CITY OF VALLEJO

2005

URBAN WATER MANAGEMENT PLAN

February 2006

Prepared by:

CITY OF VALLEJO
Utilities Department / Water Division
202 Fleming Hill Road
Vallejo, CA 94589-2337

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CITY OF VALLEJO
2005 Urban Water Management Plan

CONTACT SHEET

Date plan adopted by the Vallejo City Council: February 28, 2006

Date plan submitted to the Department of Water Resources: March 29, 2006

Name of contact person: Pamela Sahin, Water Conservation Coordinator

Phone: (707) 648-4479

Fax: (707) 648-4060

E-mail address: waterinfo@ci.vallejo.ca.us

The water supplier is a: Municipality

The water supplier is a: Retailer and Wholesaler

Utility services provided by the water supplier include: Water

Bureau of Reclamation Contractor? Yes

State Water Project Contractor? Yes

LIST OF ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
ac-ft	acre-foot or acre-feet. An acre-foot of water is the volume of water that will cover one acre of land at a depth of one foot, approximately 326,000 gallons.
ac-ft/yr	acre-feet per year
AFB	Air Force Base
BMP	Best Management Practice
CII	commercial, industrial, institutional
CUWCC	California Urban Water Conservation Council
DMM	demand management measure
DWR	California Department of Water Resources
FTE	Full time equivalent (percentage of a full time employee)
FY	fiscal year
gpd	gallons per day
mg	million gallons
mgd	million gallons per day
MTB	Methyl tert butyl ether
NBA	North Bay Aqueduct
Plan	Urban Water Management Plan
SCWA	Solano County Water Agency
SID	Solano Irrigation District
TOC	total organic carbon
USBR	United States Bureau of Reclamation
UWCC	Urban Water Conservation Committee (Solano County)
UWMP	Urban Water Management Plan
VSFCD	Vallejo Sanitation and Flood Control District
WC	Water Conservation
WSCP	Water Shortage Contingency Plan
WTP	water treatment plant
WWTF	wastewater treatment facility

SECTION 1 - INTRODUCTION

Section 1 presents a brief description of the provisions of the Urban Water Management Planning Act and describes the City of Vallejo's (City) public information efforts regarding the 2005 Urban Water Management Plan, coordination with regional water agencies, and the plan adoption process.

1.1 Urban Water Management Planning Act

In 1983, the California Legislature enacted the Act (AB 797; Water Code, Division 6, Part 2.6, Section 10610-10656). This Act requires water suppliers serving more than 3,000 customers or water suppliers providing more than 3,000 AF of water annually to prepare an UWMP to promote water demand management and efficient water use. The Act also requires water suppliers to develop, adopt, and file an UWMP (or update) every five years until 1990. In 1990, the Legislature deleted this sunset provision (AB 2661). Accordingly, the UWMP must be updated a minimum of once every five years on or before December 31 in the years ending in 0 and 5. The Act has subsequently been amended since its adoption.

Recent changes approved in 2002 and 2004 include SB 318, SB 1348, SB 1384, SB 1518, and AB 105. SB 318 requires urban water suppliers to provide a discussion of the desalination opportunities available to them. This includes ocean water, brackish water, and groundwater desalination for use as a long-term supply. SB 1348 requires that DWR consider the demand management activities of an urban water supplier in the grant and loan application evaluation. SB 1384 requires an urban water supplier to submit a copy of their UWMP to their wholesale supplier. This bill encourages coordination between the wholesale and retail agencies. SB 1518 requires additional information regarding the use of recycled water including a comparison of previously projected use to actual use to determine the effectiveness of recycled water initiatives. AB 105 requires an urban water supplier to submit a copy of their UWMP to the California State Library.

An Urban Water Management Plan is designed to provide an effective management and planning tool for water agencies throughout California. It allows for a succinct summary of an agency's water supplies, demands, and plans to ensure future reliability. It also encourages the efficient management of water supplies by requiring a discussion of potential water transfers and exchanges, desalination, and recycled water opportunities.

A copy of the current Act requiring submission of this Plan is provided in Appendix A.

The City of Vallejo is considered an urban water supplier because it provides water for municipal purposes to approximately 37,800 connections, serving a population of approximately 116,670 people within the City's boundaries and unincorporated areas of Solano and Napa Counties, based on the 2000 census. As such, the City is required to prepare and adopt an urban water management plan.

This document brings together important information on water supply and usage, and conservation programs in the City of Vallejo. This information represents the City's best efforts to promote efficient water use of available supplies consistent with the Urban Water Management Plan Act.

1.2 Public Participation

As required by law, the City requested public involvement in order to complete this UWMP update.

An "Invitation to Participate in the City of Vallejo's 2005 Urban Water Management Plan Update" was mailed on October 18, 2005 to all parties included in the City of Vallejo Planning Division's "Vallejo Neighborhood Associations & Other Groups" notification list. The list includes neighborhood and home owner associations, as well as business and professional, ethnic, environmental and other groups. Interested parties were invited to contact the Water Conservation Coordinator with any comments or concerns regarding water management, including water conservation programs and water shortage contingency actions, and/or additional information. A copy of the invitation is included in Appendix B.

The public was notified of the availability of the draft plan for review and comment, and the date and time of a public hearing to consider adoption of the plan, via display ads placed on Tuesdays and Sundays in the Vallejo Times Herald and the Fairfield Daily Republic, and announcements on the City's website and Channel 28, the government television channel beginning February 14, 2006.

Public participation opportunities also included a public hearing to receive written and oral comments on the draft UWMP report, and coordination with other agencies regarding the Plan. Public involvement activities are described below.

1.2.1 Public Hearing

The UWMP is subject to California Government Code pertaining to legal public noticing, and must be adopted by the City Council. The UWMP must be filed with the DWR within 30 days of adoption.

The City of Vallejo prepared this update of its Urban Water Management Plan from October 2005 to February 2006. Copies of the draft Plan were made available for public review at the following locations:

1) City of Vallejo City Clerk's Office
2) City of Vallejo Public Works Department
3) Fleming Hill Water Treatment Plant – Water Administration Office
4) John F. Kennedy Public Library Reference Desk
5) Springstowne Public Library Reference Desk
6) Fairfield Civic Center Community Library
7) Solano Community College Library

In accordance with, and exceeding, the requirements of Section 10642 of the State Water Code and Section 6066 of the Government Code, notices of a public hearing on the draft Plan were published in the Vallejo Times Herald and the Fairfield Daily Republic on Tuesday, February 14, 2006; Sunday, February 19, 2006; Tuesday, February 21, 2006; and Sunday, February 26, 2006.

The public hearing was held on February 28, 2006 at City Hall to receive written and oral comments from the public on the draft UWMP.

Appendix C contains a copy of the public notice, the public hearing agenda, and a summary of public comments.

1.2.2 Agency Coordination

The City of Vallejo participates in regional-wide planning efforts through the Solano County Water Agency (SCWA), is an active member of the California water community, and is continually coordinating with neighboring communities and water agencies regarding water-planning activities. SCWA members include the Cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville and Vallejo; the Solano Irrigation and Maine Prairie Water Districts; and Reclamation District 208.

Additionally, the City coordinates with Travis Air Force Base, Vallejo Sanitation and Flood Control District, and the City of American Canyon.

Regional efforts have included preparation of an Integrated Regional Water Management Plan for the member agencies. The first phase of the regional plan documented existing SCWA programs and summarized individual member agency water supplies and current demands. The second phase of the regional plan evaluated potential future water management measures and provided guidance on future programs and direction for the SCWA. The Solano County Water Agencies' Integrated Regional Water Management Plan was adopted by the City of Vallejo on August 16, 2005 by City Council Resolution No. 05-265 N.C.

Several meetings with SCWA and its member agencies were held during the preparation of the City's UWMP. The primary purpose of the meetings was to coordinate the supply reliability assessment methodology used by the member agencies sharing common water supply sources. The meetings were attended by the Cities of Benicia, Fairfield, Vacaville and Vallejo; the Solano Irrigation District (Suisun and Dixon); and SCWA.

A letter was mailed on October 18, 2005 to SCWA, SID, American Canyon, Benicia, Fairfield, Vacaville, Travis Air Force Base, the Vallejo Sanitation and Flood Control District, Solano County Dept. of Environmental Management, and the State of California Dept. of Health Services, Drinking Water Field Operations Branch. Agencies were invited to contact the Water Conservation Coordinator with any comments or concerns or issues to be included in the draft UWMP. An example letter is included in Appendix B.

A copy of the draft UWMP was provided to SCWA and its member agencies for review.

Table 1-1 provides a summary of the Agency Coordination for the City of Vallejo's Plan.

Table 1-1. Agency Coordination

	Participated in UWMP development	Commented on the draft	Attended public meetings	Contacted for assistance	Received copy of draft	Sent notice of intent to adopt	Not involved/ no interest
Other water suppliers	X			X	X	X	
Water managemer agencies	X			X	X	X	

	Participated in UWMP development	Commented on the draft	Attended public meetings	Contacted for assistance	Received copy of draft	Sent notice of intent to adopt	Not involved/ no interest
Relevant public agencies	X	X (VSFCD)		X	X	X	
Other	X			X	X	X	

Anticipated benefits of coordination include:

- Continuation of a long and successful history of working together cooperatively to improve water supply reliability and quality; and to address regional issues
- Enable the agencies to maximize resources and minimize problems of water supply reliability, water quality, and environmental protection.

1.2.3 Plan Adoption

The final UWMP was adopted by the City Council at its regular meeting on February 28, 2006 and submitted to the California Department of Water Resources within 30 days of Council approval. A certified copy of Resolution No. 06-62 N.C. of the City Council of Vallejo adopting this Plan is included in Appendix D. This Plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

1.3 Urban Water Management Plan Preparation

The Plan was prepared by City Water Division staff in conjunction with the consulting firm of Brown and Caldwell. This plan was prepared at a level of detail commensurate with the size and complexity of the City of Vallejo's water supply sources and water use demand characteristics. All elements required by the Urban Water Management Planning Act that are applicable to the City of Vallejo Water System have been addressed in this report. Historic information was included where available.

The "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan" prepared by the California Department of Water Resources (dated January 18, 2005) was used in the preparation of this plan.

1.4 Resource Maximization / Import Minimization

The City coordinated the preparation of this urban water management plan with other appropriate agencies in the area, as described in Section 1.2.2 above, including the Solano County Water Agency (SCWA), Vallejo Sanitation and Flood Control District (VSFCD), the City of Benicia, the City of American Canyon and the City of Fairfield.

The City uses water management tools and options to maximize resources and minimize the City's need to import water. These tools and options include regional water management planning,

efficiency program design and implementation, cooperative agreements, and water transfers and exchanges, all of which are described in the UWMP.

1.5 Urban Water Management Plan Implementation

The City will provide the necessary resources to implement the adopted UWMP through the annual budget process by providing adequate appropriations for water demand management (i.e. conservation) measure-related supplies and services. The City continues to designate a part-time Water Conservation Coordinator. The staffing level for this effort is anticipated to increase from 0.5 FTE (full-time equivalent) to 0.8 FTE as follows:

Table 1-2. Water Conservation Staffing

Fiscal Year	FTE
FY 2004 – 2005	0.40 FTE
FY 2005 – 2006 (UWMP update required)	0.50 FTE
FY 2006 – 2007	0.65 FTE
FY 2007 – 2008	0.70 FTE
FY 2008 – 2009	0.75 FTE
FY 2009 – 2010	0.80 FTE
FY 2010 – 2011 (UWMP update required)	0.80 FTE

As required under state law (Government Code Section 10643), the City will meet the requirement to implement its adopted plan in accordance with the schedules set forth herein.

1.5.1 Changes / Additions to the Adopted Urban Water Management Plan

Any changes to the adopted UWMP, other than minor clerical corrections and the incorporation of end-of-process information such as the date of adoption and level of agency participation, will be noticed to the public pursuant to Government Code section 6066.

Any amendments or changes required as a result of periodic review of the plan shall be adopted pursuant to Government Code Section 10640.

Copies of amendments or changes to the plans will be filed with the State of California Department of Water Resources and any city or county within which the City of Vallejo provides water supplies within 30 days after adoption.

SECTION 2 - SERVICE AREA DESCRIPTION

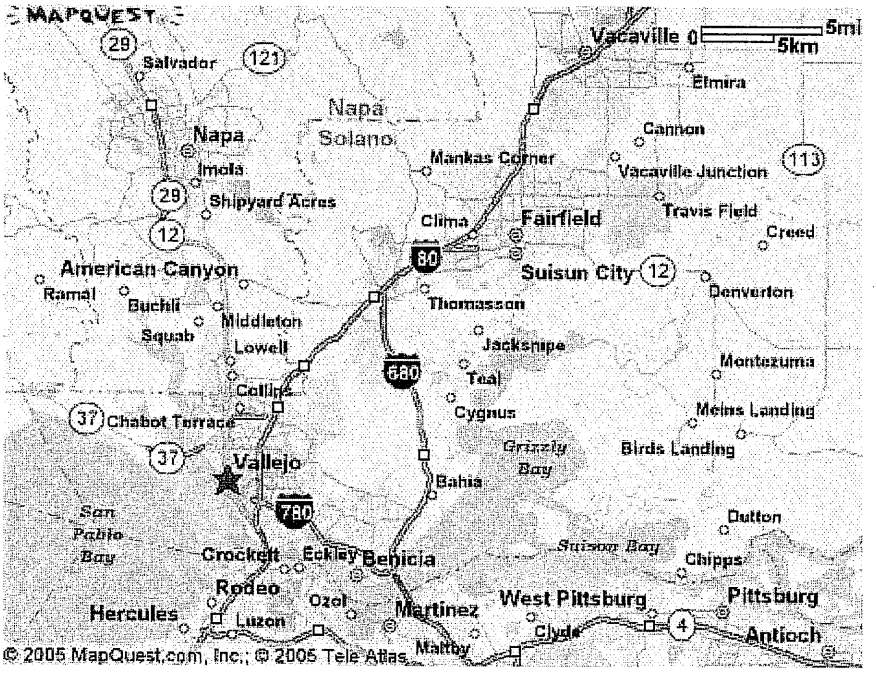
This section includes descriptions of the City's water service area including current and projected population, climate, and other demographic factors affecting water management planning.

2.1 General Description of Service Area

The City of Vallejo's water service area is characterized by a mixture of residential and commercial land use. As shown in Figure 2-1, Vallejo is a waterfront city located on the east side of San Pablo Bay. The City, with a population of more than 136,800, serves approximately 37,800 connections in the City of Vallejo and the adjacent unincorporated western parts of Solano County. The City also serves a small number of customers in unincorporated Napa County. The terrain in the service area is moderately varied. Vallejo is bordered on the north by American Canyon and unincorporated Napa County, on the east by the City of Benicia and on the south by the Carquinez Strait. Vallejo is approximately 30 miles from San Francisco and 60 miles from Sacramento.

Since the 1950's, the City has sold raw water to and operated a treatment plant on behalf of Travis Air Force Base, but is not responsible for the distribution of the water once it leaves the plant. The City is in the role of a wholesaler to the base.

Figure 2-1. Location Map



The City of Vallejo's history began in 1844 when General Mariano G. Vallejo saw the promise of the area. Named after him and twice the site of the state capitol in the 1850s, Vallejo grew into an important shipping and naval center. In 1854, the United States Navy established the first west

coast naval facility on Vallejo's Mare Island. Closed in 1996, Mare Island is now undergoing redevelopment.

2.2 Water Treatment Facilities

The Vallejo Water Systems utilize two water treatment plants--the Fleming Hill WTP and the Green Valley WTP. The Fleming Hill WTP treats water that is supplied from the Sacramento River Delta and delivered through the North Bay Aqueduct (NBA), Lake Berryessa (Solano Project), and Lake Curry (under restored conditions). The Fleming Hill WTP is the only water treatment facility for the City. The WTP uses preozonation, coagulation, flocculation, sedimentation, intermediate ozonation, filtration, and disinfection. The maximum design flow rate is 42 million gallons per day (mgd).

The Green Valley WTP was completed in 1998 with a capacity of 1.0 mgd and serves the Vallejo Lakes System.

The City operates the Travis Water Treatment Plant on behalf of the Travis Air Force Base. The Travis WTP is a complete, conventional 7.5 mgd plant with pre-ozonation.

2.3 Climate

Vallejo, located in the northern part of the San Francisco Bay area, has a climate characterized by cool, rainy winters and warm, dry summers. Like the rest of the San Francisco Bay Area, the Vallejo region is classified as a Marine West Coast Climate type with Mediterranean characteristics. Summer maximum temperatures average in the low 80's, with summer minimum temperatures in the low 50's. Winter maximums are in the mid-50's, with minimums in the mid-30's. Sunshine is plentiful, and the annual precipitation averages 20 inches, with most falling between November and May (Rains, Melton, and Carella, Inc., July 2001). The moderately hot and dry weather during the summer months results in moderately high water demand. Monthly weather data is provided in Table 2-1 below.

Table 2-1. Monthly Climate Data

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Std Monthly Avg ETo (In)	0.74	1.52	3.08	4.27	5.44	6.82	7.82	6.91	4.90	3.52	2.03	0.83	47.87
Avg Precip (Inches)	3.57	3.72	0.99	1.04	2.55	0.41	0.0	0.0	0.0	0.21	1.79	6.05	20.34
Avg Temp. (°F)	45°	52°	56°	56°	63°	65°	71°	69°	65°	62°	55°	47°	59°

Source: California Irrigation Management Information Service (CIMIS) database for the Suisun Valley weather station (#123) from December 2004 through November 2005.

2.4 Population Trends

The San Francisco Bay Area as a region has experienced a large level of growth in recent decades. The Association of Bay Area Governments (ABAG) makes population, household, and economic forecasts for the nine-county Bay Area. ABAG data presented by census tract are used for this Plan. Census tracts are the smallest geographic units for which ABAG projections are available. The ABAG population projections are driven by economic and demographic mathematical models and

constrained by examining local governments' plans, policies, and regulations affecting land development. ABAG housing projections are based on 2000 census data. Projections are made considering historical and present trends, taking into account available vacant land, redevelopment activities and current land use policies and plans. The City of Vallejo system boundaries do not fall along census tract boundaries in all cases. As a result, an estimate was made regarding how much of a given census tract is within the system area boundary. A list of the census tracts and the corresponding estimate of the amount of each tract within the City of Vallejo System is available upon request. Figure 2-2 shows the ABAG census tracts that correspond to the City of Vallejo service area.

Figure 2-2. ABAG Census Tracts – City of Vallejo Service Area

Vallejo 250101	Vallejo 250702	Vallejo 251702	Amer Cyn 201001
Vallejo 250102	Vallejo 250800	Vallejo 251802	Amer Cyn 201002
Vallejo 250200	Vallejo 250900	Vallejo 251803	Gordon Valley 252305
Vallejo 250300	Vallejo 251000	Vallejo 251804	Gordon Valley 252307
Vallejo 250400	Vallejo 251100	Vallejo 251901	Gordon Valley 201400
Vallejo 250501	Vallejo 251200	Vallejo 251902	Green Valley 252201
Vallejo 250502	Vallejo 251300	Vallejo 251903	
Vallejo 250601	Vallejo 251400	Vallejo 252103	
Vallejo 250603	Vallejo 251500	Vallejo 252105	
Vallejo 250701	Vallejo 251701		

Population in the County has grown rapidly due to the availability of land and the trend toward increased suburban growth. Solano County is one of the leading counties in the nine-county region in rankings for population and housing increases projected over the period 1995 to 2030. Vallejo is the largest city in the county.

As a result of the analysis of ABAG demographic data, it is estimated that the current population within the City of Vallejo System, including service areas within the city limits of Vallejo, unincorporated areas within Vallejo, Gordon Valley, and Green Valley, and a small area within American Canyon's city limits historically served by Vallejo is approximately 163,550 people. This population is expected to reach 198,000 by 2025. A summary of the historic and projected population within the City of Vallejo System, based on ABAG data, is presented in Table 2-2.

Table 2-2. Population Trends - Current and Projected

Service Area Population	2000	2005	2010	2015	2020	2025
City of Vallejo	147,360	163,550	173,380	181,820	191,700	198,000

Source: Association of Bay Area Governments, September 2002.

2.5 Housing and Employment

Housing and employment data developed in the Vallejo Traffic Model, presented by traffic zone, as well as billing data developed for the City of Vallejo System in the City of Vallejo Utility Financing Plan and Rate Study (Brown and Caldwell, October 2004) were used to develop estimates of future City of Vallejo System water use. Because the Traffic Model and Rate Study were conducted independently, great care was taken to ensure that only the service area of the City of Vallejo System was considered in each study. Historical and projected housing and employment data are presented in Table 2-3 below. Build out is anticipated by 2020.

Table 2-3. Housing and Employment Projections, Vallejo Water Systems

Customer category	2000	2005	2010	2015	2020	2025
City of Vallejo Water System[a]						
Single Family Residential, units	27,972	29,685	31,398	33,110	34,823	34,823
Multi-Family Residential, units	13,690	14,566	15,442	16,318	17,194	17,194
Residential, total units	41,662	44,251	46,839	49,428	52,017	52,017
CIILGR, employees[b]	35,550	41,357	47,164	52,972	58,779	58,779
Vallejo Lakes System						
Single Family Residential, units	800	825	850	875	900	900

Sources: [a] Dowling Associates, Mike Aronson, 12/20/04. Only figures for base year (1999) and 2020 (buildout) available; intermediate figures were linearly extrapolated.
[b] CIILGR = Commercial, industrial, institutional, landscaping, governmental, and recreational.

The number of connections by customer classification, as tabulated from City utility billing data for years 2001 and 2002, are shown in Table 2-4. The City provides metered irrigation for parks and street medians. As of 2004, the City's water system contains approximately 37,800 connections, of which 100% are metered connections.

Table 2-4. City of Vallejo Connections by Classification

Classification	Metered Connections	
	2001[a]	2002[b]
Single family	30,663	31,543
Multi-family	2,121	2,089
Commercial/institutional	1,904	1,829
Industrial	0	0
Park irrigation	492	482
Other	559	514
Total	35,739	36,457

Sources:

a. Pamela Sahin, City of Vallejo Department of Water Resources calendar year 2001 Public Water System Statistics.

b. 2004 Rate Study (Brown & Caldwell, 2004). Commercial, Institutional, Multi-family category for 2002 is derived from the sum of accounts under Trailer Parks, Commercial, Churches, and Schools in the 2004 Rate Study. Park irrigation category for 2002 is assumed to be from Irrigation accounts in the 2004 Rate Study.

2.6 Planned Redevelopment

Several redevelopment projects are planned within the City of Vallejo service area. In 2005, water supply assessments were prepared for the following proposed projects:

- Revised Final – Vallejo Station and Waterfront Development Project, June 14, 2005
- Final Downtown Vallejo Redevelopment Project, June 20, 2005
- Final Mare Island Redevelopment Project, June 24, 2005

The City of Vallejo is planning to implement a redevelopment project to revitalize the downtown waterfront area. The project includes a mix of commercial, residential, and recreational uses on approximately 50 acres of waterfront property to be integrated with the downtown and the existing ferry service to San Francisco. Overall, the project will add up to about 825 single-family residential units, 265 multi-family residential units, and up to 504,000 gross square feet of space for commercial, office, and light industrial use.

The City has envisioned a multimodal waterfront transportation facility—the Vallejo Station—to support the integrated mix of transportation-related improvements serving water and rubber-tired vehicles, including a 1,190-vehicle parking garage structure, bus facilities including a new off-street bus transfer facility to replace the existing on-street one, and possible light rail facilities. Various transit-supportive private sector land uses such as live-work units, rental apartments, retail space, a condominium, and an office building are planned. Approximately 86,600 square feet of vacant/storage space and various used and unused commercial/office spaces, including 37,800 square feet of U.S. Postal Office space, will be demolished to make way for the new project.

The proposed Mare Island Redevelopment Project consists of commercial, residential and open space development as well as public improvements related to transportation and access to the island. Neighborhoods will provide a full range of land uses for Mare Island including employment, residential, commercial, recreational and open space. Overall, the project will add up to 1,400 residential units and up to 9,047,000 gross square feet of space for commercial, office, education, recreation and industrial use. Approximately, 1,333,938 square feet of vacant storage, garages, bomb shelters, and miscellaneous navy base structures would be removed to make way for the new Mare Island redevelopment project.

The water supply assessments prepared for the above projects determined that, during normal climate years, adequate water supplies are available, during a 20-year projection, to serve the projected demand of the proposed projects, in addition to existing and planned future uses. In the event of a three-year drought however, supplies would be insufficient if Lake Curry supplies are unavailable. However, taking into consideration the use of residential water usage unit demand

figures in excess of gross historical average use and the demand reduction potential of water shortage response measures, then projected water supplies are sufficient to serve the projected demand of the projects, in addition to existing and planned future uses, even if Lake Curry supplies are not ultimately brought on-line.

In addition to the three known projects for which water supply assessments have been prepared, another significant, potential project is redevelopment of the Solano County Fairgrounds located on the southwest corner of the Highway 37/I-80 interchange. The site is 152 acres in size and includes a horse racing track, a 9-hole golf course (e.g. Joe Mortara Golf Course), a small motor racetrack, parking facilities, and various buildings used for year-round expositions. The fairgrounds are located within the City of Vallejo, owned by Solano County, and managed by the Solano County Fairgrounds Association (SCFA). The SCFA has plans to redevelop portions of the grounds; plans will focus on the renovation of existing fair facilities, and construction of new entertainment and recreation-related facilities. Plans are not yet detailed enough to assess the impact of this potential project.

SECTION 3 - WATER DEMAND

Section 3 summarizes the City's historical and present water demand and provides the projected future water demands to the year 2025. Water demand is the amount of water used by the City's customers and in the City's water systems, which the City will need to supply.

3.1 Annual Water Production

Surface water production from 1985 to 2004 by the Fleming Hill water system is presented in Table 3-1. Due to inaccuracies of the State Water Project meters and billings, the City does not have an accurate determination of the amount of water actually received from its water supplies. However, such data can be determined by reference to the annual water production at the City's Fleming Hill WTP, which is accurately recorded. These annual production figures are particularly representative of the amount of water received by the City from its wholesale water suppliers due to the lack of significant raw water users of the City's untreated supplies.

3.2 Historical Treated Water Use

The City maintains records of historical annual water production. Water production is the volume of water measured at the source, which includes all water delivered to residential, commercial, and public authority connections, as well as unaccounted-for water. For the purposes of this Plan, four categories of water users have been identified: (1) single family residential; (2) multi-family residential; (3) commercial, industrial, institutional, landscaping, governmental, and recreational (CIILGR); and (4) other. The next subsections discuss how the unit water use factor method was used to estimate demand for the first three user categories, and elaborate on the definition of "other users," which consists of non-billed metered water use and unaccounted-for water use.

Table 3-1. Historical Water Production, Fleming Hill Water System

	Annual average		Maximum day	
Year	ac-ft/yr	mgd	mgd	Peaking factor[a]
1985	19,291	17.23	29.152	1.69
1986	20,467	18.28	29.095	1.59
1987	21,127	18.87	30.907	1.64
1988	22,146	19.78	29.289	1.48
1989	22,617	20.20	33.360	1.65
1990	21,732	19.41	27.922	1.44
1991	21,990	19.64	28.41	1.45
1992	21,183	18.92	29.47	1.56
1993	19,851	17.73	29.56	1.67
1994	17,981	16.06	24.76	1.54
1995	19,437	17.36	28.0	1.61
1996	18,709	16.71	26.0	1.56
1997	20,254	18.09	28.0	1.55
1998	19,090	17.05	29.0	1.70
1999	20,433	18.25	31.0	1.70
2000	20,814	18.59	28.0	1.51
2001	20,377	18.20	28.0	1.54
2002	20,736	18.52	29.4	1.59
2003	20,242	18.51	30.1	1.59
2004	20,545	18.10	28.8	1.59

[a] Maximum day peaking factor = maximum day demand/annual average day demand.

3.3 Unit Water Use Factors

Unit water use factors were developed to estimate future water needs, based on the housing and employment projections discussed previously in Section 2. Current water demand, housing and employment data were used to derive the unit water use factors for the following types of water use categories: (1) single family residential; (2) multi-family residential; and (3) CIILGR. Future single family and multi-family residential water needs are determined using the projections for single family or multi-family residential dwelling units within the City's service area, coupled with a unit water use factor per single family or multi-family dwelling unit, respectively. CIILGR future water needs are determined using the projections for employees within the City area, coupled with a unit water use factor per employee. Studies show there is a good correlation between CIILGR water use and number of employees (California Urban Water Agencies, 1992[p1]). In the Vallejo Traffic Model, a conversion factor to employee counts was provided for each CIILGR category.

For the purposes of deriving estimates for unit water use factors, the set of historical billing data for FY2000-2001 was chosen, as it was the closest year to the base year for the Vallejo Traffic

Model. A summary of the calculated unit water use factors are presented in Table 3-2. Detailed calculations may be found in Appendix E.

The City of Vallejo system (i.e. Fleming Hill water system) was chosen as a surrogate basis for calculating unit water use factors. Green Valley Water Treatment Plant production figures were not included in the calculations of unit water use because they are non-representative of the majority of the Vallejo Water Systems due to the small size of the Vallejo Lakes System and its limited number of services, differing climatic conditions and more rural nature of the services. Production figures for the Travis Water Treatment Plant, which provides water to the Travis Air Force Base and a portion of the Travis Unified School District, is likewise non-representative.

Table 3-2. Residential and Non-Residential Unit Water Use Factors[a]

Classification	Unit water use factor current study
Single Family Residential:	387 gpd/unit
Multi-Family Residential:	345 gpd/unit
CIILGR[b]:	102 gpd /employee

[a] Factors exclude unaccounted-for water and non-billed metered water use.

[b] CIILGR = Commercial, industrial, institutional, landscaping, governmental, and recreational.

3.4 Other Demand Components

In addition to treated water use by customers, there are several other components of the City's total demand that must be provided by the City's water supplies. These components are summarized below.

- **Non-billed Metered Water Use**
  In addition to usage recorded in the billing data, there exists some non-billed metered water use at select City locations. Non-billed metered use has been determined to comprise approximately 12 percent of the total water production in 2000 (or 2.2 mgd). Ongoing conversion of non-billed metered accounts to billed metered accounts will create incentives for best management water use practices to be implemented. These changes are expected to reduce non-billed, non-collected metered usage figures to about 7 percent of total metered usage, or 1.7 mgd, by 2025.

- **Unaccounted-for Water (Treated Water System Losses)**
  Unaccounted-for water use is unmetered water use such as from fire protection and training, system and hydrant flushing, sewer cleaning, construction, system leaks, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies. As estimated by the City Utilities Department, Water Division, approximately 10 percent of total water production in 2004 consists of unaccounted-for water. This average value is similar to previous years. Typically, water agencies try to keep unaccounted-for water at 10 percent or less of their treated water use. However, enhanced metering programs at City connections and water auditing programs are underway, in addition to a large-meter replacement project to assure greater accuracy for major users. By 2025, it is anticipated that unaccounted-for water will gradually drop to about 6 percent of total metered use, or 1.4 mgd.

3.5 Projected Water Demands

Water demands through the year 2025 were estimated for the Vallejo Water Systems based on the unit water use factors (see Table 3-2); housing and employment projections (see Table 2-3[p2]); and projections for non-billed metered use and unaccounted-for water. Note that the totals include the minor demands of the Vallejo Lakes system. Detailed calculations of housing and employment projections are based on information from the draft Environmental Impact Report (EIP Associates, 2004), the City of Vallejo Water Utility Financing Plan and Rate Study (Brown and Caldwell, 2004), and the City of Vallejo Buildout Estimates (Meiring Contracting and Consulting, 2003)

Table 3-3. Projected Water Demands by Category

Category	2000	2005	2010	2015	2020	2025
City of Vallejo Water System						
Single Family Residential (mgd)	8.6	9.0	9.4	9.9	10.3	10.3
Multi-Family Residential (mgd)	2.3	2.7	3.1	3.5	3.9	3.9
CIILGR[a] (mgd)	3.6	4.2	4.8	5.4	6.0	6.0
Non-billed metered use[b] (mgd)	2.2	2.0	1.8	1.7	1.7	1.7
Unaccounted-for water[c] (mgd)	1.9	1.7	1.6	1.5	1.4	1.4
Golf Course Irrigation (mgd)	0.7	0.7	0.7	0.7	0.7	0.7
Subtotal mgd	19.4	20.4	21.5	21.3	24.0	24.0
Subtotal AF/yr	**21,920**	**23,030**	**24,290**	**25,690**	**27,140**	**27,140**
Vallejo Lakes System						
Single Family Residential (mgd)	0.3	0.3	0.3	0.3	0.3	0.3
Subtotal AF/yr	**320**	**330**	**340**	**350**	**360**	**370**
Wholesale Customers						
Travis AFB Deliveries[d] (AF/yr)	3,200	3,400	3,860	4,330	4,790	5,250
City of Benicia (AF/yr)	1,100	1,100	1,100	1,100	1,100	1,100
City of American Canyon (AF/yr)	750	750	750	750	750	750
Subtotal AF/yr	**5,050**	**5,250**	**5,710**	**6,180**	**6,640**	**7,100**
Other Demands[e] *AF/yr*	**1,500**	**1,500**	**1,000**	**1,000**	**1,000**	**1,000**
Total for all categories AF/yr	**28,790**	**30,110**	**31,340**	**33,220**	**35,140**	**35,610**

Source: Water Supply Assessments prepared by Brown and Caldwell, June 2005 (corrected for 2015).

[a] CIILGR = Commercial, industrial, institutional, landscaping, governmental, and recreational.

[b] Non-billed metered use, which accounts for approx. 13% of total metered use in the base year (2000), is expected to decrease linearly due to changes in non-billing practices which will create incentives for best management water use practices.

[c] Unaccounted-for water, which includes meter losses and inaccuracies, pipeline leaks, etc., is assumed to be 11% of total metered water use for calibration purposes for the base year. This value is expected to drop due to enforcement of illegal connection removal, enhanced flushing and maintenance practices, and greater meter accuracy due to large meter replacement projects which will accurately gauge true cost of service and create incentives for best management practices and reductions in use.

[d] Travis AFB demand in 2005 of 3,400 ac-ft/yr is based on the maximum demand out of three recent years of historical water production data. Demands in subsequent years are assumed to increase in equal steps to the maximum potential demand of 5,250 ac-ft/yr by 2025.

[e] Demands for "Other" includes 1,500 ac-ft/yr of potential Suisun Creek instream flow in 2000 and a combination of potential instream flows and/or potential wholesale water sales to other water agencies in 2010 and beyond.

Projected water demands by category and total projected water demands are shown in Table 3-3. By 2025, water demands are expected to increase by 24 percent, from 28,790 acre-feet per year (ac-ft/yr) in 2000 to 35,610 ac-ft/yr in 2025. Reductions in estimated water use due to proposed additional conservation measures to be implemented in the future are not reflected in the projected water demands.

SECTION 4 - WATER SUPPLY

This section provides an overview of the City's major raw water transmission facilities; current, and projected water supplies; a supply and demand comparison; the reliability of the surface water sources; shortage expectations; and planned water supply projects.

4.1 Water Supply Overview

The City of Vallejo water systems currently uses surface water as its sole source of supply. No groundwater sources are used. The City brings surface water from five different sources into three treatment plants in order to serve customers in two different counties (Solano and Napa) and on an active military base (Travis Air Force Base).

The City has five sources of surface water: Solano Project Water, State Water Project, Vallejo Permit Water, Lakes Frey and Madigan, and Lake Curry. Table 4-1 summarizes these surface water supplies including the capacity and safe yield of each surface water source in units of acre-feet per year. The safe yield is the rate of surface water diversion from a basin for consumptive use over an indefinite period of time that can be maintained without producing negative effects.

