Kennedy/Jenks Consultants

San Antonio Water Company
Urban Water Management Plan

October 2006

Prepared for

San Antonio Water Company
139 N Euclid Avenue
Upland, CA 91786

K/J Project No. 0585014

Table of Contents

List of Tables *1*

List of Appendices *2*

Abbreviations *2*

Section 1: Public Participation 3

1.1 Introduction 3
1.2 UWMP Results 3
1.3 Urban Water Management Planning Act 4
1.4 Agency Coordination 4

Section 2: Service Area 5

2.1 Background 5
2.1.1 Service Area 5
2.1.2 Climate 6

Section 3: Water Sources (Supply) 9

3.1 Overview of SAWCo's Water Supplies 9
3.2 Surface Water Supply: San Antonio Canyon 10
3.3 Groundwater Supply 10
3.3.1 San Antonio Tunnel 10
3.3.2 Chino Basin 11
3.3.3 Six Basins 11
3.3.4 Cucamonga Basin 12
3.4 Groundwater Utilization and Spreading Operations 12
3.5 Wholesale and Recycled Water Supply 14
3.6 Emergency Water Transfers 14

Section 4: Reliability of Supply 15

4.1 Water Production and Inconsistency of Supply 15
4.1.1 San Antonio Canyon and Tunnel 15
4.1.2 Chino Basin 16
4.1.3 Six Basins Area 16
4.1.4 Cucamonga Basin 16
4.2 Quality 17
4.3 Alternative Source of Supply 17

Section 5: Water Use 19

5.1 Past, Current, and Projected Water Use 19
5.2 Domestic System 20

5.3 Irrigation System 20
5.4 Future Water Supply Projects 20

Section 6: Demand Management Measures 21

6.1 Water Survey Programs 21
6.2 Residential Plumbing Retrofit 21
6.3 System Water Leak Detection 21
6.4 Metering with Commodity Rates 21
6.5 Large Landscape Conservation Programs 22
6.6 High-Efficiency Washing Machine Rebate Program 22
6.7 Public Information Programs 22
6.8 School Education Programs 22
6.9 Conservation Programs for Commercial, Industrial and Institutional Accounts 22
6.10 Wholesale Agency Programs 22
6.11 Conservation Pricing 23
6.12 Water Conservation Coordinator 23
6.13 Water Waste Prohibition 23
6.14 Residential Ultra-Low-Flush Toilet Replacement Program 23

Section 7: Water Shortage Contingency Plan 24

7.1 Water Supply Shortages 24
7.2 Estimated Minimum Water Supply 25
7.3 Prohibitions and Consumption Reduction 25

Section 8: Reliability Planning 28

8.1 Reliability During a Drought 28
8.1.1 Normal Water Year 29
8.1.2 Single Dry Year 30
8.1.3 Multiple Dry Years 32
8.1.3.1 Multiple Dry Year Period 2010 33
8.1.3.2 Multiple Dry Year Period 2015 34
8.1.3.3 Multiple Dry Year Period 2020 35
8.1.3.4 Multiple Dry Year Period 2025 36

List of Tables

Table 1: Projected Maximum Annual Water Demands
Table 2: San Antonio Heights Population
Table 3: Climate
Table 4: SAWCo Entitlements
Table 5: Current and Planned Water Supply Sources, Based on Entitlements
Table 6: Groundwater Pumping Rights
Table 7: Historic Amount of Groundwater Pumped
Table 8: Future Amount of Groundwater Projected to be Pumped
Table 9: Past Current and Projected Water Deliveries
Table 10: Additional Water Uses and Losses
Table 11: Total Water Use
Table 12: Public Information Cost Breakdown
Table 13: Water Supply Shortage Stages and Conditions
Table 14: Preparation Actions for a Catastrophe
Table 15: Three Year Estimated Minimum Water Supply
Table 16: Draft Mandatory Prohibitions and Consumption Reduction Methods
Table 17: Penalties and Charges
Table 18: SAWCo Supply Reliability
Table 19: Basis of Supply Reliability Data
Table 20: Projected Normal Water Supply
Table 21: Projected Normal Water Demand
Table 22: Projected Supply Entitlement and Demand Comparison
Table 23: Projected Single Dry Year Water Supply
Table 24: Projected Single Dry Year Water Demand
Table 25: Projected Single Dry Year Supply and Demand Comparison
Table 26: Projected Supply Multiple Dry Year Period Ending in 2010
Table 27: Projected Demand Multiple Dry Year Period Ending in 2010
Table 28: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2010
Table 29: Projected Supply Multiple Dry Year Period Ending in 2015
Table 30: Projected Demand Multiple Dry Year Period Ending in 2015
Table 31: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2015
Table 32: Projected Supply Multiple Dry Year Period Ending in 2020
Table 33: Projected Demand Multiple Dry Year Period Ending in 2020
Table 34: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2020
Table 35: Projected Supply Multiple Dry Year Period Ending in 2025
Table 36: Projected Demand Multiple Dry Year Period Ending in 2025
Table 37: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2025

List of Appendices

A	Urban Water Management Planning Act
B	DWR UWMP Checklist
C	San Antonio Water Company's Board of Directors Resolution Approving the 2005 UWMP
D	Chino Basin Judgment
E	Six Basins Judgment
F	Cucamonga Basin Judgment
G	Water Shortage Contingency Plan

Abbreviations

SAWCo	San Antonio Water Company
DWR	Department of Water Resources
AFY	Acre Feet per Year
Eto	Evapotranspiration
WMP	Water Master Plan
OSY	Optimal Sustainable Yield
WECWC	West End Consolidated Water Company
SWTR	Surface Water Treatment Rule

Section 1: Public Participation

1.1 Introduction

The Urban Water Management Plan 2005 prepared by San Antonio Water Company (SAWCo) describes a balanced approach to management of water supplies. The UWMP provides guidance by describing and evaluating sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule and other information and programs. The UWMP serves as a long-range planning tool to help SAWCo assess their water resource needs and forms a solid basis for local and regional water management planning.

SAWCo is responsible for providing water service to its domestic and irrigation shareholders. SAWCo currently provides domestic service to 1,181 residential connections in the San Antonio Heights, an unincorporated area of San Bernardino County. Surface water is supplied to the City of Upland for treatment at Upland's water treatment plant. Irrigation quality water is provided to the cities of Upland and Ontario as well as about 15 other irrigation customers within these cities, including agricultural users, golf courses, and rock quarries.

This UWMP provides a comprehensive overview and discussion of the water supplies, expected demands, and reliability planning under various drought scenarios. This UWMP is divided into the following Sections:

- Section 2 provides and overview of the SAWCo service area.
- Section 3 discusses the various water sources available to SAWCo over the next 20 year period.
- Section 4 discusses the reliability of the supply waters from both a production and water quality aspect.
- Section 5 presents the expected water demands and uses over the next 20 years.
- Section 6 discusses the water demand management measures that SAWCo is employing, or is available, in order to conserve water use.
- Section 7 discusses the draft water shortage contingency plan that is being developed by SAWCo.
- Section 8 reviews the surplus or deficit of water available to SAWCo during various drought scenarios.

1.2 UWMP Results

Through the preparation and development of this plan, it has been determined that SAWCo's water supplies and projected usage are sufficient for normal year scenarios to the year 2020. SAWCo will need to supplement for years extending from 2021. During the event of a single dry

year, or multiple dry years, SAWCo will also need to supplement supply with additional water. Result analysis is shown in detail in Section 8.

1.3 Urban Water Management Planning Act

SAWCo's Urban Water Management Plan 2005 (Plan) has been prepared consistent with the State of California Water Code Sections 10610 through 10656, known as the Urban Water Management Planning Act (Act).

Originally enacted in 1983, the Act requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt an urban water management plan. The Act requires urban water suppliers to prepare plans that describe and evaluate reasonable and practical efficient water uses, recycling and conservation activities. These plans must be filed with the California Department of Water Resources every five years. The deadline for filing the 2005 plan is December 31, 2005.

Since 1983, many amendments have been added to the Act, the most recent occurring in 2004. These amendments require additional actions addressing urban water management plan preparation and consideration of such issues as metering, drought contingency planning, and water recycling. A copy of the Urban Water Management Plan Act is included in Appendix A.

The Department of Water Resources (DWR) has provided detailed background information to guide water districts in developing the 2005 Urban Water Management Plans. Appendix B has a copy of DWR's check list for preparing a UWMP in compliance with the water code. Additional information can be found on DWR's web page (wwwd.water.ca.gov). The DWR guidelines and checklist were utilized in the completion and development of this UWMP.

