CDM

Diablo Water District

Urban Water Management Plan

December 2005

FINAL REPORT

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December 22, 2005

California Department of Water Resources
Attn: David Todd
Office of Water Use Efficiency
P.O. Box 94236
Sacramento, CA 94236

Subject: 2005 Urban Water Management Plan for Diablo Water District

Dear Mr. Todd:

On behalf of Diablo Water District, enclosed is their 2005 Urban Water Management Plan. CDM assisted the District with preparation of this Plan. It was adopted by the District Board of Directors at their December 21, 2005 Board meeting.

If you have any questions regarding the Plan, please contact the District's General Manager, Mike Yeraka, at 925-625-6159.

Very truly yours,

Lisa House

Lisa House, P.E
Camp Dresser & McKee Inc.

c: Mike Yeraka, General Manager, Diablo Water District

Enclosure: 1 copy of Diablo Water District's 2005 Urban Water Management Plan

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Section 1
Introduction and Public Participation

Law

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....After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

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.

1.1 Introduction

This Urban Water Management Plan was prepared and adopted pursuant to the Urban Water Management Planning Act (California Water Code, Section 10610 through 10656). The Act requires that each urban water supplier providing municipal water to more than 3,000 customers or supplying more than 3,000 acre-feet annually must prepare such a plan and update it every five years. In August 2005, the Diablo Water District (DWD or District) supplied water to 8,516 customers. DWD is an urban water supplier as defined by Section 10617 of the Act.

When preparing this Act, the California Legislature found that "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." The focus of this document is the planning and efficient use of water supplies for DWD.

This document presents DWD's 2005 Urban Water Management Plan (Plan). This Plan is organized according to subject as recommended by the State of California Department of Water Resources, with water code sections included as appropriate.

1.2 Public Participation and Plan Adoption

A draft of this Plan was circulated to parties known to DWD that may have an interest in the Plan. Copies of the Plan were made available for review at the Oakley Public Library and DWD's office.

Notice of the Public Hearing to review the Draft Urban Water Management Plan on November 23, 2005, was published twice in the Oakley News, which is a major local newspaper of general circulation in DWD's service area. The notice also advised the

public that copies of the Plan were available for review prior to the hearing and that written comments could be sent to DWD until December 2, 2005.

The Board of Directors adopted the Urban Water Management Plan at their regular meeting on December 21, 2006.

Notice of the Public Hearing and the Resolution adopting the Plan are included in Appendix A.

1.3 Agency Coordination

DWD has coordinated its plan preparation with other appropriate agencies in the area, as required by law. DWD has been an active participant for many years in integrated water resource planning for East Contra Costa County.

For the last decade, the water and wastewater agencies in East Contra Costa County have worked collaboratively to integrate management initiatives and infrastructure in the interest of increasing water supply reliability. More recently, Contra Costa County and Contra Costa Flood Control District joined together with local cities and districts to develop and implement a comprehensive Stormwater Management Plan to protect the beneficial uses of the Delta water system. In addition, the County, many cities, water agencies, and local districts have been working collaboratively with state and federal agencies to develop an innovative habitat conservation plan to reserve endangered species and have launched several ecosystem restoration projects.

DWD is a member of the East County Water Management Association (ECWMA). The Association is a group of eleven public agencies in Eastern Contra Costa County who participate in regional water supply planning efforts for Eastern Contra Costa County. The eleven agencies consist of the City of Antioch, City of Brentwood, Byron-Bethany Irrigation District, Town of Discovery Bay, Contra Costa Water Agency, Contra Costa Water District, Delta Diablo Sanitation District, Diablo Water District, East Contra Costa Irrigation District, Ironhouse Sanitary District, and City of Pittsburg.

In the early 1990s, the ECWMA, with DWD participation, worked together to develop a comprehensive water management plan, the East County Water Supply Management Study (Phase II Report, 1996). In July 2005, the association members, including DWD, participated in the completion of the East Contra Costa County Functionally Equivalent Integrated Regional Water Management Plan. This document brings together into a shared vision, the integrated water resource planning initiatives being conducted by the various entities serving East Contract Costa County.

Copies of the DWD Urban Water Management Plan were sent to the agencies show in Table 1-1.

Table 1-1
Coordination and Public Involvement Actions

Agency	Contacted for Assistance	Sent Copy of Draft Plan	Commented on Draft Plan	Sent Notice of Intention to Adopt
City of Antioch		X		X
Bethel Island Municipal Improvement District		X		X
City of Brentwood		X		X
Byron-Bethany Irrigation District		X		X
Contra Costa Water District	X	X		X
County Department of Health Services		X		X
State Department of Health Services		X		X
Delta Diablo Sanitation District		X		X
Town of Discovery Bay		X		X
East Contra Costa Irrigation District		X		X
Ironhouse Sanitary District	X	X	X	X
City of Oakley	X	X		X
Oakley Public Library		X		X
City of Pittsburg		X		X

Section 2
Service Area Characteristics

Law

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

2.1 Location

DWD is located in the northeastern corner of Contra Costa County, east of the City of Antioch and north of the City of Brentwood. Ultimately, as shown on Figure 2-1, DWD will provide service to the City of Oakley, including the East Cypress Corridor area, the Town of Knightsen, and some or possibly all of Bethel Island if the island residents wish to secure water service from the District. The District's sphere of influence and Bethel Island encompass approximately 19,000 acres. Currently the District serves about half the ultimate area; the remainder is undeveloped or in the process of developing.

The existing treated water system is located in the western part of the ultimate area, where the original Oakley community began. Significant development is occurring in the eastern part of the ultimate area, and the District treated water system is being expanded to serve the eastern area.

The terrain is gently rolling, with a gradual slope toward the San Joaquin River. Ground elevation varies from minus 5 feet in the eastern part of the ultimate area to approximately 100 feet at the southwest corner of DWD's service area.

2.2 Climate

The climate is Mediterranean type, with mild, rainy winters and hot, dry summers. Average annual rainfall is 13 inches. Approximately 94% of this precipitation occurs in the months of October through April. Table 2-1 presents average monthly precipitation, temperature, and evapotranspiration data for 1955-2005.

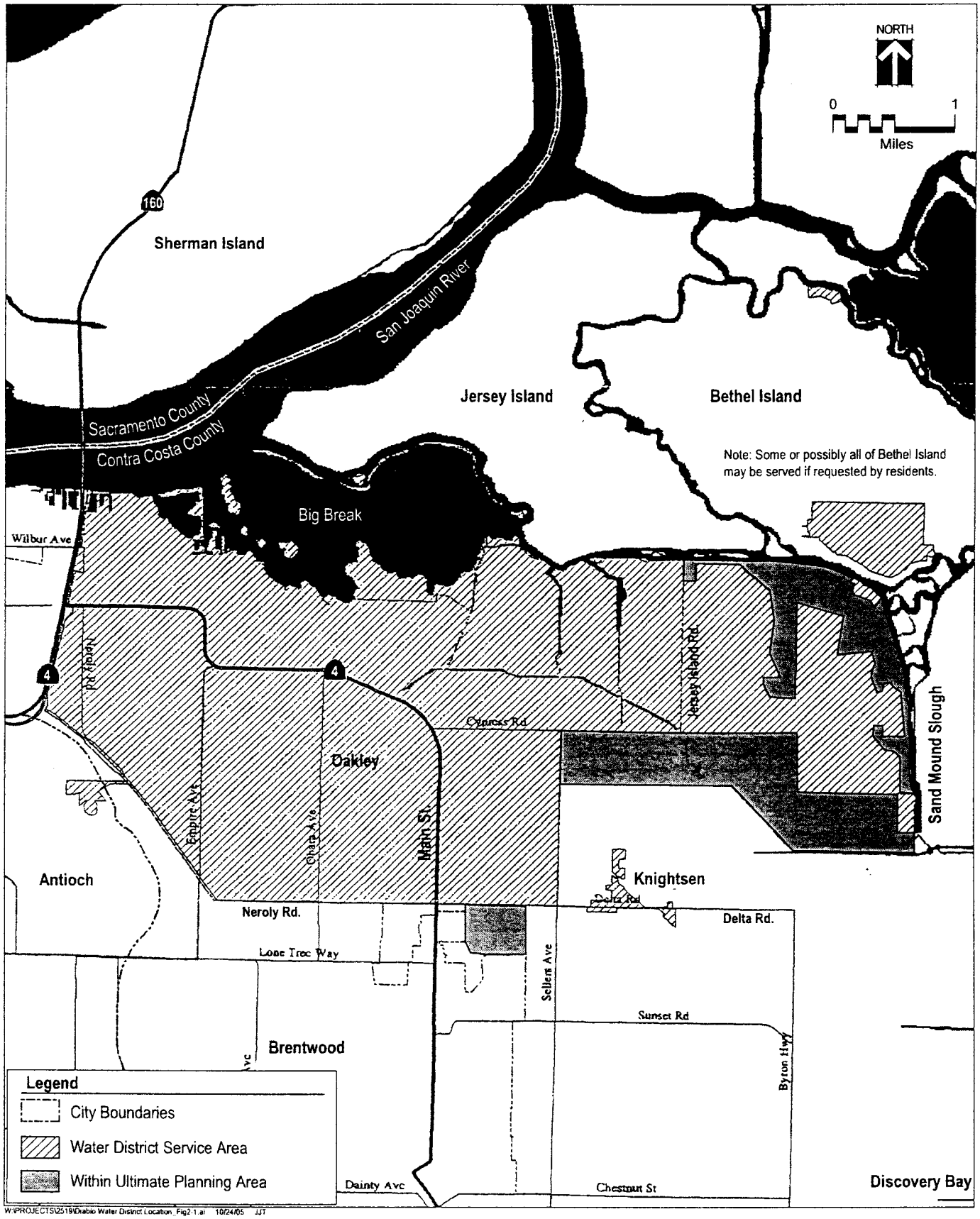

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Figure 2-1
Diablo Water District Location

Table 2-1
Climate Summary [1]

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
Average Precipitation (inches)	2.80	2.43	1.93	0.88	0.38	0.10	0.02	0.05	0.21	0.70	1.66	2.12	13.28
Average Temperature (°F)	45.3	50.6	54.4	58.8	64.9	71.0	74.1	73.3	70.7	63.8	53.5	46.0	60.5
Standard Monthly Average Evapotranspiration (ETo)	0.95	1.75	3.48	5.37	6.88	7.79	8.29	7.24	5.33	3.63	1.76	1.01	53.48

(1) Sources of climate data include: the Antioch Pump Plant 3 weather station (#040232), and average evapotranspiration (ETo) data for 1985-2005, for the Brentwood, California station of the California Irrigation Management Information System.

2.3 Population

DWD currently serves about 28,000 residents of the City of Oakley. According to the City of Oakley's adopted General Plan, the total buildout population will be about 68,000, which includes about 50,000 people within the existing City limits and 18,000 in the city's expansion areas within its Sphere of Influence. In addition, DWD will serve Knightsen and some or all of Bethel Island in the future, although it does not currently provide treated water service to those areas.

Population projections were also obtained from the Association of Bay Area Governments for 2005 through 2030. However, the ABAG sphere of influence for Oakley did not include all the City's future expansion areas, which will be served by DWD, so was not as accurate for water supply planning.

The population at buildout of DWD's ultimate service area was estimated using planning information from the City of Oakley General Plan and Contra Costa County General Plan (for Knightsen and Bethel Island). The population was calculated based buildout residential land uses, the average allowable residential densities, and average household sizes. The buildout population was estimated at about 75,000 persons assuming that DWD serves the entire ultimate area.

For this Plan, ultimate buildout is assumed to occur by 2040, consistent with the water supply planning timeframe that is used by Contra Costa Water District, DWD's wholesale supplier. The City of Oakley General Plan indicates that residential buildout within its Sphere of Influence will occur at sometime after 2020, but does not give a specific timeframe.

Table 2-2 shows estimated population projections from 2005 through 2040 for the area served by DWD. Linear interpolation was used to estimate the population at 5-year intervals between 2005 and 2040. The actual growth in population over time will depend on economic and development cycles. The East Contra Costa County area has experienced alternating periods of slow growth and high growth since the 1980's.

Table 2-2
Population Projection Estimates for Area Served by DWD

2005	2010	2015	2020	2025	2030	2035	2040
28,000	34,715	41,430	48,145	54,860	61,575	68,290	75,000

Section 3
Water Demands

Law

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

10631(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....