Table 4-1. Surface Water Sources

Source	Water Entitlements (ac-ft/yr)	Safe yield (ac-ft/yr)	Remarks
State Water Project	5,600	5,600	SCWA[c]
Vallejo Permit Water[a]	17,200 (through 2006); 22,800 (2007 and beyond)	22,800	Water rights and conveyance control with SCWA
Solano Project Water	14,600	14,600	Annual entitlement from U.S. Bureau of Reclamation through SCWA
Lakes Frey and Madigan	400	400	City water rights
Lake Curry[b]	1,500 (through 2009); 3,750 (2010 and beyond)	3,750	City water rights
Total	39,300 (through 2009); 47,150 (2010 and beyond)	47,150	

[a] Supply should increase from 17,200 ac-ft/yr in 2005 to 22,800 ac-ft/yr in 2007 and beyond, when agreements required to allow Vallejo's full conveyance of the 22,800 ac-ft/yr through the NBA should be in place.
[b] Currently 1,500 ac-ft/yr of entitlement and safe yield from Lake Curry is used for in-stream flow. The full Lake Curry supply of 3,750 ac-ft/yr entitlement and safe yield will become available beginning in 2010, when Lake Curry is returned to service by 2009.
[c] SCWA = Solano County Water Agency.

State Water Project (SWP). State Water Project water is delivered from Lake Oroville through the Sacramento River to the North Bay Aqueduct (NBA) pumping facility at Barker Slough where it is pumped to the California Department of Water Resources (DWR) Forebay at Cordelia. SWP water may be diverted to supply Travis Air Force Base before reaching the DWR Forebay. From the DWR Forebay at Cordelia it is pumped by City facilities to the Fleming Hill Water Treatment Plant (WTP).

Vallejo Permit Water. Vallejo Permit Water is delivered from the NBA pumping facility at Barker Slough to the DWR Forebay at Cordelia. Vallejo Permit Water may be diverted to supply Travis Air Force Base before reaching the DWR Forebay. From the DWR Forebay at Cordelia it is pumped by City facilities to the Fleming Hill WTP.

Solano Project Water (SPW). Solano Project Water is delivered from Lake Berryessa via the Putah South Canal to the U.S. Bureau of Reclamation Terminal Reservoir in Cordelia. From Cordelia it can be pumped to the Fleming Hill WTP or via Solano Irrigation District's distribution facilities to the Green Valley WTP.

Lakes Frey and Madigan. Lakes Frey and Madigan are located in northern Solano County. The City owns both lakes and the surrounding land. Water flows from Lake Madigan into Lake Frey and then into the diversion dam, from whence the water continues to flow under gravity through a pipe into the Green Valley WTP located at the end of Green Valley Road. Lakes Frey and Madigan and Lake Curry are collectively know as the "Vallejo Lakes System."

Lake Curry. Lake Curry, the largest lake in the "Vallejo Lakes System," is a standby source for the City located in Napa County. The City owns the lake and surrounding land. Lake Curry has a storage capacity of 10,700 acre-feet and a yield of about 3,750 acre-feet per year. However, the lake is not currently in use as a drinking water raw water source, although lake water is being used for in-stream flow into Suisun Creek. The lake will be restored to full use again as soon as new conveyance facilities are put in place. The projected completion date for the Lake Curry Water Conveyance Project is 2009.

4.2 Groundwater Supplies

No ground water sources are used. A large aquifer (a subterranean permeable body of rock holding water) system extends from the highlands area to the Napa River-Carquinez Strait system. The aquifer is shielded from salt-water intrusion by stream-deposited sediments and muds. The City does not currently use groundwater although it might be a remotely possible future supply. Groundwater is not counted as a supply to meet future demands within this Plan.

The City has authorized the Solano County Department of Environmental Management, Division of Environmental Health, or its successor agency to undertake the inspections and other activities involved in the regulation of construction, reconstruction, destruction and inactivation of private water, cathodic protection, and monitoring wells.

4.3 Other Water Supplies

The City does not have plans for any alternative water supply projects to provide additional water supplies. The City, in conjunction with the Vallejo Sanitation and Flood Control District, has considered reclaimed water. Reclaimed, secondary-treated water is available, but studies have repeatedly shown that its distribution is cost prohibitive. Further discussion of this topic can be found in Section 5.

There is no planned use of Vallejo system water for ground water recharge. Any recharge accomplished is incidental due to transmission and distribution line leakage.

4.3.1 Transfers and Exchange Opportunities

Table 4-2 provides a breakdown of the water transfers that have occurred in prior dry years per existing service agreements that the City maintains with American Canyon, Benicia, and Fairfield. Note that historically, these transfers have only been from the City to other wholesale agencies. Copies of these water transfer agreements will be provided upon request by the City. This section provides a brief description of these agreements.

Table 4-2. Water Transfers, ac-ft/yr

From whom	To whom	198[illegible]	1991	199[illegible]	2001
City of Vallejo	American Canyon	0	0	0	500
City of Vallejo	Benicia	0	5,572	0	3,807
City of Vallejo	Fairfield	0	1,716	0	1,333
TOTAL		0	7,288	0	5,640

Solano Irrigation District Exchange. Vallejo has a service exchange agreement with SID. Under this agreement Vallejo provides raw water to Tolenas, in SID's service area, and in exchange SID delivers an equal amount of raw water to Vallejo's Green Valley Treatment Plant. Consequently, Vallejo supplies Tolenas water demand from its NBA water supplies and SID augments Vallejo with Solano Project water. The demands of both areas are typically not equal and SID usually owes Vallejo a balance of Solano Project water at the end of each year.

4.3.2 Water Agreements

City of American Canyon. A water service agreement exists between the City of Vallejo and the City of American Canyon, dated May 1, 1996. The agreement gives American Canyon the right to purchase up to 1.0 mgd of potable water from Vallejo with possible additional capacity purchases. If available, American Canyon will supply its excess raw water entitlement to Vallejo at $75/acre-foot, which Vallejo shall treat and transmit to American Canyon. Existing Vallejo transmission facilities in American Canyon's water service area are available to wheel American Canyon raw water with reimbursement of costs.

Per Addendum No. 1 to the Water Service Agreement between the City of Vallejo and the City of American Canyon, dated July 18, 1996, American Canyon wants an alternative source of raw water to supply water for agricultural, golf course, and landscaping purposes. Vallejo agrees to sell raw water to American Canyon during emergencies, if available, such as a reduction in NBA entitlement, in quantities up to 500 acre-feet per year at a cost of 90 percent of what American Canyon charges their customers outside the city limit.

Per Addendum No. 2 to the Water Service Agreement between the City of Vallejo and the City of American Canyon, dated June 4, 1998, Vallejo agrees to sell and transfer 500 acre-feet of water entitlement to American Canyon from Vallejo's permit water for domestic use at a cost of $1,000 per acre-foot. American Canyon will transfer to the City of Calistoga 500 acre-feet of American Canyon's NBA entitlement. American Canyon will reimburse Vallejo for previously incurred capacity investments, and other costs associated with conveyance of the permit water. Restrictions on Vallejo's permit water will be passed along to American Canyon proportionally.

Per Addendum No. 3 to the Water Service Agreement between the City of Vallejo and the City of American Canyon, dated May 4, 2000, Vallejo agreed to provide and American Canyon purchased fire supply storage and fire supply flow to the Montevino Subdivision.

Per Addendum No. 4 to the Water Service Agreement between the City of Vallejo and the City of American Canyon, dated December 7, 2000, Vallejo would have sold up to 250 acre-feet of Vallejo Permit water to American Canyon thereby allowing American Canyon to sell an equivalent amount of its water to Yountville. However, there were a number of agreements which had to be reached before the sale can take place. The addendum was voided because all conditions were not fulfilled by December 31, 2005.

City of Benicia. The March 5, 1992 agreement providing Benicia the opportunity to purchase up to 4,400 acre-feet of water from Vallejo was terminated by Benicia Council action in February 2004, thereby reverting the 4,400 ac-ft/yr entitlement to Vallejo control.

Per Amendment No. 2 to the 1962 Vallejo / Benicia Water Agreement, dated April 28, 1989, Vallejo is to deliver 1,100 acre feet per year. A service charge applies for usage exceeding 50 days per year. Treated water is sold to Benicia at Vallejo's outside-the-City-limit rate. Raw water from the Terminal Reservoir sells at a calculated charge which is currently $37.53/ac-ft.

City of Fairfield. An agreement exists for temporary potable water service between the City of Fairfield and the City of Vallejo, dated March 20, 1992. Fairfield is to serve potable water to Vallejo's Lake System. Vallejo provides the raw water supply and pays for the cost of service (lease payment and user charge). Demand is not to exceed 1,120 acre-feet in 12 months.

Per an agreement for mutual water exchange or sale and temporary standby water service between the City of Fairfield and the City of Vallejo, dated May 4, 1993, Vallejo will provide surplus permit water to Fairfield at either an exchange rate of 2:1 for Solano Project water or at a price of $50/ac-ft (initially). Fairfield will serve potable water into the Vallejo system. Raw water used will be added to Vallejo's Solano Project use. Vallejo will be charged for water service at Fairfield's in-city general service rate.

Per Amendment No. 1 to the May 4, 1993 agreement, to provide for mutual water exchange or sale and temporary standby water service between the City of Fairfield and the City of Vallejo, dated August 4, 1993, a second connection was added through which Fairfield can serve potable water into the Vallejo system. Vallejo pays Fairfield a user charge if the connections are activated.

4.3.3 Desalination

Desalination involves the treatment of seawater or brackish water, using technologies such as reverse osmosis membranes or distillation methods to remove salts and impurities, in order to create a water supply suitable for all drinking water purposes.

At this time, the City is participating in regional planning that is considering desalination. SCWA's Integrated Regional Water Management Plan identifies desalinating Carquinez Strait water as an available long-term action to develop new permanent water supply for Solano County. Potential locations include offshore of Benicia and Vallejo. Currently, there are no planned desalination projects in Solano County. Such projects could be pursued by SCWA if grant funding becomes available or other actions are taken to improve the economics of such projects. However, feasibility studies would be needed to evaluate its cost-effectiveness relative to other sources.

Desalination facilities are costly to construct and operate relative to the City's current supply sources. According to the California Department of Water Resource's report, "Water Desalination – Findings and Recommendations" (October, 2003), the cost to construct and operate new seawater and estuarine water desalination plants will range from $700 to $1,200 per acre-foot, depending on energy costs. To distribute the desalinated water would cost another $100 to $300 per acre-foot.

There are also significant environmental and permitting issues associated with disposal of brine from the treatment process. Alternatives would need to be investigated for discharging brine into the Bay that would not have adverse environmental effects.

The City's water supply needs can be met without the development of a local desalination supply. Desalination could conceivably be considered as a potential, future, local emergency supply source. The development of such a supply would be a long-term project requiring study and evaluation to determine its feasibility and cost effectiveness.

4.4 Source Water Quality

This subsection describes the water quality of the existing water supply sources within the water systems and the manner in which water quality affects supply reliability and water management strategies.

4.4.1 Water Quality of Existing Water Supply Sources

The Solano Project is considered a reliable, high-quality water source. The large volume of Lake Berryessa provides a large dilution factor for any contaminants that may reach the lake. Additionally, the Solano Project draws its water supply from the bottom of the reservoir which

provides for additional decomposition and dilution of any contaminants before the water is released for delivery.

The only significant surface source water problems pertain to North Bay Aqueduct water from the Sacramento Delta, due in part to the location of the intake in Barker Slough. Occasionally, the Travis Water Treatment Plant, which up to recently used only an NBA supply, had to be shut down due to excessive turbidity, color, and total organic carbon (TOC) of the source water supply.

The Solano County Water Agency coordinated quarterly tests for Methyl tert Butylether (MTBE) which were performed in 2003 with none detected. The City monitors for MTBE at the Terminal Reservoir and NBA Cordelia Forebay annually.

The City's Annual Water Quality Report, also known as a Consumer Confidence Report, based on water testing performed in 2004, is attached as Appendix F.

4.4.2 Water Quality Effects on Water Management Strategies

Due to seasonal water quality shifts, water treatment staff must select and treat a changing mix of source water in order to optimize use of available sources and minimize treatment costs. As with any surface water source, the City's raw water sources are vulnerable to total and fecal coliform contamination; therefore, the City utilizes multi-barrier protection in its treatment plants.

The City has purchased equipment for use at the Travis Water Treatment Plant to monitor UV254, a surrogate for total organic carbon (TOC). Travis AFB WTP has just begun treating Solano Project water which has a much lower TOC level than the NBA water.

After two years of intensive monitoring of NBA water quality, NBA users applied for and obtained a $580,000 grant from CALFED to improve the watershed of Barker Slough, the location of the intake for the NBA. The grant will be used for pilot programs to initiate best management practices with local landowners. The water quality deterioration is primarily linked to cattle-raising land use practices and riparian erosion.

The City has a three-part monitoring program for Title 22 compliance.

1. Under a cooperative agreement with other NBA users, quarterly monitoring is done through the North Bay Regional water treatment plant which does collection and analysis (or outlab, if any).
2. Under a cooperative agreement, coordinated by the Solano Irrigation District, Solano Project water (Lake Berryessa) is tested for organics and radiological contaminants.
3. Vallejo monitors Lakes Frey and Madigan in Green Valley.

The City has prepared a watershed sanitary survey for Lakes Frey and Madigan. A survey was performed for the Solano Project by the Solano County Water Agency.

4.4.3 Water Quality Effects on Supply Reliability

No changes in water quality in any of the City's water sources are expected through and beyond 2025 which would reduce water supplies. Due to NBA water quality effects on supply, however,

less optimal water quality supplies may be directed to particular plants for treatment, and efforts are being made to enhance plant operational flexibility by providing alternative, secondary water supplies.

No available supplies to the Fleming Hill Water Treatment Plant are impacted by source water quality impairment, as that plant has the ability to treat even degraded water. In addition, water sources are switched or blended, as available, to optimize water treatment processes.

As discussed above, the only significant surface source water problems pertain to North Bay Aqueduct water deliveries to the Travis Water Treatment Plant. Occasionally, the Travis WTP, which until recently used only an NBA supply, had to be shut down due to excessive turbidity, color, and total organic carbon (TOC) of the source water supply. Temporarily, the City is providing Solano Project water to the plant, by arrangement with the City of Benicia to pump water via Vallejo's Cache waterline. These short-term treatment-related outages will be mitigated by 2007 with the construction of the Travis – Beck Avenue Pump Station which will permanently provide Solano Project water as an alternative source during NBA water quality-impaired events.

4.5 Water Shortage Expectations

No unusual short-term water shortages are anticipated. Short-term surface water supply shortages lasting from several hours to several days are accounted for in supply planning. At key locations, the City's pumps are fitted with emergency diesel-powered generators for use during power outages, which increases the reliability of supply.

The City's draft Water Shortage Contingency Plan (WSCP) is included in Section 7 of this UWMP. The WSCP addresses the short-term or emergency water management practices required during a drought or other water shortage condition. The WSCP helps the City of Vallejo consider impacts of short-term supply deficiency including financial hardship on both the community and the City, and deterioration of customer relations. The City uses shortage planning to anticipate drought conditions and prepare for impacts that may occur (e.g. supply shortages, economic impacts on the community and reduced revenue). On a regional level, the "Solano Project Members' Agreement as to Drought Measures and Water Allocation", included as Appendix H, requires specific drought measures by all participating agencies when the water level in Lake Berryessa drops below half full.

Of general concern in water demand management is the phenomenon known as "demand hardening." During drought years, savings attributed to on-going conservation will reduce opportunities to meet demand through short-term drought demand management programs. The expectations of such programs will therefore need to be reviewed in coordination with the City's other ongoing programs. Water transfers may be a more reliable solution to address such shortages in both the short and long term, as increased efficiencies over time within all customer use categories will conceivably reduce opportunities to achieve significant savings during drought years. The duration of the water shortage, whether drought or short-term supply emergency, is a factor in the sustainability of any newly achieved demand reduction.

4.6 Water Supply Reliability

To take into account the fact that water source entitlements are not always fully available to the City , a more conservative measure of water supply is used, the "normal" or average available water year supply. An analysis was made of the reliability of each of the City's source supplies, with information provided by the Solano County Water Agency, the Department of Water Resources, and City records. Percentage reductions from full entitlement were calculated and the resulting "normal" year supply volumes are presented in Table 4-4. In addition, estimations were made of the percentage of entitlement available for each water source under dry year scenarios.

4.6.1. Water Supply Vulnerability to Seasonal or Climatic Shortage

The City uses only surface water supply sources which are subject to variation due to a variety of factors. Different sources of water supplies have different historical dry year sequences, and different yields during multiple year drought conditions based on hydrology, available storage, contract entitlements, water characteristics, etc.

Several meetings with SCWA and its member agencies were held during the preparation of the City's UWMP. The primary purpose of the meetings was to coordinate the supply reliability assessment methodology used by the member agencies sharing common water supply sources. The meetings were attended by the Cities of Benicia, Fairfield, Vacaville and Vallejo; the Solano Irrigation District (Suisun and Dixon); and SCWA.

A projection of available water supply for each separate water supply source is presented below, expressed as a percentage reduction of full entitlement. The assumptions for each water source are discussed below.

Table 4-3. Percent of Entitlement Available in Normal and Dry Water Years

Water Supply	Normal	Single Dry	Second Dry	Third Dry
State Water Project	**90%**	**61%**	**50%**	**39%**
Vallejo Permit Water	**100%**	**85%**	**80%**	**75%**
Lakes Frey & Madigan	**100%**	**80%**	**75%**	**75%**
Lake Curry	**100%**	**80%**	**75%**	**75%**
Solano Project	**99%**	**98%**	**95%**	**92%**

State Water Project

Information on State Water Project reliability comes from a "Notice to State Water Project Contractors" dated May 25, 2005. Utilizing DWR Study 6 (2001 Level of Development, 2004 OCAP) and DWR Study 7 (2020 Level of Development, 2004 OCAP) from that notice and assigning a Sacramento Valley Index to each of the years from 1922 through 1993, the City's wholesaler, the Solano County Water Agency, calculated average percentage of full entitlement for a "normal" year, "single dry" water year, and "multiple dry" water year (defined as the average of all years included in sets of three or more consecutive dry years). A detailed discussion of

supply reliability for the State Water Project is available in the *Solano County Water Agencies' Integrated Regional Water Management Plan* adopted by the City of Vallejo on August 16, 2005.

Vallejo Permit Water

Vallejo Permit Water is not subject to reductions due to North Bay Aqueduct Table A delivery restrictions. The permit right is, however, subject to temporary environmental pumping restrictions which due to physical pumping capacity restraints may result in reduced ultimate yearly capacity. No historical data exists to accurately depict this scenario, and the City has chosen to conservatively reduce deliverable water by the percentages indicated in an attempt to quantify the potential for supply disruption due to environmental concerns.

Solano Project Water

Solano Project Reliability is based on ultimate level of development of Lake Berryessa watershed at 30,000 ac-ft/yr. A detailed discussion of supply reliability for the Solano Project is available in the *Solano County Water Agencies' Integrated Regional Water Management Plan.* The Solano County Water Agency has calculated reliability percentages based on a Lake Berryessa Index for water year classifications from 1906 through 1993. This is a very reliable water source. The contract between the SCWA and USBR calls for the full contract amount to be delivered to SCWA unless it is physically impossible to deliver the water from Solano Project storage (i.e. the reservoir is dry).

The Solano Project member agencies (cities, such as Vallejo, and districts that contract with SCWA for Solano Project water supply) have entered into a separate agreement to reduce deliveries based upon storage levels in Lake Berryessa. Once the storage level drops below 800,000 acre feet, as measured on April 1, 95% of contract amounts are delivered with 5% being stored in the reservoir as carryover. If the reservoir drops below 550,000 acre feet by April 1, 90% can be delivered and 10% is stored as carryover. Member agencies have the ability to carryover more than this amount if they desire. Once the reservoir level is below 450,000 acre feet on April 1, the member agencies can use their full allocation and any stored carryover. On April 1 if lake storage is less than 400,000 acre feet a drought emergency is declared. This will trigger the "Solano Irrigation District Drought Impact Reduction Program," which provides for SID growers to fallow land and provide up to 20,000 acre feet per year for voluntary sale to cities. For more information see Appendix H, the "Solano Project Members' Agreement as to Drought Measures and Water Allocation."

The main factor affecting Solano Project reliability is the frequency of long droughts which could result in major drawdown of Lake Berryessa. Environmental issues have been addressed in a legal settlement regarding downstream flows from the Solano Project and the settlement has been ratified by the State Water Resources Control Board. Limits on upstream depletions have been established through a settlement agreement administered by a court appointed watermaster.

Lakes Madigan and Frey

Safe yield supply calculations were created by Raymond Vail and Associates in January 1989 showing the safe yield of Lake Madigan and Frey, as determined using a worst case historical two year 1976 drought scenario, to be 600 acre-feet. The City has chosen to reduce this amount by one third to 400 acre-feet due to the lack of alternative water sources for this system. In addition, as

the scenario envisioned only a two year drought event, the City has chosen to reduce the lowered 400 acre-foot value of expected delivery of water by the percentages indicated during each year, single dry, multiple dry, and third dry year, to assure extension of water delivery at the noted quantities even during a three year drought review period.

Lake Curry

Safe yield supply calculations were created by Raymond Vail and Associates in January 1989 showing the safe yield of Lake Curry, as determined using a worst case historical two year 1976 drought scenario, as 3,750 acre-feet. As this scenario envisioned only a two year drought event, the City has chosen to reduce the expected delivery of water by the percentages indicated during each year, single dry, multiple dry, and third dry year, to allow extension of water delivery at the noted quantities after a three year drought review period.

The assumptions of percentage of full entitlement of water available as supply in normal and dry water years has been applied to projections of water entitlements over the next twenty years, in five year increments. The resulting supply volumes are presented below in Table 4-4.

Table 4-4. Adjusted Water Supplies for Normal and Dry Water Years

WATER YEAR & SUPPLY (All volumes in Acre-Feet)	Entitlement Reduction	**2005**	**2010**	**2015**	**2020**	**2025**
Normal Year						
State Water Project	10%	5,040	5,040	5,040	5,040	5,040
Vallejo Permit Water	0%	17,200	22,800	22,800	22,800	22,800
Lakes Madigan/Frey	0%	400	400	400	400	400
Lake Curry	0%	1,500	3,750	3,750	3,750	3,750
Solano Project Water	1%	14,454	14,454	14,454	14,454	14,454
Normal Year Total		***38,594***	***46,444***	***46,444***	***46,444***	***46,444***
Single Dry Year						
State Water Project	39%	3,416	3,416	3,416	3,416	3,416
Vallejo Permit Water	15%	14,620	19,380	19,380	19,380	19,380
Lakes Madigan/Frey	20%	320	320	320	320	320
Lake Curry	20%	1,200	3,000	3,000	3,000	3,000
Solano Project Water	2%	14,308	14,308	14,308	14,308	14,308
Single Dry Year Total		***33,864***	***40,424***	***40,424***	***40,424***	***40,424***
Second Dry Year						
State Water Project	50%	2,800	2,800	2,800	2,800	2,800
Vallejo Permit Water	20%	13,760	18,240	18,240	18,240	18,240
Lakes Madigan/Frey	25%	300	300	300	300	300
Lake Curry	25%	1,125	2,813	2,813	2,813	2,813
Solano Project Water	5%	13,870	13,870	13,870	13,870	13,870
Second Dry Year Total		***31,855***	***38,023***	***38,023***	***38,023***	***38,023***

WATER YEAR & SUPPLY (All volumes in Acre-Feet)	Entitlement Reduction	2005	2010	2015	2020	2025
Third Dry Year						
State Water Project	61%	2,184	2,184	2,184	2,184	2,184
Vallejo Permit Water	25%	12,900	17,100	17,100	17,100	17,100
Lakes Madigan/Frey	25%	300	300	300	300	300
Lake Curry	25%	1,125	2,813	2,813	2,813	2,813
Solano Project Water	8%	13,432	13,432	13,432	13,432	13,432
Third Dry Year Total		***29,941***	***35,829***	***35,829***	***35,829***	***35,829***

4.7 Water Supply Adequacy

This subsection presents an assessment of the reliability of the City's water service to its customers during normal or dry water years. Total water supply sources available to the City are compared with the total projected water use demand over the next twenty years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years.

4.7.1. Projected Normal and Dry Water Year Demands

Tables 4-5 through 4-8 include projections of water demand by service area and contractual obligation in five year increments from 2005 through 2025. In those instances where demand has exceeded 90 percent of available supply thereby triggering Stage II water shortage requirements, as further discussed in subsection 4.7.2, a separate line has been added to account for mandatory water demand reduction.

Table 4-5. Projected Normal Year Demand

Demand – Normal Year (Ac-Ft)	2005	2010	2015	2020	2025
Vallejo City System	23,030	24,290	25,690	27,140	27,140
Vallejo Lakes System	330	340	350	360	370
Travis	3,400	3,860	4,330	4,790	5,250
Benicia	1,100	1,100	1,100	1,100	1,100
American Canyon	750	750	750	750	750
Other (Environmental, etc.)	1,500	1,000	1,000	1,000	1,000
Total Demand - Normal Year	***30,110***	***31,340***	***33,220***	***35,140***	***35,610***

Table 4-6. Projected Single Dry Year Demand

Demand - Single Dry Year (Ac-Ft)	2005	2010	2015	2020	2025
Gross Demand					
Vallejo City System	23,030	24,290	25,690	27,140	27,140
Vallejo Lakes System	330	340	350	360	370
Travis	3,400	3,860	4,330	4,790	5,250
Benicia	1,100	1,100	1,100	1,100	1,100
American Canyon	750	750	750	750	750
Other (Environmental, etc.)	1,500	1,000	1,000	1,000	1,000
System Efficiencies (1% Vallejo City System)	(230)	(243)	(257)	(271)	(271)
Total Pre-DRM Demand - Single Dry Year	**29,880**	**31,097**	**32,963**	**34,869**	**35,339**
Drought Response Measures (0%)	0	0	0	0	0
Adjusted Final Demand - Single Dry Year	**29,880**	**31,097**	**32,963**	**34,869**	**35,339**

In a single dry year, the City would reduce its operational use of water, such as by limiting or eliminating water line flushing, among other measures.

Table 4-7. Projected Second Dry Year Demand

Demand - Second Dry Year (Ac-Ft)	2005	2010	2015	2020	2025
Gross Demand					
Vallejo City System	23,030	24,290	25,690	27,140	27,140
Vallejo Lakes System	330	340	350	360	370
Travis	3,400	3,860	4,330	4,790	5,250
Benicia	1,100	1,100	1,100	1,100	1,100
American Canyon	750	750	750	750	750
Other (Environmental, etc.)	1,500	1,000	1,000	1,000	1,000
System Efficiencies (2% Vallejo City System)	(461)	(486)	(514)	(543)	(543)
Total Pre-DRM Demand – Second Dry Year	**29,649**	**30,854**	**32,706**	**34,597**	**35,067**
Drought Response Measures (5% City & Lakes Systems)	(1,168)	0	0	(1,375)	(1,376)
Adjusted Final Demand - Second Dry Year	**28,481**	**30,854**	**32,706**	**33,222**	**33,692**

Projected second dry year demand analysis indicates that total water demand, adjusted only for system efficiencies employed by the Vallejo Water System in its operations, would exceed 90 percent of available supply in 2020 and 2025 and would therefore trigger a Stage II water shortage response. Refer to Table 4-11. Reductions in demand due to mandatory drought response measures are estimated at 5 percent.

Table 4-8. Projected Third Dry Year Demand

Demand - Third Dry Year (Ac-Ft)	2005	2010	2015	2020	2025
Gross Demand					
Vallejo City System	23,030	24,290	25,690	27,140	27,140
Vallejo Lakes System	330	340	350	360	370
Travis	3,400	3,860	4,330	4,790	5,250
Benicia	1,100	1,100	1,100	1,100	1,100
American Canyon	750	750	750	750	750
Other (Environmental, etc.)	1,500	1,000	1,000	1,000	1,000
System Efficiencies (3% Vallejo City System)	(691)	(729)	(771)	(814)	(814)
Total Pre-DRM Demand - Third Dry Year	**29,419**	**30,611**	**32,449**	**34,326**	**34,796**
Drought Response Measures (10% City & Lakes Systems)	(2,336)	0	(2,604)	(2,750)	(2,751)
Adjusted Final Demand - Third Dry Year	**27,083**	**30,611**	**29,845**	**31,576**	**32,045**

Projected third dry year demand analysis indicates that total water demand, adjusted only for system efficiencies employed by the Vallejo Water System in its operations, would exceed 90 percent of available supply in 2015, 2020 and 2025 and would therefore trigger a Stage II water shortage response. Refer to Table 4-12. Reductions in demand due to mandatory drought response measures are estimated at 10 percent.

4.7.2. Projected Normal and Dry Water Year Supply versus Demand

Tables 4-9 through 4-12 contain summarized supply and demand assessments comparing the total water supply sources available to the City (Table 4-4) with the total projected water use demands (Tables 4-5 through 4-8) over the next twenty years, in five-year increments, for a normal water condition year, a single dry water year, and multiple consecutive years of continued dry conditions.

Table 4-9. Projected Normal Water Year Supply versus Demand

NORMAL YEAR (Ac-Ft.)	2005	2010	2015	2020	2025
Supply	38,594	46,444	46,444	46,444	46,444
Demand	30,110	31,340	33,220	35,140	35,610
Difference = Surplus or (Deficit)	8,484	15,104	13,224	11,304	10,834
Difference (as a percentage of supply)	22%	33%	28%	24%	23%

Under normal conditions of supply and demand, the City of Vallejo can meet its service obligations with surpluses ranging from 22 to 33 percent of supply.

Table 4-10. Projected Single Dry Water Year Supply versus Demand

SINGLE DRY YEAR (Ac-Ft.)	2005	2010	2015	2020	2025
Supply	33,864	40,424	40,424	40,424	40,424
Demand	29,880	31,097	32,963	34,869	35,339
Difference = Surplus or (Deficit)	3,984	9,327	7,461	5,555	5,085
Difference (as a percentage of supply)	12%	23%	18%	14%	13%

Single dry year supplies would be sufficient to meet demand, a 1 percent reduction in the Vallejo water system due to operational changes not withstanding. Normal water demand would not exceed 90 percent of supply in any year.

Table 4-11. Projected Second Dry Water Year Supply versus Demand

SECOND DRY YEAR (Ac-Ft.)	2005	2010	2015	2020	2025
Supply	31,855	38,023	38,023	38,023	38,023
Demand (Pre Drought Response)	29,649	30,854	32,706	34,597	35,067
Difference = Surplus or (Deficit)	2,206	7,168	5,316	3,425	2,955
Difference (as a percentage of supply)	**7%**	19%	14%	**9%**	**8%**
Demand with Drought Response	28,481	30,854	32,706	33,222	33,692
Difference with Drought Response	3,374	7,168	5,316	4,800	4,331

Normal water demand would exceed 90 percent of supply in 2020 and 2025 and would therefore trigger a Stage II water shortage response. System-wide water use reduction on the order of 5% would be expected. The effect of the demand reduction by drought response measures is shown in Table 4-11.

Table 4-12. Projected Third Dry Water Year Supply versus Demand

THIRD DRY YEAR (Ac-Ft.)	2005	2010	2015	2020	2025
Supply	29,941	35,829	35,829	35,829	35,829
Demand (Pre Drought Response)	29,419	30,611	32,449	34,326	34,796
Difference = Surplus or (Deficit)	522	5,217	3,379	1,503	1,033
Difference (as a percentage of supply)	**2%**	15%	**9%**	**4%**	**3%**
Demand with Drought Response	27,083	30,611	29,845	31,576	32,045
Difference with Drought Response	2,858	5,217	5,983	4,253	3,784

Normal water demand would exceed 90 percent of supply in 2015, 2020, and 2025 and would therefore trigger a Stage II water shortage response. System-wide water use reductions on the order of 10% would be expected. The effect of the demand reduction by drought response measures is shown in Table 4-12.

4.8 Water Supply Conveyance Projects

No water supply projects are currently planned which increase water supply quantity beyond the City's current full water rights and entitlements. The City does, however, have several projects related to conveyance of its existing water supplies.

The City is planning to install pipeline inter-connections and pumping facilities in 2007 to permanently provide the Travis Water Treatment Plant serving Travis Air Force Base with a secondary, alternative, higher quality water source, namely Solano Project water. This project does not add new supply, but allows one supply source to be used at a new location.

The City owns water rights to Lake Curry but presently lacks the physical means to convey the 3,750 ac-ft annual safe water yield for use at the Fleming Hill Water Treatment Plant. Lake Curry is currently providing instream flow and with the completion of a means of conveyance Lake Curry supplies can be accounted for within the surface water supplies beginning in 2010, at which time the system will bring back online 3,750 ac-ft/yr of water, some of which may continue to be used for instream flow. The City is undertaking environmental studies to evaluate the effectiveness of several conveyance scenarios. One conveyance option contemplates the release of water from Lake Curry dam to flow into Suisun Creek. This would require the construction of a diversion structure and pumping station approximately 5 miles downstream, where Suisun Creek crosses the Putah South Canal. This water would then be usable by the City at the U.S.B.R. terminal reservoir in the identical manner in which Lake Berryessa water is currently used. A second conveyance option requires the construction of a 5-mile-long raw water pipe along the existing Gordon Valley Road from the Lake Curry dam outlet to the point of intersection of Gordon Valley Road and the Putah South Canal. The water would then be directed into the Putah South Canal and would be usable by the City in the same manner as is currently employed for Solano Project, Lake Berryessa water. The capital outlay program for financing this conveyance project has not been drafted as the options vary greatly in cost, with estimates ranging from 0.5 to 5 million dollars, depending on which alternative is implemented. Regardless of which option is ultimately implemented, the City has informed the State Water Resources Control Board that the conveyance structures are intended to be completed by approximately 2010.

SECTION 5 - WASTEWATER AND RECYCLED WATER

This section provides information on wastewater and the potential for use of recycled water in the Vallejo area, including: the quantity of wastewater generated in the service area; a description of the collection, treatment, and disposal/reuse of collected wastewater; current plans for water recycling; and the potential for water recycling in the service area. The primary source of information is the "Reclaimed Water Study" (August 2003) prepared by Raines, Melton & Carella, Inc. for the Vallejo Sanitation and Flood Control District (VSFCD) in fulfillment of Provision 13 of the District's National Pollution Discharge Elimination System (NPDES) Permit's Waste Discharge Requirements. Additional information was provided by District staff.

5.1 Coordination

A market assessment of recycled water opportunities in the Vallejo service area was done through evaluation of service area maps and through interviews and discussion with staff and representatives of the VSFCD, Vallejo Water and Planning Divisions, the Greater Vallejo Recreation District, CALTRANS, and Lennar Mare Island, LLC.

The process led to identification of 57 potential recycled water use sites including landscape irrigation of cemeteries, parks, schools, municipal facilities, amusement parks and golf courses; and toilet flushing at two proposed hotel complexes associated with two separate redevelopment projects (e.g. Downtown/Waterfront and Fairgrounds Redevelopment Projects).

The City has coordinated the most with the Vallejo Sanitation and Flood Control District (VSFCD) regarding a potential recycled water plan. VSFCD is a Special District, separate and apart form the City, created by a special act of the California State Legislature in 1952. It was developed through cooperation of the City of Vallejo and Solano County to address area-wide storm drainage and sewer problems. VSFCD serves a total area of approximately 28 square miles covering and a population of about 120,000 in the City of Vallejo and unincorporated areas in the greater Vallejo area including Mare Island, Glen Cove, Homeacres and Sky Valley.

The City and VSFCD have considered reclaimed urban wastewater. Reclaimed, secondary-treated water is available, but studies have repeatedly shown that its distribution is cost prohibitive.