1.4 Agency Coordination

SAWCo strives for community involvement, continuously educating customers on the need to conserve water in a variety of ways. A quarterly newsletter called 'SAWCo Waterworks' with conservation tips and an editorial section called 'Conservation Corner' is provided to the public. In an effort to gain interest in the development of the UWMP, SAWCo published a brief article about the history and importance of the UWMP. SAWCo also held a public meeting to collect feedback and data, which was coordinated with Inland Empire Utilities Agency and The City of Upland. The feedback was incorporated into the final plan, and the final plan was approved by the Board in June. See Appendix C for a copy of the approval resolution.

Section 2: Service Area

SAWCo is a historically established Mutual Water Company incorporated October 25, 1882. The Company has consistently provided water service to its active shareholders for the past 123 years. SAWCo is a privately owned mutual water company, whereby participants are entitled to water supply based on the amount of owned shares.

SAWCO shareholders include most residents of the unincorporated area of San Antonio Heights, the entities of Upland and Ontario, local golf course and rock product entities, and those few remaining grove irrigators within the original Village of Ontario area.

2.1 Background

SAWCO is located approximately 35 miles east of Los Angeles and lies directly south of the San Gabriel mountain range. SAWCo is responsible for providing water service to its domestic and irrigation shareholders. They currently provide domestic service to 1,181 residential connections in the San Antonio Heights. Irrigation services are provided to the cities of Upland and Ontario as well as about 15 other irrigation customers within these cities, including agricultural users, golf coursed and rock quarries.

Water demands are anticipated to increase by approximately 10,000 AFY over a 20 year period. This increase is largely dependent on the City of Upland maximizing delivery of their entitlement and on an increase of spread water in the Cucamonga Basin. Irrigation system demands may also increase as the company's shareholders look to the water company for maximum deliveries of their entitlements; however there may be a decrease in irrigation demand due to minor grove irrigators selling their land in exchange for residential development. Maximizing the water company's deliveries requires making full use of the groundwater and surface water rights owned by SAWCo.

2.1.1 Service Area

SAWCo delivers domestic and irrigation water to a variety of users. SAWCo provides domestic water to users in San Antonio Heights (an unincorporated area of San Bernardino County) and to the City of Upland for treatment in their water treatment plant. Irrigation water is supplied to the City of Upland, the City of Ontario, Holliday Rock, Calmat [Vulcan], San Antonio Materials, and Upland Hills Country Club, Red Hill Country Club, Red Hill Homeowners Association and 9 additional minor irrigators. The City of Upland is the largest shareholder with 67.87 percent of the total outstanding shares. Projected maximum annual water demands are shown in Table 1. The population given in Table 2, is strictly for the San Antonio Heights service area. It does not represent changes which may occur in the City of Upland service area. Population changes in both the San Antonio Heights and Upland will affect the projected maximum annual water demand. The population table does not represent the total increase in population for both service areas.

Table 1: Projected Maximum Annual Water Demands

Projected Maximum Annual Water Demands - AFY		
Stockholder	**Demands (2004)[(a)]**	**2025 Annual Demand[(b)]**
Domestic Water		
San Antonio Heights	1,482	1,907
City of Upland[(c)]	9,517	12,959
Irrigation Water		
City of Ontario	876	1,183
9 Small Irrigators	79	390
Rock Companies and Golf Courses	1,365	2,108
Spread Water		
Canyon Basin (Spread)	52	-
Cucamonga Basin (Spread)	1,430	4,000
Total	**14,802**	**22,547**

(a) From 2004 production reports

(b) From Water Master Plan (2000)

(c) SAWCO provides surface water to the City of Upland for treatment in their water treatment plant, as well as domestic water via connection to domestic system.

Table 2 provides the projected population numbers for the San Antonio Heights domestic system.

Table 2: San Antonio Heights Population

Population - Current and Projected					
	2005	**2010**	**2015**	**2020**	**2025**
Service Area Population [(a)]	3,156	3,245	3,333	3,422	3,510

(a) Population estimate provided by SAWCo and based on the 2000 WMP projected estimate of 118 potential connections. SAWCo assumptions are: 1 dwelling unit per connection, 3 persons per dwelling unit, equaling a population increase of 354 persons. Straight line projection was used to establish population increase per year. Population estimate will be reviewed and revised as needed in a future WMP.

2.1.2 Climate

The SAWCo service area receives average annual precipitation of 16.08 inches with average temperatures ranging from 52 degrees in the winter months to 79 degrees in the summer months. Records indicate that temperatures as high as 117 degrees have been recorded in the City of Upland. Table 3 gives an overview of the average evapotranspiration (Eto), rainfall, and temperature in the area. Eto is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an

indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity.

Table 3: Climate

Climate													
	Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Annual**
Standard Average Eto, inches [(a)]	2.00	2.28	3.43	4.62	4.99	6.04	6.98	6.97	5.27	3.96	2.65	2.06	51.25
Average Rainfall, inches [(b)]	3.10	3.45	2.72	1.28	0.38	0.09	0.04	0.16	0.34	0.64	1.39	2.49	16.08
Average Temperature, ºF [(b)]	52.8	54.8	57.1	61.5	66.3	72.0	78.5	78.7	75.0	67.4	58.9	53.6	64.7

(a) Eto from California Irrigation Management Information Systems website.
(b) Rainfall and temperature data from the Western Regional Climate Center, and is based on data gathered from 1927 to 2005.

Section 3: Water Sources (Supply)

3.1 Overview of SAWCo's Water Supplies

SAWCo's main sources of water supply for the domestic system consists of groundwater supplies from the San Antonio Tunnel, wells No. 15 and No. 16 in the Chino Basin, and well 32 in the Cucamonga Basin. Surface water from the San Antonio Canyon is primarily used for irrigation supply, but is used for domestic supply when piped to the City of Upland water treatment plant. Sources of supply to the irrigation system include both the surface water from the San Antonio Canyon and the groundwater from the Chino Basin, Cucamonga Basin, and the Six Basins. SAWCo does not have access to either wholesale or recycled waters for water supply. However, SAWCo does have an emergency exchange, through a connection with the City of Upland, with the ability to obtain water from the Cucamonga Valley Water District (CVWD) through a wheeling arrangement. Portions of this wheeled water could contain wholesale water.

A summary of water supply entitlement is given in Table 4.

Table 4: SAWCo Entitlements

Entitlements		
Supply Source	**Current AFY**	**Ultimate AFY**
Surface Water Supplies		
San Antonio Canyon	13,865	13,865
Groundwater Supplies		
San Antonio Tunnel[(a)]	1,600	1600[(c)]
Chino Basin[(b)]	2,400	3,107[(c)]
Six Basins Area[(c)]	1,383	1,383[(c)]
Cucamonga Basin[(d)]	8,500	8,500
Totals	27,748	28,455

(a) SAWCo is entitled to unlimited rights of the water flowing in the San Antonio Tunnel. For numerical purposes, the maximum production of the tunnel water is assumed to be 3,776 AFY, based on historical 1993 deliveries. However, the actual supply allotted to SAWCo from this source is uncertain since a significant amount of this tunnel water is enhanced from the un-metered spreading of the San Antonio Canyon water (which is already accounted as a source). The canyon water is spread over a portion of the tunnel to enhance its production. For the purpose of analysis in this report, a conservative estimate of 1600 AFY was used for supply entitlement from the San Antonio Tunnel.
(b) Water rights in Chino Basin could ultimately be as high as about 3,650 AFY, if most agricultural transfers are temporary rather than permanent.
(c) This figure does not reflect any permitted overdraft or replenishment condition and is dependent on OSY.
(d) SAWCo has the right to extract 4,500 AFY and up to 6,500 AFY from this basin provided with an additional 2,000 AF (10-yr average) by spreading water from the San Antonio Canyon. Ultimately, additional spread during wet years above and beyond the 10-yr average 2,000 AF may be extracted and capped in an amount not to exceed 2,000 AFY.

3.2 Surface Water Supply: San Antonio Canyon

Under the 1925 Storm Water Suit Judgment (SAWCo vs. Pomona), SAWCo has the right to divert 13,864.61 AFY from the San Antonio Canyon, a surface water supply that collects stormwater runoff from the San Antonio Canyon watershed. This watershed encompasses 89 square miles, and includes portions of Mount Baldy and the San Gabriel Mountains. Approximately 85 percent of the watershed is U.S. Forrest Service land.

SAWCo's entitled amount represents 60 percent of the total water flows in the canyon as measured by the Southern California Edison lower powerhouse. The City of Pomona owns the remaining 40 percent. An electronic copy of the 1925 Storm Water Suit Judgment was not available, therefore it has not been attached as an appendix for this report.

