City of Millbrae
2011 Water Shortage Contingency Plan

This document was prepared by the
Millbrae Public Works Department.

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2011 WATER SHORTAGE CONTINGENCY PLAN

Executive Summary

This Water Shortage Contingency Plan (WSCP) is an update to the 2005 WSCP submitted to the Department of Water Resources in December 2005. There are four sections to the Water Shortage Contingency Plan which include an Introduction, Assessing Water Supply and Demand, Demand Reduction Program and Implementation. The following provides a brief summary of the Plan.

Introduction

This section of the WSCP provides background information about the City's water system and explains the purposes and goals of this WSCP, summarizes state regulations that pertain to water shortage contingency planning, and describes the process and principles that were used to guide the preparation of this document.

The last time Millbrae was confronted with a serious water shortage was during a statewide drought that lasted from 1987 through 1992. The extraordinary drought of 1976-77, however, remains the most severe event on record.

The overarching goals of this WSCP are as follows and address water shortages of varying magnitudes:

1. To conserve the water supply of the City for the greatest public benefit;
2. To mitigate the effects of a water supply shortage on public health and safety, economic activity, and customer lifestyle; and
3. To budget water use so that supply will be available for the most essential purposes for the entire duration of the water shortage.

Assessing Water Supply and Demand

This section describes the key hydrologic factors affecting the City's water supply and discusses the process staff uses to determine whether a water shortage is expected in the year ahead.

The City of Millbrae relies on the Hetch Hetchy Water system and its snow pack for all of its annual water supply needs. The yield of this source in any given year is directly related to the amount of snow and rainfall received during the winter season and the runoff generated after it.

The degree of shortage is normally defined as the supply deficiency in relation to normal water use over a given period of time, and expressed as a percentage. For example, a 25 percent shortage means the City has one-quarter less water supply available than what is normally used during the seven month long dry season.

Demand Reduction Program

This section describes the five-stage approach and overall strategy for dealing with water shortages, explains how available water would be allocated among various customer categories according to priority of use, and presents the recommended menu of actions for cutting back water demand during a declared water shortage. This section also covers policies and recommendations regarding enforcement methods, exceptions, and appeals.

Table ES.1 Five Stage Structure to Water Shortage Contingency Plan

Stage	Magnitude of Water Shortage	Stage Title
1	0-5%	Water Shortage Alert
2	6-15%	Water Shortage Warning
3	16-25%	Water Shortage Emergency
4	26-35%	Severe Water Shortage Emergency
5	36-50%	Critical Water Shortage Emergency

This WSCP uses a staged approach that classifies a shortage event into one of five levels spanning a range from less than 5 percent up to 50 percent. The overall concept is that water shortages of different magnitudes require different measures to overcome the deficiency. Because there is nothing the City can do in the short run to increase the supply of water, the focus of this WSCP is primarily on measures that reduce demand. Each stage includes a set of demand reduction measures that become progressively more stringent as the shortage condition escalates. Normally during a drought, only one of these five stages would be put into effect early in the year at the recommendation of the Public Works Director and remain in force for the entire dry season.

There is an important distinction between Stages 1 and 2, designated above in shades of yellow, and the upper three stages. The lower two stages represent a level of curtailment that is envisioned as being necessary to balance water supply and demand from time to time. Shortages of 15 percent or less, while inconvenient, do not directly threaten public safety or pose undue economic impact. The upper three stages (3-5) are characterized as emergency water shortages since they result in more widespread hardships which will impact the community, may threaten public health and welfare, and cause more economic harm.

Customer reduction goals for all but the first stage were derived by evaluating the composition of demand for each major group and dividing it into three usage priorities. These priorities are, from highest to lowest, 1) health/safety, i.e., all domestic and sanitary uses; 2) business and industrial uses and; 3) irrigation and other outdoor uses.

This allocation system strives to balance available supplies in times of drought as much as possible through cutbacks in outdoor water use. At each level of shortfall, public health and sanitation usage is given the highest priority by cutting back on interior usage the least. The

importance of water in protecting the City's employment base is also acknowledged through proportionately modest cutbacks to the commercial sector as compared to the overall system shortfall. Irrigation and other outdoor uses in all cases are cut back the most. The larger the water shortage, the greater the cutbacks, but this system of priorities is maintained throughout the range of potential shortages. The heavy reliance on outdoor use reductions makes sense, both from a water system perspective because it reduces peak demands, which is important to preserving storage in Hetch Hetchy Reservoir, and from a public health and welfare perspective, because irrigation and other outdoor uses are the most discretionary of all uses when drinking water is in short supply.

The remainder of this section discusses the demand reduction measures, communications, publicity, and operational activities that apply to each stage.

The primary demand reduction measures used in **Stage 1** are to restrict all landscape irrigation to certain hours of the day and to prohibit various uses deemed to be non-essential that are not required for protection of public health and safety that are not normally prohibited by definition under the City's Water Conservation Ordinance. Examples include prohibition on the use of potable water for washing sidewalks and paved surfaces, dust control, or the draining and refilling of private swimming pools. Included in this category would be the serving of water in restaurants or other places where food is served unless expressly requested by the customer.

The recommended approach to reducing water use in **Stage 2** involves expanding mandatory water restrictions and limiting landscape irrigation to specified days and times. Large landscape users would be required to adhere to strict water budgets.

A **Stage 3** the two primary measures being recommended to meet this emergency reduction goal are mandatory water shortage signage in all commercial buildings, and reduced water budgets for large landscapes.

A **Stage 4** the primary additional measures, in addition to the stage 3 measures, recommended to meet the emergency reduction goal is water rationing to cover all water customers including residential and business allocations. At this severe level of shortage, only minimal water is available for outdoor purposes.

Stage 5 represents an extraordinary crisis threatening health, safety, and security of the community. It would involve reduced rationing levels for all customers and a ban on all outdoor uses to cut back normal water use by half.

Table ES.2 Summary of Demand Reduction Actions and Measures

Water Shortage Condition	Key Water Resources & Conservation Program Communication and Operating Actions	Customer Demand Reduction Measures
Stage 1: Water Shortage Alert (0-5%)	• Initiate public information and advertising campaign • Publicize suggestions and requirements to reduce water use • Step up enforcement of water waste • Coordinate conservation actions with other City Departments • Promote gray water use	• Voluntary water conservation requested of all customers • Adhere to Water Conservation Ordinance • Landscape irrigation restricted to early morning and evening • Encourage conversion to drip, low volume irrigation • Non-essential water uses banned • Use water efficient indoor devices
Stage 2: Water Shortage Warning (6-15%)	• Intensify public information campaign • Send direct notices to all customers • Conduct workshops on large landscape requirements • Intensify system leak detection and repair; suspend flushing • Increase water waste patrol	• Landscape irrigation restricted to designated watering days and times • Require large landscapes to adhere to water budgets • Prohibit exterior washing of structures • Require large users to audit premises and repair leaks • Use re-circulated water to operate decorative fountains, ponds and lakes • Use a bucket and a hand-held hose with a positive shut-off nozzle, mobile high-pressure/low-volume wash system, or at a commercial site to wash vehicles
Stage 3: Emergency Water Shortage (16-25%)	• Convene a staff Appeals Board • Expand, intensify public information campaign • Provide regular media briefings; publish weekly consumption reports • Give advance notice of possible moratorium on new connections if shortage continues	• Reduce water budgets for large landscapes • Require all commercial customers to prominently display “save water” signage and develop conservation plans • Maintain restrictions on exterior washing • No operation of ornamental fountains • Leak repair within 72 hours
Stage 4: Severe Water Shortage Emergency (26-35%)	• Expand water waste enforcement to 24/7 • Develop strategy to mitigate revenue losses and plan for continuing/escalating shortage • Modify utility billing system and bill format to accommodate residential rationing, add penalty rates.	• Institute water rationing for residential customers • Institute water rationing for commercial customers • Minimal water budgets for large landscape customers • Prohibit turf irrigation installation in new development • Prohibition on on-site vehicle washing • Rescind hydrant and bulk water permits • No car washing except at commercial washes • Leak repair within 48 hours
Stage 5: Critical Water Shortage Emergency (36-50%)	• Implement crisis communications plan and campaign • Activate emergency notification lists • Coordinate with CA Department of Public Health regarding water quality, public health issues and with law enforcement and other emergency response agencies to address enforcement challenges • Continue water waster enforcement 24/7	• Reduce residential water allocations • Reduce commercial water allocations • Prohibit outdoor irrigation • No water for recreational purposes, close pools • Continue all measures initiated in prior stages as appropriate • Leak repair within 24 hours

The City’s existing water shortage emergency ordinance contains several provisions for enforcing water use rules and regulations, and a process for issuing exceptions and hearing

appeals. Recommendations include revised penalty fees and excess use fees, adding specified findings for authorizing exceptions, and adding an alternative enforcement approach to reduce the likely caseload of appeals.

Implementation

This section describes the essential elements of implementing the updated Water Shortage Contingency Plan, discusses the approximate lead time needed to prepare for and activate a demand reduction program, outlines the process for declaring a water shortage, and identifies areas where additional ongoing efforts are necessary to address critical gaps.

It is usually at the end of March that the water supply outlook is determined for the year ahead. This WSCP would be implemented shortly after a water shortage is declared.

Formal action declaring a water shortage is taken by the City Council. The legal requirements for such action are covered in Section 350 et.seq. of the California Water Code. The Code requires the following process be followed:

- That City Council hold a public hearing on the matter;
- That the public hearing be properly noticed (minimum of publishing once in newspaper at least seven days prior to the date of the hearing);
- Upon determining and declaring the existence of a water shortage, City Council may then adopt regulations and restrictions governing the use and delivery of water.

By municipal code, rules adopted by the City Council establishing water use regulations become effective immediately after their publication in the newspaper.

Effective communication is essential to the success of any water shortage contingency plan in achieving the desired water use reductions. All customers need to be adequately informed about water supply conditions, understand the need to conserve, and know what actions they are being requested or required to take to mitigate the shortage. Even before formal declaration of a water shortage, a public information/media program should be activated to provide customers with as much advance notice as possible. Following Council action, all residents and businesses, not just customers of record, would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods, including print and television media, internet, utility bill, and other methods. Public notification and communication would also be provided for non-English speakers.
The financial impact of short-term demand reduction was estimated to range from $190,975 in a Stage 1 water shortage alert situation to $1,909,752 in a Stage 5 critical water shortage emergency. Options to lessen or overcome the revenue shortfall include the following:

- Deferring planned capital improvements
- Considering possible rate adjustments or surcharges

Implementing this WSCP will require utility billing system software that provides the necessary capabilities and flexibility to quickly shift from normal billing practices to water rationing mode. The City's Springbrook utility billing module appears to be able to handle the type of computations needed to implement the recommended method for rationing residential

customers. It does not, however, have the capability or flexibility to handle large landscape water budgets, or commercial water rationing which is based on some percentage of past use. This capability will either need to be customized or managed off-line.

As far as critical gaps that require ongoing work, the most important recommendations are to:

1. Continue to work on the new utility billing system so that the database is able to meet the City's requirements for use in water rationing if it becomes necessary; and
2. As much as possible, prepare water shortage notices, announcements, materials, and mailing lists in advance, including bilingual materials for non-English speakers.

Section 1 INTRODUCTION

1.1 Background

This WSCP is an update to the 2005 Water Shortage Contingency Plan submitted to the Department of Water Resources in December 2005. The City of Millbrae is fully dependent on imported water supplied by the San Francisco Public Utilities Commission (SFPUC). Limited storage, no available groundwater wells water, and no current supplemental sources of water highlight the importance of adequate water supply planning to meet future requirements and address potential droughts and shortages.

The City of Millbrae participates in the Bay Area Water Supply & Conservation Agency (BAWSCA) that represents the 26 wholesale agencies served by the (SFPUC). BAWSCA strives for high quality water and protection of members' customers from severe water shortages.

The business relationship between San Francisco and its Wholesale Customers is largely defined by the "Water Supply Agreement (WSA) between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County" entered into in July 2009 WSA. The new WSA replaced the Settlement Agreement and Master Water Sales Contract that expired in June of 2009. The WSA addresses the rate-making methodology used by the City in setting wholesale water rates for its Wholesale Customers in addition to addressing water supply and water shortages for the Regional Water System (RWS). The WSA has a 25 year term.