5.2 Wastewater Collection and Treatment

Collection, treatment and discharge of wastewater in the Vallejo service area are provided by VSFCD. The collection system is comprised of 370 miles of pipeline, ranging from 6 to 60 inches in diameter, and 16 pump stations.

The wastewater treatment plant has an average dry weather capacity of 15.5 million gallons per day (mgd), a wet weather capacity of 35 mgd for full secondary treatment, and an additional 30 mgd for wet weather primary treatment. The plant currently discharges an annual dry weather flow of 10.3 mgd and a maximum wet weather flow of 60 mgd. Treated wastewater is discharged via a deep water outfall (e.g. 200:1 dilution ratio) to the Carquinez Strait. During wet weather, when plant flows exceed 30 mgd, secondary-treated wastewater is also discharged into the Mare Island Strait via a deep water outfall receiving a minimum dilution ratio of 10:1.

The treatment process consists of aerated grit removal, primary sedimentation, biological treatment using a trickling filter/solids contact process, secondary clarification, and disinfection by sodium hypochlorite or ultraviolet light. Additional treatment facilities are available to supplement the wet weather secondary treatment capacity of 35 mgd. When wet weather flows exceed 30 mgd, treated effluent is discharged to the Carquinez Strait and Mare Island Strait using an automated split flow process. Effluent discharged to Mare Island Strait receives full secondary treatment. Wet-weather effluent discharged to the Carquinez Strait is a blend of disinfected primary and secondary treated effluent. This split flow process ensures that the highest quality effluent at minimum flows is discharged to the Mare Island Strait. A summary of treatment process and respective flows and discharge locations is shown in Table 5-1.

Table 5-1. Summary of Flow and Treatment Process

Flow	Treatment Level	Discharge Location
Up to 35 mgd	Secondary	Carquinez Strait
Greater than 35 mgd ▶	Blended disinfected primary and secondary	Carquinez Strait
▶	Disinfected secondary. Discharge to Mare Island Strait occurs only for flows exceeding 30 mgd	Mare Island Strait

Screenings and grit removed during primary treatment are transported to a landfill for disposal. Sludge collected at the primary sedimentation basins is pumped to a blending tank. Waste activated sludge generated during the secondary treatment process is thickened using gravity belt thickeners and pumped to the blending tank where it is mixed with the primary sludge, treated with lime, and dewatered before it is transported to Tubbs Island and used as fertilizer.

Table 5-2 illustrates how the secondary effluent meets the following water quality requirements established in the NPDES permit.

Table 5-2. Effluent Water Quality Requirements

Constituent	Units	Monthly Average	Weekly Average
BOD	**mg/L**	**30**	**45**
Total Suspended Solids	**mg/L**	**30**	**45**
Total Chlorine Residual	**mg/L**	**0.0**	**0.0**
Fecal Coliform	**MPN/100 ml**	**200**	**N/A**
Mercury[a]	**Kg/month**	**0.357**	**N/A**
Copper[a]	**Kg/month**	**15**	**N/A**
Nickel[a]	**Kg/month**	**6.5**	**N/A**
Selenium[a]	**Kg/month**	**2.0**	**N/A**

[a] Interim limits in place until TMDL and Waste Load Allocation processes are completed and implemented.

5.3 Wastewater Generation

Municipal wastewater is generated in the service area from a combination of residential, commercial, industrial and institutional sources. The quantities of wastewater generated are proportional to the population and the water use in the service area. Estimates of average wastewater flows for the present and future conditions for the City's service area population are presented in Table 5-3. Residential flow estimates were based on ABAG 2002 population projections listed in Table 5-3 and a per capita unit flow of 100 gal/capita/day up to a population of 70,000, and 85 gal/capita/day above a population of 70,000. Commercial flow estimates were based on ABAG 2002 employee projections using the area projection method. Since 2000, the District has pursued an aggressive program of replacing leaky sewers. Accordingly, flows from 2000 to 2005 have decreased although population has increased. For the planning horizon shown in Table 5-3, District staff anticipates flows to increase proportionately to population figures.

Table 5-3. Estimated Average Wastewater Generation

Year	Population[a]	Annual average dry weather wastewater flow, mgd	Wastewater flow, ac-ft/yr
2000	147,360	11.5	4,293
2005	163,550	10.4	3,882
2010	176,380	11.2[(b)]	4,181
2015	181,820	11.5[(b)]	4,293
2020	191,700	12.1[(b)]	4,517
2025	198,000	12.5[(c)]	4,666

[a] ABAG, 2002 Population and Employee Projections,
Note: The treatment plant is currently permitted to treat 15.5 mgd.
Source: Rains, Melton, and Carella, Inc. July 2001
[b] Estimates are extrapolated.
[c] Rudolf Ohlemutz, Vallejo Sanitation and Flood Control District, January 2006 telecommunication.

5.4 Wastewater Treatment and Recycling

The VSFCD owned and operated WWTF provides the wastewater treatment service for the City. The wastewater at the WWTF undergoes conventional secondary treatment with activated sludge and chlorination/dechlorination. The WWTF has a dry weather wastewater treatment capacity to treat 15.5 mgd and has a wet weather treatment capacity of 30 mgd. Currently, approximately 12.1 mgd of wastewater is treated at the WWTF. All of the treated effluent from the WWTF is discharged via pipeline to the Carquinez Strait, with the exception of a small amount which is used for on-site propagation of native plants. Recycling of water is currently not performed.

The VSFCD's recommended recycled water program for the City is to construct a tertiary treatment facility at the existing WWTF. The most cost-effective uses for an initial phase is to provide a distribution system to connect to an existing raw water pipeline and, from that, serve sites located in the northwest portion of Vallejo, near the Highway 37/I-80 interchange and along Columbus Parkway in Vallejo. Besides these major markets, other potential sites include several

parks and school playing fields north of Highway 37 between I-80 and Highway 29. In addition, there is a potential for recycled water use associated with the redevelopment plans at the Solano County Fairgrounds located in the southwest corner of the Highway 37/I-80 interchange. The site is 152 acres in size and includes a horse racing track, a 9-hole golf course, a small motor racetrack, parking facilities, and various building used for year-round expositions. Although the Fairgrounds are located within the City of Vallejo, it is owned by Solano County and managed by the Solano County Fair Association (SCFA). The SCFA plans to redevelop portions of the grounds. There is a future potential recycled water market for the recreation-related facilities.

5.5 Potential Water Recycling in the Vallejo Service Area

The State of California in Title 22 of the Code of Regulations has established water quality criteria for use of recycled water. The required water quality and the level of treatment depend on what the recycled water is used for. Disinfected Secondary Recycled Water (2.2 and 23) can be used for irrigating cemeteries, freeway landscaping, and restricted access golf courses. The more highly treated, Disinfected Tertiary Recycled Water can be used for all the above uses as well as irrigation for parks and playgrounds, school yards, residential landscaping, and unrestricted access golf courses, and for the flushing of toilets and urinals.

The VSFCD preliminarily identified reuse alternatives for the WWTF based on secondary treatment and tertiary treatment of wastewater in the VSFCD Reclaimed Water Study Plan (July 2001). The final Reclaimed Water Study was completed in August 2003. Secondary treatment reuse alternatives are considered not cost-effective due to the distribution of customers and are not being studied. Tertiary treatment reuse alternatives currently being studied include urban landscape irrigation (with centralized and satellite treatment), and industrial reuse. It is anticipated that the WWTF expansion and improvements outlined in the VSFCD Reclaimed Water Study Plan may serve the needs of the City until sometime between 2025 and 2035. There are no current plans to construct the transmission lines and pumping stations needed to return treated wastewater to the water utility service area for urban landscape irrigation or other reuse alternatives in the near future due to the lack of cost-effectiveness. For the purposes of this report, the recycled water supply for urban use within the City's service area is assumed to be 0 acre-feet per year for the next 20 years. The potential recycled water market has been preliminarily estimated at an annual total of 650 million gallons and a peak demand of 3 mgd during summer months. This represents approximately 25% of VSFCD's current dry weather average discharge of 12.1 mgd. The future use of recycled water within the City is still being evaluated, and this assumption may change in the future.

Table 5-4. Assumed Recycled Water Supply for Urban Use

Year	Ac-ft/yr
2005	**0**
2010	**0**
2015	**0**
2020	**0**
2025	**0**

SECTION 6 - DEMAND MANAGEMENT MEASURES

This section includes an overview of the City of Vallejo's Water Conservation Program, including program priority guidelines, and descriptions of the 14 demand management measures included in the Urban Water Management Planning Act.

6.1 Overview

Water conservation, or demand management, is a method available to reduce water demands, thereby reducing water supply needs for the City. This section describes the conservation program proposed for fiscal years 2005/2006 through 2009/2010 through implementation of demand management measures (DMMs), including methods to evaluate effectiveness, estimate water savings, and proposed budgets. The success of some of the practices depends on cooperative work with other entities. To the maximum extent possible the City will design programs in coordination with other agencies to leverage agency resources, reduce program costs, and improve cost-effectiveness. The City has participated in regional grants through the Solano County Water Agency – Urban Water Conservation Committee.

The City is only required to implement those measures that are found to be cost-effective (those with a benefit-cost ratio greater than 1.0). The measures that are not fully implemented are not cost effective. In some cases, the City has partially implemented measures, even though they are not cost-effective, in order to provide information to customers or to gain program experience.

The City of Vallejo will seek additional funding in the form of grants and cost-sharing with other agencies. The Vallejo Sanitation and Flood Control District has financially supported the program in the past and may be available to partner with the City on specific projects.

The City of Vallejo is not a signatory to the voluntary California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding. Due to staffing shortages, the City has not been able to fully implement all of the best management practices (BMPs) according to the schedule presented in the 1999 Water Management Plan. In addition, some BMPs were not reviewed for cost-effectiveness in 1999.

As a participating member of the Solano Project, the City is required by the USBR to utilize on-line BMP (or DMM) reporting and available water savings calculation tools on the CUWCC website. The City of Vallejo has begun to file annual program updates for the U.S. Bureau of Reclamation by filling in the information for urban BMPs on the CUWCC website, via the CUWCC's BMP Reporting Database located on their web site at www.cuwcc.org. By March 31, 2006 the reports through the end of fiscal year 2004/2005 will be formally submitted.

The City will track and record water conservation efforts and, in the absence of City-specific program data, will use standard methods of measuring water savings, as recommended by the CUWCC to measure the effectiveness of its programs and to estimate actual water savings.

In May 2005, Maddaus Water Management prepared cost-benefit calculations, more specifically benefit-to-cost ratios, for most of the DMMs. The results showed that the programs would cost more than the value of the City's avoided water procurement and operational costs associated with

the water savings. From the agency perspective, many of the DMMs are not cost-effective. This is primarily due to the pricing structure of the City's relatively inexpensive water supplies, with large flat costs irrespective of actual usage. However, the City does incur significant pumping costs to convey raw water into the City and distribute treated water. The rising cost of electricity and natural gas could eventually tip the scale. An updated review of current avoidable costs will be included in the annual report submittal to the USBR on plan implementation.

6.1.1 Program Priorities

It is the goal of the City of Vallejo Water Conservation Program to meet all federal and state water management plan preparation, implementation and reporting requirements, and to prepare plans reflecting the following order of program priorities under normal water supply conditions:

1. Improve the quality (accuracy and detail) and quantity of information collected to adequately describe the City's water supplies, potable water production, storage, system losses, and customer raw and potable water use characteristics.

2. Provide information and small, low-cost water saving devices to interested water customers (individuals and groups) by purchasing and/or producing appropriate materials and offering speakers. Pursue joint purchasing with other agencies to lower per unit cost.

3. Provide information to students and educators by purchasing and/or producing appropriate materials and training opportunities and offering speakers. Pursue joint purchasing with other agencies to lower per unit cost.

4. With the exception of data collection, public information, and school education program components, expend water system resources (staff time and funds) only on demand management measures that are shown to be potentially cost-effective from the water system perspective.

5. Research and apply for grants and no- or low-interest loans, co-operative agreements, joint programs and purchasing pools, and other means of funding demand management measures and improving their cost-effectiveness.

6. Reduce water usage by all entities, including the water system itself, which do not pay the full cost of water used and are therefore subsidized, through implementation of cost-effective demand management measures. The measures should focus on reducing water system losses and improving landscape irrigation efficiency (since irrigation accounts for a large portion of water use and contributes significantly to peak system water demand).

7. Provide further assistance, beyond information and small water-saving devices, to interested water customers in the form of identified, cost-effective demand management measures. In comparing measures, give priority to the measure with the lowest unit cost of water saved.

8. To test alternative measures and to gain program experience, participate in regional or state-wide projects with small-scale and low-cost measures not yet proven to be

cost-effective from the water system perspective, as available funds and staff time allow.

9. Implement an awareness program to contact and encourage water customers, identified through billing records as higher-than-average water users, to consider water conserving steps.

6.2 DMM 1 - Water Survey Programs for Single and Multi-Family Residential Customers

Past Activities. The City's previous plan called for 4,855 single-family surveys and 3,703 multi-family surveys to be performed by the end of FY 2008-2009, and a pilot program involving students at two grade levels to be undertaken. As of December 2005 no surveys have been performed, due primarily to a lack of resources. Although staff has researched the costs and methods of providing surveys, and received training and met with prospective surveyors, there are outstanding issues, such as liability concerns and cost-effectiveness, which must be addressed. Unfortunately, a benefit-to-cost ratio calculation was not initially prepared, which would have allowed the City to exempt from full implementation of this measure.

Some of the City's activities which contribute towards the goal of reducing residential water use include:

- Offered high quality informational brochures and pamphlets and water saving tips on local TV.
- Sunset Magazine's "Water & Energy Savings in the West," "How to Water Your Garden" and "Water-Wise Gardening for California" were purchased in bulk.
- Water staff (admin, billing, meter, maint.) answered customers' questions on leaks and reducing water use.
- Coordinator attended Water-Wise Landscaping Workshop Series in Napa in May 2004. Series was advertised in the greater Vallejo area.

Current and Proposed Program Description. As calculated by Maddaus Water Management, the benefit-cost ratio for the survey program from the agency perspective is 0.23. Therefore, the City exempts from full CUWCC BMP implementation but offers the listed measures to assist its residential water customers and to gain program experience.

In FY2005/2006 the City entered into an agreement with Resource Action Programs to offer a WaterWise program in several fifth grade classrooms in Vallejo. Students receive a retrofit kit and instructions on performing a home water use survey. Students also engage in classroom activities related to the program. The program will be extended for at least one more year to collect data to assess whether the program will prove cost-effective. First year program budget is $10,000.

Meetings were held with representatives of the Vallejo Sanitation and Flood Control District to discuss possible joint projects and it was agreed to attempt to meet quarterly. The District is most interested in reducing non-point source pollution, such as pesticides/fertilizers in landscape

irrigation runoff. Other City programs (Recycling and Code Enforcement) were contacted to discuss possible joint programs or assistance.

In addition to the above, the City will provide the following public information services to assist its residential water customers to reduce exterior and interior home water use.

FY2005/2006

- Provide residential water conserving tips on the City's website and links to useful sites.
- Water savings brochures, pamphlets, etc. are available at water offices, community events, and mailed upon request.
- Water staff (admin, billing, meter, maint.) answer customers questions on leaks and reducing water use.
- Discussions with the City of Fairfield on training opportunities. Attend surveys in spring 2006.
- Research current options and costs of training surveyors.
- Prepare contact lists of community groups, educators, and master gardeners.

FY 2006/2007

- Continue Resource Action Program (RAP) WaterWise student home water use survey program.
- Provide improved residential water conserving tips on the City's website and links to useful sites.
- Water savings brochures, pamphlets, etc. to be available at water offices, community events, and mailed upon request.
- Water Billing staff to offer information packets (including retrofit kits for pre-1992 residences) to new and change-of-service customer accounts.
- Water staff (admin, billing, meter, maint.) answer customers questions on leaks and reducing water use.
- Contact sources of potential volunteer surveyors.
- Training of staff and volunteers (if available) in the techniques of residential surveys.
- Provide information and speakers for groups. Offer workshops.
- Research and design a "do-it-yourself" survey kit, including retrofit materials. Offer to customers who receive "high use" notices.
- Notices to be printed on residential customers' water bills prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary.
- Notices to be printed on residential customers' water bills at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.
- Provide PSAs on local TV channel in the early fall reminding customers to reduce outside watering.
- Meet quarterly with staff from VSFCD and City to identify areas of program overlap and possible staff/fund sharing.

FY 2007/2008

- Evaluate two years worth of data on RAP's WaterWise school/home program and determine whether the program is cost-effective and should be continued.

- Provide improved residential water conserving tips on the City's website and links to useful sites.
- Water savings brochures, pamphlets, etc. to be available at water offices, community events, and mailed upon request.
- Water staff (admin, billing, meter, maint.) answer customers questions on leaks and reducing water use.
- Begin to offer water use surveys to customers with anomalous high water use to encourage leak repair and minimize water loss using either volunteers or City staff (dedicated 80 hours/yr). Surveys shall include the activities listed below.
- Continue to seek and train volunteers.
- Continue to provide information, speakers, workshops.
- Expand distribution of "do-it-yourself" survey kits, including retrofit materials, beyond "high use" to customers receiving notices of watermain flushing in their area.
- Provide PSAs in the early fall reminding customers to reduce outside watering.
- Notices to be printed on residential customers' water bills prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary.
- Notices to be printed on residential customers' water bills at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.
- Meet quarterly with staff from VSFCD and City to identify areas of program overlap and possible staff/fund sharing.

FY 2008/2009 & FY 2009/2010

Continue above outlined effort, and perform an annual review to determine if a direct home water survey program would be cost-effective, and if so, implement.

If the City finds that a full residential water survey program would be cost-effective, the City will develop a water survey program for residential customers. To determine actual cost-benefit and effectiveness of residential audits, a pilot program would be developed and tested in the City. The program would be implemented to reach 50 percent of the total target (as originally proposed in the 1999 Water Management Plan). The program would include the following actions:

a) Contact via letter or telephone at least 2% (10% full program) of single-family and 2% (10% full program) of multi-family residential customers each year. Also offer surveys to new customers and customers with high bill complaints.

b) Provide surveys to 350 single-family (full target - 700 homes) and 265 multi-family units (full target - 530 units) residential customers

c) Instruct customers in meter reading

d) Check for leaks, including toilets/faucets and, if necessary, provide toilet flappers/faucet washers.

e) Check showerhead and aerator flow rates, and provide low-flow models, as necessary.

f) Check toilet flow rates and, when appropriate, recommend a ULFT replacement.

g) Check irrigation system for leaks / overlap and determine timer functioning and current schedule.

h) Measure landscaped area and develop irrigation schedule.

i) Provide customer with evaluation results, water saving recommendations and other information

Schedule. The City is currently implementing a pilot program to test a residential water use survey program where students audit their own homes. This program will focus on 5th grade students to best match the state curriculum.

In addition, a small number of surveys will be done beginning in FY2007/2008 to gain program experience.

Table 6-1. Implementation Schedule for DMM 1

BMP number and name	B1 – Residential Water Audits
Type of Program	Pilot
Target Level	City Pilot
FY05/06 Actions/Budget	Begin pilot program of classroom student based home water use surveys & continue public information efforts / $10,000
FY06/07 Actions/Budget	Continue implementation of pilot program & other efforts / $10,000
FY07/08 Actions/Budget	Review pilot program results and prepare a cost-benefit analysis based on actual program expenditures. Either continue the program or prepare exemption justification. Begin to offer small number of home surveys.
FY08/09 Actions/Budget	To be determined., but minimum (80 Hrs. surveys.)
FY09/10 Actions/Budget	To be determined, but minimum (80 Hrs.) surveys.
Admin. Staffing	200 Hours to design and implement the Pilot Program
Program Staffing	Consultant services & Staff

Methods to Evaluate Effectiveness. The City collects annually the following information for inclusion in the USBR Plan Annual Update:

- Number of single-family and multi-family residential accounts in service area.
- Number of single-family residential surveys offered during reporting period.
- Number of single-family residential surveys completed during reporting period.
- Number of multi-family residential surveys offered during reporting period.
- Number of multi-family residential surveys completed during reporting period.
- Monitor annual water-use changes in consumption at surveyed accounts, individually and as a group, as feasible.

6.3 DMM 2 - Residential Plumbing Retrofit

Past Activities. The City has been distributing nearly $18,000 worth of retrofit kits purchased several years ago via "hardware give-aways" at community events, during Water Awareness Month, upon customer request at various City offices and in bulk to one apartment complex. Since 1992 Vallejo has distributed low-flow showerheads to pre-1980 households in the service area (as required by the previous version of this DMM). Currently, this DMM requires retrofitting of all

pre-1992 residences, which is estimated to be 27,500 homes and 21,000 multi-family residential units. Unfortunately, no cost-benefit analysis on this measure was completed until recently.

Per the 1999 Water Management Plan, plumbing retrofit kits were to be provided to all pre-1992 accounts at change of account status (unless the City has a record of a retrofit at that account). Customers were also to be offered water use surveys (DMM 1) at change of account status. If a survey was scheduled at that time, the retrofit kit was to have been delivered at the time of the survey. If the change of account method did not produce the targeted implementation level, other distribution channels were to be developed. At the time of kit give away, the address is recorded but no record has been made in the water billing system.

Current and Proposed Program Description. As calculated by Maddaus Water Management, the benefit-cost ratio for this DMM is only 0.41 from the agency perspective. Therefore, the City exempts from full CUWCC BMP implementation but offers the listed measures to assist its residential water customers.

FY 2005/2006

- Hardware Give-Aways at community events, during Water Awareness Month, upon customer request & to two apartment complexes.
- Request bulk purchase of retrofit kits with other SCWA water agencies.

FY 2006/2007

- Hardware Give-Aways at community events, during Water Awareness Month, upon customer request, at workshops, included in "do-it-yourself" kits, and to 5 apartment complexes or homeowner associations.
- Prepare a purchasing guide, for water-saving fixtures and equipment for use inside the home, that identifies parts and equipment, indicates a price range for each item, and lists local suppliers (not endorsement).

FY 2007/2008 and Beyond

- Hardware Give-Aways at community events, during Water Awareness Month, upon customer request, at workshops, included in "do-it-yourself" kits, and to 10 apartment complexes or homeowner associations.
- Request bulk purchase of retrofit kits with other SCWA water agencies.
- Continue to distribute inside home purchasing guide, update as needed.
- Prepare a purchasing guide, for water-saving fixtures and equipment for use outside the home, that identifies parts and equipment, indicates a price range for each item, and lists local suppliers (not endorsement).

Schedule. Implementation will consist of the following actions. Table 6-2 presents the schedule for DMM 2.

a) Retrofit kits will consist of high-quality, 2.5 gpm or less showerheads and 2.2 gpm or less faucet aerators

b) Track the location, type and number of retrofits completed, devices distributed, and program costs.

Table 6-2. Implementation Schedule for DMM 2

BMP number and name	DMM2 – Residential Retrofit
Type of Program	Partial Target
Target Level	Continue Distribution of Kits.
FY05/06 Actions/Budget	Give-aways/2 Apt. Bldgs./$6K
FY06/07 Actions/Budget	Give-aways/5 Apt. Bldgs./$6K
FY07/08 Actions/Budget	Give-aways/10 Apt. Bldgs./$6K
FY08/09 Actions/Budget	Give-aways/10Apt Bldgs./$6K
FY09/10 Actions/Budget	Give-aways/10 Apt Bldgs./$6K
Admin. Staffing	100 Hours to supervise program
Program Staffing	40 Hours additional for existing staff; may also use consultant services
Program Description	Retrofit kits, containing 2.5 gpm showerheads and 2.2 gpm aerators, will be provided to pre-1992 residences. Resident addresses will be tracked

Methods to Evaluate Effectiveness. The City will annually collect the following information for inclusion in the USBR Plan Annual Update:

- The total number of non-retrofitted pre-1992 single-family residences and multi-family units.
- The number of retrofit kits distributed and installed during previous reporting period.
- The estimated percentage of pre-1992 single-family residences and multi-family units in service area fitted with low flow showerheads and faucet aerators.

6.4 DMM 3 - System Water Audits, Leak Detection, and Repair

Past Activities. The City reviews its water system statistics and has made progress in this area. Leak detection equipment with "dataloggers" has been purchased and training offered to staff. Watermain repairs are ongoing. Customers are advised by "high use" door hangers of possible leaks.

Unaccounted for water, which includes meter losses and inaccuracies, pipeline leaks, etc. is assumed to be approximately 11% of total metered water use for calibration purposes. This value is expected to drop due to enforcement of illegal connection removal, enhanced flushing and maintenance practices, and greater meter accuracy due to large meter replacement projects which will accurately gauge the true cost of service and create incentives for best management practices and reductions in use.

Current and Proposed Program Description. The City's program consists of the following actions:

a) Annually complete a prescreening system audit to determine the need for a full-scale system audit. The prescreening system audit is calculated as follows:

   i) Determine metered sales.
   ii) Determine other system verifiable uses.
   iii) Determine total supply into system.

iv) Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a full-scale system audit is indicated.

b) When indicated, the City will complete a water audit of its distribution system using methodology consistent with that described in AWWA's "Water Audit and Leak Detection Guidebook."

c) The City also: advises customers whenever it appears possible that leaks exist on the customer's side of the meter; performs distribution system leak detection when warranted and cost-effective; and repairs leaks when found.

FY 2005/2006

- A prescreening system audit will be completed, with more detailed data collected, and if indicated (>10% unaccounted for loss) a full-scale system audit will be done per AWWA guidelines in FYE06.
- Leak detection using "dataloggers" in response to specific problem areas continued.
- Watermain repairs and replacements continued.
- Customers advised of "high use."

FY 2006/2007

- A prescreening system audit will be completed, and if indicated (>10% unaccounted for loss) a full-scale system audit will be done per AWWA guidelines.
- Leak detection at suspect sites using dataloggers."
- Study and design a cost-effective, proactive, systematic, multi-year leak detection program for implementation in FY2007.
- Continue watermain repairs and annual replacement programs.
- Customers advised of "high use" and basic leak repair, and offer of further information and retrofit kits.

FY 2007/2008 and Beyond

- A prescreening system audit will be completed, and if indicated (>10% unaccounted for loss) a full-scale system audit will be done per AWWA guidelines.
- Leak detection at suspect sites using dataloggers."
- Begin implementation of a multi-year leak detection program.
- Continue watermain repairs and annual replacement programs.
- Customers advised of "high use" and basic leak repair, and offer of further information and retrofit kits.

Schedule. Prescreening system audits will be performed annually. The implementation schedule for DMM 3 is shown in Table 6-3.

Table 6-3. Implementation Schedule for DMM 3

BMP number and name	DMM3 – System Water Audit and Leak Detection
Type of Program	Full Target
Target Level	100 percent
FY05/06 Actions/Budget	Complete prescreening /budget for full program if indicated/$5K
FY06/07 Actions/Budget	Complete prescreening/ budget for full program if indicated/$5K
FY07/08 Actions/Budget	Complete prescreening/ budget for full program if indicated/$5K
FY08/09 Actions/Budget	Complete prescreening/ budget for full program if indicated/$5K
FY09/10 Actions/Budget	Complete prescreening/ budget for full program if indicated/$5K
Budget	$5K/Yr. majority existing – adopted water admin. and maintenance budget
Admin. Staffing	20 Hours, Water Conservation Coordinator
Program Staffing	Public Works Water Maintenance & Engineering Staff
Program Description	Conduct prescreening water audit. If unaccounted for water is >10 percent, City will budget for a full audit and leak detection program.

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- Prescreening audit results and supporting documentation;
- Maintain in-house records of audit results or the completed AWWA Audit Worksheets for each completed audit period.

6.5 DMM 4 - Commodity Rates for all New Connections and Retrofit of Existing Connections

Past Activities. All new connections are metered and billed by volume of use. During FY 2003-2004 the City completed a project to identify accounts which were not billed by volume of use and the historical and/or contractual basis for the non-billing. In spring 2004 the City Manager directed that all contracts or policies allowing for non-billing of water be reviewed and terminated where legally feasible. For the first time, City Depts. (other than Water) were directed to pay the full cost of the water they used. Due to legal constraints, only one half of the Vallejo Golf Club's Blue Rock courses was found to be billable at the time. Due to legal constraints only non-Master Lease Greater Vallejo Park District (GVRD)-controlled properties were found to be billable at the time.

The City installed an additional meter to improve usage accuracy at large golf course over former method and beginning in FY2004/2005 the Vallejo Golf Club was responsible for paying the full cost for a portion of its raw water use.

Current and Proposed Program Description. All new connections are metered and billed by volume of use. All existing accounts are metered but very few are not billed by volume of use. City water staff will work with the City Attorney's office to identify the needed mechanisms, such as municipal ordinance, policy directive or contract renegotiations, to transfer these accounts at the earliest possible time to a "bill by volume" status. Progress will be included in the annual update reports.

The City will also conduct a study to identify any barriers or disincentives to retrofitting mixed-use commercial, industrial and institutional (CII) accounts with dedicated landscape meters and will assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

Meter Replacement. Meter accuracy is a vital issue to a water system, with impacts on water revenue, the reliability of consumption statistics, and equity among water consumers. The City has an ongoing meter replacement program.

FY 2005/2006

- All new connections are metered and billed by volume of use.
- City staff is working with GVRD to identify individual properties not covered under the Master Lease and for which full cost of water should be paid.
- A schedule will be prepared of the expiration dates of remaining lease provisions which require water to be provided for non-water system uses without payment.
- Confirm all recently identified billables (City, Golf Course, GVRD) are billed and collected.
- Pipeline right-of-way water allotments will be reviewed, and bills will be prepared, if warranted.
- Collect data needed to identify CII accounts with mixed-use meters. (Utility billing system, wastewater utility, business licenses, backflow prevention program, and field checks.)

FY 2006/2007

- All new connections will be metered and billed by volume of use.
- Prepare annual review of remaining legal restrictions to full system bill-by-volume. Confirm all recently identified billables (City, Golf Course, GVRD) are billed and collected.
- Pipeline right-of-way water allotments will be reviewed and compared to actual use. Bills will be prepared, if warranted.
- Work with City's MIS Division to perform an audit of the utility billing system to ensure that all customers are billed correctly.
- Use data obtained from several sources to identify the number and location of CII accounts with mixed-use meters.
- Research and identify intra- and inter-agency disincentives or barriers to retrofitting mixed-use CII accounts with dedicated landscape meters. Design and initiate a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters.

FY 2007/2008

- All new connections will be metered and billed by volume of use.
- Prepare annual review of remaining legal restrictions to full system bill-by-volume.
- Confirm all identified billables (City, Golf Course, GVRD) are billed and collected.
- Pipeline right-of-way water allotments will be reviewed and compared to actual usage. Bills will be prepared, if warranted.

- Request an audit of the utility billing system be performed immediately before and after any software changes or upgrades are to be made to the system which could conceivably impact customer billing.
- Complete a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters. Begin steps to implement program, if warranted.

FY 2008/2009 and Beyond

- Perform all annual activities as listed above.
- Implement program to provide incentives to switch mixed-use accounts to dedicated landscape meters, if demonstrated to be feasible.

Schedule. Meter replacement is implemented annually on an ongoing basis. The implementation schedule for DMM 4 is shown in Table 6-4.

Table 6-4. Implementation Schedule for DMM 4

BMP number and name	Metering with Commodity Rates
Type of Program	Study of CII mixed use meters and bill-by-quantity for City Parks
Target Level	Partially completed/ Additional study required
FY05/06 Actions/Budget	Review status of accounts/$5K
FY06/07 Actions/Budget	Start feasibility study of dedicated landscape accts./$5K
FY07/08 Actions/Budget	Complete feasibility study of dedicated landscape accts./$5K
FY08/09 Actions/Budget	Annual data collection and TBD/$5K
FY09/10 Actions/Budget	TBD/$5K
Admin. Staffing	80 Hours to research and prepare study results.
Program Staffing	None
Program Description	Staff will conduct studies of CII dedicated landscape meters and bill-by-quantity for City Parks. The results of the studies and recommended actions will be presented to the City Council

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- Confirmation that all new connections are metered and are being billed by volume of use.
- Number of accounts not billed by volume of use and reason
- Number of CII accounts with mixed-use meters.
- Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.

6.6 DMM 5 - Large Landscape Water Audits and Incentives

Past Activities. The City financially supported a regional pilot program in FY99/00 to establish and implement an effective landscape water audit program design or to develop the data for exemption. In FY01/02 and FY02/03 the City participated in a successful regional Prop 13 grant request for centralized ET-based irrigation controller installation at selected sites (Jesse Bethel High School in Vallejo). In addition to the controller, computer control and a weather station were

also installed (Jesse Bethel High). This project was coordinated with the Vallejo Unified School District and City landscape staff. It is anticipated that more sites can make use of the weather station, the only one in the area.

Water-efficient landscape design brochures were available in water offices, at community events, and were mailed upon request.

Current and Proposed Program Description. Benefit-cost ratios for the two primary types of landscape water management programs were derived: 1) the ratio for preparation of water budgets was 0.66 from the agency perspective; and 2) the ratio for providing water use surveys of landscaped sites was 0.80 from the agency perspective. Therefore, the City exempts from full CUWCC BMP (DMM) implementation but offers the listed measures to assist its large landscape water customers.

Landscape audits will be offered to a small percentage of dedicated irrigation accounts. The audit consists of sending an irrigation expert to selected turfgrass sites to evaluate and recommend improvements in irrigation practices.

Customer Support, Education, and Assistance. Provide non-residential customers with support and incentives to improve their landscape water use efficiency. The program will provide:

FY 2005/2006

- Provide landscape irrigation water conserving tips on the City's website and links to useful sites.
- Follow up on Large Landscape Pilot Program (Water Savings) Et – Based Irrigation System, Computer Control, and Weather Station (Jesse Bethel High), worked with Vallejo Unified School District and City landscape staff. (Paid for installation)
- Meet with managers of City's Landscape Maintenance Districts, school grounds, and park grounds to coordinate activities. Discussion topic: What would help them reduce water use? Voluntary water use budgets? Improved irrigation efficiencies? Training in landscape maintenance, irrigation system maintenance, and irrigation system design?
- Obtain list of dedicated irrigation meter accounts with consumption data and means to identify relative location of the service, if available. Map # of accounts by distribution zone and identify largest gross volume users to prioritize future actions.
- Water-efficient landscape design brochures available at water offices and community events, and mailed upon request.
- Notices to be printed on landscape and CII mixed-use customers' water bills prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary.

FY 2006/2007

- Provide improved landscape irrigation water conserving tips on the City's website and links to useful sites.
- Meet quarterly with managers of City's Landscape Maintenance Districts, school grounds, and park grounds to coordinate activities and priorities. Offer support for training workshops (meeting space &/or invitations & clerical support and/or funds.)
- Work with above to support extension of weather station/Et based irrigation controller system.

- Follow up with Et – Based Irrigation System, Computer Control, and Weather Station (Jesse Bethel High), worked with Vallejo Unified School District and City landscape staff. (Paid for installation) Track usage and grant requirements.
- Research least time-intensive method of determining landscaped areas (ex, field tape, GIS, planimeter off aerials, approved landscape plans, Park district and LMD records.)
- Water-efficient landscape design brochures to be available in water offices, at community events, and mailed upon request.
- Water Billing staff to offer information to new and change-of-service customer accounts.
- Coordinate with the Planning Division and Public Works Department on review and approval of landscape plans. What review standards are in use?
- Inventory landscaping at water system facilities to determine extent of water efficient landscaping.
- Notices to be printed on landscape and CII mixed-use customers' bills prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary.
- Notices to be printed on landscape and CII mixed-use customers' water bills at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.

