MOJAVE WATER AGENCY

2004 REGIONAL WATER MANAGEMENT PLAN

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
GROUNDWATER MANAGEMENT PLAN
URBAN WATER MANAGEMENT PLAN

Mojave Water Agency

SUPPLEMENT A:
2005 URBAN WATER MANAGEMENT PLAN UPDATE

December 8, 2005

Bookman-Edmonston
A Division of GEI Consultants

Schlumberger Water Services

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SUPPLEMENT A:
2005 URBAN WATER MANAGEMENT PLAN UPDATE

Mojave Water Agency
2005 Urban Water Management Plan Supplement
December 2005

Purpose of This Supplement

This document supplements the Urban Water Management Plan element of the Mojave Water Agency (MWA) 2004 Regional Water Management Plan (RWMP)[1]. The RWMP is the master plan for MWA water management activities through the year 2020. This update provides additional information to meet 2005 Urban Water Management Plan update requirements, especially a projection of supply and demand through at least 2025. The 2005 Urban Water Management Plan is fully described in the 2004 RWMP as updated by this supplement with supply and demand projections through 2030.

The MWA 2005 Urban Water Management Plan is fully described in the 2004 Regional Water Management Plan, as updated by this Supplement.

MWA first prepared a Regional Water Management Plan in 1994[2]. Several subsequent developments prompted MWA to prepare the 2004 Plan update, which was adopted on February 24, 2005 by Resolution 798-05. The Program EIR[3] for the Plan was adopted on February 24, 2005 by Resolution 797-05. The 2004 Regional Water Management Plan is an integral part of this 2005 UWMP Update, and is incorporated herein in its entirety. The information in this supplement conforms to the requirements of the DWR UWMP Guidebook[4].

Recent additions to California law promote development of integrated water resource management plans and groundwater management plans by providing preference to agencies with such plans for funding through state grant programs. **The MWA Regional Water Management Plan serves as an Integrated Regional Water Management Plan, Groundwater Management Plan and Urban Water Management Plan and meets the requirements of SB 221, SB 610, SB 1938 and AB 901.**

[1] Schlumberger Water Services, September 2004, "Mojave Water Agency 2004 Regional Water Management Plan"
[2] Bookman-Edmonston Engineering, Inc. 1994
[3] Environmental Science Associates with Schlumberger Water Services, February 2005, "Mojave Water Agency 2004 Regional Water Management Plan Final Program Environmental Impact Report", State Clearinghouse number 2003101119
[4] California Department of Water Resources, January 18, 2005, "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan"

UWMP Elements

This MWA Regional Water Management Plan was prepared to comply with 2003 California Urban Water Management Act requirements including amendments made by Senate Bill 610 and Assembly Bill 901. The California Urban Water Management Planning Act[5] requires a water supplier with over 3,000 customers or that supplies over 3,000 acre-feet of water per year to prepare an Urban Water Management Plan (UWMP). MWA does not supply water directly, but holds the State Water Project contract and imports water to replenish groundwater basins and to meet obligations of the Mojave Basin Area and Warren Valley Judgments. Seven water supply agencies within the MWA have developed UWMPs. The checklist below indicates where in this Plan specific UWMP components are located. ***Elements changed or added for this 2005 UWMP supplement are shown in italic. Changed or supplemented tables are indicated by a (s) appended to the table number.***

The RWMP incorporates all required elements of an Integrated Regional Water Management Plan (RWMP p.1-7), a Groundwater Management Plan (p.1-12), and an Urban Water Management Plan (p.1-8). There is significant overlap in the requirements of these plans.

Water suppliers that utilize groundwater (all urban suppliers in MWA use groundwater) must include in their UWMPs a description of the groundwater basin and location and amounts of groundwater pumped. Seven water supply agencies (p.7-5) within the MWA have developed Urban Water Management Plans that were reviewed and incorporated into the RWMP. Land use plans in the basin are developed by a number of different entities including San Bernardino County and each of the cities through their General Plans, General Plan Amendments and Public Facilities Element amendments.

The 2004 RWMP included adoption of a 2020 conservation goal of 10 percent of municipal consumptive use in the Mojave basin and 5 percent in the Morongo basin. This goal is incorporated into this 2005 UWMP supplement. Twenty-four regional entities have banded together to form the Alliance for Water Awareness and Conservation (p.7-1) to educate local communities on the importance of water conservation, provide tools to reduce per capita consumption, and reduce regional water use by a more ambitious target of 15 percent[6] by 2015. ***A 15 percent reduction in municipal consumptive use is assumed to be met in 2025 in this supplement.***

[5] Division 6 Part 2.6 of the Water Code
[6] 5 percent in the more water efficient Morongo Basin

Urban Water Management Plan Checklist[7] *(s)*

Checklist Organized According to Subject

Items to address	Section of Law	Location In 2004 RWMP
Public and Stakeholder Outreach		
Make plan available for public inspection before its adoption.	10642	Chapter 8 Appendix F
Adopt plan as prepared or as modified after the public hearing.		Appendix G
Coordinate the preparation of its plan with other appropriate agencies, including direct and indirect suppliers, wastewater, groundwater, and planning agencies (refer to Section 10633).	10620 (d) (2)	Pg. 2 - 10
Demand, Supply, Reliability and Contingency Planning		
Management tools and options that maximize resources and minimize the need to import water	10620(f)	
Describe the service area	10631 (a)	Chapter 2
Provide current and projected population in 5-year increments to 20 years.		***Table 5- 7(s)***
Describe the climate and demographic factors.		Pg. 3 – 23 ***Table 3-5(s)***
Identify and quantify the existing and planned sources of water available in 5-year increments to 20 years	10631 (b)	Chapter 4 Table 4 - 2 ***Table 4- 9(s)***
Describe opportunities for exchanges or transfers of water on short-term or long-term basis.	10631 (d)	Pg. 4 - 33
Quantify current and past water use in 5-year increments to 20 years.	10631 (e) (1)	Tables 5-1 and 5-3
Identify projected water uses among water use sectors in 5-year increments to 20 years.	10631 (e) (2)	Pg. 5 – 23, ***Tables 5-9(s)*** and ***5-10(s)***
Describe average, single dry and multiple dry water year data.	10631 (c)	Pg. 4-1 Tables 4 -2 through 4-6
Describe any plans to replace inconsistent water sources.		Pg. 4 – 29
Provide minimum water supply estimates based on driest three-year historic sequence.	10632 (b)	Table 4 – 4
Describe the reliability of water supply.	10631 (c)	Pg. 4 – 27, Table 4-8 and Figure 4-13

[7] From p.1-8 of the 2004 Regional Water Management Plan

Items to address	Section of Law	Location In 2004 RWMP
Describe the vulnerability of water supply to seasonal or climatic shortage.		Pg. 4 - 29
Provide an assessment of the reliability of the water supplier's water service to its customers during normal, single dry, and multiple dry water years.	10635 (a)	Pg. 4 - 16
Compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in 5-year increments (refer to 10631 (c)).		***Table 5-15(s)***
Compare normal, single dry, and multiple dry water year projected water supply sources available to the water supplier with the normal, single dry, multiple dry water year projected water uses (refer to 10631 (c)).		Tables 5-12 to 5-14
Provide actions a water supplier will take to prepare for a catastrophe.	10632 (c)	Chapter 6
Provide a copy of a draft water shortage contingency resolution or ordinance	10632 (h)	Pg. 6-2
Provide water shortage stages of action, including up to a 50 percent reduction outlining specific water supply conditions at each stage.	10632 (a)	Chapter 6
Provide mandatory prohibitions.	10632 (d)	Chapter 6
Provide penalties or charges.	10632 (f)	Chapter 6
Provide consumption reduction methods	10632 (e)	Chapter 6
Provide an analysis of the impacts on the water supplier revenues and expenditures	10632 (g)	Chapter 6
Provide measures to overcome revenue and expenditure impacts.		Chapter 6
Provide a mechanism for determining actual reductions in water use.	10632 (i)	Chapter 6

Wastewater and Reclamation

Describe the wastewater collection and treatment systems in the supplier's service area.	10633 (a)	Pg. 3 - 23
Quantify the amount of wastewater collected and treated in the supplier's service area.		Pg. 3 – 25, Table 3-3
Describe the methods of wastewater disposal in the supplier's service area.		Pg. 3 - 23
Describe the type, place, and quantity of recycled water currently used in the supplier's service area.	10633 (b)	Pg. 3 - 23
Describe and quantify potential uses of recycled water in 5-year increments to 20 years.	10633 (c) (d)	Table 3 – 4(s)
Describe the technical and economic feasibility of serving the potential users of recycled water.		Pg. 3 - 25

Items to address	Section of Law	Location In 2004 RWMP
Describe the actions that may be taken to encourage recycled water use.	10633 (e)	Pg. 3 - 25
Provide the projected acre-feet results of recycled water used per year.	10633 (e)	*Table 3 – 4(s)*
Provide a plan for optimizing the use of recycled water in the supplier's service area.	10633 (f)	Pg. 3 - 24
Provide actions to facilitate the installation of dual distribution systems and to promote recirculating uses.		Pg. 3 - 25
Groundwater		
Identification of groundwater as a water supply source.	10631 (b)	Pg. 4 - 12
Groundwater management plan preparation.		Pg. 1 - 2
Copy of the groundwater management plan.	10631 (b)(1)	This Plan
Groundwater management plan adoption (2/24/05).		Appendix G
Describe groundwater basin(s).	10631 (b)(2)	Pg. 3 – 4
Identify the groundwater basin(s).		Table 3 - 1 Fig. 3 - 2
Identify adjudicated basins.		Pg. 2 - 6
Copy of order or decree of adjudication.		Appendix A
Describe the amount of groundwater the supplier has the legal right to pump.		Appendix A
Describe and analyze location and amount of groundwater pumped for past 5 years based on information that is reasonably available.	10631 (b)(3)	Chapter 5 ***Table 5-4(s)*** Figs 5-4 through 5-9 Table 5 -5 ***Table 5-9(s)***
Describe and analyze sufficiency of groundwater pumped for past 5 years based on information that is reasonably available.		Pg. 4 - 12
Describe and analyze location and amount of groundwater that is projected to be pumped based on information that is reasonably available.	10631 (b)(4)	Chapter 5 ***Table 5-9(s)***
Water Supply Projects and Water Supply Programs		
The description explains how all the water supply projects and water supply programs increase the water supplies to meet the total projected water use as established pursuant to subdivision (a) of Section 10635.	10631 (h)	Chapter 9
Identify specific future water supply projects and water supply programs that may be implemented to increase the amount of water available during average, single-dry and multiple-dry water years.		Chapter 9 Table 9-1 Fig. 9-1