In terms of water supply, the WSA provides for a 184 million gallon per day (MGD, expressed on an annual average basis) "Supply Assurance" to the SFPUC's Wholesale Customers, subject to reduction, to the extent and for the period made necessary by reason of water shortage, due to drought, emergencies, or by malfunctioning or rehabilitation of the regional water system. The WSA does not guarantee that San Francisco will meet peak daily or hourly customer demands when their annual usage exceeds the Supply Assurance. The SFPUC's Wholesale Customers have agreed to the allocation of the 184 MGD Supply Assurance among themselves, with each entity's share of the Supply Assurance set forth on Attachment C to the WSA. The Supply Assurance survives termination or expiration of the WSA and the City's Individual Water Sales Contract with San Francisco.

The Water Shortage Allocation Plan between the SFPUC and its Wholesale Customers, adopted as part of the WSA in July 2009, addresses shortages of up to 20% of system-wide use. The Tier 1 Shortage Plan allocates water from the RWS between San Francisco Retail and the Wholesale Customers during system-wide shortages of 20% or less. The WSA also included a Tier 2 Shortage Plan adopted by the Wholesale Customers which would allocate the available water from the RWS among the Wholesale Customers.

In September 2009, BAWSCA finalized the Water Conservation Implementation Plan which identifies how BAWSCA member agencies could use water conservation as a way to continue to provide reliable water supplies to their customers through 2018 given the 184 MGD Interim Supply Limitation.

1.2 Purpose and Goals

This WSCP describes the conditions which constitute a water shortage and provides guidelines, actions, and procedures for managing water supply and demands during a declared water shortage. The focus of this WSCP is on measures that reduce customer demand for water. was developed to describe how the City would respond if faced with much larger shortages in water supply ranging as high as 50 percent.

There are several reasons why it is necessary to consider and plan for shortfalls larger than 15 percent. First, the City remains vulnerable in the near term to a critical water shortage of that scale. The City is potentially at risk of experiencing a major water shortage as demonstrated by the exceptionally dry conditions experienced during the 2007-2009 water years and by the Governor's declaration of a statewide drought in 2008. In March, 2011 the Governor officially rescinded the former emergency proclamations and executive order issued in 2008 and 2009 relating to water shortage associated with the drought. Second, State law requires all public water suppliers to develop contingency plans for situations of up to a 50 percent shortage in water supply. Finally, the City's long range water supply planning is predicated on past hydrologic records which focused on the two year, 1976-77 event, as a worst case scenario. No one can predict how the future will unfold, especially in light of the emerging science of global climate change, which some predict could bring more frequent, longer, or more intense water shortages across the state, and which compounds the uncertainty and risk going forward at the local government level.

Whatever magnitude of shortfall the City may experience, the overarching goals of this WSCP are as follows:

1. To conserve the water supply of the City for the greatest public benefit;
2. To mitigate the effects of a water supply shortage on public health and safety, economic activity, and customer lifestyle; and
3. To budget water use so that supply will be available for the most essential purposes for the entire duration of the water shortage.

1.3 State Regulations and Planning Requirements

For California water agencies, there are two main provisions of the California Water Code that pertain to water shortage contingency planning.

Sections 350-359 provide the authority for the governing body of a water agency to declare a water shortage emergency. Once having done so, the local agency is provided with broad powers to implement and enforce regulations and restrictions for managing a water shortage. Water needed for domestic, sanitation and fire protection purposes is given priority and discrimination between consumers using water for the same purpose or purposes is not allowed.

This WSCP is included as required by Section 10632 of the California Water Code. This WSCP is an update of the Plan adopted in 1992, during the latter stages of the 1980's/1990's drought, and updated and adopted as part of the Urban Water Management Plan (UWMP) in the years 1997, 2000 and 2005.

To comply with Section 10632, copies of Resolution No. 92-17 and 97-6 are included in Appendix C. These Resolutions approved and adopted the 1992 and 1997 Water Shortage Contingency Plan as a component of their respective Urban Water Management Plan. Should it become necessary to amend the contingency plan at the onset of a new drought, these Resolutions would be used as models. The full text of these two code sections is included in Appendix A.

It should be recognized that this WSCP must be considered as a planning document. It is important to note that every drought will evolve differently and that it is not practical to develop a set of hard and fast rules that apply to all situations. The Plan should be thought of as a general framework that will need to be adjusted and refined based on actual conditions. At the onset of any subsequent drought, characteristics of use, supply allocations, etc., may have changed significantly from current conditions. It may be necessary to amend this WSCP upon re-implementation to account for specific changed conditions.

1.4 Relationship Between This Document and Other Plans

This WSCP constitutes one of several elements required in the City's Urban Water Management Plan, as required by State law.

Water supply interruptions and shortages may result from a variety of causes, including facility failure, such as a major pipeline break, earthquake, flood, or other natural disaster. This WSCP specifically addresses longer-term water shortages that occur as a result of drought conditions that may extend several months or span several years in duration. For shorter term emergency incidents or disasters, the City maintains a separate Emergency Operations Plan, which is subordinate to and complements the Citywide Emergency Response Plan, to guide emergency operations response and recovery for shorter term water supply interruptions and outages. The flow chart showing the immediate actions the City will perform during a catastrophic event is included in Appendix D.

1.5 Past, Current and Projected Water Use

During the years of the drought in the late 1980's and early 1990's, the City had a full time staff employee to plan and conduct the water conservation program and other water management activities. Raising awareness and educating the public continued over the years and expanded into the subsequent years of adequate water supply and during the low water years of 2007-2009. Two part-time staff members, who have other responsibilities as well, currently implement the City's Water Resources & Conservation Program. In addition, administrative staff assists with certain program elements. Water consumption has not returned to pre-drought levels.

Millbrae has 21,532 residents and a small commercial/light industrial sector. There are large turfed areas served that include the Green Hills Country Club (golf course), Mills and Capuchino High Schools, four elementary schools, one middle school, one K-8 grade private school, City maintained athletic fields, and public parks of varying sizes throughout the City. There is no agricultural water used in the City.

The residential sector averages 70.89% of total system demand although this sector has approximately 92% of the total water meter connections (5,993 of 6,521 total). Single-family connections average 3 persons per household; multi-family connections average 2 residents per living unit and 10 living units per connection.

The commercial/light industrial sector accounts for approximately 17% of the demand with approximately 5% of the connections. The irrigation sector accounts for approximately 8% of the system demand with 1% of the system connections. Governmental/Institutional and other sectors accounts for approximately 4% of the system demand with less than 1% of the system connections.

Losses in the system are estimated at 6% of the total system demand. Losses include fire fighting use and system flushing through fire hydrants, water main breaks, and undetected leaks.

Table 1.1 2006-2010 Potable Water Use (units in CCF*)

Type of Service	2006	2007	2008	2009	2010
Residential	833,550	823,827	816,552	764,111	717,956
Commercial	178,265	177,762	187,000	167,178	170,540
Landscape/ Recreation	70,654	95,865	92,550	81,141	79,345
Institutional/ Governmental (Commercial, schools and churches)	44,579	49,492	46,602	48,655	43,431
Other (Fire service and temp meters)	655	1,121	830	3546	649
Total	1,127,703	1,148,067	1,143,534	1,064,631	1,011,921
	v	v	v	v	
	1.8%	-0.39%	-6.9%	4.95%	

*CCF =Hundred Cubic Feet
Conversion: 1 CCF = 748 gallons

Table 1.1 provides an overview of water use over the years 2006-2010. This Table was developed using the data generated from the City's Finance Department's water meter billing records.

The City's contract with the SFPUC allows the City to purchase up to 1,538,120 Hundred Cubic Feet (CCF) per year. For the five year period, 2006 through 2010, total system demand has varied from 1,011,921 CCF to 1,148,067 CCF. Average system demand for the last five years has been just under 1,099,171 CCF per year, almost 29% below the City's maximum SFPUC contract amount of 1,538,120 CCF.

During the 2007 peak demand year, consumption averaged 69 gallons per capita per day (GPCD) for single-family residences and 61 GPCD for multi-family units. Total system water consumption over the past five years, 2006-2010, has leveled off somewhat. Current demands are approximately 66 GPCD for single-family residences. Per capita use for multi-family units had decreased to 60 GPCD.

Although expansion of Millbrae's service area is limited due to geographical constraints, the area might experience an increase in population and business growth with the development of the Millbrae Station Area Specific Plan. ABAG population projections forecast a 9% increase in population by 2020.

Section 2 ASSESSING WATER SUPPLY AND DEMAND

2.1 Drought vs. Water Shortage

Drought is a normal, naturally occurring but unpredictable climatic phenomenon of varying frequency, duration and severity. Droughts differ from other natural hazards in that they are not distinct weather events, like floods, hurricanes, or tornados. They may have a slow onset, persist and evolve over a period of years, affect a large spatial region, but cause little structural damage. The most difficult aspect of a drought is that no one can tell how long it will last.

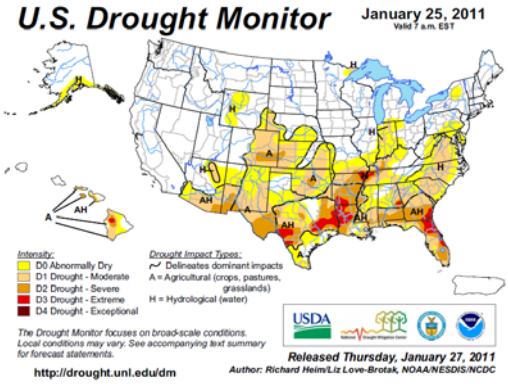
Five degrees of drought intensity are recognized nationally, including abnormally dry, moderate, severe, extreme, and exceptional.

The California Department of Water Resources describes drought as:

> *"A deficiency of precipitation over an extended period of time resulting in a water shortage for some activity, group, or environmental sector."*

A water shortage, on the other hand, occurs when a particular utility's water supply is insufficient to meet its customers' ordinary drinking water needs.

Figure 2.1 National Drought Map



Besides weather conditions, there are a number of factors that affect water supply availability, including:

- Source quality
- Source yield and reliability
- Infrastructure capacity and operating constraints
- System demand characteristics

2.2 Coordinated Planning Between SFPUC and BAWSCA

As previously mentioned, the City of Millbrae is a member of the Bay Area Water Supply and Conservation Association (BAWSCA), an association of 26 member agencies that purchase

water from the San Francisco Public Utilities Commission for distribution and resale to member agency customers.

The City of Millbrae is 100% dependent on imported water from the SFPUC. The City has little, if any, opportunity for supply expansion due to the impracticalities and cost of new transmission facilities, lack of ground water, environmental constraints, and political realities. This makes supporting the Tier 1 Plan developed by the SFPUC and BAWSCA and BAWSCA Agency Members essential for responding to a system wide drought. In a supply shortage, under the Tier 1 Plan, the SFPUC will determine whether voluntary or mandatory actions will be required to reduce the purchase of SFPUC water to required levels to meet water supply availability. If the SFPUC determines that voluntary actions will be sufficient to accomplish the necessary reductions in water use throughout its service area, the SFPUC and the Wholesale Customers will make good faith efforts to reduce their water purchase to stay within their annual shortage allocations and associated monthly water use budgets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits, or impose a ceiling on further accumulation of water bank credits. If the SFPUC determines that mandatory actions will be required to accomplish the necessary reductions in water use in the SFPUC service area, the SFPUC may implement excess use charges.