The San Antonio Canyon water is collected into a Forebay, where it can be diverted into the SAWCO irrigation system or to the City of Upland Water Treatment Plant. A portion of the canyon water is diverted to spreading grounds that provide for infiltration into the San Antonio Tunnel as well as to the Cucamonga Basin and the San Antonio Spread Grounds in Six Basins.

3.3 Groundwater Supply

SAWCo utilizes various groundwater sources that include a subterranean tunnel in addition to traditional supply wells. SAWCo also engages in spreading operations that enhance the groundwater supply available for SAWCo to utilize. These groundwater sources are described below in the following subsections.

3.3.1 San Antonio Tunnel

SAWCo has unlimited rights to all water flowing in the San Antonio Tunnel, and this water source is the primary supply of SAWCo's domestic water. Only during summer months, when the demand is higher, are groundwater wells required for augmenting domestic water supply. Maximum production is assumed to be 3,776 AFY based on 1993 deliveries. However, the actual supply allotted to SAWCo from this source is uncertain considering that an undetermined amount of tunnel water is enhanced from the spreading of the San Antonio Canyon water (SAWCo Water Master Plan, 2000). San Antonio Canyon water, which is already counted as a source, is spread over a portion of the tunnel to enhance its production. For purposes of this report and to avoid a double count of the San Antonio Canyon water, a conservative value of 1,600 AFY has been assumed for San Antonio Tunnel water flow.

Portions of the deep rock tunnel (4-foot by 4-foot rectangular tunnel) is supported by redwood and rock beams, and is situated approximately 100 feet below the ground surface. The tunnel is fed by groundwater that naturally percolates through the subsurface and then rains down into the tunnel. The tunnel is also fed by a portion of water from the San Antonio Canyon, which is diverted into spreading grounds above the tunnel. Water collects in the tunnel which is piped to the Water Company's Forebay and chlorinated and piped to SAWCo's potable water reservoirs.

3.3.2 Chino Basin

SAWCo is located in the north-western most portion of the Chino Basin. Water rights in the Chino Basin were adjudicated in January 1978, and the Basin' s safe yield was established to be 140,000 acre-ft per year. See Appendix D for the Chino Basin Judgment. Safe yield is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Basin under conditions of a particular year without causing an undesirable result." The 1978 Judgment's allocation of the safe yield of the Basin includes three separate water zones: the Overlying Agricultural, Overlying Non-Agricultural, and the Appropriative Pool. SAWCo is part of the Appropriative Pool and has rights to 2.748% of the safe yield (defined as 54,834 acre-ft/yr), or 1,506.888 acre-ft/yr.

In addition to the operating safe yield (OSY) allocated to the members of the Appropriative Pool, the Chino Basin Watermaster reallocates the unused portion of the safe yield allocated to the Overlying Agricultural Pool to members of the Appropriative Pool as a supplement to their OSY rights in any year. Ultimate water transfers to SAWCo would range from 1,070 AFY, if most of the transfers are permanent, to 2,130 AFY for temporary transfers. For this report, it is assumed that SAWCo would obtain a total of 1,600 AFY (mid point) in transfers; thus bringing the estimated future maximum extraction rights from this basin to 3,107 AFY.

3.3.3 Six Basins

The Six Basins adjudicated ground water basin is located west of the San Jose Fault at the western side of SAWCo and consists of Canyon Basin, Upper Claremont Heights Basin, Lower Claremont Heights Basin, Pomona Basin, Live Oak Basin, and Ganesha Basin. The Six Basins operate under a court judgment that went into effect on January 1, 1999. Appendix E contains the Six Basins Judgment. In accordance with that settlement, SAWCo is entitled to 7.166% of the basins operating safe yield (OSY). The total OSY at the time of the judgment was 19,300 acre-ft, corresponding to initial production rights of 1,383 acre-ft/yr for SAWCo. The Six Basins Watermaster determined the OSY to be 18,000 acre-ft for calendar year 2003, 17,000 acre-ft for calendar year 2004, and16,000 acre-ft/yr in 2005 and 2006 respectively.

The Six Basins Judgment defines OSY as "the amount of groundwater, in acre-ft, which the Watermaster shall determine can be produced from the Four Basins Area by the parties during any single year, free of any replacement obligation under the Physical Solution." The Four Basins include Lower and Upper Claremont Basins, Pomona Basin, and Canyon Basin. The Watermaster determines operating safe yield using a hydrologic balance calculation, taking into consideration water level elevations; recharge activities, extraction, water quality data, precipitation data, and the probable availability of imported water.

Spreading surface water from the San Antonio Canyon in the Upper Claremont Heights Basin could increase SAWCo's extraction rights. This could be accomplished under the special projects provisions of the Judgment and will require approval by the Six Basin Watermaster.

3.3.4 Cucamonga Basin

Cucamonga Basin is located east and north of the Red Hill Fault in the northeastern section of the City of Upland. In 1958, a stipulated judgment allocated ground water within the Cucamonga Basin to 24 stipulating parties, which today consist of SAWCo, WECWCo, and Cucamonga Valley Water District (CVWD). See Appendix F for a copy of the Cucamonga Basin Judgment. The judgment stipulates SAWCo's water production as 4,500 acre-ft/yr, and requires that SAWCo spread an average of 2,000 acre-ft/yr of imported water from San Antonio Canyon Creek within Cucamonga Basin. Over ten years, 95% of surplus spread water can be added to SAWCo's right to extract 6,500 AFY with an additional 2000 AFY cap. According to The SAWCo Water Master Plan, SAWCO spreads an average of 4,900 AFY in the Cucamonga Basin. SAWCO is currently working with CVWD and WECWC in re-writing the judgment as well as evaluating spreading water north of the Cucamonga Dam. Under the revised judgment SAWCo will continue to spread 2,000 AF based on a 10-yr average per the original judgment.

Table 5: Current and Planned Water Supply Sources, Based on Entitlements

Current and Planned Water Supply Source Entitlements - AFY					
Water Supply Sources	**2005**	**2010**	**2015**	**2020**	**2025**
Supplier produced groundwater					
Cucamonga Basin [(a)]	8,500	8,500	8,500	8,500	8,500
Chino Basin [(b)]	4,149	2,400	2,400	3,107	3,107
Six Basins	1,383	1,383	1,383	1,383	1,383
San Antonio Tunnel Water [(c)]	1,600	1,600	1,600	1,600	1,600
Supplier surface diversions					
San Antonio Canyon Surface Water	13,865	13,865	13,865	13,865	13,865
Total	**29,497**	**27,748**	**27,748**	**28,455**	**28,455**

(a) SAWCo has the ultimate right to extract up to 8,500 ac-ft per year from Cucamonga Basin by spreading water from the San Antonio Canyon above the 2,000 AFY 10-yr average. This amount is reduced to 6,500 ac-ft in the event of a single or multiple-dry year period.
(b) Water rights in Chino Basin could ultimately be as high as about 3,650 ac-ft per year if most agricultural transfers are temporary rather than permanent.
(c) SAWCo is entitled to unlimited rights of the water flowing in the San Antonio Tunnel. For numerical purposes, the maximum production of the tunnel water is assumed to be 3,776 AFY, based on historical 1993 deliveries. However, the actual supply allotted to SAWCo from this source is uncertain since a significant amount of this tunnel water is enhanced from the un-metered spreading of the San Antonio Canyon water (which is already accounted as a source). The canyon water is spread over a portion of the tunnel to enhance its production. For the purpose of analysis in this report, a conservative estimate of 1600 AFY was used for supply entitlement from the San Antonio Tunnel.
(d) This Table does not reflect any permitted overdraft or replenishment condition.

3.4 Groundwater Utilization and Spreading Operations

Table 6 quantifies SAWCo's groundwater pumping rights. Groundwater pumping rights were compiled from information provided by SAWCo and information contained in the 2000 WMP. Tables 7 gives the past pumping quantities computed from production data supplied by SAWCo, and Table 8 gives future projected pumping quantities. Future projected pumping quantities are based on future demand as seen in Table 21 and are a straight line projection of past pumping

quantities. SAWCo has the ability to pump additional water based on water spread in the Cucamonga Basin. Nearly all of the Spreading occurs in Basin No. 6 (Basin A), located south of 19th Street and east of Campus Avenue. This basin has a maximum surface area of approximately 40 acres; however, the main recharge area consists of only 14 acres. Subsequent agreements have reduced the recharge area to sub-basin A-3. Surface water from the canyon and 20th Street reservoir is delivered to this basin via the 20th Street Storm Drain.