Items to address	Section of Law	Location In 2004 RWMP
Describe the increase in water supply that is expected to be available from each of the specific future water supply projects and water supply programs.		Chapter 9
Describe the estimated implementation timeline for each future water supply project and water supply program.		Chapter 9 Table 10-2

Water Quality

Includes information, to the extent practicable, relating to the quality of existing water supply sources over the next 20 years in five year increments.	10634	Pg. 4 - 28
Describes the manner in which water quality affects water management strategies.		Chapter 10
Describes the manner in which water quality affects supply reliability.		Chapter 10

Section 1 – Agency Coordination

This UWMP 2005 supplement is based on the 2004 RWMP for the Mojave Water Agency service area prepared by Mojave Water Agency in cooperation with local water purveyors and stakeholders. The RWMP was collaborative effort to address a variety of issues related to potential water management activities.

RWMP Chapter 2 Agency and Stakeholder Background provides information about Mojave Water Agency, water management, and identifies the major stockholders in the basin. RWMP Chapter 8 Stakeholder Assessment and Public Outreach presents the process used to identify potential water purveyors, interested parities, and stakeholders and invite them to participate in this development of the 2004 RWMP.

Significant public outreach efforts were made during development of the RWMP. These efforts involved evaluation of questionnaires, and conducting meetings with individuals, groups, agencies, and a Technical Advisory Committee (TAC). The TAC met regularly during development of the Regional Water Management Plan, reviewing and providing comments and suggestions on the Plan. Outreach efforts were directed at stakeholders from local water agencies, state and federal agencies, municipalities, San Bernardino County, and 13 local community groups. A list of stakeholder groups involved in the Plan process is presented starting on RWMP page 2-11.

RWMP Management Actions[8] related to planning and stakeholder involvement include:

- MWA will provide information regarding regional water balances and availability of supplemental supply to local purveyors to allow them to reach appropriate conclusions regarding the sufficiency of supply for SB 221 and SB610 assessments.
- MWA will work with local planning agencies to ensure that areas that should be set aside to recharge the groundwater basin are reserved for that purpose and are not subject to development.
- MWA will coordinate with local planning agencies to ensure that growth projections, proposed land use changes, and types of proposed developments are consistent with water planning efforts, as required by SB 221 and SB 610. Significant deviations from projected growth and water needs will be noted and corrective action taken. Corrective actions could include securing additional sources of water, or making a finding pursuant to SB221 or SB 610 that an adequate water supply does not exist and notifying the water purveyor.
- MWA will work with the Alliance for Water Awareness and Conservation (AWAC) and serve as a clearinghouse for water conservation measures and performance data. Water conservation programs will be evaluated through the AWAC and actions taken as needed.
- Increased water conservation efforts will be identified and plans developed for implementation of cost effective demand management measures based on the reports on effectiveness.

[8] RWMP Chapter 10

- MWA will continue to coordinate, participate in, and implement recommendations of the Alliance for Water Awareness and Conservation.
- MWA has organized and held water symposia with local water leaders and regulators in Victorville and the Morongo Basin in 2003 and 2004, and may make the water symposium a semi-annual event for each area (alternating location annually).
- MWA will continue its outreach and education efforts through continued funding of the Community Liaison Officer.
- MWA will continue to develop and publish its newsletter, *The Panorama*. Regular updates on the development of the Regional Water Management Plan have been included.
- MWA will maintain its Speakers Bureau to provide timely water related information to the public.
- MWA's web site (http://www.mojavewater.org/) contains information on MWA projects, water supplies and resources, water education, Watermaster, Agency publications, a calendar of events, meeting agendas, and general information about MWA. MWA will continue to provide this service.

Section 2 – Step 1: Appropriate level of planning for size agency

Mojave Water Agency - The California State Legislature authorized the formation of the Mojave Water Agency (MWA) in 1959 for the purpose of managing declining groundwater levels in the Mojave Basin Area, El Mirage Basin, and Lucerne Valley Basin. With the vote of the people, MWA was formed on July 21, 1960. MWA was expanded by annexation in 1965 to include the Johnson Valley and Morongo Basin areas.

The MWA covers about 4,900 square miles, and includes 22 groundwater basins with about 2 million acre-feet of groundwater storage, that acts as the primary water supply for public and private water purveyors and other individual water users in the basin.

Water Supply Setting – The groundwater basins act as the primary water storage facility for the MWA service area, and all water supplies generated within the MWA or imported from outside the MWA are recharged into the groundwater basins for future use. This provides water users in the basins with a buffering capacity to absorb the effects of dry years without an immediate impact on water supply availability. While the basins maintain a high level of water supply reliability, overall management is required to maintain groundwater levels for long-term benefit of basin users.

Mojave Basin Area Judgment and Warren Valley Basin Judgment – Adjudication proceedings began in the early 1990's following a series of complaints and cross-complaints filed by local water users and the MWA. The resulting Warren Valley Basin Judgment and the Mojave Basin Area Judgment both require that additional surface water be imported to help balance the basins. The Physical Solution of the Mojave Basin Area Judgment set limits on the amount of groundwater production that can occur in each subarea without incurring an obligation to buy imported water. The Mojave Water Agency serves as Watermaster in the Mojave Basin. The Hi-Desert Water District is Watermaster for the Warren Valley Basin.

Regional Planning - The large size of the basin and long-term water management considerations require a regional entity working cooperatively with the local water purveyors and stakeholders to plan for long-term management of the basin. The RWMP was prepared by MWA in cooperation with the local water purveyors and stakeholders to provide long-term water management for the entire 4,900 square mile MWA service area.

Because of the regional nature of water management in the basin, the recently prepared Regional Water Management Plan is used as the basis for the 2005 Urban Water Management Plan Supplement. While this UWMP relies extensively on the RWMP, additional new information was developed to extend data beyond the 2020-planning horizon of the RWMP. Specific purveyor information was evaluated in the development of the RWMP and is included in this UWMP by reference.

RWMP Chapter 2 Agency Stakeholder and Background describes the MWA, water purveyors and other stakeholders, and Chapter 3 Physical Setting, describes the physical setting of the Mojave Water Agency. Other chapters of the RWMP are referenced by this document as needed to meet the requirements of the UWMP.

Section 2 – Step 2: Service Area Information with 20-year Projections

This Section of the UWMP addresses the demographic factors that may affect water use. This update includes population estimates through 2030 and climatic characteristics of the area.

Population

Actual and projected population and data sources for 1990 through 2020 are reported in Chapter 5[9]. The California State Department of Finance projects that San Bernardino County will grow at a rate of 1.8 percent per year from 2020 through 2030. ***Table 5-7(s)*** uses the assumption that each of the subareas grow at the county-wide rate, with total MWA population increasing 80 percent over the 2005-2030 period.

Table 5-7(s): **Current and Projected Population Estimates**

	2005	2010	2015	2020	2025	2030	Annual Percent Change 2005-2030
Mojave Basin Area							
Alto	266,700	303,700	348,900	407,700	432,400	486,300	2.4%
Baja	5,300	5,600	5,900	6,200	6,600	7,400	1.3%
Centro	36,100	41,500	47,100	54,100	57,400	64,600	2.4%
Este	6,800	8,100	9,400	11,300	12,000	13,500	2.8%
Oeste	8,300	9,400	11,300	13,600	14,400	16,200	2.7%
Subtotal Mojave	323,200	368,300	422,600	492,900	522,800	588,000	2.4%
MB/JV Area*							
Copper Mtn. Valley	10,300	11,000	11,800	12,700	13,500	15,200	1.6%
Johnson Valley	400	500	500	600	600	700	2.3%
Means/Ames Valley	8,300	9,300	10,400	11,700	12,400	13,900	2.1%
Warren Valley	16,600	18,600	21,000	23,600	25,000	28,100	2.1%
Subtotal MB/JV	35,600	39,400	43,700	48,600	51,500	57,900	2.0%
Total	**358,800**	**407,700**	**466,300**	**541,500**	**574,300**	**645,900**	**2.0%**

Climate[10]

The Mojave Water Agency maintains a Climatology Network that consists of 14 weather stations collecting various weather data on temperature, precipitation, and evaporation. Rain gages are mostly located within the Mojave Basin Area and the surrounding mountains.

[9] RWMP Tables 5-1 and 5-7
[10] RWMP p. 3-23

Representative precipitation, temperature, and reference evapotranspiration (ET_o) data are reported in Table 3-5***(s)***. Runoff in the upper watershed contributes substantially more to the recharge of the basin than precipitation falling in the basin. Average rainfall within the lower lying areas of the Mojave Basin Area and Morongo Basin/Johnson Valley area is roughly five inches per year. The large variation in annual rainfall within the surrounding mountains directly affects the annual water supply of the basin, and is further discussed in RWMP Chapter 4 Water Supply.