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

3.1 Historic and Projected Customers

Table 3-1 shows the historic number of customer connections (meters) served by DWD. About 98 percent of DWD's customers are residential. The remaining are primarily commercial, and some landscape irrigation. There is a limited amount of heavy industrial development in the area. DWD does not provide any water for agricultural uses.

Table 3-1
Historic Customer Connections [1]

Year	Residential		Commercial & Institutional	Industrial	Landscape Irrigation	Other/ Construction	Total
	Single Family	Multi-Family					
1995	6,294	40	102	1	0	23	6,460
1996	6,731	41	100	1	0	22	6,895
1997	6,873	40	103	1	0	5	7,022
1998	7,046	40	37	1	59	0	7,183
1999	7,148	41	37	1	59	0	7,286
2000	7,180	41	49	1	59	0	7,330
2001	7,431	41	107	1	63	0	7,643
2002	7,743	41	108	1	73	0	7,966
2003	8,063	41	108	1	73	0	8,286
2004	8,219	41	108	1	75	0	8,444

[1] Table does not include hydrant meters, fire services, and two flat rate unmetered customers.

Between 1995 and 2004, the total number of connections increased about 31 percent, which is an average annual growth rate of about 3 percent per year over the entire period. This 10-year period includes a few years with relatively flat growth, as well as five years with growth over 4%. The East Contra Costa County area, including DWD's service area, is currently experiencing a high growth period.

Table 3-2 presents estimates for the future number of customer connections through 2040, which is the assumed buildout timeframe for the DWD service area as discussed in Section 2.3. The breakdown of 2005 usage by customer sector was estimated from

available information. Buildout connections were estimated based on the calculated number of residential units and estimates of number of non-residential connections per acre from available information. Linear interpolation was used to determine the usage at 5-year intervals between 2005 and buildout, which assumes an average growth rate over the entire planning period.

Table 3-2
Projected Customer Connections

Year	Residential		Commercial, Business Park, Industrial, and Institutional	Parks and Landscape Irrigation	Total
	Single Family	Multi-Family			
2005	8,300	45	180	75	8,600
2010	10,079	123	240	86	10,527
2015	11,857	201	300	96	12,454
2020	13,636	279	360	107	14,381
2025	15,414	356	420	118	16,309
2030	17,193	434	480	129	18,236
2035	18,971	512	540	139	20,163
2040	20,750	590	600	150	22,090

Notes regarding Buildout Connection Estimates:
Single family connections equal estimated buildout number of single family units.
Multi-family connections are based on the estimated number of multi-family unit, assuming 8 units per connection (average density for multi-family is 8 units per acre).
Non-residential connections assume 1 connection per approximately 2 acres, which is similar to the current density for areas served.
Landscape irrigation connections are assumed to double.

3.2 Historic and Projected Water Use

Table 3-3 presents historic water use by customers, and unaccounted-for water (system losses between production and consumption due to such things as main breaks, fire flows, meter inaccuracy). Between 1995 and 2004, unaccounted-for water averaged about 6 percent of metered water use.

Table 3-3
Historic Water Use (1)

Year	All Customer Sectors (MG)	Unaccounted-for Water (System Losses) (MG)	Total (MG)
1995	1,406	82	1,488
1996	1,495	NA	1,495
1997	1,555	65	1,620
1998	1,218	78	1,296
1999	1,184	50	1,234
2000	1,317	140	1,457
2001	1,377	69	1,446
2002	1,475	54	1,529
2003	1,449	115	1,564
2004	1,592	123	1,715

(1) Breakdown of historic use is based on the customer usage data available from the water billing system.

Table 3-4 presents water use projections in 5-year increments from 2005 through buildout at 2040. Buildout water usage was estimated and then linear interpolation used to determine the usage at 5-year intervals between 2005 and buildout. The breakdown of 2005 usage by customer sector was estimated from available information. At buildout, residential usage will comprise about 70 percent of the total use; and non-residential uses about 30 percent.

Table 3-4
Projected Water Use

Year	Customer Sector (MG per year)						Total (MG)
	Residential		Commercial, Business Park, & Light Industrial	Heavy Industrial (1)	Institutional (Public & Schools)	Parks and Landscape Irrigation	
	Single Family	Multi-Family					
2005	1,590	45	5	0	10	35	1,685
2010	1,934	124	144	70	40	51	2,324
2015	2,279	204	284	140	70	68	2,964
2020	2,623	283	423	210	100	84	3,603
2025	2,967	362	562	280	130	101	4,242
2030	3,311	441	701	350	160	117	4,881
2035	3,656	521	841	420	190	134	5,521
2040	4,000	600	980	400	220	150	6,350

(1) Heavy industrial includes a future large heavy industrial user(s) to replace Dupont, which may use up to a total of 1.1 mgd on an average daily basis.
(2) Customer demands for each category include a factor of 6% for unaccounted – for water.

Buildout water usage for each customer sector was calculated using buildout land uses from the City of Oakley General Plan, the East Cypress Corridor Specific Plan, and the Contra Costa County General Plan (for Knightsen and Bethel Island), and unit demand factors for each customer type. Unaccounted-for water was assumed to remain at the historic average of 6 percent of total customer usage. The unit demand factors for each customer type included unaccounted-for water. Therefore, the total water use includes unaccounted-for water.

Open space and Delta recreation areas are not irrigated with DWD water. In addition, DWD's policy is to require that large new turf landscape areas use private groundwater wells or non-potable water for irrigation. Landscape irrigation is assumed to increase over existing levels to accommodate small or isolated areas where it is not feasible to provide another source of irrigation water. It is assumed that parks and landscape areas in new development areas, such as the East Cypress Corridor, will irrigate large landscape areas with groundwater, not with DWD water.

DWD does not provide water for agricultural uses, does not sell water to other agencies, and does not participate in exchanges or non-recurring agreements, saline barriers, or groundwater recharge and conjunctive use programs.

Section 4
Water Supply Sources

Law

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

10631(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 ....

10631(b) If groundwater is identified as an existing or planned source of water, all the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the supplier.

(2) A description of any groundwater basin from which the 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....and a description of the amount of groundwater the supplier has the legal right to pump..

For basins that have not been adjudicated, information as to whether the department has identified the basin as overdrafted or projected that the basin will become overdrafted...and a description of efforts to eliminate long-term overdraft conditions.

(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.

10631(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.

4.1 Overview of Supply Sources

DWD's primary water supply for its distribution system is treated surface water from the Central Valley Project purchased from Contra Costa Water District (CCWD). CCWD contracts with the U.S. Bureau of Reclamation for the Central Valley Project water. The Central Valley Project water is conveyed through the Contra Costa Canal, and treated at the Randall-Bold Water Treatment Plant (WTP) in Oakley, which is jointly owned by DWD and CCWD.

DWD is beginning development of a groundwater supply system that will provide additional supply reliability. The first groundwater well will be in service in 2006. When fully implemented, groundwater may comprise up to 20 percent of DWD's total supply.

Table 4-1 summarizes the water supply sources for DWD. Each supply source is then described in more detail.

Table 4-1
Current and Projected Water Supplies (MG per year)

Water Supply Sources	***2005***	***2010***	***2015***	***2020***	***2025***	***2030***	***2035***	***2040***
Surface water purchased from Contra Costa Water District (1)	2,738 MG	2,738 MG	3,560 MG	3,650 MG	4,562 MG	4,562 MG	5,475 MG	5,475 MG
DWD groundwater (2)	0	547 MG	547 MG	1,095 MG	1,095 MG	1,642 MG	1,642 MG	2,189 MG
Supplier produced surface diversions: None								
Transfers: Only as supplied by CCWD and included in surface water purchased from CCWD, as discussed in Section 6.4.								
Exchanges: Only through CCWD and included in surface water purchased from CCWD, as discussed in Section 6.4.								
Recycled Water: See Section 5 for discussion.								
Desalination: See Section 4.4 for discussion.								
Total Supply	**2,738 MG**	**3,285 MG**	**4,197 MG**	**4,745 MG**	**5,657 MG**	**5,657 MG**	**6,569 MG**	**6,569 MG**

(1) DWD currently has 15 mgd treatment capacity for surface water with the ability to purchase an additional 15 mgd capacity in 5 mgd increments as needed to meet future peak demands. The 15 mgd current capacity will provide an average day supply of 7.5 mgd (2,738 MG per year). A total of 30 mgd ultimate capacity for maximum day will provide an average day supply of 15 mgd (5,475 MG per year). It is anticipated that DWD will purchase 5 mgd additional capacity in 2015, 2025, and 2035 in order to meet demands.

(2) Groundwater supply until 2020 is for the first well only that is currently under construction, assuming an average 1.5 mgd pumping capacity. By 2020, it is assumed that an additional well(s) is constructed that will provide an additional 1.5 mgd capacity. By 2030, it is assumed that an additional 1.5 mgd well capacity is provided. By 2040, it is assumed that an additional 1.5 mgd well capacity is provided. Ultimately, groundwater may provide up to about 20 percent of the District's supply, which would be a total ultimate well capacity of about 6 to 7 mgd.

4.2 Surface Water Purchased from CCWD

DWD purchases Central Valley Project water from CCWD, its wholesale supplier. CCWD has a contract with the U.S. Bureau of Reclamation for 195,000 acre-feet/year of Central Valley Project Water. In March 2005, CCWD renewed their water service contract with the U.S. Bureau of Reclamation for a period of 40 years, through February 2045.

The raw surface water is supplied via the Contra Costa Canal (at approximately mile post 7.1) that conveys water from Rock Slough in the Sacramento-San Joaquin Delta. The Canal is owned by the Bureau of Reclamation and operated by CCWD.

The Canal water can also be supplemented by surface water stored at Los Vaqueros Reservoir. The Los Vaqueros Reservoir is a large 100,000 acre-foot storage facility located 8 miles south of Brentwood. Water to fill the reservoir comes from a pump station intake on Old River near Highway 4. CCWD owns and operates the Los

Vaqueros Reservoir and its related intake, pumping, conveyance and blending facilities. The Reservoir provides water quality and emergency supply benefits.

The raw surface water from the Contra Costa Canal and/or Los Vaquero Reservoir is treated at the Randall-Bold Water Treatment Plant (WTP) in Oakley. The Randall-Bold WTP is jointly owned by DWD and CCWD, and is operated and maintained by CCWD.

DWD currently has a joint powers agreement with CCWD for 15 million gallons per day (mgd) of treated water from the Randall-Bold WTP, with the right to purchase additional capacity up to a total of 30 mgd. DWD intends to purchase additional treated surface water capacity from CCWD, when needed, as its primary supply for future development.

To accommodate buildout of DWD's ultimate service area will require either purchase of additional excess capacity at the existing WTP if any is available or expansion of the existing WTP, which has a design capacity of 40 mgd and is expandable to 80 mgd. The Randall-Bold WTP was designed assuming that it would be expanded in the future to serve future development within its planned service area.

DWD's 15 mgd current capacity will provide an average day supply of 7.5 mgd (2,738 MG per year). A total of 30 mgd ultimate capacity for maximum day will provide an average day supply of 15 mgd (5,475 MG per year). DWD must purchase additional supply in 5 mgd increments. It is anticipated that DWD will purchase 5 mgd additional capacity in 2015, 2025, and 2035 in order to meet demands.

4.3 Groundwater Supply

4.3.1 Groundwater Supply Facilities

DWD no longer uses its existing well at the Rose Avenue Corporation yard under normal conditions due to poor water quality. It is a standby emergency well only. The well is 12 inches in diameter and has a capacity of 1,100 gallons per minute (gpm). The well has not been used to any extent over the past five years.

DWD is currently implementing a new groundwater supply system that will provide additional supply reliability. The groundwater from one or more wells located in the City of Oakley will be conveyed in a dedicated well supply pipeline to a blending facility located near the Randall-Bold WTP. At the blending facility, the groundwater will be treated and blended with treated surface water within DWD's distribution system, prior to distribution to any customers, so that there will be negligible impact on water quality. The amount of groundwater in proportion to surface water will be automatically controlled to maintain good water quality with an anticipated maximum hardness of 140 milligrams per liter (mg/L).

