Years: In an extreme two-year drought similar to the 1976-77 event, the estimated water supply available to the City in the second year of that event is 2,700 mg or about 37% less on an annual basis than is available in normal water years. Table 5-5 shows that there would be a severe water supply shortage under current demand conditions, which will grow worse as demand increases over time. The shortfall is also expressed in Table 5-5 as the percent of supply available to meet demand during the peak season between April and October, since this the period of year that would be most affected by a supply shortage. Under such conditions, the water system is barely able to meet half of normal

Table 5-4. Single Dry Year Supply and Demand Assessment (million gallons)

	2005	2010	2015	2020	2025	2030
Supply Totals	3,800	3,800	3,800	3,800	3,800	3,800
Demand Totals	3,900	3,952	4,154	4,345	n/a	n/a
Difference	(100)	(152)	(354)	(545)	--	--

Table 5-5. Multiple Dry Year Supply and Demand Assessment (million gallons)

	2005	2010	2015	2020	2025	2030
Supply Totals	2,700	2,700	2,700	2,700	2,700	
Demand Totals	3,900	3,952	4,154	4,345	n/a	n/a
Difference	(1,200)	(1,252)	(1,454)	(1,645)	--	--
Peak Season Deficit	46%	47%	52%	56%		

demand during the peak season in 2005, with the shortage increasing to as much as 56% in 2020. This finding is consistent with the City's Integrated Water Plan, which reported that: *"The City's water supply system is grossly inadequate to meet current demand under drought conditions. With current supplies and facilities, if a drought comparable to the 1976-77 event occurred today, the City would experience a 45% peak-season shortage in the second year of that event."*

If results of this assessment are coupled with the historical frequency of occurrence of the four different water year types represented in Figure 5-1, the existing water system would able to meet 100 percent of existing water demand in roughly 7 out of every 10 years and at least 90 percent of today's demand in about 9 out of every 10 years. The likelihood of experiencing a supply deficiency of greater than 10 percent statistically occurs about one year out of every ten.

Plans to Assure a Reliable Water Supply

The City has been actively considering possible new water supplies for many years in order to address the problem of water shortage and to plan for future growth. Past efforts to augment supplies have made little progress, however, due to stakeholder disagreement on the appropriate course of action.

In 1997, the City initiated a new effort using a broader based approach known as Integrated Water Planning to consider all practical options for decreasing demand and increasing supply. As part of this effort, a series of background studies were undertaken, including the following:

- Water Demand Investigation (1998)
- Water Conservation Plan (2000)
- Water Curtailment Study (2001)
- Alternative Water Supply Study (2000)
- Evaluation of Regional Water Supply Alternatives (2002)

An Integrated Water Plan (IWP) was then developed over a two-year period (Gary Fiske & Associates, 2003). It used the results of these background studies to develop and evaluate a set of water resource strategies to meet two fundamental goals:

1. *Reduce near-term drought shortages, and*

2. *Provide a reliable supply that meets long-term needs while ensuring protection of public health and safety.*

The project was overseen by a committee consisting of City Council members and Water Commission members, which held public meetings on regular basis and several public workshops throughout the planning process.

A program environmental impact report (PEIR) was then prepared on the plan and circulated for public review and comment. On November 8, 2005, City Council certified the PEIR and unanimously adopted the IWP as the City's long-term water resource strategy. The recommended plan includes the following three components:

1. Water conservation to maximize the use of existing water resources;

2. Curtailment of water use of up to 15 percent in times of drought; and

3. Additional water supply in the form of a 2.5 mgd seawater desalination facility that would be expandable in 1.0 mgd increments up to 4.5 mgd, if needed, in future years.

These 3 components are described briefly below.

Water Conservation. A cornerstone of the IWP is to achieve the maximum practical water use efficiency through conservation. Both state water law and the City's General Plan call for a strong emphasis on water conservation and elimination of water waste to stretch existing sources, minimize the need for new water sources, and protect the environment.

The IWP calls for continuing to implement a broad set of conservation programs which result in long-term water savings of nearly 300 million gallons per year. These programs address all fourteen best management practices for urban water conservation in California. A full description of the City's water conservation program is included in Chapter 6.

Use Curtailment. In the process of developing the IWP, the City made a fundamental recommendation to not meet full demand in drought years when surface supplies fall short. Instead the IWP calls for supplying 85 percent of normal demand in critical drought years like the 1976-77 event, and for a

corresponding reduction in peak season water use of up to 15 percent. This cutback would be achieved through temporary watering restrictions or rationing that target landscape irrigation and other outdoor uses.

The unserved demand anticipated in the curtailment component would amount to about 500 million gallons in a severe drought. This temporary reduction in water use would be in addition to the nearly 300 million gallons saved on a long-term basis through conservation.

The conservation and curtailment components of the IWP are closely related in that they both involve reducing customer demand to resolve the City's supply deficiency as opposed to increasing the supply of water. There are important distinctions, however, that set them apart:

1. Curtailment is a short-term reduction in water use that is taken in response to extraordinary circumstances that involves some level of customer sacrifice. The conservation component, in contrast, emphasizes measures that people can take to reduce average daily water use without sacrificing their quality of life.

2. Curtailment depends on people making behavioral changes, whereas the conservation component features technological improvements such as low consumption toilets and high efficiency clothes washers that increase water use efficiency without relying on conscious changes in behavior to achieve water savings.

3. Curtailment focuses on reducing outdoor uses of water such as landscape irrigation and exterior washing to preserve available supplies for essential domestic, sanitary and fire protection purposes. The conservation component is aimed primarily at reducing interior uses of water.

The IWP carefully considered other possibilities for use curtailment, ranging from no curtailment up to a 25 percent systemwide reduction in water use under worst case drought conditions. The planning decision to select 15 percent was based mainly on the fact that, while there was only a slight difference in overall cost between the 15 and 25 percent strategies, the difference in terms of the impacts and hardship to residential and business customers, as well as the frequency of cutbacks, between these two curtailment levels was much more substantial. The decision also recognized that water use per-capita is already very conservative, and that the ability of customers to make such cutbacks would become more difficult or costly over time because of the increase in efficiency achieved through additional conservation efforts.

Additional Water Supply. The IWP identified seawater desalination as the only feasible alternative for a backup supply of drinking water in times of drought. Several possible options were carefully evaluated, including drilling more wells, upgrades to the north coast system and treatment facilities, and a water transfer involving exchange of groundwater with recycled wastewater for agricultural use on the State park lands north of town. Both the wells and groundwater exchange concept ultimately proved to be infeasible, however, leaving seawater desalination as the only real solution available to the City.

The project concept adopted by City Council involves constructing a seawater intake system using an existing, abandoned wastewater outfall, building a new desalination plant with an initial capacity of 2.5 mgd, and installing the associated pipelines and pumping stations for delivering treated water to the Bay Street Reservoir and conveying seawater concentrate to the City's wastewater facilities, where it would be blended with municipal wastewater flows and disposed via a deep ocean outfall.

The purpose of this initial increment of desalination capacity is for drought protection. Accordingly, the desalination plant would only be used by the City intermittently during the dry seasons of dry and critically dry years when existing supplies fall short.

The adopted Integrated Water Plan involves cooperating with the Soquel Creek Water District, which is also looking to secure a long-term supplemental source of water to reduce its reliance on well water and avert the threat of seawater intrusion in local groundwater aquifers. The arrangement calls for the District to use some or all of the future plant's capacity when the City doesn't need it. In return, the District would share in the cost of building and operating the plant. The District's Board on January 31, 2006 voted to adopt its own updated Integrated Resource Plan that identifies this regional desalination plan as its preferred conjunctive use alternative. In adopting the IWP, however, the City left open the possibility that it would move forward to build and operate the desalination facility independently if an agreement with the Soquel Creek Water District cannot be reached.

Water Supply Increments in Concert with Growth

The provision of additional water supply would occur in three phases or increments that are intended to be flexible and responsive to, rather than out ahead of, future growth. The first 2.5 mgd increment is intended for drought protection for the current population. Subsequent 1.0 mgd

Adequacy of City Water Supplies to Support Future Development

In 2001, Senate bills 610 and 221 were signed into law, changing the way land use decisions are linked to water supply availability. Water agencies across California are now required to provide detailed information regarding water supply availability to City and County decision-makers prior to the approval of certain large development projects.

In response to these new laws, the City of Santa Cruz in 2004 explored the interrelated subjects of water supply and community development. With the City so short of water in times of drought, many questioned why additional growth and development continues to be allowed on the water system. The report found the following:

Three of the City's four major sources are presently utilized at maximum capacity for a significant portion of the year. Even under normal water conditions, there is no additional water available from these sources to support future growth.

With current facilities and normal water conditions, the North Coast streams, San Lorenzo River and Live Oak Wells are capable of producing an average of 3.25 billion gallons of water per year. With lake production limited by the City's water rights to a maximum of 1.04 billion gallons per year, it is projected that the existing water system will be fully committed when demand reaches a sustained level of about 4.3 billion gallons per year. The system is operating now at about 93 percent of capacity.

Compared to recent levels of water use, the existing system can accommodate a net increase of approximately 300 million gallons before reaching its maximum capacity.

This report revealed that most of the time, the City has a small amount of remaining water supply capacity that is available for allocation to new development. It is the policy of the City to require annual updates to City Council on the status of this remaining water supply to confirm or adjust the estimate of remaining water supply and to avoid oversubscribing the water system.

Land use planning decisions are thus based on the water supply available in normal years, while water supply planning efforts focus primarily on drought years, which occur much less frequently but can cause significant hardship and economic impact throughout the community.

increments are also intended for drought protection but would be triggered by the amount of growth in demand over time. They would be needed to maintain the same level of water supply reliability and to avoid greater use curtailments if demand grows as modeled in the IWP. In addition, it is acknowledged that it

may become necessary in the future to operate the desalination facility at part of its original 2.5 mgd capacity on a year-in, year-out basis to supplement existing supplies. The timing and need for future increments will depend largely on the amount of growth at the University that takes place under its next long range development plan, policies regarding land use, housing, and economic development that take shape under the City's next General Plan revision, and the actual increase in water use that accompanies allowed growth. Each increment of the desalination facility will be required to undergo full CEQA analysis to ensure that water supply improvements occur in concert with local land use plans.

Desalination Pilot Study

The next step is to conduct a detailed pilot study that evaluates the entire desalination treatment process to determine the best performance in terms of cost, system reliability, and water quality before designing a full scale plant. In May 2005, the City of Santa Cruz was awarded a grant in the amount of $1,982,601 from the California Department of Water Resources as part of the statewide Proposition 50 initiative for a desalination pilot study. The grant will help fund: 1) the testing of technology innovations to reduce energy consumption, improve water recovery and reduce overall life-cycle costs, 2) the development of a method to verify reverse osmosis (RO) membrane integrity and testing RO rejection of boron, algal toxins and emerging contaminants, and 3) the testing of a new two-stage seawater RO system for recovery, energy consumption, membrane costs, feed water flow and concentrate flow.

The full scale plant design is likely to begin in early 2007 and the facilities are expected to be constructed and on-line around the year 2010, pending numerous regulatory agency's approval.

Ongoing Planning Issues

A basic assumption made in developing the IWP was that the City would continue to use its existing sources of supply into the future as it has in the past. There, are however, a number of ongoing challenges facing the City over its existing source that could lead to some loss of supply in the future, although it is uncertain to what extent and which supplies might be affected. These challenges are described briefly below.

<u>Section 10 Permit.</u> The City is undertaking a Section 10 Permit Program pursuant to the Federal Endangered Species Act (FESA) and Section 2081 of the California Endangered Species Act (CESA). FESA and CESA require parties that engage in activities that are likely to result in take

of listed species to obtain incidental take permits. Continued access to the same amount of supply from the north coast sources will depend on the outcome of the Section 10 permit application and accompanying habitat conservation plan (HCP) for city activities including the City's surface water diversion facilities and pipelines that ultimately must be approved by the U.S. Fish and Wildlife Service, NOAA Fisheries, and California Department of Fish and Game. The goal of the HCP is to minimize and mitigate to the maximum extent practicable the effects of City activities on listed and other sensitive species. The conservation measures associated with the HCP may result in changes in the City's operation and management activities and potentially affect the timing and use of the City's existing water supply. However, the effect, if any, on the City's water supply is yet to be determined and may not be known for several years.

Water Rights Conformance Proposal. The City is also in the process of developing and submitting filings to the State Water Resources Control Board to rectify a historical technical deficiency in the water rights on Newell Creek. Based upon the original filings, which were thought to be adequate due to the anticipated use of Loch Lomond storage reservoir, these water rights allow only for diversion to storage and not for direct diversion. This circumstance makes the water supply technically unavailable as a source for City use during times when, for example, the reservoir is receiving more inflow from Newell Creek than is released downstream. The water rights filings are intended to correct this historical deficiency and bring the water rights and current operations into conformance. The proposed direct diversion rights are limited to the same volume of water, purposes and places of use as the existing rights such that they match the existing rights to the extent possible while allowing direct diversion, consistent with historic practice. No new structures, construction activities, or land uses are proposed for this action.

Felton Diversion Water Rights Time Extension Project. The City of Santa Cruz Water Department holds water right permits 16123 and 16601 to divert to storage up to 3,000 AFY from the San Lorenzo River at Felton. The City has been diligently putting water to beneficial use pursuant to these permits consistent with municipal water supply development requirements. To date, the City has used over half the permitted amount. The City expects to need the full amount in the future. The time to put water to full beneficial use under the permits is presently scheduled to expire on December 31, 2006. The City is filing petitions with the SWRCB for extension of the time allowed for that purpose. The water supplies from the Felton Diversion are critical to meeting the projected future demand. They are also critical to the City's ability to meet water demand

during operational outages, changes in operations in response to environmental concerns, and dry and drought periods. Therefore, the City is seeking extensions of the time allowed to put water to full beneficial use pursuant to the Felton water right permits.

Finally, as mentioned in Chapter 3, the ability to produce water from the Live Oak wells, in drought years and potentially all years, may be compromised by continued deterioration of groundwater basin conditions due to region-wide over pumping of the Purisima aquifer. The City is currently in the process of rehabilitating its wells and treatment plant to their original capacity of 2 mgd.

Any or all of these challenges could lead to some loss of existing water supply that would, in turn, affect the recommendations in the IWP about the capacity and the timing of the later phases of the desalination plant in future years.

In addition to pursuing desalination, the City remains open to exploring other water supply alternatives that would not be feasible to develop in the short-term, but may be useful to consider over a 20 year or longer time frame. Possibilities include:

- Water recycling
- Groundwater recharge
- Reservoir expansion
- Aquifer storage and recovery
- Off-stream storage

Affect of Water Quality on Water Supply Reliability

Section 10634 of the Water Code requires water suppliers to include information on the manner in which water quality affects water management and supply reliability. In adopting this requirement, the Legislature recognized that water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities. It further acknowledged that changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

Long-term protection of Liddell Spring, (one of the City's oldest and purest sources) and changes in drinking water quality standards are the two primary management challenges the City faces relating to source water quality that may affect supply reliability. The quality of Liddell Spring is potentially threatened by a nearby quarry operation, whose continuing expansion has adversely affected the turbidity of this previously pristine source. The spring is one of the few sources available to the City during periods of winter weather when other major surfaces sources are too turbid to be treated. Prior to initiation of mining at

the Bonny Doon Quarry in the late 1960's, the then quarry operator and the City established an agreement intended to protect against diminution of water quantity and quality from impacts of mining activities. Among other requirements, the agreement states: "Turbidity shall not exceed 0.5 standard turbidity units except immediately following a rain, when it shall not exceed 2.0 standard turbidity units for a period of 48 hours…". Monitoring of Liddell Spring during the winter of 2004/2005 has shown that turbidity has exceeded the limitation stipulated in this agreement. The City is working with Cemex, the current quarry owner, to better understand the relationship between quarrying activities and water quality to ensure that the long-term, sustainable use of this vital source for municipal drinking water purposes is not impaired.

The City is also investing significant resources for a Water Quality and System Improvement Study to address evolving drinking water quality standards and to evaluate changes that will be needed to modernize the Graham Hill Water Treatment Plant and improve the distribution system to meet future surface water treatment regulations. The plant cannot now operate at its original design capacity of 24 mgd under current state and federal drinking water regulations that require increased disinfection for microbial pathogens.

The chief goals of the Water Quality and System Improvement Study are to:

1. Establish water quality goals and objectives;

2. Establish water system service reliability goals and objectives;

3. Identify alternatives to meet quality and service goals at the Graham Hill Water Treatment Plant;

4. Identify distribution and storage system alternatives to meet quality and service goals;

5. Select and prioritize preferred projects; and

6. Develop an implementation plan.

The project is expected to be completed in 2006.

As a predominantly surface water supplier, the City has a strong interest in watershed protection of the lands upstream of its diversions and outside its corporate boundaries. The Water Resources section of the Water Department has responsibility for monitoring timber harvests, land development, road maintenance and other human activities to avoid contamination and pollution from occurring in the City's water supply watersheds. Water Resources staff works with state, county, and local

agencies, and private property owners to ensure land use and development in the City's watersheds are compatible with the goals to maintain water quality in local streams for municipal drinking water purposes. The Water Resources section also has responsibility for updating the City's Watershed Sanitary Survey and Source Water Assessments required by the State Department of Health Services.

Minimizing the Need to Import Water

Section 10620(f) of the Water Code requires water suppliers to describe the water management tools and options that maximize resources and minimize the need to import water from other regions. In adding this requirement, the Legislature declared that California will best be served by meeting the municipal and other water needs of each hydrologic region to the maximum extent practical without interbasin transfers that diminish the resources of other regions.

The City of Santa Cruz does not now, nor does it plan to, import water, either from outside the Central Coast hydrologic region, or outside the Santa Cruz County boundaries. All of its water resources are obtained entirely from local sources.

Refer to Chapter 6 for a description of the water conservation activities the City is pursuing that are intended to maximize the beneficial use of existing resources.

Opportunities for Exchanges or Transfers of Water

The City presently has no means to exchange or transfer water from neighboring water systems or from the State or federal water projects. Emergency interties exist between the City system and the Scotts Valley and Soquel Creek Water District that serve the urbanized areas north and east of the City water system. These connections, however, were set up to feed water from the City system to the adjacent Districts for short-term emergency purposes. The interties are not intended for, nor are the adjacent systems currently capable of, transferring or exchanging water with the City.

In the future, the City's IWP calls for transferring up to 456 million gallons per year (1,400 acre feet) to the Soquel Creek Water District once the desalination facility is operational. Although an operational agreement and financial arrangements are yet to be worked out, elected officials from both sides have expressed a strong interest in pursuing the desalination facility as a regional supply project.

CHAPTER 6

WATER DEMAND MANAGEMENT PROGRAM

The City of Santa Cruz actively promotes water conservation and appropriate water efficiency practices as a means to protect the area's natural resources, to stretch existing water supplies, to minimize the need for costly water supply projects, and to maximize sustainability in meeting future water needs for City water users. Since 1981, when the City adopted an ordinance prohibiting water waste, it has continually sought to increase public awareness, implement conservation programs, and lower per capita water demand.

The City's Water Conservation section is responsible for carrying out the city's conservation activities and has adopted the following mission statement:

"*to develop and implement programs that reduce customer demand for water and increase water use efficiency to obtain the greatest public benefit from available water supplies. Water conservation is an essential component of the City's long-term water management strategy, which seeks to make optimum use of existing water resources and minimize the need for additional water development*."