FY 2007/2008 and Beyond

- Provide improved landscape irrigation water conserving tips on the City's website and links to useful sites.
- Meet quarterly with managers of City's Landscape Maintenance Districts, school grounds, and park grounds to coordinate activities and priorities.
- Offer support for training workshops (meeting space &/or invitations & clerical support &/or funds.)
- Continue to work with above to support extension of weather station/Et based irrigation controller system.
- Follow up with Et – Based Irrigation System, Computer Control, and Weather Station (Jesse Bethel High), worked with Vallejo Unified School District and City landscape staff. (Paid for installation) Track usage and grant requirements.
- Water-efficient landscape design brochures to be available in water offices, at community events, and mailed upon request.
- Notices to be printed on landscape and CII mixed-use customers' water bills prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary.
- Notices to be printed on landscape and CII mixed-use customers' water bills at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.

Schedule. The implementation schedule for DMM 5 is shown in Table 6-5.

Table 6-5. Implementation Schedule for DMM 5

BMP number and name	DMM5 – Large Landscape Water Audits
Type of Program	Ongoing
Target Level	Outreach and Research, Extend Et-Controllers
FY05/06 Actions/Budget	Various/$2K
FY06/07 Actions/Budget	Various/$10K
FY07/08 Actions/Budget	Various/$10K
FY08/09 Actions/Budget	Various/$10K
FY09/10 Actions/Budget	Various/$10K
Admin. Staffing	120 Hours annually for program oversight
Program Staffing	Use of City staff; consultant services
Program Description	Water budgets will be provided to a percentage of dedicated landscape meters and mixed-use meter accounts. Water use at these accounts will be monitored.

Methods to Evaluate Effectiveness. The City will annually collect the following information.

Dedicated Landscape Irrigation Accounts

- Number of dedicated irrigation meter accounts in City
- Aggregate water use for dedicated landscape accounts
- Track usage at Et-controlled irrigated sites

Mixed Use Accounts

- Number of mixed use accounts
- Number, type, and dollar value of incentives, rebates, and no, or low interest loans offered to, and received by, customers.
- Estimated annual water savings by customers receiving and implementing recommendations.

Public Outreach Efforts

- Estimated reduction in water use attributable to public outreach efforts
- Training opportunities provided for improved landscape irrigation techniques

6.7 DMM 6 - High-Efficiency Washing Machine Rebate Programs

Past Activities. In 1999 the City exempted from this program because it was shown not to be cost effective. This DMM is automatically exempted if the cost-effective rebate is determined to be less than $50. The cost-benefit analysis determined that a $50 rebate is not cost effective over the ten-year-life of this program. Staff has done some minor investigation, but no rebates have been offered. The City participated through the Solano County Water Agency in the THELMA study.

Current and Proposed Program Description. A benefit-cost ratio of 0.19 from the agency perspective was calculated by Maddaus Water Management in 2005 for this DMM. Therefore, the

City exempts from full CUWCC BMP implementation but offers the listed measures to assist its water customers.

PG&E periodically offers rebates on horizontal axis washing machines to their customers in Solano County. The City supports the use of high-efficiency washing machines and will implement the following program.

The City will:

a) Support local, state, and federal legislation to improve efficiency standards for washing machines.

b) Provide information on high-efficiency washing machines and the PG&E rebate program to its customers.

FY 2005/2006

- Research available energy provider or waste-water utility rebates in service area, state-wide rebate processing programs, and examples of streamlined rebates offered by other water agencies.

FY 2006/2007 and Beyond

- Unless a better program can be designed based on the results of the research of available rebate programs, the following program will be implemented:

  Due to the interest expressed by customer inquiries, starting FY2006/2007 the City will provide a one-time $50 credit against the water bill, or other form of credit acceptable to the City of Vallejo Finance Department, for the property where the high efficiency washing machine is installed, upon receipt of verification that the customer received a rebate from either PG&E or VSFCD, or other recognized program. Total City rebates for the year will be capped at $2,000. The program to continue through FY2009/2010.

Schedule. The implementation schedule for DMM 6 is shown in Table 6-6.

Table 6-6. Implementation Schedule for DMM 6

BMP number and name	DMM6 – Efficient Washing Machine Rebates
Type of Program	Exempt
Target Level	Exempt
FY05/06 Actions/Budget	Notify customers of Efficient Washing Machine advantages, research/ Less than $2K
FY06/07 Actions/Budget	Provide rebates/ Total $2K
FY07/08 Actions/Budget	Provide rebates/ Total $2K
FY08/09 Actions/Budget	Provide rebates/ Total $2K
FY09/10 Actions/Budget	Provide rebates/ Total $2K
Admin. Staffing	20 Hours to participate in Regional Voluntary Program oversight
Program Staffing	None
Program Description	A voluntary cooperative public information program will be implemented in the SCWA service area.

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- Number of customer incentives to purchase high-efficiency washing machines being offered by local energy service providers, if any.
- Data to determine the amount of a high-efficiency washing machine incentive that would be cost-effective for Vallejo to provide its customers on an ongoing basis.
- Number of $50.00 incentives provided

6.8 DMM 7 - Public Information Programs

Past Activities. The City is most active in this area, purchasing and providing educational materials, newspaper display ads and public information notices in Spring Home and Garden newspaper inserts, and TV-based water savings tips at Earth Day, during Water Awareness Month at offices and library displays (adult and child), and other events, such as Kaiser Hospital's Earth Day, and Public Works' Week. Financial support is provided annually for the Vallejo Downtown Earth Day event and the California Water Awareness Campaign. Provided speaker to community group. Coordinate with other government agencies, industry groups, public interest groups, and the media.

Current and Proposed Description. The City participates in a regional public information program. The City also has its own public information program, primarily focused on water conservation.

During FY2005/2006 planned and in May 2006 will offer a series of workshops, in partnership with the City of Benicia, on WaterWise Gardening. Six workshops, 3 in Vallejo, 3 in Benica, to be taught by educational consultants and Master Gardeners. The workshop will be modeled on the successful workshops offered by the City of Napa.

The new classroom-based Resource Action Program's WaterWise materials include a public information component with students bringing materials home to share with their families.

This regional and local program includes the following components:

- Providing speakers to employees, community groups and the media, upon request.
- Using paid and public service advertising.
- Providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before, as available through water billing software.
- Providing public information to promote water conservation practices.
- Coordinating with other government agencies, industry groups, public interest groups, and the media.
- Offering workshops on selected topics.
- Special activities tied to Earth Day and Water Awareness Month.

FY 2005/2006 & Beyond

- Provide water conserving tips for all water use sectors on the City's website with links to useful sites.
- Provide information at Water Offices, community events, and mail or e-mail upon request.
- Continue to co-sponsor Earth Day and provide Water Awareness Month activities.
- Participate in Public Work's Week. (If needed, offer clerical support to coordinate the event.)
- Request reinstatement of the water use comparisons between current and prior periods and between current and prior year on the water bills, as soon as feasible.
- Coordinate with other government agencies, industry groups, public interest groups, and the media.
- Support California Water Awareness Campaign. Run PSA in Spring Home & Garden Guide Newspaper Insert.
- Run PSA in Fall Home & Garden Guide Newspaper Insert.

Schedule. The implementation schedule for DMM 7 is shown in Table 6-7.

Table 6-7. Implementation Schedule for DMM 7

BMP number and name	DMM7 – Public Information Program
Type of Program	Existing Agency and Regional Program
Target Level	100 percent
FY05/06 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $12K
FY06/07 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $12K
FY07/08 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $12K
FY08/09 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $12K
FY09/10 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $12K
Admin. Staffing	100 Hours to participate in Agency & Regional Program oversight
Program Staffing	SCWA and Contractors and Water system staff
Program Description	Program will include all of the elements required CUWCC

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- Number of public speaking events relating to conservation during reporting period.
- Number of media events relating to conservation during reporting period.
- Number of paid or public service announcements relating to conservation produced or sponsored during reporting period.
- Types of information relating to conservation provided to customers.
- Annual budget for public information programs directly related to conservation.

- Number of staff hours allocated to providing advice to customers on water saving measures over the phone or in person.
- Number of staff hours allocated to the coordination of the program.

6.9 DMM 8 - School Education Programs

Past Activities. Outreach to Vallejo City Unified School District, as well as local parochial and private schools. [Highest rate of participation from parochial schools. Obstacles to getting full distribution of materials, such as poster contest forms, from VCUSD school offices to classrooms. City paid for all forms to be printed by VCUSD.] Letter sent to each classroom teacher with poster contest forms reminding them of services available.

Participated in several County-wide poster contests; made a couple of classroom visits upon request; attended Public Works Week Events (1,000 kids per); purchase of educational materials to distribute to educators (to give or to loan).

Promoted Water Awareness Campaign's Scholarship to area high schools and colleges resulting in a student from Vallejo winning a $2500 scholarship.

Advertised to and financially sponsored Vallejo teachers to attend Project WET (Water Education for Teachers) workshops offered by northern Solano County educational consultant.

Wrote letter in support of MI Tech Academy's grant application for resource conservation program and offered technical support.

Other related activities in FY2004/2005 included:

- Followed up on Mare Island Tech Academy Grant Application.
- Outreach and give-aways to schools during May 2005, Water Awareness Month.
- Met with representatives of the Vallejo Sanitation and Flood Control District to discuss possible joint projects. Agreed to meet quarterly.
- Contacted other City programs (Recycling and Code Enforcement) to discuss possible joint programs or assistance.

Current and Proposed Program Description. The City currently implements its own school program, with regional projects, as well. This program includes contests (regional), maps, charts, posters, tours, videos and water awareness month activities.

The City's program will include the following components:

Work with school districts and private schools in the City's service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials will meet the state education framework requirements, and grade appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

Beginning in FY2005/2006 the City is contracting with Resource Action Programs to provide a classroom and student-based water education program combining home water surveys by the students and their families, distribution of retrofit kits, public information to the families, and school education. The program will continue for at least two school years to provide the data needed to do an accurate cost-benefit analysis.

FY 2005/2006

- Program to include working with school districts and private schools in the service area to provide instructional assistance, educational materials, and classroom presentations
- Contact the School Superintendent and each school principal by letter outlining services available.
- Contact School Librarians to discuss opportunities for water-themed displays available for use by all teachers at the school.
- Increase attention to grade levels 7-8.
- Meet quarterly with reps from VSFCD and City to identify areas of program overlap and possible staff/fund sharing, such as school library displays.
- Consider hiring an educator, on a part-time consulting basis, to provide in-class presentations. Research options and costs.
- Provide water conserving tips for educators on the City's website with links to useful sites.

FY 2006/ 2007

- Program to include working with school districts and private schools in the service area to provide instructional assistance, educational materials, and classroom presentations
- Annual contact with School Superintendent and school principals.
- Increase attention to grade levels 9-12.
- Implement student home water use survey. Review results.
- Meet quarterly with reps from VSFCD and City to identify areas of program overlap and possible staff/fund sharing.
- If not already in place, consider hiring an educator, on a part-time consulting basis, to provide in-class presentations. Update information on options and costs, if needed.
- Provide improved water conserving tips for educators on the City's website with links to useful sites.

FY 2008/2009 and Beyond

- Continue with measures outlined above.

Schedule. The implementation schedule for DMM 8 is shown in Table 6-8.

Table 6-8. Implementation Schedule for DMM 8

BMP number and name	DMM8 – School Education Program
Type of Program	Existing Agency and Regional Program
Target Level	100 percent
FY05/06 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $7K
FY06/07 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $7K
FY07/08 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $7K
FY08/09 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $7K
FY09/10 Actions/Budget	Continue existing program that fulfills all CUWCC requirements/ $7K
Admin. Staffing	80+ Hours to develop and manage cooperative program and make classroom presentations
Program Staffing	Use of a consultant in at least some areas
Program Description	Program will continue to provide all CUWCC elements to local schools. Materials will be provided to local teachers via the Internet./ Multi-Year Pilot Program utilizing Resource Action Program's WaterWise materials.

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- Number of school presentations made during reporting period.
- Number and type of curriculum materials developed and/or provided by water supplier, including confirmation that curriculum materials meet state education framework requirements and are grade-level appropriate.
- Estimated number of students reached.
- Number of in-service presentations or teacher's workshops conducted during reporting period and/or number of teachers financially sponsored for Project WET workshops.
- Annual budget for school education programs related to conservation.
- Number of hours of staff time allocated to school education.

6.10 DMM 9 - Conservation Programs for Commercial, Industrial and Institutional Accounts

Past Activities. The City participated in and financially supported a regional pilot program in FY1999/2000 and FY2000/2001 to establish an effective CII program design or develop the data for exemption. The pilot program included sites in Vacaville, Suisun, and Vallejo (City Corporation Yard and Police Station).

In FY2004/2005 and early FY2005/2006 the City participated in the Pre-Rinse Spray Valve Installation program through SCWA and the CUWCC. The program provided direct site visit and installation at participating restaurants.

In FY2005/2006 have been meeting with other members of the SCWA – UWCC to plan a regional CII program. This is the key program emphasis for the next several years for the committee. Researched the CII programs of other water agencies and spoke to program managers to make recommendations for program design in Solano County.

Annually compiled "customer" aggregate use & charge data for largest users.

Activities in FY2004/2005 also included the following:

- Part of group receiving grant to fund survey of CII conservation measures undertaken by Maddaus Water Management. Reviewed findings for use in future CII program design.
- Arranged for survey of the Buttercup Kitchen (restaurant) as part of multi-site joint CII survey project and compiled water use data.
- Compiled raw CII account information from Utility Billing system, business license data, and researched the SIC on the internet.
- Ranked top water using commercial accounts. Compiled "customer" aggregate use & charge data for largest users.
- Compared definitions of C-I-I used by regulatory agencies for required reports.
- Signed up for the Pre-Rinse Spray Valve Rebate Program.
- Outreach to the Vallejo Chamber of Commerce, Economic Development Board, Six Flags Marine World, and the Vallejo Unified School District.
- Researched California "LightWash" (laundromat washing machine replacement) rebate program.

Current and Proposed Program Description. Full implementation of this DMM is not justified, with a calculated benefit-cost ratio of 0.44 from the agency perspective. Therefore the City exempts from full implementation, but will offer the listed measures to assist its CII water customers, in addition to participating with the other water agencies in the development of a regional CII survey program.

The City will participate in the design of a regional CII program based on the recommendations of the "Final Report – Commercial/Industrial/Institutional Water Conservation Audits" prepared by Maddaus Water Management (with emphasis on high use toilets and irrigation water use) and will:

a) Identify the City's approximately 2,500 commercial, industrial, and institutional customers by SIC codes.
b) Rank commercial, industrial, and institutional customers according to annual water use.
c) Provide water use surveys to 50 CII customers by the end of FY2009/2010.
e) Monitor the effectiveness of implemented audit recommendations.
f) Identify incentives programs which would encourage the implementation of cost-effective audit recommendations which were not implemented.
g) Work with other water agencies in the region to pursue joint CII programs able to provide a higher level of technical expertise to larger commercial and industrial customers.

Continued participation in the Pre-Rinse Spray Valve Installation program through SCWA and the CUWCC in FY05/06, providing direct site visit and installation at participating restaurants.

FY 2005/2006

- Provided water conserving tips applicable to CII customers on the City's website and links to useful sites.
- Contact energy provider, PG&E, and State of Calif. regarding rebates/loans available to CII customers. Provide a link on City's web site.
- Work within the Solano County Water Agency – Urban Water Conservation Committee (SCWA-UWCC) to design a cost-effective regional CII program.

FY 2006/2007

- Continue to work with SCWA-UWCC on regional program.
- Provide improved water conserving tips applicable to CII customers on the City's website and links to useful sites.
- Work with Utility Billing to identify and report commercial and industrial use water accounts by Standard Industrial Classification.
- Expand categories of "institutional" users to more establishments than those recognized in the Utility Billing System (school, church, city).
- Meet quarterly with reps from VSFCD and City to identify areas of program overlap and possible staff/fund sharing.
- Respond to referrals from the Water Billing Office of CII customers with water use concerns with information resources.
- Work with the Chamber of Commerce to: 1) identify member's needs for water savings information; and 2) offer to distribute materials or speak.
- Rank top water using commercial accounts. Compile "customer" aggregate use & charge data for largest users.
- Work with City, GVRD and VCUSD to identify high water using sites and strategies for funding consultant services for water use surveys and for fixture replacements. Research grants and apply, as available.
- Commit $5,000 for consultant performed survey at City or GVRD (master-lease) site.

FY 2007/2008 and Beyond

- Primary focus still to be regional CII program.
- Provide improved water conserving tips applicable to CII customers on the City's website and links to useful sites.
- Meet quarterly with reps from VSFCD and City to identify areas of program overlap and possible staff/fund sharing.
- Rank top water using commercial accounts. Compile "customer" aggregate use & charge data for largest users.
- Contact CII customers with proportionally high water use compared to other similar CII uses to inform them and offer information resources.
- Respond to referrals from the Water Billing Office of CII customers with water use concerns with information resources.
- Commit $5,000 for consultant performed survey at City or GVRD (master-lease) site.
- Continue to work with Chamber of Commerce offering information and to speak.

- Perform annual search for grants/loans and apply, as appropriate.

Schedule. A regional CII water use survey program design will be completed in FY2006/2007. The City's goal will be to obtain surveys of 50 CII accounts (focusing on sanitation and irrigation). The implementation schedule is shown in Table 6-9.

Table 6-9. Implementation Schedule for DMM 9

BMP number and name	DMM 9 - Commercial, Industrial & Institutional Conservation Programs
Type of Program	Development of Regional Program and Local Outreach
Target Level	Full
FY05/06 Actions/Budget	Design program based on pilot program findings/$6K
FY06/07 Actions/Budget	Continue set up of regional program, outreach,surveys/$20K
FY07/08 Actions/Budget	Continue local outreach, fund surveys/$25K
FY08/09 Actions/Budget	Continue local outreach, fund surveys/$30K
FY09/10 Actions/Budget	Continue local outreach, fund surveys/$30K
Area of Pilot Program	Agency service area
Admin. Staffing	120 Hours annually to design and oversee program
Program Staffing	Existing staff and Regional Consultant
Program Description	CII accounts will be classified by SIC code. Surveys to be provided for 50 CII accounts as part of regional program.

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- The number of customers and amount of water use within the CII customer classes.
- Number of CII customers offered a survey during the year.
- Number of CII surveys completed during the year.
- Number of follow-up audits completed during the year.
- The type and number of water saving recommendations implemented.
- Incentive program budget and customer outlays.
- Number of staff hours allocated to promoting water efficiencies in the CII sectors.

6.11 DMM 10 - Wholesale Agency Assistance Programs

The City of Vallejo is a wholesale water supplier to the Cities of American Canyon and Benicia, but does not provide a Wholesale Agency Assistance Program since each of the cities has prepared an Urban Water Management Plan and is running its own water conservation program. In addition, the City operates the Travis (Air Force Base) Water Treatment Plant on behalf of the U.S. Air Force, but has no responsibility for the distribution system and no influence over end users on the base. However, if there is interest on the part of base personnel, City staff is willing to work with them to acquire public information materials.

Staff also works with the Solano County Water Agency, the regional wholesaler. The City contributes funds for SCWA, and reimburses some of the joint program expenditures on a proportional basis.

FY 2005/2006 & Beyond

- Provide assistance, if requested, to Travis Air Force Base staff on a consulting basis and to participate in group purchases, if feasible.

Table 6-10. Implementation Schedule for DMM 10

BMP number and name	DMM 10 – Wholesale Agency Assistance
Type of Program	Available support for Travis AFB, if requested.
Target Level	Support available, upon request.
FY05/06 Actions/Budget	Assistance if requested/ Less than $1K
FY06/07 Actions/Budget	Assistance if requested/ Less than $1K
FY07/08 Actions/Budget	Assistance if requested/ Less than $1K
FY08/09 Actions/Budget	Assistance if requested/ Less than $1K
FY09/10 Actions/Budget	Assistance if requested/ Less than $1K
Admin. Staffing	As needed, limit to 20 Hrs./Yr.
Program Staffing	None anticipated.
Program Description	Consultation, Coordination, and group purchase, as needed.

6.12 DMM 11 - Conservation Pricing

Past Activities. This DMM is complete. The City undertook a rate study in 1999 which considered uniform, inclining block, and seasonal rates. The current rate structure, effective May 1, 2000, has an inclining block rate structure for single-family residential water usage and a uniform water rate per hundred cubic foot for multi-family residential and non-residential usage. No declining tiers; and no water is included in basic service charge. All customers to pay service charges. Fixed portion of bills dropped and variable water use charges were increased, providing more incentive to save. Seasonal rates were calculated, as an alternative, but were not selected.

An inclining block rate structure is considered a conserving rate providing a negative pricing signal since each unit of water consumed beyond the first tier rate allotment carries an additional incremental cost.

Current and Proposed Program Description. The City's next major rate study, projected for FY2008-2009 will include consideration of incentive rate structures for all customer types, such as: seasonal rates; increasing block rates; connection fee discounts; grant or loan programs to help finance conservation projects; financial incentives to change landscapes; variable hookup fees tied to landscaping; and interruptible water service to large industrial, commercial or public customers. The City will consult with the Vallejo Sanitation and Flood Control District regarding an incentive rate structure for sewer service.

FY 2005/2006

- Requirement met.
- Water rate study completed in 2004 and rates to be phased in annually starting in 2005 and ending in 2009. Maintained same basic rate structure: 2-tiered single family rates, with big

step; uniform volume charge per hundred cubic foot for other customers, and all charged periodic service charges.
- Discuss conservation pricing for sewer service with VSFCD.
- Collected data on annual revenue from commodity charges by customer class.

FY 2006/2007 & Beyond
- Requirement met.
- Collect data on annual revenue from commodity charges by customer class.

Schedule. The implementation schedule for DMM 11 is shown in Table 6-11.

Table 6-11. Implementation Schedule for DMM 11

BMP number and name	DMM 11 - Conservation Pricing
Type of Program	On-going
Target Level	Full target
FY05/06 Actions/Budget	Complete, but annual data collection/ Less than $1K
FY06/07 Actions/Budget	Complete/ but annual data collection/Less than $1K
FY07/08 Actions/Budget	Complete/ but annual data collection/ Less than $1K
FY08/09 Actions/Budget	Projected time frame of next rate study which will consider other conservation rate designs/ Cost of rate study considered an administrative budget item, not conservation. / annual data collection/Less than $1K
FY09/10 Actions/Budget	Projected implementation of any new rate structure, rates or charges, or incentives./ data collection/ Less than $1K
Admin. Staffing	40 Hours for information collection and reporting
Program Staffing	None
Program Description	The next rate study will again consider a variety of conservation oriented rates.

Methods of Evaluation Effectiveness. The City will annually collect the following information.

- Report annual revenue generated by each customer class for the reporting period.
- Report annual revenue derived from commodity charges by customer class for the reporting period.
- Report rate structure by customer class for water service.

Budget. Only a minimal budget is allocated for training or other expenses. However, the next rate study will be done either in-house or by outside consultants, in which case consultant services costs may be incurred.

6.13 DMM 12 - Conservation Coordinator

Past Activities. The City has had a Water Conservation Coordinator, a full-time staff person with a small percentage of time available for conservation activities. There was minimal support staffing available due to chronic understaffing in Water Division. In early 2005 the City Council approved an additional Administrative Analyst position in the Water Administration and Engineering Division.

Current and Proposed Program Description. The new analyst position, which provides staff support to the Water Conservation Coordinator in addition to other duties, was filled for several months at the end of 2005, and will be filled again in late February 2006.

Vallejo has a water conservation coordinator who spends an average of 30% - 40% time on water conservation. This time commitment will be increased to at least 50% in FY2005/2006 to adequately cover the program demands. In addition support staff will assist in program implementation, thereby raising the full time staff equivalent to an estimated 0.8 FTE by FY2009/2010. The Water Conservation Coordinator, Pamela Sahin, can be reached at (707) 648-4479 (telephone), (707) 648-4060 (fax), or E-mail waterinfo@ci.vallejo.ca.us.

The coordinator develops and manages the conservation program and DMM implementation. The coordinator is also responsible for preparing and submitting an annual implementation status report to the U.S. Bureau of Reclamation. Other duties of the coordinator include: communication and promoting water conservation issues; coordinating City conservation programs with other City divisions; preparing annual and multi-year water conservation budgets; monitoring program impacts and recommending improvements. The Conservation Coordinator is responsible for training support staff and managing the efforts of any consultants/contractors engaged to implement conservation measures.

The position also coordinates preparation of UWMP and WMP updates for adoption by the City Council and submittal to the California Department of Water Resources and the U.S. Bureau of Reclamation, respectively.

A generalized budget allocation for the WC Coordinator will allow for the use of consultants to help plan and implement specialized activities and measures.

FY 2005/2006

- Continue to maintain a designated Water Conservation Coordinator to work on the 2004 Water Management Plan, Urban Water Management Plan, Water Supply Assessments, Annual WMP updates, and a modest level of BMP implementation.
- Use of consultants, as needed to assist in plan preparation.
- Requesting additional staff support to increase combined staffing available for Water Conservation Program design and implementation to 0.5 FTE.

FY 2006/2007

- Continue to designate a Water Conservation Coordinator.
- Requesting additional support staffing and training.
- Increase combined staffing available for Water Conservation Program design and implementation to 0.65 FTE.

FY 2007/2008

- Continue to designate a Water Conservation Coordinator.
- Maintain a minimum combined staffing level for program implementation of 0.7 FTE.

FY 2008/2009

- Continue to designate a Water Conservation Coordinator.
- Maintain a minimum combined staffing level for program implementation of 0.75 FTE.
- Update to USBR Water Management Plan due by early 2009.

FY 2009/2010

- Continue to designate a Water Conservation Coordinator.
- Maintain a minimum combined staffing level for program implementation of 0.8 FTE.

Schedule. The implementation schedule for DMM 12 is shown in Table 6-12.

Table 6-12. Implementation Schedule for DMM 12

BMP number and name	DMM12 – Conservation Coordinator
Type of Program	On-going
Target Level	Full target – Coordinator spends up to 50 percent time on water conservation; to 0.8 FTE with support staff.
FY05/06 Actions/Budget	On-going but at partial target/ $22K
FY06/07 Actions/Budget	On-going but at partial target/ $10K
FY07/08 Actions/Budget	On-going but at partial target/ $15K
FY08/09 Actions/Budget	On-going, but at partial target/ $20K WMP update due.
FY09/10 Actions/Budget	On-going, at full target/ $34K, UWMP update prep.
Budget	As above, includes $5,000 for incidentals; Consultant services vary.
Admin. Staffing	Up to 120 Hours for incidentals
Program Staffing	Coordinator, other City staff, and consultants
Program Description	Implement all water conservation programs for City of Vallejo

Methods to Evaluate Effectiveness. The City will annually collect the following information.

- Coordinator name, staff position, and years on job.
- Number of Conservation Coordinator staff or full time equivalents.
- Duties of Conservation Coordinator and staff.
- Training received and certifications earned.

6.14 DMM 13 - Water Waste Prohibition

Past Activities. Had a draft ordinance ready for adoption. Not yet adopted due to concerns over funding for enforcement and minimal public input.

Current and Proposed Program Description. The City is required to have an adopted water waste prohibition ordinance under its 1999 Water Management Plan. A copy of the water waste prohibition ordinance [Ord. No. 1567 N.C. (2d)], presented to the Vallejo City Council for consideration on February 28, 2006, and finally adopted on March 7, 2006 is included in Appendix H. The water waste ordinance was developed according to the guidelines of DMM #13.

The City will develop and implement a water waste control procedure, using either City staff, part-time employees or contractors. The City will take steps to promote a water conservation ethic, and will strive for a reasonable correlation between the degree of punitive enforcement of a waste water ordinance and the City's overall water supply picture.

FY 2005/2006

- Adopted Ordinance No. 1567 N.C. (2d), as well as a Water Shortage Contingency plan.

FY 2006/2007

- Consider revision of waste water prohibition based on feedback following public hearing on proposed ordinance.

FY 2007/2008 & Beyond

- Waste Water Prohibition Ordinance or Resolution will be in place. Provide public information regarding the ordinance.

Schedule. An ordinance was adopted and implementation to be put into place by the end of FY2005/2006. The implementation schedule for DMM 13 is in Table 6-13.

Table 6-13. Implementation Schedule for DMM 13

BMP number and name	DMM13 – Water Waste Prohibition
Type of Program	Adoption and Enforcement of a Water Waste Prohibition Ordinance
Target Level	Full target
FY05/06 Actions/Budget	Adopt a "Wasteful Water Use Prohibition Ordinance.
FY06/07 Actions/Budget	Complete but need public information effort.
FY07/08 Actions/Budget	Complete but need public information effort.
FY08/09 Actions/Budget	Complete but need public information effort.
FY09/10 Actions/Budget	Complete but need public information effort.
Budget	$2,000 /Yr. (customer materials)
Admin. Staffing	40 Hours for program oversight
Program Staffing	Assumes use of existing City staff
Program Description	Educate customers about prudent water use

Methods for Evaluating Effectiveness. The City will annually collect the following information.

- Number of customers contacted about water waste violations.
- Number of customers cited for repeat water waste violations.

6.15 DMM 14 - Residential ULFT Replacement Programs

Past Activities. A cost-benefit analysis was performed in 1998 with results justifying the request for an exemption from this measure. In 2005 a cost-benefit analysis was again performed with the same results.

FY 1999 – FYE 2005 Activities: Exempted.

FY 2005/2006
- Exempted.
- Include information on ULFTs on City's website and links to useful sites.

FY 2006/2007
- Include updated information on ULFTs on City's website and links to useful sites.
- Include ULFTs in purchasing guide for fixtures inside the home (See BMP#2)

FY 2007/2008 & Beyond
- Include annually reviewed and updated information on ULFTs on City's website and links to useful sites.
- Continue to distribute updated purchasing guides, including ULFTs.

Current and Proposed Program Description. A new cost-benefit analysis done in 2005 again demonstrated that an ultra low flow toilet rebate program would not be cost-effective for Vallejo. The City will work with other agencies to determine if a regional approach will change the cost-effectiveness calculations. The City will provide information to customers, through various media, on the benefits of ULFTs. It must be noted that ULFTs or more efficient models are the only types currently available for sale.

Schedule. The implementation schedule for DMM 14 is shown in Table 6-14.

Table 6-14. Implementation Schedule for DMM 14

BMP number and name	DMM14 – ULFT Replacement Program
Type of Program	Exempt
Target Level	Exempt
FY05/06 Actions/Budget	Cost-benefit analysis performed, exemption warranted.
FY06/07 Actions/Budget	To be determined.
FY07/08 Actions/Budget	To be determined.
FY08/09 Actions/Budget	To be determined.
FY09/10 Actions/Budget	To be determined.
Budget	Less than $1,000 /Yr.
Admin. Staffing	20-30 Hours per year for cost-benefit analysis
Program Staffing	None anticipated.
Program Description	Conservation Coordinator will consider other program designs for cost effectiveness.

Methods for Evaluating Effectiveness. The City will annually collect the following information.

- The average number of toilets per single-family and multi-family unit.
- The average persons per household for single-family residences and for multi-family residences.

- The housing resale rate for single-family and multi-family residences in service area.
- The number of ULFT installations credited to the agency's replacement program, by year.
- Estimated cost per ULFT replacement
- Estimated water savings per ULFT replacement
- Budget. A minimal budget of $1,000 is allocated assuming an annual cost/benefit analysis will continue to show that exemption is warranted. If a cost effective program design can be implemented, a budget allocation will be made.

6.16 Water Conservation Savings

An estimate of total water savings due to water conservation is not available. DMM 9 Savings will vary depending on the level of implementation of survey recommendations, but can be estimated at 10 percent. Landscape surveys are assumed to result in a 15 percent reduction in demand for landscape uses by surveyed accounts (CUWCC, March 2001). Any modest water savings already achieved by existing conservation measures will have some impact on the City's ability to further reduce demand. Nevertheless, the City anticipates achieving additional water savings by further implementation of the DMMs. In the absence of system specific water savings, the City will use the best available estimates such as from the American Water Works Association or CUWCC.

6.17 DMM Results and Forecasting

Monitoring and updating will allow the City to modify any planned programs that do not accomplish the practice as described.

The City of Vallejo has requested an exemption from DMM (BMP) 1, 2, 5, 6, 9 and 14 as they are not cost effective, based on calculations performed by Maddaus Water Management in 2005. As required, the CUWCC's tool for evaluating cost effectiveness was run using the information for Vallejo's service area. The summary results are shown in Appendix J. The tables taken from "Step 6" of the CUWCC Excel workbook show the benefit cost ratio to be less than one, which demonstrates those particular measures are not cost effective in this service area. All other tables showing inputs to the cost effective analysis (Steps 1-5) are available from the Water Conservation Coordinator, who can be reached as indicated in the contact information sheet for the UWMP.

6.18 Five-Year Budget for Expenditures and Staff Effort for BMPs

Tables 6-15 summarizes the City's budgets for FY2005/2006 through 2009/2010 and projected staff time available to complete the DMMs as currently conceived. It must be noted that program priorities are subject to change in order to participate in future, regionally-based projects, or in response to grant funding opportunities. In addition, proposed budgets through FY2008/2009 are based on revenue projections from the City of Vallejo Water Utility Financing Plan and Rate Study (Brown and Caldwell, 2004). If funding becomes restricted, conservation programs may be scaled back, except for those that are shown to be cost-effective and for a baseline level of activity for public information and school education (for which cost-effectiveness can not be effectively

measured). Alternatively, in the case of a water supply shortage, the funding for and staff time committed to water demand management efforts can be expected to increase.

Table 6-15. FY 2005/2006 through 2009/2010 Budget Summary (1,000 Dollars)

MEASURES	FY05/06 Budget	FY06/07 Budget	FY07/08 Budget	FY08/09 Budget	FY09/10 Budget
1. Residential Water Surveys	3	6	6	6	5
2. Residential Retrofit	6	6	6	6	5
3. System Audit/Leak Detection	5	5	5	5	5
4. Metering w/Commodity Rates	5	5	5	5	5
5.a. Landscape Water Budgets	1	1	1	1	1
5.b. Landscape Water Surveys	1	9	9	9	9
6. Washing Machine Rebates	2	2	2	2	2
7. Public Information	12	12	12	12	12
8. School Education Programs	7	7	7	7	7
9. CII Conservation Programs	6	20	25	30	30
10. Wholesale Agency Programs	1	1	1	1	1
11. Conservation Pricing	1	1	1	1	1
12. Conservation Coordinator	22	10	15	20	34
13. Water Waste Prohibition	2	2	2	2	2
14. ULF Toilet Program	1	1	1	1	1
TOTAL	75	88	98	108	120
FULL TIME EQUIVALENTS	0.5	0.65	0.7	0.75	0.8

SECTION 7 - WATER SHORTAGE CONTINGENCY PLAN

This section of the Urban Water Management Plan presents the City's Water Shortage Contingency Plan (WSCP). Although included as a section of the UWMP, the WSCP, upon its adoption by the City Council, can be separately cited as a stand-alone plan.

7.1 Summary of Water Code Sections

This WSCP serves to comply with the requirements of the Urban Water Management Act (Act), which became part of the California Water Code with the passage of Assembly Bill 797 during the 1983-1984 California legislative session, and addresses the elements of the California Water Code Chapter 3, Article 2, Section 10632.

7.2 Plan Adoption and Implementation

State regulations require that a properly noticed public hearing be held prior to the adoption of the Vallejo Water Shortage Contingency Plan. Prior to adopting a plan, the City will make the plan available for public inspection and hold a public hearing. The time and place of the hearing will be published prior to conducting the hearing pursuant to Section 6066 of the Government Code.

This Water Shortage Contingency Plan, adopted on February 28, 2006 by Council Resolution No. 06-62 N.C., replaces all previous versions of the Draft Water Shortage Contingency Plan.