The annual allocation between the SFPUC and the collective Wholesale Customers is as shown in Table 2.1:

Table 2.1 Water Shortage Allocations Between SFPUC and Wholesale Customers (Annual Basis)

	Share of Available Water	
Level of System Wide Reduction in Water Use Required	**SFPUC Share**	**Wholesale Customers Share**
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

This allocation only applies to shortages of 20% or less. The SFPUC and Wholesale Customers recognize the possibility of a drought occurring which could create system wide shortages greater than 20 percent despite actions taken by the SFPUC aimed at reducing the probability and severity of water shortages in the SFPUC service area. If the SFPUC determines that a system wide shortage greater than 20 percent exists, the SFPUC and the Wholesale Customers agree to meet within 10 days and discuss whether a change is required to the allocations set forth in Table 2.1 in order to mitigate undue hardships that might

otherwise be experienced by individual Wholesale Customers or the City and County of San Francisco Water Retail Users. Following these discussions, the water allocation established by the Tier 1 Plan or a modified version may be adopted by mutual written consent of the SFPUC and the Wholesale Customers. If the SFPUC and Wholesale Customers cannot agree on an appropriate allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then the provisions of the Master Contract will apply unless all of the Wholesale Customers direct in writing that an allocation methodology agreed to by them be used to apportion the water to be made available to the Wholesale Customers collectively, in lieu of the provisions of the Master Contract.

In July 2009, in connection with the Water Supply Agreement, the BAWSCA Wholesale Customers and San Francisco adopted a Water Shortage Allocation Plan (WSAP) to allocate water from the regional water system to retail and Wholesale Customers during system-wide shortages of 20% or less, which is called the Tier 1 Plan. The Tier 1 Plan replaced the prior Interim Water Shortage Allocation Plan, adopted in 2000, which also allocated water for shortages up to 20%. The Tier 1 Plan, which allocates water between San Francisco and the Wholesale Customers collectively, distributes water based on the level of shortage.

All of BAWSCA's Wholesale Customers, including the City of Millbrae, have also negotiated and adopted the Tier 2 Plan in the spring of 2011. The Tier 2 Plan is the second component of the WSAP, which allocates the collective Wholesale Customer share among each of the 26 Wholesale Customers. The Tier 2 allocation is based on a formula that takes multiple factors for each Wholesale Customer into account, including Individual Supply Guarantees, seasonal use of all available water supplies and residential per capita use. The Tier 2 Plan requires that the allocation factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency.

The Tier 1 and Tier 2 Drought Allocation Plans apply only during times of water shortages caused by drought.

SFPUC can currently deliver up to 265 million gallons of water per day (MGD) for all users including the City and County of San Francisco. Of that amount, Millbrae is entitled to approximately 3.15 MGD. Currently, approximately 2.22 MGD is consumed in the City.

Table 2.2 below shows the normal annual water demand from 2006-2010.

Table 2.2 Customer Type and Normal Annual Water Demand (1000 CCF Non-Drought Conditions)

Customer Type	Connections (2010)	Highest Use (2007)	Actual Use (2010)	Average Use (2006-2010)	GPCD*
Single-Family	5,728	648.65	550.79	616.17	73.48
Multiple-Family	265	175.18	167.17	175.03	67.67
Commercial	299	177.76	170.54	176.15	
Governmental	51	49.49	43.43	46.55	
Irrigation	83	95.87	79.35	83.91	
Other	95	1.12	0.65	1.36	
Total	6,521	1,148.07	1,011.92	1,099.16	

*2006-2010 Average GPCD = gallons per capita per day. This is calculated by converting 1,000 Hundred Cubic Feet (CCF) to gallons which equals 748,000 gallons. For purposes of this report, each single-family connection is assumed to have three residents and multi-family connections consist of 10 units with two residents each (total 20 people).

Table 2.3 below shows the base year amount of water as the average for 2006-2010 and the projections for supply shortages.

Table 2.3 Supply Sources and Worst Case Supply Projections (1000 CCF)

Source	Annual Contractual Amount	Highest Year Purchase 2007	Average Use Base Year (2006-2010)	Projected Worst Case Year 1	Projected Worse Case Year 2	Projected Worse Case Year 3
Local Surface	0	0	0	0	0	0
Groundwater	0	0	0	0	0	
Imported	1,537	1,235	1,099	879	824	604
Reclaimed	0	0	0	0	0	0
Total	1,537	1,235	1,099	879	824	604
Base Year Supply Shortage				20%	25%	45%

Section 3 DEMAND REDUCTION PROGRAM

This section describes how the City will respond to future water shortages and discusses the various actions it would take to reduce water demand under different shortage scenarios.

3.1 Staged Demand Reduction Approach

This WSCP uses a staged approach that classifies a water shortage event into one of five levels spanning a range from less than 5 percent up to 50 percent. Each stage has been ascribed a specific title to describe and convey the severity of the water shortage to the public. The City of Millbrae's water utility is a distribution system only, with little control over available water supply. However, the City is committed and has legal responsibility to provide for the minimum health and safety needs of its customers. The following rationing triggering levels are established to ensure the City's water delivery goals.

Table 3.1 Five Stage Structure to Water Shortage Contingency Plan

Stage	Magnitude of Water Shortage	Stage Title
1	0-5%	Water Shortage Alert
2	6-15%	Water Shortage Warning
3	16-25%	Water Shortage Emergency
4	26-35%	Severe Water Shortage Emergency
5	36-50%	Critical Water Shortage Emergency

Normally, only one of these five stages would be put into effect early in the year at the recommendation of the Public Works Director and remain in force for the entire dry season. Which stage would depend on the water supply outlook at the beginning of the dry season. However, conditions and circumstances will vary with each shortage event. Although it would not be desirable to do so for sake of consistency, the City might be forced to transition to the next higher stage mid-season if the reduction efforts at the initial stage do not achieve the needed results.

Reductions in use for the various stages of the program cannot be applied unilaterally to all classes of users (Residential, Commercial/Industrial, etc.). For example, the majority of commercial services have a minimal number of plumbing fixtures, which are for the convenience of employees. In this case, water is used to meet basic health and sanitation needs and reductions above the initial 5% could be an extreme hardship. Also, hotels are within the Commercial category. While the City's Water Conservation Program encourages the placement of drought advisory information in rooms, restrooms and on-site restaurants, mandatory reductions in use could result in the necessity to close blocks of rooms resulting in adverse impacts on the hotel, their employees and the City's revenue.

In Stages 2 through 5, the heaviest impacts fall on residential customers and irrigation users.

This is to be expected as these two uses account for 74% of system demand and 93% of total connections.

There is an important distinction between the lower two stages (1 and 2), designated above in shades of yellow, and the upper three stages (3, 4, and 5) designated in shades of red, with the break point occurring at the 15 percent shortage level. The lower two stages (1 and 2) represent the anticipated curtailment that is envisioned as being necessary to balance water supply and demand from time to time. Shortages of 15 percent or less, while inconvenient, do not directly threaten public safety or pose undue economic impact.

The upper three stages (3, 4 and 5), conversely, are all characterized as emergency water shortages since they result in more widespread hardships throughout the community, which may threaten public health and welfare, and could cause considerable economic harm. As a public water supplier, the City must prepare and plan for the possibility of experiencing such large deficits under state law.

While Stage 3 goal is a 20% reduction in overall demand. The average per capita consumption in Stage 3 is 62 GPCD which, referring to Table 2.4, falls in the middle of Moderate Conservation of 55 GPCD and Non-Conservation of 68 GPCD.

In Stage 4, the reduction in residential customers usage still provides an average 56 GPCD. Again referring to Table 2.4, this value is just above the Moderate Conservation level of 55 GPCD. In this stage, however, severe restrictions are imposed on irrigation customers.

In Stage 5, the reduction for residential customers allows an average consumption of 43 GPCD. This figure is just below the mid-range of Basic Need demand or 45 GPCD.

Additional restrictions are imposed on Commercial users and Governmental/ Institution users of 35% and 20% reductions, respectively. At this stage, irrigation customers are cut back 90% of current average use. Only a minimal amount of landscaping would survive this stage.

Throughout the various Stages, and particularly in Stage 4 and 5, it is anticipated that appeals related to additional needs for occupancy changes, health considerations, licensed residential day care and home health care facilities, and special commercial needs or extraordinary needs to avoid undue economic loss would be heard and decided on a case by case basis. A Water Appeals Board of three citizens appointed by the City Council would be established for this purpose.

3.2 Overview of Demand Reduction Strategy

The City's strategy for dealing with water shortages of all levels involves the following four interrelated components:

- An allocation system to establish reduction goals for different customer groups
- Demand reduction measures
- Publicity and communications
- Operating actions

These four components are summarized below.

3.2.1 Allocation System

A fundamental issue any water supplier faces in managing a water shortage involves the allocation of water and how to distribute the available supply among customer categories when supplies fall short. In the process of updating this Plan, various options and alternatives were selected on a priority-based system. This allocation system produces specific demand reduction goals for each major customer category at various levels of shortfall based on the unique usage characteristics of each customer category. It is one of the key mechanisms to ensure that the overarching goals of: 1) conserving the water supply of the City for the greatest public benefit; and 2) mitigating the effects of a water shortage on public health, safety, and economic activity, are achieved. It also provides the means for determining whether demand reduction goals are being met or, if not, making needed adjustments. The allocation system is described in more detail in Section 3.3.

3.2.2 Demand Reduction Measures

There are a variety of demand reduction techniques that could be used to curtail customer water use during a supply shortfall. These techniques fall into the following general categories:

Voluntary Water Use Reductions This approach would include issuing guidelines and suggestions to conserve water, encouraging installation or distribution of conservation devices, stepping up financial incentives for fixtures and appliances that reduce per capita water use, discouraging installation of new landscape, or encouraging replanting with low water use plants and materials.

Prohibitions on Certain Uses This technique includes banning non-essential uses not required for protection of public health and safety that are not normally prohibited by definition under the City's Water Conservation Ordinance. Examples include prohibition on the use of potable water for washing sidewalks and paved surfaces, washing vehicles on-site or the draining and refilling of private swimming pools.

Limits on Certain Uses This approach involves placing mandatory restrictions such as watering only between certain hours or on specific days, watering of landscape only by certain methods (sprinkler ban), or restricting the manner in which vehicles or buildings may be washed.

Mandatory Requirements This technique includes adopting regulations mandating that certain measures be taken by selected customers ranging from the posting of signage in various establishments to save water to requiring the preparation and filing of site-specific conservation plan or requiring an audit of company water use demonstrating conservation efforts.

Rationing This approach involves establishing a fixed volume or allocation for individual customers or for groups of customers that is intended to reduce water use to a certain level commensurate with the seriousness of the situation. Possible methods that can be used to assign customer allotments include setting a uniform or flat amount, applying a percentage reduction from past use (or other benchmark), establishing a ration on a unit basis (per capita, per dwelling unit, per connection) or using a hybrid approach that is based on a combination of

factors.

In updating this Plan, staff identified and reviewed available options for application to various customer groups and inclusion at different stages, and took into consideration the following factors:

- Water savings
- Seasonality
- Time frame and procedural requirements to implement the measure
- Administrative burden
- Applicable sector (residential, commercial, irrigation)
- Measures used by other water agencies

3.2.3 Publicity and Communications

Effective communication is essential to the success of any water shortage contingency plan in achieving the desired water use reductions. All customers need to be adequately informed about water supply conditions, understand the need to conserve, and know what actions they are being requested or required to take to mitigate the shortage. The Public Works Department naturally assumes a central role in publicizing the extent of the water shortage problem and in advising and assisting customers to conserve. The more severe the shortage, the more vigorous the public information campaign will need to be. This information will be coordinated with the City's Public Information Officer/City Clerk. No matter what the situation, any public communications strategy undertaken in connection with water shortage ideally should contain the following fundamental attributes:

Timely – information should be disseminated well in advance of voluntary and mandatory actions that are to take effect, repeated often, and updated at regular intervals.

Credible – public information efforts should strive to be clear, professional, consistent, straightforward, reasoned, and honest to build trust and community support.

Multimodal – information should be made available to the public using a variety of methods, including the internet, newsletters and newspapers, television, special events, visual displays, public meetings, speaking engagements, and other techniques that maximize outreach.

Open – the Program would actively listen to, engage, and involve its customers, solicit feedback, address identified concerns, and respond to public input in a manner that is respectful, appreciative, welcome to creative solutions, and acknowledges each individual's sacrifice, inconvenience, and contribution to the situation.

Coordinated – the Program should collaborate with other City departments, affected public agencies and organizations, its own employees, interest groups, and the news media to ensure that everyone has the same understanding and are working together.

Action Oriented – information should always contain positive action steps people can take to help foster a spirit of cooperation and create an overall atmosphere that encourages the public to save water for the common good.