In June 2001, the City of Santa Cruz became a signatory to the ***Memorandum of Understanding Regarding Urban Water Conservation in California*** **(MOU)** and joined the California Urban Water Conservation Council (CUWCC) in promoting water conservation statewide.

The Water Conservation section's goals are categorized into these four essential areas of responsibility:

1. Public Awareness and Education: to promote public awareness and education about the City's water resources and the importance of water conservation; and to provide timely and accurate information to utility customers about conservation practices and technologies, as well as the City's conservation programs and policies.

2. Water Demand Monitoring Program: to monitor water production, consumption and system water losses; to track weather and population data; to evaluate trends in per capita water use; to track demand associated with new service connections; to compare actual water demand with projected use by customer category; and to analyze the need for increased conservation

activities in response to changes in categorical water use or system losses.

3. Long-Term Water Conservation Programs: to develop and implement various conservation projects and programs that result in a sustained reduction in customer water demand; to track water savings from on-going conservation programs; and to evaluate the need for program modifications to improve efficiency, customer service, and water savings in keeping with conservation goals.

4. Planning and Emergency Management: to develop and maintain water demand forecasts for the water service area for use in supply planning; to coordinate conservation activities into an overall Integrated Water Plan; to analyze impacts of water shortages and demand hardening in order to minimize hardship to utility customers; to update the drought shortage contingency plan for use in future water shortage events; to plan for and respond to water shortage emergencies due to disaster or other unforeseen circumstances; and to periodically update the City's Urban Water Management Plan.

Of these four areas of responsibility, Long-Term Water Conservation Programs are the major focus of the City's Conservation section. In 2000, the City of Santa Cruz adopted a Water Conservation Plan that identifies 17 demand reduction programs to implement over a period of ten years (Gary Fiske & Assoc. 2000). The plan when fully implemented will provide quantifiable water savings of **282 million gallons per year by 2010**, equal to about 0.8 mgd. The Water Conservation Plan was included as one of three components that make up the City's Integrated Water Plan. In addition, the City is committed to implementing all 14 best management practices contained in the MOU and to periodically report progress made to the CUWCC. Estimated water savings to date from the City's programs total 153 million gallons per year, or 0.4 mgd.

The City has received statewide recognition for its water conservation programs on a number of occasions. In 2002, the City was selected to receive a Community Service - Resource Efficiency award by the California Municipal Utilities Association for its high efficiency clothes washer program. In 2004, the City was honored with an Energy Efficiency Award by the Flex Your Power campaign. In 2005, the City was once again recognized by the California Municipal Utilities Association with a Community Service - Resource Efficiency award for its plumbing fixture retrofit program.

Demand Management Measures

The City of Santa Cruz's active and planned conservation programs together include all of the demand management

Table 6-1. Status of City Water Conservation Programs

Program	Status
A. Residential Water Surveys	Scheduled 2006
B. Residential Plumbing Retrofit	Completed
C. System Water Audits, Leak Detection, and Repair	Ongoing
D. Metering with Commodity Rates	Ongoing
E. Large Landscape Conservation Programs	Ongoing/Scheduled 2007
F. High Efficiency Washing Machine Rebates	Ongoing
G. Public Information Programs	Ongoing
H. School Education Programs	Ongoing
I. Commercial, Industrial, and Institutional Programs	Ongoing/Scheduled 2007
J. Wholesale Agency Programs	Not Applicable
K. Conservation Pricing	Ongoing
L. Water Conservation Coordinator	Ongoing
M. Water Waste Prohibition	Ongoing
N. Residential Toilet Replacement	Ongoing

measures urban water agencies are required to describe and evaluate under section 10631(f) of the Urban Water Management Planning Act. The status of these programs is summarized above in Table 6-1. The text below describes each measure listed in order of appearance in the Act. The format for each measure is as follows:

- Title
- Status (ongoing, scheduled, or completed)
- Brief description of the measure
- Schedule of implementation
- Methods to evaluate effectiveness
- Estimate of conservation savings
- Budget

A. Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

Status: Scheduled

Description: A Residential Water Survey Program has been designed and is scheduled for implementation beginning in April 2006. A trained Water Conservation Representative will, at the

customers' request, perform an inspection of the customer's home plumbing fixtures and irrigation equipment, evaluate household water use practices, and make site-specific recommendations of actions that can be taken to conserve water inside and outside the home. The representative will, where appropriate, offer water saving devices at no cost, provide customers with irrigation schedules for proper watering of their landscapes, and provide information and applications for toilet and clothes washer rebate programs. The site review will be documented and a written report of recommended water conservation actions will be given to the participant.

Schedule: Beginning in 2006, the program will specifically be marketed each year to the largest residential water accounts, the top 20% of the single-family and multi-family water accounts. The program will be made available, however, to any residential customer that requests a water survey of their property. Referrals from the customer service section, due to high consumption, will also be used to identify potential customers for a home water survey. To meet the expectations of both the Conservation Plan and the MOU, the goal is to complete at least 273 single family surveys and 50 multi-family account surveys covering 315 units, for a total of 323 surveys during 2006 covering about 600 dwelling units.

Methods to Evaluate Effectiveness: Two kinds of program evaluations will be conducted: 1) to determine actual water savings from the residential water survey program and 2) to identify ways to improve and refine the program over time.

Evaluation of water savings for participating accounts will be addressed by comparison of usage history before and after the survey. Consumption data from the billing system will be compared for three periods following the survey: 1) winter, to evaluate indoor use, 2) summer, to evaluate outdoor use, and 3) annual, to evaluate combined impact. Further evaluation of the water savings at same accounts will be needed to investigate and address the question of persistence over time.

A customer service questionnaire also will be used to get feedback from customers on program satisfaction, to evaluate the usefulness of various components of the survey, and to identify any areas or services in need of improvement.

The City will document the number of surveys offered and completed in each customer class.

Conservation Savings: The City's Water Conservation Plan estimates the annual water savings for the Residential Water Use Review Program will be 33.7 million gallons by the year 2010. It is

estimated that 12.4 million gallons will be saved through site reviews and retrofits in the single-family account class and 21.3 million gallons per year in the multi-family account class.

Budget: The Water Conservation Plan estimated program costs of between $70,000 and $170,000 per year, depending on the number of reviews performed and assuming the program would be contracted out. During the program design phase it was decided that the program would be operated in-house. Accordingly, we estimate a first-year cost of $65,000 for 2006; including personnel, materials and equipment, marketing, and evaluation.

B. Residential Plumbing Retrofit

Status: Completed, Ongoing

Description: In 2001-02, the City carried out a Water Conservation Kit Distribution Program to all single-family residential customers, in accordance with the City's water conservation plan. This program involved door-to-door distribution of conservation devices to retrofit indoor plumbing fixtures and reduce indoor water use The kits included a low-flow showerhead, a faucet aerator, a garden hose nozzle and leak detection tablets, along with instructions for performing leak detection and repairs. Residents installed the kit devices themselves. Customers were provided with conservation literature and toilet and washer rebate brochures to encourage further action and water savings.

Schedule: The kit distribution program was carried out in three phases between March of 2001 and June of 2002. The first phase was a pilot project to gauge customer satisfaction with the selected devices and to assess installation rates and participation. Phase two, which occurred between August and December 2001, was the distribution to single family homes. In Phase 3, remaining funds were used to offer showerheads and faucet aerators to interested multi-family customers. A total of 17,851 conservation kits were delivered to single family residences. Another 1,356 showerheads and 1,684 faucet aerators were distributed for installation in multi-family accounts.

Methods to Evaluate Effectiveness: The City of Santa Cruz used a survey during the pilot project phase to measure participation and effectiveness.

Conservation Savings: The City's Water Conservation Plan estimated the water savings for the Conservation Kit Program to be 15.8 million gallons annually. The savings estimates are fairly conservative, since it assumed that only 25 percent of the nearly 18,000 single-family accounts that received the kits installed the devices. The actual savings were likely more than was estimated in the plan, based on the

results of the pilot program survey, in which installation rates were found to be closer to 50 percent, and the fact that additional devices were distributed to the multi-family accounts on request, meaning that the likelihood of installation in those households was even greater.

Budget: The City of Santa Cruz budgeted $195,983 for the Conservation Kit Distribution Program to during FY 2000-01. The program came in below budget at $138,083.

Following the Water Conservation Kit Distribution Program, the City adopted plumbing fixture retrofit regulations in 2003 that further requires all residential, commercial, and industrial buildings receiving water from the City of Santa Cruz to be retrofitted completely with low consumption plumbing fixtures, including toilets, showerheads and urinals, at the time of sale of the property. This program is described in detail under Section N. Residential Toilet replacement at the end of this chapter.

C. System Water Audits, Leak Detection and Repair

Status: Ongoing

Description: The City of Santa Cruz has conducted annual water audits of the City's distribution system using the approach described in the AWWA M36 "Manual of Water Supply Practices" since 1997. The purposes of the audit are to track unmetered water uses, to evaluate how much water is lost through underground leaks, to determine the costs of water losses, to identify appropriate steps to minimize system losses, and to improve operational efficiency of the water system. Beginning in 2003, the City began to use the internationally recognized approach developed through the International Water Association (IWA) to better characterize water losses in the distribution system.

Results of water audits conducted between 2000 and 2004 show the City's water losses average about 6.7 percent of total water production, of which 4.9 percent is due to real losses from physical leakage in the distribution system and 1.8 percent is due to apparent losses from sales meter underregistration.

Following the 1997 system audit, the City of Santa Cruz initiated a service line replacement program to eliminate all polybutylene service lines, a common cause of leaks. Approximately 3,000 polybutylene service lines have been replaced with copper lines to date and it is estimated that there are another 7,000 in the system area that will be replaced by the year 2012.

While the City does not have a formal leak detection program at this time, the

Water Department uses sonic leak detection equipment to locate and repair leaks in the water system. In addition, the Department monitors for leaks on the customer's side of the meter by reviewing reports of high meter readings and notifies customers so they can take appropriate action to repair leaks even before they receive their water bills.

Schedule: The City will continue to perform annual system water audits and will review results to evaluate the need for additional leak detection activities. The City will also continue customer service practices that identify potential customer-side leaks.

Methods to Evaluate Effectiveness: Water Department managers annually review water audit results, which are included and analyzed in an internal annual report on trends in water production and consumption. The audits have also identified the need for more frequent testing of the 491 large meters (2 inches and over) on the water system.

Conservation Savings: The City does not quantify long-term conservation savings for this measure.

Budget: This measure is not tracked separately in the City's budget.

D. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

Status: Ongoing

Description: Water meters are the foundation of the City's conservation activities. The City water system is fully metered and water is billed according to the volume of water consumed. In addition, sewer is billed by volume of use for all commercial accounts inside the City of Santa Cruz.

Consumption data provides customers with information necessary to efficiently manage their own water use. The City uses consumption data to monitor water use patterns for all customer classes and evaluate water savings from conservation programs.

In 1995, the City of Santa Cruz began replacing manual read meters with radio read meters. The efficiency gained with automatic meter reading allows in-City customers now to be billed on a monthly basis, however outside-City customers are still being billed on a bi-monthly basis. Monthly billing reduces the time that private-side leaks go undetected and allows for more accurate monitoring of water consumption. About 70 percent of the nearly 24,000 meters in service have been converted to radio read meters so far.

Water meters are required for all new water service connections in the Santa Cruz Water Department Service area. In 2001, the City amended its Landscape Water Conservation Ordinance, which

now requires dedicated irrigation meters for all new and renovated multi-family and commercial landscape projects with over 5,000 square feet in irrigated area.

Schedule: The City will continue to require water meters on new service connections and will continue to retrofit existing services with radio read meters until fully completed in 2008.

Methods to Evaluate Effectiveness: Not applicable.

Conservation Savings: The City of Santa Cruz does not quantify conservation savings for this measure, but expects water savings due to monthly monitoring of usage and earlier leak detection.

Budget: The City of Santa Cruz budgets $425,000 annually for meter replacement.

E.1 Large Landscape Conservation Programs and Incentives

Status: Scheduled

Description: A Large Landscape Water Audit Program, designed to improve irrigation efficiency and watering practices, was approved in the City's Water Conservation Plan and is planned for implementation beginning in year 2007. Professional landscape auditors will perform site reviews of large landscape customers in the commercial, residential and golf irrigation customer classes. The initial review will identify low-cost improvements such as aligning sprinkler heads, replacing broken heads and trimming plants that disrupt spray patterns. After participants make repairs to address physical irrigation problems, a detailed audit will be conducted to determine precipitation rates of spray heads, distribution uniformity of the irrigation system, turf species, root depth, and soil type. The auditor will provide site-specific watering schedules, recommendations for irrigation equipment retrofits, including new weather based controllers that would further improve efficiency, and information about irrigation equipment rebates.

Schedule: The Large Landscape Water Audit Program and any associated irrigation equipment rebate specifics will be developed in 2007. The City will solicit bids for landscape contractors to perform reviews and design marketing and evaluation materials. A contractor will be hired and the City will begin marketing the program to irrigation customers through direct mail and telephone calls. The top 20 percent of businesses will be contacted annually. Participants will receive follow-up visits every third year to assess implementation status, program satisfaction and to adjust schedules as needed.

Methods to Evaluate Effectiveness: The City of Santa Cruz will document the number of site reviews offered and performed, and will use water use data, site review records, and follow-up visits to determine effectiveness and water savings achieved as a result of program activities.

Conservation Savings: The City's Water Conservation Plan estimates that auditing of dedicated irrigation customers will result in total savings of 8.6 million gallons annually, at full implementation.

Budget: The City of Santa Cruz plans to spend $44,000 annually on the program, at full implementation.

E.2 Landscape Water Conservation Ordinance

Status: Ongoing

The City first adopted a landscape water conservation ordinance to improve water efficiency in new and renovated large landscapes in 1993 in response to AB 325. The original ordinance included provisions for plant selection, landscape design, irrigation equipment, and watering schedules. Conservation staff review landscape plans for applicable commercial, industrial, public and multi-family residential developments and coordinate with applicants and planning staff to ensure new landscapes are designed and installed to be water efficient. About one quarter of the City's 412 dedicated irrigation accounts have been reviewed under the ordinance.

The ordinance was expanded and updated in 2001 with the following changes. All new multi-family and commercial projects with landscaping that exceeds 5,000 square feet are now required to have a dedicated City irrigation meter and are assigned a fixed annual water budget based on the size of the landscaped area. Use of high water use plant species is limited to 10 percent of total landscaped area. The turf limit was lowered to 25 percent from 33 percent of the total landscaped area, and a maximum slope on which turf is allowed was reduced to 10 percent from 33 percent. Overhead spray irrigation is now prohibited in medians and other narrow areas less than five feet wide, and must be set back from adjacent sidewalks and pavement by at least 2 feet to prevent overspray and runoff. Rain sensing devices are required to prevent irrigation during wet weather. Turf limits were applied to new single residential development. In addition, single family residential projects over one-half acre in size are also now subject to all landscape standards. It is estimated that about 10.9 million gallons of water have been saved annually as a result of the City having a landscape water conservation ordinance.

Additional changes to the City's ordinance will be considered in 2006 in

response to the findings and recommendations of the AB 2717 Landscape Task Force.

F. High-Efficiency Clothes Washer Rebate Program

Status: Ongoing

Description: The City of Santa Cruz began operating a High-Efficiency Clothes Washer Rebate Program in 2000, which offers a $100 rebate for residential and commercial customers who purchase Energy Star labeled, water efficient washing machines. The City works closely with local appliance retailers who help to inform their customers about the program and the benefits of choosing high efficiency clothes washers. As mentioned above, the City received an award for its clothes washer program from the California Municipal Utilities Association in 2002.

The City has also participated in a statewide program known as LightWash to promote high efficiency clothes washers in the multi-family and commercial sector beginning in late 2002. The program is marketed and operated by a third party administrator and offers rebates to institutional and multi-family customers with common area laundry facilities, commercial Laundromats, and other businesses with on–site laundry facilities who purchase qualifying appliances. The City of Santa Cruz contributed $200 towards the rebate of each high efficiency commercial machine installed in the service area. A total of 102 washers have been rebated in this program for an estimated savings of 2.1 million gallons per year.

Schedule: The City plans to continue the High Efficiency Clothes Washer Rebate Program for Energy Star qualified washers through 2010. It may be re-evaluated, however, if the California Energy Commission is successful in adopting a water efficiency standard for residential clothes washers by 2007, or if there are any changes in the MOU regarding this BMP. The LightWash program is scheduled to end March 2006.

Methods to Evaluate Effectiveness: The City conducted an evaluation of the program based on metered water consumption data gathered from 216 accounts following the first year of operation. The results show that both participation and water savings were greater than initially estimated. Actual water savings was found to be 6,000 gallons per year per participating household, 18 percent more than the 5,100 gallons average annual water savings published by the CUWCC derived from the THELMA study.

The City of Santa Cruz documents the number of participants in the program and uses a participant survey to assess

customer satisfaction and make improvements to the program. Evaluation of the surveys shows that that 98% of the participants are satisfied with their purchase. Since 2004, the City has also kept track of the points associated with the water factor value for each appliance rebated, in accordance with the MOU.

Conservation Savings: The City's Conservation Plan estimated that 21.7 million gallons would be saved through the program by the year 2010. This estimate was based on a projected participation level of 350 households in the first year, increasing to 500 households per after several years. Actual participation has been higher than estimated, ranging between 500 and 640 households per year, totaling 3,430 appliances rebated since the City program began. The LightWash program has resulted in another 102 washers replaced in multi-family, commercial, and institutional accounts.

Using the CUWCC's more conservative figure of 5,100 gallons of water saved per year per household, the program has already achieved savings of 19.7 million gallons per year, of which 17.6 mgy is from the City rebate program and 2.1 mgy is from the Light Wash program.

Budget: The City annually budgets $70,000 for the high efficiency clothes washer rebate program to cover the cost of the rebates.

G. Public Information Programs

Status: Ongoing

Implementation Description: The City of Santa Cruz Water Department actively promotes public awareness and education about the City's water resources and the importance of water conservation in the following ways:

- Utility Newsletter, called the "SCMU Review", which includes news and information on water conservation topics;
- Water Conservation web site;
- Public meetings and speaking events to community organizations, industry associations, and service groups;
- Distribution of water conservation brochures and literature;
- Paid advertising in local newspapers;
- Providing messages and information on customers bills showing use in gallons per day and a graph comparing water use for the entire year;
- Distribution of free conservation devices, including showerheads, faucet aerators, leak detection tablets,
- Water supply and treatment facility tours;
- Community television programs;

- Participation in regional water forums;
- Financial support to the California Water Awareness Campaign and the Water Education Foundation.

The City of Santa Cruz participates on a countywide Water Conservation Committee composed of representatives from local water agencies. The committee coordinates an annual Water Awareness Campaign during the month of May to remind the public of the importance of water as a resource and to encourage conservation practices.

Schedule: The City will continue to provide information through the described methods. Additional advertising, press releases, and public service announcements will be added in times of water shortage when customers would be required to curtail water use.

Methods to Evaluate Effectiveness: The countywide Water Conservation Committee informally evaluates its activities in planning for the following year's events. Otherwise, the Water Department does not actively evaluate public information activities.

Conservation Savings: The City of Santa Cruz does not quantify conservation savings from its public information activities.

Budget: This measure is not tracked separately in the City's budget.