Copies of the WSCP are available at the Water Superintendent's office. In addition, the City shall provide customers with periodic updates on the results of the institution of this WSCP. Updates may be by bill insert, newspaper, television, or other appropriate method(s). Should a water shortage emergency occur, the City will immediately notify customers when supplies have returned to adequate operational levels and the water shortage is over.

Other implementation steps that will be taken include pursuing additional supplies and the initiation of possible coordinated planning with local agencies and organizations. In the event of a water shortage, the City shall notify outreach organizations listed in Table 7-1 to inform the public of the necessary actions to take before enforcement begins. This list will continue to be modified as additional organizations are identified which may be helpful in the dissemination of information in a timely manner. The City shall notify the public when the WSCP is implemented and the corresponding stage of shortage.

Table 7-1. Organization Notification List

Vallejo City Council	Hiddenbrooke Home Owners Association	Green Valley Landowners Association
Vallejo Times Herald Newspaper	City of Vallejo Landscape Maintenance Districts	Gordon Valley Water Crisis Committee
Vallejo City Unified School District	Vallejo Chamber of Commerce	County of Solano, Water Resources Department
Vallejo and Cordelia Fire Departments	Glen Cove Home Owners Association	County of Solano, Sheriffs Department
Fairfield Daily Republic Newspaper	Regional Television News Stations	10 Largest Consumption Accounts
Solano County Board of Supervisors		

7.3 Preparation for Catastrophic Water Supply Interruption

Aside from drought-caused water shortages, the City is also vulnerable to other potential disaster situations that could result in a catastrophic interruption of water supplies including, but not limited to, regional power outages, landslides, earthquakes, and water contamination.

Below is a brief summary of how catastrophic events, other than extreme drought, may affect the State Water Project (delivery of both State Water Project Table A and Vallejo Permit Water) and Solano Project facilities, as provided by SCWA, the City's wholesale supplier of water through these regional supply facilities.

The North Bay Aqueduct (NBA) supplies water to the City from the SWP, this includes transit of both Table A allotments and Vallejo Permit water entitlements. Potential catastrophic outages may occur from earthquakes that cause major damage to the NBA facilities, prolonged loss of PG&E power required for pumping water through the NBA, or contamination at the intake to the NBA. The NBA is an underground pipeline and not subject to landslide damage.

In the event of loss of NBA supply for any reason, the City would immediately switch to Solano Project water supplies while the emergency condition was being resolved and normal water supply restored. This high level of redundancy is possible due to the geographical separation of the two sources.

The Solano Project supplies nearly half of all water to the City under normal conditions. In the event of an earthquake, the Solano Project Emergency Response Plan is invoked. The Plan, developed in coordination with the U.S. Bureau of Reclamation, provides a detailed response for various levels of seismic activities both at the Monticello Dam site and within a specified geographical area surrounding the Solano Project. No actions are necessary from the City of

Vallejo, which will be notified at the time of the condition of the Solano Project and its ability to deliver.

The Putah South Canal is susceptible to a landslide which could either block or damage its ability to deliver Solano Project water. SCWA recently invested in a $3 million project to provide an underground pipeline bypass of an area that is most susceptible to a landslide. Any detection of contamination of Solano Project water may result in a shut-down of the Solano Project deliveries. The City of Vallejo receives its supply at the end of the delivery canal and, as such, is more exposed to potential supply interruptions due to canal impairment. Solano Project is a gravity system and is not dependent upon power to operate.

In the event of loss of Solano Project water, the City would attempt to shift to supplies delivered through the NBA including SWP water and Vallejo permit entitlements.

Delivery of water from the Vallejo Lakes – Frey, Madigan, and Curry – is via gravity systems which are susceptible to earthquake damage. Each Lakes supply is inspected after earthquakes to assure public safety and determine the viability of the supply after an event. Damage may require changeover to the Solano Project through an exchange agreement with the Solano Irrigation District.

The City has engineered all critical pump stations, and reservoirs constructed within the last 17 years, to meet all California seismic safety standards for critical facilities, and has removed most pumping facilities built prior to this date from operation. In addition, the City has, as required by law, completed and filed a Vulnerability Assessment (VA) addressing security of the City's distribution system facilities. Regional power outages are not expected to prevent the City from receiving adequate water supplies due to the multitude of facilities and the fact that due to the geographical separation of the facilities they are fed from different power grids. It is highly unlikely that all water supplies will be simultaneously affected and prevent water delivery. The main pump station which supplies raw water to Vallejo has a diesel emergency backup pump to provide up to 50% of total water need in time of power outage. Combined with available in-town treated water storage the City should be able to function until regional power is available.

The City has continued to work cooperatively with SCWA to investigate regional funding opportunities for measures to improve the reliability of key water supply facilities through participation in the Solano Water Agencies Committee. Through this committee, recommendations for water supply quality monitoring and modeling have been forwarded, and hydrologic studies have been undertaken to determine water quality and quantity parameters of the NBA facilities in Barker Slough.

This type of modeling is necessary to determine the sources of water being pumped at the NBA intake during different times of the year and different hydrologic conditions. It will also show how NBA water quality will be affected by changes in the Delta, such as levee failures. Failures of the levees are predicted to drastically reduce the ability of the NBA pump station to provide water, and as with earthquake damage, will necessitate a changeover to Solano Project Water until mitigated.

In addition to the above listed major disruptions which may occur and must be dealt with, to properly prepare for and respond to catastrophic water supply interruptions, the City believes the following additional actions are warranted.

Increase existing water storage.
The City has over 50 million gallons (mg) of treated water storage currently available, with up to 50 mg of raw water available by gravity which may be treated during an emergency. This translates to greater than a 3 day supply at maximum day usage, or greater than 7 days with notification of water shortages. Opportunities for greater storage volume are being investigated.

Obtain additional water supplies.
The City is in the process of bringing back the Lake Curry water supply of approximately 3,750 Acre-feet. The restored Lake Curry supply is expected to be back online by 2010.

Coordinate with other agencies for additional water supply funding sources.
The City, as noted above, participates in regional planning and grant applications with the Solano County Water Agency.

Put employees/contractors on-call.
Water maintenance and engineering currently have on-call and after hours contact lists available for use in emergencies.

Develop public communication methods/plans.
The City currently employs a Public Information Officer for timely distribution of City policies and announcements.

Adopt a City Disaster Preparedness Plan.
The City has a comprehensive disaster response plan. Water service for both domestic and fire fighting needs is a component of this plan. Operational plans for contacts, notification, and emergency actions are included. Additionally, the City is required to file a report with the state demonstrating the methodology to be used to inform the public of a mandatory boil water order or unsafe water conditions.

Water Shortage Response Measures.
Because water supply is a sensitive and extremely valuable resource in California, all water utilities in the region practice water conservation programs. Beyond these normal practices, additional water shortage response measures are often needed when unforeseeable droughts and emergencies reduce water supplies. This WSCP includes proposed water shortage response measures which can be put into effect by the City Council.

7.4 Water Supply and Demand Analysis

This subsection provides a brief overview of the City's water supply and demand projections. For further discussion of these topics, refer to Sections 3 and 4 of the UWMP.

7.4.1. Water Supply

The City of Vallejo has several water supply sources which are summarized in Table 7-2. These sources are described in more detail in Section 4 of the Urban Water Management Plan.

Table 7-2. Normal Water Year Supplies

WATER YEAR & SUPPLY (All volumes in Acre-Feet)	Entitlement Reduction	2005	2010	2015	2020	2025
State Water Project	10%	5,040	5,040	5,040	5,040	5,040
Vallejo Permit Water	0%	17,200	22,800	22,800	22,800	22,800
Lakes Madigan/Frey	0%	400	400	400	400	400
Lake Curry	0%	1,500	3,750	3,750	3,750	3,750
Solano Project Water	1%	14,454	14,454	14,454	14,454	14,454
Normal Year Total		***38,594***	***46,444***	***46,444***	***46,444***	***46,444***

7.4.2 Water Demand

Table 7-3 shows the City's past, present, and estimated future water demand from 2000 through 2025. Future water consumption assumes annual growth in the City, Lakes, and Travis AFB categories, normal rainfall, and normal consumption patterns adjusted for post-drought practices. For more information on demand projections refer to Section 3 of the UWMP.

Table 7-3. Past, Present, and Projected Water Demands by Service Category

Category (All volumes in Acre-Feet)	2000	2005	2010	2015	2020	2025
City of Vallejo System	21,920	23,030	24,290	25,690	27,140	27,140
Vallejo Lakes System	320	330	340	350	360	370
Travis AFB Deliveries[d]	3,200	3,400	3,860	4,330	4,790	5,250
City of Benicia	1,100	1,100	1,100	1,100	1,100	1,100
City of American Canyon	750	750	750	750	750	750
Other Demands[e]	1,500	1,500	1,000	1,000	1,000	1,000
Total for all categories	**28,790**	**30,110**	**31,340**	**33,220**	**35,140**	**35,610**

7.4.3 Water Supply and Demand Comparison

The projected annual normal water supply and demand for the Vallejo system is compared and summarized in Table 7-4. Surface water supplies are sufficient but subject to reductions in deliveries in dry years. It is anticipated that the current 38,594 ac-ft/yr normal available water supply will climb to 46,444 beginning in 2010. The table shows that in average precipitation years, the City of Vallejo has sufficient water to meet its customers' needs, through 2025.

Table 7-4. Normal Water Year Supply and Demand Comparison, ac-ft/yr

NORMAL YEAR (Ac-Ft.)	2005	2010	2015	2020	2025
Supply	38,594	46,444	46,444	46,444	46,444
Demand	30,110	31,340	33,220	35,140	35,610
Difference = Surplus or (Deficit)	8,484	15,104	13,224	11,304	10,834
Difference (as a percentage of supply)	22%	33%	28%	24%	23%

7.4.4 Minimum Supply Estimate – 3 Year Worst Case Drought

The City is required to provide an estimate of the water supply available for the next three years using the worst case historic drought delivery for each separate supply source. The three year worst case delivery may not coincide for each supply source due to differing watershed characteristics and storage availability for each supply. Table 4-6 shows the driest three year sequence for each of the City's supply sources.

Table 7-5. Driest Three-Year Historic Water Supply Sequence

Supply Source	Entitlement (Acre-Feet)	3 Year Sequence - Minimum Delivery	Percentage of Entitlement Available in Each Year
Solano Project [a]	**14,600**	**1932, 1933, 1934**	**100%, 34%, 44%**
State Water Project (NBA) Table A [b]	**5,600**	**1990, 1991, 1992**	**27%, 26%, 35%**
Vallejo Permit Water [c] [e]	**17,200 (through 2006) 22,800 (by 2007)**	**1990, 1991, 1992**	**75%, 75%, 75%**
Lakes Madigan & Frey [c]	**400**	**1990, 1991, 1992**	**75%, 75%, 75%**
Lake Curry [d]	**1,500**	**1990, 1991, 1992**	**100%, 100%, 100%**

a. Source: Ultimate level of development of Lake Berryessa watershed at 30,000 AF/yr.
b. Source: DWR Study 6, 2001 Level of Development, 2004 OCAP, using Sacramento Valley Index from 1922 through 1993.
c. Permit Water and Lakes source supply have the worst estimated reduction due to drought or environmental constraints. No historical constraints to full supply availability exist, however, the City has chosen to conservatively reduce available yield.
d. Lake Curry is calculated as a 1,500 AF yearly demand for fisheries, with no delivery potential to the City until 2010. Actual entitlement is 3,750 AF/Yr. As such, 1,500 AF is considered 100% reliable until 2010 to satisfy instream flow.
e. Pumping capacity is 22,800 AF/Yr., current maximum contractual delivery through State Water Project is 17,200 AF/Yr. Contract amendment to be signed by 2007 to allow full 22,800 AF/Yr. delivery.

Table 7-6 displays a very conservative estimate of the minimum water supply available during the next three water years based on the driest three-year historic sequence for each of the City's water sources. These worst case supply quantities were calculated by applying the percentage of entitlement available in each of the three consecutive years from Table 7-5 for each source to the available water entitlements projected for years 2006, 2007, and 2008. This would not be expected to accurately describe the actual water available due to the geographic separation of the supply watersheds. As shown in Table 7-5, the reliability of each supply is relatively independent, and as such it is highly unlikely that all sources would experience simultaneous worst case drought conditions.

Table 7-6. Minimum Water Supply Estimate over the Next Three Years (Ac-Ft)

SUPPLY SOURCE	Year 1 (2006)	Year 2 (2007)	Year 3 (2008)
Solano Project	**14,600**	**4,964**	**6,424**
State Water Project (NBA) Table A	**1,512**	**1,456**	**1,960**
Vallejo Permit Water	**12,900**	**17,100**	**17,100**
Lake Madigan & Frey	**300**	**300**	**300**
Lake Curry	**1,500**	**1,500**	**1,500**
Total Available Supply	**30,812**	**25,320**	**27,284**

Under the three year worst case drought supply delivery scenario, the City would experience reductions in water supply delivery of 20 percent in Year 1 (from 38,594 Ac-ft), 43 percent in Year 2 (from 44,194 Ac-ft), and 38 percent in Year 3 (from 44,194 Ac-ft). This takes into account an anticipated increase in water supply entitlement in 2007 for Vallejo Permit Water from 17,200 to 22,800 acre feet. The Water Shortage Contingency Plan provides for actions to address up to a 50% reduction in supply due to drought or catastrophic events.

7.5 Water Shortage Response Stages

The City of Vallejo employs a five stage water-shortage response plan (Table 7-7 below), which is triggered at prescribed levels. Water-shortage stages are monitored, reported and acted upon according to the plan set out in the reduction-measuring mechanism for each stage. Each stage consists of specific prohibitions, regulations, fines, penalties, and rate structure to encourage the appropriate level of conservation. Though all five stages have both voluntary and mandatory components, none can be considered a rationing program because they do not strictly limit water use. However, Stages IV and V are most restrictive primarily due to the landscape irrigation component, which prohibits irrigation of any decorative landscaping. Under drought conditions the City is not anticipated to have to implement any conservation above Stage II. Conservation Stages IV and V are prepared to meet emergency conditions brought upon by catastrophic events.

Table 7-7. Water Shortage Response Stages

Stage	Demand Reduction Goal
Stage I – Normal Conditions	0% Normal Usage
Stage II – Water Warning	Up to 10% reduction of normal usage
Stage III – Water Shortage	Up to 20% reduction of normal usage
Stage IV – Water Crisis	Up to 35% reduction of normal usage
Stage V – Water Emergency	Up to and Above 50% reduction of normal usage

Given the potential requirement for various levels of demand reduction due to catastrophic events and drought scenarios, prioritization of use of the available water resource must be considered. The principle of maximum beneficial usage must be implemented and plans created to efficiently produce such a result. Conservation measures for each stage are based on the priorities set in the California Water Code Chapter 3 and through public input.

- Priority 1: Maintain essential public health and safety uses.

Uses include minimum drinking, sanitation, food preparation activities, and fire protection requirements. These uses are considered the core minimum water use of the community and are estimated at approximately 50 gallons per day.

- Priority 2: Maintain the existing economic and job base of the community.

Acceptable uses would include water sufficient to allow restaurant operation, water necessary for existing industrial uses, and additional commercial uses which protect the employment base of the communities served. All these activities would be under condition of efficient water usage or penalty.

- Priority 3: Continued discretionary uses for existing customers.

Existing customers make use of large quantities of non essential water use through such activities as outdoor landscaping, swimming pools, car washing. These activities would be heavily discouraged and would be expected to account for a large percentage of demand reductions. Provisions may be made to allow continued irrigation of heritage trees and plants which benefit the community.

- Priority 4: New Service Connections

New connections would not be permitted during times of severe shortage. Only those approved connections permitted before supply reduction events occurred would be allowed to be connected to the system. Any additional service requests would be conditioned to fund demand reduction measures which produce verifiable savings greater than the proposed connection impacts.

The primary components of each stage consist of a tiered rate structure, regulations/prohibitions, and penalties/fines. Details of each response are summarized in Table 7-8 below.

Table 7-8. Stage Components

	Stage I Normal	**Stage II Water Warning**	**Stage III Water Shortage**	**Stage IV Water Crisis**	**Stage V Water Emergency**
RATE STRUCTURE	Normal	Potentially Modified	Potentially Modified	Potentially Modified	Potentially Modified
Consumption Rate Surcharge	None	(2.0*Rate) Usage between 100%-110% of Stage II Allotment	(2.0*Rate) Usage between 100%-110% of Stage III Allotment	(2.0*Rate) Usage between 100%-110% of Stage IV Allotment	(2.0*Rate) Usage between 100%-110% of Stage V Allotment
Consumption Rate Surcharge	None	(3.0*Rate) Usage between 110%-120% of Stage II Allotment	(3.0*Rate) Usage between 110%-120% of Stage III Allotment	(3.0*Rate) Usage between 110%-120% of Stage IV Allotment	(3.0*Rate) Usage between 110%-120% of Stage V Allotment
Consumption Rate Surcharge	None	(4.0*Rate) Usage above 120% of Stage II Allotment	(4.0*Rate) Usage above 120% of Stage III Allotment	(4.0*Rate) Usage above 120% of Stage IV Allotment	(4.0*Rate) Usage above 120% of Stage V Allotment
Service Charge Surcharge	0%	Up to 5%	Up to 10%	Up to 20%	Up to 50%
PROHIBITIONS	Controllable Water Leaks New installation of single pass cooling systems Uses included in an adopted Wasteful Water Use Prohibition Ordinance	Normal prohibitions plus .. Washing of paved areas except to protect public health and safety	Stage I prohibitions plus .. Running water for washing buildings, etc.	Stage II prohibitions plus .. Landscape irrigation (none) Hydrant flushing Construction of new pools, spas, etc.	Stage III prohibitions plus .. New construction (Without existing permit) Filling of pools, spas, decorative fountains, etc.

	Stage I Normal	Stage II Water Warning	Stage III Water Shortage	Stage IV Water Crisis	Stage V Water Emergency
REGULATIONS		Washing of vehicles to be done at commercial car wash or with controllable water source such as a bucket or hose with shut-off nozzle.	Stage II regulations plus .. Restaurants to serve water only upon request Hotels, etc. to post notice of drought condition Reclaimed water for construction, if feasible	Stage III regulations plus Reclaimed water only for construction projects	Stage IV regulations plus ..
FINES/PENALTIES 1st Offense 2nd Offense 3rd Offense 4th Offense	 Warning $100.00 fine $200.00 fine $300.00 and installation of flow restrictor	 Warning $100.00 fine $200.00 fine $300.00 and installation of flow restrictor	 Warning $100.00 fine $200.00 fine $300.00 and installation of flow restrictor	 Warning $100.00 fine $200.00 fine $300.00 and installation of flow restrictor	 Warning $100.00 fine $200.00 fine $300.00 and installation of flow restrictor

Any or all of these components in each stage may be enacted by determination of the City Council in order to meet the demand reduction goal for that response stage.

The current water shortage stage is based upon available water supply versus baseline supply or current demand versus current available supply. Baseline supply is defined to be equal to available supply with the largest unit out of service. Current demand and current available supply are defined to equal the current demand and available supply at the time of the water shortage stage analysis. System performance, such as water system pressure, although not listed as a trigger from one stage to another, is directly related to the supply and demand relationship, and can indicate water shortage conditions.

7.6 Supply Shortage Triggering Levels

In order to protect the City's health and safety and minimize the social and economic impacts of water shortages, the City has established "triggers" to implement the various stages of conservation based on the City's water supply analysis. The "water supply analysis" is based on State Water Project deliveries, rainfall, storage levels, continuous years of drought, current consumption levels, existing water contracts, water supply deficiency declarations, and/or any other factors significantly impacting the integrity of the City's water supply. Each stage will be declared by the Vallejo City Council in accordance with findings based on the water supply analysis. The water supply analysis will recommend a percent reduction. The stages are defined as follows.

- Stage I — Where the City water supply appears adequate but prudent water use is encouraged.
- Stage II — Where the City water supply analysis demonstrates the need for up to a 10% reduction in water consumption.
- Stage III — Where the City water supply analysis demonstrates the need for up to a 20% reduction in water consumption.
- Stage IV — Where the City water supply analysis demonstrates the need for a 35% or more reduction in water consumption.
- Stage V — Where the City water supply analysis demonstrates the need for a 50% or more reduction in water consumption.

For each of these stages, the following sections define the:

- City's ability to meet the customer demands.
- Triggering mechanism that directs each particular stage to begin.
- Consumption limits that define the amount of water consumption to be reduced.
- City actions to be implemented.
- Requested consumer actions to reduce demand.

In addition, penalties for customer misuse of water and reduction measuring mechanisms to track the City water use during each stage are defined. Note that all normal water conservation measures also remain in effect. Also note that all water shortage response measures defined in each shortage stage carry-over into more severe shortage stages. In this way, more serious water supply emergencies are met with a staircase of more stringent water shortage response measures.

7.6.1 Stage I - Normal Supply

The City's supply or distribution system is able to meet all the water demands of its customers in the immediate future.

Triggering Mechanism: Full deliveries of water supply to all City customers and the ability to meet maximum day demand with largest unit out of service.

Consumption Limits: No percentage cutback required. All normal water efficiency programs are in place.

City Actions: During Stage I, all normal water use efficiency programs will continue.

Requested Consumer Action: During this stage all normal water efficiency programs will continue. Voluntary participation in water waste restrictions requested.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Reduction Measuring Mechanism: Production figures are recorded daily within each system and monitored by the Water Superintendent monthly during normal water supply conditions.

7.6.2 Stage II - Water Warning

There is a probability that the City supply or distribution system will not be able to meet all the water demands of its customers.

Triggering Mechanism: A cutback in supply by up to 10 percent of baseline supply and the inability to obtain additional water, or demand is greater than 90 percent of available supply.

Consumption Limits: All customers would be required to reduce consumption by 10% for the duration of the water warning.

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of the calculated base year 2004 usage (per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of ninety five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

3. In addition to the above mandatory water use reductions of subdivisions 1 and 2 of this subsection, the following restrictions shall apply to all persons.

a. the use of water from hydrants shall be limited to fire fighting and other activities necessary to maintain the health, safety, and welfare, of the citizens of Vallejo.
b. All "waste of water" elements as defined in Stage I shall remain in effect in Stage II.

City Actions: City will implement the following actions:

- Initiate public information campaign explaining water supply condition, water shortage stages, and water shortage response measures. Campaign will consist of a combination of distribution of literature, direct mailers, bill inserts, restaurants message tents, and weekly water shortage status update and conservation messages printed in local newspapers.
- Notify local jurisdictions of Stage II implementation within 10 working days after implementation of Stage II. The notification shall be in the form of a letter to the appropriate contact person for each agency found by calling agencies as listed in Table 7-1.
- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage II.
- Continue ongoing educational program in area schools.
- Maintain a Water Conservation Hotline with specially trained conservation representatives to answer customer questions about conservation and water use efficiency.
- Provide free water conservation kits at the Water Billing Office for customer pickup.

- Initiate "conservation monitor" duties to existing personnel to identify and document excessive water use and advise customers regarding the appropriate watering schedule.
- Implement rate changes to penalize excess usage.

Requested Consumer Actions: Customers will be required to implement the following water shortage response measures:

- There shall be no hose washing of sidewalks, walkways, driveways, parking areas, patios, porches or verandas, except flammable or other similar dangerous substances may be washed from said areas by direct hose flushing for the benefit of public health and safety. This prohibition shall not apply where hosing of sidewalks or driveways is required by law.
- No water shall be used to clean, fill, operate or maintain levels in decorative fountains unless such water is part of a recycling system.
- No customer shall permit water to leak from any facility on his/her premises. Such facilities shall include sprinklers and irrigation systems, faucets, toilets, water heaters or any other fixture used in providing water service. Any leak shall be repaired in 72 hours.
- No customer shall sprinkle, water or irrigate any shrubbery, trees, lawns, grass, ground cover, plants, vines, gardens, vegetables, flowers, or any other landscaped or vegetated area between the hours of 9:00 a.m. and 6:00 p.m. Such watering shall not be in excess of needs nor be of a manner that allows water to flow into streets.
- Non-commercial washing of privately owned vehicles, trailers, buses, boats and equipment, except from a bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse, and only on a surface, which will allow water to be returned to the ground.
- Any use of water from a fire hydrant, except for fire protection purposes, is prohibited, unless authorized by the City.
- Use of water for construction purposes, such as consolidation of backfill, unless no other source of water or method can be used, is prohibited.
- Water will be available only for beneficial uses, all unnecessary and wasteful uses of water are prohibited.
- Water efficient plumbing fixtures, water efficient appliances and high efficiency irrigation techniques such as drip irrigation, are encouraged.
- Mow less frequently allowing grass to grow longer, inducing hydration.
- Check the soil moisture in the root zone to determine when irrigation is required.
- Restaurants shall serve water only upon request.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to $300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: During all stages of water shortages, daily production figures are reported to and monitored by the Water Superintendent daily.

7.6.3 Stage III - Water Shortage

The City's supply or distribution system will not be able to meet all the water demands of its customers.

Triggering Mechanism: A cutback in supply of 20 percent and the inability to obtain additional water, or demand is greater than 105 percent of available supply.

Consumption Limits: Customers would be required to reduce consumption by 20 percent for the duration of the water shortage condition.

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of ninety percent of residential base allotment usage, per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection, all elements of Stage II shall remain in effect in Stage III.

City Actions: The City will implement the following actions:

- Continue City actions listed through Stage I and II.
- Continue public information and education programs.
- Notify local jurisdictions of Stage III implementation within 10 working days.
- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage III.
- Mandate compliance to Stage II requested customer actions.
- Implement rate changes to penalize excess usage.

Requested Customer Actions: Customers will be notified that Stage III water conservation measures are in effect and compliance with the following water shortage response measures will be required:

- All Stage I and II actions remain in force.
- Further reduction in landscape irrigation required. Reduce watering time; tolerate some plant wilting.
- Landscape, pasture, common areas and street median irrigation shall be limited to a maximum of three days per week when necessary based on the following schedule:
    - Customers with street addresses that end with an odd number may irrigate only on Tuesdays, Thursdays, and Saturdays.

- Customers with street addresses that end with an even number may irrigate only on Monday, Wednesdays, and Fridays.
- Common areas and street medians may irrigate only on Mondays, Wednesdays, and Fridays.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to $300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: During all stages of water shortages, daily production figures are reported to and monitored by the Water Superintendent daily.

7.6.4 Stage IV - Water Crisis

The City supply or distribution system is not able to meet all the water demands of its customers under Stage III requirements.

Triggering Mechanism: A cutback in supply by 20-35 percent and the inability to obtain additional water, or demand is greater than 120 percent of available supply.

Consumption limits: All customers would be required to reduce consumption by 35% for the duration of the water crisis.

1. No residential customer shall make, cause, or commence the use of water received from the city for any purpose in an amount in excess of eighty percent of residential base allotment usage, per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection, all elements of Stage III shall remain in effect in Stage IV.

City Actions: The City will implement the following actions:

- Continue all conservation program and agency action elements through Stage III.
- Maintain public information campaign explaining water shortage conditions.
- Notify local jurisdictions of Stage IV implementation within 10 working days.

- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage IV.
- Mandate adherence to all water conservation measures required under Stage III of requested customer actions.
- Landscape, pasture, common areas and street median irrigation shall be limited to a maximum of two days per week based on the following schedule.
    - Common areas and street medians may irrigate only on Mondays and Fridays.
- Institute a rationing program through percentage cutbacks.
- Request assistance from local agencies with available water supplies.
- Implement rate changes to penalize excess usage.

Requested Customer Actions: Customers will be requested to comply with all Stage III water shortage response measures as listed below.

- All Normal and Stage I, II, and III actions remain in force.
- Landscape, pasture, common areas and street median irrigation shall be limited to a maximum of two days per week based on the following odd-even schedule.
    - Customers with street addresses that end with odd numbers may irrigate only on Tuesdays and Saturdays.
    - Customers with street addresses that end with even number may irrigate only on Monday and Fridays.
    - Common areas and street medians may irrigate only on Mondays and Fridays.
- Water use for ornamental ponds and fountains is prohibited.
- Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.
- Water shall not be used for cooling mists.
- Flushing of sewers or fire hydrants is prohibited except in case of any emergency and for essential operations.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to $300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: Daily production figures are reported to and monitored by the Water Superintendent daily.

7.6.5 Stage V - Water Emergency

The City is experiencing a major failure of a supply, storage or distribution facilities.

Triggering Mechanism: A cutback in supply of up to or greater than 50 percent and the inability to obtain additional water, or demand is greater than 125 percent of available supply.

Consumption Limits: All customers would be required to reduce consumption by 50% for the duration of the water emergency.

1. No residential customer shall make, cause, use, or commence the use of, water received from the city for any purpose in an amount in excess of sixty five percent of residential base allotment usage per residence. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of seventy percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be fifty percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty. The customer of record may request an increase in the basic allotment.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection, all elements of Stage IV shall remain in effect in Stage V.

City Actions: The City will implement the following actions:

- Continue all water shortage response measures and City action elements through Stage IV.
- Continue public information outreach program with regular updates on the state of the emergency.
- Notify local jurisdictions of Stage V implementation within 10 working days.
- Notify customers at least 24 hours in advance, via the media, when it becomes necessary to initiate Stage V.
- Mandate that all Stage V conservation measures be implemented immediately and strictly enforced.
- Request assistance from local agencies with available water supplies.
- Implement rate changes to penalize excess usage.

Requested Customer Actions: Customers will be required to comply with all of the following Stage V water shortage response measures:

- Landscape and pasture irrigation is prohibited.
- Activation of additional water service connections to the City will not be allowed.
- Flushing of sewers or fire hydrants is prohibited except in case of any emergency and for essential operations.

Penalties/Fines: The City, after one written warning that is personally delivered to the customer or left at the premises as a "door hanger" for violation of water used for non-essential or unauthorized use, shall apply the penalties as shown in Table 7-8.

Metered connections: Continued use of water for non-essential or unauthorized uses will result in fines of up to $300 per offense, flow restrictor installation, and/or discontinuance of service.

Reduction Measuring Mechanism: During all stages of water shortages, daily production figures are reported to and monitored by the Water Superintendent daily.

7.7 Revenue and Expenditure Impacts

This subsection describes the revenue and expenditure impacts that a water shortage may have on the City and the measures the City has in place to overcome these impacts. Table 7-9 below contains predictions of Vallejo's revenues and expenditures at 10, 20, 35, and 50 percent reduction levels (in consumption) in relation to each staged response.

Table 7-9. Estimated Revenues & Expenditures (1,000 Dollars)

Water Sales (A-F)	Normal	Stage I	Stage II	Stage III	Stage IV
% Reduction	0.0%	10.0%	20.0%	35.0%	50.0%
Revenues 06/07					
Water Sales (Base)	15,941	14,347	12,752	10,361	7,970
Water Sales (Avoidable)	1,486	1,337	1,189	966	743
Service Charge	6,086	6,086	6,086	6,086	6,086
Non-Rate Rev	5,755	5,455	5,155	4,705	4,255
Connection Fees	1,723	1,723	1,723	1,723	862
Revenue Total	**30,991**	**28,948**	**26,905**	**23,841**	**19,916**
% Reduction	0	9.3%	13.2%	23.1%	35.8%
Expenses 06/07					
Operations & Maintenance	19,616	19,116	18,616	17,616	16,616
Return to Base	2,793	2,568	2,394	2,132	1,871
Capital Projects	1,751	1,500	875	500	200
Debt Service	5,454	5,454	5,454	5,454	5,454
Non Operating	318	286	254	206	158
Expense Total	**29,932**	**28,924**	**27,593**	**26,908**	**25,299**
% Reduction	0	9.3%	11.0%	16.5%	18.4%
Available for Reinvestment or Reserve	1,059	24	(688)	(2,067)	(5,383)

This analysis includes the following assumptions:

- City of Vallejo Water Utility Financing Plan and Rate Study (2004), Fiscal Year 06/07 Calculations.
- Volume and daily service rates remain static.
- Limited pre-permitted new connections at Stage V.
- New capital projects will be deferred at Stage II through V.
- Return to Base Expense Proportional to Revenue.
- Operation and Maintenance Expenses Reduced.

The table above indicates the magnitude of revenue reductions to be expected due to a water supply shortage. As shown, during a minor 10% reduction, current City rates are adequate to meet expenses with no revenue remaining to fund reserves. Beyond declaration of a Stage II Shortage Contingency event, both volume and meter charges may be raised at each stage by the commensurate amount to make up the deficiency but will remain revenue neutral. City Council action will be required to adjust (lower or raise) water rates and/or charges if necessary to balance revenues and expenses per the draft Ordinance.

7.8 Monitoring of Water Usage and Revenue

The success of the City's response to a water shortage depends on its ability to accurately monitor water usage, to determine if current stage mandatory water use reductions are being met and project ongoing water supply adequacy. It also depends on the City's careful review of revenue levels to ensure steps are taken, as needed, to maintain adequate water system funding during times of reduced water sales.

7.8.1 Water Consumption Monitoring

Billing data for the City of Vallejo lags approximately 1-2 months behind usage. Given the nature of standard rotating meter reading and the inability to hire and train meter reading personnel to increase the speed of data collection, the City will use water treatment plant production volume data to monitor water use reduction goals. Depending on the level of supply reduction and the corresponding requirement for demand reduction, water plant production will be monitored on a monthly, weekly, or daily schedule as described below to ensure that the necessary level of demand reduction is being achieved.

During Stage I periods, water production/consumption is reported by the Water Superintendent monthly to the Public Works Director to ensure adequate demand and supply balance is maintained.

During Stage II and III periods, water production/consumption is reported by the Water Superintendent weekly to the Public Works Director to ensure adequate demand and supply balance is maintained. If sufficient reductions are not being realized to ensure balance of supply and demand, recommendations will be presented to the City Manager for corrective actions to be taken.

During Stage IV and V periods, water production/consumption will be monitored on a daily basis with recommendations given daily if shortages are projected.

7.8.2 Water Fund Financial Monitoring

During Stage I periods, water revenue figures are provided quarterly for review by department and division heads. The Water Superintendent will report monthly to the Public Works Director to ensure adequate revenue is being collected to meet existing and projected budgeted needs.

During Stage II and III periods, water revenue figures will be provided monthly for review by department and division heads. The Water Superintendent will report monthly to the Public Works Director to ensure adequate revenue is being collected to meet existing and projected budgeted needs. If revenues are projected to be inadequate, recommendations will be presented to the City Manager for corrective actions to be taken. Such actions may include increases or decreases in either or both the service charge and consumption charge, to ensure adequate funds are collected to maintain the financial stability of the water fund.

During Stage IV and V periods, water revenue figures will be provided weekly for review by department and division heads. The Water Superintendent will report monthly to the Public

Works Director to ensure adequate revenue is being collected to meet existing and projected budgeted needs. If revenues are projected to be inadequate, recommendations will be presented to the City Manager for corrective actions to be taken. Such actions may include increases or decreases in either or both the service charge and consumption charge, to ensure adequate funds are collected to maintain the financial stability of the water fund.