Table 3-5(s) – Climate Data

Station:	Victorville			Barstow			Twentynine Palms	
	Average Precipitation (in.)	Average Temperature (degF)	Average ETo (in.)	Average Precipitation (in.)	Average Temperature (degF)	Average ETo (in.)	Average Precipitation (in.)	Average Temperature (degF)
Period of Record:	7/1/48 12/31/04	5/1/05 6/26/05	2/1/94 12/1/04	1/6/13 12/31/04	3/27/05 6/26/05	1/1/97 12/1/04	7/1/48 12/31/04	5/1/05 6/26/05
Jan	1.00	44.4	2.02	0.76	46.0	2.20	0.49	49.3
Feb	0.98	47.9	2.61	0.71	50.4	3.09	0.40	53.4
Mar	0.83	51.9	4.55	0.64	55.2	5.13	0.36	58.6
Apr	0.34	57.7	6.19	0.22	62.1	6.61	0.13	65.7
May	0.16	65.0	7.30	0.09	69.6	8.18	0.09	74.0
Jun	0.05	73.0	8.85	0.11	78.5	9.21	0.01	82.8
Jul	0.15	79.5	9.77	0.29	84.7	9.40	0.57	88.5
Aug	0.19	78.7	8.99	0.31	82.9	8.18	0.76	86.9
Sep	0.28	73.0	6.52	0.28	76.5	6.38	0.47	80.5
Oct	0.30	62.8	4.66	0.23	65.7	4.76	0.23	69.3
Nov	0.51	51.4	2.68	0.39	53.4	2.83	0.26	56.6
Dec	0.73	44.5	2.05	0.56	46.0	2.07	0.40	49.3
Annual	**5.51**	**60.8**	**66.19**	**4.57**	**64.3**	**68.04**	**4.18**	**67.9**

Sources:

http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?cavict+sca

http://wwwcimis.water.ca.gov/cimis/frontMonthlyEToReport.do

Section 2 – Step 3 Water Sources

As described in RWMP Chapter 4 Water Supply, much of the water supply within the Mojave Basin Area originates as rain or snowfall in the San Bernardino Mountains, which enters the basin via the Mojave River. The RWMP evaluated the water sources for the Mojave Basin Area for the 1931 to 2001 period, which includes numerous single year and multiple year wet and dry periods. Based on the evaluation of the 1941 to 2001 hydrologic data for the basin, the net long-term average annual water supply for the basin is 63,400 acre-feet. RWMP Tables 4-2 through 4-4 presents the average, dry year, and multiple dry year water supply for each of the subareas in the Mojave Basin Area. Tables 4-5 through 4-7 present water supply availability for the Morongo Basin/Johnson Valley Area.

Imported Water Supplies – Current imported supplies are available to MWA through 75,800 acre-feet per year of water contracted through the State Water Project (SWP). This includes the addition of 25,000 acre-feet of Table "A" that was purchased from Berrenda Mesa Water District in 1998. DWR has published preliminary revised estimates of State Water Project deliveries in the May 2005 "Excerpts from Working Draft of 2005 State Water Project Delivery Reliability Report." The updated estimates of SWP demand in the report were developed by DWR together with representatives of the SWP contractors as part of the revised Environmental Impact Report for the Monterey Amendment. Estimated 2005 (current) demands as well as 2025 (future) demands were developed. DWR interpolates between these current and future demands to produce estimates for 2010, 2015, 2020, and 2025[11]. Average, dry, and multiple dry-year SWP supplies are summarized in RWMP Table 4-8.

Estimates of system-wide SWP reliability range from 69 percent under 2005 demands to 77 percent under 2025 conditions. The RWMP used a previous DWR estimate of 77 percent delivery for all years from 2000 through 2020. Table 4-9***(s)*** displays DWR's estimates of SWP availability through 2030.

Table 4-9*(s)*: Available Water Supply Sources Through 2030

Supply Type	2005	2010	2015	2020	2025	2030
Natural*	65,500	65,500	65,500	65,500	65,500	65,500
SWP	52,300	53,800	55,300	58,400	58,400	58,400
Total	117,800	119,300	120,800	123,900	123,900	123,900

*Average annual natural water supply data as shown in Tables 4-2 and 4-5 excluding Johnson Valley

[11] For the MWA UWMP, 2030 SWP demands and SWP deliveries are assumed equal to 2025 levels.

Section 2 – Step 3 Water Sources - Groundwater

The RWMP serves as MWA's Groundwater Management Plan and is compliant with Senate Bill 1938. The RWMP addresses the requirements of the SB 1938 as described below:

- Chapter 3 describes the geology and groundwater basins within MWA
- Chapter 9 includes basin management objectives and alternatives
- Chapter 10 includes water management actions including groundwater recharge activities
- Appendix H includes the monitoring plan for the basin

The Mojave and Morongo groundwater basins are essentially closed – very little groundwater enters or exits. Groundwater is discharged primarily by well pumping, evaporation through the soil, transpiration by plants, seepage into dry lakes where accumulated water evaporates, and by seepage into the Mojave River.

Efforts to Eliminate Groundwater Overdraft -- The Mojave Basin Area and Warren Valley adjudications mandate that groundwater extractions from each basin do not exceed the estimated annual supplies, and empower the Watermasters of each basin to enforce pumping limits as mandated by the Court.

One of the fundamental objectives of the RWMP is to "balance future water demands with available supplies recognizing the need to stabilize the groundwater basin storage balance over long-term hydrologic cycles." As part of preparation of this 2004 RWMP, projects and management actions were identified that would allow MWA to meet this objective by 2020 while also meeting a second objective to "maximize the overall beneficial use of water throughout MWA by supplying water in quantity and of quality suitable to the various beneficial uses." These objectives are described in greater detail in Chapter 9.

Groundwater Pumping amounts by Subbasin – Historical groundwater pumping quantities for the Mojave Basin from 1994 through 2004 are presented in Table 5-4***(s)***. Estimates of consumptive use of pumped groundwater are presented by Subbasin and demand sector in Tables 5-9***(s)*** and 5-10***(s)*****.**

Table 5-4(s) - Verified Annual Production of Major Producers (Acre-feet per year)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Este	8,800	8,700	9,700	8,800	7,100	7,200	7,100	6,600	6,700	5,900	6,500
Oeste	6,800	5,600	6,300	6,300	5,100	5,100	4,900	4,400	5,200	4,700	5,300
Alto	81,100	75,100	87,500	88,500	75,900	83,300	88,300	82,800	87,100	86,700	92,700
Centro	26,000	25,500	38,700	34,800	25,300	28,200	27,700	23,100	24,500	21,900	22,000
Baja	40,700	35,800	45,200	41,700	36,300	39,100	38,800	35,500	36,700	30,700	29,600
Total	**163,400**	**150,700**	**187,400**	**180,100**	**149,700**	**162,900**	**166,800**	**152,400**	**160,200**	**149,900**	**156,100**

Source: Mojave Bain Watermaster Annual Reports, Appendix L

Groundwater Consumptive Use – In adopting the 2004 RWMP, ***MWA has committed to achieving 10 percent municipal conservation by 2020 (5 percent in the more water-efficient Morongo Basin)***. As described in Chapter 7, the regional Alliance for Water Awareness and Conservation has targeted the more ambitious goals of reducing regional water use by 10 percent gross per capita by 2010 and 15 percent gross per capita by 2015 in the Mojave Basin, and 5 percent in the Morongo Basin by 2015. Table 5-9***(s)*** reflects Mojave Basin consumptive use reductions of 10 percent of municipal use by 2010, increasing to 15 percent by 2025. Table 5-10***(s)*** reflects Morongo Basin consumptive use reductions of 5 percent by 2015.

Agricultural Scenario 2 was adopted as the basis for further planning in the 2004 Regional Water Management Plan. Under Agricultural Scenario 2, there are significant decreases in agricultural consumptive use assuming agriculture will voluntarily transfer its free production allowance (FPA) to non-agricultural uses in lieu of purchasing replacement water. Examination of FPA transfers through 2004 shows that this trend has already significantly progressed. Estimates for 2025 and 2030 consumptive use are based on no increases in industrial or recreational uses, with municipal and golf course uses increasing in proportion to the population. Estimates of projected consumptive use are presented in Tables 5-9***(s)*** and 5-10***(s)***.

Table 5-9*(s)*: Mojave Basin Area Current and Projected Consumptive Use (Acre-feet/year)

Alto							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Industrial	4,200	8,200	8,200	8,200	8,200	8,200	8,200
Municipal	34,400	38,700	42,600	47,300	53,300	55,000	60,000
Golf Courses	2,200	2,500	2,900	3,300	3,800	4,100	4,600
Recreational	6,900	6,900	6,900	6,900	6,900	6,900	6,900
Total: Including Ag Scenario 1	**51,500**	**60,100**	**64,400**	**69,500**	**76,000**	*****	*****
Total: Including Ag Scenario 2	**51,500**	**57,600**	**61,900**	**67,000**	**73,500**	**75,500**	**81,000**
Baja							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Industrial	5,500	5,500	5,500	5,500	5,500	5,500	5,500
Municipal	2,500	2,600	2,700	2,700	2,800	2,900	3,100
Golf Courses	0	0	0	0	0	0	0
Recreational	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Total: Including Ag Scenario 1	**28,200**	**28,300**	**28,400**	**28,400**	**28,500**	*****	*****
Total: Including Ag Scenario 2	**28,200**	**28,300**	**17,400**	**11,300**	**11,400**	**11,500**	**11,700**
Centro							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Industrial	1,900	1,900	1,900	1,900	1,900	1,900	1,900
Municipal	6,300	6,700	7,400	8,200	9,100	9,400	10,300
Golf Courses	200	200	200	200	300	300	300
Recreational	0	0	0	0	0	0	0
Total: Including Ag Scenario 1	**17,300**	**17,700**	**18,400**	**19,200**	**20,200**	*****	*****
Total: Including Ag Scenario 2	**17,300**	**17,700**	**18,400**	**19,200**	**20,200**	**20,500**	**21,400**
Este							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Industrial	900	900	900	900	900	900	900
Municipal	900	1,000	1,200	1,300	1,500	1,600	1,700
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
Total: Including Ag Scenario 1	**5,000**	**5,100**	**5,300**	**5,400**	**5,600**	*****	*****
Total: Including Ag Scenario 2	**5,000**	**5,100**	**5,300**	**5,400**	**3,800**	**3,900**	**4,000**
Oeste							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Industrial	0	0	0	0	0	0	0
Municipal	1,900	2,200	2,400	2,700	3,200	3,300	3,600
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
Total: Including Ag Scenario 1	**3,200**	**3,500**	**3,700**	**4,000**	**4,500**	*****	*****
Total: Including Ag Scenario 2	**3,200**	**3,500**	**3,700**	**4,000**	**3,500**	**3,600**	**3,900**
Total Mojave Basin Area							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Industrial	12,500	16,500	16,500	16,500	16,500	16,500	16,500
Municipal	46,000	51,200	56,300	62,200	69,900	72,200	78,700
Golf Courses	2,400	2,700	3,100	3,500	4,100	4,400	4,900
Recreational	9,400	9,400	9,400	9,400	9,400	9,400	9,400
Total: Including Ag Scenario 1	**105,200**	**114,700**	**120,200**	**126,500**	**134,800**	*****	*****
Total: Including Ag Scenario 2	**105,200**	**112,200**	**106,700**	**106,900**	**112,400**	**115,000**	**122,000**

* Note for 2005 UWMP Update: Agricultural Scenario 2 was adopted as the basis for further planning in the 2004 Regional Water Management Plan. Under Agricultural Scenario 2, there are significant decreases in agricultural consumptive use due to the assumption that agriculture will voluntarily transfer its free production allowance to non-agricultural uses in lieu of purchasing replacement water. Examination of FPA transfers from through 2004 shows that this trend has already significantly progressed.