H. School Education Programs:

Status: Ongoing

Description: The City has a school education program for students ranging from lower elementary age children up to University students to learn about the water supply system and water conservation. It consists of the following activities:

- Class tours of Loch Lomond Reservoir and the Water Treatment plant;
- Distribution of age and grade level appropriate curriculum and educational materials;
- Classroom presentations;
- Participation in special events

The City is currently assisting the Soquel Creek Water District by helping with funding of a County-wide water education booklet for upper elementary students that covers water supply, treatment, use and conservation, as well as watershed protection and pollution prevention. A Junior Ranger program at Loch Lomond was developed in 2004.

Schedule: The City will continue to offer tours, curriculum, and materials to Santa Cruz area teachers upon request throughout the school year.

Methods to Evaluate Effectiveness: There is no formal evaluation of this activity.

Conservation Savings: The City of does not attribute any water savings to school education activities.

Budget: The City budgeted $10,000 over two years for development and printing of the County-wide water education booklet. Otherwise, this measure is not tracked separately in the City's budget.

I. Conservation Programs for Commercial, Industrial and Institutional (CII) Accounts

Status: Ongoing and Scheduled

Description: Existing Programs

There are currently four conservation programs that apply to commercial, industrial and institutional customers:

1. a commercial ULFT rebate program,
2. the Smart Rinse program,
3. the LightWash program,
4. the City's plumbing fixture retrofit program.

The City began a CII toilet rebate program in 2001. The program offers $75 to $150 rebates to commercial and industrial customers for replacing older tank and valve-type toilets and urinals with low consumption fixtures, and for installing water free urinals.

The Smart Rinse program targeted existing kitchen spray valves in restaurants, cafeterias, and food service facilities for replacement with new high performance spray valves. This program was carried out by Ecology Action, a local non-profit agency, in association with the City, during the spring and summer of 2005. Ecology Action staff provided free equipment and installation and the City helped market the program to customers within its water service area. This program was funded by a grant from California Public Utilities Commission.

The LightWash program, described in Section F, promotes high efficiency clothes washers to businesses with on–site laundry facilities. In addition, the City of Santa Cruz has administered its own high efficiency clothes washer rebate program since 2000, which is available to any commercial customer that purchases a qualifying clothes washer.

In 2003, the City of Santa Cruz adopted plumbing fixture retrofit regulations. This regulation requires all residential, commercial, and industrial buildings receiving water from the City to meet specified low consumption plumbing standards for toilets, showerheads, and urinals when real estate is sold.

Schedule: The Smart Rinse Program ended in 2005, and the LightWash Program is scheduled to end in March, 2006. The CII toilet rebate program, high efficiency clothes washer program,

and the plumbing fixture retrofit regulation are planned to continue through 2010.

Methods to Evaluate Effectiveness: A customer satisfaction survey is used to collect feedback about the rebate programs. In addition, the Water Conservation Manager periodically meets with representatives of the local Association of Realtors to gauge satisfaction with the retrofit regulations.

Conservation Savings: The Smart Rinse Program resulted in the replacement of 207 spray rinse valves at 166 locations saving an estimated 10.4 million gallons of water annually. A total of 597 fixtures have been replaced under the CII toilet rebate program for an annual savings of 3.8 mgy. Between the LightWash program and the City's clothes washer rebate program, 86 washers have been installed at commercial locations for an annual savings of 1.7 mgy. The plumbing fixture retrofit regulation has resulted to date in 297 fixtures being changed out in commercial and industrial accounts for an annual savings of 1.9 mgy. The total annual water savings for all four commercial programs to date is 17.8 mgy.

Budget: The City budgets $160,000 annually for rebate programs. This amount includes both residential and commercial programs.

Description: Scheduled Programs

The City's water conservation plan calls for implementing a commercial water audit program and separate water use review program for UCSC, which is planned for implementation in 2007. Business and industrial customers, as well as UC Santa Cruz, will be offered voluntary water audits by a trained conservation professional who will perform a complete review of all water fixtures, processes and water use practices at the site. The auditor will make recommendations on specific actions that will improve efficiency at the facility. Incentives of up to $2,500 will be offered to business customers for installing water-saving fixtures and appliances such as air-cooled ice machines, rinse recycling dishwashers, and horizontal-axis clothes washers. The program will be designed to meet the requirements of BMP 9 of the MOU.

In addition, the City Water Commission has asked staff to develop recommendations for promoting the replacement of flush urinals with water free urinals early in 2006.

Schedule: The Commercial water audit and UCSC program details will be developed by conservation staff in 2006. Selection of a contractor to conduct reviews will occur in 2007. Design and selection of review activities, marketing materials, devices for installation, and evaluation tools will be done in

coordination with the selected contractor. The program will be specifically marketed each year to UCSC and the top 20% of business customers beginning the second quarter of 2007. The site reviews will likely begin in the third quarter 2007.

Methods to Evaluate Effectiveness: The City will a survey all program participants to get comments from customers on program satisfaction and will document the number of water use reviews offered and completed. Water use data, site review records, and follow up visits to participants every third year will be analyzed to determine effectiveness and water savings achieved as a result of program activities.

Conservation Savings: The Water Conservation Plan assumes that over a three-year period, cumulative participation in this program will be 75% of the targeted customers, and that of those participants, 75% will implement the recommended changes. The Plan estimates the annual water savings to be 32.2 million gallons per year, with 29.9 million gallons saved through site reviews and retrofits on business accounts and 2.3 million gallons per year saved at UCSC.

Budget: The Water Conservation Plan estimates first year expenditures of $38,000 to operate the commercial water audit program and UCSC programs, ramping up to over $100,000 at full implementation.

J. Wholesale Agency Programs

This measure does not apply to the City of Santa Cruz since it is not currently a wholesale water supplier.

K. Conservation Pricing

Status: Ongoing.

Implementation Description: In 2004, the Water Department implemented two major changes in the way it charges for water service. First, the overall cost of water service was increased for all customers by an average of 25 percent, beginning July 2004. Another 20 percent rate increase took effect January 2005. The purpose of the large rate increases was to fund infrastructure renovation and to improve water system reliability. As indicated in Chapter 1, over $100 million in capital improvements are needed within the next decade to maintain and enhance the integrity of the water system. The Department hired a consulting firm to perform the comprehensive water rate study. The purpose of the study was to establish new rates that fully recover the costs of providing service, maintaining and improving the system, and to provide sufficient reserves for emergency and debt-service needs. Additional annual rate increases ranging from 15% to 5% are planned through the year 2009, in

accordance with the recommendations of the water rate study.

Second, as part of the rate study, a new rate structure was adopted in June 2004 that applies to residential accounts with either one or two dwelling units. All customers pay a fixed amount per billing cycle, called a "readiness to serve charge" that varies according to the size of their water meter. The new rate structure applies to the quantity of water used. It has five tiers or blocks corresponding to the following categories of use:

1. essential needs,
2. average indoor needs,
3. average outdoor needs,
4. high use,
5. inefficient or excessive use.

Prior to June 2004, the City used an inclining block rate structure with only three tiers. This new rate structure is intended to increase awareness of the amount of water consumed by single residential and two-unit customers and to encourage more efficient use, in particular outdoor use during the peak summer season, when the system relies more heavily on valuable reservoir storage to meet daily demands. The rates effective January 2006 are listed in Table 6-2. For all other customers, including multi-family, business, industrial, municipal, and irrigation customers, water is billed at a uniform rate corresponding with Block 2.

The City charges a flat rate to its residential customers for sewer service, except for certain residential accounts with very low water use, who receive a lower rate. For commercial and industrial customers, sewer is charged according to strength of sewage they generate and the volume of water used.

Schedule: The City's Water Conservation Plan includes budget-based rates for large landscape customers. The City plans to implement budget-based water rates for large landscape customers, including parks, golf courses, business and residential irrigation accounts beginning in 2007.

Methods to Evaluate Effectiveness: The City of Santa Cruz will track all irrigation customers' water usage and bill according to their individual water budgets. Customers exceeding water budgets will be offered the services of the Large Landscape Water Use Review Program. The City will use water use data to compare consumption per account before and after water budget assignments.

Conservation Savings: No firm estimate of water savings from the new rate structure is available. In 2005, the first full year since the higher rates and the new rate structure were implemented, water consumption was down markedly. This reduction was thought to be related more to an abnormally wet spring and cool summer

Table 6-2. Single Family and Two-Unit Residential Water Rate Structure (2006)

Block	Category	Inside City monthly		Outside City bimonthly	
		Rate	Units (ccf)	Rate	Units (ccf)
5	Inefficient or excessive use	$6.77	over 18	$8.63	over 36
4	High use	$5.43	15-18	$6.91	29-36
3	Average outdoor needs	$3.95	10-14	$5.04	19-28
2	Average indoor needs	$3.08	5-9	$3.93	9-18
1	Essential needs	$1.21	1-4	$1.54	1-8

weather which obscured any response to pricing changes. As mentioned earlier, the City also implemented monthly billing for all in-City customers at the beginning of 2005, which also could have had some effect in reducing overall water consumption.

Budget: There is no specific budget item for water conservation pricing.

L. Water Conservation Coordinator

Status: Ongoing

Implementation Description: Since 1986, the City of Santa Cruz has employed a full-time Conservation Coordinator who is responsible for the planning, organizing, directing, and controlling the operations of the water conservation section. The Water Conservation Coordinator meets regularly with the Water Director and senior managers to coordinate conservation activities with water supply planning, production, distribution, and customer service. The position was renamed to Water Conservation Manager in 2005. The current manager has been with the Water Department for 11 years.

The Water Conservation section currently consists of the Manager and two full-time Water Conservation Representatives, who administer existing programs and assist in the development of new programs approved in the Water Conservation Plan. Recruitment for a third Water Conservation representative is underway. The position is expected to be filled early in 2006.

Schedule: The City will continue to fund the Water Conservation Coordinator position and supporting conservation staff to operate programs approved in the Water Conservation Plan. The City plans to contract with consultants to implement the large landscape water

audit review and commercial water audit programs beginning in year 2007.

Methods to Evaluate Effectiveness: Not applicable.

Conservation Savings: There are no direct water savings attributed to the Water Conservation manager and conservation staff. The City is committed to the efficient use of its water resources and views conservation staffing as necessary to promote and sustain long-term water savings through the administration and promotion of its conservation program.

Budget: The 2005-06 budget for personnel services in the water conservation section is $252,000.

M. Water Waste Prohibitions

Status: Ongoing

Description: The City of Santa Cruz has had an ordinance prohibiting water waste since 1981. The uses of water that constitute waste under this ordinance include unauthorized use of water from a fire hydrant, irrigation runoff and over spray, allowing leaks to go unrepaired, outdoor washing without the use of an automatic shut-off nozzle, and indiscriminant running of water. The ordinance also prohibits the operation of commercial car washes or ornamental fountains unless water is recycled. In 2003, the City updated its water waste ordinance, expanding the uses considered wasteful. The ordinance now prohibits single-pass cooling in new construction, requires new industrial clothes washer systems be re-circulating, and prohibits use of potable water for dust control and soil compaction on construction sites where recycled water is available.

Conservation and customer service field staff enforce the ordinance when water waste is observed or when a complaint is received.

Schedule: The City will continue to enforce its water waste prohibitions.

Methods to Evaluate Effectiveness: The Water Department maintains records on water waste complaints and enforcement measures taken. Water billing records are used to evaluate actions taken by violators when follow-up actions are warranted.

Conservation Savings: The City of Santa Cruz has no method to quantify conservation savings from water waste prohibitions.

Budget: The City of Santa Cruz does not budget specifically for enforcement of water waste regulations. Water conservation and customer service staff conducts these activities as part of their regular job duties.

N. Residential ULFT Replacement Programs

Status: Ongoing

Description: The City's residential toilet replacement program has two components: a rebate program and a plumbing fixture retrofit regulation.

The City has operated a rebate program to promote the installation of ultra-low-flush (ULF) toilets in residential accounts since 1995. The program features a $75 rebate as a financial incentive for customers to remove their, older, higher-volume toilets and replace them with ULF toilets.

In 2003, the City adopted a plumbing fixture retrofit ordinance. This regulation requires that all residential, commercial, and industrial properties be retrofitted with low consumption showerheads, toilets, and urinals when real estate is sold. As part of the program implementation, the City worked closely with the County of Santa Cruz and the City of Capitola to have similar ordinances passed in these other jurisdictions. As a result, the retrofit regulation applies uniformly throughout the entire water service area, regardless of jurisdiction. The City is also working with the Soquel Creek Water District to help it implement the program in the rest of Capitola, and possibly extend it into other areas of the County served by the water district. As mentioned earlier, this City of Santa Cruz program was selected to receive the 2005 Resource Efficiency Award- Small Utility from the California Municipal Utilities Association. The ordinance implements the City's water conservation plan and fulfills the City's obligation under the MOU to carry out a toilet replacement program that is "at least as effective as requiring toilet replacement at time of resale."

Under the law, the seller of the property is responsible for retrofitting any older toilets, urinals, and showerheads on the property with low consumption fixtures, and for obtaining a water conservation certificate from the Water Department. There is an option in the ordinance that allows the responsibility for retrofitting to be transferred from the seller to the buyer, if both parties agree. In either case, the City requires every property to be inspected to verify that the plumbing fixtures on the property being sold meet the low consumption standards. A database software program called *WaterTrack* was developed by a consultant to manage sales data on local properties and retrofitting records, as well as follow-up enforcement of the ordinance.

Schedule: The Toilet Rebate Program was approved as part of the City's Water Conservation Plan and will continue through 2010. The Water Department is currently considering changes to promote new High Efficiency Toilets (both dual flush type and single

flush type) that use 1.28 gallons or less per flush. The Plumbing Fixture Retrofit Regulation will continue at least through 2010.

Methods to Evaluate Effectiveness: The City of Santa Cruz conducted an evaluation of its Toilet Rebate Program after the first two years of operation. It found that, while not problem free, most customers who converted to a 1.6 gallon flush toilet were satisfied with their performance. Average water savings across both single and multi-family households was found to be 22 gallons per toilet per day. The findings from this evaluation are used to estimate overall program water savings. The City continues to issue surveys with rebate checks to solicit feedback from participants about their fixtures, the program, and to gauge overall customer satisfaction with City water service.

The effectiveness of the Plumbing Fixture Retrofit Program on water use has not yet been evaluated, other than tracking compliance. Thus far, the City's program has achieved a 97 percent plus retrofit rate for properties that have sold since the regulation went into effect in early 2003. Contact with the public through routine inspections and meetings with the Real Estate industry, however, provides some customer feedback about the level of satisfaction with the retrofit regulation and the City's certification process.

Conservation Savings: The City's Water Conservation Plan estimated that the Toilet Rebate Program would save 47.2 million gallons per year and the Plumbing Fixture Retrofit Program would save 100.6 million gallons per year, by 2010. Since 2000, a total of 4,064 toilets have been replaced under the Toilet Rebate Program, saving 32.6 mgy. (Prior to 2000, 4,461 toilets had already been changed out under the program). The Plumbing Fixture Retrofit Program Regulation has resulted in 2,844 toilets being changed out at 2,542 properties to date, for an annual savings of 22.8 mgy since the program began in 2003. This estimate does not factor in any savings that occurs when older showerheads get replaced as a result of the ordinance.

Budget: The City of Santa Cruz budgets $160,000 for the Toilet Rebate Program, which covers both residential and commercial rebates.

Overall Conservation Program Water Savings

Table 6-3 provides a summary of the water savings anticipated in the City's Water Conservation Plan and a listing of the savings that has been achieved to date, by program.

Table 6-3. Summary of Water Conservation Program Savings

Water Conservation Program	Savings Goal - 2010 (mil gal/yr)	Achieved 2000-05 (mil gal/yr)
A. Residential Water Surveys	33.7	--
B. Residential Plumbing Retrofit	15.8	15.8+
E. Large Landscape Programs:		
Landscape Water Audits	16.6	--
Landscape Water Conservation Ordinance	--	4.2
G. High Efficiency Clothes Washer Rebates	21.7	17.6
J. Commercial, Industrial, and Institutional Programs:		
ULFT Rebate	13.7	3.8
Plumbing Fixture Retrofit Ordinance	--	1.9
LightWash	--	1.7
Smart Rinse	--	10.4
Commercial Water Audits	32.2	--
N. Residential Toilet Replacement		
ULFT Rebate	47.2	32.6
Plumbing Fixture Retrofit Ordinance	100.6	22.8
Conservation Savings Achieved Prior to 2000 (ULFT Rebate and Landscape Ordinance)	--	42.5
Total	281.5	153.3

CHAPTER 7

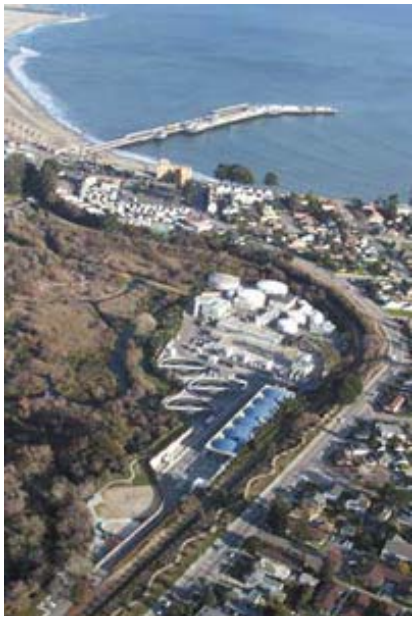
WATER RECYCLING

This chapter describes the City's wastewater collection, treatment, and disposal systems. It also presents information on recycled water and its potential for use as a supplemental water supply in the service area.

