SECTION 4

WATER RESOURCE RELIABILITY

4.1 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.

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 (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.

4.2 RELIABILITY

Despite rapidly growing demands from residential development in the District service area, a number of opportunities exist to provide a reliable water supply for the community through the year 2030. In the near term, the District will stabilize its demands on the BSU and Edgar Canyon areas, develop recycled water use, capture and percolate stormwater, and use imported water for water supply to customers. Available water supply from the SWP, stormwater capture, and recycled water use can be used interchangeably depending upon local and statewide hydrologic conditions to supplement a stable local groundwater yield.

In the near term, the District Phase 1 Stormwater Capture and Recharge Program is expected to be complete by the winter of 2006-07. In an average rainfall year, the BSU can be recharged over and above the District's extractions. The surplus recharge will become accumulated storage, which can be extracted during dry years and/or for future water demands. Reports by DWR[1] and the USGS[2] estimate that the volume of groundwater in storage is approximately 1.1 million acre-feet. USGS, in 1971, reported that 160,000 acre-feet of available storage capacity exists in the BSU. DWR, in 1987, indicated the available storage may be even higher, approaching 383,000 acre-feet. This

is over and above the 1.1 million acre-feet currently in storage. STWMA estimates the amount of water in the Beaumont Basin could be as much as 2.4 million acre-ft. STWMA has also indicated that the BSU has been in or near equilibrium for twenty years from 1980 to 2000.[3]

SWP water can be recharged for many years before the demand increases to meet the available supply. Since the BSU has a large amount of available capacity, this recharged water will essentially be banked for future use. Combining the runoff and recharge projects planned by the District and the recharge of SWP water, reliability of water supply in the area appears to be more than adequate over the next 25 years.

To further stabilize the local groundwater use in the Beaumont/ Yucaipa area STWMA is developing a Watershed Management Plan for the 140 square mile area that includes the service area and SOI of the District. The Plan will include all necessary components that will establish how the member agencies will protect water quality and manage the areas local water resources to allow for its best and most beneficial use.

STWMA has completed the first phase of a four phase program to produce the watershed management plan. Groundwater extractions of the BSU will be coordinated and stabilized through a court appointed Watermaster.

The District will continue to incorporate recycled water delivery systems into new development, focusing on servicing new irrigation demands with recycled water and converting existing irrigation uses to recycled water. Recycled water will provide the District a new local source of water of high reliability, both lessening the dependence on imported sources and increasing reliability of the District's total supply.

4.3 FREQUENCY AND MAGNITUDE OF SUPPLY DEFICIENCIES

The District experienced extended droughts during 1950 – 1969; 1976 – 1977; and 1987 – 1992. In all of these drought events the BSU and Edgar Canyon areas continued to provide adequate water quantities without the need to ration water supply and with continued supply to all customers. This can be attributed to the large amount of groundwater in storage in the BSU. This stored water is replenished during wet years. Approximately 57% of the District's current water supply comes from the BSU. From 1950 to 1993, the groundwater level has declined about an average of 1.4 feet per year to a groundwater elevation of approximately 2,260 feet above mean sea level (msl). However, from 1980 to 1999 the rate of decline slowed to nearly a steady state condition[4] with essentially no qualitative change in groundwater storage in the BSU[5]. This clearly demonstrates the ability of the BSU to provide adequate water during extended drought periods.

4.4 PLANS TO AFFIRM A RELIABLE WATER SUPPLY

The main operational goal of the District is to use the surface water runoff, recycled water, and the BSU groundwater basin conjunctively. The current and future supply projections through 2030 are provided in Table 2-8 and a discussion is provided Section 2.2, which summarizes future plans to affirm a reliable water supply.

As a means of addressing any future BSU overdraft conditions, the Pass Agency has constructed water transmission facilities initially capable of delivering a minimum average flow of approximately 8,650 AFY from northern California to spreading grounds for recharge of the BSU, and for direct delivery to a proposed treatment plant located in Yucaipa.[6] The Pass Agency's total State Water Project Table A amount is 17,300 AFY. To provide this amount, the current pump station and possibly other facilities, would need to be increased in capacity. As stated previously, the District has the financing in place and is collecting fess from all new development for the purchase of additional Table A water. Also when they are purchasing the Table A amount the District is purchasing more rights than they need to account for the reported reliability issues with delivery of State Project Water.

4.5 RELIABILITY COMPARISON

The data in Table 4-1 shows the minimum available water supply to the District for an average/normal water year and a theoretical drought of one year and three consecutive years. For the basis, the year 2030 development conditions will be assumed. (This represents a "worst case scenario.") Note that it is necessary to assume some level of development to evaluate the amount of recycled water available etc.

The data in Table 4-1 assume that a single year drought is more severe on an annual basis than an extended 3-year drought. The extractions for Edgar Canyon were based on analysis of the lowest annual production from the Canyon for the 1983 to the present and the production for the lowest 3 consecutive years from 1983 to present. Recycled water is available in more than sufficient quantities to meet the non potable water demand, i.e., 9,199 acre-ft/yr of recycled water versus 7,028 acre-ft/yr non-potable water demand.