Table 5-10(s): Morongo Basin/Johnson Valley Area Projected Consumptive Use (Acre-feet/year)

Copper Mountain Valley							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Agricultural	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Municipal	800	900	900	1,000	1,000	1,000	1,200
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
Total	**800**	**900**	**900**	**1,000**	**1,000**	**1,000**	**1,200**
Johnson Valley							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Agricultural	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Municipal	30	30	40	40	50	50	50
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
Total	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Means/Ames Valley							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Agricultural	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Municipal	600	700	700	800	900	1,000	1,000
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
Total	**600**	**700**	**700**	**800**	**900**	**1,000**	**1,000**
Warren Valley							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Agricultural	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Municipal	1,100	1,300	1,400	1,600	1,800	1,900	2,100
Golf Courses[1]	200	200	200	300	300	300	400
Recreational	0	0	0	0	0	0	0
Total	**1,300**	**1,500**	**1,600**	**1,900**	**2,100**	**2,200**	**2,500**
Total Morongo Basin/Johnson Valley Area[2]							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Agricultural	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Municipal	2,500	2,900	3,000	3,400	3,700	3,900	4,300
Golf Courses	200	200	200	300	300	300	400
Recreational	0	0	0	0	0	0	0
Total	**2,700**	**3,100**	**3,200**	**3,700**	**4,000**	**4,200**	**4,700**

[1]For the purpose of projecting consumptive use, year 2000 golf course use in the Warren Valley is set at 200 acre-feet (the average from 1995-99), due to a temporary reduction in pumping during 2000 caused by mechanical problems with the well.

[2]Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

Section 2 – Step 4: Reliability of Supply

This section describes the reliability of the water supply and the vulnerability to seasonal or climatic changes.

Annual Variability of Water Supply – The RWMP used the 1931-2001 hydrologic period to represent long-term hydrologic conditions in the basin. The variability of the supply is shown on Table 4-9***(s)***, and is described in more detail in Chapter 4 of the RWMP.

Inconsistent Water Sources – Because water use within the MWA service area is supplied entirely by groundwater, MWA does not have any inconsistent water sources that cause reduced deliveries to users within the service area. A potential exception is areas where water quality could limit use as a potable supply. Wellhead treatment or provision of an alternative supply is planned for these areas. While many of the sources that recharge the groundwater basin have high annual variability, including flows on the Mojave River and supplies from the State Water Project, the groundwater basins used within the MWA service area are sufficiently large to allow for continued water use during dry periods with only a temporary decline in groundwater levels. The variability of the water supply is discussed above under Water Sources[12] for both natural and SWP imported supplies.

Imported Water Supplies – Current imported supplies are available to MWA through 75,800 acre-feet per year of water contracted through the State Water Project (SWP). This includes the addition of 25,000 acre-feet of Table "A" that was purchased from Berrenda Mesa Water District in 1998. According to the State Water Project Reliability Report (DWR 2002) MWA can expect to receive an average of 58,400 acre-feet of its SWP supply under 2020 conditions. This estimate is based on 2020 demand projections with the current facilities in place.

Vulnerability to Climatic or Seasonal Shortages – Water Supply Balance for 5-year Increments for Normal, Dry, and Multiple Dry Years – The groundwater basins are of primary importance for water storage and regulation within the MWA service area, and all water supplies whether local or imported are recharged into the groundwater for future use. This provides water users in the basin with a buffering capacity to absorb the effects of dry years without an immediate impact on water supply availability.

As presented in Table 4-9***(s)*** above[12], estimates of system-wide SWP reliability range from 69 percent under 2005 demands to 77 percent under 2025 conditions. The RWMP used a previous DWR estimate of 77 percent delivery for all years from 2000 through 2020. As displayed in Table 5-15***(s)***, under long-term average delivery conditions the SWP supply should meet the MWA water needs to at least 2025.

[12] Section 2 – Step 3

Table 5-15*(s)*: Average Annual Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)

	2005	2010	2015	2020	2025	2030
Mojave Basin Area						
Alto	-22,900	-27,200	-32,300	-38,800	-40,800	-46,300
Baja	-22,700	-11,800	-5,700	-5,800	-5,900	-6,100
Centro	800	100	-700	-1,700	-2,000	-2,900
Este	-1,600	-1,800	-1,900	-300	-400	-500
Oeste	-2,400	-2,600	-2,900	-2,400	-2,500	-2,800
Subtotal Mojave	-48,800	-43,300	-43,500	-49,000	-51,600	-58,600
MB/JV Area						
Copper Mtn. Valley	-300	-300	-400	-400	-400	-600
Johnson Valley	2,270	2,260	2,260	2,250	2,250	2,250
Means/Ames Valley	-100	-100	-200	-300	-400	-400
Warren Valley	-600	-700	-1,000	-1,200	-1,300	-1,600
Subtotal MB/JV*	-1,000	-1,100	-1,600	-1,900	-2,100	-2,600
Total	**-49,800**	**-44,400**	**-45,100**	**-50,900**	**-53,700**	**-61,200**
Average Annual SWP Supply:	**52,300**	**53,800**	**55,300**	**58,400**	**58,400**	**58,400**
Surplus/Deficit with SWP Supply:	**2,500**	**9,400**	**10,200**	**7,500**	**4,700**	**-2,800**

*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

The 2005 Reliability Report substantially reduces estimates of water available under dry year conditions. For an extremely dry year such as 1977, DWR expects only four percent of Table A amounts would be delivered. As shown in Table 5-16***(s)***, this would result in a one-year overdraft of 114,000 acre-feet under 2030 demands, which would be met through demand management measures and increased reliance on stored groundwater.

Table 5-16*(s)*: Single Dry Year (1977) Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)

	2005	2010	2015	2020	2025	2030
Mojave Basin Area						
Alto	-47,700	-53,500	-60,500	-69,500	-73,400	-81,700
Baja	-29,700	-18,900	-12,900	-13,100	-13,300	-13,600
Centro	-6,700	-7,700	-8,800	-10,200	-10,800	-12,200
Este	-2,650	-2,850	-3,050	-1,550	-1,650	-1,850
Oeste	-3,350	-3,650	-4,050	-3,650	-3,950	-4,350
Subtotal Mojave	-90,100	-86,600	-89,300	-98,000	-103,100	-113,700
MB/JV Area						
Copper Mtn. Valley	-670	-670	-770	-770	-870	-1,070
Johnson Valley	850	840	840	830	830	830
Means/Ames Valley	-470	-470	-570	-670	-770	-870
Warren Valley	-1,160	-1,260	-1,560	-1,760	-1,860	-2,160
Subtotal MB/JV*	-2,300	-2,400	-2,900	-3,200	-3,500	-4,100
Total	**-92,400**	**-89,000**	**-92,200**	**-101,200**	**-106,600**	**-117,800**
Average Annual SWP Supply:	**3,000**	**3,000**	**3,000**	**3,000**	**3,800**	**3,800**
Surplus/Deficit with SWP Supply:	**-89,400**	**-86,000**	**-89,200**	**-98,200**	**-102,800**	**-114,000**

*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

The 2005 Reliability Report estimates SWP Table A water available under a six year drought such as 1987-1992 would be about 42 percent. As shown in Table 5-17***(s)***, this would result in an average annual overdraft of 104,900 acre-feet under 2030 conditions, which would be met through demand management measures and increased reliance on stored groundwater.

Table 5-17*(s)*: Average Annual Single Dry Year (1987-1992) Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)

	2005	2010	2015	2020	2025	2030
Mojave Basin Area						
Alto	-54,100	-59,900	-66,900	-75,900	-79,800	-88,100
Baja	-29,300	-18,500	-12,500	-12,700	-12,900	-13,200
Centro	-17,900	-18,900	-20,000	-21,400	-22,000	-23,400
Este	-3,200	-3,400	-3,600	-2,100	-2,200	-2,400
Oeste	-3,800	-4,100	-4,500	-4,100	-4,400	-4,800
Subtotal Mojave	-108,300	-104,800	-107,500	-116,200	-121,300	-131,900
MB/JV Area						
Copper Mtn. Valley	-870	-870	-970	-970	-1,070	-1,270
Johnson Valley	100	90	90	80	80	80
Means/Ames Valley	-670	-670	-770	-870	-970	-1,070
Warren Valley	-1,450	-1,550	-1,850	-2,050	-2,150	-2,450
Subtotal MB/JV*	-2,990	-3,090	-3,590	-3,890	-4,190	-4,790
Total	**-111,300**	**-107,900**	**-111,100**	**-120,100**	**-125,500**	**-136,700**
Average Annual SWP Supply:	**32,600**	**31,800**	**31,800**	**31,800**	**31,800**	**31,800**
Surplus/Deficit with SWP Supply:	**-78,700**	**-76,100**	**-79,300**	**-88,300**	**-93,700**	**-104,900**

*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

Section 2 – Step 5: Transfer and Exchange Opportunities

Water transfer and exchange opportunities into the MWA service area are discussed in Chapter 4 of the 2004 RWMP[13]. Water transfers include opportunities to import additional supplies into the Mojave Water Agency and transfers within the subareas. ***Table 4-11(s)*** summarizes the potential water transfer and exchange opportunities identified at this time.