Wastewater System Description

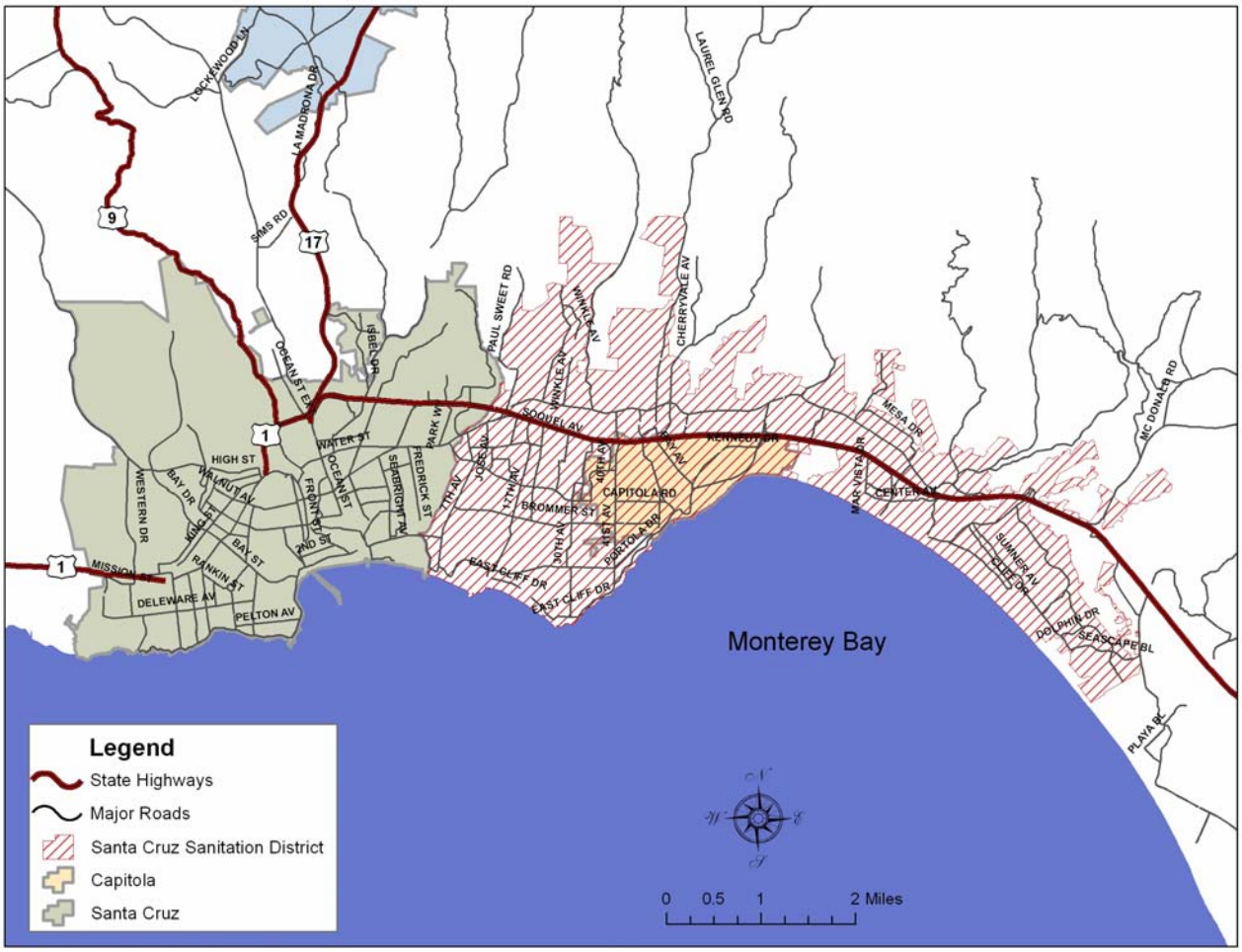
The City of Santa Cruz owns and operates a regional wastewater treatment facility providing service to a population of approximately 130,000 in the cities of Santa Cruz and Capitola and parts of unincorporated Santa Cruz County. The treatment plant is located next to Neary Lagoon, just inland from the City's main beach (Figure 7-1). The plant was recently modernized to provide secondary treatment in order to meet State and Federal waste discharge requirements.

Figure 7-1. City of Santa Cruz Wastewater Treatment Plant



The geographic area that contributes wastewater flows to the City's treatment plant is shown in Figure 7-2. Municipal wastewater generated within the Santa Cruz City limits is delivered to the treatment plant through a collection system consisting of 206 miles of gravity mains, about 10 miles of force main, and 21 pumping stations. The Santa Cruz County Sanitation District, a special district operated through the Santa Cruz County Public Works Department, collects wastewater from the Live Oak, Capitola, Soquel, Aptos, and Seacliff areas through a system of 185 miles of gravity main, 4.2 miles of force main, and 34 pump stations. Wastewater is transported to Santa Cruz for treatment from a central pumping facility in Live Oak. The City of Scotts Valley treats its wastewater separately and transports its effluent to Santa Cruz for discharge through the City's ocean outfall. The number of residential dwelling units and businesses served by the City and the District are provided in Table 7-1.

Figure 7-2. Geographic Area Served by the City Wastewater Treatment Plant



Upgrading of the City's wastewater treatment plant to secondary level was completed in 1998. The treatment process consists of a series of steps, including screening, aerated grit removal, primary sedimentation, trickling filter treatment, solids contact, secondary clarification, and ultraviolet disinfection.

The plant is designed to treat an average dry weather flow of 17 million gallons per day (mgd) and can accommodate peak wet weather flows of up to 81 mgd. The combined average daily flow currently measures around 10.0 mgd. The City contributes approximately 4.5 mgd, and the District contributes 5.5 mgd. Approximately 0.2 mgd of treated effluent is recycled internally within the treatment plant. The plant also treats excess dry weather flow of about 2 mgd from Neary Lagoon, typically from April through October.

Treated wastewater is discharged to Monterey Bay through a deep water outfall extending 12,250 feet on the

Table 7-1. Number of Residences and Businesses Served by City of Santa Cruz Wastewater Treatment Facility

Jurisdiction	Residential Dwelling Units		Commercial/ Industrial Users
	Single Family	Multi-Family	
City of Santa Cruz	11,869	9,104	1,306[1]
Santa Cruz County Sanitation District	14,344	14,472	2,518 [2]
Total	**26,213**	**23,576**	**--**

[1] Business sewage connections (accounts)
[2] Individual businesses served

ocean bottom and terminating one mile offshore at a depth of approximately 110 feet below sea level. A 2,100 foot diffuser at the end of the pipe provides an initial dilution of greater than 139 parts seawater to one part wastewater.

The City and the District facilities are jointly regulated under a waste discharge permit issued by the California Regional Water Quality Control Board, Central Coast Region (Order No. R3 - 2005 - 0003). Monterey Bay, into which the region's wastewater is disposed, was designated in 1992 as a National Marine Sanctuary and is widely recognized for its unique and diverse biological characteristics and physical features. To protect sanctuary resources, the wastewater influent and effluent characteristics are carefully monitored for compliance with state water quality requirements. The City also participates in a regional receiving water monitoring program with other dischargers in the Monterey Bay area.

Projected Wastewater Volumes

The amount of wastewater generated in the City and District's service areas during dry weather is projected to increase from 10.0 to 10.8 mgd by 2020, an increase of 8 percent over the next 15 years, or an average of about 0.5 percent per year (not counting additional wastewater flows from desalination). The City of Scotts Valley projects its wastewater flows will increase from 0.95 to 1.3 mgd by 2020, which corresponds with the city's projected buildout. It recently upgraded its wastewater facility by adding a tertiary treatment plant with a capacity of 1.0 mgd and began delivering recycled water for landscape irrigation purposes in 2002.

Recycled Water Currently Being Used

The City's wastewater plant does not currently nor is it permitted to produce recycled water for use offsite. With the commissioning of the new plant in 1998,

however, recycled water has been used inside the plant to meet its major process water needs including chemical mixing, contact and non-contact cooling water, equipment washing, and heating. Prior to 1998, the plant used an estimated 80 million gallons of potable water per year. The new plant reduced potable water demand by about 90 percent or about 70 million gallons, and now operates on less than 10 million gallons per year for sanitary, irrigation, and other miscellaneous uses.

Potential Uses of Recycled Water

A summary of the allowed uses of recycled water in California corresponding with the degree of treatment is presented in Table 7-2 (California Code of Regulations, Title 22). The City's treatment plant currently produces wastewater of a quality that would be classified as Disinfected Secondary-23.

The City's treated wastewater is potentially suitable for some agricultural applications and for limited public access irrigation. The level of treatment is not sufficient, however, for the water to be used for general irrigation or unrestricted use on playgrounds, parks, schoolyards, etc. Additional treatment above that currently provided would be needed to meet the state public health and safety requirements. In addition to the treatment upgrades, a distribution system, including pumps, meters, storage facilities, and separate piping would be required to convey the recycled water to customers.

The potential for using recycled water as a supplemental water supply was examined in the City's Alternative Water Supply Study (Carollo Engineers, 2000) and Evaluation of Regional Water Supply Alternatives (Carollo Engineers, 2002). Five project concepts for recycled water use were described and evaluated in the two reports, including the following:

- Recycled water for groundwater recharge
- Recycled water for direct use
- Recycled water from Scotts Valley
- Recycled Water for In-City landscape irrigation
- Recycled Water for North Coast agricultural application

Of these five concepts, two were determined to be viable projects: 1) recycled water for in-City landscape irrigation, and 2) recycled water for North Coast agricultural application. The other three projects were determined to be infeasible, unacceptable, or of too little benefit to pursue further.

Even though these two recycled water concepts were carried forward in the supply studies, only the one involving the use of recycled groundwater for agricultural irrigation was developed further as a supplemental water supply

Table 7-2. Recycled Water Criteria (Title 22 CCR)

Treatment Level	Allowed Uses of Recycled Water
Undisinfected Secondary	**Surface Irrigation:** Vineyards –no contact with edible portion of crop Orchards – no contact with edible portion of crop Pasture for Animals – not producing milk for human consumption Seed crops – not for human consumption Ornamental Nursery Stock Sod farms and Christmas trees Fodder and Fiber Crops **Other:** Flushing Sanitary Sewers
Disinfected Secondary - 23	**Irrigation:** Cemeteries Freeway Landscaping Restricted Access Golf Courses Ornamental Nursery Stock Sod Farms Pasture for Livestock Producing Milk for Human Consumption, Nonedible Vegetation Where Access is Controlled – cannot be used for school yards, playgrounds, and parks. **Impoundments:** Landscape impoundments not utilizing decorative fountains. **Cooling:** Industrial/Commercial cooling that does not use cooling towers, evaporative condensers or spraying. **Other:** Industrial Boilers Nonstructural Fire Fighting, Backfill Soil Compaction Mixing Concrete Dust Control Cleaning Roads and Sidewalks Industrial processes where it does not come in contact with workers
Disinfected Secondary – 2.2	**Irrigation:** Food Crops - Edible Portion Above Ground and not Contacted with Recycled Water **Impoundments:** Fish Hatcheries Restricted Recreational
Disinfected Tertiary	**Irrigation:** Food Crops Parks and Playgrounds School Yards Residential Landscaping Unrestricted Access Golf Courses. **Impoundments:** Nonrestricted Recreational **Cooling:** Cooling Towers Evaporative Condensers Spraying or Mist Cooling. **Other:** Flushing Toilets/Urinals Industrial Processes Structural Fire Fighting Decorative Fountains Commercial Laundries Commercial Car Washes – where public is excluded from process Consolidation of backfill around potable water pipelines Artificial snowmaking for commercial outdoor use

strategy in the City's Integrated Water Plan. There were a number of considerations that resulted in elimination of the concept involving the use of recycled water for landscape irrigation, including the following:

Limited yield. The potential users of the recycled water were determined to be parks, schools, cemeteries, golf courses, the University of California Santa Cruz, with an estimated outdoor irrigation demand of approximately 170 to 230 million gallons per year. This amount was considered too small by itself to meet the City's drought year needs.

High cost. The total capital cost for upgrading the City's treatment plant and installing a minimum of 60,000 feet of separate distribution piping, and constructing the necessary pumping and storage facilities was estimated to be at least $22 million, again for a relatively limited supply.

Tradeoffs involved. The City faced a fundamental choice between investing a large sum of money in a recycled water system mainly to keep turf areas green in times of drought at a comparatively high cost versus instituting drought management measures and curtailing those same outdoor uses of water at a relatively low cost when supplies fall short. Coupled with the fact that the recycled water concept did nothing to add to the supply of potable water, a choice was made to favor curtailment in developing alternative strategies for the City's Integrated Water Plan. In spite of this decision, recycled water for landscape irrigation remains a viable alternative that could be pursued in the future.

Reclamation/ Coast Groundwater Exchange

As explained in Chapter 5, the City's Integrated Water Plan did evaluate recycled water as well as desalination as a possible supplemental water supply. The general concept involved the City providing recycled water to North Coast farmers, who would cease from pumping groundwater and switch to recycled water for irrigating their crops. In return, the City would get access to the groundwater basin currently being used by farmers as a reserve supply in drought years. The project involved building a 4 to 5 mgd tertiary wastewater treatment plant and installing 45,000 feet of pipe and associate facilities to deliver the water up the coast. In addition, new wells and transmission facilities would be built to extract and deliver the groundwater to the city water system.

Initial estimates of the groundwater yield based on review of coastal hydrogeology ranged from 500 to 700 million gallons per year. That estimate was later reduced to less that 400 mgy based on a subsequent investigation of

agricultural water sources along the north coast.

The IWP developed several water resource strategies involving variations of both the reclamation concept and a desalination concept (given the large fixed cost of each concept, it was not practical for the City to consider doing both desalination and reclamation). It then evaluated those strategies with respect to cost, vulnerability to catastrophic events, energy usage, environmental impacts, and ease of implementation, and other planning criteria. It found that, as between the two basic choices, no one strategy was unequivocally superior. Desalination had certain advantages including lower near term capital costs, it was easier to implement, and there was less uncertainty about yield, while reclamation was somewhat less expensive over the entire planning period and posed no impacts to the marine environment.

The ultimate recommendation to select desalination as the City's preferred strategy, however, was strongly influenced by opposition to the reclamation project expressed by the California Department of Parks and Recreation, which is the major landowner above the groundwater basin being used by the coastal growers. In a letter from the State Parks Department dated September 11, 2002, it stated that the exchange was felt to involve "uncharted legal and complex policy issues having serious long-term implications of statewide consequence" and that "the use of reclaimed water at Wilder Ranch could result in potential adverse impacts to sensitive natural resources, place possible constraints on recreational usage and adversely impact organic agricultural leasing operations at Wilder Ranch State Park." The project was also opposed by local organic growers over concerns related to food safety, suitability of recycled water for organic crops, certification, and marketing if recycled water was brought up the coast. Ultimately, the State's unwillingness to consider the groundwater exchange represented a major, if not insurmountable, barrier to moving forward with the reclamation strategy. And although the IWP committee discussed bringing legislative pressure to challenge the Department's position, it decided against taking that approach for the time being, given the doubts about the groundwater yield and the potential for lengthy delay.

Projected Use of Recycled Water

Recycled water use at the wastewater plant is projected to remain at current levels near 0.2 mgd (70 million gallons per year) through the next 20 years.

As mentioned above, using recycled water for landscape irrigation remains a viable option for the City, but currently it is not the City's preferred water supply

strategy. Using recycled water for irrigation can spare high quality potable water used for irrigation, making more potable water supply available on a year-in, year-out basis. The steps and actions to encourage and optimize recycled water will be defined in the future if and when recycling is selected and pursued to diversify the City's water supply portfolio.

CHAPTER 8

WATER SHORTAGE CONTINGENCY PLAN

This chapter presents information about how the City of Santa Cruz manages the water system during a water shortage emergency that arises as a result of drought. It also describes actions that would be undertaken in response to a catastrophic interruption of water supplies, including a regional power outage, earthquake, or other emergency situation.

Drought Emergency Ordinance

The rules and regulations governing the use of water during a water supply shortage are contained in the City's Drought Emergency Ordinance (Appendix E). This ordinance is put into effect when Water Department staff determines that available supplies will be inadequate due to the lack of sufficient rainfall, runoff, and reservoir storage to support the community's normal water needs.

This ordinance was last adopted in 1992. Since that time, many things have changed including:

- Population
- Customer consumption patterns
- Per capita water use
- New water rates and rate structure
- Monthly billing inside City limits
- Completion of the Water Curtailment Study, which generated considerable insight and information about how the hardships of water shortage vary among different customer groups.
- Adoption of the Integrated Water Plan, which includes use curtailment as a planned component of the City's overall water management strategy.

As a result of all these changes, the Water Department recognizes the need to review and update its water shortage contingency plan and the accompanying drought emergency ordinance. Such an update is scheduled for later in 2006.

The following is a summary of the ordinance in its current form.

The need to adopt the ordinance is first discussed at the City's Water Commission, where a report on the City's water supply status is made and a recommended plan of action is discussed. The matter is then brought before the City Council for consideration at a public hearing, typically during the month of April. In adopting the ordinance, the Council makes a formal declaration of a water supply emergency. The ordinance remains in effect until October 31 of that year, unless the Council takes action before

Table 8-1. Calendar for Declaring Water Shortage and Determining Drought Response Plan

Target Date	Action
Months of Oct-Dec	Monitor rainfall, reservoir level, and runoff amounts
Late January	Prepare written status report on water supply conditions
Early February	Present initial estimate of water supply availability for year ahead
Early March	Present revised estimate of water supply availability for year ahead
Mid-March	SCWD announces existence of water shortage (if applicable)
Mid to late March	SCWD determines monthly water production budget and need for voluntary or mandatory response.
Early April	Present shortage response recommendation to Water Commission
Mid-April	City Council formally declares water supply emergency, adopts emergency ordinance
Beginning of May	Water shortage regulations become effective

then to rescind it. The general timeline for declaring a water shortage and determining the drought response plan is presented in Table 8-1.

Determination of Shortfall

When a lack of supply appears imminent, such as after an unusually dry winter or period of consecutive dry years, it becomes necessary to calculate the degree to which water supplies will be deficient relative to estimated water needs.

For the Santa Cruz water system, supplies are generally adequate to meet demand during the months from November through March, even in drought years. During this time, water consumption is at a seasonal low and production from the river, wells and coastal sources is usually sufficient to meet demands without having to draw water from Loch Lomond. The peak season from April 1 through October 31 is considered the critical period for the purpose of defining the degree of water supply shortfall, and for selecting the appropriate conservation goal.

To determine the potential shortfall, the Department follows a three-step process, described below:

1. Develop a forecast of supply available from surface diversions and wells.

2. Calculate the allocation available for use from Loch Lomond reservoir.

3. Compare the total available water supply against expected water demand.

Forecasting the supply expected from coastal streams, wells, and the San Lorenzo River involves both professional judgment and correlating runoff with the amount of rainfall received to determine the yield that can be obtained from each specific source. The Department uses a conservative estimate of yield to avoid the situation of overestimating supply and having to upgrade the emergency later in the year.

The amount of water available from Loch Lomond is then calculated, based on the level of storage at the beginning of the dry season and consideration of the reserve needed at the end of the dry season if drought conditions were to carry over into the following year.

In comparing the supply situation against demand, the Department used 1987 consumption levels during the 1987-92 drought as the reference point for “normal” water demand. Because customer demand patterns and per capita use levels have changed since the late 1980’s, the Department will need to establish a new baseline for demand in future droughts.

This process of defining the deficit condition is conducted toward the end of the winter season, when the status of the water supply situation becomes certain. The public is then immediately notified through the news media and informed of the severity of the situation.

Response to Water Supply Shortage

The Department’s response to inadequate water supply varies depending on the magnitude of the shortfall. The existing drought emergency ordinance has been designed using a phased approach that includes four stages ranging from a minimal to a severe shortage. The response varies from voluntary use restrictions to mandatory rationing. Table 8-2 summarizes the type of actions that are required of customers and activities undertaken by the Department corresponding with each stage of shortfall listed in the ordinance.

The Water Department coordinates its response to the water shortage through a rationing task force, which meets on a weekly basis when rationing is in effect. The task force consists of key staff members including the Director and the Water Conservation Manager. Public input and participation in drought contingency planning and management

Table 8-2. Water Shortage Contingency Plan

Drought Stage/ Shortage Condition	Customer Requirements	Water Department Activities	Penalties
I. Conservation Alert: Minimal Shortage (5-12%)	• Time of day restrictions on residential irrigation • Prohibition on outdoor washing of surfaces	• Initiate public information campaign, media outreach • Request voluntary conservation • Step up enforcement of prohibition on water waste	• Educational letter, visit by service representative • Warnings • Excess water use limit
II. Mandatory Restrictions: Moderate Shortage (13-19%)	• Designated irrigation days/times • Large turf rationing • Additional prohibitions on outdoor washing / swimming pool filling • Display of conservation information by hotels and restaurants	• Request voluntary % reduction • Intensify media outreach and information campaign • Monitor customer use • Suspend main flushing • Mobilize Drought Appeals Board • Mobilize Drought Patrol	• Warnings • Excess water use limit • Rationing for repeat violations • Aggravated use fees
III. Limited Rationing: Serious Shortage (20-38%)	• Residential usage allotments • % reduction for non-residential customers • Large agricultural irrigation audit • Large turf irrigation audit • Large commercial use survey/audit	• Institute rationing program for residential accounts • Implement customer meter reading program • Establish rationing taskforce • Intensify public relations • Monitor customer use • Step up leak detection/repair	• Warnings • Excess water use fee • Aggravated use fees • Flow restrictions / disconnections
IV. Full Rationing: Severe Shortage (39% and greater)	• Rationing for all customers • No turf watering by public agencies	• Institute rationing program for business, industry, agriculture and municipal customers • Intensify all stage III actions	• Warnings • Excess water use fee • Aggravated use fees • Flow restrictions / disconnections

is accomplished primarily through monthly meetings of the City's Water Commission. During a drought emergency, Commission meetings serve as a public forum for discussing the status of water conditions and issues associated with implementation of the drought ordinance.