A conservative approach is used in that no State Project Water is available in the single dry year and a reduced amount is available during the 3-year drought. Table 4-1 also shows reductions in stormwater capture, urban runoff/groundwater recharge, and captured infiltration.

4.5.1 Average Year Analysis at Year 2030

As provided in Table 3-2, presented previously, the projected potable water demand is forecasted to be approximately 23,424 acre-feet for the year 2030. The non-potable water demand for that same year is 7,028 acre-ft. The recycled water available in 2030 is 9,199 acre-ft/year (see Table 2-8) and is more than adequate to meet the non-potable water demands. The difference can be recharged and become part of the additional extractions. Hence in Table 4-1, only the potable water demands are considered. For this scenario, there is a short-fall shown of about 2,305 acre-ft/yr between the potable water supply and the potable water demand. This could easily be remedied by increasing the amount of imported water, but the District would rather reduce the amount of water which is "banked." Table 2-8 shows a large amount of water in storage in the BSU – a high of nearly 62,000 acre-ft by 2014. This "banked water" can be used during the drought years

Table 4-1
Available Potable Water Supply Reliability
Acre-ft/yr

			Multiple Dry Water Years		
Water Source	**Average / Normal Water Year**	**Single Dry Water Year**	**Year 1**	**Year 2**	**Year 3**
Development Basis	**2030**	**2030**	**2028**	**2029**	**2030**
SWP via San Gorgonio Pass Agency	6872		1,000	1,000	1,000
Groundwater Produced from Edgar Canyon	1,800	600	800	800	800
Groundwater Produced from Beaumont Storage Unit from Temporary Surplus up to BCVWD Adjud. Right					
Total Overlier Rights Distributed to BCVWD	1049	1049	1049	1049	1049
Potable Water Supplied to Overlying Parties (Sunny Cal Egg Ranch and Surroundings)	549	549	549	549	549
Recycled or Non-potable Water Supplied to Overlying Parties	3,150	3,150	3,150	3,150	3,150
Urban Runoff/Groundwater Recharge	1129	100	150	150	150
Captured Infiltration (shallow groundwater)	300	100	150	150	150
Stormwater Capture/Groundwater Recharge	4,100	500	750	750	750
Recycled Water Recharged	2171	2171	2093	2132	2171
Total Allowable Extractions from Beaumont Storage Unit	19,319	7619	8891	8930	8969
TOTAL Potable Water Supply	**21,119**	**8219**	**9691**	**9730**	**9769**
Assumes recycled water meets non-potable water demands Data taken from Table 2-8					

4.5.2 Single Dry Year Analysis at Year 2030

The year 2030 was selected as the single dry year for evaluation. See Table 4-1. This is a worst case scenario. The projected potable water demand is 23,424 acre-ft/yr. This assumes no conservation and no effort to encourage customers to reduce demand. This too, is a conservative assumption. Analysis of the supply and demand for the critical dry year indicates a shortfall of 15,205 acre-ft. Table 2-8 shows the District will have 33,960 acre-ft of water in storage banked in the BSU; so this can easily accommodate the critical dry year shortfall. In fact, there will still be 18,755 acre-ft in a storage in the BSU at the end of the critical dry year.

4.5.3 Multiple (3-year) Period of Below Average Water Supply

Table 4-1 shows the water supply which is available each year for the 3-year extended period of below average water supply.

Table 4-2
Water Supply Reliability Analysis
Multiple Dry Years

		Multiple Dry Water Years		
Item		**Year 1**	**Year 2**	**Year 3**
Year	**2027**	**2028**	**2029**	**2030**
Potable Water Demand, Table 2-8 acre-ft/yr		23,241	23,332	23,424
Demand Reduction Through Conservation		10%	15%	15%
Potable Water Demand including effect of Conservation, acre-ft/yr		20,900	19,800	19,910
Water Supply Available (Table 4-1), acre-ft/yr		9,691	9,730	9,769
Supply - Demand, acre-ft/yr		-11,209	-10,070	-10,141
Groundwater "Banked" in BSU, acre-ft	38,462	27,253	17,183	7,042

The BSU can be used during dry years to provide water supply from groundwater storage. The District does not anticipate the need to reduce water deliveries during a drought. The analysis shows that even with an extended drought at the end of the planning period, the District is still able to meet the demands and still have some banked water in storage. If the demand could be reduced even more by conservation than indicated in Table 4-2, the amount of "banked" water would increase.

It should be noted that the water in storage shown in Table 2-8 are based on average hydrologic conditions. There will be some years, such as 2004-2005 that more than ample supplies will be available and additional water can be recharged and "banked," building up the reserve for dry years.