The first well, the Glen Park Well, will be put into service in 2006. The first phase of the groundwater supply system includes a 320-foot deep well and pump station in Glen Park in the City of Oakley, a blending facility at the Randall-Bold WTP, and an 18-inch diameter, 18,250-foot-long dedicated well supply pipeline connecting the well and the blending facility. The Glen Park well has a pumping capacity of approximately 1.5 mgd.

DWD may implement additional wells as "future phases." For example, Knightsen has an existing municipal well that DWD may connect to the groundwater supply system if it provides service to the town. Future wells may also be located in the eastern part of DWD's Sphere of Influence. Specific locations of such wells would be determined as part of future well siting studies.

The well(s) will operate year-round to reduce annual operating costs, since groundwater supply is lower cost than surface water. The well(s) will operate at higher flow rates to meet peaking needs during the higher demand summer months.

The proposed 18-inch diameter pipeline is sized for the anticipated ultimate groundwater use of 7 mgd to allow flexibility to meet future demands, but installation of the 18-inch diameter pipeline does not commit DWD to implementing future phases of the well project.

It is anticipated that groundwater supply until 2020 is for the first well only that is currently under construction, assuming an average 1.5 mgd pumping capacity. By 2020, it is assumed that an additional well(s) is constructed that will provide an additional 1.5 mgd capacity. By 2030, it is assumed that an additional 1.5 mgd well capacity is provided. By 2040, it is assumed that an additional 1.5 mgd well capacity is provided. Ultimately, groundwater may provide up to about 20 percent of the District's supply, which would be a total ultimate well capacity of about 6 to 7 mgd.

DWD will base the decision to expand the groundwater supply system on the performance of the existing Glen Park well. Based on available information, it is likely that 3 mgd groundwater pumping capacity can be provided, and possibly up to a 7 mgd ultimate pumping capacity can be achieved from the local groundwater basin. However, the long-term ability of the groundwater basin to provide these quantities is not known with certainty. As the first well is implemented and operated, ongoing data collection and monitoring conducted by DWD will provide better information.

If future investigations indicate that it will not be possible to provide the anticipated amount of groundwater supply to meet demands, then DWD will either procure additional surface water supply from CCWD and/or investigate other local supply sources.

4.3.2 Groundwater Basin Characteristics

The wells will be in a groundwater basin that has been studied since the late 1990's by Luhdorff & Scalmanini Consulting Engineers (LSCE). A description of the groundwater basin is in the "Investigation of Groundwater Resources in East Contra Costa County" (March 1999). The groundwater basin is not adjudicated, and has not been studied by the California Department of Water Resources. The groundwater basin is not overdrafted.

The DWD wells will be located within the region identified as the Marginal Delta Dunes in LSCE's 1999 study. The 1999 study, and subsequent detailed investigations by LSCE, identified a favorable hydro-geologic area for well locations within DWD's service area, and a specific site for the first well.

When groundwater is withdrawn from an aquifer, groundwater levels are lowered around the well, creating a cone of depression. Additional pumping could increase the amount of drawdown and decrease the productivity of existing wells in the area. Under certain conditions this could result in a lowered water table, which in turn could adversely affect certain shallow wells, trees and creeks. However, the potential for such impacts from DWD's groundwater supply system has been investigated several times, and found to be low, as described below.

In 1999, a regional groundwater investigation was completed for DWD. This investigation determined that there is a hydraulic connection with the alluvial plain to the south, where a significant amount of groundwater pumping already exists for municipal uses (City of Brentwood) and agricultural uses (East Contra Costa Irrigation District). As part of the regional groundwater investigation, test borings and wells were completed to obtain geological and water quality information. The Glen Park well site was chosen based on results from the Glen Park test well, historic information, and the characteristics of the Brentwood wells. The groundwater investigation determined that groundwater pumping at a rate of approximately one to two mgd is feasible at the Glen Park pump station site.

Luhdorff and Scalmanini conducted an investigation of potential impacts on nearby wells in 2002. Approximately 35 wells, including the Knightsen municipal well, private domestic wells and irrigation wells, were identified within 2,500 feet of the Glen Park well site. Thirty-four of these wells are shallower than 200 feet. The deep annular seal of the proposed Glen Park well would serve to isolate these wells from significant pumping impacts. Due to the shallow depths and relatively small capacities of these wells, and the presence of the confining clay layers between these wells and the Glen Park well, impacts to these wells are not expected to occur. The one other existing deep well, located approximately 2,450 feet from the Glen Park well site, is a six-inch diameter well completed to a depth of 290 feet. Given the distance of this well to the Glen Park well site and the low pumping rate of the well (estimated to be 100 gpm), the Glen Park well is expected to have little effect on the capacity of this water supply well.

Recent testing at the Glen Park well conducted in April 2004 had no measurable or discernable impact on water levels in nearby shallow wells. The well was tested for a seven-day period to determine potential impacts from well pumping in April 2004. The testing was conducted to assess prior assumptions concerning potential impacts on ground-water levels and other wells, and potential impacts on ground-water quality. The monitoring findings are summarized as follows:

- Pumping in the Glen Park well at capacities up to 1,500 gallons per minute (gpm), and for seven days at 1,100 gpm, had no measurable or discernable impact on water levels in nearby shallow wells.
- Pumping did not have a measurable impact on ground-water levels at the nearby Brentwood municipal well site.
- During testing of the Glen Park well, it was found that water quality was essentially the same as found in the monitoring well previously installed in Glen Park, and is suitable for municipal use.

The closest municipal well is Brentwood Well 14 at Lone Tree Way and Main Street, approximately one mile southeast of the Glen Park well. The groundwater investigation for DWD's groundwater supply system evaluated potential impacts on Brentwood Well 14. The investigation determined that DWD pumping at three mgd total capacity (assuming three wells were installed) would induce an estimated ten feet of drawdown in the Brentwood well after 30 days of continuous pumping. While this impact would be detectable, it would not be expected to adversely affect the operation of Brentwood Well 14. Drawdown impacts for the first Glen Park well would be less since it would have a one to two mgd total pumping capacity. This was verified during the testing conducted in April 2004, which found that additional pumping did not have a measurable impact on ground-water levels at the nearby Brentwood municipal well site.

DWD will continue to monitor groundwater levels and consult other well operators to monitor effects on other wells in the region. In the event local wells were to be adversely affected (i.e. lowering of groundwater below existing pumps or degradation of water quality), decisions about mitigation actions would be made on a case-by-case basis. Mitigation measures may include, but not be limited to, supplying the property with a different source of water, lowering or replacing pumps, or installing new wells.

4.3.3 AB 3030 Groundwater Management Plan

DWD is beginning preparation of a groundwater management plan according to the procedures outlined in the Groundwater Management Planning Act [Sections 10750-10546 of the California Water Code AB 3030]. This action is voluntary, not mandatory. DWD is not required to develop a groundwater management plan.

Twelve technical components are identified in the Code that the groundwater management plan may include, as appropriate to the particular groundwater basin, and others may be included in the plan as appropriate. The plan can be developed only after a public hearing and adoption of a resolution of intention to adopt a groundwater management plan. Once the plan is adopted, rules and regulations must be adopted to implement the program called for in the plan.

At this time, DWD's anticipated process for developing the plan is outlined below.

Winter 2005/ Early Spring 2006	Form Advisory Committee and hold kick off meeting. Identify management area in coordination with Advisory Committee. Finalize management objectives for basins and identify other plan objectives in coordination with Advisory Committee. Circulate to other stakeholders. Prepare draft resolution of intent to prepare plan in coordination with Advisory Committee.
Spring/Summer 2006	Publish notice of public hearing. Conduct hearing on intention to prepare and adopt plan. Provide draft resolution to District Board; Board may adopt resolution of intent. Publish resolution of intention to prepare and adopt plan.
By Spring/Summer 2008	Prepare plan within 2 years of adoption of resolution (as required by Water Code)

4.4 Potential Future Desalination Supply

Desalination involves removing salts and impurities from non-potable water (e,g,, seawater, brackish surface water or brackish groundwater) using treatment technologies such as reverse osmosis membranes or distillation methods. After treatment, the water is suitable for all drinking water purposes.

Potential opportunities for desalination supply in East Contra Costa County are being explored on a regional level through the East County Water Management Association, of which DWD is an active participant. To date, the cost of implementing desalination supply including brine disposal, has not been cost-effective compared with other available sources. As advancements in technology make desalination a more cost-effective option in coming years, the East County water agencies, including DWD, will consider desalination projects as potential supply sources in future years.

Section 5
Water Recycling

Law

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 and shall include all of the following:

10633(a). A description of the wastewater collection and treatment systems in the supplier's service area...

10633(b). A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

10633(c). A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

10633(d). A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633(e). The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years....

10633(f). A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

10633(g). A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

5.1 Wastewater System Description

The Ironhouse Sanitary District (ISD) owns and operates the wastewater treatment and collection systems in DWD's service area including the Oakley Area and Bethel Island. ISD provided the information in this section on the wastewater system and potential recycled water use.

The wastewater treatment plant currently provides secondary treatment and chlorination. The plant uses an aeration pond treatment system consisting of a 9-inch parshall flume, two grinders, two pumps, and two parallel two-stage aerated treatment ponds followed by chlorination. The average daily flow to the plant is approximately 2.3 mgd. The remaining dry weather treatment capacity is approximately 0.4 mgd.

Wastewater is collected and conveyed to the wastewater treatment plant by a network of gravity sewer mains and force mains where needed due to ground elevations.

ISD conveys recycled water from the wastewater treatment plant to Jersey Island for irrigation of agricultural lands on property adjacent to the wastewater treatment plant and on Jersey Island. Jersey Island is not within DWD's planning area.

5.2 Wastewater Generation, Collection and Treatment

Table 5-1 shows the wastewater flows generated within ISD's service area that are collected and conveyed to the wastewater treatment plant. These quantities include flows from Bethel Island as well as the Oakley area. Table 5-2 shows anticipated current and buildout flows at the wastewater treatment plant.

Table 5-1
Wastewater Generated and Collected in ISD Service Area (1)

	2005	2010	2015	2020	2025	Buildout
Average Daily Flows (mgd) (2)	2.3	3.2	3.7	4.2	4.8	8.6

(1) Data includes Bethel Island flows.
(2) Assumes 500 new connections per year from 2005-2010. Assumes 300 new connections per year from 2010 to 2025. Assumes 350 gallons per day per connection.

Table 5-2
Wastewater Treatment Plant Flows

Treatment Plant Name	Location (City)	2005 Average Daily Flow	2005 Maximum Daily Flow	Year of Planned Build-Out	Planned Maximum Daily Flow
Ironhouse Sanitary District	Oakley	2.3 mgd	2.6 mgd	2050+	8.6 mgd

5.3 Wastewater Disposal and Recycled Water Uses

Currently, all wastewater collected and treated by ISD is recycled in the form of irrigation water for agricultural lands. There is no direct discharge of treated effluent to the San Joaquin River. The wastewater is pumped through a series of pipes and valves to designated fields where it is used to irrigate agricultural lands.

The irrigated crops are for non-human consumption and consist primarily of rye grass. Irrigation currently takes place on 162 acres of land adjacent to the wastewater treatment plant in Oakley and on 396 acres of land on Jersey Island. As growth

continues in the ISD service area, the irrigable acres on Jersey Island that receive recycled water supply will increase to the best extent practicable.

ISD will continue to recycle 100 percent of its treated wastewater to agricultural lands to the best extent possible. ISD is in the process of completing an Environmental Impart Report (EIR) to expand treatment and disposal capacity to 8.6 mgd. In the EIR, ISD is evaluating several alternatives including: continued irrigation of agricultural lands; direct discharge of treated effluent to the San Joaquin River year-round or only during periods when land disposal is not feasible; and a combination of land and river discharge.

At present, collected wastewater receives secondary treatment and disinfection to meet a 23 MPN/100 mL (Most Probable Number per 100 milliliters) coliform count, which limits its reuse options. To expand reuse options, the treatment process would need to be improved to further clean the wastewater. For ISD to continue supplying reclaimed water to Jersey Island, the Regional Water Quality Control Board will require improving the treatment level to tertiary treatment, meeting a 2.2 MPN/100 mL coliform count. The proposed treatment level will meet Title 22 water quality criteria for unrestricted reuse.

While proposed plant expansions and additional treatment processes may make it possible to provide non-potable water for reuse by golf courses, industry, or landscape irrigation; a need for such use would have to be identified. Currently, very little industry or landscape areas exist near the wastewater treatment plant to warrant the investment in the delivery system infrastructure. In the future, should substantial users be identified, a study could be done to determine the economic feasibility of developing a separate non-potable water system that could supply recycled water to users other than agricultural lands, such as industry or large landscape areas.