Mandatory Prohibitions Against Water Waste

As mentioned in Chapter 6, the City adopted an ordinance prohibiting water waste in 1981. The uses of water that are considered to be wasteful or without reasonable purpose include the following:

- Unauthorized use of water from a fire hydrant
- Watering of landscaping in a manner that allows excess water to run to waste
- Uncorrected plumbing leaks
- Outdoor washing without the use of a positive shut-off nozzle
- Other indiscriminate uses of water

These regulations against water waste are in effect in Santa Cruz on a permanent basis. During a drought emergency, however, the number of reports of water waste received from the general public and from field staff increase dramatically. These cases are acted upon, first through attempts to educate the customer, and then through appropriate enforcement by field service representatives, conservation staff, or by a temporary drought patrol.

Priority-Based Water Allocation System

The City has established an allocation system for individual customers and for customer categories as a whole when rationing is necessary. Allocations are based on priority of use and economic considerations, and are applied as equitably as possible in the various customer categories.

The overall intent of the drought emergency ordinance is to minimize non-essential uses of water and to conserve remaining supplies for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection. Accordingly, top priority is given to meeting minimum health and safety requirements for indoor residential needs and for public safety/fire protection purposes at all times, in accordance with the legal requirements of the California Water Code, Section 350, et seq.

The next highest priority is usage related to commercial and industrial activity. A deliberate effort is made to avoid rationing water to business, industrial, and institutional/public customers to preserve jobs and minimize economic harm unless it is absolutely necessary. These customers are required to reduce their

consumption as a group based on a percentage of their previous use. If these customers fail to meet water use reduction goals, rationing of individual accounts can be instituted. Included in this category is all usage by agriculture, and by golf courses.

Water used for outdoor irrigation is given a low priority during a water shortage emergency. All irrigation becomes subject to limitations with respect to the time of day when irrigation is allowed in Stage I and the day of week when irrigation is allowed in Stage II. Residential and commercial irrigation accounts and large turf customers are subject to further reductions during Stage III ranging between 12 and 50 percent. In addition, many residential customers choose to cut back or eliminate outdoor watering altogether when rationing is implemented during a severe drought.

Lowest in priority under the drought emergency ordinance is outdoor washing (including cars, sidewalks and buildings), swimming pool filling, operation of fountains, and other nonessential outdoor water uses.

Consumption Reduction Methods

The consumption reduction methods used in the City's water shortage contingency plan are summarized in Table 8-3. There are no specific allocations implemented in Stages I and II when the deficit is less than 20 percent. Instead, the approach taken by the City is to appeal for the voluntary cooperation of all customers to conserve water, to impose restrictions on low priority uses, to enforce prohibitions on nonessential uses, and to initiate a public information and education campaign to achieve the specified conservation goal.

Rationing for residential customers and certain irrigation accounts begins in Stage III, when the shortfall is 20 percent or greater. Business, industrial and other nonresidential customer categories are required to reduce water consumption by a certain percentage as a group, but are not rationed individually as are residential customers in Stage III.

In Stage IV, when the deficit approaches 40 percent, all customers are rationed, and turf watering by public agencies is prohibited.

Use allocations in Stages III and IV are calculated for each type of customer using the methods listed in Table 8-4.

Penalties or Charges for Excessive Use

There are three types of penalties that apply to noncompliance with regulations and overuse of water during a declared water supply emergency: excess use limits and fees, aggravated use fees, and disconnection of service.

Table 8-3. Consumption Reduction Methods

Consumption Reduction Methods	Stage When Method Takes Effect
Reduce pressure in water lines	
Flow restriction	III, IV
Restrict building permits	
Restrict for only priority uses	All stages
Use prohibitions	All stages
Water shortage pricing/penalties	All stages
Per capita allotment by customer type	III, IV
Plumbing fixture replacement	Ongoing programs
Voluntary restrictions	I
Mandatory restrictions	II
Incentives to reduce water consumption	Ongoing programs
Information and education campaign	All stages
Percentage reduction by customer type	II. III, IV

Excess use fees are imposed on single family residential customers who use more than a specifies amount, called an "excess use limit", beginning in Stage II. The limit varies depending on the number of persons per household, starting at 55 CCF per bimonthly billing period. This penalty discourages excessive consumption by high-end customers as a way of forestalling water rationing, and functions like an additional price tier above normal water rates while restrictions are in effect.

In Stages III and IV, when rationing is in effect, excess use fees are imposed for customers who use more than their allocation. Customers are charged $5.00 per billing unit (hundred cubic feet) in addition to the basic rate for the first 10 percent of water over their limit/allocation and $25.00 per unit for each additional unit thereafter. The ordinance allows a customer to use a portion of the fee, on a one-time only basis, toward the installation of water conservation equipment in lieu of paying the penalty to the Water Department.

Aggravated use fees of up to $50.00 per day may be imposed on any customer who has been issued several notices of violation of water use regulations.

Table 8-4. Water Allocation Methods

Customer Class	Allocation Method
Single Family Residential	Persons per household
Multi-Family Residential	Option of: 1. Number of dwelling units 2. Persons per household 3. Hybrid of persons per household and percent reduction
Business	Percentage reduction
Industrial	Percentage reduction
Municipal	Percentage reduction
Irrigation	Percentage reduction
Coast Irrigation	Limit based on Prior Use

For customers who knowingly and willfully violate rationing rules and restrictions, the Department may install a device to restrict flow or discontinue service altogether. The fee for installing a flow restrictor is $ 35.00 and another $35.00 is charged for removal when the matter has been resolved. Reconnection charges are determined by the size of the meter and range in price from $50.00 for a 5/8 x 3/4 inch meter to $1,250.00 for a 6 inch meter.

The City's ordinance includes a provision for variances on restrictions and usage allotments. Decisions are made on a case-by-case basis by the Water Director, and, under certain circumstances, may be appealed to a City Council-appointed Drought Appeals Board. The Appeals Board hears both requests for variances as well as petitions from customers for relief from penalties arising from violations of the drought ordinance. It has the authority to make final decision in such cases.

Tracking Reductions in Water Use

Under normal water supply conditions, water production and gross consumption is recorded daily and monthly by treatment plant operators and reported to the Production Superintendent. Metered water consumption is reported on a monthly basis though automated sales reports generated by the utility billing system.

During a water shortage emergency, a monthly production budget is developed for each source of supply. Actual production and the lake level are closely monitored on a daily and weekly basis

to verify that the budgeted goals are being met. Consumption by large users is monitored on a frequent basis. If the trend in consumption is such that the rate of drawdown at Loch Lomond is greater than anticipated, the City Manager and Council are notified so that corrective action can be taken.

In serious or severe stages of a drought, production and consumption data are evaluated daily and the status reported to the Water Director's office.

Estimate of Minimum Supply for Next Three Years

Water Code section 10632 (b) requires water suppliers to estimate the minimum water supply available during each of the next three years based on the driest three-year historic sequence for the agency's water supply.

The hypothetical scenario that follows for calendar years 2006 through 2008 is based on the following assumptions:

- As of January 1, 2006, Loch Lomond Reservoir is at full capacity (which reflects actual conditions), but the remainder of the 2005-06 water year is dry.

- Hydrologic conditions for 2007 and 2008 are similar to those experienced in the 1976-77 drought, which is the driest historic sequence on record.

- Annual water production from each major source is similar to that estimated in Table 5-2 for multiple dry years.

- Net increase in storage at Loch Lomond Reservoir over the next two winter seasons is estimated to be 100 million gallons each year.

- Unrestricted system demand is estimated to be 4.0 billion gallons per year with 2.7 billion gallons used during the peak season from April to October.

- The City's planned desalination plant is not available to increase supplies during the next three years.

The results are presented in Table 8-5. In 2006, no water shortage is expected to occur. In 2007, available water supplies would be reduced by 500 million gallons, resulting in peak season shortage of 18 percent compared to normal use of 2.7 billion gallons, which would trigger a Stage II response with mandatory water restrictions. In 2008, available water supplies would be reduced by 1.3 billion gallons, resulting in a severe peak season shortfall of 48 percent, and would require full water rationing for all customers. This scenario ends with a reserve supply in Loch Lomond Reservoir of slightly over one billion gallons, which would be retained as a safeguard against a subsequent dry year.

Table 8-5. Three-Year Estimated Minimum Water Supply (mgy)

Source/Condition		2006	2007	2008
North Coast		1,077	400	300
San Lorenzo River		2,008	2,100	1,800
Live Oak Wells		187	300	400
Loch Lomond Reservoir		728	700	200
Total Production		4,000	3,500	2,700
Peak Season Supply Deficit		0%	18%	48%
Condition of Loch Lomond Reservoir at end of season:	Elevation	563.6	549.4	539.9
	Capacity (% full)	74%	54%	42%
	Volume (bil gal)	2.1	1.5	1.2

Analysis of Revenue Impacts of Reduced Sales During Shortages

One of the consequences of drought is the decline in revenues that accompanies voluntary or mandatory reduction in customer water use. After the last drought ended in 1993, the City established a water rate stabilization fund. The primary purpose of the rate stabilization fund is to provide a financial reserve to help protect the City's Water Fund from short-term losses in revenue and to alleviate the need for rate increases under such circumstances. The fund is managed as a restricted account and can only be used with the approval of City Council under certain extraordinary circumstances, such as an emergency water shortage or other natural disaster. The fund balance currently is $2.4 million.

An analysis of the potential revenue impacts that would result if a worst-case situation like the scenario described above is summarized in Table 8-6. The total loss of revenue that would be experienced spanning the three fiscal years from FY 07 through FY 09 is estimated to be about $9.7 million. The rate stabilization fund would cover the loss of revenue in FY 07, but the fund balance would be exhausted early in FY 08. Such an event would likely force the Water Department to cut operating expenses and to defer several capital improvement projects planned in FY 08 and FY 09 in order to balance the budget.

Table 8-6. Analysis of Revenue Impacts

	FY 06	FY 07	FY 08	FY 09
Projected Normal Year Revenue	$19,695,701	$22,599,177	$25,246,724	$27,293,878
Drought Revenue	$19,695,701	$21,780,740	$21,203,970	$22,543,116
Loss of Revenue		$(818,437)	$(4,042,754)	$(4,750,762)
Rate Stabilization Fund Balance	$2,400,000	$1,581,563	$0	$0
Deficit after RSF Depletion	$0	$0	$(2,461,191)	$(4,736,952)
Postponed CIP Projects:				
- Water treatment upgrades			$0	$2,500,000
- Meter retrofit program			$400,000	$0
- City Initiated Main Replacement			$400,000	$400,000
- County/Redevelopment Work			$50,000	$50,000
- Beltz Treatment Plant Upgrade			$0	$800,000
- Power Management Study/ Electric Upgrade			$1,300,000	$0
- North Coast System Rehabilitation			$0	$500,000
- Transmission System Improvements			$200,000	$200,000
Total			$2,350,000	$4,450,000
Reduction in Operating Expense			$125,000	$325,000
Deficit/Surplus after postponing CIP and operating expense savings:			$13,809	$38,048

The analysis suggests that the rate stabilization fund balance may need to be increased over time to keep pace with the Department's budget and recent changes in water rates and rate structure.

In future years, the level of customer curtailment and impact on water revenues for a similar drought event should be less severe, assuming that additional supply becomes available from the planned desalination facility. When that happens though, the City will face increased operating expenses of about $1.7 million per year related to running the desalination facility.

Catastrophic Interruption of Water Supplies

Water Code section 10632 (c) requires water suppliers to describe the actions to be undertaken to prepare for, and implement during, a catastrophic interruption of water supplies.

The City plans for and responds to emergency incidents, including floods, earthquakes, fires, and hazardous

materials incidents in accordance with the Santa Cruz County Operational Area Memorandum of Understanding (MOU). The MOU ratifies local government agreements to follow the Standardized Emergency Management System or SEMS, as mandated under California law. The City maintains an Emergency Management Plan, which defines and describes the emergency management organization and guides the response of appropriate personnel to a major emergency. The City Manager, functioning as the City's Director of Emergency Services, would coordinate the emergency response to maintain water delivery and/or restore service as necessary.

The Water Department maintains a mutual assistance agreement with other water agencies through the Water/Wastewater Agency Response Network (WARN) to share equipment, personnel, and supplies in times of an emergency. The City is a within the California Office of Emergency Services Coastal Region II, which includes the counties in the San Francisco Bay region and northern California coast.

The Water Department has a **General Emergency Plan and Emergency Response Plan for Terrorist Activity and Natural Disasters.** This document sets forth the primary objectives of the Department in an emergency as follows:

- Maintain water service for domestic and firefighting purposes,
- Protect the water supply form possible contamination,
- Control the loss of water, and
- Keep the public informed

The plan outlines the roles responsibilities of key Departmental personnel during an emergency at both the City Emergency Operations Center and Water Department Operations Center. It also describes general actions to be taken to 1) assess situation status and extent of damage to the water system, 2) prevent contamination and loss of water, and 3) restore water service in response to the following types of emergencies:

- Earthquake
- Tsunami
- Flood
- Fire
- Suspected Contamination of Water Supply
- Civil Disorder
- Power Outage
- Treatment Plant Failure
- Damage to Distribution Storage Reservoirs or Booster Pumping Station
- Telecommunications Failure

The plan contains an emergency water rationing plan intended to preserve treated water supplies in the event a catastrophe results in impairment of the

water system. The emergency rationing plan has two stages, which are defined as follows:

Serious shortage: This condition exists when the system is unable to meet normal demand, but can supply enough water for basic public health and safely needs. In this situation, not taking swift action to ration water could jeopardize available water in storage, or could leave the City vulnerable in the event of further outages.

Critical shortage: This condition exists when production facilities are rendered incapable of meeting 50% or less of normal daily production levels and the current rate of consumption poses an immediate threat of draining Bay Street reservoir or other storage tank.

The restrictions that would be instituted in a serious or critical shortage are summarized in Table 8-7.

The City has four portable auxiliary generators to run booster pumps in case of an extended power outage. In addition, the treatment plant and major pump stations (not including the coast pump station) have stationary electrical generators as a stand-by source of power in case of a local or regional power outage.

Finally, Water Department has separate earthquake response procedures that outline responsibilities for inspection and reporting the status of critical structures, including Newell Creek Dam, Bay Street Reservoir, and other major water production facilities following an earthquake.

Table 8-7. Emergency Water Rationing Plan

Serious Shortage

Prohibited Uses:

1. Watering lawns, gardens or landscaping
2. Washing cars, boats, building exteriors
3. Washing sidewalks, driveways, or any exterior surfaces
4. No outdoor use for any reason
5. Car washes closed
6. Watering plants at nurseries, garden centers
7. Filling of swimming pools, hot tubs, decorative pools, or fountains (must be turned off)
8. Public showers closed

Permitted Uses:

1. Normal domestic uses: drinking, cooking (paper plates and plastic utensils requested)
2. Toilet flushing, only when necessary
3. Limit showers to three minutes
4. Bathing only if absolutely necessary (no more than half full)
5. Minimize clothes and dish washing

Critical Shortage

Prohibited Uses:

1. Outdoor water use for any reason (garden, landscape, car washing, cleaning, maintenance)
2. Clothes washing and commercial laundering, except for health reasons
3. Janitorial cleaning
4. Businesses and institutions that use water in their operations may be forced to close or restrict operations:
   - Restaurants, bars, and coffee shops
   - Laundromats
   - Public and Private Schools
   - Manufacturing
   - Gyms and health spas
   - Beauty salons and barber shops
5. No water for construction
6. No water for crop irrigation

Permitted Uses:

1. Water limited to health and safety only: drinking and cooking (paper plates and plastic utensils required)
2. Toilet flushing for solid waste only
3. Shower/bathing should be limited to every other day
4. Use water only when absolutely necessary

APPENDIX A

City Council Resolution

COPY

RESOLUTION NO. NS-27,159

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SANTA CRUZ TO ADOPT THE 2005 URBAN WATER MANAGEMENT PLAN AND TO AUTHORIZE THE DIRECTOR OF THE WATER DEPARTMENT TO FILE A COPY WITH THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-84 Regular session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan; and

WHEREAS, the City of Santa Cruz is an urban water supplier providing service to nearly 24,000 customers and is required to review and update the Plan every five years; and

WHEREAS, the Urban Water Management Planning Act requires water agencies to evaluate and describe their water resource supplies and projected needs over a twenty-year planning horizon, and to address a number of related subjects including water conservation, water service reliability, water recycling, opportunities for water transfers, and contingency plans for drought events; and

WHEREAS, a completed Urban Water Management Plan is required in order for a water supplier to be eligible for California Department of Water Resources administered State grants, loans, and drought assistance; and

WHEREAS, the Plan must be made available for public review and a public hearing held prior to adopting the Plan, and then filed with the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the City has therefore prepared and circulated for public review a draft 2005 Urban Water Management Plan, and a properly noticed public hearing regarding the subject Plan was held by the City Council on February 14, 2006.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Santa Cruz that it hereby adopts the 2005 Urban Water Management Plan and authorizes the Director of Water to file a copy with the California Department of Water Resources.

This is to certify that this document is a true and correct copy of Resolution No. NS-27,159 passed and adopted by the City Council on the 28th day of February 2006

Jane Palmanteer
Deputy City Clerk

PASSED AND ADOPTED this 28th day of February, 2006, by the following vote:

AYES:	Vice Mayor Reilly; Councilmembers Rotkin, Madrigal, Porter, Coonerty; Mayor Mathews.
NOES:	None.
ABSENT:	Councilmember Fitzmaurice.
DISQUALIFIED:	None.

APPROVED: Cynthia Mathews
Mayor

ATTEST: Shelli Cook
City Clerk

WT575RESO 2005 Urban Water Management Plan

APPENDIX B

California Urban Water Management Planning Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384, Costa, 2002
SB 1518, Torlakson, 2002
AB 105, Wiggins, 2004
SB 318, Alpert, 2004

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in

its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council

in accordance with the ‘‘Memorandum of Understanding Regarding Urban Water Conservation in California,’’ dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement,

wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public

Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

APPENDIX C

Public Comments and Responses

SOQUEL CREEK
WATER DISTRICT

Board of Directors
Bruce Daniels, *President*
Dr. Thomas R. LaHue, *Vice President*
John W. Beebe
Dr. Bruce Jaffe
Daniel F. Kriege

Laura D. Brown, *General Manager*

February 10, 2006

City of Santa Cruz Water Department
Attn: Mr. Toby Goddard
809 Center Street, Room 100
Santa Cruz, CA 95060

Subject: Comments to the Draft 2005 Urban Water Management Plan for the City of Santa Cruz

Dear ~~Mr. Goddard~~ Toby:

The Soquel Creek Water District appreciates the opportunity to review the City's *Draft 2005 Urban Water Management Plan.* Since the District has recently completed our own UWMP update, we appreciate the significant effort and difficulty involved in preparing a well-written plan.