Table 4-11(s):
Water Transfer and Exchange Opportunities in the Mojave Basin

Name/Type	Exchange/Transfer	Duration	Proposed Quantities
Pre-delivery of unused State Water Project supplies	Current water contract	Permanent	Estimated 400,000 acre-feet total from 2005 thought 2020
Solano County Water Agency	Exchange Program	Existing agreement	Not defined
Metropolitan Water District Water Exchange Program	Exchange program	Being analyzed. Draft EIR published.	18,000 to 34,000 acre-feet pump back. Total annual return range of 18,000 – 65,400 acre-feet. Maximum storage at MWA of 390,000 af.
Other SWP contractors	Water transfer, exchange or banking	Under consideration	Not defined
Transfers within Mojave Basin Subareas	Base Annual Production (BAP) and/or Free Production Allowance (FPA)	On-going	Variable

[13] RWMP p.4-33

Section 2 – Step 6: Water Use by Customer Type- Past, Current, Future

This section presents regional water use information by primary water use category. Tables 5-9***(s)*** and 5-10***(s)***, presented above[14], show historic and projected consumptive water use for each of the primary water use categories by subarea for the 2000 to 2030 period in five-year increments. The 2004 RWMP was developed in cooperation with the urban purveyors in the basin. Detailed information of the water use by customer type for municipal and industrial uses is included in the RWMP by reference to the UWMPs for each of the urban water purveyors.

Section 2 – Step 7: Demand Management Measures

In the MWA service area, demand management and water conservation are addressed both at the local (water purveyor) and regional levels. Water conservation efforts of individual water agencies and cities are currently being implemented, and are described in the existing UWMPs for each purveyor. Water conservation and demand management addressed at the regional level in Chapter 7 of the RWMP is based upon the information developed by the individual purveyors. The regional efforts include cooperative partnerships between MWA and a number of individual entities and groups of entities such as water agencies, cities, colleges, other educational institutions, and the Mojave Desert Resource Conservation District.

Alliance for Water Awareness and Conservation – During the development of the 2004 RWMP, stakeholders formed a united regional water conservation program to coordinate and improve water use efficiency. The Alliance for Water Awareness and Conservation (AWAC) was formed in August of 2003. The enabling MOU states the purpose of the AWAC is to "provide a vehicle to attract support for a regional water conservation program and coordinate implementation of activities by forming partnerships to obtain common measurable goals."[15]

The AWAC will determine the appropriate mix, market penetration, budget and schedule for implementation of demand management measures in order to achieve the desired water reduction goals. Initially the AWAC is targeting outdoor irrigation where there is the greatest potential for significant reduction in water use.

Demand Management Measures – Demand Management Measures (DMMs) represent the Best Management Practices that the California Department of Water Resources requires to be addressed in Urban Water Management Plans. The DMMs are intended to reduce current and future water demands through more efficient water use. Additional programs may be necessary during periodic water supply shortages.

[14] p. 18
[15] RWMP p. 7-1

MWA adopted the DMMs in 1997.[16] MWA is not a direct purveyor of drinking water and therefore is not required to implement the DMMs. In addition, MWA does not have the authority to implement programs in cities where water users are supplied water by their city or water agency. MWA is implementing some of the DMMs and is working with water agencies and cities both individually and collectively through the AWAC to promote the efficient use of water. Table 7-2 summarizes the implementation status of the DMMs for drinking water purveyors in the basin. Chapter 7[17] of the RWMP provides a description of each of the 14 DMMs and implementation status and an estimate of the water savings.

Section 2 – Step 8: Evaluation of DMMs not implemented

RWMP Table 7-2 identifies the DMMs that are being implemented by each entity. The RWMP does not attempt to quantify the water savings or associated cost of the DMMs not being implemented. As described above, the AWAC is looking to implement demand management measures to achieve its desired water reduction goals.

Section 2 – Step 9: Planned Water Supply Projects and Programs

The menu of water supply projects and programs that may be undertaken to meet the projected water use are identified in Chapter 9 for the RWMP[18]. The Basin Management Objectives[19] and alternatives developed during the formation of the RWMP are also presented in Chapter 9.

Alternatives – A total of 18 alternatives were evaluated in the course of RWMP development. These include eight initial alternatives, eight revised alternatives, and two final alternatives developed based on the recommendations made at the Technical Advisory Committee. Chapter 9 details the alternatives, identifying the common assumptions as well as the primary factors used to distinguish between the alternatives. Performance measures used to evaluate the alternatives are detailed in RWMP Appendix B. The alternatives screening process is described starting on RWMP p. 9-29.

Project Timeline – The project timeline for the implementation of the Management Action Plan is presented in RWMP Figure 10-2. It includes the Planning/Engineering, Groundwater, and Construction-related activities from the present through 2020. The Management

[16] Resolution 630-97, January 28, 1997
[17] RWMP p. 7-6
[18] RWMP p. 9-10 and Tables 9-2 and 9-3
[19] RWMP p. 9-2

Actions[20] consist of 60 specific actions that can be grouped into the following seven elements:

1. Monitoring
2. Improve the characterization of the basin
3. Continue long-term planning
4. Groundwater protection
5. Construction and implementation
6. Financing
7. Public participation

The highest priority projects that are anticipated to begin in the next three to five years include[21] (from page 4-34):

- Implementing 10% municipal conservation in the Mojave Basin and 5% in the Morongo Basin/Johnson Valley
- Wastewater reclamation in Alto
- Wellhead treatment in Alto
- Recharge in the Alto Floodplain and Regional and Warren Valley aquifers
- Providing a new water supply for Pioneertown

The following projects have a lower priority, but are being evaluated for possible implementation by 2020:

- A regional treatment plant in Alto
- Recharge in the Alto Transition Zone, Baja, Centro, Este, Oeste, Copper Mountain Valley and Means/Ames Valley
- Providing a new water supply for Hinkley

Section 2 – Step 10: Development of Desalinated Water

At this time Desalination is not considered in the water management actions for the MWA. Regional desalination has been identified as a potential MWA strategy for post-2020 supply.

Section 2 – Step 11: Current or Projected Supply Includes Wholesale Water

MWA is responsible for managing groundwater in the Mojave Basin, and worked with other water purveyors, stakeholders, and interested parties in the region to develop the RWMP.

[20] RWMP p. 10-2
[21] RWMP p. 4-34, p. 10-21

Tables 5-9***(s)*** and 5-10***(s)*** present the projected demands developed in consultation with retail agencies to which MWA provides wholesale water services. RWMP Table 4-8 and Table 4-9***(s)*** present the projected SWP supply. The SWP is the primary source of wholesale water conveyed by MWA into the basin. Chapter 4 of the RWMP addresses local water source and water supply availability for the Mojave Basin Area and Morongo Basin, and the reliability of imported State Water Project water. While the water supply availability from local and SWP supplies may fluctuate on a yearly basis, the water supply available from the Mojave Basin groundwater is not subject to the annual and seasonal hydrologic fluctuations, and therefore has a very high water reliability.

Section 3 – Determination of DMM Implementation

RWMP Chapter 7 describes DMM implementation by MWA and participating water wholesale agencies as of 2004. Additional information will be published by urban water supplies as part of their individual 2005 UWMP updates.

Section 4 – Water Shortage Contingency Plan

Chapter 6 of the RWMP describes the water shortage planning efforts of the MWA and summarizes the water shortage planning efforts for the individual water purveyors in the MWA service area. The water shortage contingency plans are summarized here for each of the individual purveyors in Chapter 6 based upon information included in the current Urban Water Management Plans.

Adelanto Water Authority

The current Adelanto Water Authority Urban Water Management Plan addresses the water shortage contingency plan.

1- Stages of Action - The UWMP proposes a four-stage plan of action in the event of a long-term drought condition or loss of supply. The action levels are as follows:

- **Stage 1 –** Stage 1 occurs when the Authority declares a water shortage and imposes voluntary water conservation. In Stage 1, Authority shall notify customers that water deliveries will be reduced and recommend a voluntary 10 percent water use reduction. At the same time, the Authority shall start its own public awareness program to encourage efficient use of water.
- **Stage 2** – Stage 2 occurs with the Authority determines voluntary water reduction goals are not being met and the declared water shortage has been in effect for two consecutive years or otherwise as determined appropriate by the Authority. At this time the Authority will establish a water conservation advisory committee.
- **Stage 3** – Stage 3 occurs if the water shortage continues for four consecutive years or as otherwise determined appropriate by the Authority. In this stage the Authority will recommend a mandatory 10 percent and a voluntary 20 percent water use reduction from the established base year. The Authority will also develop a plan and ordinance to enforce penalties for excessive water use. The Authority will also analyze the impacts of the Conservation Plan on the revenues and expenditures of the Authority and propose measures to overcome those impacts.
- **Stage 4** – Stage 4 occurs if a declared water shortage continues for more than one year after Stage 3. In this stage the Authority shall conduct a survey on the mandatory 10 percent and voluntary 20 percent water use reduction programs and consider enforcing penalties described in the ordinance developed under Stage 3.

2 – Estimate of Minimum Supply for Next Three Years - Historically, the local aquifer in the Adelanto area has not been a limiting factor in groundwater production, even during drought periods.

3 - Catastrophic Supply Interruption Plan – As discussed above, the local aquifer in the Adelanto area has not been a limiting factor in groundwater production, and is expected to continue to produce reliable supplies even in a catastrophe.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – The Authority will develop a plan and ordinance to enforce penalties for excessive water use as part of Stage 3 of the Authority's water conservation plan.