Appendix A – Urban Water Management Planning Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AD 11X, Filante, 1991
AS 1869, Speier, 1991
AS 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AD 2853, Cortese, 1994
AS 1845, Cortese, 1995
SB 1011, Polanco, 1995
AD 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AD 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384 Costa, 2002
SB 1518 Torlakson, 2002
AS 105, Wiggins, 2003
SB 318, Alpert, 2004

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

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."
10610.2. (a) The Legislature finds and declares all of the following:
(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.
10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.
10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.
10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.
10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.
10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.
10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.
10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.
10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.
10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

10620.
(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year alter it has become an urban water supplier.
(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.
(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.
(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.
10621.
(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.
(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.
10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.
(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management
(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.
(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.
(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.
(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

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

(2) The water use projections shall be in the same five-year increments described in subdivision (a).
(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.
(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
(4) An estimate, if available, of existing conservation savings on water use within the suppliers service area, and the effect of the savings on the supplier's ability to further reduce demand.
(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).
(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water suppliers plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).
10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.
10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that 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. -
(I) Penalties or charges for excessive use, where applicable.
(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
(h) A draft water shortage contingency resolution or ordinance.
(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.
10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplie?s service area, and shall include all of the following:
(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.
10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.
(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.
(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.
(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

10640.Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

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

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

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

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days alter adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to die Legislature, on or before December31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

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

CHAPTER 4. MISCELLANEOUS PROVISIONS

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

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

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

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

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

supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.
10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.
10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.
10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.
10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.
10657. (a) The departmentshalltakeinto-consideration-whether.the-urbanwater.supplierhas submitted-an-updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.
(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Appendix B – Invitation to Participate in the UWM Plan Update

CITY OF VALLEJO

UTILITIES DEPARTMENT
Water Division

202 FLEMING HILL ROAD • VALLEJO • CALIFORNIA • 94589-2337 • (707) 648-4307
website: www.ci.vallejo.ca.us FAX (707) 648-4060

INVITATION TO PARTICIPATE IN THE CITY OF VALLEJO'S
2005 URBAN WATER MANAGEMENT PLAN UPDATE

The City of Vallejo will be updating its Urban Water Management Plan (UWMP) in the coming weeks. The City will also be considering a Draft USBR Water Management Plan, Water Shortage Contingency Plan, and Water Waste Prevention Ordinance.

Urban water suppliers, such as the City of Vallejo, are required by the Urban Water Management Planning Act to update their UWMP and submit a completed plan to the Department of Water Resources every five years. An UWMP is required in order for a water supplier to be eligible for DWR administered State grants and loans and drought assistance.

The plan describes and evaluates the City's water sources, water use patterns, and actions the City will take to assure that water is used efficiently within the service area, including during potential water shortages.

If you have any comments or concerns regarding water management, including water conservation programs and water shortage contingency actions, or wish additional information, please contact:

Pamela Sahin, Water Conservation Coordinator
PHONE: (707) 648-4479
FAX: (707) 648-4060
E-MAIL: waterinfo@ci.vallejo.ca.us
MAIL: 202 Fleming Hill Road, Vallejo, CA 94510

If received by Friday, November 4, 2005, your comments will be considered in the preparation of the draft 2005 Urban Water Management Plan. Please note that the draft plan and related documents will be available for a 30-day public review and comment period beginning mid-November 2005.

10/18/05

Printed on Recycled Paper

Back side of Invitation

Where Does My Water Come From?

City of Vallejo customers are fortunate because we enjoy an abundant water supply from four sources. Water from the Solano Water Project is impounded in Lake Berryessa and transported by way of the Putah South Canal to Cordelia. State Water Project water is delivered to Lake Oroville and runs through the Sacramento River to the North Bay Aqueduct Pumping Facility at Barker Slough, where it is pumped to the Department of Water Resources (DWR) Forebay at Cordelia. Vallejo's State License Water also comes from Barker Slough. Lake Curry is a standby source for the City System located in Napa County. It will be utilized as soon as conveyance facilities are in place. Water from any of all of these sources is then pumped from Cordelia to the Fleming Hill Water Treatment Plant located on the hilltop above Six Flags Marine World. Vallejo also has three sources of water for its Lakes System that serves Gordon Valley, Old Cordelia, Green Valley and parts of American Canyon and Suisun Valley. Solano Project Water is delivered from Lake Berryessa via the Putah South Canal. Lakes Frey and Madigan are located in northern Solano County. The city owns both lakes and the surrounding land and restricts any activity that would result in contamination. Water flows into Lake Frey from Lake Madigan. Water from Lake Frey and the Putah South Canal is pumped from the Diversion Dam above the plant to the Green Valley Water Treatment Plant located at the end of Green Valley Road. During brief periods of construction or emergency repairs, Lakes System customers may be served by the Waterman Treatment Plant located in the City of Fairfield. For a copy of their water quality report call (707) 428-7594.

Excerpt from the City of Vallejo Annual Water Quality Report (for 2004 results)

CITY OF VALLEJO

UTILITIES DEPARTMENT
Water Division

202 FLEMING HILL ROAD • VALLEJO • CALIFORNIA • 94589-2337 • (707) 648-4307
website: www.ci.vallejo.ca.us FAX (707) 648-4060

October 18, 2005

David Okita, General Manager
Solano County Water Agency
6040 Vaca Station Road
Elmira, CA 95625

Subject: City of Vallejo Urban Water Management Plan Update
Draft Water Shortage Contingency Plan

Dear David,

As you are aware, under California law, updated Urban Water Management Plans are to be adopted by December 31, 2005. Per Water Code Section 10620. (d)(2) "Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable." We may be contacting your agency in the very near future seeking clarifying information for use in preparing our draft UWMP.

Please let us know of any comments or concerns that you have or issues you want to see addressed in our draft UWMP. If received by Friday, November 4, 2005, your comments will be considered in the preparation of the draft 2005 Urban Water Management Plan.

We will respond to your submittals and send you a review copy of the completed draft UWMP. Please provide staff contact information. Note that the draft plan and related documents will be available for a 30-day public review and comment period beginning mid-November 2005.

Sincerely,

Pamela Sahin

Pamela Sahin
Water Conservation Coordinator
Phone: (707) 648-4479
Fax: (707) 648-4060
E-mail: waterinfo@ci.vallejo.ca.us
Address: 202 Fleming Hill Road, Vallejo, CA 94510

cc: Thomas Pate

Printed on Recycled Paper

Appendix C – Notice of Public Hearing and Summary of Public Comments

CITY OF VALLEJO

NOTICE OF PUBLIC HEARING AND AVAILABILITY OF
DRAFT 2005 URBAN WATER MANAGEMENT PLAN
AND ASSOCIATED WATER DEMAND MANAGEMENT DOCUMENTS FOR REVIEW

Notice is hereby given that a public hearing will be held Tuesday, February 28, 2006 at 7:00PM, in the City Council Chambers, 555 Santa Clara Street, to consider the adoption of a proposed Urban Water Management Plan (UWMP) dated February 2006. A draft Water Shortage Contingency Plan (Section 7 of the UWMP) and a proposed Wasteful Water Use Prohibition Ordinance will also be under consideration for adoption.

Urban water suppliers, such as the City of Vallejo, are required by the Urban Water Management Planning Act (Water Code section 10610 et seq.) to update their UWMP and submit a completed UWMP to the Department of Water Resources every five years. A UWMP is required in order for a water supplier to be eligible for State administered grants and loans and drought assistance. The UWMP describes and evaluates the City's water sources, water use patterns, and actions the City will take to assure that water is used efficiently within the service area, including during potential water shortages.

A Water Shortage Contingency Plan examines the potential for water shortages and provides an action plan for reducing water demand. Additional Council action would be required to authorize implementation of the Water Shortage Contingency Plan during a water shortage.

The Wasteful Water Use Prohibition Ordinance was prepared to implement a water conservation best management practice. It includes a description of prohibited water uses.

The UWMP and the associated water demand management documents are available for public review at the following locations:

Vallejo City Clerk's Office (3rd Floor)
[For hours call: (707) 648-4527]
Vallejo Public Works Office (4th Floor)
[For hours call: (707) 648-4315

Vallejo City Hall
555 Santa Clara Street
Vallejo, CA 94590

Vallejo Water Admin Office
[For hours call: (707) 648-4307]

Fleming Hill Water Treatment Plant
202 Fleming Hill Road
Vallejo, CA 94589

John F. Kennedy Library
Adult Reference Desk
[For hours call: 553-5568]
505 Santa Clara Street
Vallejo, CA 94590

Springstowne Library – Ref. Desk
[For hours call:553-5546]
1003 Oakwood Avenue
Vallejo, CA 94589

Fairfield Civic Center Library
[For hours call: 421-6500]
1150 Kentucky Street
Fairfield, CA 94533

Solano Community College Library
[For hours call: 864-7132]
4000 Suisun Valley Road
Fairfield, CA 94534

Persons wishing to comment can do so either in writing or in person. Comments can also be presented at the public hearing. Please return written comments on the draft Urban Water Management Plan, including the draft Water Shortage Contingency Plan, and the proposed Wasteful Water Use Prohibition Ordinance to Pamela Sahin.

For further information, please contact:
Pamela Sahin, Water Conservation Coordinator
PHONE: (707) 648-4479
FAX: (707) 648-4060
E-MAIL: waterinfo@ci.vallejo.ca.us
MAIL: 202 Fleming Hill Road, Vallejo, CA 94589

7. **PUBLIC HEARINGS**

A. CONSIDERATION OF TWO RESOLUTIONS:: 1) HOLDING ON FIRST READING A PROPOSED ORDINANCE ADDING CHAPTER 11.54 TO THE VALLEJO MUNICIPAL CODE CONCERNING THE PROHIBITION OF WASTEFUL WATER USE; AND 2) APPROVING AND ADOPTING THE CITY OF VALLEJO'S 2005 URBAN WATER MANAGEMENT PLAN.

A number of water demand management documents have been prepared to meet the requirements of the California Water Code. A proposed "Wasteful Water Use Prohibition Ordinance" has been prepared to implement a water conservation best management practice. A draft Water Shortage Contingency Plan (WSCP) has been prepared and incorporated into the Draft 2005 Urban Water Management Plan, which examines the potential for water shortages and provides an action plan for reducing water demand. The WSCP would not take effect until the Council took further future action declaring a water shortage. The City is required to prepare and adopt an updated Urban Water Management Plan every five years which describes and evaluates the City's water sources, water use patterns, and actions the City will take to assure that water is used efficiently within its service area. Public notice of this public hearing has been provided, the documents have been available for public review and the Council will accept pubic comment on the City of Vallejo's Draft 2005 Urban Water Management Plan.

RECOMMENDATION: Adopt the following resolutions:

1) Adopt the resolution holding on first reading a proposed ordinance adding Chapter 11.54 to the Vallejo Municipal Code, concerning the prohibition of wasteful water use; and

2) Adopt the resolution approving and adopting the City of Vallejo's 2005 Urban Water Management Plan.

B. CONSIDERATION OF A RESOLUTION APPROVING A FUEL SURCHARGE MECHANISM TO COVER UNANTICIPATED INCREASES IN THE COST OF MARINE DIESEL FUEL REQUIRED FOR FERRY OPERATIONS. **(THIS ITEM WILL BE REMOVED FROM THE AGENDA. NO ACTION WILL BE TAKEN)**

8. **POLICY ITEMS - NONE**

9. **ADJOURN TO A SPECIAL JOINT MEETING WITH THE VALLEJO REDEVELOPMENT AGENCY**

10. **ADMINISTRATIVE ITEMS**

A. CONSIDERATION BY THE CITY COUNCIL AND REDEVELOPMENT AGENCY (AGENCY) TO APPROVE 5 RESOLUTIONS (2 FOR THE CITY AND 3 FOR THE AGENCY) THAT WILL AMEND BOTH ENTITIES' BUDGETS, APPROVE A LOAN AGREEMENT BETWEEN THE CITY AND THE AGENCY AND APPROVE A REIMBURSEMENT AGREEMENT BETWEEN THE AGENCY AND TRIAD DOWNTOWN VALLEJO, LLC. THESE RESOLUTIONS WILL ALLOW FOR EXPENDITURES ON PHASE 1 OF THE TRIAD DOWNTOWN PROJECT TO

CONSIDERATION OF TWO RESOLUTIONS:: 1) HOLDING ON FIRST READING A PROPOSED ORDINANCE ADDING CHAPTER 11.54 TO THE VALLEJO MUNICIPAL CODE CONCERNING THE PROHIBITION OF WASTEFUL WATER USE; AND 2) APPROVING AND ADOPTING THE CITY OF VALLEJO'S 2005 URBAN WATER MANAGEMENT PLAN.

A number of water demand management documents have been prepared to meet the requirements of the California Water Code. A proposed "Wasteful Water Use Prohibition Ordinance" has been prepared to implement a water conservation best management practice. A draft Water Shortage Contingency Plan (WSCP) has been prepared and incorporated into the Draft 2005 Urban Water Management Plan, which examines the potential for water shortages and provides an action plan for reducing water demand. The WSCP would not take effect until the Council took further future action declaring a water shortage. The City is required to prepare and adopt an updated Urban Water Management Plan every five years which describes and evaluates the City's water sources, water use patterns, and actions the City will take to assure that water is used efficiently within its service area. Public notice of this public hearing has been provided, the documents have been available for public review and the Council will accept pubic comment on the City of Vallejo's Draft 2005 Urban Water Management Plan.

RECOMMENDATION:

Adopt the following resolutions: 1) holding on first reading a proposed ordinance adding Chapter 11.54 to the Vallejo Municipal Code, concerning the prohibition of wasteful water use; and 2) approving and adopting the City of Vallejo's 2005 Urban Water Management Plan.

FEBRUARY 28, 2006
J:\WT\Water Demand Management Docs CCR.doc

PUBLIC HEARING A

Agenda Item No.

COUNCIL COMMUNICATION **Date:** February 28, 2006

TO: Honorable Mayor and Members of the City Council

FROM: John P. Thompson, Interim City Manager
Robert V. Stout, Finance Director
Mark K. Akaba, Public Works/Utilities Director

SUBJECT: Proposed "Wasteful Water Use Prohibition Ordinance", Draft Water Shortage Contingency Plan, and Draft 2005 Urban Water Management Plan

RECOMMENDATION

Adopt the following two resolutions: 1) holding on first reading a proposed ordinance adding Chapter 11.54 to the Vallejo Municipal Code, concerning the prohibition of wasteful water use; and 2) approving and adopting the City of Vallejo's 2005 Urban Water Management Plan.

SUMMARY

A number of water demand management documents have been prepared to meet the requirements of the California Water Code. A proposed "Wasteful Water Use Prohibition Ordinance" has been prepared to implement a water conservation best management practice. A draft Water Shortage Contingency Plan (WSCP) has been prepared and incorporated into the draft 2005 Urban Water Management Plan, which examines the potential for water shortages and provides an action plan for reducing water demand. The WSCP would not take effect until the Council took further future action declaring a water shortage. The City is required to prepare and adopt an updated Urban Water Management Plan (UWMP) every five years which describes and evaluates the City's water sources, water use patterns, and actions the City will take to assure that water is used efficiently within its service area. Public notice of this public hearing has been provided, the documents have been available for public review and the Council will accept public comment on the City of Vallejo's Draft 2005 Urban Water Management Plan.

BACKGROUND AND DISCUSSION

Wasteful Water Use Prohibition Ordinance

The preparation, consideration, and adoption of such an ordinance is a water conservation best management practice measure included in the City's 1999 Water Management Plan.

The draft ordinance included in the 1999 plan, which was never adopted, has been reviewed and revised.

Although the City of Vallejo has acquired the right to the use of its water supply, and in the case of the Vallejo Lakes actually owns the watershed, under state law (Water Code §102) "all water within the State is the property of the people of the State" for the public welfare. "The right to water shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use of ... water." (Water Code §100). The proposed ordinance lists practices that are generally recognized to be wasteful water uses, and should therefore be prohibited.

Water Shortage Contingency Plan

The 1999 Water Management Plan (WMP) includes a rough draft of a water shortage contingency plan (WSCP). While sufficient to meet short term requirements at the time of the approval of the WMP by the U.S. Bureau of Reclamation, the WSCP needed to be reviewed and rewritten to fulfill additional state-required elements. A draft WSCP was prepared by Brown and Caldwell and versions of that draft have circulated and have been referenced in other documents. The WSCP now under consideration would replace any previous drafts. The proposed WSCP is both a stand-alone plan and a distinct section of the draft 2005 Urban Water Management Plan (Section 7).

It is important to note that adoption of the WSCP does not make the plan immediately effective. For the plan to be "activated," the Public Works/Utilities Director would need to conclude that the City's available water supplies were sufficiently reduced to warrant bringing the matter to the attention of the City Council and request the adoption of a resolution to declare a specific stage of water shortage emergency thereby implementing the water shortage response measures included in the plan and as detailed in the draft Water Shortage Contingency Plan Ordinance included as Appendix G of the Draft 2005 UWMP. This Ordinance will be brought back to Council for adoption in the future after the Council's approval and adoption of the UWMP, as it is prudent that the City have an adopted Water Shortage Contingency Plan Ordinance available for implementation if needed to deal with potential drought or emergency conditions.

Urban Water Management Plan

The Urban Water Management Plan is a state-mandated planning tool for the City of Vallejo Water Division. The plan is used to assess the impact of future development on the water resources of the City; helps identify potential problems with water supply; and identifies cost-effective water demand management measures (DMMs) (i.e., BMPs or best management practices) that the City will perform to help ensure efficient use of its water

supply. The City is required to pursue prudent, cost-effective measures to increase water use efficiency thereby maximizing the water available for competing public interests.

The UWMP includes description of the 14 demand management measures (BMPs) listed in Water Code section 10631 and whether or not the measure is currently being implemented or scheduled for implementation, including the steps necessary to implement any proposed measures. For many of the measures, a benefit-to-cost ratio of less than 1.0 indicates that full implementation of the measure, as envisioned by the California Urban Water Conservation Council, is not warranted. However, in these cases, staff proposes a program of public outreach and education.

Public Review and Participation Process

A Notice of Public Hearing was published in the Vallejo Times Herald and the Fairfield Daily Republic in accordance with applicable law. A notice was sent to parties on the City's notification list obtained from the Vallejo Planning Division, to regulatory agencies, and to local water agencies inviting them to participate in the plan preparation. No responses were received except from two agencies which asked for copies of the draft UWMP. All the proposed documents were made available for public review at the following locations and on the City website: John F. Kennedy Library, City Hall – Clerk's Office and Public Works, Water Administration Office, the Solano Community College Library and the Fairfield Civic Center Library. Copies of the draft UWMP were sent to other relevant agencies for comment.

ENVIRONMENTAL REVIEW

Water Code section 10652 and section 15282(w) of Title 14 of the California Code of Regulations provide a statutory exemption from the California Environmental Quality Act for the preparation and adoption of an Urban Water Management Plan or for the implementation of actions taken pursuant to Water Code section 10632, which includes the adoption of the Wasteful Water Use Prohibition Use Ordinance.

FISCAL IMPACT

Section 7.7 of the UWMP describes the revenue and expenditure impacts that varying water shortage stages may have on the City and the measures the City may put in place to overcome these impacts. Recommendations are made for future Council adoption that may temporarily apply "surcharges" and penalties to water rates and service charges in order to maintain minimal required revenue levels.

The cost of implementation of the proposed UWMP in this fiscal year is included in the FY2005/2006 operating budget in Fund 401 in personnel costs (0.5 FTE) and conservation

supplies (401-2701-431.14-32) and services (401-2701-431.15-56).

The Draft UWMP includes proposed future annual budgets sufficient to cover increases in water conservation staffing from 0.5 to 0.8 FTE and expanded demand management measures from approximately $75,000 to $120,000. These costs have been considered in the recent water rate study used to set current and future water rates and service charges. These proposed program expenditures are subject to City Council review and approval of each annual Water Enterprise Fund budget.

DOCUMENTS ATTACHED

a. A resolution holding on first reading an Ordinance adding Chapter 11.54 to the Vallejo Municipal Code concerning the prohibition of wasteful water use.

b. The proposed ordinance adding Chapter 11.54 to the Vallejo Municipal Code concerning the prohibition of wasteful water use.

c. A resolution to approve and adopt the Draft 2005 Urban Water Management Plan dated February 2006.

d. The Draft 2005 Urban Water Management Plan, dated February 2006, including the Draft Water Shortage Contingency Plan as Section 7.

PREPARED BY: Pamela Sahin, Admin Analyst II, Water Conservation Coordinator (707) 648-4479

CONTACT: Pamela Sahin, Admin Analyst II, Water Conservation Coordinator (707) 648-4479, sahin@ci.vallejo.ca.us

Erik Nugteren, Deputy Water Superintendent – Engineering (707) 648-4482, enugteren@ci.vallejo.ca.us.

OFFICE OF THE CITY MANAGER
CITY OF VALLEJO

February 28, 2006

TO: Honorable Mayor and City Council

FROM: John P. Thompson, Interim City Manager

SUBJECT: Public Hearing Item 7A – CONSIDERATION OF TWO RESOLUTIONS: 1) HOLDING ON FIRST READING A PROPOSED ORDINANCE ADDING CHAPTER 11.54 TO THE VALLEJO MUNICIPAL CODE CONCERNING THE PROHIBITION OF WASTEFUL WATER USE; AND 2) APPROVING AND ADOPTING THE CITY OF VALLEJO'S 2005 URBAN WATER MANAGEMENT PLAN.

Corrections are required to Section 5 of the draft City of Vallejo 2005 Urban Water Management Plan per communications received from Vallejo Sanitation and Flood Control District. These corrections do not affect the analysis of the City's water supply and demand. Those corrections, along with others identified by staff, are included on the attached page.

A revised resolution, reflecting the incorporation of these corrections into the 2005 Urban Water Management Plan, has been prepared for your consideration. Please remove the existing resolution, attachment "c" from Public Hearing Item 7A in your council agenda packet, and replace it with the attached revised resolution.

Corrections Needed to the circulated Draft City of Vallejo UWMP, as of Feb. 27, 2006

In addition, to the corrections noted below, staff requests the opportunity to correct any further small errors, such as minor spacing, formatting, and grammatical errors contained in the draft document before the plan, if adopted, is finalized and distributed.

Pg. 5, MTB listing: remove "[confirm]".

Pg. 19, Table 3-2: replace "c" superscript with "b".

Pg. 27, 2nd ¶: Paragraph split after 2nd sentence.

Pg. 29, 1st ¶, 4th line: replace "Table 4-2" with "Table 4-4".

Pg. 36, 3rd ¶, 11th line: add "water" after "Lake Berryessa".

Pg. 37, last ¶, 4th line: replace "flow of 12.1 mgd" with "flow of 10.3 mgd".

Pg. 38, Table 5-1: Under "Flow" column, replace "Up to 30 mgd" with "Up to 35 mgd" and "Greater than 30 mgd" with "Greater than 35 mgd."

Pg. 39, 1st ¶, 4th line: replace "City's population" with "City's service area population"; 5th line and 7th line: replace "Table 5-1" with "Table 5-3".

Pg. 39, 1st ¶, 5th line: remove "The source of the estimates is the Vallejo Sanitation and Flood Control District's Reclaimed Water Study (August 2003)."

Pg. 39, 1st ¶, last 2 sentences: replace "Per District staff, future increases in wastewater flow due to population increases will be offset by further reductions in inflow and infiltration. For that reason, wastewater flow is expected to remain level" with "Since 2000, the District has pursued an aggressive program of replacing leaky sewers. Accordingly, flows from 2000 to 2005 have decreased although population has increased. For the planning horizon shown in Table 5-3, District staff anticipates flows to increase proportionately to population figures." [Note: Correction provided by VSFCD]

Pg. 39, Table 5-3, footnotes: replace "Current treatment plant capacity is 30.0 mgd (11,200 ac-ft/yr)" with "The treatment plant is currently permitted to treat 15.5 mgd.", and replace the name "Rolf Uhlmutz" with "Rudolf Ohlemutz" [Note: Correction provided by VSFCD]; add footnote that estimates are extrapolated.

Pg. 39, Table 5-3, replace "10.4mgd" from 2010 – 2025, with "11.2, 11.5, 12.1, and 12.5" mgds and wastewater flow ac-ft/yr of "3,882" from 2010 – 2025, with "4,181; 4,293; 4,517; and 4,666" ac-ft/yr. [Correction provided by VSFCD, as extrapolated by City Staff.]

Pg. 62, Under "Activities in FY2004/2005…": Move first bullet "Provided water conserving tips applicable to CII customers on the City's website and links to useful site" to Page 63 under "FY2005/2006."

Pg. 79, Section 7.5, 1st line: replace "Table 7-7" with "Table 7-5"; 5th line: replace "four" with "five" stages; 9th line: replace "Stage III" with "Stage II"

Pg. 84, last line: replace "Water Utilities Office" with "Water Billing Office" and remove shading.

Pg. 151: add "Vallejo Sanitation and Flood Control District Reclaimed Water Study Plan (July, 2001)

Pg. 151: Solano County Water Agency Urban Water Management Plan, adopted "October 13, 2005".

City of Vallejo
2005 Urban Water Management Plan (UWMP)

Presented By:
Erik Nugteren - Deputy Water Superintendent
Pamela Sahin – Water Conservation Coordinator

FOR FURTHER INFORMATION CONTACT:
Water Conservation Coordinator, 648-4479, waterinfo@ci.vallejo.ca.us

2005 Urban Water Management Plan Mandate

- Urban Water Management Planning Act adopted by California Legislature 1983
- Required for suppliers providing greater than 3000 acre feet annually
- Requires updates to be adopted a minimum of every five years in years ending in 0 or 5
- Brings together important information on supply, demand, conservation, and emergency preparedness for public review

Public Comment & Review for 2005 UWMP

- Invitations sent to Planning Departments "Vallejo Neighborhood Associations and other groups list", invited to participate or comment during creation of the draft document
- Public notified of draft report availability for comment by multiple newspaper advertisements
- Today's public hearing to address comments
- Regional participation and coordination with neighboring Cities, Agencies, Districts

Historical City of Vallejo Water Usage/Demand

1985 - 17 MGD	19,300 Ac-Ft
1989 - 20 MGD	22,600 Ac-Ft
1994 - 16 MGD	18,000 Ac-Ft
2004 - 18 MGD	20,500 Ac-Ft

- Approximately 7,000 Ac-Ft additional demand for the Lakes, Benicia, American Canyon, Travis AFB
- Influences to past water demand; Mare Island, Weather, Economy
- Historical demand used to calculate per capita and unit use factors for future demand analysis
- Requirement for 20 year future water demand calculations by planning act

Estimated Future City Water Usage/Demand

2005 -	30,110 Ac-Ft
2010 -	31,340 Ac-Ft
2015 -	33,220 Ac-Ft
2020 -	35,140 Ac-Ft
2025 -	35,610 Ac-Ft

- Ultimate demand of 36,610 Ac-Ft includes the following usages:
  - Full City of Vallejo General Plan build-out
  - Lakes System
  - Travis AFB
  - City of Benicia
  - City of American Canyon
  - Environmental
- Assumes no drop in demand due to conservation even during prolonged drought

City of Vallejo Water Entitlements

- Multiple Sources of Supply

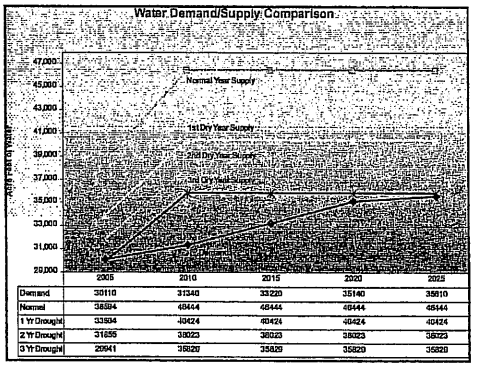
– State Water Project (NBA)	5,600
– Vallejo Permit Water	22,800
– Solano Project (Lake Berryessa)	14,600
– Vallejo Lakes (Madigan & Frey)	400
– Lake Curry	3,750
Total Acre Feet	47,150

* These are entitlements, not firm availability
* Availability influenced by environmental, mechanical, and drought conditions

1

City of Vallejo Water Supplies (Cont)

- Act requires projections for Normal, Single Dry & Multiple Dry year estimates of water supply availability
- City of Vallejo Calculations are as follows:
  - Normal Year = 46,444 Ac-Ft
  - Single Dry Year = 40,424 Ac-Ft
  - Multiple Dry Years = 35,829 Ac-Ft



	2005	2010	2015	2020	2025
Demand	30110	31340	33220	35140	35810
Normal	38594	46444	46444	46444	46444
1 Yr Drought	33594	40424	40424	40424	40424
2 Yr Drought	31655	38023	38023	38023	38023
3 Yr Drought	29941	35829	35829	35829	35829

Reclaimed or Recycled Water

- Coordinated with VSFCD
- Repeated studies have shown distribution is cost prohibitive
- No planned contribution to water supply within span of the UWMP

Water Conservation Program Highlights

- Public Information & Outreach with expanded use of City website
- Water Wise Activity Kits & Student Home Water Use Surveys
- Distribution of Retrofit Kit & Other Small Water Saving Devices
- Real-Time Weather-Based Landscape Irrigation Controllers
- High-Efficiency Washing Machine Rebates
- Regional Commercial, Industrial, & Institutional Program
- Proposed Wasteful Water Use Prohibition Ordinance

Water Shortage Contingency Plan (WSCP)

- Required by statute to plan for up to a 50% catastrophic water supply interruption
- Intended to allow quick implementation to cope with emergencies
- 5 stage plan proposal

Contingency Plan - WSCP (Cont)

- Stages ratchet up both voluntary & mandatory measures to bring about required cutbacks
- Potential rate & service change penalties and surcharges
- Must be revenue neutral
- Only upon declaration of council is plan implemented

2

Public Comments Received

1. Vallejo Sanitation and Flood Control District staff requested corrections to Section 5 of the Draft 2005 Urban Water Management Plan, as included in the February 28, 2006 memo above.

2. A faxed communication was received from M R Wolfe & Associates, P.C. on February 28, 2006, the day of the public hearing. It deals with statements and assumptions in the UWMP that differ from an earlier water supply assessment prepared for the Vallejo Station/Waterfront Project. [Note: No revision or correction to the UWMP was needed in response to this communication, a copy of which follows.]

RECEIVED
2006 FEB 28 PM 12:03
OFFICE OF THE
CITY CLERK
CITY OF VALLEJO

These inconsistencies reinforce the Coalition's previously stated concerns regarding the adequacy of the WSA and Final EIR for the Vallejo Station/Waterfront Project. The City Council should accordingly reconsider its approvals of these

m|r|wolfe
& associates, p.c.
attorneys-at-law

February 28, 2006

By Fax

Mayor Anthony Intintoli
Members of the City Council
c/o City Clerk
City of Vallejo
555 Santa Clara Street
Vallejo, CA 94590
Fax: (707) 648-4535

Re: Proposed Resolution Adopting City of Vallejo 2005 Urban Water Management Plan

(February 28, 2006 City Council Meeting Agenda Item No. 7.A.)

Dear Mr. Mayor and Members of the City Council:

On behalf of the Vallejo Waterfront Coalition, please accept these comments on the draft 2005 Urban Water Management Plan ("UWMP"). The Coalition does not object to the City's adoption of the UWMP *per se*. However, there are statements and assumptions in the UWMP that appear to contradict statements and assumptions in the City's "Revised Final Water Supply Assessment" ("WSA") approved by the Council on December 20, 2005, and in the Final EIR for the Vallejo Station/Waterfront Project certified on October 25, 2005. Examples include the following:

- The UWMP indicates that available water supplies in normal years, single dry years and double dry years are significantly less than those reported in the WSA.
- The UWMP includes estimates of annual water demand that are significantly greater than those reported in the WSA.
- The UWMP assumes reductions in demand due to drought response measures that are significantly greater than those assumed in the WSA, but significantly less than those claimed in the FEIR for the Vallejo Station/Waterfront Project – although none of these document provides evidence to support claims that their respective reduction assumptions are reasonable and can be achieved.

cc: Mayor & Council

49 Geary Street | Suite 200 | San Francisco, CA 94108 | Tel 415.369.9400 | Fax 415.369.9405 | www.mrwolfeassociates.com

FROM :M.R.WOLFE ASSOCIATES FAX NO. :4153699405 Feb. 28 2006 11:29AM P2

These inconsistencies reinforce the Coalition's previously stated concerns regarding the adequacy of the WSA and Final EIR for the Vallejo Station/Waterfront Project. The City Council should accordingly reconsider its approvals of these documents.

Thank you for considering these comments. Please call with any questions.

Yours sincerely,

M. R. WOLFE & ASSOCIATES, P.C.

Mark R. Wolfe
On behalf of the Vallejo Waterfront Coalition

MRW:es

FROM :M.R. WOLFE ASSOCIATES FAX NO. :4153699405 Feb. 28 2006 11:47AM P2

Appendix D - Resolution of the Vallejo City Council Adopting the UWMP

RESOLUTION NO. 06 – 62 N.C.

BE IT RESOLVED by the Council of the City of Vallejo as follows:

WHEREAS, the Urban Water Management Planning Act requires all urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet annually to update their Urban Water Management Plan (UWMP) at least every five years and to submit the UWMP to the Department of Water Resources; and

WHEREAS, an UWMP is required in order for a water supplier to be eligible for State administered grants, loans, and drought assistance; and

WHEREAS, the City is an urban supplier providing water to approximately 37,800 customer connections; and

WHEREAS, the City has updated its UWMP in compliance with the California Water Code; and

WHEREAS, the City is required to adopt a Water Shortage Contingency Plan as part of an Urban Water Management Plan; and

WHEREAS, the adoption of an UWMP is statutorily exempt from the requirements of the California Environmental Quality Act pursuant to Water Code section 10652 and section 15282(w) of Title 14 of the California Code of Regulations; and

WHEREAS, the UWMP was available for public review and comment; and

WHEREAS, a properly noticed public hearing was held on February 28, 2006, to receive oral or written statements regarding the UWMP; and

WHEREAS, the City Council finds that the adoption and implementation of the Urban Water Management Plan, including the Water Shortage Contingency Plan will meet the existing and projected future water demand through 2025 during normal years and during the third year of multiple dry years either through existing water supplies or through the implementation of the Water Shortage Contingency Plan.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Vallejo hereby approves and adopts the City of Vallejo's 2005 Urban Water Management Plan, dated February 2006, with revisions as outlined in the City Manager's memo dated February 28, 2006.

BE IT FURTHER RESOLVED that the City Manager or his designee is directed to submit the revised Plan to the California Department of Water Resources, the California State Library and to any city or county in which the City of Vallejo provides water within 30 days of the date of adoption.

ADOPTED by the Council of the City of Vallejo at a regular meeting held on February 28, 2006 with the following vote:

AYES:	Mayor Intintoli, Councilmembers Bartee, Cloutier, Davis, Gomes, and Sunga
NOES:	None
ABSENT:	Vice Mayor Pearsall (excused)
ABSTENTIONS:	None

//s//
ANTHONY J. INTINTOLI JR., Mayor

ATTEST: //s//
ALLISON VILLARANTE, City Clerk

Appendix E – Calculations of Unit Water Use

City of Vallejo Urban Water Management Plan -- Calculations for Demand Projections within Vallejo Water Systems
By Lisa Maddaus and Wynn Yin, Brown and Caldwell
Last Modified: June 10, 2005

Unit Water Use Factors

Single Family (gpd/unit)	387
Multi-family (gpd/unit)	345
Employees (gpd/employee)	102

TYPE OF UNITS AND BUILDING PROJECTION

City of Vallejo Water System

	2000	2005	2010	2015	2020	2025
Single Family, units						
City of Vallejo Buildout Estimates[a]	30445H	31,540EE	32,634EE	33,729EE	34823BE	34823BE
ABAG						
EIR						
Multi-family, units						
City of Vallejo Buildout Estimates[a]	12629H	13,770EE	14,911EE	16,053EE	17194BE	17194BE
ABAG						
EIR						
Total Residential, units						
City of Vallejo Buildout Estimates[a]	43074H	45,310EE	47,545EE	49,781EE	52017BE	52017BE
ABAG[b]	35,844	40,784	42,588	44,614	46,511	48,100
EIR[c]	40,608	42,814	45,020	47,045	49,070	49,070+
CIILGR[d], employees						
City of Vallejo Buildout Estimates[a]	35,550IE	41,357EE	47,164EE	52,972EE	58779BE	58779BE
ABAG[b]	25,113	28,660	31,685	34,391	37,203	39,849
EIR[c]	32,210	35,695	39,180	42,370	45,560	45,560+

Vallejo Lakes System

	2000	2005	2010	2015	2020	2025
Single Family, units						
Vallejo Utilities Division, Water Dept.[e]	778	803	828	853	878	900

Notes:

[a]Miering Contracting and Consulting, 2003. Figures based on historical data, and the City of Vallejo Buildout Estimates for base year (1999) and 2020 (buildout); intermediate figures were linearly extrapolated. Figures for 2025 are assumed to be the same as for 2020. H = historical; IE = initial City of Vallejo Buildout Estimates; EE = extrapolated City of Vallejo Buildout Estimates; BE = buildout City of Vallejo Buildout Estimates.