General Comments
We think your 2005 Plan is well done. We commend you for the manner in which the information was presented and organized. The general public should be able to understand it.

Specific Comments

- Page 3-7, Table 3-2: It would be useful to explicitly state the units.

- Page 3-10, Groundwater Conditions: You may want to replace the first paragraph with an expanded the description of the Purisima Formation as follows: *The Purisima Formation is a collection of distinct geologic units, which hydrogeologists have assigned the identification letters AA through F, with AA being the deepest and oldest unit. The gradual uplift of the California coast has caused the units of the Purisima Formation to tilt from the west to the east. This easterly dip has limited the productive units in the western portion of the Formation to the AA and A. All units extend offshore; however, the Purisima A layer outcrops the nearest to shore in the vicinity of Pleasure Point, which is in close proximity to the Live Oak well field.*

  Being a coastal system, the Purisima Formation is vulnerable to seawater contamination. ~~The Purisima aquifer is a coastal system that extends offshore and is in direct connection with the ocean.~~Water levels in the aquifer are indicative of the amount of groundwater stored inland and moving down through the aquifer system. The water level at any given location is a balance of the local and regional dynamics of of recharge to, and extraction or outflow from, the aquifer.

MAIL TO: P. O. Box 158 • Soquel, CA 95073-0158
5180 Soquel Drive • TEL: 831-475-8500 • FAX: 831-475-4291 • WEBSITE: www.soquelcreekwater.org

- Page 3-10, second paragraph under Groundwater Conditions: We suggest changing Purisima Formation to *Purisma A aquifer.*

- Page 3-11: We suggest the following revisions to the second paragraph to encompass the broader source of impacts on Purisima A groundwater levels as identified by Barry Hecht and the assessment conducted by Nick Johnson and Derrik Williams: "Groundwater level data collected over the past 15 years indicate that water levels across the Purisima *Formation* ~~basin~~ have been lowered by *a combination of* changes in *recharge* ~~pumping patterns~~ and the gradual increase in overall groundwater production. ~~from the aquifer. The data suggest that ...~~ The *cumulative impact is particularly apparent in the Purisma A aquifer* and has likely impaired the City's ability to maintain production and favorable coastal groundwater conditions *to sustain an adequate buffer to prevent seawater intrusion."*

Again, thank you for the opportunity to review and comment on the City's Draft UWMP. We look forward to continued cooperation on groundwater management efforts that will be of mutual benefit.

Sincerely,

SOQUEL CREEK WATER DISTRICT

Laura

Laura D. Brown
General Manager

Water Commission Minutes
7:00 p.m. – Monday, February 6, 2006
City Council Chambers
809 Center Street

Draft until approved by the Water Commission

Call to Order **Chair A. Schiffrin called the meeting to order at 7:00 p.m. in Council Chambers.**

Roll Call

Present: B. Fouse, B. Malone, M. McClellan and A. Schiffrin.
Absent: L. Bennett, absent with notice; B. Cox, absent without notice; C. Keutmann, absent with notice.
Staff: L. Almond, Deputy Director/Engineering Manager; T. Goddard, Water Conservation Manager; P. Harmon, Principal Administrative Analyst; B. Kocher, Water Director and D. Paul, Administrative Assistant.

Presentation **There were no presentations.**

Statements of Disqualification **There were no statements of disqualification.**

Oral Communications **There were no oral communications.**

Announcements **There were no announcements.**

Approval of Minutes

Commissioner B. Malone moved to approve the December 5, 2005 Water Commission minutes with a correction to Page 4 Roll Call, adding M. McClellan to the list of present. Commissioner B. Fouse seconded.

VOICE VOTE: MOTION CARRIED
AYES: B. Fouse, B. Malone, M. McClellan and A. Schiffrin.
NOES: None.
ABSENT: L. Bennett, B. Cox and C. Keutmann.

Consent Agenda

Commissioner M. McClellan moved to approve the Consent Agenda as submitted. Commissioner B. Fouse seconded.

VOICE VOTE:	**MOTION CARRIED**
AYES:	**B. Fouse, B. Malone, M. McClellan and A. Schiffrin.**
NOES:	**None.**
ABSENT:	**L. Bennett, B. Cox and C. Keutmann.**

General Business

Election of Chair and Vice Chair for 2006

Chair A. Schiffrin opened the floor for nominations for the office of Chair.

Commissioner M. McClellan nominated Chair A. Schiffrin.

Being no further nominations Commissioner B. Fouse moved to close nominations for the office of Water Commission Chair. Commissioner M. McClellan seconded.

VOICE VOTE:	**MOTION CARRIED**
AYES:	**B. Fouse, B. Malone, M. McClellan and A. Schiffrin.**
NOES:	**None.**
ABSENT:	**L. Bennett, B. Cox and C. Keutmann.**

Chair A. Schiffrin received the following vote for the office of Water Commission Chair.

VOICE VOTE	
AYES:	**B. Fouse, B. Malone, M. McClellan and A. Schiffrin.**
NOES:	**None.**
ABSENT:	**L. Bennett, B. Cox and C. Keutmann.**

Chair A. Schiffrin opened the floor for nominations for the office of Vice Chair.

Commissioner B. Malone nominated Commissioner B. Fouse.

Being no further nominations Commissioner B. Malone moved to close nominations for the office of Water Commission Vice Chair. Commissioner M. McClellan seconded.

VOICE VOTE:	**MOTION CARRIED**
AYES:	**B. Fouse, B. Malone, M. McClellan and A. Schiffrin.**
NOES:	**None.**
ABSENT:	**L. Bennett, B. Cox and C. Keutmann.**

Commissioner B. Fouse received the following vote for the office of Water Commission Vice Chair.

VOICE VOTE
AYES: B. Fouse, B. Malone, M. McClellan and A. Schiffrin.
NOES: None.
ABSENT: L. Bennett, B. Cox and C. Keutmann.

1. FY 2007-2009 Capital Improvement Program Request

Director Kocher, Deputy Director Almond and Principal Analyst Harmon provided information and answered questions on the FY 2007-2009 Capital Improvement Program Request.

Commissioner B. Fouse moved to recommend that City Council approve the FY 2007-2009 Capital Improvement Program request. Commissioner M. McClellan seconded.

VOICE VOTE: MOTION CARRIED
AYES: B. Fouse, B. Malone, M. McClellan and A. Schiffrin.
NOES: None.
ABSENT: L. Bennett, B. Cox and C. Keutmann.

2. County of Santa Cruz Improvement Projects Funding

Director Kocher reported that the County Redevelopment Agency projects in the Live Oak area are impacting the Water Department financially and in regards to staff workload.

Principal Analyst Harmon reported on how the water infrastructure portions of these projects could be funded by the County Redevelopment Agency on a case by case basis or a blanket agreement to fund a number of projects.

Commission Comment

The commission discussed how the County trenching ordinance has made it important that the water department complete the underground infrastructure work done before the public works projects begin.

The County has planned a number of projects in the Live Oak area and the City should request that the Redevelopment Agency help fund the water infrastructure costs on these projects including increased staffing as necessary.

Commissioner M. McClellan moved that the Water Commission recommend that City Council make a request to the County of Santa Cruz Redevelopment Agency to enter into a cooperation agreement with the City to provide funding for the water infrastructure work necessary for Redevelopment Agency projects on a case by case or ideally a blanket agreement for all projects. Commissioner B. Fouse seconded.

VOICE VOTE:	**MOTION CARRIED**
AYES:	**B. Fouse, B. Malone, M. McClellan and A. Schiffrin.**
NOES:	**None.**
ABSENT:	**L. Bennett, B. Cox and C. Keutmann.**

3. Duplex Metering

Staff requested that the Water Commission continue this item to the March meeting.

4. Draft 2005 Urban Water Management Plan (UWMP)

T. Goddard Water Conservation Manager presented an overview of the plan and reported how the UWMP Act has changed since the last revision in 2001. He provided revisions to Tables 3-4, 5-3, 5-4, 5-5 and Figure 4-2 and reported that the Drought Ordinance needs to be revised.

Commission Questions and Comments

How doe this report relate to the Integrated Water Plan?

Water Conservation Manager Goddard reported that UWMP summarizes for the State what the choices and challenges for future water supply planning. It is consistent with the IWP and other documents.

Review of Document

Page 2-7 add a discussion regarding the issue of the provision of services outside of the City's service area to the University of California Santa Cruz (UCSC).

Page 3-5 Table 3.1 Collection and Withdrawal, add a footnote explaining water rights.

Page 3-13 second column, first paragraph add to the end of the last sentence "and UCSC growth."

Page 4-8 and 4-9 change wording to more clearly reflect the Integrated Water Plan and the City's response letter to the University's LRDP EIR.

Page 5-5 Table 5-5 add a line expressing the peak season shortfall as a percentage to be consistent with the IWP.

Page 5-8 last paragraph add explanation that if an agreement cannot be reached with Soquel Creek Water District that the City will move ahead on its own.

Page 5-10 first paragraph, make clear that subsequent 1.0 mgd increments are also intended for growth. Later in the paragraph "the City's next General Plan revision" add and proposed UCSCS growth. Last Paragraph "Ongoing Planning Issues" add language in this section about the City looking at other supply alternatives which would not be useful in the short term, but may be for the long term water supply planning.

Page 6-3 Table 4-1 change to 6-1 and in text below.

Page 6-16 first column last paragraph Table should be referenced as 6-2.

Page 6-17 Table 6-2 add "2006" in the header.

Page 6-20 add information regarding what kinds of High Efficiency Toilets are available i.e. dual flush.

Page 7-2 and 7-3 Include a statement that the outflow numbers do not include concentrate and would change in the future when wastewater discharge is mixed with the concentrate from the desalination plant.

Page 7-7 first column last paragraph cite the source of the first quote, or rewrite to show that both quotes are from the same letter.

Page 8-1 Water Conservation Manager Goddard will provide to the commission a work plan for revising the Drought Ordinance at a future meeting.

Commissioner B. Malone moved to recommend that City Council pass a resolution adopting the Urban Water Management Plan (with the changes recommended by the Commission and staff this evening) and authorizing the Water Department to file a copy with the California Department of Water Resources. Commissioner M. McClellan seconded

VOICE VOTE:	**MOTION CARRIED**
AYES:	**B. Fouse, B. Malone, M. McClellan and A. Schiffrin.**
NOES:	**None.**
ABSENT:	**L. Bennett, B. Cox and C. Keutmann.**

5. General Plan Advisory Committee Appointment

Chair A. Schiffrin reported that he could no longer serve as the Water Commission alternate.

Commissioner B. Malone volunteered to be the Water Commission Alternate to the General Plan Advisory Committee.

By acclamation, Commissioner B. Malone was appointed as Water Commission alternate to the General Plan Advisory Committee.

Items Removed from the Consent Agenda **No items were removed.**

Subcommittee/Advisory Body Oral Reports

1. Integrated Water Plan pEIR Advisory Committee

Director Kocher reported that he will be meeting with the General Manager of the Soquel Creek Water District to discuss the need for renaming this committee and having it work on the development of cooperative agreement. An agenda item will be included on the next meeting agenda.

Director's Oral Report

1. Water Supply Status

   Director Kocher provided stream flow data from the San Lorenzo River and an article on the return of La Nina.

2. Integrated Water Plan Implementation **No report.**

Items Initiated by Members for Future Agendas **No items were initiated.**

The meeting was adjourned at 9:20 p.m. until next regular meeting of the Water Commission is scheduled for March 6, 2006 at 7:00 p.m. in Council Chambers.

Respectfully submitted,

_____

Staff

520-50 **Joint City Council/Redevelopment Agency Oral Communications (cont.)**

Devon James Biden presented a history of his life in Santa Cruz, and stated that while he is a college student with a 3.5 grade point average, he has currently become homeless. Mr. Biden expressed concerns that the local shelter is full, and he has no place to go. Mr. Biden stated that the community needs affordable housing.

Mike Tomasi expressed concerns that the flag was not at half staff for deceased Judge Art Danner. Mr. Tomasi stated that he could assist in helping the Police Department work properly.

Adjournment — At 7:54 p.m. the Redevelopment Agency adjourned from the regularly scheduled meeting of February 14, 2006 to the next regularly scheduled meeting on February 28, 2006, for a closed litigation session at 1:30 p.m., in the Courtyard Conference Room, followed by an open session at the approximate hour of 3:00 p.m. in Council Chambers.

Public Hearing

1200-10 41. 2005 Urban Water Management Plan Update. (WT570)

Mayor Mathews opened the public hearing at 7:54 p.m.

Water Conservation Coordinator T. Goddard presented an oral staff report, and he and Director of Water B. Kocher responded to Council's questions.

SPEAKING FROM THE FLOOR EXPRESSING CONCERNS:
Glen Guy
Rick Longinotti
Reed Searle
Kent Faurf
Ron Pomerantz

Mayor Mathews closed the public hearing at 8:36 p.m.

For the record, Councilmember Porter recommended that Council request at the next Council meeting, that staff evaluate strategies and policies relating to our remaining capacity, and prepare a proposed definition of threshold of significance relating to the expanded use of our remaining capacity, and recommend a City policy and strategy when effective remaining capacity is depleted.

No action was recommended.

Note: A resolution adopting the Urban Water Management Plan will be considered on the February 28, 2006 meeting Consent Agenda.

Consent Agenda (continued)

1040-60 8. Revised Lighthouse Field State Beach General Plan. (CA107)

Councilmembers Porter and Rotkin disqualified themselves from acting on this item.

Resolution No. NS-27,158 was adopted rescinding Resolution No. NS-26,187 which was adopted by the City Council on April 22, 2003 and served to approve the Revised Lighthouse Field State Beach General Plan and the Negative Declaration for the General Plan revision, since the intended effect is to return the park to management under the 1984 Plan. The motion carried unanimously (Councilmembers Porter and Rotkin disqualified and Councilmember Fitzmaurice absent).

Note: Adoption of the proposed resolution reinstated Resolution No. NS-15,791A.

1200-10 9. 2005 Urban Water Management Plan Update. (WT575)

Resolution No. NS-27,159 was adopted adopting the 2005 Urban Water Management Plan and authorizing the Director of the Water Department to file a copy with the California Department of Water Resources.

370-40
330-40 10. Meter Retrofit Program – Budget Adjustment. (WT574)

Resolution No. NS-27,160 was adopted transferring funds and amending the FY 2006 budget in the amount $210,000 to provide additional funds for the Water Department Meter Retrofit Program c709860.

480-05
330-40 11. 2006 Byrne Memorial Grant. (PD178)

Resolution No. NS-27,161 was adopted transferring funds and amending the FY 2006 budget in the amount of $33,266 to fund the purchase of two police vehicles.

APPENDIX D

Cooperative Agreement For Groundwater Management Within the Soquel-Aptos Basin

COOPERATIVE AGREEMENT
FOR GROUNDWATER MANAGEMENT WITHIN THE SOQUEL-APTOS BASIN

THIS COOPERATIVE AGREEMENT, made and entered into this 1st day of November, two thousand and five, by and between Soquel Creek Water District, City of Santa Cruz, Central Water District, and the County of Santa Cruz, all of which represent agencies with interests in groundwater management within the area known regionally as the Soquel-Aptos Basin, hereby join together for a common and specific purpose.

ARTICLE I. BACKGROUND AND OBJECTIVES

RECITALS

1. The parties to this interagency cooperative agreement, pursuant to their respective statutory authorizations, are engaged in programs and projects intended to further the assurance of a long–term, sustainable, reliable, good quality groundwater supply in Santa Cruz County;

2 In 1994 and 1996, the Soquel Creek Water District and the Central Water District entered into a Joint Exercise of Powers Agreement and created the *Ground-Water Management Plan – Soquel-Aptos Area*, respectively, to manage the groundwater in their service areas under the provisions of AB3030, as set forth in Part 2.75 of Division 6 of the California Water Code;

3. The Department of Water Resources (DWR) has added Amendments to Sections 10750 et.seq. whereby the managing entity shall "involve other agencies that enables the local agency to work cooperatively with other public entities whose service area or boundary overlies the groundwater basin." (Water Code # 10753.7 (a)(2)) The County of Santa Cruz and the City of Santa Cruz are both agencies whose boundaries overlie the Soquel-Aptos Area groundwater basin;

4. The Soquel-Aptos Basin is currently in overdraft and susceptible to seawater intrusion and, in an effort to include locales that are outside the existing AB 3030 boundaries in order to provide consistent, basin wide management practices, the parties to this agreement are interested in developing an expanded regional Groundwater Management Plan (GWMP);

5. The City of Santa Cruz and the County of Santa Cruz have agreed to join the continued efforts by Soquel Creek Water District and Central Water District to manage the basin and update/expand the regional GWMP, although the extent of their participation has not yet been defined;

6. All parties to this agreement wish to join in a common effort to create an updated/expanded GWMP which shall include, but not be limited to: 1) Establishing management objectives for the Soquel-Aptos Basin, including components relating to monitoring and controlling saline intrusion, monitoring and managing groundwater levels and storage, groundwater quality, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping; and 2) Adopting monitoring protocols for the above referenced components;

7. The parties to this agreement are empowered by law to enter into this agreement.

ARTICLE II. STATEMENT OF WORK

NOW THEREFORE, the parties to this agreement mutually agree to:

1) Establish the Soquel-Aptos Groundwater Management Alliance (SAGMA). The agency members of the Alliance shall form a committee comprised of one representative from each party to this agreement, accompanied by support staff and consultants, as needed. The committee shall meet on a regular basis and establish programs and policies consistent with the alliance's objectives, review data and coordinate groundwater pumping to the extent possible to both meet demand and avoid exacerbating undesirable coastal groundwater conditions.

2) Undertake ongoing and comprehensive efforts to collect, maintain, and share groundwater data with respect to water levels and quality.

3) Support and provide technical assistance in updating the 1996 AB 3030 Groundwater Management Plan for the Soquel-Aptos Area.

4) Collaboratively review and update the database for private wells within the Soquel-Aptos Basin.

5) Prepare a map showing the area of the groundwater basin(s), as defined by DWR Bulletin 118, with area(s) subject to the Groundwater Management Plan as well as the boundaries of other local agencies that overlie the Soquel-Aptos Basin.

6) Develop and foster relationships with regional, state, and local governments, individuals, and other interested organizations to develop protocols that recognize the importance of groundwater management practices to preserve and protect this natural resource.

7) Establish cooperative relationships with state, local, and other public entities within this region that regulate groundwater matters.

8) Undertake cooperative research and resource management initiatives that are regional in scope and disseminate information resulting from these activities.

9) Establish and implement management objectives (MOs) for the Soquel-Aptos Groundwater Basin (Water Code 10753.7 (a)(1)).

10) Coordinate Urban Water Management Plans and Groundwater Emergency Plans.

11) Jointly pursue groundwater management grants or studies, such as grants available from the State under AB303 and Proposition 50 and studies undertaken by the University of California or United States Geological Survey.

12) Consider the benefits of and form for entering into an arrangement that expands the AB3030 Groundwater Management Authority established under the Joint Exercise of Powers Agreement between Soquel Creek Water District and Central Water District to include those areas within the Soquel-Aptos Groundwater Basin that are under the jurisdiction of the City and/or County of Santa Cruz.