There are a number of key groups to whom water shortage communications will need to be aimed. These include, but are not limited to the following:

City Council and Countywide officials The Council authorizes the use of emergency powers and funds, adopts water shortage regulations, and makes appointments to a special Appeals Board. As the City's governing body, it will have to deal with frequent inquiries from the media and constituents. It will need to know about possible impacts on citizens and the City's own municipal water use. The City Council will be provided in-depth information for its decision-making. City Council meetings are the primary forum where policy issues are discussed and the public is able to make its voice heard. The Bay Area Water Supply and Conservation Agency (BAWSCA) and the County Board of Supervisors will also need to be kept informed.

City Departments and other governmental bodies All City departments, including Parks, Fire, Police, and Public Works, as well as other public institutions, will be asked to provide leadership and present a good example to the community by reducing their own water demand.

News media The media has a key role to play in helping communicate timely and accurate information to the public, especially when water restrictions or regulations are initially announced. The City Clerk serves as the official spokesperson for the media. Because the news media is such a powerful force, care always must be given to deliver accurate and consistent messages and to maintain good relationships with the media. Feature reporters and editors can also be instrumental in writing about personal interest stories and alternative approaches to help people deal with water shortage in a positive way.

Large water users and groups most affected by water shortage The local landscaping and hospitality industries, along with other high water using businesses such as retirement centers will need additional information about water shortage restrictions or regulations that will affect their business or clients.

City water customers/general public All City water users, regardless of whether they are the customer of record, will need to be properly notified so that everyone understands the reasons for voluntary or mandatory cutbacks, what is expected in terms of usage restrictions, and the consequences of failing to abide by any adopted regulations. The Water Resources and Conservation Program will need to step up distribution of conservation tips and water saving ideas and respond to an increasing number of individual customer contacts. Special efforts also will need to be made to translate copies of all public notices, regulations, and outreach materials into the appropriate languages for non-English speakers.

There are various methods the Program could employ to carry out added communications and public outreach responsibilities that become necessary in a water shortage situation. The menu of possible techniques is listed in Table 3.2.

Table 3.2 Communications and Public Outreach Methods

- Press releases
- Press conferences
- Opinion page coverage
- Paid print advertising
- Community television
- Radio interviews
- Public service announcements
- Internet
- Utility bill messages
- Revisions to utility bill layout
- Direct mail
- Printed material (posters, banners, signage)
- E-newsletter & e-mails
- Garbage bill newsletter
- Public meetings, forums
- Publish figures and charts of actual water supply and demand on graph, comparing system use against daily, weekly, or monthly water budgets
- Presentations at neighborhood, homeowner's associations, service, and community meetings
- Telephone hotline
- Fliers at schools, churches, libraries, grocery markets, and other social gathering places
- Outdoor signs for visitors
- Conservation events, contests, booths
- Lead or participate in regional drought awareness media campaigns

3.2.4 Operating Actions

When a water shortage occurs, Public Works staff will need to be flexible and adaptable to realigning its work priorities. The added responsibilities change what must be done in both field and office operations on a daily basis compared to usual duties under normal water supply conditions. This may result in increased costs to the Department for additional personnel, services, and supplies.

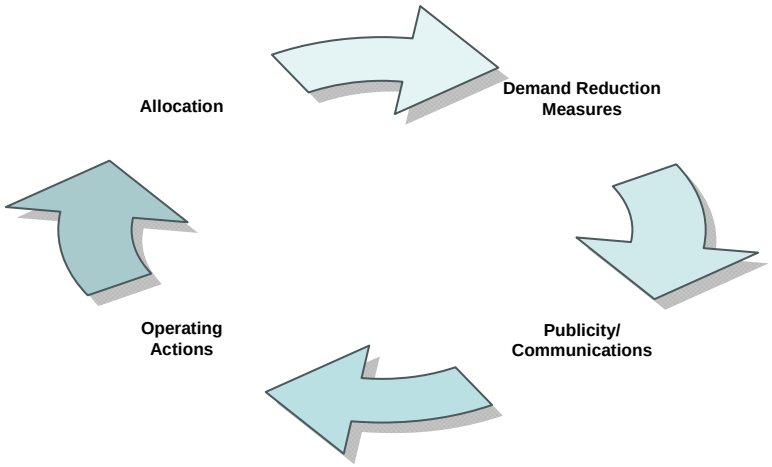
The Public Works Director will need to mobilize the necessary personnel, resources, and equipment to undertake the various activities that are critical to implementing an effective response. These initial actions may include, among other things:

- Coordinating with other city departments and affected public agencies
- Establishing a public communications program to publicize use restrictions and to engage and involve the community and key water-using sectors in curtailing their demand
- Ensuring adequate staff and training to effectively respond to customer inquiries and enforce water shortage regulations
- Adapting utility billing format and database capabilities
- Expanding water conservation assistance, outreach, and education
- Instituting a system for processing exception requests and appeals
- Addressing policy issues and updating status with decision makers
- Implementing monitoring mechanisms to track actual usage and measure performance

These and other operating actions are described further below and in Section 4, Implementation.

Together, the following four demand reduction strategy components represent a system whose parts function together to accomplish change; change in customer understanding and awareness, change in their behavior and actions, and fundamentally change in how much water residents, businesses, and visitors use in times of water shortage. As illustrated in Figure 3-1, these interrelated components provide the standards and feedback mechanism to ensure that water consumption is reduced to the level that the system can safely support.

Figure 3.1 Demand Reduction Strategy



3.3 Priority-Based Water Shortage Allocation

The recommended allocation system is based on the premise that, when water is in short supply, certain end uses should have a higher priority than others. Using a priority-based approach, the normal water demands of each major customer category are first classified into three basic priorities, as follows:

1. **Health and safety.** This is the highest priority use, which includes residential and non-residential interior domestic and sanitary uses.

2. **Business.** This category is the second highest priority and includes all non-sanitary usage related to commercial and industrial activity.

3. **Irrigation.** This is the lowest priority and includes all irrigation and outdoor usage in the single family, multiple residential, and irrigation categories.

Table 3.3 shows the normal water use for each of the City's major customer groups during the April to October peak season and the composition of that demand according to usage priority. These figures are based on an analysis of actual consumption records for the three-year period from 2002 through 2004, which was selected as being representative of typical water consumption patterns in a stable period marked by normal weather and water conditions.

Table 3.3 Composition of Peak Season Water Use, by Usage Priority
(Million gallons April-October)

Customer Class:	Usage Priority: 1 Health/ Safety	2 Business	3 Irrigation	Total	Percent of Total
Single Family Residential	221.14		124.39	345.53	59.03%
Multiple Residential	60.90		22.52	83.42	14.25%
Business	31.18	50.87		82.05	14.02%
Municipal	11		18.74	29.74	5.08%
Irrigation			42.49	42.49	7.26%
Other		2.09		2.09	0.36%
SUBTOTAL	324.22	52.96	208.14	585.32	100%
Percent of Total	**55.3%**	**9.04%**	**35.56%**	**100%**	
System uses/losses				16.95	
TOTAL SYSTEM PRODUCTION (million gallons)				602.27	

Metered water use by all customers during this 7-month period averages 585 million gallons. In terms of the breakdown by usage priority, water used for health and safety purposes amounts to 324 million gallons or just over half (55%) of the total demand during the peak season. Water used for business-related purposes amounts to 53 million gallons (9%) and the volume of water used for irrigation and associated outdoor purposes totals 208 million gallons (36%). To arrive at demand reduction goals for each customer group, the normal year demands shown in Table 3.3 are scaled back by usage priority in accordance with the schedule shown in Table 3.4.

Table 3.4 Reduction in Water Delivery by Usage Priority
(percent of normal deliveries)

Stage	Overall System Shortfall:	Health/Safety	Business	Irrigation
2	15%	95%	95%	64%
3	25%	95%	90%	34%
4	39%	90%	85%	12%
5	50%	75%	67%	0%

In essence, this allocation system strives to balance available supplies in times of drought as much as possible through cutbacks in outdoor water use. At each level of shortfall, public health and sanitation usage is afforded the highest priority by cutting back on interior usage the least. The importance of water in protecting the City's employment base is also acknowledged through proportionately modest cutbacks to the commercial sector as compared to the overall

system shortfall. Irrigation and other outdoor uses in all cases is cutback the most. The larger the water shortage, the greater the cutbacks, but this system of priorities is maintained throughout the range of potential shortages. The heavy reliance on outdoor use reductions makes sense, both from a water system perspective because it reduces peak demands, which is important to preserving storage in Hetch Hetchy, and from a public health and welfare perspective, because irrigation and other outdoor use are the most discretionary of all uses when drinking water is in short supply.

Under this system, a system wide water shortage of 15 percent - the maximum unserved demand envisioned in the Urban Water Management Plan - can be addressed through modest cutbacks in both indoor and business water uses, combined with an approximately one-third reduction in outdoor water use. Emergency water shortages would involve far deeper cutbacks. A 25 percent system wide shortage requires slightly greater reduction in business water use combined with a harsher two-thirds reduction in outdoor watering. A 35 percent system wide shortage requires reducing health/safety and business uses somewhat more, combined with drastic reductions in outdoor water use. To achieve a 50 percent reduction would take nothing less than a significant reduction in both health/safety and business usage, combined with the elimination of all outdoor water use.

Single family residential customers are cut back in all stages slightly more than the overall system shortfall and more than the multifamily customers due to their relatively higher proportion of outdoor to indoor use. Business and industrial customers are also cut back, but by less than the system deficit. Municipal facilities would be cut back substantially greater due to the high percentage of water use that goes to outdoor purposes. Dedicated landscape/irrigation customers suffer the deepest cutbacks of any single group.

Approximately two-thirds of the total cutback would be realized through reductions at single and multifamily residential accounts, which is roughly proportional to their overall percentage of normal system demand.

This allocation system is recommended after consideration of several options, and is based on current patterns and composition of water consumption. As demand level changes over time, it should be reviewed and possibly revised. In addition, alternative allocations may always be considered at the time a given stage is implemented.

A prime concern of any water shortage contingency plan is maintaining sufficient water for public health and sanitation. Table 3.5 below presents the health and safety allocation for residential customers in terms of gallons per person per day under the four deficit conditions. Current indoor water use averages 58 gallons per person per day for single residential accounts and about 62 gallons per person per day for multifamily accounts. In all but the most extreme case, there is enough water to meet essential health and safety needs, which is considered to be between 45 and 50 gallons per person per day for single family homes, assuming they have been fitted with water conserving fixtures and leakage is minimized. At a 50 percent deficiency, even highly water-efficient households would have to take additional actions to get their usage down to the upper 30 or low 40 gallons per person per day.

Table 3.5 Health & Safety Indoor Residential Use

Deficiency condition	Health / Safety Allocation	Single Residential (gal/person/day)	Multiple Residential (gal/person/day)
No deficiency	100%	58	62
15%, 25%	95%	55	59
39%	90%	52	56
50%	75%	43	47

Table 3.6 Health & Safety Inside Residential Use (gallons per capita per day)

Non-conserving fixtures			Conserving fixtures	
Toilets	5 flushes x 3.6 gpf	18	5 flushes x 1.6* gpf	8
Shower / bath	12.7 shower/ 2.6 bath	15.3	9.2 shower & 2.6 bath	11.8
Clothes washer	1/3 load	14.7	1/3 load	7.8
Kitchen / bathroom	Faucets & dishwasher	10	Faucets & dishwasher	6.7
Inside Total (gallons per capita per day)		58		34.3

Table 3.7 Health & Safety Inside Residential Use With Habit Changes (gallons per capita per day)

Non-conserving fixtures			Conserving fixtures	
Toilets	4 flushes x 3.6 gpf	14.4	4 flushes x 1.6* gpf	6.4
Shower / bath	9.2 shower/ 2.4 bath	11.6	9.2 shower & 2.4 bath	11.6
Clothes washer	1/4 load	11	1/4 load	6
Kitchen / bathroom	Faucets & dishwasher	8	Faucets & dishwasher	6
Inside Total (gallons per capita per day)		45		30

* Standard toilets that may be purchased use 1.6 gallons per flush (gpf); however Millbrae provides rebates for and promotes High Efficiency Toilets (HETs) that use 1.28 gpf.