5.4 Encouraging and Optimizing Recycled Water Use

Since all recycled wastewater is currently used by ISD on agricultural lands, DWD is taking no current actions to encourage or optimize additional use of recycled water.

DWD's policy is to require that large new turf landscape areas use private groundwater wells or non-potable water for irrigation. The separate irrigation systems to serve these areas could be supplied by recycled water if it becomes available.

In the future, if DWD identifies large potential users of recycled water within its service area, it will coordinate with ISD to determine if an economic feasibility study may be warranted. For example, such users may include large industries requiring cooling water or other non-potable uses, or large landscape areas that would otherwise irrigate with potable water.

Section 6
Water Supply Reliability

Law

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

10631(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

10631(c) 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 replace that source with alternative sources or water demand management measures, to the extent practicable.

10631(c) Provide data for each of the following: (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.

10631(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier..., and the manner in which water quality affects water management strategies and supply reliability.

6.1 Drought Reliability Analysis

This section discusses the reliability of DWD's water supplies during an average water year, a single dry water year, and multiple dry water years (three consecutive dry years). Section 7 shows the comparisons of projected supplies and projected demands for each of these conditions at 5-year intervals through year 2030.

As discussed in Section 4, DWD is currently implementing a groundwater supply system. This groundwater supply will be available during dry years when surface water supplies may be reduced. If surface supplies are reduced, DWD will operate its wells to make up the difference. The combination of surface water and groundwater supply will meet all the District's demands.

The first well will be in service in early 2006, and will be capable of providing 1.5 mgd on a sustained basis during a drought (547.5 million gallons per year). The well will have backup power. Future wells are planned that will ultimately increase the groundwater supply up to a maximum of 6 to 7 mgd.

Appendix B contains a letter dated September 1, 2005 from CCWD, DWD's wholesale supplier of surface water regarding its supply reliability to year 2030. CCWD's supply planning includes all of its supply sources, including surface water from the

Central Valley Project (CVP). The CVP supply reliability conditions are: normal year is adjusted historical use; single dry year and first year of a multiple dry year period is 85 percent of historical use; second year of a multiple dry year period is 75 percent of historical use; and third year of a multiple dry year period is 65 percent of historical use. However, CCWD's water supply planning includes other supply sources to make up for cutbacks in CVP supply, e.g., transfer/exchange agreements discussed in Section 6.4, in order to meet their supply reliability goals.

The water supply reliability goal approved by the CCWD Board of Directors is to meet at least 85 percent of demand in a second or third dry year, and 100 percent of demand in all other years from all sources of supply. The remaining 15 percent during second or third dry years would be met by a combination of short-term water purchases by CCWD, and a voluntary short-term conservation program by CCWD retail customers, and its wholesale customers, including DWD.

CCWD expects to meet near-term demands to 2010 under all supply conditions. Beginning in 2010, additional actions will be needed to meet demands during the second and third years of a multiple year drought. These actions include short-term water purchases by CCWD, in conjunction with a request for up to a 5 percent demand reduction during the second year and a 15 percent demand reduction during the third year of the drought. The maximum amount of short-term conservation expected to be necessary during a multiple year drought is 15 percent of demand.

Table 6-1 summarizes the expected reliability (availability) of supplies during a normal year, a single dry year, and a multiple dry year period of three consecutive dry years. As indicated in Table 6-1, DWD should not experience any severe rationing during a three-year drought or other shortage situation. During the critical 1977/1978 drought, DWD customers voluntarily conserved water to such an extent that DWD did not need to impose mandatory rationing.

Table 6-1
Summary of Supply Reliability (Availability) during Droughts

Supply Source	*Average/Normal Water Year*	*Single Dry Water Year*	*Multiple Dry Water Years*		
			Year 1	*Year 2*	*Year 3*
CCWD Surface Water [1]	100%	100%	100%	100% to 2010 85 % after 2010	100% to 2010 85 % after 2010
DWD Groundwater	100%	100%	100%	100%	100%

[1] In the near-term to 2010, CCWD expects to meet all near-term demands under all supply conditions, i.e., the near-term CCWD supply is 100% reliable.

When power outages occur, the District relies on its elevated storage to provide service to its customers. The District also has backup gas and propane driven pumps which can be brought into service in the event of a power failure. While the District's WTP does not have the capability to produce water during a power failure, it is able to pump water from its 5 MG underground storage reservoir at a rate of 4.2 mgd with one pump running on a stand-by generator.

If DWD's surface water supply is disrupted, DWD's groundwater supply will be available for emergency fire fighting or to maintain service. In addition, DWD has three emergency interties with the City of Antioch's treated water system, which could provide 1,000 gpm each.

6.3 Water Quality Impacts on Reliability

6.3.1 Surface Water

The Los Vaqueros Reservoir is part of the CCWD raw water supply system. DWD is no longer subject to the impacts of seasonal or climatic shortages as severely as before the Los Vaqueros Reservoir was constructed.

Prior to construction of the 100,000 acre-foot Los Vaqueros Reservoir, surface water quality was affected by seasonal or climatic shortages. During periods of water shortage there are insufficient river flows in the Delta to push back the salt water from the San Francisco Bay. As a result, salt water flows into the Delta thus reducing the quality of the water at the water supply intakes located at Rock Slough and Old River.

The quality of the water in the Delta is typically measured by its chloride content. Current drinking water standards require chloride concentrations not to exceed 250 parts per million, with short term limits of 500-600 parts per million. The chloride concentration at the water supply intakes has historically fluctuated between 20 and 250 parts per million and in some instances has gone above 250 parts per million during drought conditions.

The Los Vaqueros Reservoir stores water with a very low chloride concentration. The stored water is then blended as needed with water from the water supply intakes in order to achieve a consistent water quality of 65 parts per million 100 percent of the time.

6.3.2 Groundwater

DWD's groundwater supply system is being implemented to provide good quality water. In addition, treatment and monitoring are provided at the centralized blending facility to ensure that all drinking water standards are met.

A water quality evaluation of the first well, the Glen Park well, water indicated that the groundwater is generally of good quality. The only constituent regulated by the Department of Health Services (DHS) that was detected was nitrate at levels well

below the regulatory limits. Based on the water quality data, the only treatment required at the Glen Park well is disinfection.

Based on several groundwater investigations conducted by Luhdorff & Scalmanini Consulting Engineers from 1999 through April 2004, it has been determined that the proposed groundwater pumping at a rate of one to two mgd would not induce groundwater quality degradation locally or regionally. This assessment was confirmed during the testing of the Glen Park well in April 2004, when it was found that water quality was essentially the same as found in the monitoring well previously installed in Glen Park. DWD will monitor groundwater quality continuously during well operation.

The most common scenario would be water quality degradation by introducing nitrates from the shallower aquifer and manganese from the deep aquifer. However, groundwater quality impacts are unlikely to occur given the presence of multiple clay layers between the aquifers, and the 200-foot annular seal on the deep well.

6.4 Transfer or Exchange Opportunities

Most of DWD's water is purchased from CCWD; therefore, no exchange or transfer opportunities exist for DWD, except through CCWD. CCWD has identified water transfers as a preferred means of strengthening drought protection for existing customers and meeting supply shortfalls.

CCWD's location in the Sacramento-San Joaquin Delta provides access to supplies from the Sacramento and San Joaquin Rivers and their tributaries. In addition, the State Water Project and Central Valley Project direct their supplies through the Delta en route to delivery points in the San Joaquin Valley and Southern California. CCWD's location provides direct or indirect access to virtually all water supply and storage facilities in the Central Valley.

Current and future opportunities through CCWD are summarized below.

6.4.1 East Contra Costa Irrigation District Contract for Long-Term Water Transfer

CCWD's February 2000 Agreement with the East Contra Costa Irrigation District (ECCID) is for a long-term water transfer. It provides up to 8,200 acre-feet in normal years and includes provisions for an additional 4,000 acre-feet through groundwater exchange when the Central Valley Project is in a shortage condition.

6.4.2 Other Long-Term Water Transfer Opportunities

CCWD anticipates that an additional water transfer will be purchased in the next 5 to 10 years. The following water transfer opportunities are being evaluated by CCWD:

Conjunctive Use with Long-term Contract. CCWD would partner with an agricultural district holding pre-1914 surface water rights and co-invest in conjunctive use facilities, such as new groundwater wells. The new wells would allow the agricultural district to shift use from surface water to groundwater supplies in dry years and exchange its surface water supplies to CCWD to meet dry-year demand.

Groundwater Banking. CCWD would extend the reliability of its existing Central Valley Project supplies by banking, through groundwater storage, surplus Central Valley entitlement or other available wet year supplies. CCWD would draw upon the banked water supplies to meet demand when needed.

Lease/Purchase Water Rights and Remarket Surplus Supplies. CCWD would enter into a long-term water supply lease or purchase an existing water right. The lease or sale would be for a fixed amount of annual supplies. All surplus water supplies would be remarketed through a long-term contract with a third-party buyer or the spot market.

Co-Investment in Agricultural Conservation. This option would involve forming a long-term relationship with agricultural partner holding pre-1914 water rights. CCWD would invest in agricultural conservation infrastructure, such as canal lining and weed abatement projects. A fixed amount of conserved supplies would be made available to CCWD annually and any surplus supplies could be banked through groundwater storage or remarketed.

Fallowing or Crop Shifting Option Contract. This option includes a long-term option contract with an agricultural district. When called upon by CCWD through exercise of the option, the agricultural district would fallow land or shift crops to make water supplies available.

6.4.3 Short-Term Water Transfers

CCWD has experience in implementing short-term water transfers. For example, CCWD purchased approximately 3,400 acre-feet of water from Western Water in calendar year 2000 and 5,000 acre-feet from the Yuba County Water Agency in 2003 and 2004. The goal of the short-term transfer program was to establish relationships with sellers, work through the various institutional issues associated with transfers before a serious water shortage occurs, and to develop water transfer agreements that would allow CCWD to purchase water in shortage years.

Many agricultural districts in Northern California participate in the spot market each year. If required, CCWD would pursue additional short-term water transfers directly with these agencies, or short-term water transfers available through the Department of Water Resources Dry Year Water Purchase Program.

Section 7
Supply and Demand Comparison

Law

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.

7.1 Supply and Demand Comparisons

Tables 7-1, 7-2 and 7-3 provide an assessment of the reliability of the District's water service to its customers during normal, dry, and multiple dry water years. These tables compare the total water supply sources available to the District with the total projected water use over the next 25 years, in five-year increments. Section 3 presents the water demand projections. Section 4 describes the supply sources. Section 6 provides a detailed discussion of supply reliability issues.

As indicated in the tables, DWD has adequate supply sources to meet future needs under all conditions. DWD is entitled to and intends to purchase additional surface water treatment capacity, when needed to meet future demands. Ultimately, DWD can purchase up to 30 mgd treatment capacity to meet maximum day demands, which will provide an average day supply of 15 mgd in the District's system.

DWD's groundwater supply will provide additional supply to supplement surface water and meet the projected demands. Ultimately groundwater is anticipated to provide up to 20 percent of the total supply, about 6 to 7 mgd. If future investigations indicate that it will not be possible to provide the anticipated amount of groundwater supply, then DWD will either procure additional surface water supply from CCWD and/or investigate other local supply sources.