Table 6: Groundwater Pumping Rights

Groundwater Pumping Rights - AF Year	
Basin Name	**Pumping Right - AFY**
Cucamonga Basin [(a)]	6,500
Chino Basin	3,107
Six Basins Area	1,383
San Antonio Tunnel [(b)]	1,600
Total:	12,590

(a) Cucamonga Basin can pump additional water based on water spread. SAWCo has the right to extract 4,500 AFY and up to 6,500 AFY from this basin provided with an additional 2,000 AF (10-yr average) by spreading water from the San Antonio Canyon. Ultimately, additional spread during wet years above and beyond the 10-yr average 2,000 AF may be extracted and capped in an amount not to exceed 2,000 AFY.
(b) San Antonio pumping right is based on the normal year scenario (1997).

Table 7: Historic Amount of Groundwater Pumped

Historic Amount of Groundwater Pumped [(b)] - AFY					
Basin Name (s)	**2000**	**2001**	**2002**	**2003**	**2004**
Cucamonga Basin[(a)]	9,683	6,040	7,277	6,368	7,207
Chino Basin	40	487	1,128	870	1,198
Six Basins	885	1,303	1,339	1,286	1,355
San Antonio Tunnel	2,229	2,131	1,460	2,169	2,092
Groundwater Totals:	12,837	9,961	11,203	10,693	11,852
Total Supply Each Year[(c)]:	15,671	14,236	13,094	15,337	15,201
% of Total Supply	82%	70%	86%	70%	78%

(a) see section 3.4 for an explanation of Cucamonga Basin pumping rights
(b) Based on SAWCo's production report.
(c) The total supply includes groundwater and surface water.

Table 8: Future Amount of Groundwater Projected to be Pumped

Future Amount of Groundwater Projected to be Pumped - AFY				
Basin Name(s)	**2010**	**2015**	**2020**	**2025**
Cucamonga Basin[(a)]	5,335	6,636	6,500	6,500
Chino Basin[(a)]	847	1,053	2,861	3,107
Six Basins[(a)]	1,039	1,292	1,383	1,383
San Antonio Tunnel[(b)]	1,600	1,600	1,600	1,600
Groundwater Total[(c)]:	8,822	10,583	12,344	12,590
Total Supply Rights:	12,590	12,590	12,590	12,590
% of Total Water Supply	70%	84%	98%	100%

(a) Projected basin totals are based the averages pumped from 1998-2004 and are straight line projected to meet future demand. New wells are planned in Six Basins and Chino Basin and are expected to increase capacity by 1/3rd.

(b) San Antonio Tunnel water is based on the normal year (1997) as described in section 8.1

(c) Groundwater total is based on projected normal year demand as seen in Table 22, minus the normal year (1997) quantity of surface water supplied through San Antonio Canyon (4442 AFY).

3.5 Wholesale and Recycled Water Supply

SAWCo does not use wholesale water and does not have connections to any wholesale water supply. Therefore, no supply of wholesale water is available and consequently not included in the UWMP.

There is also no recycled water available in the area, so this water is also not considered for water supply.

3.6 Emergency Water Transfers

SAWCo maintains a connection with the City of Upland for emergency purposes. This connection is used for wheeling water from the CVWD through the city of Upland distribution system into the SAWCo potable water distribution system. A portion or all of the CVWD water may be comprised of wholesale water, but again, this connection is only used during emergencies.

Section 4: Reliability of Supply

4.1 Water Production and Inconsistency of Supply

The main sources of water supply for the domestic system consist of deep rock tunnel water from the San Antonio Tunnel, groundwater from wells No. 15 and No. 16 in the Chino Basin, and groundwater from well 32 in the Cucamonga Basin. Sources of supply to the irrigation system include surface water from the San Antonio Canyon and groundwater from the Chino, Cucamonga and Six Basins areas.

Historically, SAWCo has classified the cities of Upland and Ontario as irrigation customers. In reality, these customers, along with the San Antonio Heights domestic users, all receive water that meets or exceeds the Department of Health Services water quality standards and regulations for domestic use, with the exception of the surface water that is delivered to the City of Upland. This surface water is treated at the Upland water treatment plant when used for potable distribution. The water supply and distribution facilities that serve the San Antonio Heights are fairly independent and distinct from those that supply the City of Upland with only minor interconnection between them. Further, the water company has separate supply sources on both sides of the City of Upland's service area.

SAWCo's ability to move water between the different supply sources and end users is constrained by water quality concerns, an aging supply system, and the seasonal imbalance between supply availability and peak summer demands. All this has resulted in a continuous under utilization of water rights for the different groundwater basins. SAWCo has planned for the addition of a Well in the Claremont Hts. Basin (Six Basins) and in the Chino Basin. With the proposed well construction, SAWCo is proposing to construct appropriate booster stations and Reservoirs for additional supply reliability.

4.1.1 San Antonio Canyon and Tunnel

Surface water in the San Antonio Canyon is captured by a diversion structure at the Southern California Edison lower powerhouse and measured at the "Main Box" downstream from the diversion point. After the "Main Box", a small portion of water is piped and metered to spreading ponds along the west side of Mountain Avenue to enhance Tunnel production. By separate pipeline, flows leave the main box for conveyance to the Forebay irrigation box in the San Antonio Heights.

The amount of water available from the canyon is highly dependent on the rainfall in the San Antonio Canyon. During the 1988-2004 period, an average of 4,433 AFY of water was diverted through the Main Box; diversions ranged from a low of 1,831 AFY in 2002 to a high of 9,573 AFY in 2005. The amount of water diverted from the tunnel during the same period averaged 2,324 AFY and ranged from 1,237 AFY in 1989 to a maximum of 3192 in 2005. SAWCo does not maximize deliveries from the canyon because there is a lack of demand for irrigation water during the spring months when flows are typically the highest.

4.1.2 Chino Basin

SAWCo has two active production wells in the Chino Basin, well No. 15 and No. 16 in the northern portion of the basin. Well 12 is currently inactive.

SAWCo's production from the Chino Basin decreased significantly during the 1980's and early 1990's due to high nitrate problems in the northern portion of the basin and practically ceased after 1994 when well No. 12 went out of service. Very low levels of production have been recorded in the last few years from well No.15. This well has been regularly used to supply the San Antonio Heights domestic system during the summer. The presence of high levels of dissolved oxygen precluded this well from being used on a continuous basis. However, with the recent addition of well No. 16 and the installation of de-aeration tanks, use of wells No. 15 and No. 16 has increased. Current agreements allow the City of Upland to assign up to 50% of its production from the Chino Basin when delivery of water is to the City of Upland via a connection through their domestic system at 24th St and Campus Ave.

4.1.3 Six Basins Area

Existing SAWCo facilities in this basin are limited to wells No. 26 and 27 in the vicinity of the City of Upland's 17th Street reservoir. These two wells pump directly into this reservoir. SAWCo is proposing to drill a new Well (25a), booster station and reservoir at 17th & Benson.

Groundwater extractions from the Six Basins area have fluctuated significantly in the last few years between 442 AFY recorded in 1995 to 1,355 recorded in 2004. Maximum extractions from wells 26 & 27a, have been as high as 2,512 AFY recorded in 1984.

4.1.4 Cucamonga Basin

SAWCo currently has six active wells in this basin and there is one City of Upland well No. 15 operated under a license agreement with SAWCo and WECWCo. Four of these wells are concentrated in the 16th Street well field and are mainly used to provide potable water to the City of Upland at the 15th Street and Campus Avenue reservoirs. Water from these wells may also be used for landscape irrigation at the Upland Hills Golf Course, Red Hill Country Club and Red Hill Homeowner Association. Occasionally, water is pumped to the 20th Street Reservoir for irrigation user or deliveries to Holliday Rock plant on 20th Street from Well 31. Well 31 has limited use since DBCP and Nitrate concentrations currently exceed the maximum contaminant level allowed by DOHS and therefore is used strictly for irrigation. Of the other two wells in this basin, well No. 22 delivers irrigation water to the City of Upland and irrigation water to Red Hill Country Club. Well No. 32 is used for domestic service in the San Antonio Heights.

The 16th Street Well Field consists of Well 2, 3, 24, & 31. Due to contaminant levels of DBCP & Nitrate SAWCo blends Wells 2, 3, & 24 to meet DHS criteria in delivery to the City of Upland. These wells will be considered for a scientific evaluation to determine the possibility of reducing the contaminants produced from these wells in FY2006.

Water production from the Cucamonga Basin peaked in 1984 when 10,461 AF of water was extracted from the basin. Since then, water extractions have decreased with a low of 3,721 AF

in 1998. This was partially due to nitrate and DBCP contamination of wells in the lower portion of the basin. Lower water levels also decrease production.

4.2 Quality

In the past the State of California Department of Health Services (DOHS) has indicated concern that the San Antonio Tunnel water may be "under the influence of surface water", which would make it subject to the Surface Water Treatment Rule (SWTR). However, through studies with SAWCo, the California DHS has determined that the water from the San Antonio Tunnel does demonstrate the water quality of a separate groundwater and not under the influence of the surface water. Therefore, the DHS has classified the Tunnel water as a groundwater: and therefore the SWTR is not included in the following discussion. It should be noted that the water company continues to monitor the tunnel water through weekly sampling for total coliform and fecal indicators and yearly MPA and biological analysis.