Referring to Table 3.6 the per capita water demand per day for Health and Safety with non-conserving fixtures is 174 gpd for a single-family residence (3 persons per household) and 116 gallons per day for a multi-family unit (2 persons per household). This is approximately what single family residents are currently using and 96% of current average usage for a multi-family unit.

3.4 Water Shortage Response Actions

The allocation system described above serves to establish demand reduction goals for each of the City's major customer groups. The challenge in crafting this contingency plan is to select the most appropriate set of measures that logically correlate with these targets for each sector and stage of shortfall, acknowledging the inherent uncertainties involved and difficulty in predicting their effectiveness in advance.

The recommended list of actions to cut water use is presented below starting with Stage 1-Water Shortage Alert. It is meant primarily to help inform the public and decision-makers about the types of measures that would be taken under various water shortage scenarios. Specific circumstances will vary with each shortage and decisions about the most appropriate response should be based on the water supply and demand conditions at the time, and the collective judgment of staff and City Council, with ample public input. These actions are thus intended as a list of probable measures for advance preparation purposes rather than a set script to be strictly followed, recognizing that as supply and demand change over time, or as a shortage evolves, the ultimate choice of options and actions to best address the shortage also may change.

It is also important to recognize that flexibility in selecting the most appropriate stage may be needed. In the case of a borderline situation, for instance, where there is reasonable likelihood that system demand could be curtailed sufficiently with the lesser restrictions, it may be advantageous to initially choose the lower stage, conditioned with a well publicized caveat that, if water use exceeds targets, the more restrictive regulations would kick in.

Each section that follows includes:

- An overview of the response;
- A discussion of any key issues involved in that stage;
- The prepared public message; and
- A list of the recommended demand reduction measures, communications actions, and operating actions applicable to that stage

3.4.1 Stage 1 – Water Shortage Alert

Stage 1 applies to relatively minor water shortages that can be accommodated with a combination of voluntary conservation measures and minimal usage restrictions, combined with enhanced enforcement of the City's ongoing ordinance prohibiting water waste. Except for a few instances, all demand reduction measures apply uniformly to nearly all customers, therefore no specific allocation is proposed during this stage.

A Stage 1 response may also be appropriate in other situations. It may be prudent as a precautionary measure during an unusually dry year in advance of a declared water shortage or during the winter season following an actual shortage event if needed to maintain a continuing level of awareness among customers until normal water conditions are restored.

The Stage 1 public message is as follows:
"Due to abnormally dry conditions this winter, we're asking all customers to voluntarily cut back water use this summer by 5 percent to stretch the available water supply. City water users should stop using water for non-essential purposes and conserve where possible in case the dry period experienced this past winter continues into next year. If everyone cooperates, we may avoid imposing more stringent watering restrictions. As always, wasting water is prohibited by law"

Table 3.8 Stage 1 Water Shortage Alert Response Measures

System-wide Demand Reduction Goal: 0-5%
Demand Reduction Measures: • Request voluntary water conservation by all customers • Step up enforcement of water waste • Restrict the time of landscape irrigation to early morning and evening • Prohibit non-essential water use: - serving drinking water by restaurant or food service establishments except upon request - use of potable water for washing driveways, patios, parking lots or other paved surfaces - require hotel, motel, and other commercial lodging establishments to offer option of not laundering towels and linen daily - draining and refilling of swimming pools • Encourage use of drip and other low volume irrigation systems • Encourage appropriate use of *gray water use • Require the use of water efficient indoor devices **Publicity/Communications** • Send out a Public Notice to announce water conditions, request cooperation • Initiate public information campaign through media, utility bill and newsletter, website • Develop regular advertising campaign to remind consumers of the need to conserve water • Prepare and disseminate suggestions/requirements to reduce water use • Inform large landscape/property managers of irrigation restrictions • Continue to promote meter reading and regular leak detection by all customers • Include water saving measures and reductions on website **Operating Actions** • Coordinate water conservation actions with other City Departments and public agencies • Eliminate system water uses deemed non-essential • Delegate water waste patrol duties to appropriate personnel • Institute regular monitoring and reporting of water production and consumption • Undertake contingency planning for continuing/escalating shortage

* Gray water use includes drain water from showers, bathtubs, bathroom sinks, and clothes washers. It does not include water that has come in contact with toilet waste, water from kitchen sinks and dishwashers, or laundry water used for washing diapers. There are no restrictions on the use of gray water if it is carried in a bucket. Plumbed gray water systems could also be built to convey drain water and provide subsurface irrigation to trees and shrubs.

3.4.2 Stage 2 – Water Shortage Warning

Stage 2 applies to moderate water shortages. This condition requires more vigorous public information and outreach and an expansion of mandatory water restrictions and prohibitions, particularly on outdoor water uses. The primary methods to meet target consumption levels are to limit irrigation to specified days of the week and to institute water budgets for large landscapes and parks.

The recommended approach to reducing outdoor water use in this stage would be to restrict watering of all lawns and established landscapes to twice weekly during specified hours and to disallow any watering with automatic sprinkler systems on certain days to maximize reduction.

Exact schedules would be developed with public input.

Other measures that would be imposed under Stage 2 would include mandatory leak inspection and repair for large customers and to expand restrictions on exterior washing to dwellings, buildings, and structures.

The Stage 2 public message is as follows:

"It is necessary to impose mandatory restrictions on water use to ensure that throughout the duration of this water shortage an adequate supply of water is maintained for public health and safety purposes. Our overall goal is to reduce water use by 15 percent, which can be achieved if everyone cuts back their outdoor watering by one-third the normal amount."

Table 3.9 Stage 2 Water Shortage Warning Response Measures

System-wide Demand Reduction Goal: 6-15%
Demand Reduction Measures: • Continue all measures initiated at Stage 1 • Restrict landscape irrigation to designated watering days and times • Require the use of re-circulated water to operate decorative fountains, ponds and lakes • Require the use of a bucket and a hand-held hose with a positive shut-off nozzle, mobile high-pressure/low-volume wash system, or at a commercial site to wash vehicles • Require large landscapes to adhere to water budgets • Prohibit exterior washing of dwellings, buildings, or structures (with exceptions for window washing or in preparation for painting) • Reduce time allowed to resolve water waste • Require large users to audit premises and repair leaks • Continue to promote meter reading and regular leak detection by all customers **Publicity/Communications** • Intensify public information campaign with regular media updates, direct notices to all customers, paid advertising, billing messages. • Generate publicity about individuals and businesses demonstrating leadership to save water • Consult with major customers to develop conservation plans • Publish monthly consumption graph on website • Inform large landscape/property managers of additional irrigation restrictions • Conduct workshops on large landscape requirements for property owners, contractors, maintenance personnel **Operating Actions** • Coordinate with all City Departments and public agencies to reduce water use • Suspend main flushing except as required for emergency and essential operations • Intensify distribution system leak detection and repair • Continue regular monitoring and reporting of water production and consumption • Undertake contingency planning for continuing/escalating shortage • Develop strategy to mitigate revenue losses

3.4.3 Stage 3 – Water Shortage Emergency

This level of water shortage constitutes an emergency situation requiring significant actions by the public to achieve up to a 25 percent reduction. The two primary measures being recommended to meet this emergency reduction goal are:

1. Required water shortage signage in all non-residential establishments
2. Reduced landscape water budgets for large landscapes

Commercial customers would be expected to meet their collective reduction goal by adhering to continuing water restrictions, and by being required to prominently post **"SAVE WATER – REPORT LEAKS AND WATER WASTE"** signs at the entrance and in every bathroom of commercial, industrial and institutional buildings, including:

- Hotels, motels, lodging
- Restaurants, cafeterias, cafes, and all food service establishments
- Offices and government buildings
- Health care and retirement centers
- Schools

Large landscape customers would be held to water budgets as described in Stage 2, reduced in accordance with the allocation for irrigation customers in Stage 3.

One charged policy issue that often arises in connection with a water shortage emergency is the question of whether or not to continue allowing new connections on the system. In the past, it has been the City's policy to continue allowing new connections mainly because the demand they add in any one year is negligible. The water that would be made available to existing customers by banning new water connections, therefore, would not make any real difference in terms of increasing the existing customers' allocation. This issue is typically driven by customers who are called on to make sacrifices and feel that water agencies should concentrate on fulfilling present obligations rather than accepting new customers. A number of agencies, however, do have provisions for a temporary ban or place a low priority on new connections in later stages of their drought plans.

Staff recommends giving the public a one-year advance notice, beginning in Stage 3, stating that a temporary water service connection ban would be strongly considered if the shortage emergency continues or escalates into the following year. This notice would allow those people with plans and projects already underway time to complete work or make arrangements, and those considering future construction projects to make timely decisions about proceeding with the knowledge that they risk not being able to secure a water service connection until the shortage is over.

The Stage 3 public message is as follows:

"The City faces a serious water shortage emergency due to prolonged drought. Our goal is to reduce system water demand by 25%. We are relying on cooperation and support of all water users to abide by all restrictions to reach this goal. Otherwise, the shortage could lead to a more serious emergency that requires rationing household water use to avoid depleting the available water supply."

Table 3.10 Stage 3 Water Shortage Emergency Response Measures

System-wide Reduction Goal: 16-25%
Demand Reduction Measures: • Continue landscape irrigation restrictions to designated watering days and times • Require large landscapes to adhere to reduced water budgets • Prohibit operation of ornamental fountains • Require all commercial customers to prominently display "save water" signage with specified language at specified locations • Maintain restrictions on exterior washing of surfaces and structures • Require leak repair within 72 hours • Continue to promote meter reading and regular leak detection by all customers **Publicity/Communications** • Expand, intensify public information campaign focused on 2/3 reduction in outdoor use • Provide regular media briefings, manage media coverage • Provide regular information reports to City Council and other agencies • Consult with major customers to develop conservation plans • Publish monthly consumption graph on website • Enlist support of the Chamber and other business groups • Inform large landscape/property managers of reduced allocations • Conduct workshops on large landscape requirements for property owners, contractors, maintenance personnel • Prepare public notice regarding possible future service connection moratorium • Promote appropriate use of gray water for reuse **Operating Actions** • Expand size and coverage of water waste patrol • Expand, strengthen water conservation education, activities, and program • Continue all operating actions listed under Stage 2 • Increase frequency of monitoring and reporting of water production and consumption • Undertake contingency planning for continuing/escalating shortage • Develop strategy to mitigate revenue losses

3.4.4 Stage 4 – Severe Water Shortage Emergency

The water supply conditions that would trigger Stage 4 parallel the difficult situation the City experienced in the drought of late 1970s. Under this scenario, virtually all available water must be reserved either for health and safety purposes or to sustain local business.

Achieving a 35 percent system wide reduction would require water rationing to cover all water customers, including business.

Unfortunately, there is no practical way to assign a commercial water budget based on variables like the number of employees, square footage, etc. given the variety of usage characteristics in this sector. Every business (or group of businesses sharing a single water account, as is often the case in shopping centers) is unique. They include laundries, restaurants, retirement centers, retail outlets, hotels, car washes, and office buildings. At this point, there is no choice other than to ration business customers individually based on a

percent of prior use in a normal year that is consistent with the overall allocation for Stage 4. Where essential water use at a business establishment involves a public health service, including doctor's offices, medical laboratories, and skilled nursing facilities, or where a business can demonstrate it has already achieved maximum practical water conservation, provision for additional water could be made on a case by case basis through an exceptions process.

The basic concept of water rationing is that each utility customer is given a certain allocation of water, expressed in billing units, to use in a billing period. If they use the amount they are allocated or less, charges for water are calculated at the normal rate. If they exceed their allocation, the portion in excess of their allocation is charged a penalty rate. The penalty rate may be broken into multiple tiers so the more the excess usage, the higher the penalty price per CCF, or 748 gallons, used. The purpose is not to generate revenue but rather to use water pricing as a way to motivate the customer to modify their usage to stay within their allocation and avoid being penalized, which most customers do. Those that don't reduce would be charged for their overuse at the penalty rates.

The method to allocate water when rationing is instituted varies according to customer type. It may be based on the number of people in a home, the number of dwelling units in a multifamily complex, or set as a percentage of past use during some prior year.