13) Review land use plans and coordinate with land use planning agencies to assess activities and potential impacts of activities that have an impact on groundwater quantity and quality.

14) Produce and share relevant informational materials among the members of SAGMA

15) Recommend to the respective governing boards actions necessary to protect the groundwater basin.

ARTICLE III. TERM OF AGREEMENT

GTB

This agreement shall be evaluated and reviewed by staff no later than one year after its implementation at which time, recommendations for improvements and modifications shall be considered by all ~~parties~~ approving bodies. Any amendment or modification to this agreement shall be in writing, agreed upon by all signatories, executed by the

GTB

duly authorized representatives of the parties hereto, and incorporated into this agreement by reference.

ARTICLE IV. KEY OFFICIALS

Laura D. Brown, General Manager, Soquel Creek Water District
Clarke Wales, General Manager, Central Water District
Bill Kocher, Director, City of Santa Cruz Water Department
John Ricker, Water Resources Program Coordinator, Santa Cruz County Environmental Health Services

ARTICLE V. AWARD

This basic agreement does not provide for any financial obligation and is a vehicle for determining agency agreement on basic premises, goals, and objectives. Subsequent work requiring the transfer of funds between member agencies may be made by amendment of this basic document with the approval of the legislative bodies of the participating agencies and the SAGMA.

Preliminary discussions regarding any costs associated with projects developed under this agreement may use a formula based on estimated net pumpage from the basin by member agencies.

ARTICLE VI. TERMINATION

Agencies can terminate their participation in the Soquel-Aptos Groundwater Management Alliance by providing 60 days written notice to all signatory parties.

SIGNATURES

Laura D. Brown
General Manager
Soquel Creek Water District

10/07/05
~~Bill Kocher~~ Richard C. Wilson
~~Director~~ City Manager
City of Santa Cruz, ~~Water Department~~

Clarke Wales
General Manager
Central Water District

~~John Ricker~~ Rama Khalsa
~~Water Resources Program Coordinator~~ Health Services Agency Director
County of Santa Cruz ~~Environmental Health Services~~

Approved as to Form:

Bosso Williams

_____
District Counsel, Soquel Creek Water District & Central Water District

County Counsel

Harry A. Oberhelman III 8/14/05
County Counsel, County of Santa Cruz

City Attorney

10-5-05
City Attorney, City of Santa Cruz

APPENDIX E

Drought Emergency Ordinance

ORDINANCE NO. 92-10

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF SANTA CRUZ PROHIBITING AND REGULATING CERTAIN USES OF WATER FROM THE CITY WATER SUPPLY SYSTEM NOT ESSENTIAL TO THE PUBLIC HEALTH AND WELL-BEING FOR WATER CONSERVATION PURPOSES, PRESCRIBING PENALTIES FOR VIOLATIONS, ESTABLISHING A DROUGHT APPEAL BOARD AND DECLARING THE PRESENCE OF AN EMERGENCY AND DECLARING THE URGENCY THEREOF

WHEREAS, an impending water shortage emergency exists because of a prolonged drought; and

WHEREAS, rainfall has not been sufficient and consequently leaves the level of the Loch Lomond Reservoir at a low level, and other water sources are inadequate to meet seasonal water demand due to continuation of an area-wide drought; and

WHEREAS, engineering analysis of water supplies indicates water available through October, 1992, will be insufficient to meet average demand for the same period; and

WHEREAS, the regulations and fees hereinafter enacted are designed to discourage violations of the prohibitions and restrictions set forth herein and other nonessential or wasteful uses, encourage conservation (particularly in noncommercial irrigation), minimize peak load demands on City facilities, conserve the water supply of the City for the greatest public benefit with particular regard to domestic use, community economic viability, sanitation, and fire protection; and

WHEREAS, the usage allotments hereinafter established will spread the burden of restricted usage most equitably over all consumers of City water, with consideration for the business community because of prior regulations on installation of water conservation devices, consistent with the City's ability to administer such allotments; therefore,

BE IT ORDAINED by the City of Santa Cruz, California, as follows:

SECTION 1. DECLARATION OF EMERGENCY. It is hereby found and declared that a water shortage and imminent emergency exists within the water service area of the Water Department of the City of Santa Cruz as total projected customer water usage through October 31, 1992, will exceed projected supply for the same period; therefore, it is necessary to prohibit and regulate water uses as provided in this ordinance.

SECTION 2. APPLICATION OF REGULATIONS. The provisions of this ordinance shall apply to all persons using water both in and outside the City and within the City water service area, and regardless of whether any person using water shall have a contract for water service with the City.

SECTION 3. Notwithstanding other Code provisions inconsistent with this ordinance, the provisions of this ordinance shall supersede and prevail for the duration of the emergency and until this ordinance terminates pursuant to its own provisions or is repealed.

SECTION 4. DEFINITIONS.

A. "CCF" refers to one-hundred (100) cubic feet of water and is the unit of measurement by which customer accounts are billed. One-hundred cubic feet equals 748 gallons of water.

B. "Water conservation devices" refers to the following devices: showerheads which limit the flow rate to a maximum of 2.5 gallons per minute (gpm), faucet aerators which limit the flow rate to a maximum of 2.5 gpm, toilet displacement devices that reduce the flush by at least 1.0 gallon, ultra low-

flush toilets refers to water closets or associated flushometer valves that meet the standards of 1.6 gallons of water per flush or less, separate water submeters, drip irrigation equipment, and any other devices as determined by the Water Director, Customer Service Manager, and the Water Conservation Coordinator as water-saving.

C. "Water conservation services" refers to the following services: landscape or building water audits, labor for installation of water conservation devices.

D. "Landscape water audit" refers to an analysis by a qualified expert of the irrigation system and planted materials on a property to determine the actual water needs and water budget of the property based on climate data for Santa Cruz and available through the California Irrigation Management Information System (CIMIS) weather station located in Santa Cruz.

F. "Permanent resident" refers to a person who resides at the service address at least 75 percent of the time from May 1 through October 31.

SECTION 5. <u>DROUGHT STAGE I: CONSERVATION ALERT.</u>

A. The Director of the Water Department is empowered to enforce the restrictions in Drought Stage I of this section when:

1. The projected customer water usage through October 31, 1992, exceeds available supplies by more than 5 percent based on the amount of water delivered to customers during the same period in 1987; or

2. The Director estimates that at the end of any month, water use from the Loch Lomond Reservoir will exceed that month's allocated amount set at the beginning of the declared water shortage. The allocated amounts are based on Loch Lomond water levels remaining over 550 feet mean sea level on October 31, 1992.

B. It is unlawful for any person, firm, partnership, association, corporation, or political entity to use water obtained from the water system of the City of Santa Cruz Water Department through fraud, including misrepresentation made to obtain a particular allocation of water, or for any of the following prohibited or restricted uses:

1. The irrigation of noncommercial landscape at times other than those designated by the Director of the Water Department, with exceptions as noted:

From April 1 through October 31, 1992: 12:00 AM (midnight) to 11:00 AM and 6:00 PM to 12:00 AM (midnight) only.

<u>Exceptions for residential and commercial watering</u>:

(a) Drip irrigation and soaker hoses.

(b) Watering of container plants (plants in pots).

2. The washing of noncommercial sidewalks, driveways, porches, or other outdoor surfaces. Use of a bucket is allowed at any time, if cleaning food, grease, oil, or other stains from surfaces.

C. EXCESS WATER USE LIMIT. An EXCESS WATER USE LIMIT will be set for single-family, single-metered customers beginning May 1, 1992. Any single-family customer that exceeds this limit shall be subject to an excess water use fee as specified in SECTION 9. The limit will be set based on the number of persons in a household and begin with two persons or less at 55 CCF, bi-monthly, and increase by 4 CCF bi-monthly for each additional person in the household. This excess water use limit is designed to curtail excessive use of water by a few customers. The use of an EXCESS WATER USE LIMIT may allow the Water Department to forestall DROUGHT STAGE II: MANDATORY RESTRICTIONS or DROUGHT STAGE III: RATIONING.

SECTION 6. DROUGHT STAGE II: MANDATORY RESTRICTIONS.

A. The Director of the Water Department is empowered to enforce the restrictions in Drought Stage II of this section when:

1. The projected customer water usage through October 31, 1992, exceeds available supplies by more than 13 percent based on the amount of water delivered to customers during the same period in 1987; or

2. The Director estimates that at the end of any month, water use from the Loch Lomond Reservoir will exceed that month's allocated amount set at the beginning of the declared water shortage. The allocated amounts are based on Loch Lomond water levels remaining over 545 feet mean sea level on October 31, 1992.

B. It is unlawful for any person, firm, partnership, association, corporation, or political entity to use water obtained from the water system of the City of Santa Cruz Water Department through fraud, including misrepresentation made to obtain a particular allocation of water, or for any of the following prohibited or restricted uses:

1. The filling or re-filling of any swimming pool, wading pool, hot tub, or jacuzzi, public or private, except for the initial filling of a newly installed hot tub or jacuzzi.

2. The addition of water above the minimum level necessary to comply with the health requirements for pool, hot tub, or jacuzzi circulation, public or private (i.e. adding water to bring the level to the top, where splash-out occurs).

3. The irrigation of noncommercial landscape on days and at times other than those designated by the Director of the Water Department, with exceptions as noted:

Residential watering:

Odd-numbered addresses: From April 1 through October 31, 1992: Saturday and Wednesday, 12:00 AM (midnight) to 11:00 AM and 6:00 PM to 12:00 AM (midnight) only;

Even-numbered addresses: From April 1 through October 31, 1992: Sunday and Thursday, 12:00 AM (midnight) to 11:00 AM and 6:00 PM to 12:00 AM (midnight) only;

Commercial watering: From April 1 through October 31, 1992: Monday and Thursday, 12:00 AM (midnight) to 11:00 AM and 6:00 PM to 12:00 AM (midnight) only.

Exceptions for residential and commercial watering:

(a) Drip irrigation and soaker hoses.

(b) Watering of container plants (plants in pots).

(c) Customers may water turf areas only IF they have completed a landscape water audit conducted by a qualified professional and the watering schedule reflects a reduction from needed demand by the system shortfall (up to 19 percent) and post a water conservation sign with wording and site locations approved by the Water Conservation Office. In these cases, the prohibition on time-of-day watering will remain; no watering from 11:00 AM to 6:00 PM.

(d) Customers who are required by a governmental entity to water for purposes of erosion-control or other documented health, safety or fire requirements, will follow the requirements of (c) above.

(e) Large turf customers. Customers operating golf courses, parks, school turf areas, cemeteries, highway landscape areas and the University of California-Santa Cruz will be subject to a mandatory rationing allotment of

88 percent of the customer's 1987 water use. Except for UCSC, these provisions apply to irrigation-only meters. If the customer allocation is exceeded, provisions in SECTION 9, SECTION 11, AND SECTION 12 of this ordinance will apply. The customer must be bound by the allocation regulations until the end of the water shortage emergency is declared or until October 31, 1992, whichever comes first. They must post a water conservation sign with wording and site locations approved by the Water Conservation Office.

4. The washing of noncommercial sidewalks, driveways, porches, or other outdoor surfaces. Use of a bucket is allowed at any time, if cleaning food, grease, oil, or other stains from surfaces.

5. The washing of commercial sidewalks, driveways, filling station aprons, parking lots, or other outdoor surfaces, except on designated days of the week specified by the Director, using the procedures specified by the Water Department. Use of a bucket is allowed at any time, if cleaning food, grease, oil, or other stains from surfaces. Commercial designated days: Monday and Thursday.

6. The washing of commercial and noncommercial boats and boat trailers is allowed at boat marinas or launching facilities where automatic shutoff nozzles are installed and where time limits, based on proper engine flushing, are enforced.

7. The washing of automobiles, trucks or other vehicles in automobile dealerships, except on designated days of the week specified by the Director, plus the day of delivery to the dealership and the day of delivery to a new customer. Car rental agencies and bus leasing agencies may only wash vehicles on the day of delivery to the customer. Designated days: Monday and Friday.

8. The washing of automobiles, trucks or other vehicles in commercial or governmental fleets except on designated days of the week specified by the Director or as required for health and safety. Designated days: Thursday and Saturday or Sunday.

9. No restaurant may serve water except upon customer request. All hotels and motels shall display water conservation information cards or tents in each guest room. All restaurants shall display water conservation information cards or tents at dining tables and counters.

10. Outdoor ornamental fountains in major public areas shall be turned off to remind visitors and citizens the severity of the water shortage. Indoor ornamental fountains will be posted with a sign that acknowledges the water emergency and states that fountains use a recirculating system.

11. Bulk Water Station Prohibited Use: No bulk water hauler shall deliver water to its customers outside the Santa Cruz Water Department service area. No bulk water hauler shall supply any of its customers with water from the Santa Cruz Water Department service area EXCEPT for construction site dust control and other construction use. Delivery of such water to any customer for landscape use or swimming pool refill is expressly prohibited. Any violation of this provision may result in cancellation of the bulk water hauler's permit and discontinuation of the water service where the water was delivered.

12. Any use of water in violation of provisions set forth in the City's Water Conservation Ordinance, Chapter 16.02.

C. WATER LEAK CHECKS. Any business or industrial customer whose use exceeds 200 CCF in any billing period is required to have a plumber certify the property is leak-free. EXCEPTION: If the customer's water use has remained at 88 percent or less of their 1987 water use, no certification is necessary.

D. EXCESS WATER USE LIMIT. An EXCESS WATER USE LIMIT will be set for single-family customers beginning May 1, 1992. Any single-family customer that exceeds this limit shall be subject to an excess water use fee as specified in SECTION 9. The limit will be set based on the number of persons in a household and begin with two persons or less at 55 CCF, bi-monthly, and increase by 4 CCF bi-monthly for each additional person in the household. This excess water use limit is designed to curtail excessive use of water by a few customers. The use of an EXCESS WATER USE LIMIT may allow the Water Department to forestall DROUGHT STAGE III: RATIONING.

E. REPEATED VIOLATIONS RATION: Any customer who violated the water restrictions in 1990 or 1991, and has more than one offense of these same provisions in 1992, or any customer who has two or more repeat offenses in 1992, may be required to ration water as set forth in Drought Stage III (SECTION 7 for residential and irrigation customers) or Drought Stage IV (SECTION 8 for business customers).

F. Other Water Sources: Restrictions in this section do not apply to water used from reclamation, on-site sources, or water delivered to a site from a source other than the City of Santa Cruz Water Department. On-site sources must be equipped with an approved backflow device. The customer will be required to demonstrate that an on-site source is separate from the City water supplies.

G. Discretion of Director: The Director has the discretion to make all the mandatory restrictions listed in Section 6B less restrictive, and make the specific landscape watering restrictions listed in Section 6B(3) more restrictive, depending on the severity of the water shortage.

SECTION 7. <u>DROUGHT STAGE III: USAGE ALLOTMENT (LIMITED RATIONING)</u>.

A. The Director is empowered to enforce the provisions of this section upon notification to customers if the Director determines:

1. That projected customer water usage through October 31, 1992, will exceed available supplies by more than 19 percent based on the amount of water delivered to customers during the same period in 1987; or

2. That, based on the Director's estimate, at the end of any month, water use from the Loch Lomond Reservoir will exceed that month's allocated amount as set at the beginning of the declared water shortage. The allocated amounts are based on Loch Lomond water levels remaining over 530 feet above mean sea level on October 31, 1992.

B. Single-family residential customers, multi-family residential customers, and noncommercial irrigation customers who use water for permitted purposes in excess of the usage allotment defined below shall be subject to an excess water use fee as specified in SECTION 9.

1. The "usage allotment" for each of the three above-referenced customer classes shall be determined by projecting the total amount of water that will be available for the 180-day period beginning May 1, 1992. The 1991 water use for all accounts other than residential and noncommercial irrigation will be totalled and subtracted from the total projected available supply. The remainder will be divided among the single-family residential, multi-family residential, and noncommercial irrigation accounts depending on the amount of shortfall to the water system as follows:

(a) **Single-Family, Individually Metered Residential Customers**: The baseline bi-monthly allocation for each account in this customer class will be based on the number of permanent persons residing at the service address as follows:

	20-28% Shortfall	29-38% Shortfall
	Bi-Monthly	Bi-Monthly
2 persons	17 CCF	15 CCF
Each additional person	4 CCF	4 CCF

By written request and appropriate documentation, state-certified residential child care facilities will be given an additional ration of half the proportional share allocated to each permanent resident based on a current roster of children cared for, not to exceed the maximum number of children the facility has been certified for by the State.

An optional method for allocation based on a landscape water audit is available through administrative review.

(b) **Multi-Residential Master-Metered Customers WITHOUT separate irrigation meters**. One of three methods will be allowed. The customer will automatically receive an allocation from Method 1. Methods 2 and 3 would require submittal of documentation.

(1) Method 1: Allocation based on the number of dwelling units on a customer service account:

	20-28% Shortfall	29-38% Shortfall
Dwelling units on property	Bi-monthly allocation per dwelling unit	
2	16 CCF	14 CCF
3 and 4	14 CCF	13 CCF
5 to 39	12 CCF	11 CCF
40+	8 CCF	7 CCF

(2) Method 2: Allocation based on gallons per person per day (gppd) on the account: 55 gppd for 20-28% shortfall, 50 gppd for 29-38% shortfall.

(3) Method 3: Allocation based on 45 gallons per person plus the landscape needs as documented by the submitted landscape water audit reduced by the system shortfall.

(c) **Multi-Residential Master-Metered Customers WITH separate irrigation meters**. One of two methods will be allowed. The customer will automatically receive an allocation from Method 1. Method 2, based on the number of persons, would require submittal of documentation.

(1) Method 1: Allocation based on the number of dwelling units on a customer service account:

	20-28% Shortfall	29-38% Shortfall
Dwelling units on property	Bi-monthly allocation per dwelling unit	
2	15 CCF	13 CCF
3 and 4	13 CCF	12 CCF
5 to 39	11 CCF	10 CCF
40+	7 CCF	6 CCF

(2) Method 2: Allocation based on gallons per person per day (gppd) on the account: 50 gppd for 20-28% shortfall, 45 gppd for 29-38% shortfall.

(d) Multi-family Residential Master-Metered Customers Where Dwelling Unit is 35 Percent or Less of Lot Size: The multi-family customers where their dwelling unit is 35 Percent or less of their lot size may be

considered as single-family singly-metered customers for the purposes of establishing rationing allocations. Excess use fees will be based on reading the master meter without regard for the number of housing units on the meter. All of the dwelling units on the property, on the average when added together, must be 35 percent or less than the total lot for all properties excluding separately metered common areas. The documentation must be submitted by the customer according to Water Conservation Office procedures.

(e) **Residential Noncommercial Irrigation**: The allocation for this customer class will be based on 50 percent (20-28% shortfall) or 40 percent (29-38% shortfall) of the customer's 1987 water use. If a customer can document through a water audit performed by a qualified professional that his or her watering practices and scheduling are water-efficient based on a landscape water audit using CIMIS data for Santa Cruz, the required allocation will be revised. The new allocation will use the water audit as a base and it will then be reduced by the system shortfall as defined in SECTION 7.A.1 or SECTION 8.A.1. For customers who have no prior water use history, the allocation will be established based on a water audit submitted by the customer and then reduced by the system shortfall as defined in SECTION 7.A.1 or SECTION 8.A.1. If the customer does not submit a water audit, an allocation will be set for the customer based on either recent past water use, water use at a similar property, or water use for a standard xeriscape landscape.