SAWCo's tunnel water is tested weekly for coliform. Positive tests for total coliform have come back in a limited number of instances before chlorination and a few incidences after due to improper handling or environmental conditions. No fecal coliform has ever been present, before or after chlorination. Within SAWCo's distribution system, only one site has tested positive for coliform in the past five years. Total coliform has been detected at a number of wells, but fecal coliform has never been detected.

Radioactivity data for SAWCo (1995-2004) shows the total alpha particle activity reading have been well below the MCL of 15 pCi/L, and in most cases below 5 pCi/L. Similarly, SAWCo's uranium levels are well below the 20 pCi/L MCL.

Recent SAWCo water quality sample result data shows lead and copper levels to be well below their respective action levels. Lead was not detected, and copper was detected at only ~0.2 mg/l.

4.3 Alternative Source of Supply

SAWCo's goal is to increase production from the different groundwater basins, enhance the reliability of those sources, and increase the ability of the water company to move water between them and the end users. SAWCo plans to construct the following two new groundwater wells:

- Well 25A, in the Six Basins aquifer at 17th and Benson, which will be used for irrigation or domestic supply.
- Well 35, in the Chino Basin aquifer, at 20th and Campus, which will also have a reservoir and Booster Station to be used for irrigation and domestic supply to the Heights.

These projects are proposed within the next 5 years.

SAWCo also has a direct connection to the City of Upland at San Antonio Park & Forman. Should water be unavailable from Upland, SAWCo has the ability to receive water via a

wheeling arrangement with the City of Upland at the City's connection to CVWD at 19th Street & Saphire which will enable delivery of water from CVWD based on their water availability.

Section 5: Water Use

5.1 Past, Current, and Projected Water Use

SAWCo has developed future water demands for both the domestic and irrigation systems. The domestic system includes service to customers in San Antonio Heights and the City of Upland. Irrigation service includes the City of Upland, City of Ontario, Holliday Rock Co., Calmat, Upland Hills Golf Course, Redhill Country Club and a conglomerate of small irrigators sparsely distributed throughout the cities of Upland, Ontario and San Antonio Heights. Table 9 illustrated the past, current and projected water deliveries, Table 10 lists spread water quantities and losses and Table 11 sums the total water use.

Table 9: Past Current and Projected Water Deliveries

Past, Current and Projected Water Deliveries						
	2000	**2005**	**2010**	**2015**	**2020**	**2025**
Water Use Sectors	AFY	AFY	AFY	AFY	AFY	AFY
Domestic	1,759	1,935	1,915	2,171	2,427	2,683
Irrigation	11,984	9,235	11,003	12,473	13,943	15,413
Total	13,743	11,170	12,919	14,645	16,370	18,096

Water delivery numbers have been straight line projected from historical use to meet future demands.

Table 10: Additional Water Uses and Losses

Additional Water Uses and Losses [(a)] - AF Year						
Water Use	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**
Cucamonga Basin Spread	1,696	7,800	4,000	4,000	4,000	4,000
Canyon Basin Spread [(b)]	-	800	-	-	-	-
Unaccounted-for system losses [(c)]	233	600	345	381	416	451
Total	1,928	9,200	4,345	4,381	4,416	4,451

(a)SAWCo is currently working with Six Basins to establish a Storage and Recovery program to credit water spread into the San Antonio Spread Grounds.

(b)SAWCo only spreads water in the Canyon Basin during wet years. This analysis is based on normal year scenarios. Therefore, no water was added for Canyon Basin spread in the projected years 2010 to 2025.

(c) 2000 and 2005 unaccounted for system losses are taken from production reports. Future unaccounted losses are the average percent loss from 1998-2004, which is 2% of supply.

Table 11: Total Water Use

Total Water Use - AF Year						
	2000	2005	2010	2015	2020	2025
Total From Table 9 & 10	15,671	20,370	17,264	19,025	20,786	22,547
Essential Water Use (no spread)	13,975	11,770	13,264	15,025	16,786	18,547

Future use correlated with projected growth and development potential with respect to the developable properties and County Land Use Plan.

5.2 Domestic System

The domestic system provides potable water service to customers in the San Antonio Heights and non-potable water to the City of Upland for treatment in their water treatment facility. The service area covers the unincorporated area north of the City of Upland wedged between the Cucamonga Creek on the eastside and the San Antonio Creek on the west and the US Forest Service boundary on the north.

The monthly supply entitlement to shareholders varies throughout the year depending on the season of delivery. This seasonal variation enables the water company to make better use of its water rights while more closely matching the shareholders seasonal demands. The allocations per share are as follows: Jan-Feb 12,200 cf, Mar-Apr 14, 800 cf, May-Jun 21,400 cf, Jul-Aug 26,600 cf, Sept-Oct 24,100 cf, and Nov-Dec 13,900 cf. During the late fall, winter and early spring months the consumption demand is lower and it is increased in the summer months starting in May. On an annual basis, the monthly allocation averages 9,417 cf per month per share of stock or 2, 354 cf per month per quarter share. Deliveries beyond the base entitlement are deemed as excess flow and are charged at a premium rate. Water demands in the domestic system have been fairly consistent in recent years.

5.3 Irrigation System

SAWCo's irrigation system users include the City of Upland, City of Ontario, Holliday Rock, Calmat (Vulcan), Upland Hills Country Club, Red Hill Country Club, Red Hill HOA, San Antonio Materials, and 9 small irrigators. The entitlements increase deliveries during the summer when demands are at their highest and reduce deliveries during the winter months. Maximum water demand projections for irrigation are estimated based on 13,300 cubic feet per share of stock to reflect summer entitlements.

5.4 Future Water Supply Projects

In FY2007 SAWCo propose to budget for a new well (No. 25A) with Booster Station and Reservoir in the Claremont Basin, and a new well (No. 35), Booster Station and Reservoirs in the Chino Basin.

Section 6: Demand Management Measures

SAWCo is a new member of the California Urban Water Conservation Council (CUWCC). They have started implementing the 14 urban water conservation Best Management Practices (BMPs) to reduce long-term urban demands. Since SAWCo is a new member of CUWCC, no BMP reports have been submitted. The following sections outline the steps taken by SAWCo to implement BMPs.

6.1 Water Survey Programs

SAWCo has developed and implemented a marketing strategy for residential water use audits. This implementation began in 2003 and has been continued by SAWCo into 2005. SAWCo utilizes an outside contractor to conduct water audits to check for leaks; including toilets and faucets, and water usage patterns. Showerhead and aerator flow rates are checked and replacement is recommended if necessary. Irrigation systems and timers are checked, and irrigation schedules are reviewed or developed. The landscaped area and total irrigated area are both measured. Customers are then provided with information packets that include evaluation results and water savings recommendations. The number of audits completed, results and costs are tracked in excel.

Water use survey programs through IEUA have also been utilized for Multi-family residence/commercial users.

6.2 Residential Plumbing Retrofit

SAWCo promotes awareness of exchanging high-flow showerheads and other water use fixtures with their low flow counterparts by; publishing articles on water conservation in the *SAWCo Waterworks*, informing users by manning booths at local events and providing information during Water Awareness Month. At these events SAWCo also emphasizes water use surveys and ultra-low flush toilet replacement programs (refer to sections 6.1 and 6.14).

6.3 System Water Leak Detection

SAWCo has conducted water audits and leak detection and repair since 2003. They provide visual inspection for water leak detection, and meter calibration (production and customer meters) programs in their utility operations.

6.4 Metering with Commodity Rates

SAWCo requires meters for all new connections and the bill is based on volume of use. All existing accounts are metered, so there is not a need for a meter retrofit program. A meter change-out is completed on a 10 to 15 year basis.

6.5 Large Landscape Conservation Programs

SAWCo currently works with IEUA on the implementation of large landscape conservation programs.

6.6 High-Efficiency Washing Machine Rebate Program

SAWCo runs a high-efficiency washing machine rebate program in conjunction with IEUA. To date, 77 rebates have been paid totaling a water savings of 1.54 AF/Y.

6.7 Public Information Programs

SAWCo maintains an active public information program to promote and educate customers about water conservation. The following activities are included in the public information program: bill inserts, newsletters, brochures, bill showing water usage in comparison to previous year's usage, appearances at special events, and a website with information available to the public. Table 12 gives a breakdown of cost for each activity per year.