For single family residential customers, the per capita approach is probably the fairest practical method, easiest to communicate, would be best understood and accepted by the general public, and is effective in achieving cutbacks where they are needed most, in outdoor water use.

Staff recommends using a modified per capita rationing system developed by the Goleta Water District located in Southern California. Under this system, all households are given a default allocation sufficient for a family of 4 persons. Households that have more than four persons would be required to contact the Water Billing Office and verify household size in order to be granted an increased allocation, which would depend on the actual number of persons living at the residence.

2009 Census data for the City of Millbrae indicates that only 28.7 percent of all occupied households within the City have four or more persons per household. Establishing a default allocation for a family of four would more than satisfy the 71.3 percent majority of households that have three or fewer persons per household. This method is similar to that last used by the City to ration water in 1991, which provided a baseline allocation for households of two or less, except that a census was undertaken then to survey the actual number of persons living at each household.

The Goleta rationing model is considered to be preferable because it eliminates the significant work associated with carrying out an occupancy census and alleviates concerns about potential for inaccurate responses. The principle drawback is the problem of equity, since there will be less "cushion" in the allocation for households with four residents than there is for homes with fewer number of residents, and an increased possibility of exceeding their allocation. Whatever method is selected, allocation disagreements should be expected and

procedures need to be put in place to handle valid appeals and exceptions.

Table 3.11 below shows a typical rationing calculation for a single family residence in Stage 4.

Table 3.11 Water Rationing Schedule: Single Family Residential Account

	CCF */month	Gallons per day:
Up to four persons:	11	265
Each additional person:	2	50
Example monthly allocation for a 6-person household:		
Base allocation:	11 CCF	
2 additional persons x 2 CCF per person	+ 4 CCF	
Monthly Allocation	= 15 CCF	= 374 or 62 GPCD

*CCF =748 gallons.

What makes multifamily customers more challenging for developing a water rationing system are the large differences in housing types, the presence or absence of irrigation meters at a complex, and the fact that many larger accounts are handled by an independent property management firm on behalf of the homeowner's association. These companies typically do not track how many people reside in each unit or in the complex as a whole.

It is recommended that multiple-residential accounts be rationed based on the number of dwelling units associated with the water service account. The number of dwelling units is the best starting point since that data is available on the utility billing system and, in the absence of information about the number of people living on the property, it is the next best driver for indoor water demand. It is further recommended that multiple-residential accounts be allowed alternative rationing options that reflect the heterogeneous nature of building types on multifamily properties and the fact that some of these properties have separate irrigation accounts while others don't. These wide differences in user characteristics cause inequities in allocation based solely on the number of dwelling units. Offering alternatives allows the customer to choose for themselves the option that works best in their particular case. These options include:

- An allocation based on the number of persons residing at the property;
- An allocation based partly on the number of persons residing at the property and partly on landscape water needs at the property that reflect the same cutback to irrigation that other customers would experience (for properties without irrigation accounts);
- The same allocation per dwelling unit as single family accounts would receive for certain properties that resemble single family lots in terms of lot coverage

Recommended rationing allotments for single and multiple residential accounts are presented in Appendix B.

It should be reiterated that water rationing is a situation that the City is seeking to avoid

through long-term conservation efforts.
Other actions/restrictions that likely would be necessary in a severe water shortage emergency, in addition to those previously described, include the following:

- Prohibition on lawn/turf irrigation and on installation of new landscaping in new development;
- Prohibition on using potable water in fountains and ornamental water features;
- Prohibition on on-site vehicle washing, including dealer lots, company fleets;
- Rescinding hydrant and bulk water permits, i.e. temporary water meters;
- Suspending water main replacement projects

The Stage 4 public message is as follows:

"Due to continuing deterioration in storage and overall scarcity of available water supplies, all customers, residential and business alike, are now unavoidably subject to water rationing. The current water shortage is among the most severe faced in modern times. We must all continue to conserve water to the maximum extent possible and strive to maintain water use within our established rationing limits as long as the drought endures in order to avert a water crisis. All customers are urgently asked to make every effort to conserve water and/or face reductions in water allotments."

Table 3.12 Stage 4 Severe Water Shortage Emergency Response Measures

System-wide Reduction Goal: 26-35%
Demand Reduction Measures: • Institute water rationing for residential customers • Institute water rationing for commercial customers • Minimize water use by large landscape customers – only for the most valuable plant and tree survival • Prohibition on lawn/turf irrigation and on installation of new landscaping in new development • Prohibition on car washing except at commercial car washes • Prohibition on on-site vehicle washing, including dealer lots, company fleets • Rescind hydrant and bulk water permits, prohibit use except by special permission • Require leak repair within 48 hours **Publicity/Communications** • Continue to provide regular media briefings, manage media coverage • Provide regular information reports to City Council and other agencies • Publish monthly consumption graph on the website • Prepare public notice regarding possible service connection moratorium • Publish information on ways to minimize most valuable landscape damage and loss **Operating Actions** • Modify utility billing system and bill format to compare actual use with customer allocation • Adopt penalty rates • Expand home water survey program • Increase customer service training to address high bills, irate customers • Convene the staff Appeals Board to process requests for exceptions and appeals of penalties • Expand water waste enforcement to 24/7 • Delegate field staff to assist in enforcement (shut offs, flow restrictors) • Continue all applicable operating actions listed under Stage 3 • Increase frequency of monitoring and reporting of water production and consumption • Undertake contingency planning for continuing/escalating shortage • Revise Department operating budget to address revenue shortfall • Defer portions of capital improvement program • Consider surcharges, rate changes

3.4.5 Stage 5 – Critical Water Shortage Emergency

Stage 5 represents an imminent and extraordinary crisis threatening health, safety, and security of the entire community. Under this dire situation, extreme measures are necessary to cut back water use by up to half the normal amount. Not enough water would exist even to meet the community's full health and safety needs, the top priority. All water should be reserved for human consumption, sanitation, and fire protection purposes and any remaining amount allocated to minimize economic harm. A shortage of this severity could be expected to generate stress, confusion, and chaos much the same as any major emergency and at some point could transform into a full blown natural disaster that can no longer be governed by local ordinance and may need to be managed by the same basic principles and command structure under the state Standardized Emergency Management System that other natural disasters are. The City has experienced water shortages in the past but never one of such large proportion.

This fifth stage would involve nothing less than rationing all customer groups and instituting a

prohibition on residential outdoor water use for any reason (e.g., garden, car-washing, cleaning, maintenance, etc.) It may also require shutting down or severely restricting use at certain public facilities, like local parks and school play fields. Some businesses may be forced or required to either partially or completely close.

The planned response for a shortage of this magnitude would involve reducing rationing allocations for residential customers to minimal levels and reducing commercial rationing amounts in accordance with their overall allocation. All outdoor irrigation would be prohibited (other than by hand-held container and what has been captured or collected from another non-prohibited use). No water would be available for public showers or private, community, or public pools and hot tubs. These facilities likely would be forced to close.

A shortage of this magnitude could affect other local water suppliers as people substitute normal activities, such as laundry, showers, etc. from their home to other locations not so affected. The City's response would therefore involve greater coordination at a regional and perhaps even statewide level.

The Stage 5 public message is as follows:
"The City of Millbrae is confronted with a critical water shortage emergency of unprecedented proportions. At this time, there exists barely enough drinking water for the most essential human health, sanitation, and safety needs. As a result, all outdoor watering is now prohibited. We understand the hardship this extraordinary condition poses to every resident and business in the City and appreciate the sacrifices people are making to ensure that the water system does not run dry. Everyone is urgently requested to do whatever is necessary to maintain water use within or below their allotted amount."

Table 3.13 Stage 5 Critical Water Shortage Emergency Response Measures

System-wide Reduction Goal: 50%+
Demand Reduction Measures: • Further reduce residential water allocations • Reduce commercial water allocation • Prohibit all outdoor irrigation • Require leak repair within 24 hours • No water for outdoor washing or recreational purposes; close pools, public showers • Continue all measures initiated in prior stages as appropriate **Publicity/Communications** • Contract with crisis/emergency communications consultant to develop crisis communications plan and major publicity campaign • Assign Public Information Officer to communicate with media • Set up emergency notification lists for medical/dental facilities, public facilities, large users, food and beverage facilities, and critical businesses **Operating Actions** • Consider shifting to EOC model of command management for overall policy guidance and coordination • Coordinate with CA Dept of Public Health, District Engineer and other emergency response agencies regarding water quality, public health issues • Coordinate with law enforcement agencies to address enforcement challenges • Continue water waste enforcement 24/7 • Delegate field staff to assist in enforcement (shut offs, flow restrictors) • Continue all applicable operating actions listed under Stage 4 • Coordinate with the Waste Water Treatment Plant Superintendent and the Utilities and Operations Superintendent for treatment plant processes regarding sewer line maintenance • Continue close monitoring and reporting of water production and consumption • Procure resources to utilize dead storage, if needed • Undertake emergency planning for continuing/escalating shortage

3.5 Enforcement, Exceptions, and Appeals

An important part of a water shortage plan is to have the appropriate authority and a combination of methods to enforce mandatory measures such as water restrictions or rationing in order to protect public health and safety. General authority and powers of the City to enforce ordinances is contained in Title 1, Chapter 1 of the Millbrae Municipal Code. In addition, the City's water conservation ordinance contains specific language regarding enforcement of water use rules and regulations and includes provisions for issuing exceptions and hearing appeals.

3.5.1 Water Rates and Charges for Excessive Use

Millbrae's current rate structure is provided in Table 3.14.

Table 3.14 Rate Structure (1/7/2010)

Meter Size	Monthly Readiness to Serve Charge
3/4”	$12.40
1”	$18.49
1-1 ½ “	$30.30
2”	$49.40
3”	$92.80
4”	$135.70
6”	$246.80
8”	$437.10
10”	$700.30

A usage charge of $4.53 per hundred cubic feet (CCF or 748 gallons) is assessed based on meter readings. The proposed excess use schedule is shown in Table 3.15.

Table 3.15 Proposed Excess Water Use Charge Schedule

% Over Allocation	Excess Use Charge Per CCF
0-10%	$5.00
10.1% - 20%	$13.00
20.1% - greater	$25.00

Monthly Bill = (Readiness to Serve Charge) + (CCF used) ($4.53) + excess Use Charge
Excess use fees Excess use fees are the primary method for enforcing water rationing and are imposed on customers whose water use exceeds their allocation when rationing is in effect. The purpose of the excess use fee is to make the consequences of exceeding one’s rationing allocation so severe that the customer is induced to keep their water use within their allocation and avoid being fined. Like water rates, there are two components to setting excess use fees: 1) the way they are structured; and 2) the dollar amount.

It is, however, recommended that the penalty amount be increased to bring it more in line with current rates, as shown below:

For example, in Table 3.15 above, a 4-person household is provided an allocation of 11 CCF per month in Stage 4. At 2010 rates, the normal water charges for a customer using 11 CCF would total $62.23, including the $12.40 monthly service charge for a 3/4” meter. Under water rationing, if that same customer used 18 CCF, their normal water charges would amount to $93.94, and excess use fees would cost $413 (1 CCF @ $5, 1 CCF @ $13 and 5 CCF @ $125), for a total of $205.23.

The purpose of a three-tier excess use structure is to avoid very large penalties for households that make a good faith effort to stay within their allocation but wind up going over a little. If a customer’s water use exceeds one’s allocation by a large amount, though, the penalty should be very steep.

Flow restriction Some customers will continue to exceed their allotment regardless of the amount of their water bill. In such instances, the Public Works Department is authorized to

install a flow restricting device to provide minimal water flow, just enough for health and safety purposes. In these cases the customer is charged a fee to cover the staff time needed to install the flow restrictor and another fee for its removal. Staff would not use this method where fire suppression sprinklers are on the same supply line as domestic water.

Disconnection/reconnection fees Water suppliers have the legal authority to enforce water shortage regulations by terminating service for egregious violations. In such cases, the customer would be charged for both disconnection and reconnection.

Citation Finally, the City's water conservation ordinance authorizes staff to issue administrative citations that would have to be paid or challenged in court. This method could be used in cases like a multifamily property where terminating service or restricting flow to all households may not be an option.