Table 7-1
Projected Supply and Demand Comparison for Normal Year (MG)

	2005	2010	2015	2020	2025	2030	2035	2040
Surface water from Contra Costa Water District	2,738	2,738	3,650	3,650	4,562	4,562	5,457	5,457
DWD groundwater	0	547	547	1,095	1,095	1,642	1,642	2,189
Supply Total	***2,738***	***3,285***	***4,197***	***4,745***	***5,657***	***6,204***	***7,099***	***7,646***
Demand	1,685	2,324	2,964	3,603	4,242	4,881	5,521	6,350
Difference (Surplus of Supply)	1,053	961	1,233	1,142	1,415	1,323	1,578	1,296

Table 7-2 Projected Supply and Demand Comparison for Single Dry Year (MG)								
	2005	***2010***	***2015***	***2020***	***2025***	***2030***	***2035***	***2040***
Surface water from Contra Costa Water District	2,738	2,738	3,650	3,650	4,562	4,562	5,457	5,457
DWD groundwater	0	547	547	1,095	1,095	1,642	1,642	2,189
Supply Total	***2,738***	***3,285***	***4,197***	***4,745***	***5,657***	***6,204***	***7,099***	***7,646***
Demand	1,685	2,324	2,964	3,603	4,242	4,881	5,521	6,350
Difference (Surplus of Supply)	1,053	961	1,233	1,142	1,415	1,323	1,578	1,296

Table 7-3 Projected Supply and Demand Comparison for Multiple Dry Year Period (MG)								
	2005	***2010***	***2015***	***2020***	***2025***	***2030***	***2035***	***2040***
Surface water from Contra Costa Water District	2,738	2,738	3,103	3,103	3,878	3,878	4,638	4,638
DWD groundwater	0	547	547	1,095	1,095	1,642	1,642	2,189
Supply Total	***2,738***	***3,285***	***3,650***	***4,198***	***4,973***	***5,520***	***6,280***	***6,827***
Demand	1,685	2,324	2,964	3,603	4,242	4,881	5,521	6,350
Difference (Surplus of Supply)	1,053	961	686	595	731	639	759	477

Section 8
Water Demand Management Measures

Law

10631 (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 measure...

10631 (g) An evaluation of each water demand management measure that is not currently being implemented or scheduled for implementation....

8.1 Overview of Implementation Status

This section of the Plan provides a description of the District's demand management measures (DMM). Appendix C contains a copy of DWD Regulation No. 8, "Water Conservation", which was originally adopted in 1986 and amended in 1994 after the extended drought in 1987-1991.

Table 8-1 summarizes the implementation status of the demand management measures. DWD, in conjunction with CCWD, has implemented all the demand management measures, except for wholesale agency program which is not applicable since DWD is not a wholesale agency. A description of each measure is provided in Section 8.2.

Table 8-1
Summary of Demand Management Measures (DMM) Implementation

DMM	Implementation Status
1—Interior and Exterior Residential Water Audits	Implemented
2—Residential Plumbing Fixture Retrofits	Implemented
3—Water Delivery System Audits, Leak Detection and Repair	Implemented
4—Metering with Commodity Rates	Implemented
5—Large Landscape Conservation	Implemented
6—High-Efficiency Washing Machine Rebates	Implemented
7—Public Information	Implemented
8—School Education	Implemented
9—Commercial, Industrial and Institutional Water Conservation	Implemented
10—Wholesale Agency Program	Not applicable - DWD is not a wholesale supplier.
11—Conservation Pricing	Implemented
12—Conservation Coordinator	Implemented
13—Water Waste Prohibition	Implemented
14—Ultra Low Flow Toilets	Implemented

DWD receives its water supply from CCWD who is a signatory to the Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California developed by the California Urban Water Conservation Council. The fourteen

demand management measures identified in the MOU are implemented by DWD, with assistance from CCWD. Customers within the DWD service area are eligible to participate in all of CCWD's conservation programs. DWD periodically publicizes the availability of these services to their customers. The CCWD website contains detailed information on the water conservation programs.

Below is a description of each of the demand management measures.

8.2 Description of Demand Management Measures

8.2.1 Residential Water Audits (DMM 1)

Each month DWD evaluates every account in the District for abnormal water use. Each account is compared to a history of the prior 18 months usage. If the current month's usage is higher than what would be considered normal usage for the given time of year the customer is contacted by phone. The DWD employee interviews the customer as to any changes in usage patterns, new landscaping or swimming pool fill that might account for the increase. The DWD employee also offers to dispatch a field worker to conduct an audit of water usage and to help the customer to check for leaks.

In addition, DWD customers are also eligible for free home water surveys conducted by CCWD water conservation staff. These water use surveys are conducted for single family and multiple family residences. The CCWD staff person checks toilets for leaks and determines flush volume, determines flow rates of showerhead and faucets. Installs high-efficiency showerheads and faucets as needed, and provides a brief report of findings and installations done.

Customers with unusually high consumption will experience higher than average water bills. There is significant incentive for the customer to participate in the audit program given the substantial monetary savings associated with reduced water consumption.

8.2.2 Residential Plumbing Fixture Retrofits (DMM 2)

DWD serves water within Contra Costa County and the City of Oakley which require all new construction to utilize low flow fixtures including 1.6 gallon per flush toilets. This requirement for low flow fixtures has been in place since 1992 on a statewide basis.

For customers with older pre-1992 homes, DWD makes available water conservation kits that include high-quality, 2.5 gpm or less showerheads and 2.2 gpm or less faucet aerators. In addition, DWD customers are eligible to receive free conservation devices from CCWD including showerhead, kitchen faucet aerator, bathroom faucet aerator, hose nozzle, and dye tables to check for toilet leaks.

Over time, as older buildings are maintained and remodeled, older fixtures are replaced with new low flow fixtures, since they are all that is now commercially available.

8.2.3 Distribution System Water Audits, Leak Detection and Repair (DMM 3)

DWD constantly monitors the amount of unaccounted for water which is the difference between the quantity of water pumped into the distribution system and the metered quantity delivered to its customers. When a distribution system pipe is suspected to be leaking in a particular area, the District immediately either performs or contracts out the leak detection and repair.

The percentage of unaccounted-for water in DWD's system has historically ranged from about 4 percent to 8 percent, and averaged about 6 percent per year over the last 10 years. This percentage is well below the target level of below 10 percent.

8.2.4 Metering with Commodity Rates (DMM 4)

All water services connected to the District's system are required to be metered. All meters register in cubic feet with customers being billed for every hundred cubic feet of water usage. Meters are read on a monthly basis which allows the District to catch a customer water leak or abnormally high usage. The District then contacts the customer in an effort to determine the cause of the high usage. In the past, meters were read every 60 days. Reading meters every 30 days has allowed the District to curtail high usage 30 days sooner than before.

8.2.5 Large Landscape Water Audits (DMM 5)

DWD's Regulation Number 8 "Water Conservation" provides that no area in the District which was not regularly irrigated prior to April 1, 1991, shall be landscaped, planted or irrigated unless the landscaping plan and irrigation system makes efficient use of a minimum quantity of water and is installed, operated and maintained in accordance with plans that comply with all ordinances and regulations of Contra Costa County relating to landscaping in new developments.

DWD utilizes CCWD services to conduct large landscape audits. CCWD has an ongoing large landscape audit program which includes customers within the DWD service area. The CCWD program provides non-residential customers with support and incentives to improve their landscape water use efficiency, and provides information on climate-appropriate landscape and irrigation design to new and changed service connections. The large landscape program assists owners and managers of large landscape areas including: commercial properties, stores, Homeowners Associations (HOAs), parks, apartments, schools, and business complexes.

During the free Large Landscape Water Survey, CCWD conservation staff will: inspect the irrigation equipment; perform sprinkler precipitation tests; provide a written report listing suggestions for improving the efficiency of the irrigation system; provide a site-specific irrigation schedule based on test data and local weather data; and provide a site-specific landscape water budget designed to assist in managing landscape water.

In conjunction with the Large Landscape Survey, CCWD also provides rebates designed to encourage customers to upgrade selected irrigation equipment with new more-efficient irrigation equipment. Items included as appropriate may be: controllers, drip retrofits, rain sensors, flow meters, and sprinkler heads. These rebates are only provided after a landscape survey has been conducted to evaluate the existing equipment.

8.2.6 High-Efficiency Washing Machine Rebate (DMM 6)

DWD customers are eligible for a washing machine rebate program through CCWD. The program is administered by CCWD, and provides a $50 to $100 rebate for purchasing and installing a new high efficiency washing machine. The amount of the rebate depends on the efficiency of the washing machine, with the highest rebate for the most water-efficient models.

CCWD is implementing this program in conjunction with the Electric & Gas Industries Association (EGIA), which provides rebates for energy efficient appliances. The current program is funded through June 30, 2006; and funding must be renewed each year for continued availability.

In addition, CCWD and Energy Solutions are currently implementing LightWash II, a high-efficiency commercial clothes washer rebate program authorized by the California Public Utilities Commission. LightWash II combines energy efficiency rebates with CCWD's water efficiency rebates to make installation of high-efficiency commercial washers more cost-effective. This rebate program is open to owners and operators of multi-family properties and institutions with common area laundries, commercial laundries, coin laundries, and similar entities with on-premise washers. Rebates are $300 per qualifying washer.

8.2.7 Public Information (DMM 7)

DWD's public information program includes mailing a periodic newsletter to its customers. This newsletter contains conservation tips, and reminds customers of the availability of water conservation programs through CCWD, as well as DWD.

CCWD's public information program includes providing speakers to the public, mailing newsletters to DWD customers providing them with many water conservation ideas, sponsoring media events related to conservation, and producing public service announcements.

DWD monitors system wide usage on a daily basis. When usage climbs above the norm for the given time of year, DWD publishes a notice in the local newspaper to its customers advising them to check their sprinkler systems and to look for leaks. DWD also reminds its customers via bill messages and newspaper ads to reduce the amount of outside landscape watering when the weather turns cooler.

8.2.8 School Education (DMM 8)

CCWD provides an extensive Water Education Program available to school districts and private schools in DWD's service area. CCWD was awarded the 2004 Exceptional Public Outreach Award by the California Special Districts Association. All programs are provided free of charge.

The current school education program reaches over 30,000 students, parents and teachers every year. Students learn about water conservation, water quality and stewardship through a variety of resources:

- Classroom presentations are provided for Grades 2 through 5. The classroom presentations are designed to support grade-level state curriculum standards.
- A new assembly theater program "Delta Dawn" for elementary and middle schools explores the local water system from the Sacramento-San Joaquin Delta to homes and schools. Students and teachers interact with the performers.
- For schools located near the Contra Costa Canal, community service presentations are provided year-round to Grades K through 5 to remind students that canal safety rules exist to protect them and their families.
- Field trip opportunities are provided to: Los Vaqueros Reservoir Watershed (Grades 3 and up); a water treatment plant tour at either the Concord or Oakley locations (Grades 5 and up); and a science cruise on the Research Vessel Brownlee studying the Delta (Grade 5, co-sponsored with Mt. Diablo Unified School District).
- Teacher development workshops are also provided to enable teachers to provide ongoing information as part of regular classes.

8.2.9 Commercial and Industrial Water Conservation (DMM 9)

CCWD initiated a Commercial Audit Program within DWD's service area in September 1992. CCWD offers free technical assistance to commercial, industrial and institutional customers to operate more water efficiently, and thereby reduce costs.

CCWD provides free commercial water use surveys to: evaluate and analyze water usage; provide an annual water consumption history; calculate a cost/benefit analysis for water conserving technology; provide water-efficient plumbing fixtures, devices and materials, subject to availability; provide a detailed evaluation of the site and

recommend equipment upgrades and water management improvements; and offer rebate incentives for selected plumbing upgrades.

In addition, CCWD also offers rebates and incentives for replacing selected existing plumbing fixtures and devices with new water-efficient plumbing fixtures and devices. These include: commercial high-efficiency washer rebates (up to $300); free pre-rinse dishwashing sprayers; ultra low flow toilet rebates (up to $150 per unit); low flow urinal or waterless urinal rebates (up to $75 per unit); water broom rebates (up to $75 per unit); and cooling tower conductivity meter rebates (up to $500 per unit).

8.2.10 Wholesale Agency Program (DMM 10)

DWD does not function as a wholesale water agency and therefore does not have a wholesale agency program. This DMM is not applicable.

8.2.11 Conservation Pricing (DMM 11)

DWD's uniform price rate structure, which includes a monthly service charge and a charge per 100 cubic feet of water use, encourages water use efficiency. DWD's low monthly service charge rewards consumers with low water usage.

8.2.12 Water Conservation Coordinator (DMM 12)

As DWD's water supplier, CCWD has maintained a full time conservation coordinator position since 1991. In addition to the CCWD conservation coordinator, DWD's General Manager has overall responsibility for conservation measures implemented in the District.

8.2.13 Water Waste Prohibitions (DMM 13)

DWD's Regulation Number 8 was put into effect to assure that all water furnished by the District is put to reasonable beneficial use, to prevent unreasonable use or waste of water and to promote efficient use and conservation of water. All users of water furnished by DWD are urged to take all reasonable action to conserve water and prevent waste of water. Recommended actions under normal conditions include:

- Periodically examine all plumbing systems to detect any leaks and repair leaks immediately upon detection.
- Prevent water from running off premises into street gutters.
- Install flow restrictors on all shower head that will limit flow to not more than 3 gallons per minute.
- Install displacement devices in toilet tanks to reduce water use to 3.5 gallons per flush.
- Install aerators or laminar flow devices on kitchen and lavatory faucets to reduce maximum flow to 2.75 gallons per minute.