Table 12: Public Information Cost Breakdown

Program Expenditures by Year					
Actual	2001	2002	2003	2004	2005
Bill Inserts / Newsletters / Brochures	$ 790.00	$ -	$ 3,595.20	$ 226.78	$ 5,705.05
Bill showing water usage in comparison to previous year's usage	$ -	$ -	$ -	$ -	$ -
Special Events, Media Events	$ -	$ -	$ 2,057.08	$ 3,348.40	$ 3,663.18
actual expenditures - $	$ 790.00	$ -	$ 5,652.28	$ 3,575.18	$ 9,368.23

6.8 School Education Programs

There are no schools located within the San Antonio Water Company domestic service area. Staff has made presentations at a local pre-school.

6.9 Conservation Programs for Commercial, Industrial and Institutional Accounts

SAWCo currently has 6 commercial accounts, 3 industrial accounts and 3 institutional accounts. There are currently no conservation programs in place for these customers; however SAWCo is working in conjunction with IEUA to implement the Commercial, Industrial and Institutional (CII) toilet replacement part of the measure.

6.10 Wholesale Agency Programs

SAWCo receives no wholesale water at this time.

6.11 Conservation Pricing

SAWCo does not currently utilize conservation pricing

6.12 Water Conservation Coordinator

SAWCo does not have a dedicated water conservation coordinator. In the past, SAWCo has worked with IEUA to develop and implement conservation practices. As a new member of California Urban Water Conservation Council (CUWCC), existing SAWCo staff will work together to develop and implement conservation practices in accordance with Best Management Practices (BMPs).

6.13 Water Waste Prohibition

A water waste prohibition resolution has been in effect within SAWCo's service area since 2003. In September of 2006, SAWCo adopted a Water Shortage Contingency Plan which incorporated the water waste prohibition resolution. A copy of the Water Shortage Contingency Plan can be seen in Appendix G.

6.14 Residential Ultra-Low-Flush Toilet Replacement Program

SAWCo has a program for replacing high-water using toilets with ultra-low flush toilets. This program is run in conjunction with IEUA.

Section 7: Water Shortage Contingency Plan

SAWCo adopted a Water Shortage Contingency Plan in September of 2006. A copy of the water shortage contingency plan can be seen in Appendix G. SAWCo's plan contains the following measures and stipulations.

7.1 Water Supply Shortages

SAWCo's four stage rationing plan is invoked during declared water shortages. The plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage. Different actions are taken at each stage and all decisions are the opinion of the Board. The authority of the Board is official.

Table 13: Water Supply Shortage Stages and Conditions

Water Supply Shortage Stages and Conditions		
Stage No.	**Water Supply Conditions**	**% Shortage**
Year Round	When the demand for water consumption exceeds the Company's available supply, or threatens to do, provided there are no resources available to remedy the situation.	At the Opinion of the Board
Moderate Shortage	When the demand for water consumption exceeds the Company's available supply, or threatens to do, provided there are no resources available to remedy the situation.	At the Opinion of the Board
High Shortage	When the demand for water consumption exceeds the Company's available supply, or threatens to do, provided there are no resources available to remedy the situation.	At the Opinion of the Board
Severe Shortage	When the demand for water consumption exceeds the Company's available supply, or threatens to do, provided there are no resources available to remedy the situation.	At the Opinion of the Board

Emergency generators will power critical pumps and facilities in the event of a power outage. In the event of an earthquake, damage will be evaluated and responses will be made accordingly.

Table 14: Preparation Actions for a Catastrophe

Preparation Actions for a Catastrophe	
Possible Catastrophe	**Summary of Actions**
Regional power outage	Emergency generators power critical pumps and facilities.
Earthquake	Evaluate damage and respond accordingly.
Fire	Emergency generators power critical pumps and facilities.

7.2 Estimated Minimum Water Supply

The three year estimated minimum water supply quantifies the minimum water supply available during the next three years based on the driest three-year historic sequence for SAWCo. The driest three-year historic sequence is 1990-1992 as referenced in section 8, Table 19. Table 15 reflects the minimum amount of water available. SAWCo has entitlement and access to additional groundwater, not reflected in this table, to meet customer demands.

Table 15: Three Year Estimated Minimum Water Supply

Three-Year Estimated Minimum Water Supply - AF Year				
Source	**Normal**	**Year 1**	**Year 2**	**Year 3**
Ground Water	11,259	11,259	11,259	11,259
Surface Water	4,442	4,442	3,910	2,283
Total	15,701	15,701	15,169	13,542

Note: Surface water decreases in a dry year scenario while groundwater remains the same due to spread water and ability to pump through a three year dry period. The decrease in Surface Water is consistent will the decrease seen for a 3-year dry period as illustrated in Table 18.

7.3 Prohibitions and Consumption Reduction

SAWCo has prohibitions and consumption reduction methods set up for four water shortage stages. The stages consist of the Year Round Stage, seen below in Table 16, the moderate shortage stage, the high shortage stage and the severe shortage stage. Information pertaining to specific prohibitions and reduction methods for each of the four stages can be found in the Water Shortage Contingency Plan, Appendix G. Penalties and charges will be enforced in accordance with the stipulations in Table 17.

Table 16: Draft Mandatory Prohibitions and Consumption Reduction Methods

Mandatory Prohibitions and Consumption Reduction Methods
Conservation Program Ordinance - Year Round Stage
The washing of sidewalks, walkways, driveways, public and private parking areas and all other impervious hard surfaced areas by direct hosing when runoff water directly flows to a gutter or storm drain, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety; Excessive or unreasonable run off of water or unreasonable spray of the areas being watered. Every shareholder is deemed to have his/her water system under control at all times, to know the manner and extent of this water use and any run off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;
Allowing, permitting or causing the escape of water through breaks or leaks within the customers plumbing or private water distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the Water Company of a break or leak, is a reasonable time within which to correct such break or leak, or, at a minimum, to stop the flow of water from such break or leak;
Outdoor irrigation of landscape by sprinklers during the hours of 10:00 a.m. to 6:00 p.m. Shareholders are encouraged to avoid the use of sprinklers on windy days. Irrigation by hand held hose, drip irrigation, hand held bucket, or similar container or by use of a cleaning machine equipped to recycle any water used are permitted anytime. In no event shall any water so used be permitted to run off into adjacent property, streets, and alleys or storm drains;
Washing of automobiles, trucks, trailers, boats, and other types of equipment (mobile or otherwise) unless done with a hand held bucket or hand held hose equipped with a positive shutoff nozzle for quick rinses. The nozzle shall be removed when the hose is not in use to ensure the water supply is shutoff. However, this section does not apply to the washing of the above-listed vehicles or mobile equipment when conducted on the immediate premises of a commercial carwash;
With respect to eating and drinking establishments of any kind including, but not limited to, any restaurant, hotel, cafe, cafeteria, bar or club, whether public or private, that benefits from the supply of water by the Water Company shall not provide drinking water to any person unless expressly requested.
Exceptions: None of these restriction shall apply to the following: The routine and necessary use of water, other than for landscape irrigation, by a governmental entity in pursuit of its governmental functions for the benefit of the public, such as construction projects and for the cleaning of streets to prevent debris and harmful substances from entering water systems via storm drains; The necessary use of water for the routine maintenance, repair or construction of distribution and water supply facilities, residential and commercial plumbing and permanently installed landscaped irrigation systems. Available non-potable water which is only delivered for irrigation purposes and/or not available for distribution by current Water Company production and conveyance facilities.

(a) Water Shortage Contingency Plan Resolution 2006-03-06 was adopted as guidelines on September 19, 2006.

Table 17: Penalties and Charges

Penalties and Charges
Penalties or Charges
Any shareholder who uses water provided by the Water Company knowingly use, or permit the use of water in a manner contrary to any provision of this part, or in an amount in excess of that use permitted by the provisions of this resolution or that is reasonably necessary to satisfy the water usage need shall be found in non-compliance with this resolution and assessed the following:
If found in non-compliance of this resolution for a first occurrence during any calendar year or declared conservation stage, whichever time period is shorter in duration shall be assessed $50;
If found in non-compliance of this resolution for a second occurrence during any calendar year or declared conservation stage, whichever time period is shorter in duration shall be assessed $100;
If found in non-compliance of this resolution for a third occurrence or more during any calendar year or declared conservation stage, whichever time period is shorter in duration shall be assessed $500.
In addition to the above, the General Manager is hereby empowered to enact other restrictive measures that are intended to abate the conductor circumstances comprising the occurrence, including but not limited to the following: placement of a flow restricting device upon the water service, locking off of water meter, removal of water meter, and shutting off of the service line valve.

(a) Water Shortage Contingency Plan Resolution 2006-03-06 was adopted as guidelines on September 19, 2006. The above text is representative of what SAWCo's resolution will include.