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – The Authority will analyze the impacts of the water shortage of revenues and expenditures as part of Stage 3 of the Authority's water conservation plan.

6 - Draft Ordinance and Use Monitoring Procedure - The Authority keeps historic and current pumping records on all wells and monitors customer's water usage. These records can be used to determine the actual reductions in water use, and evaluate the effectiveness of each conservation measure implemented under the Conservation Plan.

Apple Valley Ranchos Water Company

The Apple Valley Rancheros Water Company (AVR) is an investor owned utility and is subject to the rules of the California Public Utilities Commission (CPUC). The existing UWMP includes a Water Shortage Contingency Plan. Some of the components of the Plan associated with the water supply contingency plan are described below.

1 - Stages of Action – The AVR cannot enforce any conservation stages because it is a private water utility. AVR does work closely with the Town of Apple Valley to encourage conservation and institute necessary ordinances. The Town of Apple Valley has adopted a Water Conservation Plan with the intent to achieve a 10 percent reduction in water use.

2 – Estimate of Minimum Supply for Next Three Years - AVR is not dependent on surface water supplies, and water supply shortages are not expected. During the 1987 to 1991 shortage, AVR's customers were not affected by the dry conditions because the groundwater basin provided adequate supply. In a multiple year drought, the groundwater basin would be pumped to meet demands.

3 - Catastrophic Supply Interruption - AVR has developed an Emergency Response and Recovery Plan to respond to major emergencies associated with natural disasters, technology incidents, and national security emergencies affecting the facilities and service areas. The goal of the Emergency Response and Recovery Plan are to rapidly restore service after an emergency; ensure adequate water service for fire suppression; minimize water or electrical damage; minimize impact and loss to customers, and provide emergency public information concerning customer service. AVR has interconnections with Southern California Water

Company and Victor Valley Water District to transfer water and would utilize these to continue delivering water.

The priority of use for available potable water supplies is based on the legal requirements set forth in the California Water Code 450-358 that conserve the water supply for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – As a private water utility, AVR is unable to enforce any conservation stages associated with the current availability of water. AVR works closely with the Town of Apple Valley to encourage conservation and institute ordinances as necessary. The Town of Apple Valley has adopted a Water Conservation Plan with the intent on achieving a 10 percent reduction in water use. In AVR's tariff schedules, there is CPUC authorization to discontinue service for waste of water.

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – During the last drought CPUC allowed AVR to track expense and revenue shortfalls caused by voluntary conservation efforts. The conservation memorandum account was established to allow AVR to accumulate the revenues lost due to conservation.

6 - Draft Ordinance and Use Monitoring Procedure – During normal water supply conditions, production figures are recorded daily and are incorporated into a monthly production report. During rationing conditions, water shortages will be monitored on a daily or hourly basis depending on the severity of the drought to determine the effects of reductions on water production within the system.

Baldy Mesa Water District

The Baldy Mesa Water District Urban Water Management Plan[22] was completed in March 2002. The district is served entirely from groundwater. The water shortage contingency plan is addressed in Section IV of the BMWD plan.

1- Stages of Action – BMWD Ordinance No 1969-9 established a three-stage plan of action for periods of water supply shortage or emergency. The action levels are as follows:

- **Stage 1 –** Stage 1 stipulates water conservation measures under normal water supply conditions.
- **Stage 2** – Stage 2 stipulates water conservation measures under threatened water supply shortages.
- **Stage 3** – Stage 3 stipulates mandatory conservation measures under emergency water shortage conditions such as a natural disaster.

All stages will consist of both voluntary and mandatory conservation measures. Current demand is approximately 222 gallons per capita per day (gpcd).

[22] So & Associates Engineers, Inc., March 2002, "Baldy Mesa Water District 2000 Urban Water Management Plan"

- For shortages up to 10%, a 10 percent reduction goal will be established (200 gpcd).
- For shortages of 11 to 20 percent, a 20 percent reduction goal will be established (178 gpcd).
- For shortages of 21 to 35 percent, a 35 percent reduction goal will be established (144 gpcd).
- For shortages of 36 to 50 percent, a reduction goal of 50 percent or more will be established (111 gpcd).

Priorities for use of available water during shortages are:

1. Health and safety needs
2. Commercial, industrial and municipal use
3. Existing landscaping
4. New demand (projects under construction)

Exiting BMWD conservation measures include promotion of xeriscaping and replacement of high-water use fixtures, a leak detection and repair program, a corrosion control program, a ten-tier inclining block rate structure, enactment and enforcement of a water conservation ordinance, and a public information program. The District is also considering retrofit programs, landscape irrigation control program, and graywater and water recycling programs.

2 – Estimate of Minimum Supply for Next Three Years – The district is served entirely from groundwater. Historically, the local aquifer in the BMWD service area has not been a limiting factor in groundwater production, even during drought periods.

3 - Catastrophic Supply Interruption Plan – As discussed above, the local aquifer in the BMWD service area has not been a limiting factor in groundwater production, and is expected to continue to produce reliable supplies even in a catastrophe.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – The County Board of Supervisors adopted "no waste" Ordinance 1996-9[23] in October 1996. First time violators are issued a warning letter. A $100 surcharge is assessed for a second violation, and a $200 per month surcharge is added if the problem is not corrected in 30 days. In addition, the District has a adopted a 16-point conservation and waste reduction plan. This plan includes prohibitions on excess use, washing of paved areas, fountains, leakage. Mandatory measures include low water use landscaping for commercial and industrial developments, recycling of cooling water, evaporation-resistant swimming pool covers, and irrigation time of use. The District's present goal is to achieve a 10 percent reduction in per capita use. If this reduction goal is not met through Ordinance 1996-9, the BMWD Board will take appropriate action after public hearings.

BMWD has a ten-tier inclining-block rate structure. Households using the average 650 gallons per day would pay at the rate of $0.91 per hundred cubic feet. Households using half

[23] Ordinance No. 1996-9, "Ordinance of the Baldy Mesa Water District, County of San Bernardino, California, Amending Portions of the Baldy Mesa Water District Ordinance No. 1990-7 Establishing Additional Conservation Measures"

this amount pay $0.74 per hundred cubic feet, while households using twice the average pay $1.01 per hundred cubic feet[24].

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – The BMWD UWMP concludes that reduced water sales due to demand reduction would impact District revenues. BMWD maintains an operating reserve to cover most fixed operating costs, and the Plan recommends changes to the water rate structure to fully cover these costs.

6 - Draft Ordinance and Use Monitoring Procedure – Ordinance 1996-9 is attached to the BMWD Urban Water Management Plan. The District keeps historic and current pumping records on all wells and monitors customer's water usage. These records can be used to determine the actual reductions in water use, and evaluate the effectiveness of implemented conservation measures.

Hesperia Water District

The current Hesperia Water District (HWD) Urban Water Management Plan addresses the water shortage contingency plan for the District. The Water Shortage Contingency Plan is designed for implementation during drought conditions or extended unforeseen disasters resulting in long-term water shortages.

1 - Stages of Action - The HWD Board of Directors adopted Ordinance No. 31 on April 26, 1990 which defines the various stages of voluntary and mandatory conservation measures to be implemented in response to drought related water shortages. It includes three stages of water conditions:

- **Stage 1** – **Normal Conditions:** In effect during normal conditions and involves voluntary wise water use practices and mandatory timed irrigations and drought tolerant plants for new developments.
- **Stage 2** – **Threatened Water Supply Shortage:** Increase actions to conserve water when water supply shortages threaten the district's ability to provide water.
- **Stage 3** –**Water Shortage Emergency: Mandatory Conservation Measures**: To be implemented in the event of disaster or disruption of service. Actions include mandatory conservation measures and suspension of issuance of new construction permits.

2 – Estimate of Minimum Supply for Next Three Years The District relies on groundwater to meet its water needs so its water supply availability is not immediately impacted by annual variations in hydrologic conditions. The groundwater supply is adequate to meet water needs for a three-year period.

3 - Catastrophic Supply Interruption - A Stage 3 Water Shortage Emergency may result from an unforeseen disaster or water emergency such as an earthquake or other water emergency. If there is such a disaster, the District manager is authorized to implement the

[24] 2001 Water Rate Structure

emergency provisions. Within 72 hours of such a declaration, the Board of Directors will adopt a resolution finding a Stage 3 Water Shortage Emergency. In the event of a severe and extended shortage, the District would have to implement other alternatives to provide long-term water supplies.

In the event of natural or man-made disaster that could affect the District's ability to provide potable water supply for up to 30 days, the following measures would be implemented as required:

- HWD's Boil Water Notification Program will be activated.
- Irrigation uses of water will immediately be prohibited.
- Local bottled water companies will be contacted to begin delivery of potable water tanks to selected sites with HWD's service area.
- A public information program will be initiated.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – HWD's Ordinance includes penalties for violators of mandatory provisions, including civil action.

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – The District's current UWMP addresses the impacts to revenues and expenditures. The evaluation addresses a ten percent and 25 percent reduction in water use. To make up for lost revenue, HWD will consider:

- Reducing O&M expenses,
- Deferring certain capital improvements,
- Deferring certain purchases of computers and upgrades, meeting expenses, and certain non-operating materials.
- Utilizing funds held in reserve for replacement of facilities.

6 - Draft Ordinance and Use Monitoring Procedure – not specifically included in UWMP.

Hi-Desert Water District

The Urban Water Management Plan for the Hi-Desert Water District is comprised of the Warren Valley Basin Management Plan and associated addenda. The plan contains a description of their Emergency Stage Response Plan (ESRP) to implement more stringent water conservation measures during times when water demand exceeds supply. The initial, although undefined, provisions of the ESRP are implemented when the water supply system reaches 80 percent of capacity for three consecutive days. When demand increases further, Stage 2 becomes effective and places increasing, yet undefined, restrictions on water use, particularly outdoor water use. If delivery capacity continues to be inadequate, Stage 3 becomes effective and requests unspecified, voluntary conservation measures until such time as delivery problems can be mitigated.