[b]ABAG data by census tract, sent to Brown and Caldwell on 9/17/02. City of Vallejo service area only.

[c]EIP Associates, Vallejo Waterfront/Downtown Project, Draft EIR, 12/02. Only figures for even years listed were available; other figures were linearly extrapolated when necessary.

[d]CIILGR = Commerical, industrial, institutional, landscaping, governmental, and recreational use.

[e]Vallejo Lakes System service area assumes 778 residential connections per Vallejo Water Utility Financing Plan and Rate Study, at a growth rate of 5 connections/year up to a capacity of 900 connections, per the City of Vallejo, Utilities Division, Water Department. All residential units are conservatively assumed to be single-family.

DEMAND ESTIMATES

City of Vallejo Water System	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**
Single Family Units, mgd						
City of Vallejo Buildout Estimates	8.6	9.0	9.4	9.9	10.3	10.3
ABAG						
EIR						
Multi-Family Units, mgd						
City of Vallejo Buildout Estimates	2.3	2.7	3.1	3.5	3.9	3.9
ABAG						
EIR						
Total Residential, mgd						
City of Vallejo Buildout Estimates	10.9	11.7	12.5	13.3	14.1	14.1
ABAG						
EIR						
Total Commerical, mgd						
City of Vallejo Buildout Estimates	3.6	4.2	4.8	5.4	6.0	6.0
ABAG	2.6	2.9	3.2	3.5	3.8	4.1
EIR	3.3	3.7	4.0	4.3	4.7	4.7+
Total Other Demand, mgd (water losses, etc.)						
Non-billed metered use[f]	2.2	2.0	1.8	1.7	1.7	1.7
Unaccounted for water[g]	1.9	1.7	1.6	0.1	1.4	1.4
Golf course irrigation	0.7	0.7	0.7	0.7	0.7	0.7

Vallejo Lakes System	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**
Single Family Units, mgd						
Vallejo Utilities Division, Water Dept.	0.3	0.3	0.3	0.3	0.3	0.3

Notes:

[f]E-mail from E. Nutgeren, City of Vallejo, received 1/3/05. Non-billed metered use, which accounts for approx. 13% of total metered use in the base year (2000), is expected to decrease linearly to due to changes in non-billing practices which will create incenvitve for best management water use practices.

[g]E-mail from E. Nutgeren, City of Vallejo, received 1/3/05. Unaccounted-for water, which includes meter losses and inaccuracies, pipeline leaks, etc., is assumed to be 11% of total metered use for calibration purposes for the base year. This value is expected to drop due to enforcement of illegal conneciton removal, enhanced flushing and maintenance practices, and greater meter accuracy due to large meter replacement projects which will accurately gauge true cost of service and create incentives for best management practices and reductions in use.

[h]E-mail from E. Nutgeren, City of Vallejo, received 4/14/05. Irrigation of Hiddenbrooke Golf Course and Blue Rock Springs East and West Golf Courses comprise of 270 million gallons per year, or 0.7 mgd.

Total Demand Projection for Vallejo Water System (based on City of Vallejo Buildout Estimates sent 12/20/04), mgd, unless otherwise specified

	2000	2005	2010	2015	2020	2025
Single Family	8.6	9.0	9.4	9.9	10.3	10.3
Multi-family	2.3	2.7	3.1	3.5	3.9	3.9
Commerical	3.6	4.2	4.8	5.4	6.0	6.0
Other	4.9	4.4	4.1	2.6	3.8	3.8
Total, mgd	19.4	20.4	21.5	21.3	24.0	24.0
Total, AF/yr	21,920	23,030	24,290	24,120	27,140	27,140

Total Demand Projection for Vallejo Lakes System

	2000	2005	2010	2015	2020	2025
Single Family, mgd	0.3	0.3	0.3	0.3	0.3	0.3
Single Family, AF/yr	320	330	340	350	360	370

Demand Projections for Other Wholesale Customers, ac-ft/yr, unless otherwise specified

	2000	2005	2010	2015	2020	2025
Travis AFB deliveries[1]	3,200	3,400	3,860	4,330	4,790	5,250
City of Benecia	1,100	1,100	1,100	1,100	1,100	1,100
City of American Canyon	750	750	750	750	750	750
Total, AF/yr	5,050	5,250	5,710	6,180	6,640	7,100

Notes:

[1]Travis AFB demand in 2005 of 3,400 ac-ft/yr is based on the maximum demand out of three recent years of historical water production data. Demands in subsequent years are assumed to increase in equal steps to the maximum potential demand of 5,250 ac-ft/yr by 2025.

Total Supply

	2000	2005	2010	2015	2020	2025
State Water Project	5,600	5,600	5,600	5,600	5,600	5,600
Vallejo Permit Water	17,200	17,200	22,800	22,800	22,800	22,800
Solano Project Water	14,600	14,600	14,600	14,600	14,600	14,600
Lakes Frey, Madigan	400	400	400	400	400	400
Lake Curry	-	-	3,750	3,750	3,750	3,750
Total Supply Excluding Lake Curry, AF/yr	37,800	37,800	43,400	43,400	43,400	43,400
Total Supply Including Lake Curry, AF/yr	37,800	37,800	47,150	47,150	47,150	47,150

Total Demand

	2000	2005	2010	2015	2020	2025
Total Demand, All Sources	27,290	28,610	30,340	30,650	34,140	34,610

Supply vs. Demand Comparison	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**
Surplus, AF/yr	10,510	9,190	16,810	16,500	13,010	12,540

Appendix F – City of Vallejo's 2004 Water Quality Report

Copies of the "City of Vallejo Annual Water Quality Report" based on water testing performed in 2004 can be obtained in person at the following locations or can be mailed upon request.

City of Vallejo Water Billing Office
1st Floor, City Hall, 555 Santa Clara Street, Vallejo
(707) 648-4345

City of Vallejo Water Administration Office
202 Fleming Hill Road, Vallejo
(707) 648-4479

The City's Laboratory Chemist is also available to answer questions regarding the results of water quality testing and can be reached at (707) 649-3472.

Substances That Might Be In Drinking Water

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

In order to ensure that tap water is safe to drink, the U.S. EPA and the California Department of Health Services (CDHS) prescribe regulations that limit the amount of certain substances in water provided by public water systems. CDHS regulations also establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some substances. The presence of contaminants does not necessarily indicate that water poses a health risk.

Substances that may be present in source water include:

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

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

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

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

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

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

How Is My Water Treated and Purified?

At the Fleming Hill Treatment Plant, the treatment process consists of a series of steps. First, raw water is drawn from the Cordelia Reservoir or the Summit Reservoir and sent to a pre-ozonation contactor, where ozone is applied to aid the downstream processes. The water then goes to mixing basins where coagulants are added. The addition of these substances causes small particles to adhere to one another (called floc) making them heavy enough to settle into a basin from which sediment is removed. Following sedimentation, ozone is again applied to act as a disinfectant and an oxidizing agent to remove color, taste and odor. At this point, the water is filtered through layers of granular activated carbon and sand. As smaller, suspended particles are removed, turbidity disappears and clear water emerges. Chlorine is added as a precaution against any bacteria that may still be present. Finally, caustic soda (used to adjust the final pH and alkalinity), and fluoride (used to prevent tooth decay) are added before the water is pumped to sanitized reservoirs and into your home or business.

Community Participation

You are invited to participate in our public forum and voice your concerns about your drinking water. The Solano County Water Agencies meet the second Thursday of each month at 7:00 p.m. at the Solano Irrigation District Headquarters, 508 Elmira Road, in Vacaville. Please feel free to participate in these meetings.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Ang ulat na ito ay nagtataglay ng mahalagang impormayson. Ang kumpletong salin nito sa wikang Pilipino ay matatagpuan sa aming Web site sa www.ci.vallejo.ca.us. Kung nais ninyong makipagusap sa kinauukulan na may kaalaman ukol sa ulat na ito, mangyari lamang na tawagan si jun malit sa telepono (707) 648-4309.

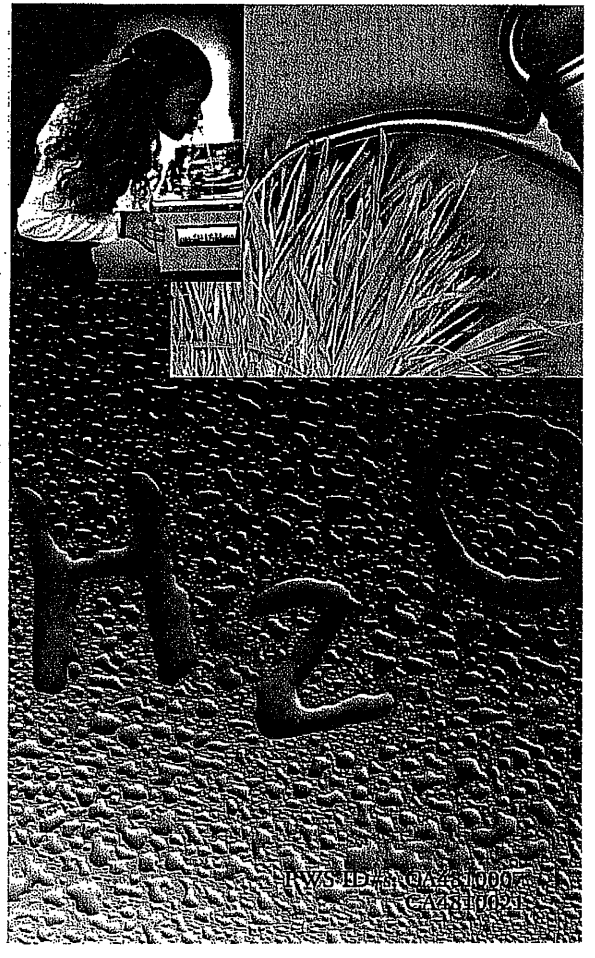
CA10B3

Proudly Presented By:

City of Vallejo

Annual Water Quality Report

Water testing performed in 2004



Sampling Results

During the past year we have taken thousands of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. Although the majority of the substances listed here are under the Maximum Contaminant Level (MCL), we feel it is important that you know exactly what was detected and how much of the substance was present in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

PRIMARY DRINKING WATER STANDARD (Regulated in order to protect against possible adverse health effects)

				Vallejo System Treated Water		Lakes System Treated Water		HBA Raw Water		SID Raw Water		Lake Frey Raw Water			
SUBSTANCE (UNITS)	YEAR SAMPLED	MCL [MRDL]	PHG (MCLG) [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Aluminum (ppm)	2004	1	0.6	ND	ND	0.130	0.130-0.130	NA	NA	NA	NA	NA	NA	No	Erosion of natural deposits; residue from some surface water treatment processes
Chlorine (ppm)	2004	[4.0 (as Cl_2)]	[4 (as Cl_2)]	0.67	ND-1.58	0.39	ND-1.35	NA	NA	NA	NA	NA	NA	No	Drinking water disinfectant added for treatment
Control of DBP precursors (TOC) (ppm)	2004	TT>1	NA	2.4	1.8-2.4	1.1	0.5-1.1	NA	NA	NA	NA	NA	NA	Yes[2]	Various natural and manmade sources
Fluoride (ppm)	2004	2	1	1.43[1]	0.03-1.43[1]	0.12	0.05-0.12	0.16	0.08-0.16	0.19	0.08-0.19	0.07	0.03-0.07	No	Water additive which promotes strong teeth
Gross Alpha particle Activity (pCi/L)	2002	15	NA	NA	NA	NA	NA	3.1	ND-3.1	4.11	ND-4.11	2.38[3]	ND-2.38[3]	No	Erosion of natural deposits
HAAs [Haloacetic Acids] (ppb)	2004	60	NA	17	6-25	52	ND-78	NA	NA	NA	NA	NA	NA	No	By-product of drinking water disinfection
Nitrate (as nitrate, NO_3) (ppm)	2004	45	45	2.75	ND-2.75	ND	ND	NA	NA	NA	NA	NA	NA	No	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2004	80	NA	55	18-63	113	70-160	NA	NA	NA	NA	NA	NA	Yes[2]	By-product of drinking water chlorination
Turbidity (NTU)[4]	2004	TT	NA	0.22	0.01-0.22	0.14	0.01-0.14	NA	NA	NA	NA	NA	NA	No	Soil runoff
Uranium (pCi/L)	2002	20	0.43	NA	NA	NA	NA	14.1	ND-14.1	NA	NA	1.83[3]	ND-1.83[3]	No	Erosion of natural deposits

Tap Water samples were collected for lead and copper analyses from homes throughout the service areas *(Lead was not detected at the 90th percentile)*

				Vallejo System Treated Water		Lakes System Treated Water			
SUBSTANCE (UNITS)	YEAR SAMPLED	AL	PHG (MCLG)	AMOUNT DETECTED (90TH %TILE)	HOMES ABOVE AL/TOTAL HOMES	AMOUNT DETECTED (90TH %TILE)	HOMES ABOVE AL/TOTAL HOMES	VIOLATION	TYPICAL SOURCE
Copper (ppb)	2003	1,300	170	61	0/50	100[5]	0/11[5]	No	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

SECONDARY DRINKING WATER STANDARD (Regulated in order to protect the odor, taste and appearance of drinking water)

				Vallejo System Treated Water		Lakes System Treated Water			
SUBSTANCE (UNITS)	YEAR SAMPLED	SMCL	PHG (MCLG)	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Aluminum (ppm)	2004	200	NA	ND	ND	0.130	0.130-0.130	No	Erosion of natural deposits; residual from some surface water treatment processes
Chloride (ppm)	2004	500	NA	40	8.4-40	33.0	15.5-33	No	Runoff/leaching from natural deposits; seawater influence
Odor–Threshold (Units)	2004	3	NA	2.0	1.0-2.0	2.0	1.0-2.0	No	Naturally occurring organic materials
Specific Conductance (µmhos/cm)	2004	1,600	NA	427	209-427	478	150-478	No	Substances that form ions when in water; seawater influence
Sulfate (ppm)	2004	500	NA	47.9	26.1-47.9	29.8	5.8-29.8	No	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids [TDS] (ppm)	2004	1,000	NA	267	131-267	299	94-299	No	Runoff/leaching from natural deposits

Footnotes:

[1] To be in compliance, 80 percent of measurements must be within the range of 0.8–1.4 ppm.
[2] Violation occurred in the Lake System only – refer to the *About our Violation* section in this report.
[3] Sampled in 2003
[4] Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration systems. During the reporting year, 100% of all samples taken to measure turbidity met water quality standards.
[5] Samples for Lakes System Treated Water taken in 2002.
[6] For grains per gallon divide by 17.1.

UNREGULATED SUBSTANCES

		Vallejo System Treated Water		Lakes System Treated Water Regulated Substances	
SUBSTANCE (UNITS)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH
Calcium (ppb)	2004	25.0	12.0-44.1	19	4.8-40
Hardness (ppb)[6]	2004	129	58-180	115	20-162
Magnesium (ppb)	2004	16.2	6.8-24.1	16	1.9-26
pH (ppb)	2004	7.7	6.5-8.5	7.8	6.9-8.7
Sodium (ppb)	2004	25	25-25	16	16-16

About our Violation

In 2004, the U.S. EPA required systems serving fewer than 10,000 people to monitor for total organic carbon (TOC), trihalomethanes (THMs), and haloacetic acids (HAAs). After collecting four quarters of data, the Lakes System was found to be in violation of this new regulation. The City of Vallejo anticipates having a new technology operating by December 2005 to correct this violation. Customers affected by this violation have been notified previously.

Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of cancer.

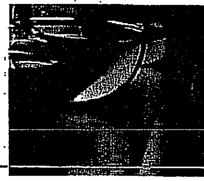


Table Definitions

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

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

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

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

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLs are set by the U.S. EPA.

NA: Not applicable

ND: Not detected

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water.

pCi/L (picocuries per liter): A measure of radioactivity.

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

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

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

µmhos/cm (micromhos per centimeter): A measure of electrical conductance.

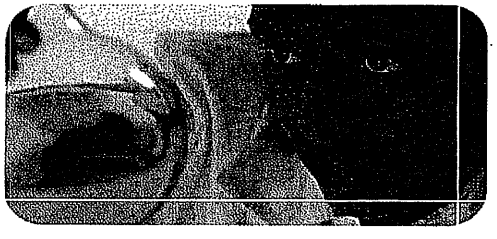
Continuing Our Commitment

Once again we proudly present our annual water quality report. This edition covers all testing completed from January through December 2004. As in the past, we are committed to delivering the best quality drinking water. To that end, we remain vigilant in meeting the challenges of source water protection, water conservation, and community education while continuing to serve the needs of all of our water users.

For more information about this report, or for any questions relating to your drinking water, please call Nancy Dodsworth, Laboratory Chemist, at (707) 649-3472.

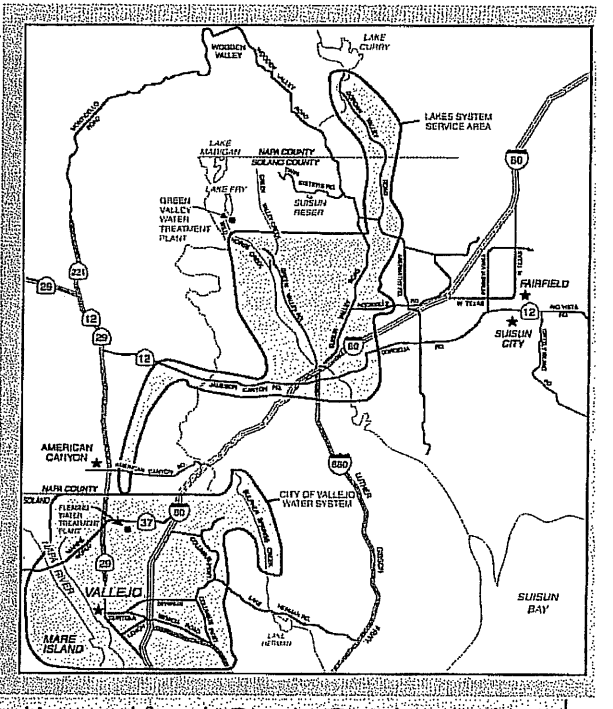
Important Health Information

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



Where Does My Water Come From?

City of Vallejo customers are fortunate because we enjoy an abundant water supply from four sources. Water from the Solano Water Project is impounded in Lake Berryessa and transported by way of the Putah South Canal to Cordelia. State Water Project water is delivered to Lake Oroville and runs through the Sacramento River to the North Bay Aqueduct Pumping Facility at Barker Slough, where it is pumped to the Department of Water Resources (DWR) Forebay at Cordelia. Vallejo's State License Water also comes from Barker Slough. Lake Curry is a standby source for the City System located in Napa County. It will be utilized as soon as conveyance facilities are in place. Water from any or all of these sources is then pumped from Cordelia to the Fleming Hill Water Treatment Plant located on the hilltop above Six Flags Marine World. Vallejo also has three sources of water for its Lakes System that serves Gordon Valley, Old Cordelia, Green Valley and parts of American Canyon and Suisun Valley. Solano Project Water is delivered from Lake Berryessa via the Putah South Canal. Lakes Frey and Madigan are located in northern Solano County. The city owns both lakes and the surrounding land and restricts any activity that would result in contamination. Water flows into Lake Frey from Lake Madigan. Water from Lake Frey and the Putah South Canal is pumped from the Diversion Dam above the plant to the Green Valley Water Treatment Plant located at the end of Green Valley Road. During brief periods of construction or emergency repairs, Lakes System customers may be served by the Waterman Treatment Plant located in the City of Fairfield. For a copy of their water quality report call (707) 428-7594.



Source Water Assessments and Vulnerability Summaries

Source	Most Vulnerable Activities	Moderately Vulnerable Activities	Contact
Lake Frey	Illegal body contact* Wild animal access* Agricultural drainage*	Other animal operations Wildfires	Erik Nugteren (707) 648-4307
Putah South Canal	Illegal activities/ Dumping Herbicide applications	Road/Streets Storm drain discharge Recreational area	Alex Rabidoux (707) 455-1106
North Bay Aqueduct	Grazing animals* Runoff from grazing land*	Runoff from agricultural land	Erik Nugteren (707) 648-4307

*Associated with detected contaminants

Source Water Assessments evaluate the quality of the water used as drinking water supplies for local communities. The assessment examines activities associated with the specific waterway and surrounding areas to determine their contribution to contamination. These potential contributors are then compiled into a Vulnerability Summary. Vulnerability Summaries were completed for the Putah South Canal and Lake Frey in 2001 and for the Sacramento Delta in 2002. The results of the Source Water Assessments and information about how to obtain copies of them are summarized in the adjacent table.

Appendix G – Draft City of Vallejo Water Shortage Contingency Plan Ordinance

DRAFT ORDINANCE

ORDINANCE NO. _____ N.C. (2d)

AN ORDINANCE AMENDING TITLE 11, WATER, OF THE VALLEJO MUNICIPAL CODE BY ADDING CHAPTER 11.XX CONCERNING A WATER SHORTAGE CONTINGENCY PLAN.

THE COUNCIL OF THE CITY OF VALLEJO DOES ORDAIN AS FOLLOWS:

SECTION 1. Section 11.xx.010 is hereby added, and shall read as follows:

"11.xx.010 Scope.

There is established a city water shortage contingency plan."

SECTION 2. Section 11.xx.020 is hereby added, and shall read as follows:

"11.xx.020 Declaration of policy.

It is declared that, because of the conditions prevailing in the city, the general welfare requires that the water resources available to the City be put to the maximum beneficial use to the extent to which they are capable, and that the waste or unreasonable use, or unreasonable method of use of water be prevented, and the conservation of such water is to be extended with a view to the reasonable and beneficial use thereof in the interests of the people of the city and for the public welfare."

SECTION 3. Section 11.xx.030 is hereby added, and shall read as follows:

"11.xx.030 Definitions.

A. The "city" means the city of Vallejo acting by and through the city of Vallejo public works department as operator of the city of Vallejo and Lakes water system.
B. "Director" means the director of the public works department of the city.
C. "Person" means any person, firm, partnership, association, corporation, company, organization, or, governmental entity.
D. "Customer" means any person, whether within or without the geographic boundaries of the city of Vallejo, who uses water supplied by the city.
E. "GPD" means gallons per day.
F. "HCF" means one hundred cubic feet."

SECTION 4. Section 11.xx.040 is hereby added, and shall read as follows:

"11.xx.040 Authorization.

The city manager or his designate, upon the recommendation of the director is authorized and directed to implement the applicable provisions of this chapter upon their determination that such implementation is necessary to protect the public welfare and safety."

SECTION 5. Section 11.xx.050 is hereby added, and shall read as follows:

"11.xx.050 Application.

The provisions of this chapter shall apply to all persons, customers and property served by the city."

SECTION 6. Section 11.xx.060 is hereby added, and shall read as follows:

"11.xx.060 Water Shortage Stages.

No customer of the city shall knowingly make, cause, use, or permit the use of water from the city for residential, commercial, industrial, irrigation, agricultural, institutional, governmental, or any other purpose in a manner contrary to any provision of this chapter, or in amount in excess of that use permitted by the water shortage stage in effect pursuant to action taken by the city manager, or his designate in accordance with the provisions of this chapter.

A. Stage I. Normal Supply - Voluntary Conservation.

1. Customers of the city are requested to voluntarily limit the amount of water used to that amount necessary for health, business, and irrigation.

2. In addition to the above voluntary water use reductions, the following restrictions shall apply to all persons;
   a. All prohibitions within the adopted Wasteful Water Use Prohibition Ordinance. [Ord. No. ___ N.C. (2d)]

B. Stage II. Mandatory Compliance – Water Warning.

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of 300gpd (two thousand four hundred cubic feet per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of ninety five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during

the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

3. In addition to the above mandatory water use reductions of subdivisions 1 and 2 of this subsection B and in compliance with Section 11.xx.070, the following restrictions shall apply to all persons.

   a. the use of water from hydrants shall be limited to fire fighting and other activities necessary to maintain the health, safety, and welfare of the citizens of Vallejo.
   b. All "waste of water" elements as defined in Stage I shall remain in effect in Stage II.

C. Stage. III. Mandatory Compliance - Water Shortage

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of 270 gpd (two thousand one hundred and sixty cubic feet per sixty day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section. 11.xx.110.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy-five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection C, and in compliance with Section 11.xx.070, all elements of Stage II shall remain in effect in Stage III.

D. Stage IV. Mandatory Compliance – Water Crisis

1. No residential customer shall make, cause, or commence the use of water received from the city for any purpose in an amount in excess of 240gpd (one thousand nine hundred and twenty cubic feet per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in

Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of eighty five percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be seventy five percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection D, and in compliance with Section 11.xx.070, all elements of Stage III shall remain in effect in Stage IV.

E. Stage V. Mandatory Compliance – Water Emergency

1. No residential customer shall make, cause, use, or commence the use of water received from the city for any purpose in an amount in excess of 195gpd (one thousand five hundred and sixty cubic feet per sixty-day billing cycle) per residence. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

2. No industrial or commercial customer shall make, cause, use, or permit the use of water received for any purpose in an amount in excess of seventy percent of the amount used during the base period defined as the amount of water used on a customer's premises during the corresponding monthly billing period in the base year of 2004. In addition to the above allotment, for meters that strictly serve landscaping, the allotment shall be fifty percent of the amount used during the base period defined above. New services or services without 2004 history shall be allotted on comparable customer usage. Water used in excess of this amount shall be subject to a drought penalty as set forth in Section 11.xx.090. The customer of record may request an increase in the basic allotment as set forth in Section 11.xx.110.

3. In addition to the mandatory water use reductions of subdivisions 1 and 2 of this subsection E, and in compliance with Section 11.xx.070, all elements of Stage IV shall remain in effect in Stage V except that:

   a. Section 11.xx.110.A.4 does not apply in this stage. The customer of record may still apply for exceptions as outlined in Section 11.xx.110, but the reason for applying for an exception cannot be based on economic hardship."

SECTION 7. Section 11.xx.070 is hereby added, and shall read as follows:

"11.xx.070 Mandatory water shortage stage implementation.

A. The department of public works shall monitor the projected supply and demand for water by its customers and shall recommend to the city manager the extent of the conservation required in order for the department to prudently plan for and supply water to its customers. Thereafter, the city manager may order that the appropriate water shortage stage be implemented in accordance with the applicable provisions of this section. Said order shall be made by public announcement and shall be published a minimum of one time in a daily newspaper of general circulation and shall continue to be published on a weekly basis until such time as all restrictions are removed. Said order shall become effective immediately upon the first publication.

B. Water shortage stages. The various water shortage stages shall be implemented by the city manager as directed by resolutions of the city council."

SECTION 8. Section 11.xx.080 is hereby added, and shall read as follows:

"11.xx.080 Duration of water shortage stages.

Stage I shall be effective upon the effective date of the ordinance codified in this chapter and the restrictive provisions of Stage I as set forth above shall apply to all water consumption on and after said date. Stage I will be rescinded at such time that conditions as set forth in Section 11.xx.070 indicate a more restrictive stage is necessary."

SECTION 9. Section 11.xx.090 is hereby added, and shall read as follows:

"11.xx.090 Water shortage excess use penalty.

A. Customers will receive prior individual notification of the standard allotment basis, applicable rates, and the opportunity to request exceptions to the standard allotment basis.

B. Water use beyond the maximum allowed for each water shortage stage shall be subject to a drought penalty pursuant to the schedule set forth below. The customer of record may request an increase in this basic allotment as set forth in Section 11.xx.110. Application forms and instructions will be provided to customers and will also be available at the city water billing office.

C. In addition to the normal water service rates, each customer shall pay, during each billing period a drought penalty for water delivered in excess of the water allotment. The drought penalty is as follows:

1. For water delivered up to ten percent in excess of allotment there shall be a drought penalty equal to 2.0 times the applicable volume charge, in addition to the applicable service charge and volume charge;

2. For water delivered from 10.01 percent to twenty percent in excess of allotment there shall be a drought penalty of 3.0 times the applicable volume charge levied on this excess only, in addition to the drought penalty on the first ten percent and the applicable service charge and volume charge;

3. For water delivered over 20.01 percent in excess of allotment, there shall be a drought penalty of 4.0 times the applicable volume charge levied only on this excess over twenty percent, in addition to all drought penalties described above for the first twenty percent and the applicable service charge and volume charge.

D. In addition to the drought penalty, if drought usage exceeds the allowed allotment, a warning will be issued and enforcement actions may be taken as described in Section 11.xx.120."

SECTION 10. Section 11.xx.100 is hereby added, and shall read as follows:

"11.xx.100 Water shortage service charge surcharge.

A. A water shortage service charge surcharge may be imposed by resolution of the city council upon the recommendation of the finance director, to compensate for a loss of water revenue or to pay an additional cost for the purchase of water by the city.

B. The water shortage service charge surcharge shall be in effect until rescinded after the finance director states that the water emergency costs have been fully recovered."

SECTION 11. Section 11.xx.110 is hereby added, and shall read as follows:

"11.xx.110 Exceptions and application for exception.

A. Any customer of record may apply to the director to increase the amount of water which may be used without exceeding the basic allotment based on any one or more of the following reasons:

1. Medical requirements;
2. More than four residents in a single family residential household. The additional amount allotted shall be fifty gpd per person;
3. Incorrect customer classification based on predominant use;
4. When failure to do so would cause severe economic hardship to the applicant, including, but not limited to, threat of imminent insolvency;
5. When failure to do so would cause an emergency condition affecting the health, sanitation, fire protection, or safety of the applicant or the public.

B. Written applications for such exceptions may be granted by the director based upon clear and convincing evidence that any one or more of the foregoing conditions has been satisfied and it is in the public interest to grant such application.

C. The quantity of water allowed in addition to the basic allotment shall be determined by the director, said shall not exceed that quantity necessary to alleviate the condition which justified granting of the application for an exception. "

SECTION 12. Section 11.xx.120 is hereby added, and shall read as follows:

"11.xx.120 Violation Enforcement.

The violation of each provision of this chapter, and each separate violation thereof, shall be deemed a separate offense, and shall be enforced accordingly.

A. Except for the imposition of the drought penalty, as a condition of enforcement of any violation of this chapter, any customer that violates any provision of this chapter shall be given a written warning or notice to refrain from further violations.

B Written warning or notice shall be given to the violator either by mailing said warning or notice to the address given to the city by the customer of record, by personal service on the violator, or by leaving said warning or notice in a conspicuous place on the served property wherein the violation occurred.

C. If after issuance of the written warning or warnings, the director determines that the customer has continued or is continuing to violate the provisions of this chapter, the director may authorize and implement installation of a flow restricting device on the service line or reduce the amount of water available to the customer. Any costs incurred by the city to authorize, implement, and remove the installation of a flow restricting device on the service line or reduce the amount of water available to the customer shall be borne by the customer. The flow restricting device shall be removed and the prior water supply amount resumed no sooner than sixty days after the date of the installation of the flow restricting device, or a reduction in water available, provided that no further violations have occurred within that time.

D. If after implementation of a flow restricting device or reduction of water available to a customer, the customer continues to violate the provisions of the chapter, the director may authorize disconnection of water service to the customer for a period of three days. All costs or expenses incurred by the city for enforcement of this section shall be borne by the customer."

SECTION 13. Section 11.xx.130 is hereby added, and shall read as follows:

"11.xx.130 Violation - Penalties.

In addition to all other remedies provided herein, any person who violates any provision of this chapter after having received a written notice to refrain as provided in Section 11.xx.120, is guilty of an infraction. The violation of each provision of this chapter and each separate violation thereof shall be deemed a separate offense and shall be punished accordingly. Each offense shall be punishable by (1) a fine not exceeding one hundred dollars for the first violation; (2) a fine not exceeding two hundred dollars for a second violation of this chapter within one year; and (3) a fine not exceeding five hundred dollars for each additional violation of this chapter within one year."

SECTION 14. Section 11.xx.140 is hereby added , and shall read as follows:

"11.xx.140 Violation - Additional remedy.

As an additional remedy, the violation of any provision of this chapter by any person who has received more than one written warning pursuant to Section 11.xx.120 to refrain from the same or any other violation under this chapter in one calendar year shall be deemed and is declared to be a public nuisance and may be subject to abatement by a restraining order, or injunction issued by a court of competent jurisdiction."

SECTION 15. This ordinance shall take effect and be in full force and effect from and after _____ days after its final passage.

Appendix H - Solano Project Members' Agreement as to Drought Measures

SOLANO PROJECT MEMBERS'
AGREEMENT AS TO DROUGHT MEASURES
AND WATER ALLOCATION

THIS AGREEMENT, dated as of March 1, 1999, by and among the Solano Irrigation District, a California Irrigation District (hereinafter referred to as "SID"), Maine Prairie Water District, (hereinafter referred to as "MPWD"), the City of Fairfield, a California municipal corporation (hereinafter referred to as "Fairfield"), the City of Vacaville, a California municipal corporation (hereinafter referred to as "Vacaville"), the City of Suisun City (hereinafter referred to as "Suisun"), and the City of Vallejo, a California municipal corporation (hereinafter referred to as "Vallejo"), individually referred to or collectively referred to in this Agreement as "Party" or "Parties," respectively, is made and entered into and the Parties do, for full and adequate consideration, receipt of which is hereby acknowledged, agree as follows:

Section 1.0: Background Facts

1.1 The Parties are all, through contracts with the Solano County Water Agency ("SCWA"), Participating Agencies of the Solano Project, entitled to annual deliveries of water from the Solano Project in the following amounts:

Name of Party	Annual Entitlement (Acre-Feet ("AF")/Water Year)
Solano Irrigation District	141,000
Fairfield	9,200
Vacaville	5,600
Suisun City	1,600
Maine Prairie	15,000
Vallejo	14,750
Total:	187,150

The present contract between the United States and SCWA for Solano Project water supply ("Solano Project Master Contract") expires in 1999, and negotiations between the United States and SCWA for Solano Project Master Contract renewal and extension are underway, and the Member Unit Parties' contracts with SCWA for the annual entitlements will be extended or renewed.

(Final 1/25/99)

1.2 The Parties wish to provide for this Agreement as to the measures to be used in regard to the accounting of water not used from a Party's annual entitlement from the Solano Project in a year after renewal, and also to provide for contractually agreed-to and enforceable curtailments in the amounts of water taken under the respective Parties' annual entitlements during certain drought conditions. This Agreement provides for the accounting of and preservation of the rights of the Parties to those waters which are voluntarily or mandatorily curtailed.

1.3 The Parties wish to further provide in this Agreement for special measures which SID will implement should the drought conditions deepen and become more severe, resulting in reduction of storage in Lake Berryessa to certain levels despite all reasonable efforts of the Parties.

1.4 The Parties agree that each of the Background Facts in Section 1.0 *et seq.* is true and correct, and a portion of the consideration for this Agreement.

Section 2.0: Definitions.

2.1 The phrase "Storage in Lake Berryessa" shall mean the amount of water stored on the date specified in this Agreement within Lake Berryessa (i) excluding any amounts of water in dead storage which may not be physically released or diverted from Lake Berryessa for any reason, (ii) excluding any amounts of water held on that date in Voluntary Carryover Accounts by the Parties to this Agreement, but (iii) including any amounts of water held in Restricted Carryover Accounts by the Parties on that date. The Storage in Lake Berryessa shall be calculated utilizing the most current elevation capacity curve for Lake Berryessa approved by the United States.