(f) Single-metered and master-metered customers may apply for an administrative allocation review at any time based on the following considerations: number of people living at the service address, medical conditions, landscape water audit, business use at the property, multiple meters on one multi-family master-metered parcel, and livestock (not domestic animals). The allocation review will require documentation from the customer as set forth in Water Conservation Office procedures 1991. The following standards will be applied once the customer has provided adequate documentation:

(1) Optional allocation for single-metered and master-metered residential accounts: 45 gallons per person per day allowed plus the landscape needs as documented by the submitted landscape water audit reduced by the system shortfall.

(2) Multiple meters on one multi-family master-metered parcel. If a customer has two or more meters on one property parcel, as defined by the APN number, then the ration for all meters on that one parcel will be treated as one and the ration allocation will equal the total allocation of all meters on that parcel.

(3) For medical needs, a new ration may be set based on adequate documentation provided by a medical or health professional.

(4) Livestock, horses and cows shall be allotted an additional 1 CCF bi-monthly per animal. Customer shall submit documentation on all animals.

(5) Business use at residence. Where an account has both business and residential water use, a business license at that address, and there is NOT enough water use to classify the account as a business (396 CCF/annually), the additional allocation will be based on a submitted water budget and/or past use by a similar business. An allotment of water not to exceed 82 percent of the estimated business need (based on expected reduction from business customers) will be added to the customer account based on reasonable business use. The customer will then be considered a business customer with associate utility fees as applies to business. The classification may not be changed for one calendar year.

(6) Returning family members: An allocation of 50 gallons per person per day will be allowed for returning family members such as students. No additional water will be allocated for house guests.

(7) Customer accounts used as vacation rentals: Customer shall submit leases verifying the number of persons at the property over the billing period. Adjustment will be made based on 50 gallons per person per day.

C. Once the Director has implemented Drought Stage III (SECTION 7 herein), all prohibitions and restrictions on water usage specified in SECTION 6, will be lifted for single-family, multi-family, and residential noncommercial irrigation customers EXCEPT that no landscape watering will be allowed from 11:00 AM to 6:00 PM on any day.

D. **All nonresidential customers** as individual accounts, will not be rationed in DROUGHT STAGE III. Instead, in Drought Stage III, these customers, excluding industrial customers, as a group will be expected to effect an 18 percent savings reduction from 1987 water use. Industrial customers will be expected to effect a 12 percent savings reduction from 1987 use. In DROUGHT STAGE III, all these customers will be required to follow the restrictions set forth in Section 6, DROUGHT STAGE II, MANDATORY RESTRICTIONS, plus additional conservation requirements as follows:

1. All nonresidential customers, except commercial agricultural customers: From April 1 through October 31, 1992, watering is allowed only: Monday and Thursday, 12:00 AM (midnight) to 11:00 AM and 6:00 PM to 12:00 AM (midnight) only; from May 1 through October 31, 1992, areas other than turf will still be able to be watered, but no watering of turf will be allowed unless the turf area is subject to mandatory rationing as follows:

(a) Industrial customers, as an alternative to compliance with the provisions of Section 6B(3) of this ordinance, may apply to the Director for permission to be subject to a mandatory rationing allotment of 88 percent of the customer's 1987 water use. This mandatory rationing must include all meters on the customer account at the property. If, upon acceptance of water rationing, the customer allocation is exceeded, provisions in SECTION 9, SECTION 11, and SECTION 12 of this ordinance will apply. The customer must be bound by the allocation regulations until the end of the water shortage emergency is declared or until October 31, 1992, whichever comes first. A water conservation sign with wording approved by the Water Conservation Office must be posted on the site.

(b) All other nonresidential customers, EXCEPT all governmental customers, as an alternative to compliance with the provisions of Section 6B(3) of this ordinance, may apply to the Director for permission to be subject to a mandatory rationing allotment of 82 percent of the customer's 1987 water use. Where no records exist, or where use is less than the use on the account in 1990, 1990 will be used as a base. In any case, a landscape water audit must be completed. This mandatory rationing must include all meters on the customer account at the property. If, upon acceptance of water rationing, the customer allocation is exceeded, provisions in SECTION 9, SECTION 11, and SECTION 12 of this ordinance will apply. The customer must be bound by the allocation regulations until the end of the water shortage emergency is declared or until October 31, 1992, whichever comes first. A water conservation sign with wording approved by the Water Conservation Office must be posted on the site.

(c) All governmental customers (City, County, State), as an alternative to compliance with the provisions of Section 6B(3) of this ordinance, may apply to the Director for permission to be subject to a mandatory rationing

allotment based on the system shortfall and an additional reduction of 5 percent of the customer's 1987 water use. This mandatory rationing must include all meters on the customer account at the property. If, upon acceptance of water rationing, the customer allocation is exceeded, provisions in SECTION 9, SECTION 11, and SECTION 12 of this ordinance will apply. The customer must be bound by the allocation regulations until the end of the water shortage emergency is declared or until October 31, 1992, whichever comes first. A water conservation sign with wording approved by the Water Conservation Office must be posted on the site.

2. Nonresidential customers, excluding customers under rationing and commercial agricultural customers, where water use exceeded two hundred (200) CCF of water for any billing period from April through November of 1991 and whose 1991 use exceeded the target voluntary rations set in 1991 of 88 percent of 1987, will be required to do the following within 30 days of the beginning of DROUGHT STAGE III:

(a) conduct a water use survey and submit the survey and a water conservation plan that meets an 18 percent reduction in water use.

(b) to have a plumber certify the property is leak-free.

3. Nonresidential customers, excluding customers under rationing and commercial agricultural customers, where a turf area exceeds 5,000 square feet and is watered with an automated irrigation system, will be required to conduct a landscape water audit within 60 days of the beginning of DROUGHT STAGE III.

4. **Coast irrigation customers** where water use exceeds one-thousand (1000) CCF of water for any billing period from April through November of 1991 basis, will be required to conduct an irrigation analysis on a test plot for one of the customer's accounts within 30 days of the beginning of DROUGHT STAGE III.

5. The water survey, landscape water audit, or irrigation analysis, as referenced above, may be waived by the Director, upon review, if the customer has had a similar service performed within the last 6 months and submits the documentation to the Water Department.

6. No washing of noncommercial boats will be allowed at the Santa Cruz Harbor wash rack. The fish cleaning sinks will also be shut off. The hosing down of boats at the private docks will be allowed only if positive shut-off nozzles are used. The Santa Cruz Port District will be the enforcement agency for compliance with these restrictions within its boundaries.

E. The Water Department has the authority to inspect any property on the customer account to verify information that may affect a water allocation decision.

F. The Water Director may grant an administrative review for uses of water otherwise prohibited or adjust any consumer's usage allotment, if the Director finds and determines that to fail to do so would cause an emergency condition affecting health, sanitation, or fire protection of the applicant or the public.

G. By request, where one service line divides to more than one meter and then the water line comes back into a common property side service line, the ration for those meters will be based on the combined use on those meters.

SECTION 8. DROUGHT STAGE IV: USAGE ALLOTMENT (FULL RATIONING).

A. The Director is empowered to enforce the provisions of this section upon notification to customers if the Director determines:

1. That projected customer water usage through October 31, 1992, will exceed available supplies by more than 38 percent based on the amount of water delivered to customers during the same period in 1987; or

2. The EXPECTED savings from the business and industrial customers has not been realized in DROUGHT STAGE III and has therefore jeopardized the Water Department's ability to meet customer demand with the existing water supply; or

3. That, based on the Director's estimate, at the end of any month, water use from the Loch Lomond Reservoir will exceed that month's allocated amount as set at the beginning of the declared water shortage. The allocated amounts are based on Loch Lomond water levels remaining over 520 feet above mean sea level on October 31, 1992.

B. In Drought Stage IV, a customer's use of water for permissible purposes in excess of the usage allotments defined below shall be subject to an excess water use fee as defined in SECTION 9:

1. Single-family residential, multi-family residential and noncommercial irrigation accounts will have usage allotments as defined in SECTION 7.B, DROUGHT STAGE III, USAGE ALLOTMENT.

2. All other customer classifications shall receive bi-monthly or monthly allocations as applicable for each account based on 82 percent of their 1987 use for the same billing period. Where there are no records existing for the account, 100 percent of their 1991 water use will be used.

C. Once the Director has implemented Drought Stage IV, all prohibitions and restrictions on water usage specified in SECTION 6, will be lifted EXCEPT that landscape watering will <u>not</u> be allowed from 11:00 AM to 6:00 PM on any day.

D. Additional prohibitions and restrictions on water usage at this stage will include the following:

1. No watering of any turf areas of the following customers: City, City Schools, County, State, and special districts.

2. Bulk water permits may be discontinued in Stage IV if the Director determines that to do so will not affect the water quality of the system by potential illegal use of water from fire hydrants.

E. By written request, coast irrigation customers may use the same period of time in 1986 to establish allocation amounts for meters where no use occurred in 1987; in those cases where the customer wants an allocation on a meter that was unused in 1987, the customer will be required to designate another meter where water will not be used in 1992 in lieu of assigning use to the unused 1987 meter; in no case will the total use for the assigned meter exceed the 1987 designated amount.

F. Where no such records exist or such records are unsatisfactory to determine usage, prior use shall be deemed to be the average prior water use of similar existing services as determined by the Water Director.

SECTION 9. <u>WATER USE FEES</u>.

A. EXCESS WATER USE FEE. The excess water use fee shall become effective for all charges for water service rendered to any customer beginning with the billing period after the declaration of the water restrictions (SECTION 6) or rationing (SECTION 7 or 8) is in effect. This "excess water use fee" shall be defined as the use of water in excess of the limits and/or usage allotments set under SECTIONS 5, 6, 7, and 8 as hereinabove provided, and, is hereby declared to be subject to an excess water use fee of $5.00 per 100 CCF (100 cubic feet) for the first 10 percent of water over the limit set, and an excess water use fee of $25.00 per 100 CCF for each additional CCF in excess of 10 percent over the limit set. Excess water use fees are in addition to the basic rate. The customer may petition the Water Department to utilize a portion of the excess water use fee, on a one-time only basis, to install water-conservation devices

including labor on the metered property as defined in SECTION 4 (DEFINITIONS). Where customers have used this option in 1990 or 1991, a pre-inspection of the proposed installation and equipment will be required prior to allowing this option in 1992. Limits to expenses for materials and labor will be set by the Water Conservation Office. Other actions that may be taken for noncompliance are in SECTIONS 11, and 12.

B. AGGRAVATED EXCESS USE FEE. Any customer who has been issued a second notice of violation of the water use restrictions or the water use requirements for business and industrial customers and the Department has written documentation supporting that notification, will be charged an additional fee of $50 per day, until the violation has been terminated. Other actions that may be taken for noncompliance are in SECTIONS 6(E), 11, and 12.

SECTION 10. VARIANCES ON USAGE RESTRICTIONS OR USAGE ALLOTMENTS.

A. Applications for variances under Drought Stage I (Conservation Alert) or Drought Stage II (Water Restrictions) will not be accepted until the customer alleges that he or she has been treated unfairly as a result of the manner in which the provisions of SECTION 5 or 6 have been applied to him or her. Applications for variances under Drought Stage III or IV (Water Rationing) will not be accepted until an excess water use fee has been assessed on the customer bill.

B. No customer will be allowed to file a variance request without first having completed a self water audit.

C. Variances will be accepted for the following ONLY:

(1) Any of the provisions allowed in SECTION 7 for administrative review.

(2) Use of the excess use fees for water conservation devices, services and landscape water audits as defined in SECTION 4.

(3) Request for adjustment based on conserving water for the duration of the emergency to offset any penalties. If the customer receives an excess use fee and applies for this adjustment, they must complete a self water audit. If the customer keeps water use for the entire rationing period below their ration for the entire period, an adjustment will be made and the account credited. There will be no action on the account until after October 31.

D. Variances will NOT be accepted for property leaks. All leaks will be handled administratively through the Customer Service Division. Any customer account where excess use fees were NOT adjusted through Customer Service for a leak, may apply further adjustment based on provision stated in (C) above, but NOT for the leak.

E. The variance application shall state the nature of the variance and the basis upon which the action of the Water Director is considered to be in error.

F. Such variance, to be effective, must be received by the Water Director not later than ten (10) business days following the date that the Water Director has given notice of the action from which the appeal is being taken;

(1) A resident who is not an account customer may notify the Water Department of their intention to file a petition to force the account customer to appeal the excess water use fee within ten (10) business days following notification of the account customer.

(2) If the Water Department has been given a notice of intention to appeal by a resident who is not an account customer, the appeal from the account customer must be received within fifteen (15) business days after the account customers has been notified.

G. Variances will be processed where one of the conditions contained herein are met. The decision of the Director regarding whether or not an appeal may be considered shall be final.

H. Within twenty-four (24) hours of the date that a master-meter account customer receives notice of an excess water use fee, all tenants or residents at the service address must be notified by the account customer that the property has exceeded its ration. Any water use fee resulting from exceeding a ration shall be appealed by the account customer if residents representing at least twenty-five percent (25%) of the housing units affected by the excess water use fee, file a petition with the account customer, with a copy to the Water Department, requesting an appeal within 10 business days of notification. The petition shall state the nature of the appeal and the basis upon which the appeal is to be taken. The account customer shall make available to the residents petitioning for an appeal, any information concerning water usage at the service address, including billing statement and water use logs maintained by or on behalf of the account customers.

SECTION 11. DISCONNECTION OF WATER SERVICE. Any person, firm, partnership, association, corporation, or political entity within the water service area which is in violation of the water prohibition and restriction provisions of SECTION 5, 6, 7 or 8 shall be subject to disconnection of water service. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made. In lieu of water disconnection, the Director may allow the customer to install a flow restrictor. Installation and removal are governed by SECTION 12.

SECTION 12. RECONNECTION OF WATER SERVICE. Where water service has been disconnected, as authorized in Section 11, water service shall be immediately restored when the effected customer provides the Water Department with proof that corrective action has been taken. In addition, the Water Department may require:

A. That the Water Department be authorized by the customer to install a flow-restricting device on the customer's water service; with an installation charge of $35.00 to be paid by the customer; and an additional service charge of $35.00 to be paid by the customer for removal; and/or

B. That a reconnection charge be paid in an amount determined by the size of meter as follows:

Meter Size	Reconnection Charge
5/8" x 3/4"	$ 50.00
1"	75.00
1 1/2"	125.00
2"	200.00
3"	400.00
4"	625.00
6"	1,250.00

SECTION 13. APPEAL BOARD.

A. A Drought Appeal Board will be established by the City Council of the City of Santa Cruz by May 1, 1992, and will consist of one member of the Water Commission, and one member each from the following groups: business, landscape industry, residential, and two at-large members residing within the water service area.

B. Any water service customer who considers an action taken by the Water Director under the provisions of this ordinance, to have been erroneously taken, may appeal that action to the Drought Appeal Board in the following manner:

1. All appeals shall be made in writing and/or by variance application and shall state the nature of the appeal and the basis upon which the action of the Water Director is considered to be in error;

2. Such appeals, to be effective, must be received by the Water Director not later than ten (10) business days following the date that the Water Director has given notice of the action from which the appeal is being taken;

(a) A resident who is not an account customer may notify the Water Department of their intention to file a petition to force the account customer to appeal the excess water use fee within ten (10) business days following after the account customer has been notified.

(b) If the Water Department has been given a notice of intention to appeal by a resident who is not an account customer, the appeal from the account customer must be received within fifteen (15) business days after the account customer has been notified.

3. The Water Director shall schedule the appeal for consideration by the Drought Appeal Board at the earliest next regularly scheduled board meeting.

4. The decision of the Drought Appeal Board on said appeals shall be final. In ruling on appeals, the Drought Appeal Board shall strictly apply the provisions of the ordinance, not going beyond the terms and conditions as set forth in this ordinance.

C. The Chair of the Drought Appeal Board shall have the discretion to divide the Board into two-three member hearing panels. Each hearing panel shall have the same authority to hear and rule upon appeals in the same manner as the entire Board. A hearing panel shall have no more than one at-large appointee as a member. The decision of the three member hearing panel on appeals heard by the panel shall be final.

D. The Drought Appeal Board shall be authorized to promulgate its own rules of procedure for conducting appeal hearings.

SECTION 14. <u>VIOLATION IS AN INFRACTION</u>. Any person, firm, partnership, association, corporation, or political entity violating any of the provisions of this ordinance shall be deemed guilty of an infraction and upon conviction thereof shall be fined in accordance with the provisions of SECTION 1.08.010 of the City of Santa Cruz Municipal Code. Each day, such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

All peace officers and persons authorized by law to issue citations within the water service area shall, in conjunction with duties imposed by law, diligently enforce the provisions of this ordinance.

The following officers and employees of the City of Santa Cruz are hereby designated and authorized to issue citations for enforcement of this ordinance:

Director of Water Department
Deputy Director/Operations Manager
Water Quality Control Manager
Water Production Superintendent
Customer Service Manager
Water/Energy Conservation Coordinator
Water Service Field Representative
City Employees designated by the Director as Drought Patrol

SECTION 15. SEVERABILITY. If any provisions of this ordinance are held to be unconstitutional, it is the intent of the City Council that such portion of such ordinance be severable from the remainder and that the remainder be given full force and effect.

SECTION 16. DECLARATION OF URGENCY. This ordinance is declared to be an emergency measure adopted pursuant to the provisions of Section 612 of the Santa Cruz City Charter and is necessary for preserving the public peace, health, safety, and property, and the general welfare, and the urgency for its adoption is set forth in the findings above.

SECTION 17. EFFECTIVE DATE. This ordinance shall take effect immediately and shall remain in effect until October 31, 1992, unless sooner rescinded by the City Council of the City of Santa Cruz.

PASSED AND ADOPTED this 10th day of March, 1992, by the following vote:

AYES:	Councilmembers:	Coonerty, Mahaney, Yokoyama, Rittenhouse Kennedy; Mayor Lane.
NOES:	Councilmembers:	None.
ABSENT:	Councilmembers:	Beiers.
DISQUALIFIED:	Councilmembers:	None.

APPROVED: Don Lane
Mayor

ATTEST: Emma Golden
City Clerk

This is to certify that the above and foregoing document is the original of Ordinance No. 92-10 and that it has been published or posted in accordance with the Charter of the City of Santa Cruz.

Emma Golden
City Clerk

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APPENDIX F

References

References

1. Association of Monterey Bay Area Governments. 2004 AMBAG Population, Housing Unit, and Employment Forecast.

2. University of California, Santa Cruz, 2005. Long Range Development Plan 2005-2020

3. EDAW, 2005. Draft Integrated Water Plan Program Environmental Impact Report.

4. Hopkins Groundwater Consultants, Inc., 2004. Preliminary Hydrogeological Study.

5. Maddaus Water Management/Weber Group, 1998. Water Demand investigation.

6. Gary Fiske & Associates, 2003. City of Santa Cruz Integrated Water Plan.

7. Gary Fiske & Associates, 2000. City of Santa Cruz Water Conservation Plan.

8. California Regional Water Quality Control Board, Central Coast Region, 2005. Waste Discharge Requirements for City of Santa Cruz and Santa Cruz County.

9. California Health Laws Related to Recycled Water, 2001.

10. Carollo Engineers, 2000. City of Santa Cruz Alternative Water Supply Study.

11. Carollo Engineers, 2002. City of Santa Cruz/Soquel Creek Water District Evaluation of Regional Water Supply Alternatives.