3.5.2 Enforcement Methods

Enforcement is carried out in a number of ways during a water shortage. In cases such as a report of water waste, the first step is to communicate with the customer by telephone, letter, door tag, or by making personal contact in the field to educate them about regulations. Many times this contact is all that is required to get the problem resolved. If not, enforcement progresses to a written notice of violation. Beyond this, there are several methods in the City's existing water conservation and water shortage ordinances that can be used to enforce water restrictions and rationing regulations. These methods are described below.

Penalty fees This method would apply in situations involving violation of water restrictions, if, after multiple warnings had been given, a violation continued to occur at an account. The fee would be added to a customer's utility bill along with a written notice sent to the customer in advance. The penalty fee would increase with subsequent violations, as follows:
1st Violation $100
2nd Violation $200
3rd Violation $500

Staff recommends that additional, higher penalty fees also be established and applied to large users that willfully violate water restrictions.

3.5.3 Exceptions

No water shortage plan can account for all situations. The exception procedure allows the Public Works Department to provide for special or exceptional circumstances that otherwise would create undue hardship for an individual customer or class of customers. An exception allows a customer to be relieved of a particular regulation or receive an increased allocation for the duration of the shortage. Therefore, it should be granted only when justified on specific grounds that warrant allocating more water than other similarly situated customers and when consistent with the intent of the water shortage regulations, while providing equal treatment of all customers.

Recommendations Regarding Exceptions

The City Council should approve of an exception process with the following measures:

- Under water restrictions, an exception application is not accepted unless the customer alleges unfair treatment in writing.
- Under water rationing, an exception application should not be accepted unless an excess use fee has been assessed.
- Leaks would not qualify for an exception.
- It allows a resident who is not an account holder to force the customer of record to appeal.
- The process is administered by the Public Works Director.

The policy is to make the customer first demonstrate the demand reduction efforts taken to meet the restriction or allocation, and places responsibility for managing and monitoring water use on the customer. It also serves to minimize the number of exception applications from those merely seeking more water without having gone to the effort to try to live within their given allocation.

The policy would include a process that requires the Director of Public Works to make formal findings to authorize an exception. This is proposed to better articulate the standard that must be met in order to receive relief. The suggested language for such findings is as follows:

- Failure to do so would cause a condition affecting the health, sanitation, fire protection, or safety of the applicant or the public.
- Strict application of the allotment provisions imposes a severe or undue hardship on a particular business, or render it infeasible for a business or class of business to remain in operation.
- Alternative restrictions which achieve the same level of demand reduction as the restrictions from which an exception is being sought are available and are binding and enforceable.
- The customer has demonstrated to the Director’s satisfaction that circumstances have changed warranting a change in the customer’s allocation.
- Health care and retirement facilities using industry best management practices are eligible for an exception.
- Demonstration by a business of actions already taken to increase environmental sustainability that have reduced water consumption to the maximum extent feasible, as determined by the Public Works Director.

Additional recommendations regarding the exception process are as follows:

- That the denial of an exception may be appealed to an Appeals Board.
- The policy would adopt administrative procedures similar to those used by other cities for including appropriate information on an exception application, including the requirement that the applicant must demonstrate maximum practical reduction in water consumption.
- That the policy allow the Director to impose conditions requiring long-term water efficiency changes from customers as part of the exception process.

3.5.4 Appeals

The City’s Municipal Code allows any water service customer who considers an enforcement

action to have been erroneously undertaken to appeal their case before the Public Works Director. The Director considers the evidence presented by the customer and decides whether to uphold the enforcement action or to provide relief.

The difference between an exception and an appeal is that an appeal gives an individual the opportunity to challenge an official decision about an enforcement action. It is not the primary means to secure a larger allocation or get an exception to a water use regulation. However, as mentioned above, customers should be able to appeal a denial by the Public Works Director of such an exception request to an Appeals Board.

The most common reason for filing an appeal would be expected to contest large excess use fees that were levied while under water rationing, often due to a leak in the customers' plumbing fixture or system. The Public Works Department would continue to follow its existing water leak rebate policy that provides administrative relief, including forgiveness of excess use fees, for certain types of leaks that are considered to be beyond the customer's control, such as a leak that develops in an underground pipeline serving a property. Common maintenance items, such as a leaking toilet or failing automatic irrigation valve, that are considered to be customer's responsibility to control, would not be eligible for such forgiveness.

Recommendations Regarding Appeals

A new process could be added to allow a customer to request to use a portion of the excess use fee, on a one-time only basis, toward the installation of water conservation equipment in lieu of paying all of it to the City. If the customer already has water conserving fixtures such as high efficiency toilets and a high efficiency washing machine, then the City could provide a one-time forgiveness of excess use charges while under water rationing. To be considered for such forgiveness, the customer would be required to submit a completed survey and the City would provide them with educational information and water saving devices.

3.6 Water Shortage Recovery and Plan Termination

A water shortage ends when local rainfall, runoff, and reservoir storage levels improve to the point where the water system is once again capable of supporting unrestricted water demand. Any water use rules and regulations in effect at the time are officially rescinded by City Council and public notice is given that the water shortage is over. The Public Works Director would then oversee any remaining termination and plan review activities. These activities could include:

- Publicize gratitude for the community's cooperation;
- Restore water utility operations, organization, and services to pre-event levels;
- Document the event and response and compile applicable records for future reference;
- Continue to maintain liaison as needed with external agencies;
- Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs;
- Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future;
- Complete a detailed evaluation of affected facilities and services to prepare an "after action" report; and

- Update the Water Shortage Contingency Plan as needed.

Section 4 IMPLEMENTATION

This section describes the essential elements of implementing the updated Water Shortage Contingency Plan and discusses the approximate lead time needed to prepare for and activate a demand reduction program. The elements discussed below differ in the amount of staff time, effort, priority, and funding that is required for implementation; some steps can be taken relatively quickly and inexpensively while others will require substantial ongoing work and expense before they are able to be set up and applied as shortage management tools. The primary purpose of this section is to map out the major tasks and timelines required to implement the demand reduction program and to identify where additional ongoing efforts are necessary to address critical gaps.

4.1 Timeline for Declaring a Water Shortage

The table below indicates the approximate times of the year when the City evaluates water supply conditions and, if necessary, declares a water shortage. Planning for a water shortage may begin earlier in winter, and should commence early if winter conditions are unusually dry or are preceded by a dry year, but it is not usually until the end of March that the water supply outlook for the year ahead becomes certain. This leaves very little lead time to prepare for implementing the water shortage contingency plan.

Long-range weather forecasting has not yet advanced to the point where it is possible to know in advance with certainty whether the City will experience a water shortage. Therefore, it is not practical to plan more than one season at a time, other than to prepare possible scenarios using multiple dry years for modeling purposes.

4.2 Process for Declaring a Water Shortage

Once the water shortage condition has been defined (as soon as reasonably certain), recommendations regarding water shortage rules and regulations consistent with this contingency plan are discussed with staff.

Following consideration by staff, formal action declaring a water shortage is taken by City Council. The legal requirements for such action are covered in Section 350 et.seq. of the California Water Code. The code requires the following process be followed:

- That the City Council hold a public hearing on the matter;
- That the public hearing be properly noticed (minimum of publishing once in newspaper at least seven days prior to the date of the hearing);
- Upon determining and declaring the existence of a water shortage, City Council may then adopt regulations and restrictions governing the use and delivery of water.

In accordance with Municipal Code section 8.45.030, rules adopted by the City Council establishing water use regulations become effective immediately after their publication in a newspaper of general circulation in the City.

4.3 Public Notification and Coordination

Even before formal declaration of a water shortage, a public information/media program should be activated to provide customers with as much advance notice as possible. Following Council action, all residents and businesses, not just customers of record, would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods, including print and television media, internet, and other methods. The timeline for getting information out to the public on television, radio, and through newspaper articles is very short. Additional notification would occur though the City's residential newsletter and utility billings, which both require a longer lead time. It is also recommended that a separate website page be designed in advance if rationing becomes necessary to provide basic information about the program, conservation information, forms related to the program, contact information, etc., which then can be modified and expanded as necessary. Large water users and those businesses that are most likely to be seriously affected should be contacted directly in writing. Public notification will be provided for non-English speakers.

Coordination with other City departments and other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations.

Getting the public involved and keeping them informed will require a significant expansion of existing water conservation public information and outreach efforts. There is printed information already available on how to conserve water and additional material can be developed to tailor to various types of water customers.

4.4 Personnel, Office Space and Equipment

Staffing for different levels of a drought will vary and would include staff from the Public Works Department including from the Water Resources & Conservation Program, Utilities and Operations Division, and from the Finance Department. Additional staffing may be needed.

The role of the administrative and office assistants would be to help with the processing of customer appeal and exception requests, administration of the Appeals Board meetings, and related correspondence. Water staff would be responsible for patrolling the service area for violations of watering rules and restrictions and public contact, while Public Works and Finance staff would deal with the greatly increased customer contact (in person and by telephone) and would help with utility billing issues. The meter reader's role would be to support the additional customer service workload related to verifying meter reads, data-logging, and other field activities. Water conservation staff's role would assist customers with on-site water audits, provide conservation education, and publicity. Water staff would provide leak detection and repair advise and instruction. Assistance may also be needed from Springbrook programmers to provide utility billing system software services when water rationing is in effect.

Existing staff and any new hires would need to be quickly integrated into the organization with basic training in the following areas:

- Public Works Water Program functions, organization, facilities, and service area boundary
- Customer service standards, City policies, and safety responsibilities

- Computer equipment and the utility billing system
- Water rates and charges and meter reading
- Water shortage regulations and enforcement processes.

In addition, all existing Public Works Department staff and Finance Department utility billing personnel would need to understand water shortage rules and regulations in effect at the time to be able to respond to customer questions.

4.5 Effect of Water Shortages on Revenue

One of the negative consequences of using demand reduction to deal with water shortages is the corresponding reduction in revenue that occurs to the City's Water Enterprise Fund as a result of reduced water sales. To better understand the magnitude of revenue losses that the Water Enterprise Fund might experience, a table was developed based on 2010 calendar year revenues, the most recent year for which complete revenue data is available. The table assumes the "ready-to-serve" or fixed monthly service charge that is based on meter size would remain unaffected while the volumetric portion of the Water Fund's revenue derived from water sales would vary by customer class in accordance with the allocation presented in Table 3.6 over the seven month period in which water shortage regulations are likely to be in effect. Results are summarized in Table 4.1.

Table 4.1 Revenue Losses Associated with Various Water Shortages

	2010 Revenue ($000)			Revenue Losses due to Reduced Water Sales ($000)				
Customer Category:	**From service charges**	**From water sales**	**Total**	**Stage 1 (5%)**	**Stage 2 (15%)**	**Stage 3 (25%)**	**Stage 4 (35%)**	**Stage 5 (50%)**
Single Family Residential	706,653	2,091,727	2,798,380	-104,586	-313,759	-522,932	-732,104	-1,045,864
Multi-Family Residential	67,600	613,577	681,177	-30,679	-92,037	-153,394	-214,752	-306,789
Business	61,825	639,682	701,507	-31,984	-95,952	-159,921	-223,889	-319,841
Municipal	23,566	175,576	199,142	-8,779	-26,336	-43,894	-61,452	-87,788
Irrigation	25,794	296,064	321,858	-14,803	-44,410	-74,016	-103,622	-148,032
Other	23,003	2,877	25,880	-144	-432	-719	-1,007	-1,439
Total 2010 Revenue	**908,441**	**3,819,503**	**4,727,944**					
Total Revenue Losses				-190,975	-572,925	-954,876	1,336,826	-1,909,752
Estimated Net Revenue				**4,536,969**	**4,155,019**	**3,773,068**	**3,391,118**	**2,818,193**

Table 4.1 shows revenue losses ranging from just under $191,000 in a 5 percent water shortage situation to just over $1.9 million in a critical 50 percent water shortage. Compared to 2010 revenues of just over $4.7 million, the City's net revenue would be reduced to approximately $4.5 million in Stage 1 to approximately $2.8 million in Stage 5. These estimates of losses are the best estimates at this time and may underestimate the problem. Actual losses would be different for the following reasons:

- It is unlikely that system water use would immediately recover to normal levels in the months following a period of curtailment as modeled, thereby further depressing income;
- The table above does not include added operating costs of staff, equipment, and materials related to the water shortage response;
- The table above does not include potential penalties or excess use charges.