- Landscape with minimal turf and drought-tolerant (low water-using) plants.
- Every new customer of the District is advised to water lawns only five minutes at a time, twice a day, given the sandy soil conditions in Oakley. This communication takes place when a new customer calls to sign-up for water service.

During water shortage conditions, DWD has imposed additional prohibitions on the following uses of water:

a) Outside watering that results in excessive flooding or in runoff into a gutter or drain, or onto a street, sidewalk, driveway or paved area.

b) Washing paved or other hard-surfaced areas, including sidewalks, driveways, patios and parking areas.

c) Washing cars, boats, trailers or other vehicles without a shut-off nozzle on the hose.

d) Using water for decorative fountains or for filling decorative ponds or lakes.

e) Flushing sewers or hydrants or washing streets, except for emergencies, protection of public health or safety, or essential industrial operations.

f) Using potable water for construction except if no other water supply is reasonably available.

8.2.14 Ultra-Low-Flush Toilet Replacement (DMM 14)

CCWD is currently offering free ultra-low flow toilets (ULFTs) to its customers, including those within DWD's service area, to replace older toilets in homes and multi-family properties. Customers are given a voucher and told where to pick up the new ULFT ($175 value). The new ULFT must be installed within 30 days of receiving the ULFT. This program will continue as long as funding is available.

At other times, instead of providing a free toilet, CCWD has offered $75 rebate to single and multi-family customers who replace older toilets with ULFTs. The rebate program initially began in 1994.

The voucher or rebate programs are on a first-come, first-serve basis each year.

Section 9
Water Shortage Contingency Plan

Law

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

10632 (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.

10632(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.

10632 (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.

10632 (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.

10632 (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.

10632 (f) Penalties or charges for excessive use, where applicable.

10632 (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 [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.

10632 (h) A draft water shortage contingency resolution or ordinance.

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

9.1 Purpose of Contingency Planning

The purpose of the water shortage contingency plan is to be prepared to impose temporary demand reductions in case available supply falls below the planned levels discussed in Sections 6 and 7. Supplies may be reduced below planned levels due to such causes as extreme (worst case) drought conditions, unplanned outages of water supply facilities due to earthquakes or other major disasters, prolonged power outages, or any other catastrophic loss of supply.

In the event of an interruption of water supply beyond the control of the District's staff or a local emergency declared by an adjoining city or a state of emergency declared by the Governor or his staff, the Diablo Water District's Emergency Plan is put into effect. Appendix D contains a copy of the current Emergency Plan. This Plan addresses provisions for handling emergencies, including emergency notification procedures, operational criteria for priority uses such as fire fighting, emergency operational procedures, emergency public information procedures, and related relevant procedures. The Plan is updated periodically.

9.2 Estimate of Minimum Supply for Next Three Years

Based on the information presented Section 6.1, Table 9-1 shows the minimum projected supply during the next 5-year period assuming three consecutive dry years. As indicated in Table 9-1 and discussed in Section 6.1, no reductions in surface water supply are expected in the near-term to 2010 per information from the District's wholesale supplier (see Appendix B).

Table 9-1
Estimated Three Year Minimum Supply between 2005 to 2010

Supply Source	*2005-2010 Average/Normal Water Year*	*Multiple Dry Years*		
		Year 1	*Year 2*	*Year 3*
CCWD Surface Water [1]	1,785-2,540 MG	1,785-2,540 MG	1,785-2,540 MG	1,785-2,540 MG
DWD Groundwater	550 MG	550 MG	550 MG	550 MG
Total Supply	*2,335 – 3,090 MG*	*2,335 – 3,090 MG*	*2,335 – 3,090 MG*	*2,335 – 3,090 MG*

[1] CCWD expects to meet all near-term demands to 2010 under all supply conditions.

As discussed in Section 6.2, DWD also has a reliable supply system under most non-drought conditions. The District's Emergency Plan addresses two levels of operational emergency planning:

1) Short-Term Water Supply Outage - Duration of 72 hours or less during which water supply may fall short of desired quantity and/or pressure, such that the District's usable storage could be reduced to 33% capacity before the end of approximately 72 hours. In such an event, the District would implement the following measures:

- In the event of a raw water outage from the Contra Costa Canal intake, request CCWD to backflow water from Contra Loma Reservoir or provide supply from Los Vaqueros Reservoir.
- Conserve treated water by reducing and maintaining minimum pressure in system. Restrict Reservoir 2 outflow to reduce loss of storage.
- Should the outage be due to broken water mains, valve off affected areas.
- Supplement with City of Antioch supply, if interconnections are available for use.

2) Long-Term Water Supply Outage - Unknown length of time when water supply may fall short of desired quantity and or pressure, such that the District's storage could be reduced to less than 25%. In such an event, the District would implement the following measures:

- Take all of the steps described above for the short-term outage.
- Maintain a minimum of 1,000,000 gallons storage for fire protection if possible.
- Contact Contra Costa County Office of Emergency Services and notify them of the water supply outage.
- Ban use of water for all non-essential uses. This may require going house to house and notifying customers.
- Board of Directors to adopt regulations on emergency water use as discussed below.
- Send out news bulletins periodically to keep the public updated on the problem.

9.3 Stages of Action

DWD's water shortage contingency plan provides for three stages of action during water supply shortages. These stages of action are described below:

9.3.1 Stage A - Up to 15% Reduction

If DWD's supply is reduced by not more than 15 percent of normal use in a non-drought period, the District will appeal to its customers to voluntarily reduce their water consumption, to prevent waste and unreasonable use of water and to comply strictly with the conservation measures set forth in the District's Regulation No. 8 "Water Conservation" and in the Urban Water Management Plan.

9.3.2 Stage B - 15% to 35% Reduction

If DWD's supply is reduced between 15 to 35 percent, the District will continue with all measures from Stage A. In addition, the District's Board of Directors may declare, pursuant to Water Code section 350, a water shortage emergency condition to prevail within the District. Thereafter, the Board could adopt regulations and restrictions on the use of water that will, in the sound discretion of the Board, conserve the District's water supply for the greatest public benefit with particular regard to essential domestic uses, sanitation, and fire protection.

9.3.3 Stage C - 35% to 50% Reduction

If the reduction of available water supply is between 35% and 50% of normal use or if the measures implemented in Stages A and B above do not achieve their intended reduction in water use, the Board may adopt limitations on consumption by rationing customer water use and imposing extra charges and other penalties for exceeding allotments.

9.4 Prohibitions, Consumption Reduction Methods and Penalties (Draft Emergency Water Shortage Ordinance)

The following is a draft of an emergency regulation restricting the quantity and use of water supplied by Diablo Water District and imposing penalties for non-compliance. In the event of a water shortage emergency requiring such measures, the District Board of Directors would enact this or a similar ordinance.

Section 1 - Effective Period

These regulations shall be effective during the water shortage emergency condition which the Board declared on _____ and shall continue in effect until such date as the Board may declare that the condition has ended.

Section 2 - Allocation of Water

A. <u>Allocation for residential single-unit service</u>

Each single-unit residence is allocated _____ gallons per day from and after _____. Upon application to the District, said allocation may be increased by gallons per day for each resident of the unit in excess of four, and by _____ gallons per day for each horse, cow or other large animal kept at the residence.

B. <u>Allocation for other treated water services</u>

Each treated water service other than a residential single-unit is allocated a percentage of the customer's use during the same months of the previous year as follows:

Type of service	*Allocation*
Residential multiple unit	_____ percent
Commercial	_____ percent
Industrial	_____ percent
Service to public authorities	_____ percent
Irrigation (residential, commercial, industrial, public authority)	_____ percent
Service through fire hydrants	_____ percent
Temporary service	_____ percent

If the District did not serve water to a customer's property during the previous year, the District shall compute a hypothetical use by the customer during that period on the basis of quantities used on similar properties or other information available to the District.

C. Under-use carryover

Water savings below a customer's allocation in any month may be carried over and used in a subsequent month.

D. Penalties for excess use

If a customer uses water in excess of its allocation, the customer shall be charged for such excess use at the following rates:

Current rate for approved allocation (rate per 100 cubic feet): $_____

Use in excess	Rate per 100 cubic feet for excess
First 10% of excess use	$ _____
Second 10% of excess use	$ _____
Third 10% of excess use	$ _____
Fourth 10% of excess use	$ _____
All additional use	$ _____

If water use at any connection to the District's system exceeds the allocation by more than 20% for two consecutive months, the District may install a flow restrictor in the meter serving the property.

Section 3 - Prohibited Uses of Water

The following uses of water supplied by the District have been determined to be unreasonable and are prohibited during the effective period of this regulation:

1) Using water for decorative fountains or filling decorative lakes or ponds.

2) Washing paved or other hard-surfaced areas, including sidewalks, walkways, driveways, patios, and parking areas.

3) Outside watering that results in excessive flooding or runoff in a gutter, drain, patio, driveway, walkway or street.

4) Flushing sewers or hydrants, or washing streets except for emergencies, protection of public health or safety, or essential operations.

5) Using potable water for construction except if no other water supply is reasonably available.

6) Washing cars, boats, trailers or other vehicles without a shut-off nozzle on the hose, or at a commercial car wash with recirculating water.

Section 4 - Exceptions and Waivers

Written applications for exceptions to or waivers of any provision of these regulations shall be received and may be granted in any case where the restriction might create a hazard to the health and safety of any individual or the public, or would cause an undue and unavoidable hardship, including but not limited to adverse economic impacts such as loss of production or jobs. Denial of an application may be appealed in writing to the Appeals Committee appointed by the Board.

9.5 Revenue and Expenditure Impacts

Table 9-2 summarizes hypothetical reductions in revenue due to 15%, 35% and 50% cutbacks in water use based on estimated 2005 water sales and costs as a normal year. The Net Revenue Loss is the difference between the reduction in revenue from lower water sales minus the savings from not having to purchase, treat and distribute as much surface water. The revenue impact analysis assumes that the water reduction condition is in effect for an entire year.

As noted in Table 9-2, the District currently has monies in a contingency reserve to balance the budget if revenues fall up to 15 percent below expected levels, such as during abnormally low water use years. For example, the District used these reserves during the El Nino winter and spring of fiscal year 1997/98 when water use was at a ten year low.

Table 9-2 Revenue Impacts With Up to 50% Reduction in Supply			
Percent Reduction	***15%***	***35%***	***50%***
Water sales reduction [estimated normal sales of 1,700 MG in 2005]	255 million gallons	595 million gallons	850 million gallons
Revenue Reduction (Loss) [estimated normal total revenue for 2005 of $6 million]	($900,000)	($2,100,000)	($3,000,000)
Savings for Not Purchasing Surface Water [estimated normal total purchase cost of $2,300,000 for 2005]	$345,000	$805,000	$1,150,000
Savings for Reduced RBWTP Treatment Cost [estimated normal total cost of $420,000 in variable expenses for 2005]	$63,000	$147,000	$210,000
Net Revenue Loss	*($492,000)*	*($1,148,000)*	*($1,640,000)*
Reserve Funds Available	*$650,000*	*$650,000*	*$650,000*
Estimated Deficiency	*$0*	*($498,000)*	*($990,000)*

A one time 15% reduction in water sales can be covered by reserves. Reductions in water sales of 35% and 50% are estimated to result in revenue deficiencies of about $498,000 and $990,000 respectively. It is not anticipated that reductions this severe will occur, as discussed in Section 6 and Section 9.2. However, should they occur, DWD could take any of the following actions to offset the loss in revenue:

- Defer capital and maintenance expenditures,
- Utilize funds from other District emergency reserves,
- Temporary excess use charges (such as described in the emergency water shortage ordinance),
- Temporary increases in water rates,
- Short term borrowing.