Joshua Basin Water District

The current Joshua Basin Water District UWMP includes water shortage contingencies for the District. Some of the components of the plan are summarized below.

1 – Stages of Action - The water shortages are addressed in a four-stage plan with the levels of voluntary and mandatory conservation:

- **Stage 1** – If the shortage involves a 25 to 40 percent shortage in supply, a voluntary conservation program will be implemented with a 10 percent reduction goal.
- **Stage 2** – If the shortage involves a 40 to 55 percent shortage in supply, a voluntary conservation program will be implemented with a 15 percent reduction goal.
- **Stage 3** – If the shortage involves a 50 to 60 percent shortage in supply, a mandatory conservation program will be implemented with a 20 percent reduction goal.
- **Stage 4** – If the shortage involves more than a 60 percent shortage in supply, a mandatory conservation program will be implemented with a 25 percent reduction goal.

The contingency plan is designed to provide a minimum 60 percent of normal supply during a severe or extended water shortage. In addition, the District has established priorities for use of available water during a water shortage. Because the District relies solely on groundwater, rationing stages may be triggered by a shortage in aquifer supply, equipment failure, or catastrophic event.

2 – Estimate of Minimum Supply for Next Three Years - The District relies on groundwater to meet its water needs so its water supply availability is not immediately impacted by annual variations in hydrologic conditions. The groundwater supply is available to meet water needs for the next three-year period.

3 - Catastrophic Supply Interruption - As discussed above, the local aquifer in the Joshua Basin area has not been a limiting factor in groundwater production, and is expected to continue to produce reliable supplies even in a catastrophe.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – The District's rate structure is provided in Resolutions 96-567 and 99-601. In a declared water shortage emergency, a customer who exceeds the established allotment will pay a surcharge. If the customer continues to exceed the allotment usage for three consecutive billing periods, the District will install a flow restrictor on the service meter. The District reserves the right to terminate service to any customer who knowing and willingly violates any of the provisions of the water shortage contingency plan.

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – The District's current Urban Water Management Plan addresses the impacts to revenues and expenditures. The evaluation addresses a ten percent to 25 percent reduction in water use. A 25 percent reduction in water use would result in are 10 percent reduction in revenue. The UWMP

states that District maintains a reserve that would allow it to respond to a yearlong reduction in revenue.

6 - Draft Ordinance and Use Monitoring Procedure - During Stage 1 and Stage 2 water shortages, daily production figures will be reported to the Superintendent to verify that the reduction goal is being met. During Stage 3 and Stage 4 water shortages, this information will also be provided to the general manager. In the case of a disaster shortage, production figures will be reported to the Superintendent hourly. If reduction goals are not met during shortages, the District's Water Shortage Response Team will examine individual customer usage and corrective action will be taken.

Southern California Water Company

The current Southern California Water Company UWMP includes a Water Shortage Contingency Plan. The purpose of the Water Shortage Contingency Plan is to provide a plan of action to be followed at the various stage of a water shortage. The Water Shortage Contingency Plan is summarized below.

1 – Stages of Action - SCWC has developed a four-stage action plan to address water shortages of up to a 50 percent reduction in water supply. Because SCWC is an investor-owned utility, it must obtain approval of the CPUC prior to implementing mandatory water use restrictions. The water shortages and water conservation goals are described below:

- **Stage I** – **Minimum Shortage:** This stage includes a voluntary conservation program with a 10 percent demand reduction goal.
- **Stage II** – **Moderate Shortage:** This stage addresses a 10 to 20 percent shortage, and may include voluntary conservation or mandatory conservation rules with a 10 to 20 percent water use reduction goal. Prior to implementation of mandatory reductions, SCWC must obtain the approvals from the CPUC.
- **Stage III** –**Severe Water Shortage**: A Stage III water supply shortage includes a 20 to 35 percent reduction in supply, and includes some mandatory conservation rules (upon approval from CPUC). In addition, rate changes are implemented to penalize excessive water usage.
- **Stage IV** –**Critical Water Shortage**: A Stage IV water supply shortage includes a 35 to 50 percent reduction in supply, and includes some mandatory conservation rules (upon approval from CPUC). All steps taken in prior stages are intensified and water production is monitored daily for compliance with necessary reductions.

2 – Estimate Minimum Supply for Next Three Years - SCWC relies on groundwater to meet its water needs so its water supply availability is not immediately impacted by annual variations in hydrologic conditions. The groundwater supply is available to meet water needs for the next three-year period.

3 - Catastrophic Supply Interruption Plan - SCWC has a Master Disaster Plan in place that coordinates the overall company response to a disaster in any of its districts. In addition,

the Master Plan requires each district of have a local disaster plan that coordinates emergency response with other agencies in the area.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – The California Water Code section 10632(d) requires mandatory prohibitions against specific water use practices, which may be considered excessive during water shortages. SCWC is not authorized to pass any ordinances since it is an investor owned utility, but would request authority to add Tariff Rule 14.1 (Mandatory Conservation and Water Restriction Plan) to existing tariffs. SCWC may enforce penalties and charges for excessive water use during Stage III and IV water shortages ranging from charges for excessive use to termination of service.

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – SCWC is an investor-owned utility regulated by the CPUC. The CPUC authorizes all utilities to establish a memorandum account to track expenses and revenue shortfalls caused by both mandatory and voluntary conservation efforts. Utilities with CPUC approved water management plans are authorized to implement a surcharge to recover revenue shortfalls recorded in their drought memorandum accounts.

6 - Draft Ordinance and Use Monitoring Procedure – SCWC monitors water production on a daily basis during normal water supply conditions. During all stages of water shortages, daily projection figures are reported to and monitored by the Superintendent daily to determine the actual reductions in water use in the connection with implementing the water supply shortage contingency analysis.

Victor Valley Water District

The current Victor Valley Water District (VVWD) UWMP includes a water shortage contingency analysis for the District. Some of the components of the water shortage contingency plan are summarized below.

1 – Stages of Action - VVWD adopted Ordinance No. A-101-89 in which the District declared its authorization to prohibit the waste of District water during the declaration of a water shortage emergency. VVWD has developed a four stage-rationing plan to implement conservation measures during a water shortage. The water rationing stages are presented below:

- **Stage 1** – This stage represents a water supply shortage up to 10 percent. In Stage 1, the District will implement a voluntary conservation program with a 10 percent water demand reduction goal.
- **Stage 2A** – This stage represents a water supply shortage of 11 to 20 percent. In Stage 2A, the District will implement a voluntary and mandatory conservation program with a 20 percent water demand reduction goal.
- **Stage 2B** – This stage represents a water supply shortage of 21 to 35 percent. In Stage 2B, the District will implement a mandatory conservation program with a 30 percent water demand reduction goal.

- **Stage 3** – This stage represents a water supply shortage of 36 to 50 percent. In Stage 3, the District will implement a mandatory rationing with at least a 50 percent water demand reduction goal.

The priority for potable water use during shortages is based on the legal requirements set forth in the California Water Code Section 350-358.

2 - Minimum Supply for Next Three Years - The District relies on groundwater to meet its water needs so its water supply availability is not immediately impacted by annual variations in hydrologic conditions. The groundwater supply is available to meet water needs for the next three-year period.

3 - Catastrophic Supply Interruption Plan – In the case of a water shortage, the general manager is empowered to declare a water shortage emergency, subject to ratification of the Board of Directors within 72 hours, which will result in water conserving rules and regulations going into effect.

4 - Prohibitions, Penalties, and Consumption Reduction Methods – Under Ordinance A-101-89, the District states mandatory conservation and rationing conditions. Failure to comply with Stage 2B and 3 mandatory conservation policies will result in the following penalties:

- First violation: written notice.
- Second violation: $100.00 surcharge
- Third violation: $200.00 surcharge
- Subsequent violations: discontinuance of service

5 - Analysis of Revenue Impacts of Reduced Sales During Shortages – The District is primarily funded through a combination of fixed monthly service charges and water consumption charges**.** During a water shortage emergency, the District's based water service rate does not change while pumping costs decrease. In addition, penalty charges for excessive use during times of reduced use help compensate for lower utility bills.

6 - Draft Ordinance and Use Monitoring Procedure – VVWD adopted a Water Conservation Program on May 9, 1990. It addresses the items discussed above. During a water shortage emergency, the General Manager shall monitor supply and demand for water on a daily basis to determine the level of conservation required by the implementation of the Water Conservation Plan Stages, and notify the Board of Directions about the necessity for the implementation or termination of each stage.

Section 5 – Recycled Water Plan

Chapter 3 of the RWMP identifies wastewater and water recycling opportunities[25] in the MWA service area. There are two sources of recycled water: wastewater generated within the basin, and wastewater imported into the basin.

Imported Wastewater

Wastewater is imported to the Mojave Basin Area from the Lake Arrowhead Community Services District, Big Bear Area Regional Wastewater Agency, and Crestline Sanitation District. In all cases, this treated wastewater is discharged into streams that flow into the Mojave Basin Area.

Wastewater Reclamation within MWA

The City of Adelanto, the City of Barstow, and the Victor Valley Wastewater Reclamation Authority (VVWRA) provide wastewater collection and treatment services within the Mojave Water Agency boundaries. The VVWRA is coordinating recent water recycling efforts in the Upper Mojave River Basin, and has developed a recycled water project with the City of Victorville to provide reclaimed water for irrigation of the golf course at the Southern California Logistics Airport. They also have developed a memorandum of understanding with the California Department of Fish and Game regarding the maintenance of wastewater discharges to the Mojave River for habitat water supply. The VVWRA efforts are being coordinated with the Lahontan Regional Water Quality Control Board in order to secure appropriate permits for use of recycled water. Updated estimates of wastewater flows[26] from the VVWRA are presented in Table 3-3***(s)***.