On the other hand, the time of year in which regulations would take effect includes parts of two fiscal years, so the full effect of revenue losses may not impact the Department's annual budget to such a large degree. In addition, there would be relatively minor cost savings associated with reduced power and chemical usage at the water treatment plant. Finally, some of the revenue loss may be offset by penalty and/or excess use fees.

Whatever the situation, one element of implementing this WSCP involves examining the Water Enterprise Fund budget for the coming year and recommending action(s) to reduce expenditures to lessen or overcome the revenue shortfall. Options include the following:

- Deferring planned capital improvements
- Considering possible rate adjustments or surcharges

Another implementation issue associated with pricing is the Proposition 218 procedure for increasing water rates, fees, and charges. It is assumed that the proposed changes to both penalty fees and excess use fees discussed in Section 4 would require written notice to all customers, a public hearing, and consideration of written protests and comments before implementing the new fees. Given the minimum 45 day protest period, the entire Prop 218 process can take several months to complete.

4.6 Household Survey

To implement water rationing for single residential customers in Stages 4 and 5, it is recommended that the City use the system developed by Goleta Water District in lieu of performing a household census or survey. The advantages are that it is simpler, easy to understand, more likely to be feasible with the new utility billing system, avoids having to perform a household survey or census, allows adjustments for larger households, and achieves the fundamental goal of reducing peak season water use, particularly outdoor use. The Goleta system also required that, for households larger than four, certain efficiency steps be taken before authorizing a larger allocation.

For the majority of households that have fewer than four residents, little opposition to this approach is expected. However, the one downside to this approach is that it does afford somewhat unequal amounts of water on a per person basis to households of different sizes, and so some may object to the City adopting this system. If, based on public input, a true per capita rationing system becomes the preferred approach to ration water instead of the Goleta model, the following describes the work involved to update the number of people residing at each account on the billing system. In the past this survey has been done by mail and is based fundamentally on the honor system. There are currently over 5,700 accounts classified as single residential customers on the water system. This task would involve data processing personnel to prepare data files for mailing, a mailing service vendor to provide printing and mailing services and to provide return envelopes, and additional temporary staff to handle data

input. The task would also involve maintaining census data on a daily basis as household sizes change and new utility accounts are established. The lead time necessary to conduct the survey and enter data is approximately 3 months.

The other major work item involved in a census-based approach to rationing involves configuring the utility billing system to calculate allotments based on household size, discussed below.

4.7 Utility Billing/Data Processing Capabilities

Implementing this WSCP will require utility billing system software that provides the necessary capabilities and flexibility to quickly shift from normal billing practices to water rationing mode. To manage a water shortage as outlined in this plan, the billing system should be capable of, at a minimum, the following:

- Integrate penalty fees into the utility bill;
- Calculate rationing allocations, whether determined by per capita, per dwelling unit, or percentage of past use method;
- Maintain long-term water usage history;
- Calculate excess use fees;
- Address special needs customers (overwrite default allocation to handle rationing exceptions);
- Handle special cases, such as multiple meters serving a single property;
- Calculate seasonally varying landscape water budgets.

In addition, the utility bill format and the data files that are generated to create the utility bills must be modified to incorporate water restrictions, water budgets, and rationing requirements.

The newly installed Springbrook utility billing module appears to be able to handle the type of computations needed to implement both the Goleta rationing model for single family residential customers and the per dwelling unit method for multi-family accounts. It currently does not have the capability or flexibility to handle a census-based approach to rationing, large landscape water budgets, or commercial water rationing which is based on some percentage of past use. To add this capability to the Springbrook utility billing module or to manage this data separately would require additional resources.

4.8 Customer Exceptions and Appeals

One of the actions that is triggered when City Council adopts the Water Shortage Contingency Plan is the establishment of an Appeals Board. Part of implementing this WSCP involves providing administrative support to the Appeals Board, including processing requests, preparing recommendations, posting agendas, attending meetings, preparing meeting minutes, and handling correspondence. After the Board's membership has been established and approved by City Council, the Appeals Board function can be implemented quickly, but depending on the stage of water shortage and number of appeals filed, may require substantial staff time over the course of the water shortage to address the resulting caseload.

4.9 Large Landscape Water Budgets

The City's Water Resources & Conservation Program offers a large landscape water budget program for the largest commercial customers. The program consists of developing water budgets for 34 large landscape sites served by dedicated irrigation meters, offering water audits, and education. The project is designed so that water budgets can be quickly adapted for use as a water shortage management tool in Stages 3-5.

4.10 Monitoring Water Supply and Demand

Metered water consumption is reported on a bi-monthly basis through automated sales reports generated by the utility billing system.

Consumption by large users would be monitored on a frequent basis. In severe stages of a water shortage, consumption data would be evaluated daily and the status reported to the Public Work Director. If the trend in consumption is such that the rate of drawdown at Hetch Hetchy is greater than anticipated, the City Manager and Council are notified so that corrective action (such as increased publicity and enforcement or consideration of declaring the next higher stage) can be taken.

4.11 Ongoing Implementation Steps

The final tasks in updating the Plan include the following steps:

- Preparing an updated water shortage ordinance;
- Preparing a proposed Proposition 218 notice which would be used in emergency planning to specify penalty and excess use fees.

As far as critical gaps that require ongoing work, the most important recommendations are to:

- Continue to work on the new utility billing system so that the database is able to meet the City's requirements for use in water rationing if it becomes necessary; and
- As much as possible, prepare water shortage notices, announcements, materials, and mailing lists in advance, including materials for non-English speakers.

Appendix A

California Water Code Sections 350-359 and 10632

Water Code Section 350-359

350. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, may declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

351. Excepting in event of a breakage or failure of a dam, pump, pipe line or conduit causing an immediate emergency, the declaration shall be made only after a public hearing at which consumers of such water supply shall have an opportunity to be heard to protest against the declaration and to present their respective needs to said governing board.

352. Notice of the time and place of hearing shall be published pursuant to Section 6061 of the Government Code at least seven days prior to the date of hearing in a newspaper printed, published, and circulated within the area in which the water supply is distributed, or if there is no such newspaper, in any newspaper printed, published, and circulated in the county in which the area is located.

353. When the governing body has so determined and declared the existence of an emergency condition of water shortage within its service area, it shall thereupon adopt such regulations and restrictions on the delivery of water and the consumption within said area of water supplied for public use as will in the sound discretion of such governing body conserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.

354. After allocating and setting aside the amount of water which in the opinion of the governing body will be necessary to supply water needed for domestic use, sanitation, and fire protection, the regulations may establish priorities in the use of water for other purposes and provide for the allocation, distribution, and delivery of water for such other purposes, without discrimination between consumers using water for the same purpose or purposes.

355. The regulations and restrictions shall thereafter be and remain in full force and effect during the period of the emergency and until the supply of water available for distribution within such area has been replenished or augmented.

356. The regulations and restrictions may include the right to deny applications for new or additional service connections, and provision for their enforcement by discontinuing service to consumers willfully violating the regulations and restrictions.

357. If the regulations and restrictions on delivery and consumption of water adopted pursuant to this chapter conflict with any law establishing the rights of individual consumers to receive either specific or proportionate amounts of the water supply available for distribution within such service area, the regulations and restrictions adopted pursuant to this chapter shall prevail over the provisions of such laws relating to water rights for the duration of the period of emergency; provided, however, that any distributor of water which is subject to regulation by the State Public Utilities Commission shall before making such regulations and restrictions effective secure the approval thereof by the Public Utilities Commission.

358. Nothing in this chapter shall be construed to prohibit or prevent review by any court of competent jurisdiction of any finding or determination by a governing board of the existence of an emergency or of regulations or restrictions adopted by such board, pursuant to this chapter, on the ground that any such action is fraudulent, arbitrary, or capricious.

359. (a) Notwithstanding any other provision of law that requires an election for the purpose of authorizing a contract with the United States, or for incurring the obligation to repay loans from the United States, and except as otherwise limited or prohibited by the California Constitution, a public water agency, as an alternative procedure to submitting the proposal to an election, upon affirmative vote of four-fifths of the members of the governing body thereof, may apply for, accept, provide for the repayment together with interest thereon, and use funds made available by the federal government pursuant to Public Law 95-18, pursuant to any other federal act subsequently enacted during 1977 that specifically provides emergency drought relief financing, or pursuant to existing federal relief programs receiving budget augmentations in 1977 for drought assistance, and may enter into contracts that are required to obtain those federal funds pursuant to the provisions of those federal acts if the following conditions exist:

(1) The project is undertaken by a state, regional, or local governmental agency.
(2) As a result of the severe drought now existing in many parts of the state, the agency has insufficient water supply needed to meet necessary agricultural, domestic, industrial, recreational, and fish and wildlife needs within the service area or area of jurisdiction of the agency.
(3) The project will develop or conserve water before October 31, 1978, and will assist in mitigating the impacts of the drought.
(4) The agency affirms that it will comply, if applicable, with Sections 1602, 1603, and 1605 of the Fish and Game Code
(5) The project will be completed on or before the completion date, if any, required under the federal act providing the funding, but not later than March 1, 1978.

(b) Any obligation to repay loans shall be expressly limited to revenues of the system improved by the proceeds of the contract.

(c) No application for federal funds pursuant to this section shall be made on or after March 1, 1978.

(d) Notwithstanding the provisions of this section, a public agency shall not be exempt from any provision of law that requires the submission of a proposal to an election if a petition requesting such an election signed by 10 percent of the registered voters within the public agency is presented to the governing board within 30 days following the submission of an application for federal funds.
(e) Notwithstanding the provisions of this section, a public water agency that applied for federal funds for a project before January 1, 1978, may make application to the Director of the Drought Emergency Task Force for extension of the required completion date specified in paragraph (5) of subdivision (b). Following receipt of an application for extension, the Director of the Drought Emergency Task Force may extend the required completion date specified in paragraph (5) of subdivision (b) to a date not later than September 30, 1978, if the director finds that the project has been delayed by factors not controllable by the public water agency. If the Drought Emergency Task Force is dissolved, the Director of Water Resources shall exercise the authority vested in the Director of the Drought Emergency Task Force pursuant to this section.

(f) For the purposes of this section, "public water agency" means a city, district, agency, authority, or any other political subdivision of the state, except the state, that distributes water to the inhabitants thereof, is otherwise authorized by law to enter into contracts or agreements with the federal government for a water supply or for financing facilities for a water supply, and is otherwise required by law to submit those agreements or contracts or any other project involving long-term debt to an election within that public water agency.

Water Code Section 10632

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.

Appendix B

Residential Water Rationing Allotments

(Monthly allotment, in CCF or 748 gallons/billing units)

<table>
<tr><th></th><th colspan="2">Stage 4
26-35% Deficiency</th><th>Stage 5
36-50% Deficiency</th></tr>
<tr><td>Single Residential Accounts
Up to 4 persons:
Each Additional person:</td><td colspan="2">11
2</td><td>9
2</td></tr>
<tr><td rowspan="2">Multiple Residential Accounts
Allotment is <u>per dwelling unit</u> based on number of dwelling units on account:</td><td colspan="2">Separate irrigation meter serving property?
No Yes</td><td>All multiple residential accounts, regardless of whether there is a separate irrigation meter serving the property or not:</td></tr>
<tr><td>2-4:
5-20:
Over 20:</td><td>7
6
5</td><td>6
5
4</td><td>6
5
4</td></tr>
<tr><td>Multiple Residential Accounts Alternative A
Allotment is in gallons per person per day (gpcd) based on the number of permanent residents at the account:</td><td colspan="2">47 gpcd</td><td>45 gpcd</td></tr>
<tr><td>Multiple Residential Accounts Alternative B
(not applicable to 2-unit accounts)

Where lot coverage, by dwelling units, is <35% of entire property</td><td colspan="3">Same allotment as single residential accounts</td></tr>
</table>