It is important to note that the above discussion on revenue impacts is hypothetical. As discussed in Section 6 and Section 9.2, the likelihood of a catastrophic long-term significant reduction in DWD supply is very low. According to CCWD's September 1, 2005, correspondence (Appendix B), any supply deficiency that may occur over a three year period can be met by a combination of short-term water purchases by CCWD and a voluntary short-term conservation program of up to 15 percent demand reduction. In addition, DWD will have a new groundwater supply system in service starting in 2006 which will provide additional reliability. It is anticipated that there will be ample supply to meet the District's demands for the next three years. Given

this scenario, the District does not anticipate demand reductions and corresponding revenue reductions greater than 15 percent, which can be handled using available reserve funds.

A catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster are expected to be short term, as discussed in Section 6.2. DWD has never had a measurable loss of revenue from such an event. It is difficult to determine the revenue impacts from a hypothetical catastrophic event. The District maintains sufficient reserves to make necessary repairs as well as to make up for lost revenue. Any revenue shortages could be made up with short term borrowing.

Revenues of the District would be increased as a result of penalties that may be imposed by the District during a time of water shortage. The extent of the revenue increase would be based on the amount of water a customer used in excess of their allocation and the charge for such excess as may be established by the Board of Directors. In the case of extreme excessive use by a customer, revenues of the District would not be enhanced since this usage pattern would most likely result in installation of a flow restrictor or disconnection of service. Additional revenues from penalties would be used to supplement reserve funds and other methods.

9.6 Reduction Measuring Mechanisms

Demands must be monitored frequently during emergency water shortages to enable the District to effectively manage the balance between supply and demand. The demand monitoring methods are described below.

During normal water supply conditions, production figures are recorded daily. Totals are reported monthly to the General Manager and the Board of Directors.

During a 15% reduction stage, daily production figures would be reported to the General Manager. A comparison of weekly production targets with actual figures would also be prepared and reviewed by the General Manager. These summaries would also be forwarded to the Board of Directors on a monthly basis.

During a 35% reduction stage, the procedure for the 15% reduction stage would be followed with the Board of Directors receiving weekly updates rather than monthly. If reduction goals are not met then the General Manager would call a special meeting of the Board of Directors to discuss corrective actions.

During a 50% reduction stage, daily reports would be generated for review by the General Manager with weekly, or more frequent, reports given to the Board of Directors. If reduction goals are not met then, the General Manager would call a special meeting of the Board of Directors to discuss corrective actions.

Appendix A

Notice of Public Hearing and Resolution Adopting Plan

Published in Oakley News – November 4 and November 11, 2005

Diablo Water District

NOTICE OF PUBLIC HEARING
and
Availability of Draft Urban Water Management Plan for Public Review

As required by Law, the Diablo Water District has prepared an update of its Urban Water Management Plan. The Draft Plan is available for public inspection and review as of November 7, 2005 at the following locations:

Diablo Water District office in Oakley
(Located in the Raley's Shopping Center)
2107 Main Street, Suite 278
Hours: Monday through Friday from 8 am to noon and 1 pm to 5 pm.
Closed from noon – 1 pm.

Oakley Public Library
(Located in the Freedom High School Complex)
1050 Neroly Road
Hours: Tuesday and Wednesday from 10 am to 9 pm; Thursday from 2 pm to 9 pm; Friday from 2 pm to 6 pm; Saturday from 10 am to 6 pm.

A public hearing on the Draft Plan will be held on November 23, 2005 at 7:30 p.m. at the District's office. Comments may be presented in person at the public hearing. Written comments on the Draft Plan should be submitted to the District no later than December 2, 2005 at the address shown below.

Mr. Mike Yeraka
General Manager
Diablo Water District
P.O. Box 127 (mailing address)
2107 Main Street, Suite 278 (street address)
Oakley, CA 94561

The Final Plan, incorporating appropriate comments, will be set for adoption at a Board Meeting in mid to late December 2005. Please call Mike Yeraka, the District's General Manager, at 625-6159 with any questions.

RESOLUTION NO. 2005 - 20

A RESOLUTION OF THE BOARD OF DIRECTORS OF DIABLO WATER DISTRICT ADOPTING UPDATED AND REVISED URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Plan of Diablo Water District has been reviewed, updated and revised, and

WHEREAS, a draft of the updated and revised Plan has been made available for public inspection at the office of the District and at the Oakley Public Library since November 7, 2005, and

WHEREAS, following two notices published in the *Oakley News*, a public hearing on the Plan was held on November 23, 2005, now therefore,

BE IT RESOLVED, by the Board of Directors of Diablo Water District as follows:

1. This Board finds and declares that the Urban Water Management Plan of Diablo Water District has been reviewed, updated and revised in accordance with the provisions of the Urban Water Management Planning Act.

2. Said Plan bearing the date December 2005, is hereby approved and adopted.

3. The General Manager is directed to forward a copy of the Plan to the Department of Water Resources.

* * * * * * *

I certify that the foregoing is a true and complete copy of a resolution duly and regularly adopted by the Board of Directors of Diablo Water District at a meeting thereof regularly held on December 21, 2005, by the following vote:

AYES: Crockett, de Fremery, Garcia, and Head

NOES: none

ABSENT: Hobbs

Dated: December 21, 2005

Mike Yeraka, Secretary

Appendix B

Contra Costa Water District Supply Reliability Analysis

CONTRA COSTA
WATER DISTRICT

1331 Concord Avenue
P.O. Box H20
Concord, CA 94524
(925) 688-8000 FAX (925) 688-8122

RECEIVED
SEP - 6 2005
DIABLO WATER DISTRICT

September 1, 2005

Directors
Joseph L. Campbell
President

Elizabeth R. Anello
Vice President

Bette Boatmun
John A. Burgh
Karl L. Wandry

Walter J. Bishop
General Manager

Mr. Mike Yeraka
General Manager
Diablo Water District
2107 Main Street
Oakley, CA 94561

Subject: **Urban Water Management Plan – Supply Reliability Analysis**

Dear ~~Mr. Yeraka~~ Mike:

The Contra Costa Water District (District) is currently preparing an update to its Urban Water Management Plan (UWMP). In conformance with California Water Code Division 5, Part 2.6, Section 10635, the District has prepared an assessment of its water supply reliability. This analysis is being provided to all wholesale municipal customers of the District for use in the preparation of their UWMPs.

Existing demand and demand projections for the District's service area in five-year increments over the next 25 years are shown in Table 1. The projections are consistent with the projections presented in the District's 2002 Future Water Supply Study (FWSS).

Table 2 presents the existing sources of supply and their expected availability under various supply conditions in five-year increments over the next 25 years. If your agency uses groundwater for municipal supply, we would appreciate data on your past 5 years of groundwater pumpage so we can update this overall supply analysis accordingly.

Table 3 shows the comparison between projected water supply and demand over the next 25 years. The water supply reliability goal approved by the District's Board of Directors is to meet at least 85 percent of demand in a second or third dry year and 100 percent of demand in other years. The remaining 15 percent would be met by a combination of short-term water purchases and a voluntary short-term conservation program.

Note that near-term demands can be met under all supply conditions. However, beginning in 2010, during the second and third years of a multi-year drought, short-term water purchases in conjunction with a request for up to a 5 and 15 percent, respectively, voluntary short-term conservation would be considered to meet

demands. The maximum amount of short-term conservation expected to be necessary is 15 percent of demand.

We will follow up this letter with a phone call to you within the next two weeks to discuss whether you might have any questions or concerns about this information; however, should you have any questions about the District's UWMP or the enclosed material prior to hearing from our office, please feel free to contact me at (925) 688-8312.

Sincerely,

Fran Garland
Principal Planner

Enclosures

File: Project #50533100

Table 1: Past, Current and Projected Water Demands

Water Use Sectors	2000 (actual) (af/yr)	2004 (actual) (af/yr)	2005 (af/yr)	2010 (af/yr)	2015 (af/yr)	2020 (af/yr)	2025 (af/yr)	2030 (af/yr)
Raw Water Service Area								
Municipal[a]	47,057	53,055	52,383	57,708	63,862	70,015	73,912	77,809
Major Industrial/Irrigation/Ag.[b]	34,836	42,537	53,507	72,177	72,177	72,177	72,177	72,177
Unincorporated Areas	233	251	259	284	305	326	349	371
Subtotal	82,126	95,843	106,148	130,169	136,344	142,518	146,438	150,357
Treated Water Service Area	41,098	43,446	46,434	51,769	54,162	56,555	57,795	59,034
Other Uses								
Other Unincorporated Areas	213	248	262	310	354	398	428	457
Conveyance Losses	10,225	12,500	12,500	12,500	12,500	12,500	12,500	12,500
TOTAL SERVICE AREA [c]	133,662	152,037	165,300	194,700	203,400	212,000	217,200	222,300

(a) Actuals include CCWD municipal sales. City of Antioch River diversions, and an estimate of 3,000 af/yr of groundwater use. Projected water demands have not been reduced by expected water conservation savings.
(b) Future projections of major industrial use include a placeholder amount for industrial customers currently using less than capacity.
(c) All projections have been rounded to the nearest hundred acre-foot/year.

Table 2: Projected Water Supply

Condition [a]	CVP (af/yr)	Industrial Diversions (af/yr)	Mallard Slough [b] (af/yr)	Antioch Diversions[c] (af/yr)	Ground-water [d] (af/yr)	ECCID Purchases (af/yr)	Recycled Water (af/yr)	Total Firm Supply (af/yr)	Conser-vation savings (af/yr)	Total Supply (af/yr)
2005										
Normal	174,100	10,000	3,100	6,700	3,000	5,700	7,500	210,100	1,900	212,000
Single-Year Drought	148,000	0	0	0	3,000	9,700	7,500	168,200	1,900	170,100
Multi-Year Drought (yr 1)	148,000	0	0	0	3,000	9,700	7,500	168,200	1,900	170,100
Multi-Year Drought (yr 2)	130,600	0	0	0	3,000	9,700	7,500	150,800	1,900	152,700
Multi-Year Drought (yr 3)	113,200	0	0	0	3,000	9,700	7,500	133,400	1,900	135,300
2010										
Normal	194,700	10,000	3,100	6,700	3,000	7,000	12,000	236,500	3,800	240,300
Single-Year Drought	165,500	0	0	0	3,000	11,000	12,000	191,500	3,800	195,300
Multi-Year Drought (yr 1)	165,500	0	0	0	3,000	11,000	12,000	191,500	3,800	195,300
Multi-Year Drought (yr 2)	146,000	0	0	0	3,000	11,000	12,000	172,000	3,800	175,800
Multi-Year Drought (yr 3)	126,600	0	0	0	3,000	11,000	12,000	152,600	3,800	156,400
2015										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	6,200	244,200
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	6,200	199,200
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	6,200	199,200
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	6,200	179,700
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	6,200	160,200
2020										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	8,500	246,500
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	8,500	201,500
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	8,500	201,500
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	8,500	182,000
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	8,500	162,500
2025										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	11,100	249,100
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	11,100	204,100
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	11,100	204,100
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	11,100	184,600
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	11,100	165,100
2030										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	13,600	251,600
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	13,600	206,600
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	13,600	206,600
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	13,600	187,100
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	13,600	167,600

a) 2005 UWMP: The CVP conditions used for supply planning are defined as follows: Normal is Adjusted Historical Use. Single Year Drought and Multi-year drought (year 1) supply is 85 percent of Historical Use. Multi-Year Drought (year 2) is 75 percent of Historical Use. Multi-Year Drought (year 3) is 65 percent of Historical Use.

b) Average annual diversion over 15 year period (1990 - 2004).

c) Average annual diversion over 6 year period since pumping plant improvements (1999 - 2004).

d) Groundwater represents production from Mallard Wells, Diablo Water District wells, and miscellaneous other wells in the District's service area.