Section 8: Reliability Planning

8.1 Reliability During a Drought

The available supplies and water demands for SAWCo's service area were analyzed to assess the region's ability to satisfy demands during three scenarios: a normal water year, single dry year, and multiple dry years. The tables in this section present the supply-demand balance for the various drought scenarios for the twenty year planning period 2005-2025. It is expected that SAWCo will be able to meet 100 percent of its normal year demand through the year 2025. Under single-dry year, and multiple-dry year scenarios SAWCo will need additional supply starting in the year 2020. The following Tables 20-37, quantify the supply and demand for each the normal, single-dry, and multiple-dry scenarios.

The following Table 18 presents the historical basis for supply reliability during normal, single dry, and multiple dry water years. Spreading water is an option for SAWCo. Water will not be spread during drought conditions or when there is a problem meeting general demand. Therefore, in the following scenarios, water spread has been neglected.

Table 18: SAWCo Supply Reliability

Supply Reliability[(a)] - AF Year					
			Multiple Dry Water Years		
Average / Normal Water Year	**Normal Water Year (1997)**	**Single Dry Year (1999)**	**Year 1 (1988)**	**Year 2 (1989)**	**Year 3 (1990)**
Groundwater	11,259	11,581	11,095	8,881	8,237
Surface Water[(b)]	4,442	3,676	5,369	3,910	2,283
Total	15,701	15,257	16,465	12,792	10,520
% of Normal Year	100%	97%	105%	81%	67%

(a) Numbers were taken from the SAWCO production reports of the years specified. See basis of water year data below for explanation of the years chosen.

(b) Surface Water includes San Antonio Canyon Water only. San Antonio Tunnel water is classified as groundwater.

The historical basis for the supply reliability data is presented in Table 19. Base years were chosen by analysis of rainfall data for the historical sequence of 1985-2005. The normal year is the year that most closely represents median rainfall and surface water collection. The single-dry year represents the year with the least rainfall following a normal or above average year. The multiple-dry years represent the lowest rainfall for a 3 consecutive years.

Table 19: Basis of Supply Reliability Data

Basis of Water Year Data		
Water Year Type	**Base Year(s)**	**Historical Sequence**
Normal Water Year [(a)]	1997	1985-2005
Single-Dry Water Year[(a)]	1999	
Multiple-Dry Water Years[(a)]	1988-1990	

(a) Rainfall data provided by SAWCo for the years 1985 to 2005 was used to determine base years.

The following subsections describe the region's water supply and demand during each of the three scenarios (normal, dry and multiple-dry) for the next twenty years. Groundwater supply is calculated to meet demand and capped at entitlement. Entitlements, as illustrated in Table 5, are capped at the following numbers: 13,883 AFY for normal year scenarios to year 2015, 11,883 AFY for dry year scenarios to year 2015, 14,590 AFY for normal year scenarios from year 2015 to 2025, 12,590 AFY for dry year scenarios from year 2015 to 2025. These numbers hold true for all analysis included in Tables 20 through 37. As discussed in Section 3, Normal year and dry year entitlement in the Cucamonga Basin shows a difference of 2000 AFY due to water available during normal and dry years. The increase in water available after the year 2015 is due to increased capacity in the Chino Basin. Surface water supply is assumed to be equal to the normal year (1997), as seen in Table 18 and reductions for single-dry and multiple-dry years are taken in accordance with the historical percent reduction seen in Table 18. Each analysis contains a grouping of 3 tables; a supply table, a demand table and a comparison table.

8.1.1 Normal Water Year

SAWCo's water supply is broken down into two categories: groundwater and surface water. Tables 20 to 22 show a comparison of normal year supply reliability vs. normal year demand. During a normal year scenario in the year 2025, SAWCo is projected to have an excess of 485 AFY of water.

Table 20: Projected Normal Water Supply

Projected Normal Year Water Supply - AFY				
	2010	**2015**	**2020**	**2025**
Groundwater Supply	11,883	11,883	12,590	12,590
% of projected normal	106%	106%	112%	112%
Surface Water Supply	4,442	4,442	4,442	4,442
% of projected normal	100%	100%	100%	100%
Total	16,325	16,325	17,032	17,032

Percent of projected normal is calculated as water supply divided by normal year supply (1997) for each groundwater and surface water as seen in Table 18.

Table 21 reflects demand numbers from Table 11 and summarizes SAWCo's demands during a normal year over the next twenty years and reflects only essential water use, no spread water is included. It is estimated that water demands will increase gradually over the next twenty years.

Table 21: Projected Normal Water Demand

Projected Normal Year Water Demand - AFY				
	2010	**2015**	**2020**	**2025**
Demand	13,264	15,025	16,786	18,547
% of year 2005	113%	128%	143%	158%

Percent of year 2005 calculates demand divided by normal water demand in the year 2005, as seen in Table 11.

The comparison between supply and demand for a normal water year is presented in Table 22. In a normal year, zero water conservation has been assumed, providing a more conservative assessment of the region's supplies. The difference of the supply total and demand total is shown and a difference as percent of supply and demand is shown. SAWCo shows an excess of 246 AFY in the Year 2020 and a deficit of 1,515 AFY under the Normal Year water demand scenarios. SAWCo will need to add additional sources of supply if growth reaches the projected 2025 numbers.

Table 22: Projected Supply Entitlement and Demand Comparison

Projected Normal Year Supply and Demand Comparison - AFY				
	2010	**2015**	**2020**	**2025**
Supply Totals	16,325	16,325	17,032	17,032
Demand Totals	13,264	15,025	16,786	18,547
Difference	3,061	1,300	246	(1,515)
Difference as % of Supply	19%	8%	1%	-9%
Difference as % of Demand	23%	9%	1%	-8%

8.1.2 Single Dry Year

The water demands and supplies for SAWCo's service area over the next twenty years were analyzed in the event that a single dry year occurs. The following paragraphs describe the effect of a single dry year on each of Uplands water sources.

Groundwater. Groundwater supplies represent a significant source of water for SAWCo. The majority of groundwater is produced from the San Antonio Tunnel, with additional water produced in the Cucamonga Basin, Chino Basin, and Six Basins groundwater wells. SAWCo spreads a significant amount of water each year and does not use its entitlement from the Chino Basin to full capacity. Therefore, SAWCo has effectively added to the groundwater aquifer

storage availability and needed water supply will be available during single dry year events. Groundwater in the Cucamonga Basin is capped at 6500 AFY during a dry-year scenario. It is assumed, water in other basins will be 100 percent available due to spreading.

Surface Water. SAWCo is entitled to Surface Water from the San Antonio Canyon. Currently SAWCo can spread 2,000 AF of collected surface water from the San Antonio Canyon to the Cucamonga Basin on a 10-yr average. During a dry year, however, it is anticipated that the availability of surface supplies will decrease. For a single dry year event, surface supplies are assumed to have 83 percent reliability, as seen in the supply reliability analysis, Table 18.

Tables 23 to 25 summarize the projected single dry year water supply and demand for the years 2010 through 2025. Percent of projected normal is the amount of projected supply divided by the projected normal year supply (table 20) displayed at a percent. As explained above, the groundwater supply was adjusted to meet demand and capped at a value of 12,590. This resulted in a shortage of water beginning in the year 2020, as seen in Table 25.

Table 23: Projected Single Dry Year Water Supply

Projected single dry year Water Supply - AFY				
	2010	**2015**	**2020**	**2025**
Groundwater Supply	9,588	11,349	12,590	12,590
% of projected normal	81%	96%	100%	100%
Surface Water Supply	3,676	3,676	3,676	3,676
% of projected normal	83%	83%	83%	83%
Total	13,264	15,025	16,266	16,266

Table 24: Projected Single Dry Year Water Demand

Projected single dry year Water Demand - AFY				
	2010	**2015**	**2020**	**2025**
Demand	13,264	15,025	16,786	18,547
% of projected normal	100%	100%	100%	100%

Table 25: Projected Single Dry Year Supply and Demand Comparison

Projected single dry year Supply and Demand Comparison - AFY				
	2010	**2015**	**2020**	**2025**
Supply totals	13,264	15,025	16,266	16,266
Demand totals	13,264	15,025	16,786	18,547
Difference	0	0	(520)	(2,281)
Difference as % of Supply	0.0%	0.0%	-3.2%	-14.0%
Difference as % of Demand	0.0%	0.0%	-3.1%	-12.3%

8.1.3 Multiple Dry Years

The Water demands for San Antonio's service area over the next twenty years were analyzed in the event that a multiple dry year period occurs. The following paragraphs summarize the effects of a multiple dry year scenario on SAWCo's water supplies.