The emphasis of the District is to continue to develop the recycled water infrastructure and develop the stormwater capture recharge programs. The immediate benefit for additional water resource is the capture of stormwater runoff for percolation into the BSU. The first phase of the project (2,600 AFY) is scheduled for completion by about 2007. It can be seen from Figure 4-1 that full implementation of the project, which is anticipated for completion by 2010, will generate 4,100 AFY of additional water supply. Obviously the anticipated stormwater runoff during a dry year is not expected to match the long-term average of 4,100 AFY, however, the runoff is also expected to be greater during heavy rainfall years such as the winter of 2004-05. The accumulated storage from

heavy rainfall years and surplus storage from typical years can be extracted during dry years when necessary.

4.6 INCONSISTENT WATER SOURCES

4.6.1 Law

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

Groundwater is consistently available due to the size of the BSU. Recycled water is also consistently available. The District can for short periods of time, extract greater quantities of groundwater in the BSU knowing that during wet years the basin will be replenished. In addition, the Adjudication allows the District to build up a storage account for use during dry years. Section 6 discusses water shortage contingencies that can be implemented on a short-term basis to assist during periods of water supply shortages.

4.7 NEXT THREE YEAR MINIMUM WATER SUPPLY (2006 -2008)

4.7.1 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 (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.

4.7.2 Analysis

Table 4-3 presents a summary of the water supply and demand over the next 3 years. The law requires that the District evaluate what would happen under the "driest three year historic sequence" for the District's water supply. The District has encountered reduce pumping from Edgar Canyon. This has been addressed elsewhere in this UWMP, but has never had a reduction in the groundwater supply from the BSU. So for this analysis, the District will use the hydrologic conditions assumed for the extended 3-year dry period, presented previously.

The District has ordered 3950 acre-ft of State Project Water from the Pass Agency and this has been approved by the Pass Agency Board. Hydrologic conditions in the Sierra Nevada Mountains in early January 2006 indicate that water deliveries should be above 80 percent of the total Table A amount by the time the snow season is over. As a result the District will assume that it will obtain 3950 acre-ft for 2006. For subsequent years, it is assumed this is cut back to 1000 acre-ft/yr.

Table 4-3
Available Potable Water Supply Next 3 Years
Acre-ft/yr

	Multiple Dry Water Years		
Water Source	**Year 1**	**Year 2**	**Year 3**
Development Basis	**2006**	**2007**	**2008**
SWP via San Gorgonio Pass Agency	3950	1,000	1,000
Groundwater Produced from Edgar Canyon	800	800	800
Groundwater Produced from Beaumont Storage Unit from Temporary Surplus up to BCVWD Adjud. Right	6802	6802	6802
Total Overlier Rights Distributed to BCVWD	1986	2595	2090
Potable Water Supplied to Overlying Parties (Sunny Cal Egg Ranch and Surroundings)	0	0	69
Recycled or Non-potable Water Supplied to Overlying Parties	800	1600	2450
Urban Runoff/Groundwater Recharge	150	150	150
Captured Infiltration (shallow groundwater)	150	150	150
Stormwater Capture/Groundwater Recharge	750	750	750
Recycled Water Recharged	610	0	0
Total Allowable Extractions from Beaumont Storage Unit	15,198	13,047	13,461
TOTAL Potable Water Supply	**15,998**	**13,847**	**14,261**
Potable Water Demand	9,908	11,189	13,109
Supply - Demand	6,090	2,658	1,152
Banked Water in BSU (Includes 3,294 acre-ft carryover from 2005)	9,384	12,042	13,194
Data taken from Table 2-8			

Table 4-3 clearly indicates the District is able to meet the water supply demands even under rather severe hydrologic conditions. The supply exceeds the demand in each of the three years and permits the District to "bank" surplus water in the BSU.

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[1] *Ground Water Storage, Movement, and Quality Data, San Gorgonio Pass Water Agency* (September 1987). Letter Report prepared by Department of Water Resources, page 25.

[2] *Underground Storage of Imported Water in the San Gorgonio Pass Area, Southern California,* Geological Survey Water-Supply Paper 1999-D (1971). Prepared by R.M. Bloyd, Jr., page D29.

[3] San Timoteo Watershed Management Authority, *Watershed Management Program, Phase 1* (March 2002). Prepared by Wildermuth Environmental Inc., Section 2.3.2.2, page 2-7.

[4] *1994 Water System Master Plan Update* (September 1995). Beaumont-Cherry Valley Water District. Prepared by Parsons Engineering Science Inc. Pages 4-13 through 4-15.

[5] San Timoteo Watershed Management Authority, *Watershed Management Program, Phase 1* (March 2002). Prepared by Wildermuth Environmental Inc., Section 2.3.2.3, page 2-8.

[6] *Noble Creek Vistas Specific Plan Draft Environmental Impact Report* (September 2001). City of Beaumont. Prepared by Applied Planning Inc. Pages 4.3-4 and 4.3-5.