Table 3: Projected Supply and Demand Comparison

Condition [a]	Demand (af/yr)	Available Supply (af/yr)	Supply Deficit (af/yr)	Planned Purchases [b] (af/yr)	Short-term Demand Management [c] (af/yr)
2005					
Normal	165,300	212,000	none	-	-
Single-Year Drought	165,300	170,100	none	-	-
Multi-Year Drought (yr 1)	165,300	170,100	none	-	-
Multi-Year Drought (yr 2)	165,300	152,700	12,600	-	-
Multi-Year Drought (yr 3)	165,300	135,300	30,000	-	-
2010					
Normal	194,700	240,300	none	-	-
Single-Year Drought	194,700	195,300	none	-	-
Multi-Year Drought (yr 1)	194,700	195,300	none	-	-
Multi-Year Drought (yr 2)	194,700	175,800	18,900	9,000	9,900
Multi-Year Drought (yr 3)	194,700	156,400	38,300	9,000	29,300
2015					
Normal	203,400	244,200	none	-	-
Single-Year Drought	203,400	199,200	4,200	5,000	-
Multi-Year Drought (yr 1)	203,400	199,200	4,200	5,000	-
Multi-Year Drought (yr 2)	203,400	179,700	23,700	13,000	10,700
Multi-Year Drought (yr 3)	203,400	160,200	43,200	13,000	30,200
2020					
Normal	212,000	246,500	none	-	-
Single-Year Drought	212,000	201,500	10,500	11,000	-
Multi-Year Drought (yr 1)	212,000	201,500	10,500	11,000	-
Multi-Year Drought (yr 2)	212,000	182,000	30,000	18,000	12,000
Multi-Year Drought (yr 3)	212,000	162,500	49,500	18,000	31,500
2025					
Normal	217,200	249,100	none	-	-
Single-Year Drought	217,200	204,100	13,100	14,000	-
Multi-Year Drought (yr 1)	217,200	204,100	13,100	14,000	-
Multi-Year Drought (yr 2)	217,200	184,600	32,600	19,500	13,100
Multi-Year Drought (yr 3)	217,200	165,100	52,100	19,500	32,600
2030					
Normal	222,300	251,600	none	-	-
Single-Year Drought	222,300	206,600	15,700	16,000	-
Multi-Year Drought (yr 1)	222,300	206,600	15,700	16,000	-
Multi-Year Drought (yr 2)	222,300	187,100	35,200	21,500	13,700
Multi-Year Drought (yr 3)	222,300	167,600	54,700	21,500	33,200

a) Single Year Drought and Multi-year drought (year 1) supply is 85 percent of Historical Use. Multi-Year Drought (year 2) is 75 percent of Historical Use. Multi-Year Drought (year 3) is 65 percent of Historical Use.

b) Planned purchases consistent with the District's Future Water Supply Implementation Program. The water supply reliability goal adopted by the Board of Directors is to meet at least 85 percent of demand in a 2nd or 3rd dry year and 100 percent of demand in other years.

c) Beginning in 2010, during the second and third years of a multi-year drought, short-term water purchases in conjunction with a request for up to a 5 and 15 percent, respectively, voluntary short-term conservation would be considered to meet demands.

Appendix C

Diablo Water District
Regulation No. 8 - Water Conservation

DIABLO WATER DISTRICT

REGULATION NO. 8
WATER CONSERVATION

Section 1. Purpose

The purpose of this regulation is to assure that all water furnished by the District is put to reasonable beneficial use, to prevent unreasonable use or waste of water and to promote efficient use and conservation of water.

Section 2. Prevention of Waste or Unreasonable Use

All users of water furnished by the District are urged to take all reasonable action to prevent waste of water. The District shall have the right, following notice and hearing, to impose upon any water service connection such conditions as the District determines to be necessary to prevent unreasonable use or waste of water.

Section 3. Conservation Measures by Customers

All users of water furnished by the District are urged to take all reasonable action to conserve water. Among the actions recommended are the following:

(a) Periodically examine all plumbing systems to detect any leaks and repair leaks immediately upon detection.

(b) Prevent water from running off premises into street gutters.

(c) Install flow restrictors on all shower heads that will limit flow to not more than 3 gallons per minute.

(d) Install displacement devices in toilet tanks to reduce water use to 3.5 gallons per flush.

(e) Install aerators or laminar flow devices on kitchen and lavatory faucets to reduce maximum flow to 2.75 gallons per minute.

(f) Landscape with minimal turf and drought-tolerant (low water-using) plants.

Section 4. Conservation Measures of District

(a) The District shall vigorously pursue at all times a program for the conservation of water consisting in such cost-effective measures as are from time to time authorized by the Board of Directors.

(b) All water service, except through hydrants for fire fighting, shall be metered.

(c) The unit rate for all water services shall not decrease as the quantity used increases.

(d) The General Manager is authorized and directed to do the following:

(1) Make audits as frequently as he deems necessary of the quantities of water received by the District and the quantities of water delivered to water users in order to detect system leaks. The results of such audits shall be reported to the Board of Directors not less frequently than annually.

(2) Cooperate with local school districts in developing education

programs on efficient water use.

(3) Make available at the District's office, public library and other public places, printed materials on the need for, and methods of, water conservation.

Section 5. New Landscaping

No area in the District which was not regularly irrigated prior to April 1, 1991, shall be landscaped, planted or irrigated unless the landscaping plan and irrigation system makes efficient use of a minimum quantity of water and is installed, operated and maintained in accordance with plans that comply with all ordinances and regulations of the County of Contra Costa relating to landscaping in new developments.

Appendix D

Diablo Water District Emergency Plan

EMERGENCY PLAN
OF
DIABLO WATER DISTRICT
NOVEMBER 2004

In the event of an interruption of water supply beyond the control of the District's staff or a local emergency declared by an adjoining city or a state of emergency declared by the Governor or his staff, Diablo Water District's Emergency Plan will become effective. The emergency management plan of the District will follow the SEMS guidelines as required by law. Upon notice or knowledge of such event, District employees are to immediately report to work once the emergency needs of the employee's family have been met, regardless of holiday or vacation schedule and notify the following:

District's Engineering Consultants
Camp, Dresser & McKee, Inc. 933-2900

State and County Health Services
State of California Health Services – General Phone 510-540-2158

Clifford Bowen — Work 510-540-2173
Evening 925-827-4578

Dmitriy Ginzburg — Work 510-540-2649
Evening 510-835-7977

Contra Costa County Environmental Health Department 646-5225
(After hours phone sheriff (228-8282) and ask for the Health Officer on-call)

Contra Costa County Sheriff (Non-Emergency) 228-8282
(Emergency) **Do not call from cell phones** 911

Contra Costa County Office of Emergency Services 646-4461
After Hours (24 Hrs) (ask for alert duty officer) 228-5000
Fax 646-1120

State Warning Center

State of California Office of Emergency Services....(24 Hours).....916-845-8911

Coastal Region Office of Emergency Services .....(24 Hours).....510-286-0895

Contra Costa Water District.....(24 Hours).....688-8374

Randall-Bold Water Treatment Plant 625-6500
Randall-Bold Water Treatment Fax 625-6505

Diablo Water District's Directors
Kenny Crockett.....625-2527
Jack De Fremery.....625-3742
Howard Hobbs.....757-2457
Edward Garcia.....625-2609
Richard Head.....625-5655

Oakley Police Department (24 Hours) 646-2441

East Contra Costa County Fire Protection District.....634-3400
Emergency 911
Non-Emergency (business) ..... (24 Hours)..... 778-2445

For emergency repairs, names of contractors and suppliers are on file at both the office and the corporation yard and are contained in this Emergency Plan on Pages 8 through 15.

Raw water and treated water supplies to Diablo Water District can be interrupted due to saline degradation, chemical spills, natural disaster or criminal acts.

For the purpose of developing emergency plans, respective to the length of the water supply outage, the outline for response has been divided into Level I and Level II criteria. Level I and Level II water supply outages shall be as declared by the General Manager, Superintendent of Operations or employee on call, respectively. Employee on call shall

contact the General Manager and Superintendent if a Level I or Level II water supply outage is imminent.

The main objective is to maintain fire flow supply. The calculation to determine a Level I or Level II response is, 1) the time of year [winter/summer]; 2) extent of breakage/repair involved; and 3) available supply/demand.

As a first action, the worst case scenario as to the duration shall be estimated by the District's staff and engineers in consultation with Contra Costa Water District and the appropriate state, county and local offices.

LEVEL I / Short-Term Water Supply Outage - Duration of time of 72 hours or less that water supply may fall short of desired quantity and/or pressure, such that the District's usable storage could be reduced to 33% capacity before the end of approximately 72 hours.

1 - Notify the following agencies of the nature of the outage stressing water conservation:

Radio Station KCBS (740 AM).....415-765-4000
TV Station KOVR, Sacramento 800/374-8813
TV Station KOVR, Stockton.....209/466-6985
Ledger Dispatch.....757-2525
Ledger Dispatch (Aaron Crowe, Asst. City Editor) Fax 706-2305
Ledger Dispatch (Aaron Crowe, Asst. City Editor) Phone.....779-7134

Notify the local fire departments and let them know we are endeavoring to maintain fire flow.

Emergency 911
Dispatch for all Fire Departments (non-emergency – 24 Hours) 778-2445

2 - In the event of a raw water outage, request Contra Costa Water District to backflow water from Contra Loma Reservoir.

Antioch Operations Center (CCWD)..... ..... 679-3400 or 757-7147
Emergency .....(24 Hours) 688-8374
(the on-call supervisor will be notified)

Pat Panus (R-B Superintendent)	(Wk)	625-6501 or 688-8094
	(Hm)	925-706-2911
	(Pager)	925-210-5694
	(Cell)	925-525-2566
John Parsons (R-B Supervisor)	(Wk)	625-6503
	(Hm)	925-753-1840
	(Cell)	925-525-2520

3 - Conserve treated water by reducing and maintaining a minimum pressure in system, of 25 psi or per calculation from instrument located at the Corporation Yard (50# approximately). This may require valving off Reservoir No. 2 outflow to reduce loss of reservoir storage.

4 - Should the outage be due to broken water mains, valve off the areas that are affected. See as-built drawings in map file at office listed alphabetically or by subdivision number. To isolate 24" main, refer to Figure 1 on page 17 and Figure 2 on page 18.

In the event of a main break that poses a threat to the railroad call and report immediately to:

Stop Train Emergency Number..... 1-800-285-2164
Burlington Northern /Santa Fe Communications 1-800-333-2383

5 - Operate the District's well and request R-B (625-6500) to increase production as needed; if necessary, to maintain maximum levels in reservoirs.

Diablo Water District has begun using Diablo Water District Well No. 1 on emergency basis. Notify State of California Department of Health and begin bacteria testing of this well.

6 - Should interconnection facilities with the City of Antioch be available, supplement the Diablo Water District supply with Antioch supply using the following procedure:

- Advise City of Antioch, Director of Public Works of intentions and time of planned valve opening interconnecting the systems.

  Antioch Maintenance Services 779-6950
  After Hours – Emergency.....778-2441
  Phil Harrington, Director of Public Works.....779-6820
  Pat Scott, Superintendent of Water/Wastewater.....779-6952
  Vince Darone, Water Treatment Plant.....779-7029

- The area to be valved off will be predicated by the volume of water Antioch will be able to supply.

<u>LEVEL II / Long-Term Water Supply Outage</u> - unknown length of time when water supply may fall short of desired quantity and or pressure, such that the District's storage could be reduced to less than 25%.

1 - Take all of the steps described under short-term outage potential. See Pages 3 through 5. Continue to have Reservoir 2 outflow restricted to conserve water.

2 - Maintain a minimum of 1,000,000 gallons storage for fire protection if possible.

3 - Call Contra Costa County Office of Emergency Services at 646-4461 or at the 24 hour emergency number 228-5000 and ask for our alert duty officer and apprise him/her of the water supply outage.

4 - Ban use of water for all non-essential uses. This may require going house to house and notifying customers.

5 - Board of Directors adopt regulations on emergency water use.

6 - Send out news bulletins periodically to keep the public updated on the problem. Call Ledger Dispatch at 757-2525, or fax to Aaron Crowe, Asst. City Editor, at 706-2305.

CHLORINATION PROCEDURE TO BE IMPLEMENTED IN REPAIRING BROKEN WATER MAINS:

1 - Trench treatment: liberal quantities of hypochlorite applied to open trench area will lessen the danger of pollution.

2 - Main disinfection: scrubbing with hypochlorite solution.

3 - Flush main, should water be available, until discolored water is eliminated.

4 - Sample for bacteria testing in affected area.

II-WARN OMNIBUS MUTUAL AID AGREEMENT - Diablo Water District is a member of II-WARN (Water Agency Response Network Region II) and has an Omnibus Mutual Aid Agreement with more than fifty water agencies. This agreement provides Diablo Water District the opportunity to call upon water agencies in Region II for additional manpower and/or equipment during an emergency. The agreement with contact names and phone

numbers is located at the corporation yard in the main office in a binder and is also located at the administration office in a file. Additionally, an equipment database is on the computer at the corporation yard to help you decide which water agency to call upon for a particular piece of equipment.