Groundwater. Ground water from the Cucamonga Basin has been capped at 6,500 AFY for multiple-dry year scenarios. SAWCo spreads a significant amount of water each year in the Cucamonga Basin and some in the San Antonio Spread Grounds. It is assumed needed water supply from the basins will be available during multiple dry year events.

Surface Water. The volume of available surface water is expected to decrease in a multiple dry year scenario. Surface water reliability was estimated using rainfall data and is projected to be 100 percent, 88 percent and 51 percent reliable, respectively, during a 3 year dry period. These percents were calculated from data in Table 18.

The following Tables 26 to 37 show the water supply available to SAWCo during a multiple dry year periods for 2010 to 2025. The first numerical column represents a normal year, the second a single-dry year, and the 3 to 5th, multiple-dry years. There are 4 separate analyses, each with a grouping of 5 years, starting in 2006 and extending to 2025. Each analysis contains a supply table, a demand table and a comparison table. The percent of projected normal for each ground/surface supply and demand is calculated as the supply or demand divided by the projected supply or demand for that year. Projected supplies and demands have been straight line projected from the data in Table 20 for supply and Table 21 for demand. A 10 percent reduction in demand was taken for multiple-dry years due to conservation. As explained above, the groundwater supply was adjusted to meet demand and capped at the maximum entitlement. A deficiency is shown for the 3rd multiple dry year in the periods extending to 2020 and 2025. The deficiency seen in the single-dry year 2022 has been discussed above in the single-dry analysis (section 8.1.2) and the deficiency seen in the normal year 2021 is discussed in the normal year analysis (section 8.1.1).

8.1.3.1 Multiple Dry Year Period 2010

Table 26: Projected Supply Multiple Dry Year Period Ending in 2010

Projected supply multiple dry year period ending in 2010 - AFY					
	(normal)	(single dry)	(multiple dry)	(multiple dry)	(multiple dry)
	2006	**2007**	**2008**	**2009**	**2010**
Groundwater Supply[(a)]	7,627	8,692	6,958	7,758	9,655
% of projected normal	55%	73%	59%	65%	81%
Surface Water Supply[(b)]	4,442	3,676	4,442	3,910	2,283
% of projected normal	100%	83%	100%	88%	51%
Total Supply	12,069	12,368	11,400	11,669	11,938

Table 27: Projected Demand Multiple Dry Year Period Ending in 2010

Projected demand multiple dry year period ending in 2010 - AFY					
	2006	**2007**	**2008**	**2009**	**2010**
Demand (Table 11) [a]	12,069	12,368	11,400	11,669	11,938
% of projected normal	100%	100%	90%	90%	90%

(a)The demand for projected multiple dry year period years 2006-2025 is a straight line projection between the existing water use and the ultimate demand of 22,547 seen on Table 1. This is the same straight line projection used to develop 5 year incremental numbers in Table 9 which in turn result in the essential water use numbers on Table 11.

Table 28: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2010

Projected Supply and Demand Comparison multiple dry year period ending in 2010- AFY					
	2006	**2007**	**2008**	**2009**	**2010**
Supply totals	12,069	12,368	11,400	11,669	11,938
Demand totals	12,069	12,368	11,400	11,669	11,938
Difference	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

8.1.3.2 Multiple Dry Year Period 2015

Table 29: Projected Supply Multiple Dry Year Period Ending in 2015

Projected supply multiple dry year period ending in 2015 - AFY					
	(normal)	(single dry)	(multiple dry)	(multiple dry)	(multiple dry)
	2011	**2012**	**2013**	**2014**	**2015**
Groundwater Supply	9,174	10,292	8,447	9,295	11,239
% of projected normal	66%	87%	71%	78%	95%
Surface Water Supply	4,442	3,676	4,442	3,910	2,283
% of projected normal	100%	83%	100%	88%	51%
Total Supply	13,616	13,968	12,889	13,206	13,522

Table 30: Projected Demand Multiple Dry Year Period Ending in 2015

Projected demand multiple dry year period ending in 2015 - AFY					
	2011	**2012**	**2013**	**2014**	**2015**
Demand (Table 11) [a]	13,616	13,968	12,889	13,206	13,522
% of projected normal	100%	100%	90%	90%	90%

(a)The demand for projected multiple dry year period years 2006-2025 is a straight line projection between the existing water use and the ultimate demand of 22,547 seen on Table 1. This is the same straight line projection used to develop 5 year incremental numbers in Table 9 which in turn result in the essential water use numbers on Table 11.

Table 31: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2015

Projected Supply and Demand Comparison multiple dry year period ending in 2015- AFY					
	2011	**2012**	**2013**	**2014**	**2015**
Supply totals	13,616	13,968	12,889	13,206	13,522
Demand totals	13,616	13,968	12,889	13,206	13,522
Difference	0	0	0	0	0
Difference as % of Supply	0%	0%	0%	0%	0%
Difference as % of Demand	0%	0%	0%	0%	0%

8.1.3.3 Multiple Dry Year Period 2020

Table 32: Projected Supply Multiple Dry Year Period Ending in 2020

Projected supply multiple dry year period ending in 2020 - AFY					
	(normal)	(single dry)	(multiple dry)	(multiple dry)	(multiple dry)
	2016	**2017**	**2018**	**2019**	**2020**
Groundwater Supply	10,935	12,053	10,031	10,880	12,590
% of projected normal	75%	96%	80%	86%	100%
Surface Water Supply	4,442	3,676	4,442	3,910	2,283
% of projected normal	100%	83%	100%	88%	51%
Total Supply	15,377	15,729	14,473	14,790	14,873

Table 33: Projected Demand Multiple Dry Year Period Ending in 2020

Projected demand multiple dry year period ending in 2020 - AFY					
	2016	**2017**	**2018**	**2019**	**2020**
Demand (Table 11) [a]	15,377	15,729	14,473	14,790	15,108
% of projected normal	100%	100%	90%	90%	90%

(a)The demand for projected multiple dry year period years 2006-2025 is a straight line projection between the existing water use and the ultimate demand of 22,547 seen on Table 1. This is the same straight line projection used to develop 5 year incremental numbers in Table 9 which in turn result in the essential water use numbers on Table 11.

Table 34: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2020

Projected Supply and Demand Comparison multiple dry year period ending in 2020- AFY					
	2016	**2017**	**2018**	**2019**	**2020**
Supply totals	15,377	15,729	14,473	14,790	14,873
Demand totals	15,377	15,729	14,473	14,790	15,108
Difference	0	0	0	0	(235)
Difference as % of Supply	0%	0%	0%	0%	-2%
Difference as % of Demand	0%	0%	0%	0%	-2%

8.1.3.4 Multiple Dry Year Period 2025

Table 35: Projected Supply Multiple Dry Year Period Ending in 2025

Projected supply multiple dry year period ending in 2025 - AFY					
	(normal)	(single dry)	(multiple dry)	(multiple dry)	(multiple dry)
	2021	**2022**	**2023**	**2024**	**2025**
Groundwater Supply	12,590	12,590	11,616	12,465	12,590
% of projected normal	87%	100%	92%	99%	100%
Surface Water Supply	4,442	3,676	4,442	3,910	2,283
% of projected normal	100%	83%	100%	88%	51%
Total Supply	17,138	16,266	16,058	16,375	14,873

Table 36: Projected Demand Multiple Dry Year Period Ending in 2025

Projected demand multiple dry year period ending in 2025 - AFY					
	2021	**2022**	**2023**	**2024**	**2025**
Demand (Table 11) [a]	17,138	17,491	16,058	16,375	16,692
% of projected normal	100%	100%	90%	90%	90%

(a)The demand for projected multiple dry year period years 2006-2025 is a straight line projection between the existing water use and the ultimate demand of 22,547 seen on Table 1. This is the same straight line projection used to develop 5 year incremental numbers in Table 9 which in turn result in the essential water use numbers on Table 11.

Table 37: Projected Supply and Demand Comparison Multiple Dry Year Period Ending 2025

Projected Supply and Demand Comparison multiple dry year period ending in 2025- AFY					
	2021	**2022**	**2023**	**2024**	**2025**
Supply totals	17,138	16,266	16,058	16,375	14,873
Demand totals	17,138	17,491	16,058	16,375	16,692
Difference	(106)	(1,225)	0	0	(1,819)
Difference as % of Supply	-1%	-8%	0%	0%	-12%
Difference as % of Demand	-1%	-7%	0%	0%	-11%

Appendix A: Urban Water Management Planning Act

Appendix B: DWR UWMP Checklist

Appendix C: SAWCo's Board of Directors Resolution Approving the 2005 UWMP

Appendix D: Chino Basin Judgment

Appendix E: Six Basins Judgment

Appendix F: Cucamonga Basin Judgment

Appendix G: Water Shortage Contingency Plan