Current Uses of Reclaimed Water

Much of the locally reclaimed and recycled water is recharged to the groundwater basin. Because the Mojave Basin Area is essentially a closed basin – very little groundwater enters or exits the basin - these supplies contribute to the overall water supply of the area. Reclaimed water is also currently used to support riparian vegetation and habitat along the Mojave River Channel and supplies water to downstream areas.

Future Uses of Reclaimed Water

The VVWRA has identified additional opportunities for future recycled water use and is planning to expand waste water treatment capacity through development of sub-regional treatment facilities. These would provide recycled water to surrounding communities to irrigate landscaped areas such as golf courses, parks, municipalities, and schools. Table 3-3***(s)*** presents the expected wastewater flows in 5-year increments through 2025.

[25] RWMP p. 3-23

[26] Victor Valley Wastewater Reclamation Authority, August 1, 2005 "Sewerage Facilities Plan Update, Year 2005 Amendment"

Table 3-3*(s)*: Total Wastewater Flow Projections (MGD)

Member Agency	2005	2010	2015	2020	2025	2030
Victorville including SCLA	7.99	10.40	12.47	15.04	18.25	--
CSA 42	0.06	0.06	0.06	0.06	0.06	--
CSA 64	0.82	1.00	1.22	1.37	1.56	--
Apple Valley	2.04	2.55	3.20	3.99	4.92	--
Hesperia	1.65	2.67	3.73	5.14	7.02	--
Total	**12.56**	**16.68**	**20.68**	**25.60**	**31.81**	--

Based on the assumption that all of the additional flows would be recycled, and that the possible users are identified, the projected recycled wastewater that will be produced and used is shown in Table 3-4***(s)***.

Table 3-4*(s)*: Recycled Water Projections (MGD)

Member Agency	2005	2010	2015	2020	2025	2030
Regional Plant						--
Victorville including SCLA	7.99	10.4	12.47	15.04	18.25	--
CSA 42	0.06	0.06	.06	0.06	0.06	--
CSA 64	0.82	1.00	1.22	1.37	1.56	--
less DFG MOU	(8.57)	(8.93)	(8.93)	(8.93)	(8.93)	--
Total Regional Plant	0.30	2.53	4.82	7.54	10.94	--
Apple Valley	n/a	2.42	3.04	3.79	4.67	--
Hesperia	n/a	2.54	3.54	4.88	6.67	--
Total	**0.30**	**7.49**	**11.41**	**16.22**	**22.29**	**--**

Reclaimed Water Costs

The estimated cost to provide facilities to reclaim the projected amount of wastewater is $75 million to $125 million. Annual operation and maintenance costs for each subregional facility ranges from $0.55 to $1.13 million. The project is to be funded from a number of federal or state grants and low-interest loans obtained through the State Revolving Fund. Consultants have been retained to provide engineering and environmental documentation services for the four subregional treatment facilities. The cost of providing reclaimed water, transmission infrastructure, and ownership of distribution facilities has yet to be determined.

The Wastewater Reclamation and Recycling Program would address a number of issues in the VVWRA service area. The need for additional collection and transmission facilities, the

desire of the member agencies to reuse water where possible, and the need for additional treatment capacity have all contributed to the aggressive pursuit of this program.

Section 6 – Water Quality Impacts on Reliability

Generally, water quality does not affect water supply reliability in the region. Some small areas have undesirable local concentrations of some constituents for which wellhead treatment or an alternative supply have been identified as remedial actions. Chapter 4 of the RWMP addresses water quality, and Chapter 10 addresses the impacts on water supply reliability, including the management strategies a water purveyor will implement such as selection of raw water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. The Plan Program EIR also provides an analysis of water quality and groundwater contamination[27].

The accumulation of salts in the groundwater basins is a concern, since the basins are essentially closed and salt contained in the imported reclaimed wastewater, salt added to locally generated wastewater, and salts in the SWP supplies will generally remain in the basin. An evaluation of the affects of salt loading is included as Appendix C of the PEIR. This evaluation predicts saline concentration increases of between 0.13 and 4.01 percent over the 20 year span of the Plan.

MWA has initiated a monitoring program which includes 65 wells from which the water quality samples are taken. Water quality enforcement responsibilities reside with the RWQCBs and the State Department of Health Services.

Several state, regional and county agencies have jurisdiction and responsibility for monitoring water quality and contaminant sites. Programs administered by these agencies include contaminant cleanup, public outreach, and emergency spill response.

MWA has commenced a project to develop a groundwater quality analysis system for the entire MWA service area. The project will include an evaluation of existing groundwater data and identification of data needs, the development of an information management system and regional model that will allow MWA to collect, reconcile, analyze, and access water quality information to meet MWA's long-term water quality objectives.

[27] Environmental Science Associates/Schlumberger Water Services, 2004, "Mojave Water Agency 2004 Regional Water Management Plan Program Environmental Impact Report", p. 3.2-12, Table 3.2-4, Figures 3.2-6 through 3.2-10

Section 7 – Water Service Reliability

The RWMP describes how the groundwater basins of the Mojave Basin Area act as a long-term storage facility for the region. All water demands in the area are met with groundwater supplies. While the increased groundwater pumping in excess of natural supplies over the last 50 years has resulted in a decline in groundwater elevations, the groundwater basins remain capable of meeting annual water demands through dry years and consecutive multiple dry years. The Mojave Basin Area Judgment, Warren Basin Judgment, and RWMP are intended to bring all basins into long-term hydrologic balance by 2020.

As water demands increase over the next 20 years, additional projects and water management actions are needed to continue to recharge the groundwater basins to maintain groundwater levels and protect groundwater quality for municipal, agricultural, industrial, recreational, and environmental uses. If such projects are not implemented and groundwater overdraft persists or intensifies, the presiding Judge for the Mojave Basin Area Judgment could require mandatory cutbacks in production.

RWMP Table 5-6 presents the average annual water balance for 2000 conditions. Tables 5-15***(s)*** through 5-17***(s),*** presented above[28], show average, dry year, and multiple dry year water balances from 2005 through 2030 in five year increments for each Subarea. The water balances present the annual surplus/deficit at the various demand levels for various hydrologic conditions. These balances are more representative of the change in groundwater storage in a given year rather than the ability to meet water demands in that year. Table 5-15***(s)*** indicates that, with implementation of the RWMP, the MWA area should have adequate supplies through at least 2025.

The 2005 SWP Reliability Report substantially reduces estimates of water available under dry year conditions. For an extremely dry year such as 1977, DWR expects only four percent of Table A supplies would be delivered. As shown in Table 5-16***(s)***, this would result in a one-year overdraft of over 92,000 acre-feet under 2025 demands, which would be met through demand management measures and increased reliance on stored groundwater.

The 2005 Reliability Report estimates water available under a six year drought such as 1987-1992 would be about 42 percent of Table A amounts. As shown in Table 5-17***(s)***, this would result in an average annual overdraft of 83,400 acre-feet under 2025 conditions, which would be met through demand management measures and increased reliance on stored groundwater.

[28] p.21

Section 8 – Adoption and Implementation of UWMP

A copy of the resolution adopting this Urban Water Management Plan supplement is attached.

RESOLUTION NO. 816-05
A RESOLUTION OF THE BOARD OF DIRECTORS OF THE MOJAVE WATER AGENCY APPROVING THE 2005 URBAN WATER MANAGEMENT PLAN

WHEREAS, Chapter 97 of Appendices to the Water Code ("MWA Law") enabled formation of the Mojave Water Agency, and prescribes the powers and duties of the MWA; and,

WHEREAS, Section 15 (a) of said Chapter 97 declares that "The Agency may do any and every act necessary so that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants of the agency including without limiting the generality of the foregoing, irrigation, domestic, fire protection, municipal, commercial, industrial, and recreational uses."; and,

WHEREAS, Subsection (11) of Section 15 (b) of said Chapter 97 empowers the Agency "To gather data for, and to develop and implement, after consultation and coordination with all public and private water entities who are in any way affected, management and master plans to mitigate the cumulative overdraft of groundwater basins, to monitor the condition of the groundwater basins, to pursue all necessary water conservation measures, and to negotiate for additional water supplies from all federal, state and other sources."; and,

WHEREAS, the California Urban Water Management Planning Act requires a water supplier with over 3,000 customers or that supplies over 3,000 acre-feet of water per year to prepare an Urban Water Management Plan (UWMP); and,

WHEREAS, in February of 2005 the Board of Directors adopted a Regional Water Management Plan (RWMP) now known as the 2004 Regional Water Management Plan ("RWMP"); and,

WHEREAS, said RWMP was developed after extensive review and discussion with the Technical Advisory Committee to the Mojave Water Agency over several meetings and presented to the general public at public meetings throughout the Agency; and,

WHEREAS, said RWMP serves as an Integrated Regional Water Management Plan, Groundwater Management Plan and Urban Water Management Plan and meets the requirements of SB 221, SB 610, SB 1938 and AB 901; and,

WHEREAS, the Mojave Water Agency has received additional information since adoption of the RWMP which when incorporated will maintain consistency with the California Urban Water Management Planning Act and the California Department of Water Resources UWMP Guidebook; and,

WHEREAS, the Mojave Water Agency will incorporate said additional information through a Supplement ("Mojave Water Agency 2004 Regional Water Management Plan Supplement A: 2005 Urban Water Management Plan Update") to the RWMP and said Supplement has been presented to the Technical Advisory Committee and the public for review and consideration; and,

WHEREAS, a public hearing to adopt the 2005 UWMP Update has been duly publicly noticed and was conducted by this Board of Directors on December 8, 2005.

NOW THEREFORE, IT IS RESOLVED, as follows:

The Board of Directors hereby approves the "Mojave Water Agency 2004 Regional Water Management Plan Supplement A: 2005 Urban Water Management Plan Update" which incorporates the previously adopted 2004 Regional Water Management Plan in its entirety.

PASSED AND ADOPTED at a meeting held on December 8, 2005.

Jim Ventura, President of the Board

ATTEST:

Kimberly Cox, Secretary of the Board