2.2 The phrase "annual entitlements" shall mean the amount of water a Party is entitled to delivery each water year in the amounts set forth in Paragraph 1.1 above, where each "water year" begins on March 1, and ends on the last day of the following February, as set forth in the present contracts.

Section 3.0: Renewal Contracts of Parties

3.1. The Parties agree that the Parties shall each be entitled to renewal of their

Contract with SCWA for the purchase of water from the Solano Project annually on the basis of the annual amounts set forth in Paragraph 1.1 above.

3.2 It shall be a precondition to the enforceability of this Agreement that each of the Parties shall have received and accepted a renewal contract for Solano Project Water in the above amounts from SCWA ("Renewal Participating Agency Contract") and that the terms of those agreements have been accepted by each Party and approved by the United States Department of Interior, Bureau of Reclamation, if such approval is required by the Solano Project Master Contract, and the Renewal Participating Agency Contracts have each been validated in accordance with the provisions of California Code of Civil Procedure section 860, *et seq.* It shall be a further precondition of the enforceability of this Agreement that no material change has been made in the terms and provisions of each Renewal Participating Agency Contract including, without excluding other material changes, that:

3.2.1 The term of all of the Renewal Participating Agency Contracts shall be equivalent to the term of the renewed Solano Project Master Contract; and

3.2.2 The proportions of payment amounts per AF of water available under the Renewal Participating Agency Contracts shall be the same as the existing Contracts of $15.00 per AF for municipal and industrial ("M&I") water use and $2.65 per AF for irrigation use or a ratio of 5.66 to 1, depending on the respective purpose of use; and

3.2.3 There shall be included within all Renewal Participating Agency Contracts provisions permitting each Party to voluntarily retain carryover storage in Lake Berryessa for any unutilized portion of that Party's annual water entitlement under its Renewal Participating Agency Contract under the following conditions:

(a) The amount so voluntarily unutilized on the last day of February shall be added on that date to a carryover account ("Voluntary Carryover Account") for the Party that did not order delivery of the amount of water, but the Party shall pay SCWA for the undelivered water as if the water was delivered to the Party in that year in accordance with the Renewal Participating Agency Contract terms. No additional payment will be required for subsequent use of that water if there is no change in type of use.

(b) Any water in a Party's Voluntary Carryover Account may be utilized by that Party, in addition to all portions of their annual entitlement, in any water year subsequent to the water year in which it is added to the Party's Voluntary Carryover Account, or may be assigned, with approval by SCWA, to another Party to this Agreement, for use by the other Party in the year of non-diversion before its addition to a Party's Voluntary Carryover Account or for use in a subsequent water year from that assignee's Voluntary Carryover Account.

(c) Any water in a Party's Voluntary Carryover Account at the time that Lake Berryessa spills, or at a time in which emergency releases are made from Lake Berryessa for any other reason which releases are not delivered by the Solano Project to SCWA, may be lost as follows: The spill or emergency release shall be charged proportionately to each Party having a Voluntary Carryover Account and subtracted from the Parties' Voluntary Carryover Accounts then having a balance in their accounts to the extent of the spill or emergency release.

Example: Party A has 20,000 AF in its Voluntary Carryover Account, Party Y has 10,000 AF in its Voluntary Carryover Account, and Party X has 2,000 AF in its Voluntary Carryover Account, as these accounts exist at the time the spill condition commences, and these are the only carryover amounts presently in Lake Berryessa. A spill condition occurs in which water is not diverted into the Putah South Canal for beneficial use, or is not credited to a release requirement of the Solano Project in Putah Creek, including carriage losses upstream of Putah Diversion Dam. Each net acre foot spilling shall be charged proportionately to each Party's Voluntary Carryover Account. In the example, the percentages are: Party A, 62.5%; Party Y, 31.25%; Party X, 6.25%. If the net spill was of 16,000 AF, the Voluntary Carryover Accounts of all Parties would be reduced by 50%. If the net spill exceeded 32,000 AF, each Party's Voluntary Carryover Account would have a zero balance.

(d) No monies shall be reimbursable from SCWA to the Parties for the amounts paid for the Voluntary Carryover Account water to SCWA which is spilled.

(e) No evaporation, measurement or carriage loss will be charged upon any Party's Voluntary Carryover Account balance. No Party shall be charged a storage charge upon its Voluntary Carryover Account balances.

Section 4.0: Preparation of Drought Contingency Plans:

4.1 When Storage in Lake Berryessa falls below 800,000 AF as measured on December 1, the Parties will participate with SCWA staff in preparation of a Drought Contingency Plan which shall include reasonable water conservation measures, investigation of potential emergency supplies which could be imported without construction of new conveyance facilities, and other reasonable measures which could reduce the depletion of Storage in Lake Berryessa. Implementation of any of these measures by the Parties and SCWA will only be with the consent of the individual Parties electing to participate, and SCWA will not suspend or supersede provisions of the Participating Agency Renewal Contracts with SCWA. The Drought Contingency Plan shall also address terms and conditions for water sales pursuant to Paragraph 5.6(b). If Storage in Lake Berryessa exceeds 1.1 million AF on the following April 1, development of the Drought Contingency Plan shall be suspended.

Section 5.0 Mandatory Additions to Storage and Carryover Accounts by Parties ("Restricted Carryover Account"):

5.1 When Storage in Lake Berryessa is between 550,000 AF and 800,000 AF as measured on April 1 of any water year, then each of the Parties agrees to forego taking delivery of at least 5% of the Party's annual entitlement. If the Storage in Lake Berryessa is between 450,000 AF and 550,000 AF as measured on April 1, the Parties agree that they will forego taking delivery of at least 10% of their annual entitlements. On the first day of the next water year, a 5% (if Storage in Lake Berryessa had been between 550,000 AF and 800,000 AF the previous April 1) or 10% (if Storage in Lake Berryessa had been between 450,000 AF and 550,000 AF the previous April 1) portion of each Party's annual entitlement shall be credited to what will be called the Party's "Restricted Carryover Account."

5.2 Restricted Carryover shall be classified as either irrigation or M&I. For a Party that delivers only one class of water, 100% of its Restricted Carryover shall be designated of that class. For a Party that delivers both irrigation water and M&I water, the Restricted Carryover shall be segregated into irrigation ("irrigation Restricted Carryover") and M&I ("M&I Restricted Carryover") classes based on the amounts of each class of water acquired by that Party from SCWA during the water year in which the Restricted Carryover was generated.

Example: The Storage in Lake Berryessa is between 550,000 AF and 750,000 AF on April 1. Party A delivers both M&I and irrigation water, and in the current water year acquires 20% M&I and 80% irrigation from SCWA. The 5% of annual entitlement foregone amount deposited in Party A's Restricted Carryover Account the following water year would be classified as 1% M&I Restricted Carryover and 4% irrigation Restricted Carryover.

5.3 Notwithstanding the mandatory foregoance of a portion of its annual entitlement, a Party having a Voluntary Carryover Account balance from voluntary curtailment of use may take any portion of the Voluntary Carryover Account balance from that account in a water year.

5.4 A Party shall not withdraw water from its Restricted Carryover Account until either (a) the Storage in Lake Berryessa on a subsequent April 1 exceeds 800,000 AF, or (b) the Storage in Lake Berryessa on a subsequent April 1 falls below 450,000 AF. If the April 1 Storage in Lake Berryessa exceeds 800,000 AF, the Restricted Carryover Accounts shall convert to or combine with Voluntary Carryover Accounts of the respective Parties. If the April 1 Storage in Lake Berryessa falls below 450,000 AF, the water in Restricted Carryover Accounts will become available to the Member unit Parties as specified in Section 5.6 below.

Example: Party A serves only M&I water and has a Voluntary Carryover Account balance of 2,000 AF on April 1 and no Restricted Carryover Account balance. The April 1 Storage in Lake Berryessa is less than 800,000 AF but more than 550,000 AF. Party A will forego taking delivery of at least 5% of its annual entitlement in the current water year ending on the last day of February. Party A may, up to the last day of February, order and receive 95% of its annual entitlement and an additional 2,000 AF from its Voluntary Carryover Account, bringing its Voluntary Carryover Account to zero on the last day of the water year. The following water year, the Restricted Carryover Account of Party A will have the foregone amount of 5% in it, classified as 100% M&I Restricted Carryover. If the Storage in Lake Berryessa on April 1 of that year exceeds 800,000 AF, Party A's Restricted Carryover Account will convert to a Voluntary Carryover Account, and Party A is entitled to use the water at any time. If the Storage in Lake Berryessa falls below 450,000 AF on April 1 of that year, the water in Restricted Carryover Accounts will become available to the Parties as specified in Section 5.6

below. If the April 1 Storage in Lake Berryessa is any other amount (between 450,000 AF and 800,000 AF), the foregone amount remains in Party A's Restricted Carryover Account and is not available for use.

5.5 After successive water years in which Storage in Lake Berryessa is between 450,000 AF and 800,000 AF on April 1, water will tend to accumulate in the Restricted Carryover Accounts. The above provisions notwithstanding, however, accumulated water in a Party's Restricted Carryover Account (combined M&I and irrigation Restricted Carryover) shall not exceed 50% of that Party's annual entitlement.

Example: Same as last example (Section 5.4) except Party A starts with a Restricted Carryover Account balance of 48% of its annual entitlement. Party A would be required to deposit only 2% of its annual entitlement into its Restricted Carryover Account to bring the Restricted Carryover Account up to the maximum 50% of annual entitlement. Party A may take delivery and use up to 98% of its annual entitlement that water year, excluding any Voluntary Carryover.

5.6 When Storage in Lake Berryessa falls to less than 450,000 AF on April 1, the Parties will not be required to deposit additional water into Restricted Carryover attributable to that water year and water from the Restricted Carryover Accounts will be released to the Parties as follows:

a. The Parties shall have access to their M&I Restricted Carryover Account balances for M&I uses; and

b. The Parties shall have access to their irrigation Restricted Carryover balances for voluntary sale to other Parties for M&I uses based on terms and conditions established through the drought contingency planning process of Section 4.0.

Example: In 2006, Storage in Lake Berryessa is between 550,000 AF and 800,000 AF on April 1 after being above 800,000 AF the previous year. A 5% Restricted Carryover amount is required of all Parties for that water year. Since water orders are submitted to SCWA prior to March 1, the order for that year will be amended to reflect the reduction in available water supply for each of the Parties and the foregone amount will be credited to the Restricted Carryover Accounts on March 1, 2007. On April 1 in each of years 2007 and 2008,

Storage in Lake Berryessa is between 450,000 AF and 550,000 AF. On March 1, 2009, each Party will have 25% of its annual entitlement in its Restricted Carryover Account. On April 1, 2009, Storage in Lake Berryessa falls below 450,000 AF. The Parties will not be required to deposit further water into their Restricted Carryover Accounts that year, and each Party may use any M&I Restricted Carryover in its Restricted Carryover Account for M&I uses that year. Furthermore, Parties with irrigation Restricted Carryover may sell all or any part of that water to other Parties for M&I use pursuant to the drought contingency plan of Section 4.0 above. Any water not sold will remain irrigation Restricted Carryover in the selling Party's Restricted Carryover Account, and such water's disposition will be determined by the April 1 Storage in Lake Berryessa in subsequent years.

5.7 Any amounts of water which are mandatorily foregone and placed into the Restricted Carryover Accounts by the Parties pursuant to Paragraph 5.1 shall be subject to payment of the water charge to SCWA for the foregone amount. No additional payment will be required for subsequent use of that water if there is no change in the type of use.

5.8 In addition to the provisions above, when Storage in Lake Berryessa is less than 400,000 AF on April 1, SID will prepare to implement a voluntary agricultural water marketing program in order to sign up growers who are willing to sell their water allocations for the next water year beginning March 1 of the following year. The water obtained by this voluntary process will be marketed by SID to the Parties to meet M&I water needs of those Parties. The process, methods of determining cost, and conditions governing the marketing to Participating Agencies shall be reasonable and are generally outlined as to form in Exhibit "A" entitled "Solano Irrigation District Drought Impact Reduction Program" (referred to herein as "Program"). The SID Board of Directors may alter and modify the conditions, charges and terms of the Program from time to time, but the purposes of the Program of providing for voluntary relinquishment of agricultural water, while avoiding permanent adverse economic, environmental and social or organizational damage to the agricultural community and to the Parties' M&I users, and retaining the viability of SID, shall be reasonably retained in the Program adopted and implemented by SID. Parties desiring to obtain water from SID for M&I purposes will be provided a reasonable opportunity to comment on any proposed Program changes in advance of their implementation by SID.

5.9 If the Solano Irrigation District Drought Impact Reduction Program shall have been implemented for two or more successive years in the previous three years, and a total of more than 35,000 AF of water are subscribed during the three years to meet M&I water needs of Parties, and on the following April 1 Storage in Lake Berryessa is less than 400,000 AF, the amounts of water to be made available under the Program in that year shall be reduced by SID to a maximum of 5,000 AF.

Example A: Same as last example (Section 5.6), with the additional facts that Storage in Lake Berryessa drops below 400,000 AF on April 1 in years 2010 through 2012, and in year 2009 and 2010, the Program provides for the subscription of 20,000 AF annually for M&I use. Because in the successive years 2009 and 2010 the Program is utilized to provide 35,000 AF or more to M&I users, each Party would have the additional right to participate in the Program in year 2011, but only to the extent of the Party's share of a total Program amount not to exceed 5,000 AF. In year 2012, because more than 35,000 AF were subscribed to under the Program over the past three years and the program was in effect in at least two successive years within the previous three years, the Program shall be reduced again to a maximum of 5,000 AF. If Storage in Lake Berryessa continues below 400,000 AF on April 1, 2013, the 5,000 AF restriction would not be in effect because the Program did not provide 35,000 AF or more to M&I users over the past three years.

Example B: Same as last example, except Storage in Lake Berryessa is above 400,000 AF on April 1, 2010, and therefore the Program is not in effect that year. In year 2011 the program provides for the subscription of 20,000 AF for M&I use. In year 2012, the 5,000 AF restriction would not be in effect because, although the Program provided over 35,000 AF to M&I users over the past three years, the Program was not in effect in at least two successive years during that period. If Storage in Lake Berryessa continues below 400,000 AF on April 1, 2013, the 5,000 AF restriction would be in effect if the 2012 subscription was 15,000 AF or more (so that the combined 2011 and 2012 subscription was 35,000 AF or more).

5.10 Except as provided otherwise by this Section, Restricted Carryover will be treated the same as Voluntary Carryover.

Section 6.0: No Assignments

6.1 This Agreement, and the rights, duties and benefits given in it, may not be assigned by a Party to a non-Party without the advance written consent of all other Parties, and any attempted direct or indirect assignment without such consent is void. The amounts of water in a Party's Voluntary or Restricted Carryover Accounts may not be assigned directly or indirectly for the benefit of non-Parties and SCWA must consent to any such assignments between Parties. Approval of assignment of portions of a Party's annual entitlement to water under its Renewal Participating Agency Contract by SCWA shall carry with it the obligation to provide the Restricted Carryover Account amounts attributable to that entitlement.

Section 7.0: Counterparts

7.1 This Agreement may be executed in several duplicate counterparts, each of which shall be an original.

Section 8.0: SCWA Consent

8.1 The Solano County Water Agency executes this Agreement for the purposes of consenting to the terms hereof. Each Party shall have the right to enforce the terms of this Agreement against any or all other Parties.

SOLANO IRRIGATION DISTRICT

Dated: By: _____
President, Board of Directors

[SEAL] Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
District Counsel, Solano Irrigation District

MAINE PRAIRIE WATER DISTRICT

Dated: By: Milton Rayn
President, Board of Directors

[SEAL] Attest:

Secretary, Board of Directors

Approved as to form:

District Counsel

CITY OF FAIRFIELD

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk, City of Fairfield

Approved as to form:

_____
City Attorney, City of Fairfield

CITY OF SUISUN CITY

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk of the City of Suisun City

Approved as to form:

_____
City Attorney, City of Suisun City

MAINE PRAIRIE WATER DISTRICT

Dated: By: _____
President, Board of Directors

[SEAL] Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
District Counsel

CITY OF FAIRFIELD

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk, City of Fairfield

Approved as to form:

_____
City Attorney, City of Fairfield

CITY OF SUISUN CITY

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk of the City of Suisun City

Approved as to form:

_____
City Attorney, City of Suisun City

MAINE PRAIRIE WATER DISTRICT

Dated: By: _____
President, Board of Directors

[SEAL] Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
District Counsel

CITY OF FAIRFIELD

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk, City of Fairfield

Approved as to form:

_____
City Attorney, City of Fairfield

CITY OF SUISUN CITY

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk of the City of Suisun City

Approved as to form:

_____
City Attorney, City of Suisun City

CITY OF VACAVILLE

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk of the City of Vacaville

Approved as to form:

_____
City Attorney, City of Vacaville

CITY OF VALLEJO

Dated: By: _____
City Manager

[SEAL] Attest:

_____
Clerk of the City of Vallejo

Approved as to form:

_____
City Attorney, City of Vallejo

CONSENTED TO:

SOLANO COUNTY WATER AGENCY

Dated: By: _____
President, Board of Directors

[SEAL] Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
District Counsel

12

CITY OF VACAVILLE

Date By: _____
Mayor

[SEAL] Attest:

_____
Clerk of the City of Vacaville

Approved as to form:

_____
City Attorney, City of Vacaville

CITY OF VALLEJO

Dated: 3/12/99 By: _____
City Manager

[SEAL] Attest:

_____
Clerk of the City of Vallejo

Approved as to form:

_____
City Attorney, City of Vallejo

CONSENTED TO:

SOLANO COUNTY WATER AGENCY

Dated: By: _____
President, Board of Directors

[SEAL] Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
District Counsel

CITY OF VACAVILLE

Dated: By: _____
Mayor

[SEAL] Attest:

_____
Clerk of the City of Vacaville

Approved as to form:

_____
City Attorney, City of Vacaville

CITY OF VALLEJO

Dated: By: _____
City Manager

[SEAL] Attest:

_____
Clerk of the City of Vallejo

Approved as to form:

_____
City Attorney, City of Vallejo

CONSENTED TO:

SOLANO COUNTY WATER AGENCY

Dated: By: _____
President, Board of Directors

[SEAL] Attest:

_____
Secretary, Board of Directors

Approved as to form:

_____
District Counsel

EXHIBIT "A"

SOLANO IRRIGATION DISTRICT
DROUGHT IMPACT REDUCTION PROGRAM ELEMENTS

The Program will include the following elements:

1.0 The District's Contract with the Parties requesting Municipal and Industrial Water:

1.1 Proportions in Program: On or about April 1 when it is determined that the amount of water in Storage in Lake Berryessa is less than 400,000 AF, excluding water which is in dead storage and water which is in the voluntary carryover accounts of the Parties to the Agreement, the Parties, including SID, delivering municipal and industrial water in proportion to the average annual amounts of municipal and industrial water ordered and paid for from the Solano Project by those Parties during the preceding five (5) full water years, shall be entitled to participate in the SID Drought Impact Reduction Program ("The Program").

1.2 No Assignment of Proportion of Program Water: All Parties seeking water under the Program for municipal and industrial use shall be entitled to their proportional share of the water made available by the Program. If a Party desires less than their proportional share of the Drought Impact Reduction Program water, they may not assign their relinquished portion of the Program water to any other Party, and the relinquished portion of the water will be divided in accordance with the percentage of the Program water requested by Parties, if any Party requests less than their proportional share.

1.3 District Target Price: On or before May 1, SID will establish and announce a target price per AF for the amount of water which will be deemed relinquished by a Landowner and/or Tenant within SID for the Program in the following water year.

1.4 Additional Costs: In addition to the target price payable to the Landowner and/or Tenant for each acre foot, SID shall establish the additional amounts payable to SID for its operation and maintenance costs, lost water revenues and other reasonable costs to be incurred in implementing the Program. SID will establish the amounts of water which will be allocated to each acre of land under the rules and regulations in the following water year in which the Program is to be implemented and to which the target price and charges of SID would apply if the Landowner and/or Tenant elect to participate in the Program.

1.5 Contract with District: Upon establishing the economic terms of the Program, ninety (90) days notice shall be provided to the Parties serving Municipal and Industrial water of their right to subscribe and contract to the terms of the Program and their right to purchase upon those terms their proportionate share of the Program water in the following water year. The Program water to be made available to the Parties providing for municipal and industrial water service, including SID, shall not exceed twenty thousand (20,000) AF in a water year, or the water allocation from 7,500 acres of SID land, whichever sum is less. A Party declining to or omitting to subscribe to its proportionate share of the Program water may subscribe to a lesser amount of water, or if no election to subscribe is made, their proportionate share shall be divided among the other participants in proportion to requests of the remaining Parties limited by those Parties' proportions established under Paragraph 1.1 above (five years' historic ordering of M & I water from Solano Project). All subscription requests shall be submitted in writing.

1.6 Solicitation Period: Because the terms will be announced and the subscriptions sought approximately 9 months before the relinquishment would commence to take effect, a period of at least 45 days beginning on or before August 1 will be provided for Landowners and Tenants within the boundaries of SID to offer in writing the amounts of water specified and committed to be purchased by the Parties for municipal and industrial purposes in the following water year under the Program.

1.7 Solicitation Complete - Finalization of Contract Amounts: If sufficient Landowner and/or Tenant participants are received within the initial 45-day period by SID, a final binding contract for these amounts shall be delivered by the Parties to SID for the purchases, and SID will submit contracts to the participating SID landowners and/or tenants for the relinquishment to take effect in the following water year.

1.8 Insufficient or Excessive Landowner Offers: If insufficient lands subscribe to the SID Program in the solicitation, and insufficient amounts of water are obtained to meet the total demand of the requesting Parties, which demand shall not exceed 20,000 AF or water from 7,500 acres, whichever is less in any water year, the Parties shall nevertheless be bound to purchase those amounts tendered by landowners and/or tenants from SID.

If the participating landowners and/or tenants offer amounts of water in excess of subscriptions of the Parties, the amounts tendered by each participant will be reduced by a factor representing the excess amount as a percent of the subscribed amount.

Final contracts with participants and the subscribing Parties shall be delivered to SID for approval on or before October 15.

1.9 Payment to District: The monies due to SID from the Parties shall be paid on or before October 15, and shall be obtained by SID and distributed by SID in accordance with its contractual terms with the Landowners and Tenants. Interest earned upon the payments prior to disbursement shall be credited to the Parties participating in the Program. The participating Parties shall pay to SCWA the municipal and industrial rate for the water so assigned by SID to the Parties prior to the Parties participating in the Program ordering and delivery of the water in the following water year.

1.10 No Upset Price: The provisions of the Parties' agreement with SID and the Landowner/Tenant agreement with SID will not provide for an upset price, and thus if the following water year is a plentiful water year, nevertheless the water to be transferred by SID to the Parties will be transferred on the first day of the subsequent water year and will be added to the account of the participating Parties in the Program on that day Participating Parties should recognize that it is possible that spills of Lake Berryessa may occur after March 1, and thus it is theoretically possible to obtain water pursuant to the Program and to lose it forthwith without the ability to use it or hold it in a carryover account. Water transferred by SID to participating Parties will be treated as voluntarily added to the Party's carryover account if not utilized in the water year.

1.11 No Waiver or Transfer of Water Outside Solano Project Service Areas: As a condition of participating in the Program, no Party participating in the receipt of water from the Program shall directly or indirectly in the water year that deliveries are made under the Program (i) waive the ability to receive water from other sources available to it, or (ii) transfer directly or indirectly the amounts held by the Party in their Solano Project account or held by them pursuant to their State Water Project contracts or held as other water rights to any non-Party, or (iii) allow amounts to be received by the Party pursuant to the Solano Irrigation District Drought

Impact Reduction Program to be used for the benefit of a non-Party or for use outside the service area of the Solano Project.

1.12 Solano County Water Agency will be paid for the water transferred by SID at the municipal industrial rate by the purchaser in accordance with the schedule for payments by the Party to SCWA under the Renewal Member Unit Contract.

2.0 SIDs' Contract with Landowners/Tenants: The Program will be implemented with voluntarily participating landowners and tenants by SID determining an amount of water to be allocated by SID in the ensuing water year for each acre of participating land, and a price per acre divided by the number of AF to be allocated. yielding a per AF price for water tendered by landowner and tenant to SID. Landowners will be required to allocate full measurable fields or tracts to the Program. Parcels of 20 acres or less in size will not be eligible. Water from land with permanent crops such as trees and vines will not be eligible for transfer. Participants in this relinquishment program shall not supplement their allocation with ground water at levels which exceed the historical average over the previous four (4) years. No more than 7,500 acres of SID lands will be removed from production in a water year under the Program. Specific guidelines and contract forms will be developed by SID prior to the beginning of the landowner solicitation period and that information will be provided in a notice to owners of eligible lands.

Appendix I – Wasteful Water Use Prohibition Ordinance

ORDINANCE NO. 1567 N.C. (2d)

AN ORDINANCE OF THE CITY OF VALLEJO AMENDING TITLE 11 OF THE VALLEJO MUNICIPAL CODE BY ADDING CHAPTER 11.54 CONCERNING THE PROHIBITION OF WASTEFUL WATER USE

THE COUNCIL OF THE CITY OF VALLEJO DOES ORDAIN AS FOLLOWS:

SECTION 1. The Vallejo Municipal Code is hereby amended by enacting, adopting and adding thereto a new Chapter 11.54 to read as follows:

"Chapter 11.54
WASTEFUL WATER USE PROHIBITION ORDINANCE

Sections:

11.54.010 Purpose and Intent

The purpose of this chapter is to ensure that the water supply of the City of Vallejo is put to maximum beneficial use and that waste or unreasonable use or unreasonable method of use be prevented.

11.54.020 Short Title

This chapter shall be known and cited as the Wasteful Water Use Prohibition Ordinance.

11.54.030 Regulations and restrictions on water use

It is unlawful for any customer to intentionally waste water. As used herein, the term "waste" means:

A. Use of potable water to irrigate turf, ground-cover, shrubbery, crops, vegetation, and trees in such a manner as to result in runoff for more than fifteen (15) minutes;

B. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except by hose equipped with a shutoff nozzle and where necessary for public health or safety;

C. Allowing potable water to escape from breaks within the customer's plumbing system for more than thirty-six (36) hours after the customer is notified or discovers the break;

D. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment;

E. Operating decorative water fountains without water recirculation;

F. Use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where non-potable or recycled water is available in sufficient quantities;

G. Use of single-pass cooling systems; and

H. Use of non-recirculating systems in new conveyor car wash facilities.

SECTION 2. Severability

If any subdivision, paragraph, sentence, clause, or phrase of this Ordinance is, for any reason, held to be invalid or unenforceable by a court of competent jurisdiction, such invalidity or unenforceability shall not affect the validity or enforcement of the remaining portions of this Ordinance, or any other provisions of the City's rules and regulations. It is the City's express intent that each remaining portion would have been adopted irrespective of the fact that any one or more subdivisions, paragraphs, sentences, clauses, or phrases be declared invalid or unenforceable.

SECTION 3. Effective Date

This Ordinance shall take effect and be in full force and effect thirty (30) days from and after its final adoption.

FIRST READ at a regular meeting of the Council of the City of Vallejo held the 28th day of February, 2006 and finally passed and adopted at a regular meeting of the Council held the 7th day of March, 2006 by the following vote.

AYES:	Mayor Intintoli, Vice Mayor Pearsall, Councilmembers Bartee, Cloutier, Davis, Gomes and Sunga
NOES:	None
ABSENT:	None
ABSTENTIONS:	None

//s//
ANTHONY J. INTINTOLI JR., Mayor

ATTEST: //s//
ALLISON VILLARANTE, City Clerk

Appendix J – Summaries of Costs and Benefits for BMP (DMM) Exemption

Enclosed are benefit-to-cost ratios, calculated by Maddaus Water Management (2005) for the following demand management measures (best management practices):

BMP (DMM) 01 - Residential Surveys

BMP (DMM) 02 - Residential Plumbing Retrofit

BMP (DMM) 05 - ETo-Landscape Water Budget Component

BMP (DMM) 05 - Large Landscape Surveys

BMP (DMM) 06 - High Efficiency Washing Machine Rebate Programs

BMP (DMM) 09 - CII Surveys

BMP (DMM) 14 - ULFT Replacement Programs

Detailed calculations and assumptions are available from the Water Conservation Coordinator upon request for each of the benefit-to-cost ratios. Contact information is provided at the front of the UWMP.

BMP 01 Residential Surveys - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**	**Society Perspective**
1. Total surveys	505	505
2. Total water savings	86.9 AF	86.9 AF
3. Agency program costs	$62,947	$62,947
4. Customer program costs	NA	$8,672
5. Cost share	$0	NA
6. Net Program Cost	$62,947	$71,619
Program Present Value Benefits		
7. Agency supply & wastewater benefits	$14,560	$14,560
8. Environmental benefits	$0	$0
9. Customer program benefits	NA	$55,821
10. Other utility benefits	NA	$6,738
11. Total benefits	$14,560	$77,119
12. Net Present Value (Line 11 - Line 6)	**($48,387)**	**$5,500**
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.23	1.08
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$724 /AF	$824 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$807 /AF	$918 /AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is cost-effective to implement from the Society Perspective

BMP 02 Residential Plumbing Retrofit - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**	**Society Perspective**
1. Total devices distributed	2,161	2,161
2. Total water savings	341.1 AF	341.1 AF
3. Agency program costs	$158,127	$158,127
4. Customer program costs	NA	$0
5. Cost share	($30,000)	NA
6. Net Program Cost	$128,127	$158,127
Program Present Value Benefits		
7. Agency supply & wastewater benefits	$52,875	$52,875
8. Environmental benefits	$0	$0
9. Customer program benefits	NA	$324,351
10. Other utility benefits	NA	$24,471
11. Total benefits	$52,875	$401,696
12. Net Present Value (Line 11 - Line 6)	**($75,252)**	**$243,569**
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.41	2.54
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$376 /AF	$464 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$524 /AF	$646 /AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is cost-effective to implement from the Society Perspective

BMP 05 ETo-Landscape Water Budget Component - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**	**Society Perspective**
1. Total budgets	434	434
2. Total water savings	7,318 AF	7,318 AF
3. Agency program costs	$1,693,874	$1,693,874
4. Customer program costs	NA	$1,037,843
5. Cost share	$0	NA
6. Net Program Cost	$1,693,874	$2,731,717
Program Present Value Benefits		
7. Agency supply & wastewater benefits	$1,120,597	$1,120,597
8. Environmental benefits	$0	$0
11. Total benefits	$1,120,597	$1,120,597
12. Net Present Value (Line 11 - Line 6)	**($573,277)**	**($1,611,120)**
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.66	0.41
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$231 /AF	$373 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$336 /AF	$542 /AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is not cost-effective to implement from the Society Perspective

BMP 05 Large Landscape Surveys - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**		**Society Perspective**	
1. Total surveys	27		27	
2. Total water savings	213.3	AF	213.3	AF
3. Agency program costs	$45,190		$45,190	
4. Customer program costs	NA		110,052.00	
5. Cost share	$0		NA	
6. Net Program Cost	$45,190		$155,242	
Program Present Value Benefits				
7. Agency supply & wastewater benefits	$36,258		$38,890	
8. Environmental benefits	$0		$0	
9. Total benefits	$36,258		$38,890	
10. Net Present Value (Line 9 - Line 6)	**($8,932)**		**($116,352)**	
11. Benefit-Cost Ratio (Line 9 ÷ Line 6)	0.80		0.25	
12. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$212	/AF	$728	/AF
13. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$226	/AF	$777	/AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is not cost-effective to implement from the Society Perspective

BMP 06 High Efficiency Washing Machine Rebate Programs - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**	**Society Perspective**
1. Total rebates distributed	505	505
2. Total water savings	96.7 AF	96.7 AF
3. Agency program costs	$80,686	$80,686
4. Customer program costs	NA	$100,938
5. Cost share	$0	NA
6. Net Program Cost	$80,686	$181,624
Program Present Value Benefits		
7. Agency supply & wastewater benefits	$15,646	$15,646
8. Environmental benefits	$0	$0
9. Customer program benefits	NA	$327,426
10. Other utility benefits	NA	$7,241
11. Total benefits	$15,646	$350,312
12. Net Present Value (Line 11 - Line 6)	**($65,040)**	**$168,689**
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.19	1.93
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$834 /AF	$1,877 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$1,034 /AF	$2,327 /AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is cost-effective to implement from the Society Perspective

BMP 09 CII Surveys - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**	**Society Perspective**
1. Total surveys	18	18
2. Total water savings	282.4 AF	282.4 AF
3. Agency program costs	$105,229	$105,229
4. Customer program costs	NA	365,800
5. Cost share	$0	NA
6. Net Program Cost	$105,229	$471,029
Program Present Value Benefits		
7. Agency supply & wastewater benefits	$45,900	$56,899
8. Environmental benefits	$0	$0
9. Customer energy benefits	NA	$2,443,723
10. Other utility benefits	NA	$18,728
11. Total benefits	$45,900	$2,519,349
12. Net Present Value (Line 9 - Line 6)	**($59,329)**	**$2,048,320**
13. Benefit-Cost Ratio (Line 9 ÷ Line 6)	0.44	5.35
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$373 /AF	$1,668 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$452 /AF	$2,024 /AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is cost-effective to implement from the Society Perspective

BMP 14 ULFT Replacement Programs - Summary of Costs & Benefits
City of Vallejo

Program Present Value Costs	**Agency Perspective**	**Society Perspective**
1. Total ULFTs distributed	1,498	1,498
2. Total water savings	900.9 AF	900.9 AF
3. Agency program costs	$168,615	$168,615
4. Customer program costs	NA	$125,496
5. Cost share	$0	NA
6. Net Program Cost	$168,615	$294,112
Program Present Value Benefits		
7. Agency supply & wastewater benefits	$141,136	$141,136
8. Environmental benefits	$0	$0
9. Other utility benefits	NA	$65,320
10. Total benefits	$141,136	$206,456
11. Net Present Value (Line 10 - Line 6)	**($27,479)**	**($87,655)**
12. Benefit-Cost Ratio (Line 10 ÷ Line 6)	0.84	0.70
13. Simple Unit Supply Cost (Line 6 ÷ Line 2)	$187 /AF	$326 /AF
14. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	$253 /AF	$441 /AF

This BMP is not cost-effective to implement from the Agency Perspective
This BMP is not cost-effective to implement from the Society Perspective

Appendix K – Reference List

Association of Bay Area Governments Projections (2002)

City of Vallejo Draft Urban Water Management Plan (Brown and Caldwell, Oct. 2004)

City of Vallejo General Plan (July 1999)

City of Vallejo Water Management Plan (adopted 1999)

City of Vallejo Water Utility Financing Plan and Rate Study (Brown and Caldwell, October 2004)

Draft Downtown Specific Plan and Virginia Street Development EIR (DC&E, 5/13/05)

Final Downtown Vallejo Redevelopment Project Water Supply Assessment (Brown and Caldwell, 6/20/05)

Final Mare Island Redevelopment Project Water Supply Assessment (Brown and Caldwell, 6/24/05)

Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan (Cal DWR, 1/18/05)

Revised, Final Vallejo Station and Waterfront Water Supply Assessment (Brown and Caldwell, 6/14/05)

Solano County Water Agencies Integrated Regional Water Management Plan (SCWA, 2005)

Solano County Water Agency Urban Water Management Plan, adopted October 13, 2005.

U.S. Census data

Vallejo Sanitation and Flood Control District Reclaimed Water Study Plan (RMC, July 2001)

Vallejo Sanitation and Flood Control District Reclaimed Water Study (RMC, August 2003)

Water Desalination – Findings and Recommendations (Cal DWR, October 2003)